

# **SBK-VERIFICATION PROTOCOL INCLUSION DATA IN THE DUTCH ENVIRONMENTAL DATABASE**

**Based on the  
Assessment Method Environmental Performance of Construction  
and Civil Engineering (GWW) Works**

**Final Version 2.0, November 2014**

*SBK*



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Stichting Bouwkwiteit in Rijswijk (hereinafter referred to as: ' SBK ') has put together the Assessment Method Material Based Environmental Performance of Buildings and Civil Engineering Works (hereinafter: ' the assessment method ') and the SBK verification protocol (hereinafter referred to as: ' the verification protocol ') with the great care.

SBK reserves the right to change the Assessment Method and the Verification Protocol unannounced at all times.

Translations of the determination method and the verification protocol are based on the Dutch version of these documents. In case of ambiguity of these translations the explanation and interpretation of the Dutch version will be leading and decisive.

Stichting Bouwkwiteit excludes, in addition, liability for any damage, direct or indirect, of any kind, arising out of or in any way connected with the use of the Assessment Method and the SBK Verification Protocol.

## **1. INTRODUCTION**

### **1.1. Of general interest**

This version of the verification protocol replaces version 1.0 of July 2011.

The verification protocol describes the procedure to verify data in order for that data to be included in the Dutch Environmental Database (MND). The verification requirements have been described in the Assessment Method Environmental Performance Construction and Civil Engineering (GWW) Works. (from here on referred to as: Assessment Method).

The Assessment Method Environmental Performance Construction and Civil Engineering (GWW) Works (from here on out referred to as Assessment Method) has been developed to calculate the material-based environmental performance of construction, construction works and civil engineering works over their entire life cycle in a unified and controllable method. For more information and for definitions of terms used in this verification protocol, see the Assessment Method (version June 2014), also available on [www.milieudatabase.nl](http://www.milieudatabase.nl).

The Assessment Method acts as a Product Category Rules (PCR) document for all construction products. Another aim of the Assessment Method is to synchronize the calculation core of building- and construction instruments.

### **1.2. Dutch Environmental Database**

To achieve a uniform calculation of the environmental performance of construction and civil engineering works in the context of the Netherlands, the Dutch Environmental Database (NMD) was established. The NMD includes base profiles and the on the base profiles based product cards (B&U) and item cards (GWW). These base profiles and product/item cards are used by several calculation instruments, which are employed to calculate the environmental performance at the building or civil engineering works level. Together with the calculation rules in the Assessment Method, this will ensure an identical calculation core in the different calculation instruments, which, in turn, will result in identical results.

The NMD contains three categories of product information:

- Category 1: brand data, verified by an independent, qualified third party according to the SBK Verification Protocol.  
Level of publicity: underlying data are not made public, environmental profiles are accessible through instruments such as DuboCalc, GreenCalc en GPR.  
For whom: producers and suppliers.
- Category 2: generic data (brand-less), verified by an independent, qualified third party according to the SBK Verification Protocol, with declaration of representativeness, (representative, for example, for the Dutch market or a group of producers).  
Level of publicity: underlying data are not made public, environmental profiles are accessible through instruments such as DuboCalc, GreenCalc en GPR.  
For whom: groups of producers, suppliers and branches
- Category 3: generic data (brand-less), not verified according to the SBK Verification Protocol.  
Level of publicity: underlying data (set-up of product/item cards) is made public through the webpage of SBK: [www.milieudatabase.nl](http://www.milieudatabase.nl)  
For whom: groups of producers, suppliers and branches.

The category 1 and 2 base profiles and product/item cards that serve as input for the NMD are supplied by producers and branches of construction products. They retain ownership of the Environmental profiles and can always choose to publicize the data, possibly including underlying data, in another way.

The Assessment Method and the NMD are closely connected in order to achieve unified environmental performance calculations at the building and civil engineering works level. In the schematics that are printed below, it is explained that the Assessment Method serves as PCR, to establish EPD as well as calculation rules for the calculation core of instruments such as GPR and GreenCalc.

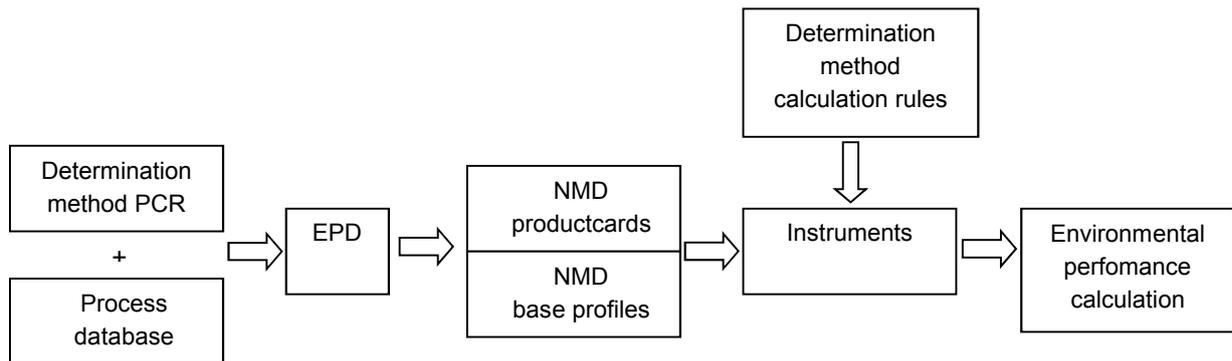


Figure 1: Assessment Method, EPD, NMD and instruments for environmental performance calculation

### **1.3. SBK Verification Protocol (this document)**

The environmental data that is declared in the NMD, based on the Assessment Method, are verified according to the procedures described in this SBK Verification Protocol. It is the responsibility of the composer of the environmental data to ensure inspection of the latest version of the SBK Verification Protocol.

In order to ensure a verification according the SBK Verification Protocol, the LCA executor needs to fill-out the remarks column. He or she has to indicate where in the project file the required information can be found and this form is to be included in the project file. This document is available as a word-file on the website of the NMD: [www.milieudatabase.nl](http://www.milieudatabase.nl).

The subject and scope of the Verification protocol are the category 1 and 2 data.

Category 1 and 2 data for inclusion in the NMD are:

Verified information about the environmental aspects of a construction product which are generated on the initiative of a (representative of) producer(s) through an environmentally focussed Life Cycle Analysis, that is usable for inclusion in the NMD.

Categories 1 and 2 data for inclusion of data are, licensed third party inspected, declarations, type III EPD (Environmental Product Declaration) specifically intended for the Dutch Construction and Civil Engineering Works market.

The individual producer or his or her representative (branch, association, holding)<sup>1</sup> is responsible for the supply of information on the construction products as well as additional services that are provided with them. De producer provides data to be included in the NMD or has them provided. This is also the person that requests the inclusion into the NMD at SBK. After a successful verification process, the data can be included in the NMD. The verification is to be executed by an agency that completes the

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<sup>1</sup> Hereafter referred to as “the producer”

procedure “SBK-voorwaarden erkenning LCA-deskundige t.b.v. de Nationale Milieudatabase” (SBK-requirements recognition NMD LCA-expert), version 2.0 (December 2014) and the agency has to be listed on the “Lijst van erkende LCA-deskundigen” (List of licensed NMD LCA experts). Both documents are available on [www.milieudatabase.nl](http://www.milieudatabase.nl).

The verification is to be executed according to the requirements set out in this Verification Protocol. The verification has two parts:

1. A licensed agency checks if the data, to be included in the NMD, are prepared according to the Assessment Method;
2. The licensed verification agency supplies its verification report to the producer who can arrange the inclusion of the data in the NMD with that verification report.

This Verification protocol contains requirements for both parts.

The Verification protocol consists of:

- Application procedure for the inclusion of data in NMD of SBK (chapter 2);
- Requirements for the inclusion of data in the NMD (chapter 3);
- Instruction for the evaluation of the verification agency (chapter 4);

In appendix A, verification tables are included that are to be filled out by the verification agency.

Appendix B contains the requirements for the project file and the LCA-report. In appendix H of the Assessment Method, information is supplied on the way product/item cards and base profiles are to be delivered to SBK.

## **1.4. Equivalence**

When the requirements of the Assessment Method (chapter 2) are not fulfilled, equivalency may be possible. See the procedure “Determination of Equivalency and verifying of data for NMD” that is included in appendix C.

## 2. PROCEDURE FOR INCLUSION OF DATA IN THE NMD.

In figure 2, the application procedure is depicted. Below the figure, the parts are elaborated on.

