Cutting Extinguishing Tactic

Exercise:
1430
2015-05-26

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

About the training material

The cutting extinguishing tactic was produced by Kristoffer Wahter together with the fire fighters and crew commanders at Frölunda fire station.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Unit 1160 at Frölunda fire station is one of Sweden´s most called out cutting cutting extinguisher units

About the training material

The cutting extinguishing tactic provides suggestions for tactical measures in various scenarios. Use the training material, which is by no means exhaustive, as the basis for tactical discussions. Each scenario should be discussed in light of how it can be managed using the various resources available.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

The cutting extinguisher’s area of application

- Fire in enclosed spaces
- Structural fires
- Fires in attics and roofs
- Fire in premises with large volumes

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Fire in enclosed spaces

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Fire in a building

Building fires can start and spread in several different ways. Common reasons why fires start are ovens that people forget to switch off, chimney fires, technical faults in electrical appliances or that someone starts a fire on purpose.

Fires in enclosed spaces

Fire in an enclosed space often starts with a starting object such as an oven someone has forgotten to switch off for example.

Forgotten oven

The fire can spread from one source to another, for example, from a candle to curtains which in turn runs up the ceiling. The room's volume will start to fill with smoke and combustible gases.

Fires in enclosed spaces

Fires in enclosed spaces vary depending on what stage the fire is at, the fire is affected among other things by:

- Quantity and type of combustible material
- Density, form and location of the material
- Properties in the room's surrounding construction
- Available quantity of air
- Size and geometry of the room

Fires in enclosed spaces

The cutting extinguisher is suitable for cooling the fire gases from the outside of the building or room. This is a risk reducing measure to create a better working environment before internal extinguishing.

Fires in enclosed spaces

A fully developed fire in an enclosed space may last for a long time, sometimes for several hours, depending mainly on the amount of fuel in the room. Temperatures of 800–900°C are common.

Risks associated with fire in enclosed space

Risk of explosive fire when we start internal extinguishing of fires in enclosed spaces.

Tactic for fires in enclosed spaces

1. Thermal Imaging scan of the building to locate the fire room
2. Read the building and select your method
3. During a cutting extinguisher attack, pierce from the outside towards the fire room until the fire gases turns to white steam and the turbulence subsides
4. Create a ventilation point
5. Pressure ventilate the space affected by fire
6. Start internal extinguishing, extinguish any remaining seats of fire and slow combustion

Gather the facts and draw up tactical plan:

- **Themal Image scan the building**
- **Walk around the building, look with naked eye and scan with Thermal Imaging camera**
- **Locate the fire and its extent**
- **Read the building**
- **Acquire plans**
- **Engage the property owner**

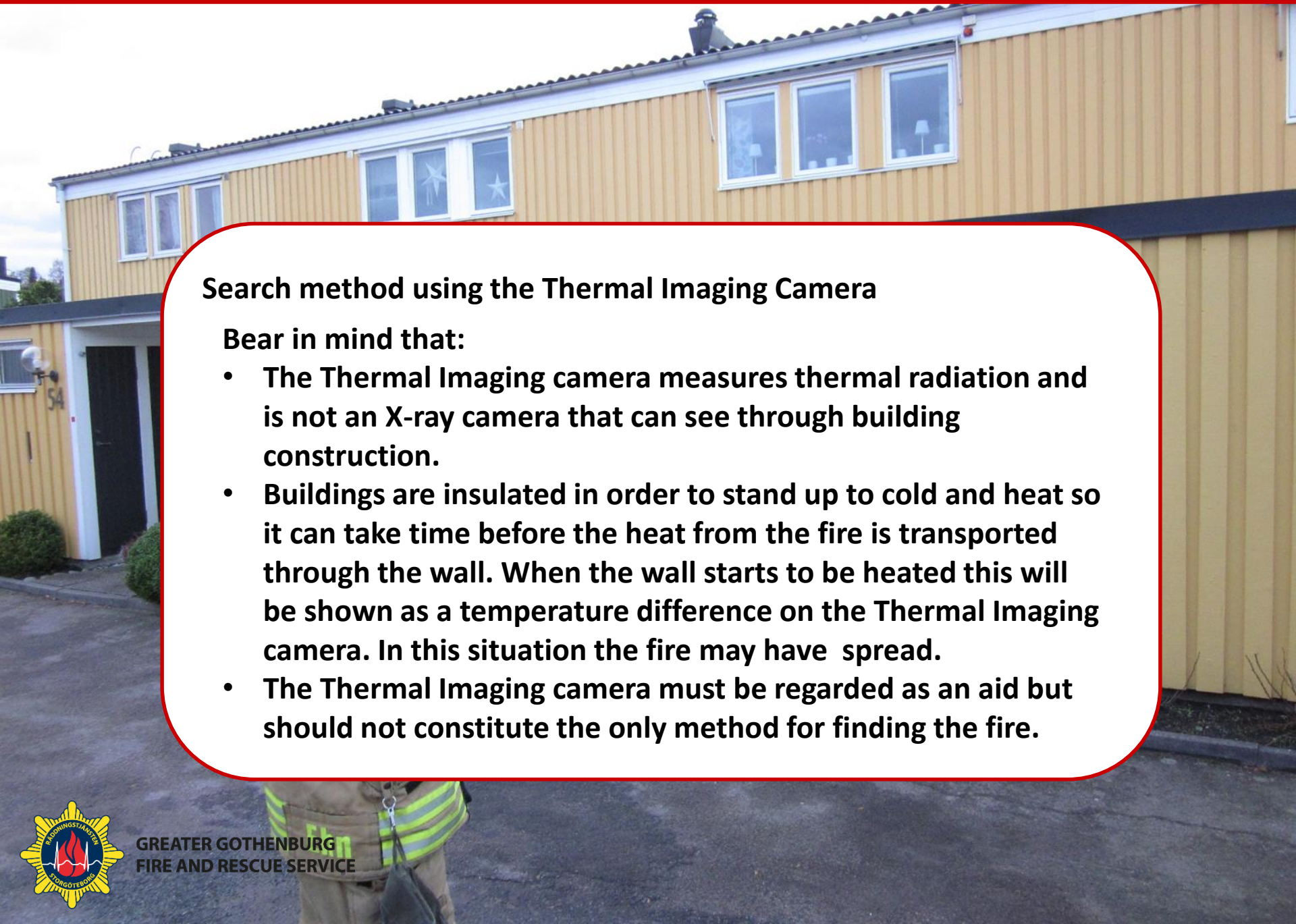
GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Search method using the Thermal Imaging camera

