

BELGIUM - COUNTY REPORT

1.1 **Response on questionnaire**

- Questionnaire 1 : Arcadis Belgium NV, filled in on 16/7/2010
- Questionnaire 2 : WTCB, filled in on 16/7/2010
- Comments on the draft text by OVAM, FOD Volksgezondheid en Leefmilieu, FOD Economie

1.2 Rule system

1.2.1 <u>Type of regulation</u>

In Belgium, there exists legislation and some provisions that relate to buildings and construction. The clearest is the national legislation for fire safety, which is arranged in terms of risk classes related to fire-fighting equipment. Within the framework on their competences, each region has additional provisions and also the larger municipalities like Brussels and Antwerp have issued local regulations.

In addition to the regional regulation and the few national laws and building ordinances, there are the national 'rules for good workmanship', consisting of:

- NBN standards, the Belgian standards issued by the Belgian Normalisation Institute (NBN)
- 'PTV's': Prescriptions Techniques (Technical Prescriptions). These are 'normative' documents drafted by a qualified technical institute, for example Probeton, the Belgian institute for the certification of concrete products, which add to the standards in question in order to connect the Benor quality mark to it, awaiting the appearance of a standard.

There are also documents made by institutions with a normalizing activity. These 'documents with a normative character' do not connect directly nor indirectly to the working of the NBN. These are for example:

- the 'STS' (Spécifications Techniques unifiées unified technical specifications), published by the Federal governmental office DGV.
- the technical approvals (ATG) of the BUtgb (Belgian Union for the technical approval in construction); (see hereafter)
- The 'TV' (Technische Voorlichtingsnota's, Technical Reports) and the 'Cahier géneral des charges pour traveaux de construction privé' (general specifications for private construction projects) of the WTCB-CSTC (Belgian Building Research Institute), an organization established by law and financed by building contractors and public research funds which conducts research into construction and the components used in building. TV's are guidance documents, primarily intended for contractors, but used by everyone in the Belgian construction sector as good practice documents even used in court to judge workmanship of contractors.

All these standards and documents are not mandatory by law, but are usually referred to in construction contract documents.

1.2.2 <u>Regulated sustainability topics for new buildings</u>

In Belgium in fact only fire resistance and energy performance are regulated. Other sustainability topics are based on voluntary systems. See also paragraphs 1.2.1. and 1.4.



1.2.3 Rules for existing buildings and for renovation of existing buildings

In Belgium no sustainability regulations apply to existing buildings and to renovation of existing buildings.

1.2.4 Level of regulation

See paragraph 1.2.1.

1.2.5 Background in EU-Directives

Energy performance, construction products, waste, water regulations have a background in EUdirectives.

1.2.6 Ordering of the regulations

As far as known to Arcadis Belgium different sets of "regulations" apply to different building types.

1.2.7 Type of requirements and deemed-to-satisfy solutions

Fire resistance regulations are rather prescriptive. Energy is performance based. Documentation on accepted and deemed-to-satisfy solutions is available.

1.2.8 Process of implementation

The process of implementation of energy performance regulation was mostly a cooperative process in which governmental parties collaborate with the construction sector.

1.3 Enforcement regime

The foundation of the system of building quality control in Belgium is very similar to that in France. It is determined by the extensive responsibilities of construction partners in the building process, based on the Civil Code, the decennial liability of contractors and architects and age-old jurisprudence. The supervision of building work is a system of permanent self-inspection by the architect, his design engineer, and the contractor. Projects have to be prepared by registered architects and a building permit is required. The permit is given by the local authorities but they do not carry out checks on structural or other calculations or general technical compliance unless hazardous or unhealthy installations are proposed. They also do no inspect the work in progress. The local (or regional) fire brigade is, however, involved in the fire safety check.

Due to the liability questions, there is technical control by private insurance companies which is still voluntary (unlike in France where decennial insurance has become mandatory in some circumstances). Besides the well-known SECO, more and more private bureaux have been established which carry out these controls.

1.4 Sustainable construction initiatives – including public and joint public-private initiatives

Example 1: Sustainability checklist

A successful public initiative is the 'Sustainability checklist' started by the Flemish Infrastructural Fund for Personal Matters (VIPA). The 'Sustainability checklist' has to be filled in (some points being compulsory) in the request dossier for subsidies of VIPA (for hospitals, kindergarten, elderly homes, etc.). All parties have to integrate as many elements as possible in order to obtain subsidies.



The goal of this initiative is to implement sustainability measures in order to save running costs for the subsidized and to enhance comfort for the occupants. An organization has been set up to administer and steer the initiative.

Example 2: Policy plans of the Belgian Environmental Federal Administration

The Belgian Environmental Federal Administration (SPF Health, Safety of the Food Chain and Environment) has two main actions in her policy plans regarding construction products and sustainability. These plans were approved by the Minister's Council in 2009.

Action 1: Stimulate the provision of environmental information over the life cycle of construction products, this by means of the introduction of Environmental Product Declarations. The establishment of a database with EPD's is also an agreed action for the coming years.

In the long term we want to achieve that construction products shall only be put on the market when their global environmental impact over its life cycle is known. This should become a standard precondition.