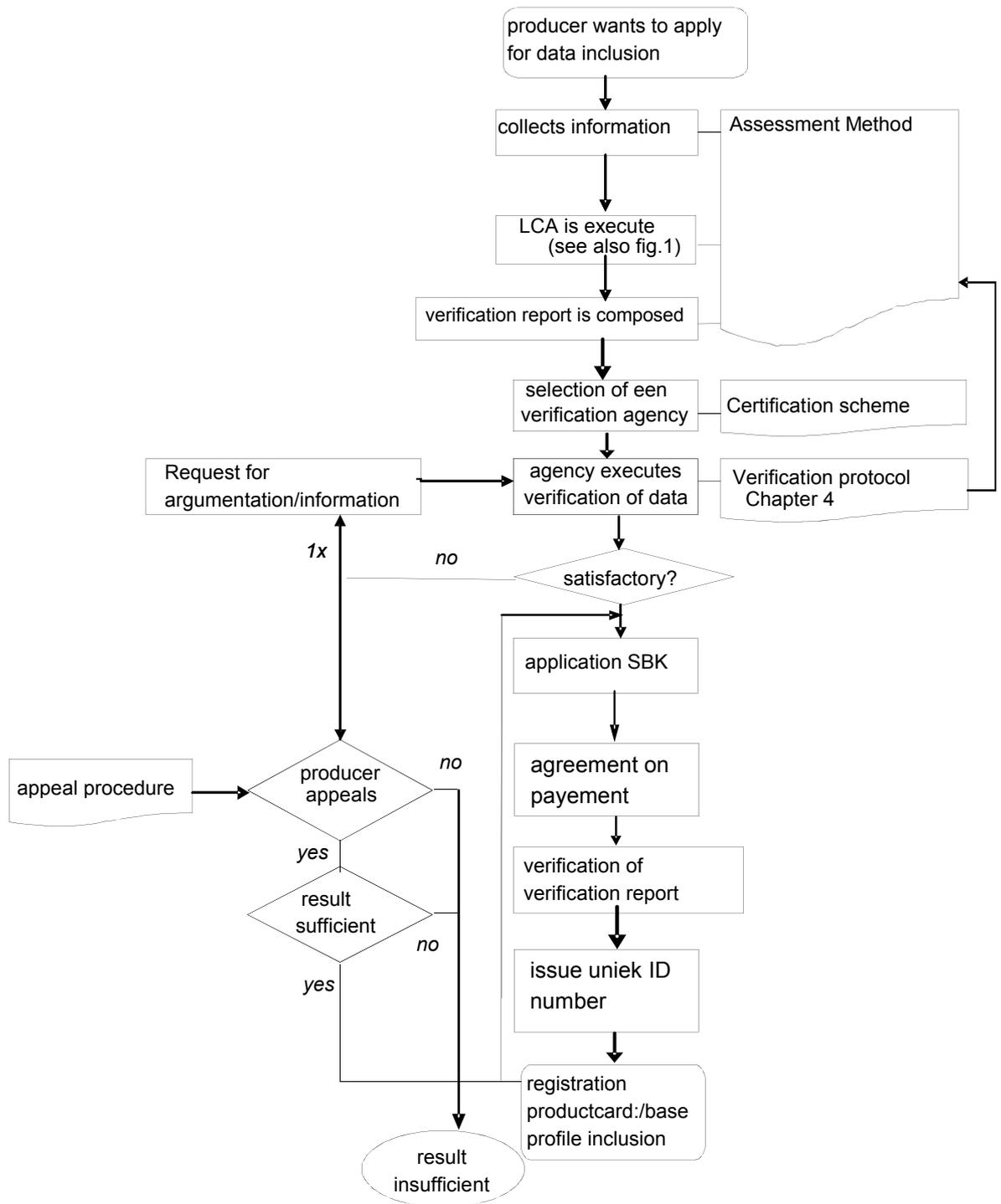


Figure 2. Application procedure

## **2.1. Information on the request for inclusion in the MND**

Information on the application for inclusion of data in the NMD can be found in the “Processchema aanleveren data voor de NMD in hoofdlijnen” (Process scheme recording data for NMD in general terms) (see [www.milieudatabase.nl](http://www.milieudatabase.nl)).

## **2.2. LCA**

The LCA requirements are mentioned in the Assessment Method.

## **2.3. Verification file**

The producer supplies the verification agency with the verification file. This file, at a minimum, contains:

- the LCA-report as described in the Assessment Method;
- The product/item card, base profile and other data that are necessary for the correct record inclusion in the NMD, as required in the Assessment Method;
- The instructions from chapter 4 of this Verification Protocol;

Additional supporting data for the LCA-report or the product/item card are allowed be supplied as well.

## **2.4. Selection verification agency**

The producer selects a verification agency that is listed on the “Lijst van erkende LCA deskundigen” (List of licensed LCA expert). The producer and verification agency make an agreement on planning and costing of the verification.

## **2.5. Execution of data assessment**

The verification agency assesses the data to be recorded in the NMD according to the procedure outlined in chapter 4 of this Verification Protocol. The verification agency reports the final results and conclusions to the producer.

## **2.6. Complaints relating to the assessment**

When a producer disagrees with the final results and/or conclusions or otherwise has complaints about the verification this can be reported to SBK. The “College van Beroep en Bezwaar” (Board of Appeals and Objections), founded by “Stichting Bouwkwiteit” (Institution for Construction Quality) for any appeal to a ruling or decision by SBK, will address the appeal.

## **2.7. Application file**

The producer supplies the following file with the application for inclusion in the NMD:

- The product/item card and/or base profile(s) as described in the Assessment Method;
- The verification report of the verification agency which shows that the LCA and the product/item card and/or base profile meet the requirements of this Verification Protocol and the requirements set for the inclusion into the NMD.
- A declaration stating that the methodical requirements in the Assessment Method are met and that the input data meet the requirements in the Assessment Method.

## **2.8. Assessment of request for inclusion in the NMD**

After receiving the application file and paying the application fees, SBK inspects the application file's completeness, and judges the verification report. After conformity to the requirements is determined, the producer is issued a unique ID number and is given the privilege for the data to be recorded in the NMD.

### 3. REQUIREMENTS FOR OBTAINING A POSITIVE SBK-VERIFICATION, FOR INCLUSION IN THE NMD

In figure 3, it is depicted how an LCA-project file is put together before it can be verified. This process and the LCA-Project file are part of the complete application procedure for the inclusion of data in the NMD, which is displayed in chapter 2 (figure 2)