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Search method using the Thermal Imaging camera

Scan the entire building using the Thermal Imaging camera in order to locate the area of fire.

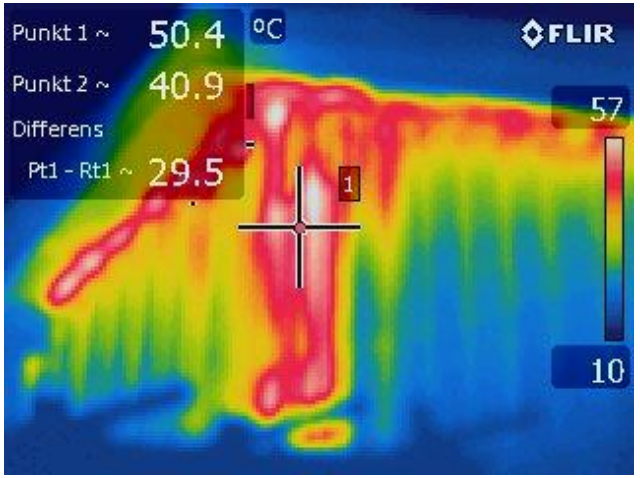


Search method using the Thermal Imaging Camera

Bear in mind that:

- **The Thermal Imaging camera measures thermal radiation and is not an X-ray camera that can see through building construction.**
- **Buildings are insulated in order to stand up to cold and heat so it can take time before the heat from the fire is transported through the wall. When the wall starts to be heated this will be shown as a temperature difference on the Thermal Imaging camera. In this situation the fire may have spread.**
- **The Thermal Imaging camera must be regarded as an aid but should not constitute the only method for finding the fire.**

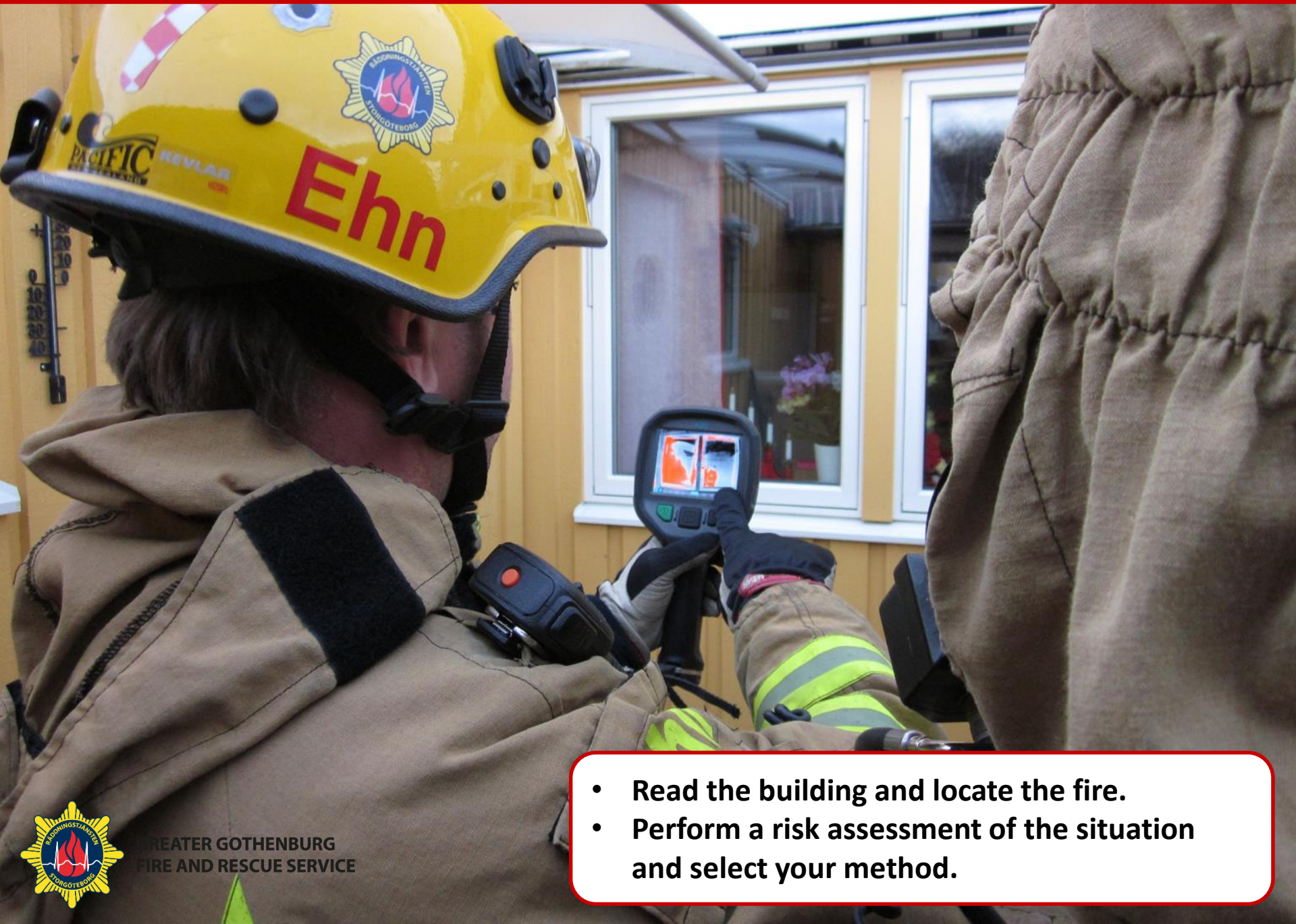
Search method using the Thermal Imaging camera