Action 2: This action is on the social pillar of sustainability: the health aspect. Limit values for emissions of construction products in indoor air are being prepared in order to lower the presence of dangerous substances in the indoor air and to contribute to a healthier indoor air quality.

Example 3: Contest of exemplary buildings'

Another public initiative is the 'Contest exemplary buildings' started by the Brussels institute for environmental management (BIM). BIM calls for projects that implement sustainability measures on several fields. The goal of this initiative is to set the example, show the potential and demonstrate reproducibility.

Example 4: Belgian Sustainable Building Council

Moreover Flanders (government agency) started a feasibility study in 2009 aiming to ground a Belgian Sustainable Building Council

The mission of the Belgian Sustainable Building Council (BSBC) is to improve the sustainability of the built environment.

The activities of the BSBC are focused on the developing measurement instruments, assessment methods and certification schemes for sustainable buildings and built environments, including the related exchange of knowledge, professional training and communication activities. These activities are addressed to the building sector and government.

The BSBC believes in the force of a multi-actor platform that includes industry, non-governmental organizations, research/academic institutions and (local) government agencies, and that aims for ambitious targets towards a sustainable built environment.

This study is still going on in 2010.

Example 5: Valideo

A private initiative is Valideo. Valideo is a voluntary Sustainable Construction certification system, started by SECO, BCCA and WTCB-CSTC. Valideo can be compared with assessment schemes such as Breeam, HQE, Minergie and Leed. The first Valideo-certified green building was completed in May 2009.

1.5 Role of EU

Both respondents see a role for the EU to stimulate sustainable construction in Belgium. Regulation



should be based on an European uniform, transparant and open source framework (e.g. developed within the sustainable building alliance). It can not be expected from the three regions in Belgium to develop a separate system (which was the case in the EPBD implementation).



Regulations on sustainable construction – Arcadis Belgium

			REGUI SUST/ CONS	INAB	ILITY A		PECIFIES TS OF					I SPECII RUCTIOI			REGULATION SPECIFIES SUSTAINABIL			Process of Implementi	Comments
Subject	•	Regulat ion?	Level	of regu	llation		Back- ground in EU- Direc- tives?	Comments	Orderin	g of the	regula	ions		building?		reg's drawn	documentati on on accepted of	implementing	
	Requirements/regulations are set:		Nation al/ federal	nalł		Quasi manda tory			apply to all	reg's per building type of	reg's pe building type for	a set of r reg's per building type for r industria	reg's per building type for				solutions?	sustainability aspects of construction ?	

Energy		For energy performance	Yes		X			Yes		X	X	X		Yes	Yes, but only for	As performance	Yes	Cooperative,	Τ
		To use renewable energy sources	Yes		X			Yes							renovation of	based		governmental	
		To implement energy efficiency techniques (e.g. low-	Yes		X			Yes							the main	regulations		parties	a
		energy light bulbs) To thermal insulation	Yes	-	v			Yes							structure or building services	(performance levels are		collaborated with the construction	
		To reduce air permeability	No		<u> </u>			162							building services	stipulated)		sector	la-
Water		To implement water conservation techniques	Yes		Х			Idont	X					Yes	I dont know	As prescripitive	Yes	I dont know	de
								know								regulations			
		To implement water efficiency techniques (e.g. low-	No													(construction			
		water flush toilets) For water metering	No		<u> </u>	<u> </u>	<u> </u>									methods are stipulated)			
Minimize	Waste	To minimize waste during construction	Yes	-	X			Yes	×					Yes	I dont know	I dont know	Yes	I dont know	4
pollution	10000	To register waste production (e.g. in site waste	No					1.55							1 doint know	1 don thou		1 don thinking in	
		management plan)																	
		To separate/recycle waste	Yes				X	Idont											
	-							know						1.1					4
	Other aspects	To limit emission of CO2	Yes		X			Yes						I dont know	I dont know	I dont know	I dont know	I dont know	
	related to ecology	To limit ozone depleting gasses To limit green house gasses	Yes Yes	X	Ŷ		-	Yes Yes											
Protect	ecology	To conserve flora on sites	No	0	<u> </u>		-	165											
biodiversity and		To conserve wildlife on site	Yes		X			Yes											
natural		To conserve natural habitats on site	Yes		X			Yes											
Minimize the use		To use recyclable materials	No																
of resources		To use renewable materials	No																
		To refurbish and redevelop existing buildings in stead of demolities and new development	No																
		stead of demolition and new development			I	I	I	I	1	1	I								
Economic qua	ality																		
Enable businesse		To reduce energy consumption during the	No		Γ			1						I dont know	I dont know	I dont know	I dont know	I dont know	1
and competitive		construction process																	
		To reduce waste during the construction process	Yes		-Χ			Yes											
		To keep water use to a minimum during the	No																
		construction process Top construct adaptable buildings	81a			-		 											
Support local eco	onomic diversitu	To the density of the development (e.g. minimal	Yes	_	X	X	<u> </u>	No											
oupportionalect	Shornic diversity	number of dwellings per area)	Tes		<u> </u>	<u> </u>		100											
		To mixed land use	Yes		X	X		No											
		To use local material/goods in construction	No																
Provide employn	nent opportunities	To use local labor in construction	No						·										4
Social quality		To secure athiest trading through out supply shain	Ma	_		—	—	1	0		<u> </u>			V	Van (as all	A	Vee	Tan dava itura	
Adhere to ethical development	i standards during	To ensure ethical trading throughout supply chain To provide safe and healthy work environment	Yes	X	v	<u> </u>	-	Yes	^					Yes	Yes, for all renovation	As prescripitive regulations	Yes	Top-down, it was mostly a	
Provide adequati	e local services	To provide sale and heating work environment To provide information to local community during		X	X	X	<u> </u>	No							renovation	(construction		government led	
and facilities		construction activities		- ¹¹	1 °	1 ° 1										methods are		process	
		To provide space for training workmen	No													stipulated)			
		To provide local schools, health, social facilities	No																
Provide housing	that meets needs	To develop a mix of tenure types	Yes		X	X		No											
		To provide affordable housing	Yes	X	X	Х	 	No											
Integrate develop	mentiplocal	To provide housing for the elderly To reject or discourage gated development	No	—	 			<u> </u>											
integrate develop context	mentimocal	To reject or discourage gated development To provide transport links to local context	Yes	-	X	X	-	No											
*****		To provide transport links to local context	No	-			<u> </u>												
Conserve local h	eritage	To reuse locally valued buildings	Yes		X	X		No											
Access to green	-	To have green space within a certain distance	No																
	_																		
Functional qu		To the charge of the set of	U.,												U / P	A strength of the	0	O	-
Design optimaliz	ation	To the shape of the exterior	Yes	—	X	X	<u> </u>	No		X	X	X	X	A lower level	Yes, for all	As functional	Yes	Cooperative,	
		For aesthetics To planned service life of structures	Yes	_	X	X	<u> </u>	NO						applies	renovation	regulations (goals are		governmental parties	
		To planned service life of structures To planned service life of building services	No	-	1	1	1	 								(goais are specified)		parties collaborated with	
		To the demand of space per occupant and/or	No		1	1	1	1								specified)		the construction	
		dwelling			1	1	1											sector	
Building envelop	e	To moisture protection of the building envelope	No		L		L												
- '		To wind protection of the building envelope	No																
		For electric-magnetic shielding	Yes	Х				Idont											
									1										4
						<u> </u>	<u> </u>	know											
	and user	For indoor air-quality	Yes		X			Know Yes											
Health, comfort a satisfaction	and user	For indoor air-quality To thermal comfort in winter To thermal comfort in summer	Yes No		X			_											