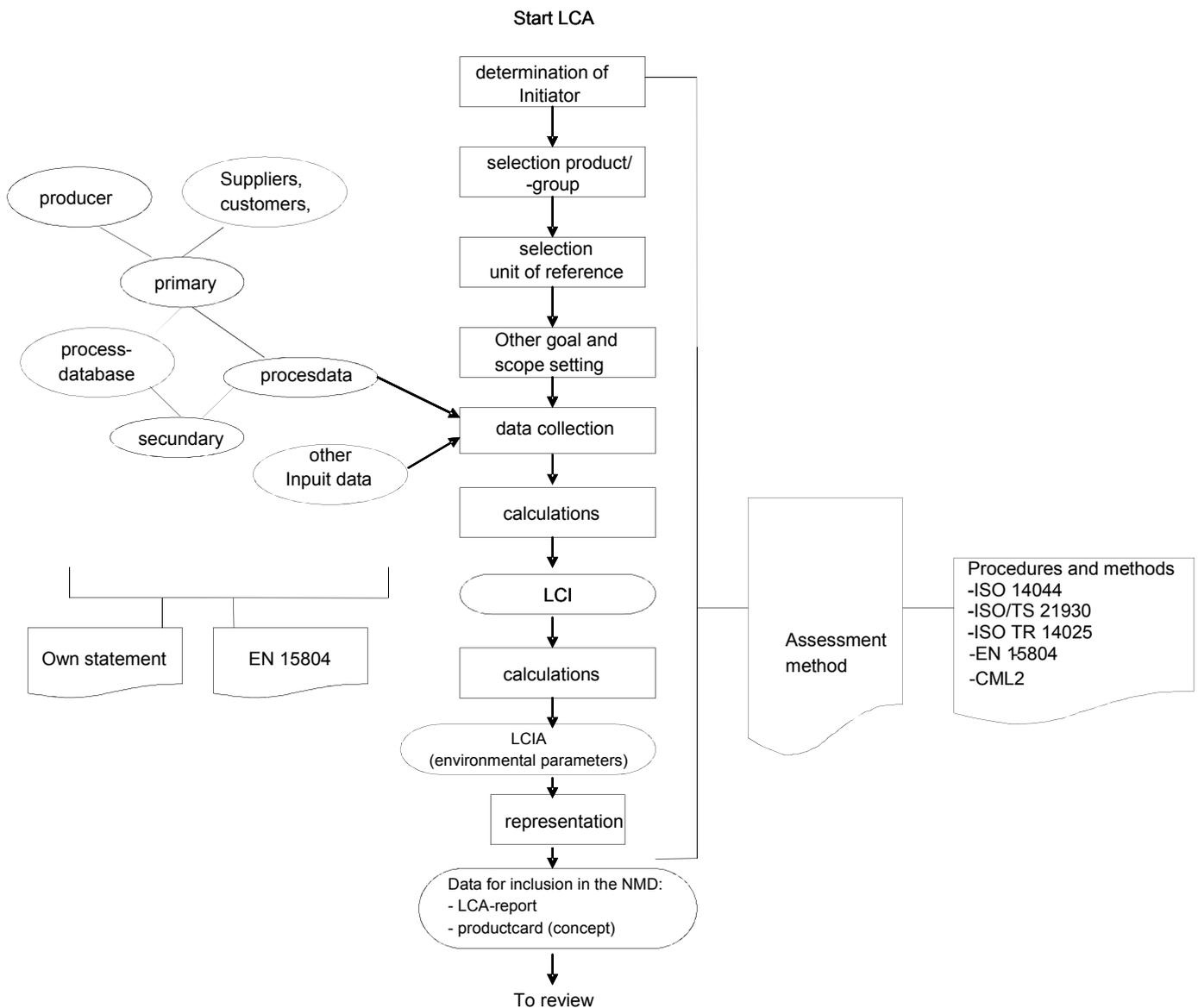


Figure 3. Execution of a LCA and the drafting of the project file

### **3.1. Documentation and control of project file**

The project file of the LCA-research must comply with the Assessment Method. The project file remains with the producer. When requested, the project file has to be made available to an independent party, put forward by SBK, for review and verification of the verification system or in case of an appeal or complaint procedure coming according to procedure of complaints assessment as mentioned in paragraph 2.6.

### **3.2. LCA-report**

The LCA report is to be executed according to the requirements, which can be found in the Assessment Method. This LCA-report, at least, contains the parts mentioned in appendix 3.2 of the Verification Protocol. Besides these parts, the LCA-report also contains the tables as put forward in appendix A of this Verification Protocol in which the LCA-executor has filled out the "Opmerkingen" (Remarks) column with references as to where information on the specific subject is located. The assessment itself (satisfactory: yes/no) is not to be filled out by the LCA-executor.

### **3.3. Assessment by verification agency**

The LCA-report and the example product/item card have to meet the requirements of this Verification Protocol. This has to be determined by a verification agency that meets the conditions put forward by SBK.

The verification has to be carried out according to the instructions outlined in chapter 4 of this Verification Protocol and needs to be reported in a verification report by the verification agency.

## **4. INSTRUCTIONS FOR THE ASSESSMENT BY THE VERIFICATION AGENCY**

### **4.1. Documentation to be assessed**

The verification agency assesses the following documents:

- A LCA-report that meets the requirements of the Assessment Method;
- The filled-out product/item card and the base profile for inclusion in the NMD, including the scaling if applicable, for which the producer (or its representative) wants to request inclusion in the NMD.  
See also the SBK format for base profiles and the SBK-guideline input product/item cards on [www.milieudatabase.nl](http://www.milieudatabase.nl);
- The filled-out verification table (see paragraph 3.2);

The verification is applied for each product/item card and/or base profile (multiple base profiles per product/item card are possible). One LCA-report can be applied to several different product/item cards and/or base profiles. In practice, it is possible to verification (large) numbers of EPD of one single producer or branch at the same time, provided that they are developed in one project file. On this project file, one verification can be executed. This will save time and costs.

### **4.2. Method of assessment**

The verification must be executed by filling out the tables out of appendix A.

These tables contain the requirements for the data to be included in the database. In each table the corresponding chapter or paragraph of the Assessment method is mentioned. In the tables, the verification agency indicates whether the data in the LCA-report on the concerning subject meets the requirements by marking “yes” (which implies satisfactory) or “no” (which implies not satisfactory). When a requirement is not applicable “n.v.t.” is indicated. In the last column, the verification agency can place remarks and commentary with a negative verification. The verification agency does not have to council the producer on how he could meet the requirements. However the verification agency has to motivate its verification.

When the verification agency, based on its expertise, has doubts about the data that is to be verified, the verification agency will state this along with the reasoning behind the doubt, in a separate letter to the producer. This letter does not part of the verification report.

The next steps are to be followed:

- The verification agency expresses the reason for the doubt in a separate letter to the producer;
- When the producer cannot provide a satisfactory answer, the verification agency will make a notification in the verification report.
- The verification agency can confidentially send the letter to SBK, after which the SBK Technical Committee (Technisch Inhoudelijke Commissie = TIC) will discuss it.

The producer has the latitude to deviate from the criteria set in the Assessment Method. Deviations are allowed when they are sufficiently argued and stay within the limits set by the Assessment Method. Based on its knowledge and expertise, the verification agency needs to make a statement whether or not the deviation is sufficiently substantiated. The producer however remains responsible for the presented data. Therefore, the verification agency does not have to state that the assumptions made in the deviating method are true.

### **4.3. Assessment by chapter**

The verdict per table/chapter is “yes” when all subjects in the paragraph or chapter have been answered with “yes” or “n.v.t.”. The verdict per chapter is “no” in all other situations.

### **4.4. Global assessment**

When every chapter can be answered with “yes”, it is deemed that the requirements of the Assessment Method are met.

### **4.5. Contact with the producer and report**

The report of the verification agency includes:

- the findings of the verifier in the form of the by way him (or her) filled-out tables;
- the final verdict with regard to whether the standard is met or not.

When appropriate, the verification agency can express possible doubts on issues that are not covered by the verification procedures, in a separate letter to the producer that is not part of the verification report.

The verification agency supplies the producer with at least one concept verification report after which the producer can supply additional information to be taken into account by the verification agency in its final verification report. The additional information is to be added to the LCA-report in an addendum.

The verification agency supplies the producer with the final version of the verification report.

## **APPENDIX A. ASSESSMENT TABLES**

In chapter 2 of the Assessment Method Environmental Performance of Constructions and Civil Engineering (GWW) Works, the requirements are set for the generation of and reporting on the environmental data of construction products and building elements as well as the presentation of these data in an environmental (product) declaration. This appendix contains an overview of these requirements in the form of verification tables. With these verification tables, a SBK-certified verification agency will be able to determine if the requirements for the establishment of an EPD for inclusion in the NMD are met.

The table follows the structure of the Assessment Method and, in doing so, also of EN15804. This means that several issues will be addressed multiple times, for instance, first in general and later in more detail. When this leads to a single requirement, it is listed only one time.

Rated by (name verification agency + verifier)	
Date	
Concerning	

**Methodical requirements**

<b>METHODICAL REQUIREMENTS</b> (paragraph 2.1 and 2.2 Assessment Method; chapter 1 and 2 and paragraph 8.2 EN 15804)			
<b>Subject</b>	<b>Criteria</b>	<b>Satisfies criteria yes/no</b>	<b>Remarks</b>
Methodical requirements	<p>The LCA – method has to comply with the methodical requirements set in NEN-EN-ISO 14040 and NEN-EN-ISO 14044.</p> <p>The product card and/or base profile(s) have to comply with the requirements of EN 15804 and ISO 14025 on EPD.</p>		<p>The LCA-file contains a declaration stating that the LCA complies with these standards.</p> <p>The LCA-file contains a declaration stating that the LCA is in conjunction with the additions from the Assessment Method.</p>
General aspects	<p>The verification report needs to contain:</p> <ul style="list-style-type: none"> <li>• the client of the LCA study;</li> <li>• the LCA-executor; and</li> <li>• the date of publication of the LCA-report .</li> </ul>		
Final verdict	The methodical requirements and general aspects of the Assessment method are met satisfactorily.		

**General aspects (paragraph 2.5 Assessment Method; chapter 5 EN 15804)**

<b>GOAL</b> (paragraph 2.5.1 Assessment Method; paragraph 5.1 EN 15804)			
<b>Subject</b>	<b>Criteria</b>	<b>Satisfies criteria yes/no</b>	<b>Remarks</b>
Goal	<p>The goal of a product/item card and/or base profile(s) is to record reliable and accurate quantitative environmental data on construction materials, construction products and construction elements in to the NMD. These data serve as the basis for calculations at building level in order to generate solutions that have less environmental impact.</p> <p>The product/item card and/or base profile(s) serve one or two purposes:</p> <ol style="list-style-type: none"> <li>1. The transmission of environmental data to the next elements in the supply chain in order for them to be able to make environmental declarations on their products</li> <li>2. The application of these environmental data in LCA calculations of buildings. For this application, the methodical comparability (additivity) of environmental data is essential.</li> </ol>		
Focus group	The focus group of the EPD (customers of the products, NMD) is described.		
Final verdict	Satisfies the requirements of the Assessment Method regarding goal.		