Locate the fire room and perform the cutting extinguisher attack.

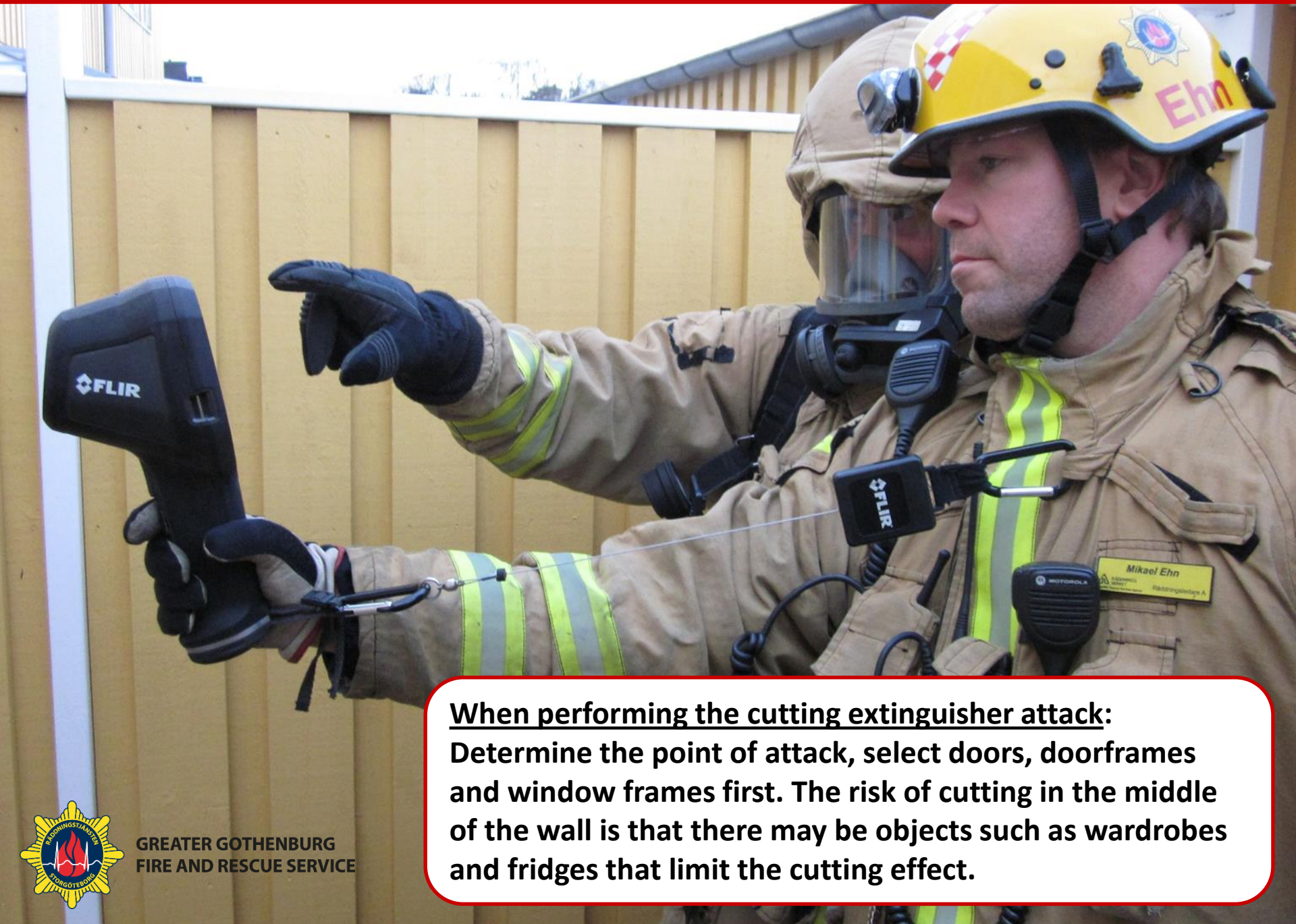
GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Cutting extinguishing tactic – Fire in a building



- Read the building and locate the fire.
- Perform a risk assessment of the situation and select your method.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE



<u>When performing the cutting extinguisher attack</u>:
Determine the point of attack, select doors, doorframes and window frames first. The risk of cutting in the middle of the wall is that there may be objects such as wardrobes and fridges that limit the cutting effect.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Cool until the fire gases turns to white steam and the turbulence subsides. Be patient – depending on the volume of the room it may take time before the fire gases are made inert.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Demonstration film of the cutting extinguisher's effect on fires in enclosed spaces

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Consider that the water jet is relatively uniform up to approx.: 5 metres from the nozzle where the first dispersal of the jet takes place. At approx.: 7 metres from the nozzle the jet is completely dispersed. Try to ensure that the water jet disperses completely in order to achieve the best extinguishing effect, angle the cutting extinguisher if required.

