Annex 1-A

Project 1

Innovative and Multifunctional Composite Materials from Local Resources for Sustainable Structures

Time frame the Core task 1 activities

	2014		2015				2016				2017			
	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
1. To create production method of high performance concrete composites (compression strength >100MPa) for use in infrastructure and public buildings, partly replacing concrete with microfillers having local origin.	x	x	x	x	x									
1.1.1. To design high strength concrete mixes	x	x	x	x	x									
1.2. To determine mechanical and physical properties.	x	x	x	x	x									
1.3. Preparation method for innovative and advanced cement composite with microfillers materials for infrastructure projects and public buildings (deliverable)					x									
2. To develop recommendation on increase of the corrosion and freeze resistance properties for the concrete produced from the Latvian cement.			x	x	x	x	x	x	x	x				
2.1. To assess sulphate resistance of the developed concrete mixes			x	x	x	x	x	x						
2.2. To determine alkali silica reaction resistance of the developed concrete mixes							x	x	x	x				
2.3. To assess carbonisation resistance of the developed concrete mixes			x	x	x	x	x	x	x	x				
2.4. To assess resistance to the impact of chloride of the developed concrete mixes					x	x	x	x						

2.5. To assess freeze resistance of the developed concrete mixes			x	x	x	x	x	x	x					
2.6. Recommendation on increase of the corrosion and freeze resistance properties for the concrete produced from the Latvian cement (deliverable)										x				
3. To develop methods for innovative reinforced cement composite material production for infrastructure and public buildings											x	x	x	x
3.1. To design mixes for glass fibre reinforced concrete composites											x			
3.2. To determine mechanical and physical properties of the designed mixes											x	x	x	
3.3. To assess alkali silica reactions by using pozzolanic additives in glass fibre reinforced concrete composites												x	x	
3.4. Method for innovative reinforced cement composite material production (deliverable)														x
4. Parameter optimisation of cement composite mixing process											x	x		
2.1. Recommendation for parameter optimisation of cement composite mixing process (deliverable)												x		
4. Publications, Scopus														
5. Conferences														
6. Supervision of doctoral thesis and master's thesis	x	x	x			x	x		x	x	x		x	x

Annex 1-B

Project 1

Innovative and Multifunctional Composite Materials from Local Resources for Sustainable Structures

Time frame the Core task 2 activities

	2014		2015				2016				2017			
	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
1. To create production method for high performance asphalt concrete mixes from local low quality components.	x	x	x	x	x	x								
1.1.To select raw materials, to deliver them, to assess their properties	x	x	x	x	x	x								
1.2. To design high performance asphalt concrete mixes by using local dolomite shiver and bitumen B20/30			x	x	x	x								
1.3. Production method for high performance asphalt concrete mixes from low quality components (deliverable)						x								
2. To develop recommendations for parameter optimisation of mixing process for asphalt concrete mixes					x	x	x	x	x	x				
2.1. To design high performance asphalt concrete mixes by using local gravel shiver and bitumen B20/30					x	x	x	x						
2.2. To design high performance asphalt concrete mixes by using local gravel and dolomite shiver and polymer-modified bitumen PMB							x	x	x	x				
2.3. Recommendation for parameter optimisation of mixing process for asphalt concrete mixes (deliverable)										x				
3. To develop recommendations for transportation and incorporation of asphalt concrete mix											x	x		

3.1. Recommendation for transportation and incorporation of asphalt concrete mix (deliverable)												x		
4. To develop methodology for use of recycled asphalt concrete									x	x	x	x	x	x
4.1. To select raw materials, to deliver them, to assess their properties									x	x				
4.2. To determine design and exploitation properties of the designed mixes									x	x	x			
4.2.1 To restore properties of asphalt concrete mix recovered from recycled material with traditional bitumen having lower viscosity									x	x				
4.2.2 To restore properties of asphalt concrete mix recovered from recycled material with warm asphalt concrete production additives											x	x		
4.3. Methodology for use of recycled asphalt concrete (deliverable)														x
4.4. Recommendation for use of high-viscosity bitumen using warm asphalt concrete production additives														x
5. To prepare economic assessment of high performance asphalt concrete exploitation											x	x	x	x
5.1.To assess external factors – transport load and temperature											x	x		
5.2.To select forecasting model (based on results of laboratory experiments) and to determine parameters for functions of the model												x	x	
5.3. Economic assessment of high performance asphalt concrete exploitation (deliverable)														1
6. Recommendations for improvement of road technical rules													x	x
4. Publications, Scopus														
5. Conferences														
6. Supervision of doctoral thesis and master's thesis						x	x		x	x	x		x	x

Annex 1-C

Project 1

Innovative and Multifunctional Composite Materials from Local Resources for Sustainable Structures

Time frame the Core task 3 activities

	2014		2015				2016				2017			
	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
1. To develop method for production of ecological composite materials from textile plants and local mineral binders.		x	x	x	x	x	x							
1.1. To design fibre composite materials mix		x	x	x										
1.2. To determine mechanical and physical properties		x	x	x	x	x								
1.3. Method for production of ecological composite materials from textile plants and local mineral binders (deliverable)							x							
2. To develop and write guidelines for data collection system, which is suitable for heat and humidity migration control in energy-efficient buildings.	x	x	x	x	x	x	x	x	x	x	x	x	x	x
2.1.To develop plan for sensor installation in real stand (in cooperation with producer)	x	x												
2.2. To install sensors		x	x											
2.3.To collect data (humidity, temperature, etc.)			x	x	x	x	x	x	x	x	x	x	x	x
2.4. To develop model based on the collected data								x	x	x	x	x	x	x
2.5. Guidelines for data collection system (deliverable)														x
3. Life-cycle calculations of natural fibre composite materials						x	x	x	x	x				
3.1. To collect and process data						x	x	x	x	x				
3.2. Method for life-cycle calculations of natural fibre composite materials (deliverable)										x				

4. Recommendation for information about thermal properties of natural fibre composite materials to be added to LBN 002-01											x	x	x	x
4.1. To prepare recommendations for information about thermal properties of natural fibre composite materials to be added to LBN 002-01 (deliverable)														x
4. Publications, Scopus													1	
5. Conferences														
6. Supervision of doctoral thesis and master's thesis	x	x	x			x	x		x	x	x		x	x