<b>TYPE EPD EN ASSOCIATED LIFE CYCLE STAGES</b> (paragraph 2.5.2 Assessment Method; paragraph 5.2 EN 15804)			
<b>Subject</b>	<b>Criteria</b>	<b>Satisfies criteria yes/no</b>	<b>Remarks</b>
Type EPD	It is clearly marked whether it concerns a: 1. <b>unit of product</b> ; or a 2. <b>functional unit</b>		
Life cycle stages	The life cycle stages are recorded in accordance with the Assessment Method: 1. unit of product: production + demolition waste stage (when the product is solely offered as a material, for instance cement for the production of concrete, the production stage is sufficient). 2. functional unit: full life cycle		
Final verdict	Satisfies the requirements of the Assessment Method regarding type EPD and life cycle stages.		

NOTE: The in paragraph 5.4 EN 15804 required additional information is not relevant for the NMD and is not verified with this table.

<b>COMMUNICATION FORMAT AND FORMAT FOR THE SUPPLY OF DATA TO SBK FOR THE NMD</b> (paragraph 2.5.6 Assessment Method; paragraph 5.6 EN 15804)			
<b>Subject</b>	<b>Criteria</b>	<b>Satisfies criteria yes/no</b>	<b>Remarks</b>
Communication format EN 15804	The communication format does not have to be in accordance with the requirements of EN 15804, when recording in the NMD is the sole focus.		
Assessment Method	The SBK-formats for the supply of base profiles and product/item cards have been followed		
Final verdict	Satisfies the requirements regarding the communication format in the Assessment Method		

**Product Category Rule, Calculation rules for LCA (paragraph 2.6.3 Assessment Method; paragraph 6.3 EN 15804)**

<b>FUNCTIONAL UNIT, UNIT OF PRODUCT AND REFERENCE SERVICE LIFE</b> (paragraph 2.6.3.1 t/m 2.6.3.3 Assessment Method; paragraph 6.3.1 t/m 6.3.3 EN 15804)			
<b>Subject</b>	<b>Criteria</b>	<b>Satisfies criteria yes/no</b>	<b>Remarks</b>
Functional unit (paragraph 2.6.3.1 Assessment Method)	Contains description(s) of the function(s) that are fulfilled and the context of the application, such as type of construction.		
	Contains performance requirements that apply to the function(s), including the reference service life (RSL).		
	Contains the circumstances and region where the function(s) are to be fulfilled, as far as relevant with respect to the function.		
	Contains a quantity of the function(s), expressed in a SI unit. or combination of SI units.		
	The functional unit is in line with the construction and civil engineering works elements in the NMD (see also appendix BD of the Assessment Method).		
	Contains a product description of the construction product that is the subject of the environmental performance declaration.		
	Contains the quantity (in kg) of the construction product including possible auxiliary materials.		
Service life (paragraph 2.6.3.3 Assessment Method)	When the entire life cycle A1-C4 is being declared, the reference lifetime for each type of construction product is taken from the SBR-publication "Levensduur van bouwproducten" [SBR, 2011]. Provided sufficiently corroborated, these may be altered. When altered documentation is needed to calculate the RSL. The RSL has to be representative for the subject construction product in its designated application(s).		

Unit of product (paragraph 2.6.3.1 Assessment Method)	Contains the application areas, expressed in classifications or quality levels when needed, with, when relevant, the empirical lifetime of the construction product for each application area.		
	Contains the unit of the construction product expressed in a SI unit. or combination of SI units.		
	Contains a description of the construction product.		
	Contains a specification of the construction product.		
Final verdict	Satisfies the requirements regarding functional unit, unit of product and reference lifetime.		

<b>SYSTEM BOUNDARIES AND CRITERIA FOR THE EXEMPTIONS OF INPUT AND OUTPUT</b> (paragraph 2.6.3.4, 2.6.3.5 and 2.6.4.3 Assessment Method; paragraph 6.3.4, 6.3.5, 6.4.3.3 and 8.2 EN 15804)			
<b>Subject</b>	<b>Criteria</b>	<b>Satisfies criteria yes/no</b>	<b>Remarks</b>
Process tree	The life cycle of the construction product is to be modelled with a process tree. The process tree contains all economic flows (both goods (materials, products) and services), qualitative (process names) as well as quantitative (quantities), that are required for the unit of product to fulfil the function(s) listed in the functional unit.		When a process tree contains too many components and becomes unclear, a process tree outline is allowed containing the most important components. Other issues can be added in tables per information module.  Incidents, such as unforeseeable damages, are not declared in the process tree.
Stages in the life cycle of the construction product.	The process tree, at least, has to distinguish the following stages in the life cycle: - production stage (A1-A3); - transportation stage (A4); - construction and implementation process (A5); - use and maintenance stage (B1 -B5); - demolition and waste (C1-C4); - environmental loads and benefits recycling/re-use (D).		
Losses	According to EN 15804 6.3.4.1, losses (waste) need to be declared in the module where it originates.		The Assessment Method 2014 follows EN 15804. Deviations are allowed solely to be recorded in the NMD, provided they are declared.

Processes that have to be included in the process tree of the construction product	The processes in the production stage (A1-A3).		The production stage starts at the extraction of raw materials and ends at the moment the construction product is ready for transportation to the customer. The system boundary for the input of secondary materials or of energy from secondary fuels between the studied system and its predecessor (from which the secondary material arise) is determined by the economic turning point.
	The processes in the transportation stage (A4). These processes are put in, in the form of scenarios.		The transportation stage starts at the point when the construction product or element at the producer is ready for transportation to the customer and ends at the point where it is delivered at the construction site next to the truck or other means of transportation.
	The processes in the construction and implementation stage (A5). These processes are put in, in the form of scenarios.		
	The processes in the use and maintenance stages (B1-B5) are recorded in the form of one or more scenarios. The possible release of substances during the utilization stage is modelled in B1.		
	The processes in the demolition and waste processing stages (C1-C4) and the possible incineration or recycle processes, including transportation to the incinerator or recycle-installation (D). These processes are put in, in the shape of scenarios.		
Check system boundaries according to appendix C Assessment Method	System boundaries, like the ones included in appendix C of the Assessment Method, are followed. Deviations have been supported sufficiently.		
Criteria for the exemptions of input and output.	Starting point is that all inputs and outputs of which data is available are used in the calculations. <ul style="list-style-type: none"> <li>• Estimations for missing data will be conservative ('worst case').</li> <li>• Infrastructure- and capital goods are included in the process data (such as flat-rate Ecoinvent data).</li> </ul>		Possible deviations are supported and reported.

Average product	The average composition is based on yearly figures or multi-year figures of the entire production, weighed based on production; or on a composition that covers more than 80% of the production quantity in the year the study was executed.		
Average production (EN 15804 paragraph 8.2)	When product groups (similar products of a producer and/or of different production installations) are presented as averages: <ul style="list-style-type: none"> <li>• Calculation rules to determine averages</li> <li>• Representativity of averages</li> </ul> <p>If different locations/products: presentation of the modelling of all locations and products including the weighing of each.</p>		
Module D	According to EN 15804, Module D is optional, according to the Assessment Method obligatory. Is Module D (loads and benefits of allocated co-products) added?		See below "life cycle inventory: calculation procedures and allocation"
Final verdict	Satisfies the requirements regarding the system boundaries, life cycle stages and criteria for the exemption of inputs and outputs in the Assessment Method.		

<b>SELECTION OF DATA AND DATA QUALITY REQUIREMENTS</b> (paragraph 2.6.3.6 and 2.6.3.7 Assessment Method; paragraph 6.3.6 and 6.3.7 EN 15804)			
<b>Subject</b>	<b>Criteria</b>	<b>Satisfies criteria yes/no</b>	<b>Remarks</b>
Representativeness of the processes	The processes in the product system that were executed at the producer of the construction product need to give a recent (for the period or time of the environmental product declaration) geographical and technological representative picture.		
	Data on individual production locations have to be related to those specific locations.		
	When all production locations provide data with horizontal aggregation, the result automatically is representative for that specific group. When not, a representative cross-section needs to be taken from the group of production locations, of geographical and technical differences that can lead to different environmental performances, in so far as they produce to deliver to the Dutch market.		Horizontal aggregation can be executed for different production locations of one single producer as well as for groups of producers or branches that want to declare the environmental performance.
Representativeness of other data	The other processes in the product system must give a representative or typical image of the actual geographic and technological situation. The application area, for which this standard is applicable, is the Netherlands. 'Representative' means that the data correctly represent the real population. 'Typical' means that the data describes a specific, common situation (also described as modal)		
Specializations	As an exception to the rule of actuality, a future scenario may be used for the disposal scenario if the hardship clause is met. It has to be proven that a working return system will be in place at the moment of disposal.		Deviations of the actuality requirements need to be transparent.