Image from the Swedish Civil Contingencies Agency's (MSB) report: The cutting extinguishing concept's operative use

Cutting extinguishing tactic – Fire in a building

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

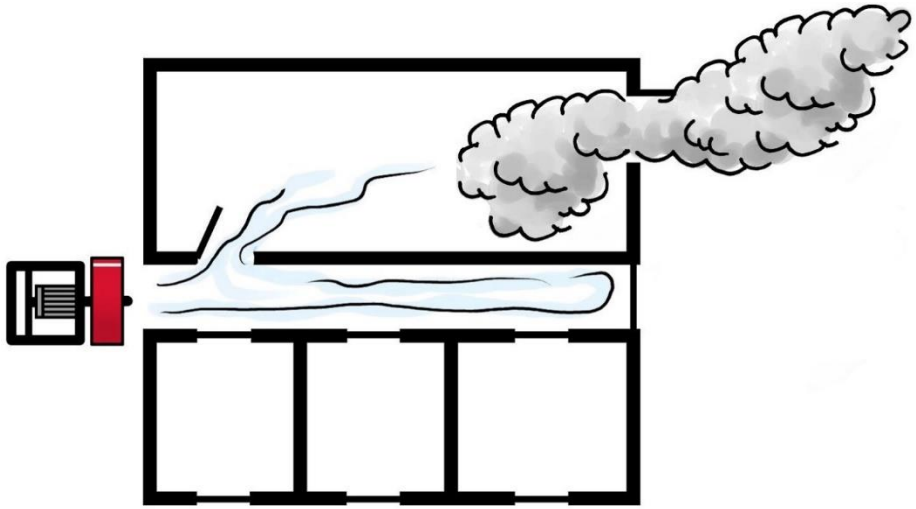
Prepare for internal extinguishing at the same time as the cutting extinguisher attack is in progress.

Create exhaust air opening when the cutting extinguisher attack has had the intended effect.

Create supply air opening and start the fan in order to ventilate the fire gases.

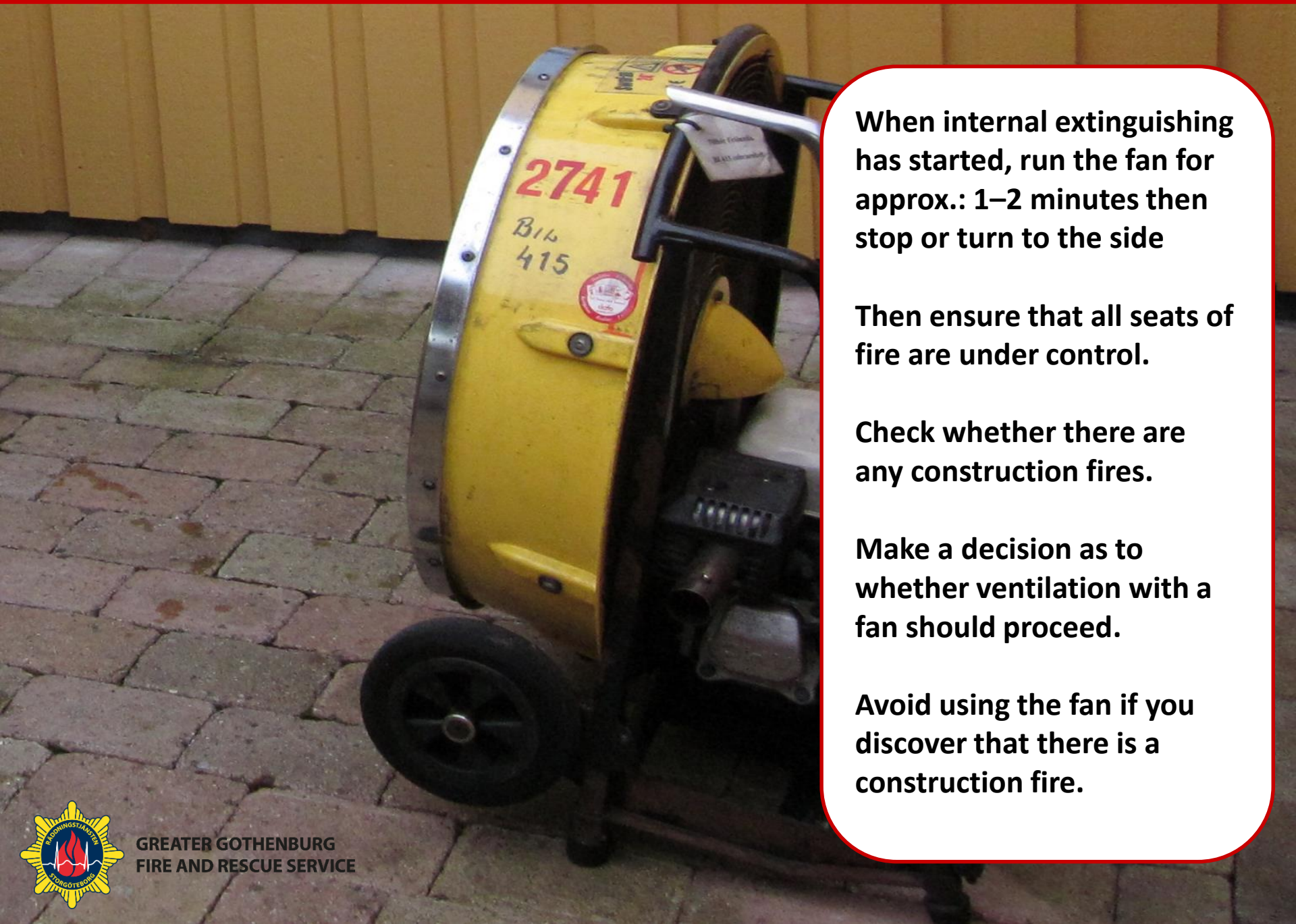
During mechanical fire gas ventilation using a PPV fan, the exhaust air opening should be twice the size of the supply air opening