	To acoustic comfort	No														
	To in-door daylight entry	No						1								
	To the capability of conversion by a	No						1								
	construction/building user															
Usability for disabled	To accessibility for disabled	Yes	X	X			I dont									
_	-						know									
Technical quality (construction					_			_						_		
		No	_	<u> </u>	<u> </u>			1	X	1		Yes	Yes, for all	As performance	Yes	I dont know
Technical execution /quality of the	on process) To limit construction time (planning) To construction management	No No	-		-			-	X			Yes	Yes, for all renovation	As performance based	Yes	l dont know
Technical execution /quality of the construction process	To limit construction time (planning)	No No Yes				X	No		X			Yes			Yes	l dont know
Technical execution /quality of the construction process	To limit construction time (planning) To construction management	No No Yes Yes	X			X	No No		×			Yes		based	Yes	l dont know
Technical execution /quality of the construction process	To limit construction time (planning) To construction management To keeping records on construction progress		×			X	No No No		X			Yes		based regulations	Yes	l dont know
Technical execution /quality of the construction process	To limit construction time (planning) To construction management To keeping records on construction progress To level of education/experience of builders	Yes	X			X	No No No		X			Yes		based regulations (performance	Yes	l dont know



Regulations on sustainable construction – BBRI

			REGU Sust <i>i</i> Cons	AINAB	ILITY A		PECIFIES TS OF		regul Aspec					STAINABILITY	SPECIFIES	 	process of Implementi	Comments
	•	Regulat ion?	Level				Back- ground in EU- Direc- tives?	Comments	Orderin all reg's		-			apply to existing building?		documentati on on	Type of process of implementing reg's which specifies sustainability	
	,,		alł federal	nalł		manda tory			apply to all building s	reg's p buildin type o	er reg's p g buildii f type f	per re ng b or ti	reg's per building type for			solutions?	aspects of construction ?	