Flat-rates	<p>Flat-rates as mentioned in paragraph 2.6.3.6 of the Assessment Method can be used when:</p> <ul style="list-style-type: none"> <li>- The waste scenario is according to appendix B of the Assessment Method.</li> <li>- Transportation distances; Location to determine the transportation distance from a production location of materials outside the Netherlands to and from the construction site or customer: Utrecht;</li> <li>- Transportation means</li> <li>- Energy generating processes</li> <li>- Losses in the form of construction waste</li> <li>- Incineration in waste energy production site (AEC)</li> <li>- other processes based on Ecoinvent 2.2</li> </ul>		
Data quality	<p>The data quality is based on the idea that the quality level of data regarding processes that take place at the producer of the construction product has to be higher than the other processes. Furthermore, the idea is to have economic flows that resemble reality as close as possible within practical achievable limits by the LCA-executor.</p> <p>The data quality is scored according to appendix E of the Assessment Method and possible additional instruction by SBK.</p>		
Final verdict	<p>Satisfies the requirements regarding data selection and data quality in the Assessment Method.</p>		

**Inventory (paragraph 2.6.4 Assessment Method; paragraph 6.4 EN 15804)**

<b>INVENTORY: DATA COLLECTON</b> (paragraph 2.6.4.1 Assessment Method; paragraph 6.4.1 EN 15804)			
<b>Subject</b>	<b>Criteria</b>	<b>Satisfies criteria yes/no</b>	<b>Remarks</b>
Data categories	The environmental interventions of the product system are collected within the following data categories: resource extraction, emissions to air, water and soil.		Energy and waste are economic flows that are seen as part of the product system.
Data collection Included	For each intervention, the name, unit and quantity have to be declared. The name must clearly indicate what was really measured.		The wording has to be clear and not create any misunderstanding. When available, an index name from the CAS-registration system should be used, unless that name does not resemble the CML-VLCA names.
	The preferred order to determine emissions is: 1. Methods designated in laws, decisions, and regulation; 2. Methods in standards; 3. Methods that originated from private (possible sector-specific) agreements.		When assessment methods are prescribed in laws, decisions of standards the following priority will be taken into account: 1) harmonised within the EU; 2) the Netherlands; 3) voluntary within the EU (non-harmonised); 4) world; 5) other countries.
	The following interventions need at least to have a value: — emissions to air when using thermal energy of CO <sub>2</sub> , CO, NO <sub>x</sub> (NO <sub>2</sub> and N <sub>2</sub> O), SO <sub>2</sub> , C <sub>x</sub> H <sub>y</sub> and fine particles (PM <sub>10</sub> : particle < 10 µm); — emissions to water of COD, BOD, P-total, N-total and solids (PM <sub>10</sub> : particles < 10 µm); — emissions to soil of PAH and heavy metals; — other emissions based on which the environmental regulations are set for the producer of the construction product..		When the verifier, based on his expertise, knows that probable emissions are not included in the LCA, the verifier will inform the LCA writer of this.

Data collection Biogenic carbon (CO <sub>2</sub> , CH <sub>4</sub> , etc.)	If applicable When the inclusion of biogenic carbon in a product is valued, the biogenic emissions at the end of the life cycle need also to be calculated. De biogenic carbon inclusion during the growth of biomass and the release of biogenic carbon during natural decay of burning has to be balanced at all times, with the exception of biogenic carbon that is fixed permanently.		Given the difficulties (chances of mistakes), in CML-VLCA, a characterization factor of "0" is issued for the inclusion of CO <sub>2</sub> due to growth of biomass as well as the emissions of biogenic CO <sub>2</sub> .
Data collection Waste	Are the released substances determined to be waste? Is the end-of-waste status checked? Has it been determined if the waste is hazardous?		
Data sources	The data regarding the producer of the construction product need to come from primary sources and need to be valid (representative) for the period for which the environmental declaration is issued.		
	The data of other processes need to be valid (representative) for the period for which the environmental declaration is issued.		
	The suppliers and customers of the verified production locations of the construction product are asked for data according to the requirements set in the standard.		
	If a supplier or customer does supply any or insufficient data, public data sources can be used as well as branch data and figures derived from literature. In the case deviations in relation to the NMD are to be checked, possible deviations have to be mentioned in the verification report. The verification agency has to indicate that the deviation is significantly or not, in order for it to be mentioned on the SBK product/item card.		

	<p>Conventional public sources and literature have to be used. As guideline can be used:(EN 15804 6.3.7):</p> <ul style="list-style-type: none"> <li>• &lt;10 years for background data.</li> <li>• &lt;5 years for data of the producer</li> <li>• Data of the producer based on a one year average</li> <li>• Time period of 100 years in the case of a dumping scenario – even longer when relevant</li> <li>• Technical background complies with physical reality</li> <li>• Integrity of generic data, validity of system boundaries and proven cut-off criteria for generic data</li> </ul>		
	<p>When processes or flat-rates are available from different regions the following priority order is to be used:</p> <ol style="list-style-type: none"> <li>1) the concerning country,</li> <li>2) a neighbouring country;</li> <li>3) the concerning region (for example. north-western Europa);</li> <li>4) the concerning continent or part of it,</li> <li>5) the world.</li> </ol>		
Reliability	<p>The value of an environmental intervention has to be an average of measurements or calculations over a time period within which occurring fluctuations like seasonal influences, methods of measuring and such are averaged out.</p>		<p>The standard deviation is preferably known.</p> <p>Preferably, the value of an environmental intervention is externally verified for use in LCA or for other external purposes, such as annual reports or licences.</p>
Representativeness	<p>The values of an environmental intervention have to be representative for the process for which the environmental data is being collected.</p>		

Completeness	<p>All interventions from CML-VLCA need to be looked at. The interventions will get a value assigned unless a value is not available. Thus a three-way split occurs:</p> <ol style="list-style-type: none"> <li>1) A positive or negative value;</li> <li>2) The value "0" (for interventions that are below the detection threshold);</li> <li>3) An asterisk ("x"), when it is unknown if the intervention really takes place.</li> </ol>		
Sum parameters	<p>Where available, sum parameters (such as NO<sub>x</sub>, C<sub>x</sub>H<sub>y</sub>, COD, BOD, P-total, N-total, PAH and heavy metals) have to be split into individual components for the characterization. The standard list contains a number of sum parameters, for which characterization factors are also available.</p>		<ol style="list-style-type: none"> <li>a) The intervention value of the sum parameters can be entered in two ways;</li> <li>b) One or more individual substances are known, but only one characterization factor for the sum parameter is available. A sum parameter is a representative characterization factor for the sum of a group of substances for a specific impact, such as PAKs. The other substances in the sum parameter will be filled in with intervention values through ratios. When, for a number of substances of the sum parameter, data is available, each of the sum parameters will be calculated and the results will be averaged.</li> </ol>
Data quality of other processes	<p>When the producer requests data from suppliers and customers relating to a construction product, data for the environmental interventions need to be requested. The quality has to be comparable to the data demanded regarding to the processes of the producer.</p>		<p>If a supplier or customer is not able to supply data with the requested data quality, this has to be clearly marked in the Data Quality Description (see Assessment Method paragraph 2.6.3.7).</p>
Validation of data (by the EPD writer)	<p>The energy balance at company level needs to be determined for the processes that take place at the producer of the construction product as well as corrections of deviation to an accuracy of <math>\geq 95\%</math>.</p>		
	<p>For processes that take place at the producer of the construction product (when diverging from the data at company level) the mass balance per process used (when diverging from the data at company level) and correction of deviations to an accuracy of <math>\geq 95\%</math>.</p>		

	The validity of other processes has to be checked to determine the mass balance per process and correction of deviations to an accuracy of $\geq 95\%$ .		
Recording of data quality per unit of process	The reliability of environmental interventions has to be documented, when available, in the process data: <ul style="list-style-type: none"> <li>• temporal representativity</li> <li>• geographic and technological representativity of the processes</li> <li>• completeness of the economic flows, by an accounting of cut-off processes</li> <li>• completeness of the environmental interventions, by an accounting of estimated environmental interventions</li> </ul>		
Reproducibility	A reference for all sources, primary and public, and literature is recorded, in which, at least; title, author/composer and year are recorded.		
	In regard to reproducibility, a project file, as mentioned in paragraph 2.8.4 of the Assessment Method, is to be recorded.		
Consistency	The justification for the consistency has to be executed by giving an explanation of the used sources and the operations executed to get the LCA to be consistent		
Final verdict	Satisfies the requirements regarding inventory and data collection in the Assessment Method		

**Life cycle inventory: calculation procedures and allocation**

<b>LIFECYCLE INVENTORY: CALCULATION PROCEDURES AND ALLOCATION</b> (paragraph 2.6.4.2 & 2.6.4.3 Assessment Method; paragraph 6.4.2 & 6.4.3 EN 15804)			
<b>Subject</b>	<b>Criteria</b>	<b>Satisfies criteria yes/no</b>	<b>Remarks</b>
Energy generation	For energy generation, Ecoinvent processes are the reference point. When Ecoinvent is not used as starting point, this has to be motivated and calculations are to be made with net caloric values. The motivation, or sensitivity analysis, will clear up if there are any major deviations in the end result.		
Allocation in: 1. multi-output processes; 2. multi-input processes; 3. recycling and re-use processes.	Allocation of multi-output processes has to be executed based on mass. When 'products' from the multi-input processes deviate strongly from economic values or properties, because, of which mass is not representative, another appropriate allocation method has to be used. Such deviations need to be documented and argued.		
	Multi-input processes need to be allocated based on physical composition and stoichiometry of the inputs. In cases where this is not possible, another allocation method based on either physical or chemical principals needs to be used.		