Supply air opening → **Suitable area for corresponding exhaust air opening**



Wait approximately: 15-20 seconds so the most of the fire gases have been ventilated before commencing internal extinguishing. Avoid standing in doorways as this obstructs the fan's air flow.

- Important: Consider what is behind the wall, floor or ceiling!
- Check that nobody is behind the cutting surfaces
- Coorperation is important during an intervention as personnel are inside the building



When internal extinguishing has started, run the fan for approx.: 1–2 minutes then stop or turn to the side

Then ensure that all seats of fire are under control.

Check whether there are any construction fires.

Make a decision as to whether ventilation with a fan should proceed.

Avoid using the fan if you discover that there is a construction fire.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Example of fires in enclosed spaces

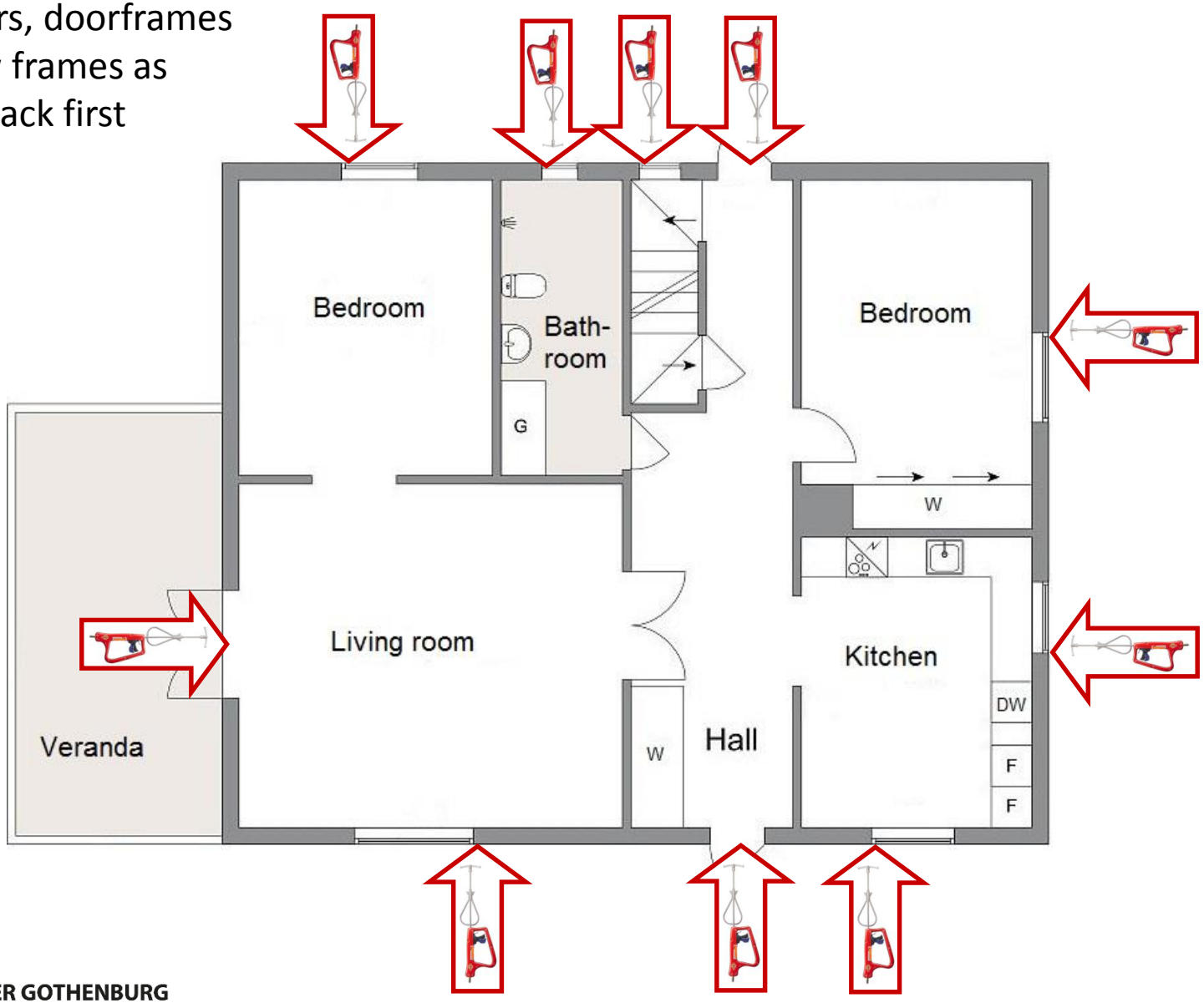
Fires in enclosed spaces occur in all types of buildings, for example in:

- House fires
- Office fires
- Workshop fires
- Industrial fires
- Apartment fires

For house fires, the rooms are often easily accessible via doors, doorframes and window frames.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