Energy		For energy performance	Yes		X		Yes	most of the extra	X		No	No	As performance	No	Bottom-up, it
inergy		To use renewable energy sources	No		0		162	elements which	<u> </u>		140	140	based	100	was mostly a
		To implement energy efficiency techniques (e.g. low-						are asked are					regulations		construction
		energy light bulbs)						local and are					(performance		sector led
		To thermal insulation	Yes		X		Yes	using insentives					levels are		process
		To reduce air permeability	Yes			X	Yes	to be					stipulated)		
//ater		To implement water conservation techniques	No					implemented	X		No	No	As functional	No	Bottom-up, it
		To implement water efficiency techniques (e.g. low-	No										regulations		was mostly a
		water flush toilets)											(goals are		construction
		For water metering	Yes	Х			No						specified)		sector led
Vlinimize	Waste	To minimize waste during construction	No						X		No	No	As performance	Yes	Bottom-up, it
ollution		To register waste production (e.g. in site waste	Yes		X		No						based		was mostly a
		management plan)	0		X		N.						regulations (performance		construction
	Other aspects	To separate/recycle waste To limit emission of CO2	Yes		^		NO			 			(performance		sector led
	related to	To limit ozone depleting gasses	No												
	ecology	To limit green house gasses	No	_											
Protect	lecology	To conserve flora on sites	No												
biodiversity and		To conserve wildlife on site	No												
natural		To conserve natural habitats on site	No												
Minimize the use	e	To use recyclable materials	No		1						1	1			
of resources		To use renewable materials	No												
		To refurbish and redevelop existing buildings in	No												
		stead of demolition and new development													
conomic qu				_						 					
	es to be efficient	To reduce energy consumption during the	No						X		NO	NO	As performance	NO	Bottom-up, it
ind competitive		construction process	N.					4					based		was mostly a
		To reduce waste during the construction process To keep water use to a minimum during the	No					4					regulations (performance		construction sector led
		construction process	NO										levels are		process
		Top construct adaptable buildings	No					1					stipulated)		process
Support local ed	onomic diversity	To the density of the development (e.g. minimal	Yes		X	X	No						Suparated)		
		number of dwellings per area)													
		To mixed land use	No					1							
		To use local material/goods in construction	No					1							
Provide employ	ment opportunities	To use local labor in construction	Yes		X		No								
Social quality															
				_						 			_		
Adhere to ethica	al standards during	To ensure ethical trading throughout supply chain	No					4	X		No	No	I dont know	I dont know	Top-down, it was
Adhere to ethica development	al standards during	To provide safe and healthy work environment	No No						X		No	No	I dont know	I dont know	mostly a
Adhere to ethica development Provide adequa		To provide safe and healthy work environment To provide information to local community during	No No No						X		No	No	I dont know	I dont know	mostiy a government led
Adhere to ethica levelopment Provide adequa	al standards during	To provide safe and healthy work environment To provide information to local community during construction activities	No No No						X		No	No	I dont know	l dont know	mostly a
Adhere to ethica development Provide adequa	al standards during	To provide safe and healthy work environment To provicde information to local community during construction activities To provide space for training workmen	No No No No						X		No	No	l dont know	I dont know	mostiy a government led
Adhere to ethica Jevelopment Provide adequa and facilities	al standards during te local services	To provide safe and healthy work environment To provicde information to local community during construction activities To provide space for training workmen To provide local schools, health, social facilities	No No No No No						X		No	No	l dont know	l dont know	mostiy a government led
Adhere to ethica development Provide adequa and facilities	al standards during te local services	To provide safe and healthy work environment To provicde information to local community during construction activities To provide space for training workmen To provide local schools, health, social facilities To develop a mix of tenure types	No No No No No						X		No	No	l dont know	I dont know	mostiy a government led
Adhere to ethica development Provide adequa and facilities	al standards during te local services	To provide safe and healthy work environment To provicde information to local community during construction activities To provide space for training workmen To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing	No No No No No No No						X		No	No	l dont know	I dont know	mostiy a government led
Adhere to ethica development Provide adequa and facilities Provide housing	al standards during te local services g that meets needs	To provide safe and healthy work environment To provicde information to local community during construction activities To provide space for training workmen To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing To provide housing for the elderly	No No No No No No No						X		No	No	l dont know	I dont know	mostiy a government led
Adhere to ethica development Provide adequa and facilities Provide housing ntegrate develo	al standards during te local services g that meets needs	To provide safe and healthy work environment To provide information to local community during construction activities To provide space for training workmen To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing To provide housing for the elderly To reject or discourage gated development	No No No No No No No No						X		No	No	l dont know	I dont know	mostiy a government led
Adhere to ethica levelopment Provide adequa and facilities Provide housing ntegrate develo	al standards during te local services g that meets needs	To provide safe and healthy work environment To provide information to local community during construction activities To provide local schools, health, social facilities To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing To provide housing for the elderly To reject or discourage gated development To provide transport links to local context	No No No No No No No No No No						X		No	No	l dont know	I dont know	mostiy a government led
Adhere to ethica Jevelopment Provide adequa and facilities Provide housing ntegrate develo context	al standards during te local services g that meets needs prnent in local	To provide safe and healthy work environment To provide information to local community during construction activities To provide local schools, health, social facilities To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing To provide housing for the elderly To provide housing for the elderly To reject or discourage gated development To provide transport links to local context To provide links to adjacent neighborhoods	No No No No No No No				No		X		No	No	l dont know	I dont know	mostiy a government led
Adhere to ethica levelopment Provide adequa and facilities Provide housing ntegrate develo context Conserve local	al standards during te local services g that meets needs prment in local heritage	To provide safe and healthy work environment To provide information to local community during construction activities To provide space for training workmen To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing To provide housing for the elderly To reject or discourage gated development To provide transport links to local context To provide links to adjacent neighborhoods To reuse locally valued buildings	No No No No No No No			×	No		X		No	No	I dont know	I dont know	mostiy a government led
Adhere to ethica evelopment rovide adequa nd facilities rovide housing ategrate develo ontext	al standards during te local services g that meets needs prment in local heritage	To provide safe and healthy work environment To provide information to local community during construction activities To provide local schools, health, social facilities To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing To provide housing for the elderly To provide housing for the elderly To reject or discourage gated development To provide transport links to local context To provide links to adjacent neighborhoods	No No No No No No No				No		X		No	No	I dont know	I dont know	mostiy a government led
dhere to ethic: evelopment rovide adequa nd facilities rovide housing tegrate develo ontext onserve local ccess to greer	al standards during te local services g that meets needs prment in local heritage n space	To provide safe and healthy work environment To provide information to local community during construction activities To provide space for training workmen To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing To provide housing for the elderly To reject or discourage gated development To provide transport links to local context To provide links to adjacent neighborhoods To reuse locally valued buildings	No No No No No No No			×	No		×		No	No	I dont know	I dont know	mostiy a government led
Adhere to ethic: levelopment Provide adequa and facilities Provide housing htegrate develo context Conserve local Access to green	al standards during te local services g that meets needs pment in local heritage n space uality	To provide safe and healthy work environment To provide information to local community during construction activities To provide space for training workmen To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing To provide housing for the elderly To reject or discourage gated development To provide transport links to local context To provide links to adjacent neighborhoods To reuse locally valued buildings	No No No No No No No			×	No		X		No	No	I dont know		mostiy a government led
Adhere to ethic: levelopment Provide adequa and facilities Provide housing htegrate develo context Conserve local Access to green	al standards during te local services g that meets needs pment in local heritage n space uality	To provide safe and healthy work environment To provide information to local community during construction activities To provide local schools, health, social facilities To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing To provide housing for the elderly To reject or discourage gated development To provide transport links to local context To provide links to adjacent neighborhoods To reuse locally valued buildings To have green space within a certain distance	No No No No No No No			×	No		×		No	No			mostly a government led process
Adhere to ethic: levelopment Provide adequa and facilities Provide housing htegrate develo context Conserve local Access to green	al standards during te local services g that meets needs pment in local heritage n space uality	To provide safe and healthy work environment To provide information to local community during construction activities To provide local schools, health, social facilities To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing To provide housing for the elderly To reject or discourage gated development To provide transport links to local context To provide links to adjacent neighborhoods To reuse locally valued buildings To have green space within a certain distance To the shape of the exterior	No No No No No No Yes No			×	No		×		No	No	Asperformance		mostly a government led process
Adhere to ethic: levelopment Provide adequa and facilities Provide housing ntegrate develo context Conserve local Access to green	al standards during te local services g that meets needs pment in local heritage n space uality	To provide safe and healthy work environment To provide information to local community during construction activities To provide local schools, health, social facilities To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing To provide housing or the elderly To reject or discourage gated development To provide transport links to local context To provide links to adjacent neighborhoods To reuse locally valued buildings To have green space within a certain distance To the shape of the exterior For aesthetics	No No No No No Yes No Yes			×	No		 ×		No	No	As performance based		mostly a government led process Bottom-up, it was mostly a construction sector led
Adhere to ethic: levelopment Provide adequa and facilities Provide housing htegrate develo context Conserve local Access to green	al standards during te local services g that meets needs pment in local heritage n space uality	To provide safe and healthy work environment To provide information to local community during construction activities To provide local schools, health, social facilities To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing To provide housing for the elderly To reject or discourage gated development To provide transport links to local context To provide links to adjacent neighborhoods To reuse locally valued buildings To have green space within a certain distance To the shape of the exterior For aesthetics To planned service life of structures To planned service life of structures	No No No No No No Yes No Yes I dont			×	No		 ×		No	No	As performance based regulations (performance levels are		mostly a government led process Bottom-up, it was mostly a construction
Adhere to ethic: levelopment Provide adequa nd facilities Provide housing tegrate develo ontext Conserve local Access to green	al standards during te local services g that meets needs pment in local heritage n space uality	To provide safe and healthy work environment To provide information to local community during construction activities To provide local schools, health, social facilities To provide local schools, health, social facilities To develop a mix of tenure types To provide housing for the elderly To provide housing for the elderly To reject or discourage gated development To provide transport links to local context To provide inks to adjacent neighborhoods To reuse locally valued buildings To have green space within a certain distance To the shape of the exterior For aesthetics To planned service life of structures To planned service life of structures To the demand of space per occupant and/or	No No No No No No Yes No Yes I dont			×	No		 ×		No	No	As performance based regulations (performance		mostly a government led process Bottom-up, it was mostly a construction sector led
Adhere to ethica levelopment Provide adequa nd facilities Provide housing ategrate develo ontext Conserve local Access to green Functional q Design optimalia	al standards during te local services g that meets needs prment in local heritage h space sality zation	To provide safe and healthy work environment To provide information to local community during construction activities To provide space for training workmen To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing To provide housing for the elderly To reject or discourage gated development To provide transport links to local context To provide transport links to local context To provide inks to adjacent neighborhoods To reuse locally valued buildings To have green space within a certain distance To the shape of the exterior For aesthetics To planned service life of structures To planned service life of building services To the demand of space per occupant and/or dwelling	No No No No No No Yes No Yes I dont know No			×	No		×		No	No	As performance based regulations (performance levels are		mostly a government led process Bottom-up, it was mostly a construction sector led
Adhere to ethica development Provide adequa and facilities	al standards during te local services g that meets needs prment in local heritage h space sality zation	To provide safe and healthy work environment To provide information to local community during construction activities To provide local schools, health, social facilities To provide local schools, health, social facilities To develop a mix of tenure types To provide housing for the elderly To provide transport links to local context To provide transport links to local context To provide transport links to local context To reuse locally valued buildings To have green space within a certain distance To planned service life of structures To planned service life of structures To the demand of space per occupant and/or dwelling To moisture protection of the building envelope	No No No No No No Yes No Yes I dont know No			×	No		×		No	No	As performance based regulations (performance levels are		mostly a government led process Bottom-up, it was mostly a construction sector led
dhere to ethic: welopment ovide adequa d facilities ovide housing tegrate develo ontext onserve local occess to greer unctional q esign optimali	al standards during te local services g that meets needs prment in local heritage h space sality zation	To provide safe and healthy work environment To provide information to local community during construction activities To provide space for training workmen To provide local schools, health, social facilities To develop a mix of tenure types To provide affordable housing To provide housing for the elderly To reject or discourage gated development To provide transport links to local context To provide transport links to local context To provide inks to adjacent neighborhoods To reuse locally valued buildings To have green space within a certain distance To the shape of the exterior For aesthetics To planned service life of structures To planned service life of building services To the demand of space per occupant and/or dwelling	No No No No No No Yes No Yes I dont know No			×	No		×		No	No	As performance based regulations (performance levels are		mostly a government led process Bottom-up, it was mostly a construction sector led