	<p>At an economic turning point from a negative value to a positive one, the product system has to be framed in such a way that the boundary is at the turning point from the negative to the positive economic value. For recycling and re-use at the end of the life cycle, the model is extended until the economic turning point is reached. These environmental interventions will be classified in the disposal stage. With the use of recycled or re-used materials, the reverse modelling will be executed until the economic turning point. These environmental interventions are modelled in the production stage.</p>		
	<p>When no economic turning point is reached, the recycling and re-use processes at the end of the life cycle will be modelled until a material or product is reached that can be used again in a product system. One of the three situations from paragraph 2.6.4.3 of the Assessment Method is used.</p>		
<p>Allocation of co-products (EN 15804 paragraph 6.4.3.2)</p>	<p>Check A1 tot A3: Allocation of co-products:</p> <ul style="list-style-type: none"> <li>• Specification of the "end-of-waste state"</li> <li>• Selection of the allocation factors for the allocation of co-products</li> <li>• Justification of specific allocation processes (for example when data is not available to allocate according to the rules in EN15804)</li> <li>• Presentation of the energy and material flows as a result of deviating allocation processes.</li> <li>• No declaration of load and benefits in module D when allocating in A1-A3</li> </ul>		
<p>Final verdict Calculation procedures</p>	<p>Satisfies the requirements regarding calculation procedures and allocation in the Assessment Method.</p>		

## Life cycle impact assessment

LIFE CYCLE IMPACT ASSESSMENT (paragraph 2.6.5. Assessment Method; paragraph 6.5 EN 15804)			
Subject	Criteria	Satisfies criteria yes/no	Remarks
Impact categories	The environmental profile contains eleven impact categories that are listed in paragraph 2.6.5 of the Assessment Method. They are calculated according to CML-VLCA.		
Calculation environmental profile	The values of the impact categories are calculated by: 1) The allocation of the environmental interventions across impact categories; 2) The multiplication of the interventions per category with the characterization factors from the CML-LCA; 3) The adding of the obtained values per impact category.		The calculation steps are to be documented in the LCA report, the LCA expert needs to declare that the aforementioned calculation methods have been used.  Emissions of groups of substances. The emissions of groups of substances are included according to the Assessment Method.
Non-characterized interventions	If not all environmental interventions are characterized: - If caused by varying naming: use the correct name and characterize the substance; - If a characterization factor is not available: characterize according to a chemical and physical similar substance If a similar substance is not available, include the intervention in a list of non-characterized interventions, while notifying when an environmental intervention can be expected.		

Aggregation of environmental profiles	With the aggregation of environmental profiles an average environmental profile is achieved. The average profiles are calculated on the basis of a weighted production quantity <sup>2</sup> average of the selected production locations. The production quantities may be estimated in order of magnitude.		
Final verdict	Satisfies the requirements regarding life cycle impact assessment in the Assessment Method.		

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<sup>2</sup> Or production volume when that is a usual unit.

<b>LIFE CYCLE INTERPRETATION</b> (paragraph 2.6.6 Assessment Method)				
<b>Subject</b>	<b>Criteria</b>	<b>Satisfies criteria yes/no</b>	<b>Remarks</b>	
Sensitivity analysis	Contains the influence of the most important choices and assumptions made in the LCA.			
	Contains the influence of geographical and technological dispersion within the group of production locations. Use the highest and lowest values in the sensitivity analysis.			
	Contains the distribution as a result of the dispersion in the average composition. Use the highest and lowest values in the sensitivity analysis.			
	Contains the distribution as a result of centring when taking the group average. Use the highest and lowest values in the sensitivity analysis.			
	Contains the distribution as a result of the uncertainties in the allocation with recycling. When methods 1) or 2) from 2.6.4.3 of the Assessment Method are applied, use method 3) in a sensitivity analysis. When method 3) is applied, do a sensitivity analysis for the dispersion in values.			
	The differences on one of the environmental impacts are no more than 20% in relation to the average value. When, in a sensitivity analysis, differences turn out to be bigger than 20% the environmental declaration needs to be split up to stay within the 20% limit			The worst case profile can also be included. In doing so, the variation in environmental impacts with very low values can be handled.
	Final verdict	Satisfies the requirements regarding life cycle interpretation in the Assessment Method.		

**Content of the EPD (paragraph 2.7 Assessment Method; chapter 7 EN 15804)**

<b>DECLARATION OF THE GENERAL INFORMATION, REQUIREMENTS REGARDING THE EXTERNAL PRESENTATION IN A PRODUCT/ITEM CARD AND/OR BASE PROFILE(S)</b> (paragraph 2.7.1 t/m 2.7.5 Assessment Method; paragraph 7.1 t/m 7.5 EN 15804)			
<b>Subject</b>	<b>Criteria</b>	<b>Satisfies criteria yes/no</b>	<b>Remarks</b>
General (paragraph 2.7.1)	<p>The following has to be declared in an EPD:</p> <ul style="list-style-type: none"> <li>a) The name and address of the producer(s);</li> <li>b) The description of the use on which the data relates too;</li> <li>c) identification of the construction product (name) (including possible product code);</li> <li>d) a description of the product</li> <li>e) the name of the program operator;</li> <li>f) the date on which the declaration was issued and the validity of 5 years;</li> <li>g) information on stages which were not looked at, when the declaration is not based on an LCA over all life cycle stages;</li> <li>h) a declaration that EPD on construction products can be comparable when they are not executed according to the Assessment Method;</li> <li>i) When an EPD describes an average of a number of products, a declaration has to included that this does not lead to a distribution of more than 20% of the averages per environmental parameter</li> <li>j) the website(s), producer or group of producers or their representative;</li> <li>l) information indicating where additional information can be obtained.</li> </ul> <p>Aside from these, the third party verification agency is named.</p>		

Rules for the declaration of LCA information per module (paragraph 2.7.2)	The environmental impact categories (table 1 Assessment Method), the use of resources (table 2), waste categories (table 3) and output flows (table 4) were followed.		
Scenarios and additional technical information (paragraph 2.7.3)	De parameters for transportation to the construction site (module A4) from table 7 EN 15804 were taken into account ('volume transportation' also).		
Additional information use stage (paragraph 2.7.4)	Information on the emission of hazardous substances to the air, soil and water in the use phase is provided.		
Aggregation of information modules (paragraph 2.7.5)	The input format for product/item card and base profile was used.		
Scaling	When applicable, the scaling is executed according appendix H. Assessment Method.		
Final verdict	According to the requirements on content of the EPD		

## Project report

<b>PROJECT REPORT (the project report is not a part of public communication)</b> (paragraph 2.8 Assessment Method; chapter 8 EN 15804)			
<b>Subject</b>	<b>Criteria</b>	<b>Satisfies criteria yes/no</b>	<b>Remarks</b>
Project file	The project file contains, at least, the information as described in paragraph 2.8 of the Assessment Method.		As aid to the verifier, a checklist is included in appendix B.1 of this Verification Protocol with the subjects that need to be in the project file.
LCA-report	The LCA-report contains, at least, the information as described in paragraph 2.8 of the Assessment Method.		As aid to the verifier, a checklist is included in appendix B.2 of this Verification Protocol with the subjects that need to be in the LCA-report.
Final verdict	Satisfies the requirements regarding reporting in the Assessment Method.		