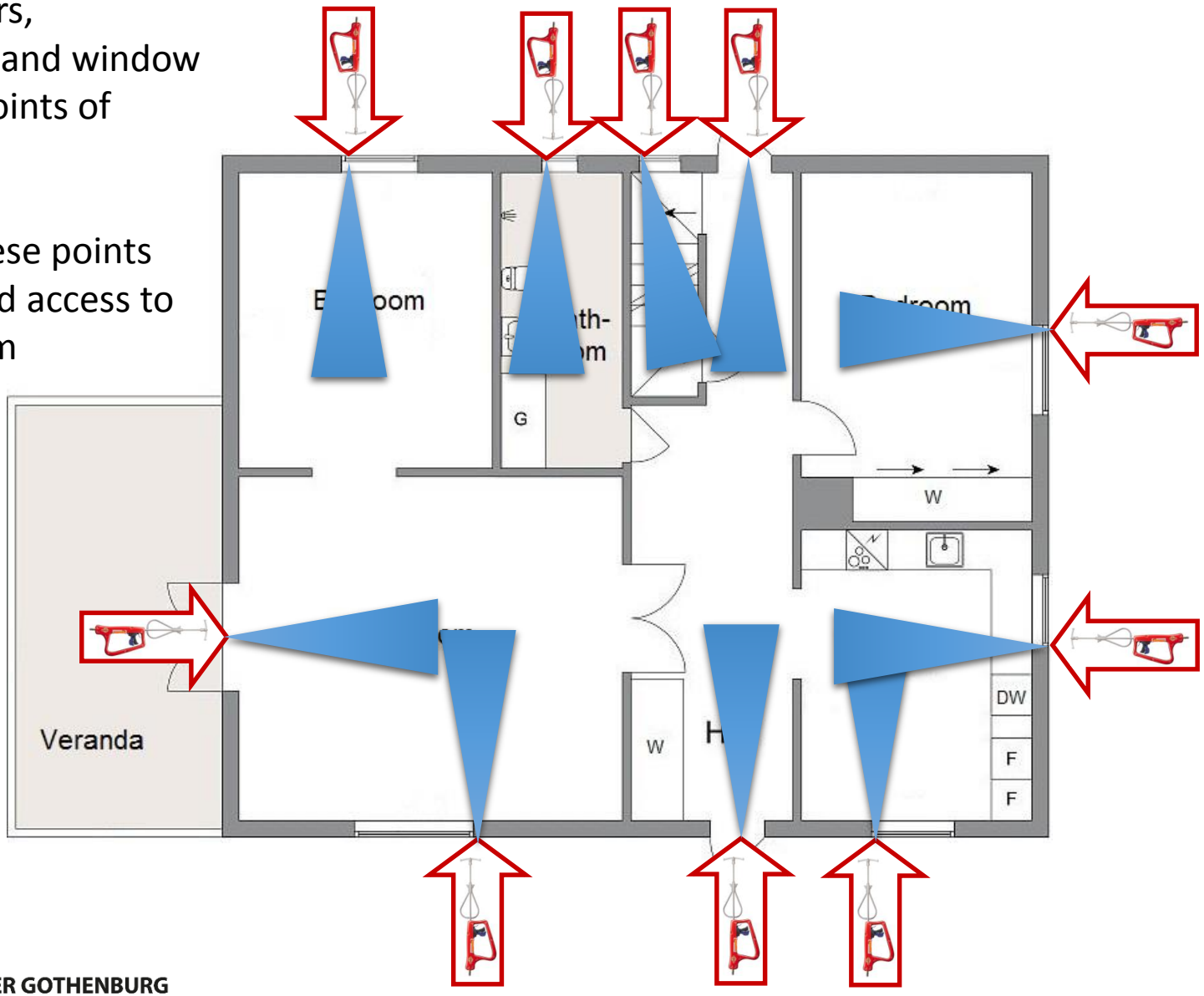
Choose doors, doorframes and window frames as points of attack first