	To wind protection of the building envelope	No												
	For electric-magnetic shielding	No												
Health, comfort and user	For indoor air-quality	No												
satisfaction	To thermal comfort in winter	Yes		X		No								
	To thermal comfort in summer	No												
	To acoustic comfort	Yes			X	No								
	To in-door daylight entry	No												
	To the capability of conversion by a	No												
	construction/building user													
Usability for disabled	To accessibility for disabled	Yes			X	I dont								
						know								
Taakaiaal gualite (aaacteusti														
Technical quality (constructi Technical execution density of the		Mo				 	Group to guipted	V	 	 Mo.	Ma	Ac proceripitius	Ma	Pottom un it
Technical execution /quality of the	To limit construction time (planning)	No					fire is regulated	X		No	No	As prescripitive	No	Bottom-up, it
	To limit construction time (planning) To construction management	No No					since many	X		 No	No	regulations	No	was mostly a
Technical execution /quality of the	To limit construction time (planning) To construction management To keeping records on construction progress	No No					since many years, this was	X		No	No	regulations (construction	No	was mostly a construction
Technical execution (quality of the	To limit construction time (planning) To construction management	No No No Yes	X			No	since many	X		No	No	regulations	No	was mostly a
Technical execution (quality of the	To limit construction time (planning) To construction management To keeping records on construction progress	No No No Yes No	X			No	since many years, this was	X		No	No	regulations (construction	No	was mostly a construction
Technical execution (quality of the	To limit construction time (planning) To construction management To keeping records on construction progress To level of education/experience of builders	No No No Yes No No	X			No	since many years, this was organised on	X		No	No	regulations (construction methods are	No	was mostly a construction sector led



