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*Good practice*

# Monitoring and Evaluation For Ice and Snow Cleaning In North Tallinn

**During the XIII MiSRaR seminar Tallinn presented the Monitoring and evaluation for ice and snow cleaning in Tallinn**

**Mitigation, actions, monitoring and evaluation of cleaning the roofs and the pavements from ice and snow.**

According to the legal acts of regional government there are regulations for owners of the buildings and for the regional and municipal government to clean the pavements and roofs from snow and ice.

The reasons of why icicles are forming on the roofs:

1. If the roofs are properly heat insulated then the icicles are not forming to the roofs.
2. Icicles can be dangerous to people and vehicles when they are falling in result of melting.
3. Icicles can also be dangerous for the roofs of the buildings while they are growing.

The reasons of the snow forming to the roofs:

1. During warmer weathers or rain the snow on the roofs are getting heavier and can damage the roofs and the constructions of the roofs thus becoming dangerous to the people inside the buildings.
2. Heavy snow on the roofs is especially dangerous for light constructions (for example sport facilities, petrol stations etc.).

The reasons of ice and snow forming on the pavements:

1. Snow is on pavements when it is not cleaned by the owners of the building or by municipalities.
2. When the snow is melting or there is rain then during the cold nights the ice is forming on the pavements.
3. On slippery pavements it is more difficult to walk and there is a danger of injuries.
4. To avoid slippery pavements the pedestrians are walking in the streets where there is a danger to get involved in traffic accidents.

Mitigation methods that shoul be used by the owners of the buildings:

1. To heat insulate the roofs properly to avoid icicles.
2. To clean constantly the roofs from the snow to avoid the melting of the snow.
3. To install electricity cables to the rain water pipes to avoid the pipes from freezing.

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4. To guarantee the existence of other equipment necessary for the safe cleaning of the snow from the roofs.
5. To guarantee the existence of the granulated stuff for the fight with the slippery pavements.
6. To make thermografic pictures with the thermocameras that show the flaws in heat insulation.

Mitigation methods that should be used by the municipalities:

1. To inform the owners of the buildings for their responsibilities in cleaning the ice and snow from the roofs and pavements.
2. To inform the owners of the buildings on traffic regulations during the cleaning of ice and snow from the roofs and pavements.
3. To inform the owners of the buildings of the sanctions and fines on not cleaning the ice and snow.
4. To inform the owners of the buildings of the dangers connected to ice and snow (cleaning) on the roofs and pavements.
5. To create an overview of the buildings where the heat insulation of the roofs is necessary
6. If possible then to support the owners with thermostatic studies of the roofs.
7. To support the owners with the information of heat insulation procedures and if possible then to support the heat insulation itself.

The municipal police has to:

1. Inform the owners of their responsibilities to clean the ice and snow from the roofs and pavements.
2. To make sanctions and fines to the owners if the responsibilities are not carried out.

Safety regulations during the cleaning procedures of the ice and snow from the roofs and pavements:

1. It is possible to avoid damages to the roof constructions if the cleaning of the snow from the roofs is carried out regularly.
2. Roof construction are in danger to be damaged when the width of the snow is more than 30 cm.
3. If the owner of the building does not possess the proper equipment or other necessary devices to clean the ice and snow from the roofs and pavement then she/he has to outsource these services.
4. The weather conditions have to be considered carefully before climbing to the roof, strong wind or blizzard can magnify the danger of falling from the roof.
5. The owners of the buildings have to secyre the safety of the people working on the roofs.
6. If the roofs lack the security ladders or other necessary devices then it is obligatory to install them before the cleaning operations.
7. To avoid the cleaning equipment falling down from the roofs.
8. To avoid the ice and snow falling down from the roofs it is also necessary to install the snow fences to the roof.
9. If the ice and snow are cleaned in the area of human- or car traffic then it is obligatory to mark the dangerous area with the safety ribbons.
10. Also it is necessary to avoid any chemicals in melting the ice and snow because it can drip to the water collectors and cause lot of damage for the bacteria in waste water cleaning station – it takes six months to grow new bacteria.

11. To use the equipment that is not damaging the roof of the building while mechanivally cleaning it.

Actions of the owners during the cleaning of the roofs and pavements from the ice and snow:

1. To let the habitants of the building and the owners of the cars to know beforehand of the time of the cleaning operation.
2. To organize the reparking for the cars.
3. To avoid the snow and icicles falling to the lower buildings (one similar accident happened in Estonia in a sport facility).
4. To guarantee for the pedestrians (especially for the handicapped people) the safe passway during the cleaning operation.

The responsibility on cleaning the ice and snow from the roofs and pavements of The City Engineering Office:

1. To collect information about the change of the weather conditions and to let the municipalities and the head of the heavy weather conditions' committee know if weather conditions turn to emergency situations (heavy snow fall or blizzard or extreme cold).
2. To organize effectively the cleaning of the roads, streets, pavements, bus stations from the snow and ice.

The responsibility on cleaning the roofs and the pavements from the roofs and the pavement of The City Transport Office:

1. To have an overview of the cleaning times and places in the city that demand the redirection of human or car traffic.
2. If necessary then redirect the city transport during the cleaning operations.

Monitoring and evaluating the cleaning of ice and snow from the roofs and pavements by the Municipal Police and the City Engineering Office:

1. The City Engineering Office is carrieng out constant monitoring and evaluation of the conditions of the roads, streets and pavements.
2. The Municipal Police is constantly monitoring and evaluating the conditions of the roofs and pavements.
3. The Municipal Police is also making fines in case of negligence after constant remindings.

***The MiSRaR project***

*The MiSRaR project is about Mitigation of Spatial Relevant Risks in European Regions and Towns. The project is a cooperation between seven partners in six EU member states:*

- *the Safety Region South-Holland South, The Netherlands (lead partner)*
- *the city of Tallinn, Estonia*
- *the region of Epirus, Greece*
- *the province of Forlì-Cesena, Italy*
- *the municipality of Aveiro, Portugal*
- *the municipality of Mirandela, Portugal*
- *the Euro Perspectives Foundation (EPF), Bulgaria.*

*The goal of the project is to exchange knowledge and experiences on risk mitigation in spatial policies. The project will result in a handbook in which the lessons on the mitigation process are described and the good practices from the partners are presented. The Risk Assessment and Mapping Guidelines for Disaster Management of the European Commission will be implemented in the handbook. The MiSRaR project is cofinanced by the European Regional Development Fund and made possible by the INTERREG IVC programme.*

*www.misrar.eu*

***Contact information***

*Nico van Os, general project manager MiSRaR,*
*Safety Region South-Holland South,*
*The Netherlands*
*n.van.os@vrzhz.nl*

*Jaan kuks , project manager MiSRaR of Tallinn,*
*jaan@procivitas.ee*