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

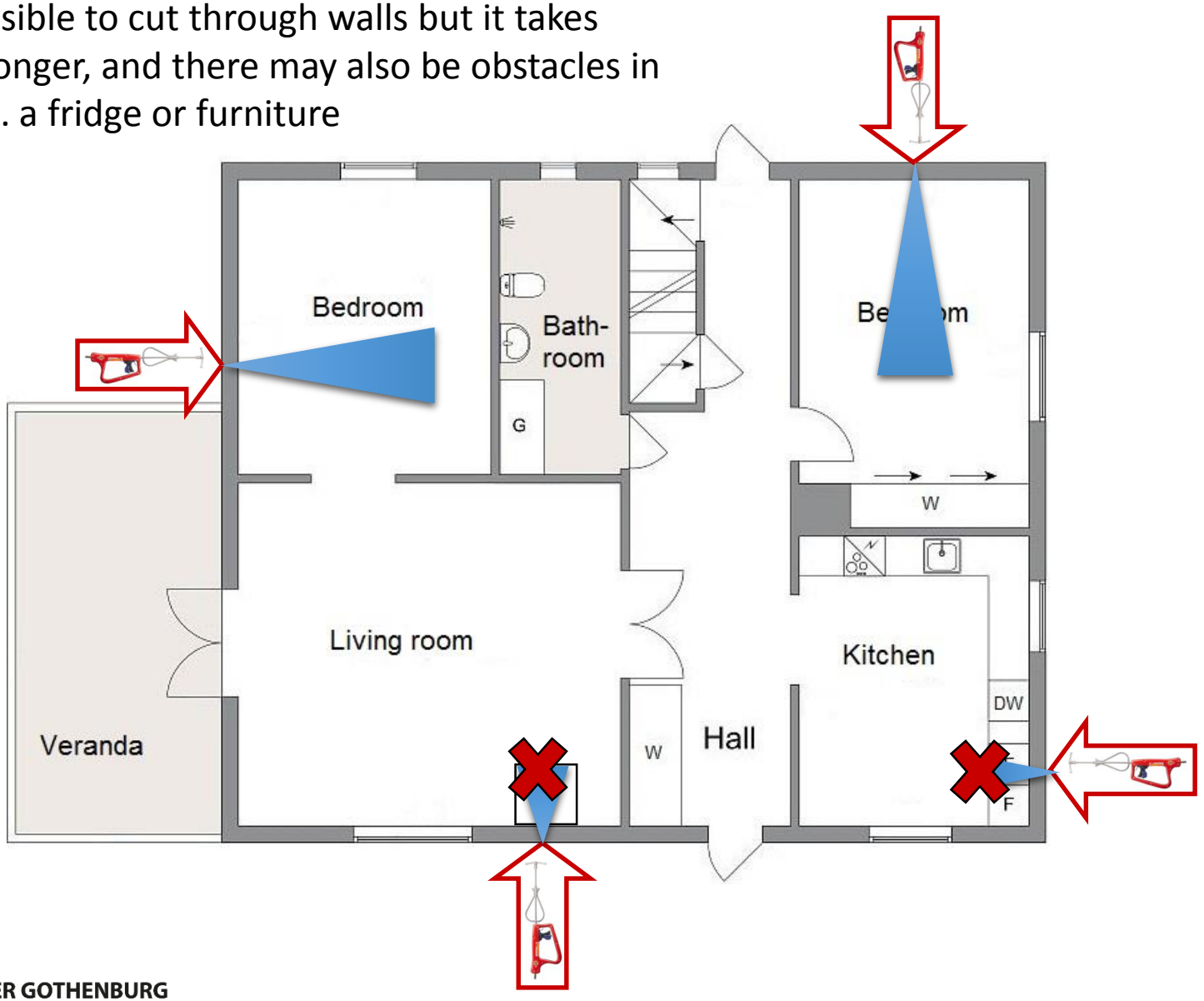
Choose doors, doorframes and window frames as points of attack first

As a rule these points provide good access to the fire room



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

It is also possible to cut through walls but it takes somewhat longer, and there may also be obstacles in the wall, e.g. a fridge or furniture



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Try to ensure that the water jet disperses completely, i.e. 5–7 metres from the nozzle, in order to achieve the best extinguishing effect, angle the cutting extinguisher if required.

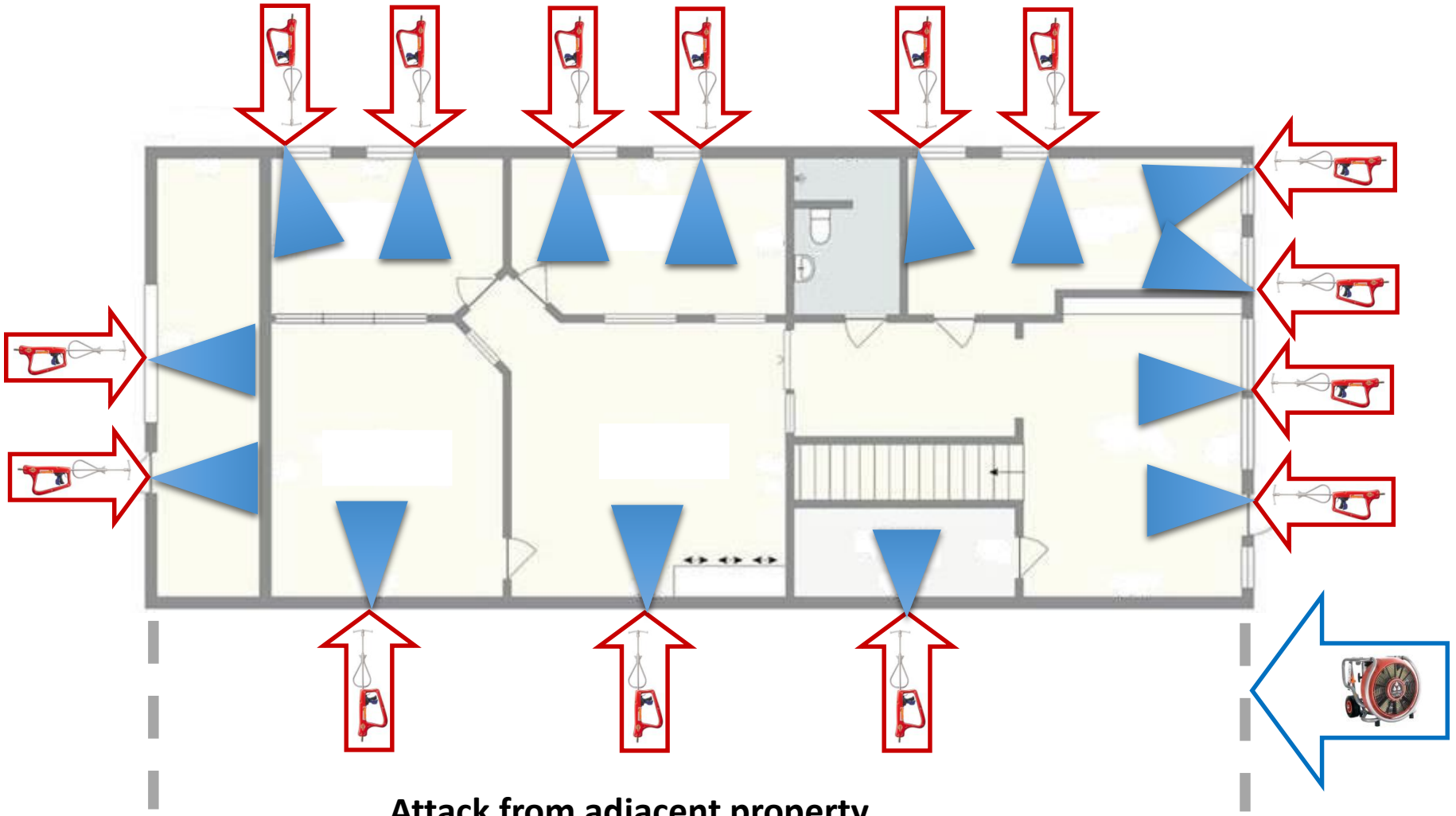
GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Extinguishing work concerns getting water on the fire. If the fire is difficult to access, change the point of attack or change your method selection.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