Checking of building plans – Arcadis Belgium

										CHEC	KING O	F BUILDING PL	ANS							
Subject	Are building plans monitored to check compliance			ring sus		-						ls the monitoring process regulated in law?	How ar monito sustain regulat	red to c ability c ion?	ig plans heck co riteria ir	mpliance constru	e with uction	How thoroughly are building plans normally	If from this monitoring non- compliance is found, how	
	with sustainability criteria in construction regulation?	Municip al authorit y	Other public auth.	Architec t	(Tech,)a dvisor on behalf of auth's	Techn.a dv. on behalf of insurers	Techn.a dv. On behalf of (future) owner	Utility compan y	Private Inspect or	Building owner	Other		A visual check, to find if/how criteria have been integrat ed in the building design	A check based on a paper checklis t, to find if/how criteria on the list have been integrat ed in the building design	comput er aided check based on a digital checklis t, to find if/how criteria on the list have	Check on registrat ion of the architec t/engine er who approve s the design	Other	monitored to check compliance with sustainability criteria in construction regulation?	is this disciplined?	sustainabilty regulation, is this reported to the future owner of the building and/or the builder?
Ecological quality - Energy	No			1						1	1	I						I		
Ecological quality - Water	Yes	×										Yes, on regional/state level						Superficial, mostly a check only assesses if criteria have been integrated	The building permit will not be issued	Yes, a proof on paper is issued (e.g. a report, a letter, a permit or certificate)
Ecological quality - Waste	No																			
Ecological quality - Other	No			ļ				L	L											
Economic quality	No			 																
Social quality	Yes	×										Yes, on regional/state level						Superficial, mostly a check only assesses if criteria have been integrated	The building permit will not be issued	Yes, a proof on paper is issued (e.g. a report, a letter, a permit or certificate)
Functional quality	No									L	L									
Technical quality (construction process)	No																			