**Verification and validity of the data for the NMD**

<b>THIRD PARTY VERIFICATION AND VALIDITY OF AN EPD</b> (paragraph 2.9 Assessment Method; chapter 9 EN 15804)			
<b>Subject</b>	<b>Criteria</b>	<b>Satisfies criteria yes/no</b>	<b>Remarks</b>
Verification	The LCA and the environmental declaration are consistent with the methodical requirements in the Assessment Method.		
	The methods used to execute the LCA are valid from a scientific and technical point of view		
	The data used are sufficiently supported and within reason in relation to the purpose of the environmental declaration.		
	The interpretations and the identified limits correspond to the goal of the verification		
	The report of the verification is transparent and consistent.		
Reporting of verification agency	Contains the findings of the verification agency		
	Contains the final verdict with respect to whether or not the requirements of this standard are met.		
Final verdict	Satisfies the requirements regarding third party assessment in the Assessment.		

## **APPENDIX B. REQUIREMENTS TO REPORTING**

This appendix contains the subjects that have to be included in the project file and the LCA-report. The requirements are based on the requirements in the Assessment Method. The verifier can use these lists as a checklist. Note: the below printed checklists do not pretend to be complete.

### **B.1 Project file (on the basis of the Assessment Method 2.8.4)**

A project file from the LCA-research on the construction product has to be established, containing, at least, the following:

- The input and output environmental flows (environmental interventions) of the unit processes (process data) that are used as input for the LCA-calculations;
- The documentation (measurements, calculations, estimates, sources, correspondence, to the origin traceable references etcetera) based on which the process data for the LCA is prepared. Among others, these are documentation on the recipe with which the composition of the construction product of the producer is determined, energy use figures, emission data and waste production as well as data with which the completeness is supported. In specific cases, standards or quality regulations can be referred to;
- documentation showing that materials, products or elements (reference flow) can fulfil the required function(s) and performance(s);
- documentation showing that the selected processes and scenarios in the process tree meet the requirements of the Assessment Method;
- documentation showing that the selected lifetime of the construction product is supported;
- the data with which the sensitivity analysis and the internal check on the collected data are executed. The internal check contains a balance of mass per process step, a balance of mass at company level and a balance of energy at company level;
- documentation and support for the percentages with which the waste scenario is calculated;
- documentation and support for the percentages and figures (number of cycles prices etc.) with which calculations were done in the allocation procedure;
- in an environmental declaration of a weighted average for more than one production location or producer:
  - The un-weighted data;
  - documentation showing how the weighing factors used (production quantities) are derived;
- documentation with which possible qualitative information in the environmental declaration is supported;
- information showing that all suppliers and possible customers have been approached for the LCA-research. When this has not been done, the information must show that data was used that can be judged as equal to the data of suppliers (for example; when suppliers have published data collectively for use in an LCA);
- procedures according to which the data collection was executed (questionnaires, instructions, educational materials, agreements on confidentiality and such);
- the used characterization factors, and in so far applied for the calculation of environmental parameters, standardization factors and weighing factors,
- the criteria and support that was used for the determination of the system boundaries and the selection of input and output flows,
- documentation with which other choices, scenarios and assumptions were supported.

## **B.2 LCA report**

The LCA-research on a construction product has to be recorded in an LCA-report that is available for external assessment. This LCA-report contains at least (when applicable):

- The name of names of the issuer(s) of the environmental declaration;
- The name of the LCA executor;
- The date of the LCA Report;
- A statement that LCA was executed according to the requirements of the Assessment Method Environmental Performance Constructions and Civil Engineering Works;
- A description and the support for the geographic and technological representativity of the production location(s) of the issuer of the environmental declaration concerned and the influence of the distribution in geography and technology on the end results;
- The timeframe in which the LCA was executed;
- The goal for which the intended environmental declaration is prepared;
- The user group for which the intended environmental declaration is prepared;
- The unit of function;
- The construction product (reference flow) that is the subject of the LCA and for which an environmental declaration is prepared. The description needs to clearly list which product(s) from the assortment is the subject of the LCA;
- A list of materials (The composition does not have to contain the names of the substances but the composition of the construction product );
- Possible additional function(s) that are not included in the unit of function but that are in relation to the application of the construction product in a construction or civil engineering works;
- A description of the way the composition of all materials, products or elements in the list of materials is prepared (for example through provisions in standards);
- A description of and the support for the process tree and the boundaries of the process tree;
- The used service life of the construction product, with support arguments and/or the number of replacements accounted for in the LCA-calculations,
- A description of and the support for the used scenarios;
- Information that shows that the system boundaries of the Assessment Method were used, where possible deviations have occurred and why, and which influences these had on the end result;
- The data categories;
- The procedures for the data collection (questionnaires, checklists and so forth.);
- The calculation procedures (for example for estimates);
- Which data originates from primary sources and which from secondary sources;
- The supporting arguments for choices made on generic data (NMD, Ecoinvent, other data);
- A list of citations of literature data, at least with; title, author and year;
- When no flat-rates are used: a description of the conversion efficiency of energy sources, of the way the extraction and transportation of fuels is treated, of the of the combustion values of energy carriers, of the fuel mix in electricity production and the distribution of energy,
- A description per data category of the way how the level of completeness is determined and the deviations have been treated;
- A list with process emissions that are part of the environmental licence;
- A list with the selected suppliers;
- The way in which was validated;
- The result of the energy and mass balances, corrections and statements on deviations;
- A qualitative description of the data quality;
- The allocation method used;
- The nomination of the processes where allocation is applied;
- The percentages and other data with which was calculated when allocating;

- Information which proves that the requirements with respect to allocation are met;
- The environmental profiles and the other environmental parameters;
- The way in which the weighted average is achieved;
- The used characterization factors, and insofar applied in the calculation of environmental measures, the standardization and weighing factors (not only a referral but the actual factors themselves);
- The non-characterized substances;
- The results of the sensitivity analysis, amongst which are the in this standard required analysis and other choices and assumptions that have impact on (the dispersion of) the result (if applicable).

**APPENDIX C.**

**PROCEDURE 'EQUIVALENCY DETERMINATION AND  
VERIFICATION OF DATA FOR NMD'**

**APPENDIX C: SBK-Verification Protocol 'Recording data in  
the Dutch National Environmental Database'**



**version 1.0, oktober 2014  
SBK**



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## **STATUS PROCEDURE**

This procedure 'Equivalency determination and Verification of data for NMD', from here on out referred to as the procedure 'Equivalency', serves as appendix to the 'SBK-Verification Protocol Recording of Data in the Dutch National environmental Database'. The Stichting Bouwkwaliiteit (Institution for Construction Quality) is responsible for this procedure. The Procedure is prepared by the Technical Content SBK-Commission (TIC), and is set by the SBK-Environmental Performance Commission Construction and Civil Engineering Works (MBG).

Proposals to improve this procedure can, at any time, be brought to SBK's attention. If the significance or urgency demands it, the TIC Commission will be requested to formulate a text proposal. The procedure will ultimately be set by the MBG commission. An alteration of the procedure can also be issued and published in the form of an addendum or addition.

This is the first version, version 1.0, of the procedure. Intermediate updates of the procedure are possible, without the changing of the version number for the SBK-Verification Protocol itself.

## 1. BOUNDARIES PROCEDURE 'EQUIVALENCY'

### 1.1. Environmental Performance Constructions and Civil Engineering Works

The reduction of the material-based environmental impact of constructions and civil engineering works is the goal. In this procedure, the improvement of the environmental performance is discussed. This is the reason for a system that creates the possibility to quantify the environmental impact. This system, managed by the Stichting Bouwkwaliiteit (SBK) (Institution for Construction Quality), consists of an Assessment Method, including calculation rules and an Environmental Database. The system ensures that the construction and civil engineering works sector become aware of the environmental impact of the constructions and civil engineering works and creates the possibility to influence this in the private as well as public sector. Since January 1, 2012, article 5.9 of the Dutch building code 2012 the quantification according to the Assessment Method Environmental Performance Construction and Civil Engineering Works is set. The Equivalency procedure is also aimed at the environment of the private sector.

#### Section 5.2. Environment, new construction

Article 5.8. Controlling article:

1. A construction to be built is such that the impact of the environment by the materials used in the construction is limited.
2. Insofar directed for a function of use in table 5.8 regulations are set, the requirements in the first member are met for that function of use, by the application of these regulations and provisions stemming from the regulations.
3. The first member is not applicable to the functions of use for which, in table 5.8, no regulation is indicated.

Function of use	applicable members				
	Article member	sustainable construction			modification
		5.9	5.9	5.9	5.10
	1	2	3	*	
<b>1 residential function</b>					
<b>a mobile home</b>	-	-	-	-	
<b>b other residential function</b>	1	-	3	*	
<b>6 office function</b>	-	2	3	*	
<b>All other not mentioned function of uses</b>	-	-	-	-	

Article 5.9. Building Sustainably:

1. The composition of construction parts for a residential function is the emission of greenhouse gasses and the depletion of resources quantified according to the Assessment Method Environmental Performance Constructions and Civil Engineering Works.
2. The composition of construction parts for an office function and additional functions with a total useful surface of more than 100 m<sup>2</sup> is the emission of greenhouse gasses and the depletion of resources quantified according to the Assessment Method Environmental Performance Constructions and Civil Engineering Works.
3. Ministerial rules can be used to set values for the regulations as set in members 1 and 2.

