Cost-effective and sustainable Bio-Renewable Indoor Materials with high potential customization and creative design in Energy Efficient buildings

EXTERNAL INSULATION WALL ASSEMBLY

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DESCRIPTION

Beforehand prepared NCC panel (wrapped with material protecting the panel from water and moisture) will be fixed to external wall by means of anchors. Afterwards the insulation material should be covered with external cladding depending on architects façade design.

REQUIREMENTS

- NCC as a material which easily absorbs water needs to be protected from weather conditions. To preserve insulating properties of NCC each panel should be wrapped into material which is water and vapour tight like aluminium foil.
- Due to application of protective material onto NCC panel it is not possible to use the material as a part of ETICS system and needs to be used with systems comprising external cladding.
- Installation of NCC panels do not require any specific devices and can be mounted using typical equipment. Due to light weight of panels the installation process is simple and can be easily performed by no more than two workers. However, depending on chosen external cladding the system in general may require utilization of additional devices (e.g. cranes), facilitating proper system installation on the building due to dimensions or weight of particular elements.
- Depending on results from fire tests on NCC panels and achieved fire class there may be limitations in usage of NCC panels as insulation material in ventilated façade systems. For different countries regulations may vary, with increasing height of the building regulations also get stricter. That is why before making a decision about implementation of NCC panels as an insulation material on certain parts of the building fire class of panels should be compared with proper regulations.
- NCC panels can be mounted to different substrates. They can be fixed to external walls made of concrete or brick materials or of stud structure.

END USERS

Contractors, architects, engineers.

BLOCK DIAGRAM

Ventilated facade:

Cavity wall:

GUIDELINES FOR EXTERNAL INSULATION WALL ASSEMBLY

Step 1 – Surface preparation

For new build structures make sure that the surface is dry and free from elements which may cause problems during insulation installation. For retrofitting actions remove all elements which protrude from the surface to create flat wall surface.

Step 2.1 – Installation of L brackets (ventilated façade)

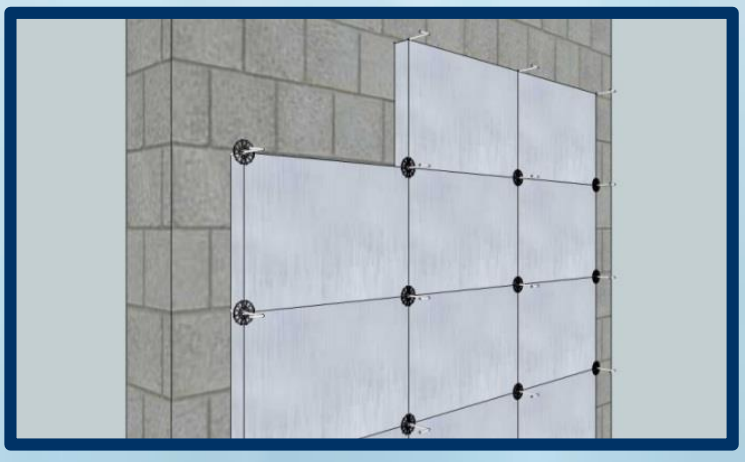
For ventilated façade system, firstly L brackets used as a support for further cladding system needs to be installed.

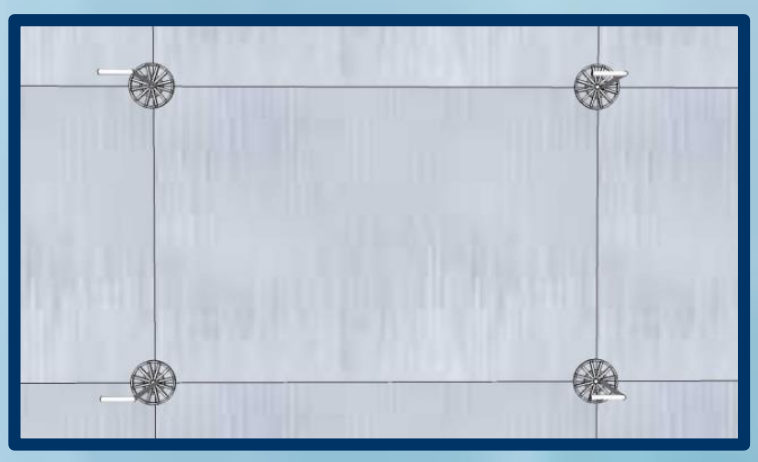
Step 3.1 – Installation of NCC panels (ventilated façade)

Cover the wall surface with NCC panels. Insulation material should be fixed to the wall by means of pins intended for installation of insulation boards (pins with plates). NCC panels should be fixed in each corner so that the pins do not perforate protective layer covering NCC material (foil). Plates will hold the panels in each corner. Eventual cracks which may appear due to earlier L bracket installation and lack of possibility to install NCC panels tightly one to another should be filled with insulating foam like polyurethane foam to eliminate thermal breaks.

Step 4.1 – Cladding installation (ventilated façade)

Perform all other actions related to final cladding installation depending on type of designed cladding system (installation of other supporting profiles, installation of cladding and all other finishing elements).





Step 2.2 – Installation of NCC panels (cavity wall)

Cover the wall surface with NCC panels. Pay attention to put panels tightly one to another to eliminate cracks between particular panels which can cause thermal breaks. Insulation material should be fixed to the wall by means of pins intended for installation of insulation boards in cavity structures (pins with plates and additional element to fix external brick layer). NCC panels should be fixed in each corner so that the pins do not perforate protective layer covering NCC material (foil). Plates will hold the panels in each corner.

Step 3.2 – Installation of external layer (cavity wall)

Perform other actions to create external layer depending on type of material used (brick, stone, etc.). It is recommended to do these actions in parallel with NCC panels installation. In this way it will be easier to mount anchoring elements to external structural wall on proper height as they have to be placed in horizontal joints of external brick/stone wall. The number of anchorages that need to be used depends from height of external finishing layer as well as from type and weight of used material.

TROUBLESHOOTING TABLE

PROBLEMS	POSSIBLE CAUSES	CONTINGENCY
NCC panels do not fit to places like corners, window door openings.	NCC panels wrapped with foil will have fixed dimension.	There will be places on the façade were insulation panels will have to be adjusted to shape and dimensions of façade. In this way the best solution would be to adjust panels on site and cut them to proper shape. Sides of panels which will come uncovered after cutting will have to be sealed on site with extra pieces of foils by means of adhesives.

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