Checking of building plans – BBRI

										CHEC	(ING OI	F BUILDING PL	ANS							
iubject	Are building	Vho is	monito	ring sust	ainabilit	y criteria	a?					ls the	How are	e buildin	g plans	normally	,	Ноч	If from this	lf the
-	plans											monitoring	monito	red to cl	heck co	mpliance	e with	thoroughly	monitoring	monitorin
	monitored to											process	sustain	ability c	riteria in	n constru	uction	are building	non-	shows
	check											regulated in	regulati	ion?				plans	compliance	compliance
	compliance											law?						normally	is found, how	with
	with	Municip	Other	Architec	(Tech,)a	Techn.a	Techn.a	Utility	Private	Building	Other		A visual	A check	Α	Check	Other	monitored to	is this	sustainab
	sustainability	al	public	t	dvisor	dv. on	dv. On	compan	Inspect	owner			check,	based	comput	on		check	disciplined?	regulation
	criteria in	authorit	auth.		on	behalf	behalf	y	or				to find	ona	er aided	registrat		compliance		this repo
	construction	y			behalf	of	of	_					if/how	paper	check	ion of		with		to the fut
	regulation?				of	insurers	(future)						criteria	checklis	based	the		sustainability		owner of
					auth's		owner						have	t, to find	ona	architec		criteria in		building
													been	if/how	digital	t/engine		construction		and/or th
													integrat	criteria	checklis	er who		regulation?		builder?
													ed in the	on the	t, to find	approve				
													building	list have	if/how	s the				
													design	been	criteria	design				
														integrat	on the					
														ed in the	list have					
														building	been					
														design	integrat					
															ed in the					
															building					
															design					

Ecological quality - Energy	No											
Ecological quality - Water	No											
Ecological quality - Waste	No											
Ecological quality - Other												
Economic quality	No											
Social quality	No											
Functional quality	Yes	×					Yes, on regional/state level	×			permit will not be issued	l dont know
Technical quality (construction	No											
process)												



Checking of work under construction – Arcadis Belgium

	CHECKING OF	VORK	UNDER	CONST	RUCTIO	IN										
Subject	Is work under construction monitored to check compliance	Vho is i	monitor	ing <u>work</u>	under (construc	tion?					Is the monitoring process of work under construction	How is work under construction normally monitored to	How thoroughly is work under construction normally	lf from this monitoring non- compliance is found, ho v	lf this monitoring shows compliance with
	with sustainability criteria in construction regulation?	Municip al authorit y	Other public auth.	Architec t	(Tech,)a dvisor on behalf of auth's	Techn.a dv. on behalf of insurers	Techn.a dv. On behalf of (future) owner	Utility compan y	Private Inspect or	Building owner	Other	regulated in law?	check compliance with sustainability criteria in construction regulation?	monitored to check compliance with sustainability criteria in construction regulation?	is this disciplined?	sustainabiltg regulation, is this reported to the future owner of the building and/or the builder?
Ecological guality - Energy	v											Yes, on	A visual check,	Superficial,	Other	
Ecological quality - Energy	Yes											regional/state	to find if/how	mostly a check	Other	No
Ecological quality - Water	No											_				
Ecological quality - Waste	No															
Ecological quality - Other	No															
Economic quality	No															
Social quality	No															
Functional quality	No															
Technical execution /quality of the construction process	Yes			×		×						Yes, on national/federal	A visual check, to find if/how	Thorough, mostly a check	The contractor is requested to	Yes, a proof on paper is issued

Checking of work under construction – BBRI

ſ	CHECKING OF	VORK	UNDER	CONST	RUCTIO	N									
	Is work under construction monitored to check compliance with sustainability criteria in construction regulation?	Who is Municip al authorit y		Architec			Techn.a	Utility compan y	Building owner	Other	monitoring process of <u>work under</u> <u>construction</u> regulated in la w ?	under construction normally	thoroughly is work under construction normally monitored to check compliance	monitoring non- compliance is found, ho v is this disciplined?	If this monitoring shows compliance with sustainabilty regulation, is this reported to the future owner of the building and/or the builder?

Ecological quality - Energy	Yes				×		Yes, on national/federal	A check based on a paper	The contractor is requested to	Yes, by word of mouth (e.g. a
Ecological quality - Water	No									
Ecological quality - Waste	No									
Ecological quality - Other										
Economic quality	No									
Social quality	No									
Functional quality	No									
Technical execution /quality of the construction process	Yes					×	Yes, on national/federal	A check based on a paper	The work is halted until the	No



Checking of the finished work, prior to occupation – Arcadis Belgium

CHECKING OF	HECKING OF FINISHED CONSTRUCTION WORK PRIOR TO OCCUPATION														
finished construction (a finished building)			_			-				-	Is the monitoring process of sustainability criteria of Ginichad	normally	thoroughly are building plans normally	monitoring non- compliance is found, ho v	
monitored to check compliance with sustainability criteria prior to occupation?	Municip al authorit y	Other public auth.	Architec t	(Tech,)a dvisor on behalf of auth's	Techn.a dv. on behalf of insurers		Utility compan y		Building owner	Other	finished construction work regulated in law?	monitored to check compliance with sustainability criteria in construction regulation prior to occupation of the building?	compliance with	disciplined?	sustainabilty regulation, is this reported to the future owner of the building and/or the builder?