Regarding equivalency, a number of levels can be distinguished:

1. The uniform assessment of the environmental performance of a construction or civil engineering works  
This is an equal alternative to the entire Assessment Method.
2. The ensuring of the data quality in the Dutch National Environmental Database (NMD)  
This is an equal alternative to the recording and verifying of data, aimed at obtaining the status of the verified information (category 1 or 2).

Up until now, the main focus has been on a level 2 procedure. Product rating systems are available, with differing procedures. EPD from outside the Netherlands are expected to be offered that do not completely comply with the Dutch standards. This procedure is also aimed at this second level.

## **1.2. Subject and application of: category 1 and 2 data**

The Dutch National Environmental Database (NMD) of SBK contains several databases. The most important of which are; Base Profile Database (environmental information) and the Product/item card Database (composition and quantities of construction materials). These databases contain information in three categories:

- Category 1: brand data, verified by third party.  
For whom: producers and suppliers
- Category 2: generic data (unbranded), verified by third parties with a declaration of the representativity (for example for the Dutch market of a group of producers).  
For whom: groups of producers, suppliers and branches
- Category 3: generic data (unbranded), not verified by third parties, outlines are verified by the TIC of SBK.  
For whom: groups of producers, suppliers, branches and principals

Category 1 and 2 data for inclusion in the Dutch National Database are:

*Verified data regarding the environmental aspects of a construction material, construction product or construction element initiated by a (representative of) producer(s) and generated by an environmentally-focused Life Cycle Analysis (LCA), usable for inclusion in the Dutch National Environmental Database.*

## **1.3. Alternative route**

The Assessment Method and the standard Verification Protocol are aimed at one single LCA, at one single product or a number of products. The procedure 'Equivalency' offers the possibility for other formats. Examples:

- Foreign EPD
- Tool for the generation of LCA-data

### **Summarizing**

The procedure 'Equivalency' aims for an equal, alternative route for the determination and verification of category 1 or 2 data in the NMD. The route can be aimed at one single LCA, but also at the generation and supply of data through a process or tool. This data can be used in private as well as public applications.

## **2. VERIFICATION OF EQUIVALENCY**

### **2.1. The Basic idea**

The requirements in the Assessment Method and the Verification Protocol ensure that the data quality in the NMD is guaranteed. What is meant with quality is derived directly from pursued objectives. An alternative route for the inclusion and/or verification of the data is only equal when the objectives are realized to, at least, the same degree. An alternative route will only be approved, if the applicant has sufficiently made plausible that this is the case.

The above is the basic requirement for the alternate route. Deliberately, no elaborate set of requirements or criteria was set. This is to provide enough space, within the limits, to come to similar solutions. In assessing the alternative route, the requirements of the Assessment Method and the Verification Protocol will serve as guidelines. The applicant will have to indicate where and why is deviated, and will need to show that this does not compromise the objectives described below.

In addition to the basic requirement in all cases, the involvement of an independent third party verification agency will be required. An independent third party verification shall always be part of an alternative route.

### **2.2. Goals Assessment Method**

The main goals are:

1. Environmental performance of constructions and civil engineering works.  
The reduction of the material-based environmental impact of constructions and civil engineering works is the underlying purpose. It concerns the performance of the entire construction and not of the individual products. This means that it should be possible to sum the products.
2. Level-playing-field  
Environmental Performance of constructions can influence the position in the market of the supplying producers of construction products. The system needs to be such that fair competition is ensured in the market place.

As a result of this the following sub goals are:

1. Consistency  
The fact that the data have to be added to each other to result in an end result for the entire construction places even higher demands on the consistency of an LCA/EPD of individual products. For a Level-playing-field, it is also important that products are judged on exactly the same requirements. This means that:
  - a) Full lifespan  
The environmental impact over the full lifespan of a construction is to be regarded. In order to determine this, it is necessary to have information at the product level, which covers the entire lifespan. The composition of an entire construction has to be possible with the products in the database. This means that the products must be able to provide the functionality defined in the element descriptions. Missing parts can, for example, be solved by a worst-case approach or by supplementing with NMD defaults.

- b) Calculation results  
Applying deviating calculation rules is only allowed if this results in the same environmental performance per unit of product, as the application of the calculation rules associated with the Assessment Method. This could be justified by a calculation of a case. Another option is to show that the most relevant components will be determined by the Assessment Method.
- c) Environmental impacts  
The next item is the input and output of all processes across the life span. It must be ensured that, at least, the processes and emissions are included as it would have been in the application of the Assessment Method.  
To be able to add up the environmental performances, they need to be expressed among the environmental impacts listed in the Assessment Method. When information on a number of impacts is missing, they will have to be supplemented, for example, by a worst-case approach.  
Environmental data (EPD) according to EN 15804, without the deviating environmental impact categories from the Assessment Method, are therefore not eligible for Equivalency.
- d) Representativeness  
The construction is built in the Netherlands. The environmental product information has to be representative of the product available on the Dutch market. If produced outside the Netherlands, the real transportation distances are taken into account.

## 2. Reliability

The use of an alternative route to gain competitive advantage is to be prevented. This places high demands on the reliability and because of that on the:

- a) Transparency  
In order to achieve transparency, a sufficient measure of reporting is necessary. Text or tables are not always necessary. Also, for example, insightful tools are possible.
- b) Reproducibility  
The results have to be reproducible. Deviations from the rules for calculation have to be reproducible, for example by supplying a spreadsheet with the calculations and results.
- c) Dealing with uncertainties  
Regarding uncertainties or when information is missing, this needs to be clearly mentioned. At a minimum, sensitivity analysis is required, unless a worst-case method was clearly used.
- d) Accuracy, completeness  
The Assessment Method sets extensive requirements for the primary data collection for suppliers and the inspection thereof (balances, demand to check all procured materials, etc.). Has it been established that no incomplete or inaccurate data have been supplied by the producer? For example: has maintenance of a machine that releases substantial waste been accounted for or not? Are all emissions (also those not measured) accounted for? Do the requirements under "Validation of data" (mass and energy balance) in Appendix A Assessment tables of the Verification Protocol apply.

### **3. PROCEDURE EQUIVALENCY**

#### **3.1. Procedure Stichting Bouwkwaliiteit**

The environmental performance calculation is included in the Dutch Building Code. Thus, the Interior Ministry is in charge of the proceedings aimed at equality. In relation to the Building Code, a 'Commission Equivalency' has been established. Until now, this commission limits itself to issues regarding fire safety and hazards. The environmental performance calculation (level 1, with the limits in chapter 1) has not been discussed yet. No procedure has been developed for level 1. At level 2, the data in the NMD, requests have been filed. In view of the connection to the NMD, this has been accommodated under the Stichting Bouwkwaliiteit (SBK) (Institution for Construction Quality). For this purpose, the procedure described in this document, 'Equivalency', has been established. In the schematics below, level 2 is further developed.



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equivalency and it is indicated what needs to be verified for each individual product. The 'product verification' can then be executed in a limited amount of time, depending on the result of the basic verification.

3. SBK will submit the memorandum to the technical commission (TIC). This commission will determine if the correct subjects have been addressed and argued by the verifier. When necessary, the TIC will demand additional information from the data owner. The TIC will draft a binding advice for the Commission Environmental Impact Construction and Civil Engineering Works (MBG).

If a member of the TIC is involved with the application, he or she cannot take part in the discussions that will determine Equivalency.

4. The MBG will adopt the advice from the TIC or decline it, while motivating its decision to SBK.
5. Within 3 weeks after receipt of the memorandum, SBK will inform the data owner. The decision, including the motivation, will be registered by SBK and published on its website.
6. If the decision of the MBG is negative, appeal is possible. This appeal must be done by the "College van Beroep en Bezwaar" (Board of Appeals and Objections), established by SBK for every complaint regarding a ruling or decision of SBK.

After a positive decision, the data owner has to follow the same process as in the standard route of the Verification Protocol. Amongst others, this entails a verification by a certified third party.

### **File**

When SBK receives an application, it will immediately start building a file. In this file, all relevant correspondence is stored, as well as the information submitted by the applicant including the result of the external verification. The TIC-advice and the decision of the MBG commission and any possible decisions by the 'Board of Appeals and Objections' are put into the dossier.

### **Costs**

The procedure is in the interest of the data owner. As such, it is logical that he or she is responsible for (a part of) the costs, including administrative costs and the verification by the TIC.