Ecological quality - Energy	Yes	×					×	Yes, on regional/state level	A computer aided check, based on a digital checklist, to find if/how criteria on the list have been integrated during co		Other	Yes, a proof on paper is issued (e.g. a report, a letter, a permit or certificate)
Ecological quality - Water	No											
Ecological quality - Waste	No											
Ecological quality - Other	No											
Economic quality	No											
Social quality	No											
Functional quality	Yes	×					×	Yes, on regional/state level	A computer aided check, based on a digital checklist, to find if/how criteria on the list have been integrated during co			Yes, a proof on paper is issued (e.g. a report, a letter, a permit or certificate)
Technical execution /quality of the construction process	Yes		×					Yes, on national/federal level	A visual check, to find if/how criteria have been integrated during construction work	Thorough, mostly a check assesses if and how criteria have been integrated	The building may not be occupied	

Checking of the finished work, prior to occupation – BBRI

	CHECKING OF	IECKING OF FINISHED CONSTRUCTION WORK PRIOR TO OCCUPATION														
Subject	ls the finished construction (a finished building)	¥ho is⊤	monito	ring sust	ainabilit	y criteri	a prior t	o occup	ation of	ls the monitoring process of sustainability criteria of	normally	How thoroughly are building plans normally	If from this monitoring non- compliance is found, how	lf this monitoring shows compliance with		
	monitored to check compliance with sustainability criteria prior to occupation?	Municip al authorit y	Other public auth.	Architec t	(Tech,)a dvisor on behalf of auth's	Techn.a dv. on behalf of insurers	Techn.a dv. On behalf of (future) owner	Utility compan y	Private Inspect or	Building owner	Other	regulated in la v ?	monitored to check compliance with sustainability criteria in construction regulation prior to occupation of the building?	monitored to check compliance with sustainability criteria in construction regulation?	disciplined?	sustainabilty regulation, is this reported to the future owner of the building and/or the builder?
Ecological quality - Energy	Yes			×						×		No	i dont know	I dont know	The building may be occupied under the condition that this non- compliance is solved within a certain time- frame	I dont know
Ecological quality - Water	I dont know															
Ecological quality - Waste	I dont know															
Ecological quality - Other																
Economic quality	I dont know															
Social quality	No															
Functional quality	No															
Technical execution /quality of the construction process	Yes				×				×			No	A computer aided oheck, based on a digital ohecklist, to find if/how criteria on the list have been integrated during		Other	Yes, by word o mouth (e.g. a phone call or a short talk after the inspection)



Checking of existing buildings in use –Arcadis Belgium

	CHECKING OF	EXISTI	NG COM	ISTRUC	TIONS I	N USE									
constructs monitor s monitor to check complian with sustaina	Are existing construction s monitored to check compliance with	n monitoring construction d process of s in use construction normally s in use monitored to												How thoroughly are construction s in use normally	If from this monitoring non- compliance is found, how is this
	sustainability criteria when	Municip al authorit y	Other public auth.	Architec t	(Tech,Ja dvisor on behalf of auth's	Techn.a dv. on behalf of insurers		Utility compan y	Private Inspect or	Building owner	Other	law?	cneck compliance with sustainability criteria in construction regulation?	monitored to check compliance v ith	disciplined?
Ecological quality - Energy	Yes								X			Yes, on regional/state level	A computer aided check, based on a digital checklist, to find if/how criteria on the list have been integrated during co	Superficial, mostly a check only assesses if criteria have been integrated	No disciplining measures are taken
Ecological quality - Water	No														
Ecological quality - Waste	No														
Ecological quality - Other	No														
Economic quality	No														
Social quality	No														
Functional quality	No														
Technical execution /quality of the construction process	Yes				×							I dont know	I dont know	I dont know	I dont know

Checking of existing buildings in use -BBRI

CHECKING OF	CHECKING OF EXISTING CONSTRUCTIONS IN USE														
 Are existing construction s monitored to check compliance	Vho is	monitor	ring sust	ainabilit	s in use	How are construction s in use normally monitored to	thoroughly are construction s in use	lf from this monitoring non- compliance is found, ho v							
with sustainability criteria when in use?	Municip al authorit y	Other public auth.	Architec t	(Tech,)a dvisor on behalf of auth's	Techn.a dv. on behalf of insurers	dv. On behalf of	Utility compan y		Building owner	Other	regulated in law?	check compliance with sustainability criteria in construction regulation?	normally monitored to check compliance with sustainability criteria in	is this disciplined?	

Ecological quality - Energy	No							
Ecological quality - Water	No							
Ecological quality - Waste	No							
Ecological quality - Other								
Economic quality	No							
Social quality	No							
Functional quality	No							
Technical execution /quality of the	No							
construction process								