For fires in enclosed spaces in office premises, the cutting extinguisher attack may need to be performed from adjacent properties. Pressurise adjacent properties as well in order to prevent the fire spreading.

Attack from the outside

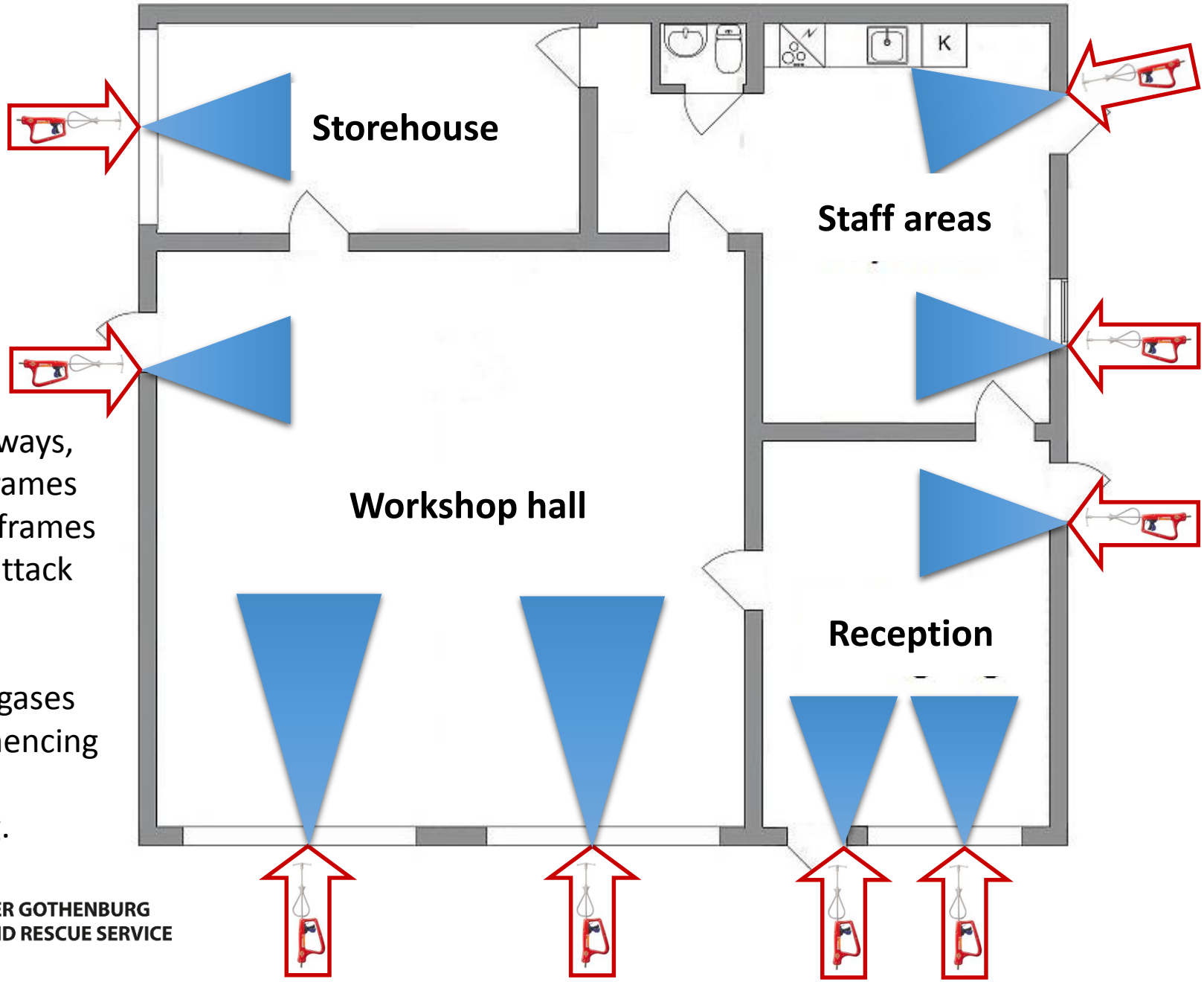


Attack from adjacent property

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Pressurise adjacent premises in order to prevent the fire spreading

Workshops and industrial buildings are often classified as high risk objects. In rooms with large volumes, the cutting extinguisher needs to work for several minutes before the extinguishing effect is noticed. In order to improve the effect, several cutting extinguishers can be used simultaneously. Perform the attack via doorways, doors, doorframes and window frames.



Choose doorways, doors, doorframes and window frames as points of attack first.

Cool the fire gases before commencing internal extinguishing.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Industrial premises with separation between the various companies.

Cutting extinguishing tactic – Fire in a building

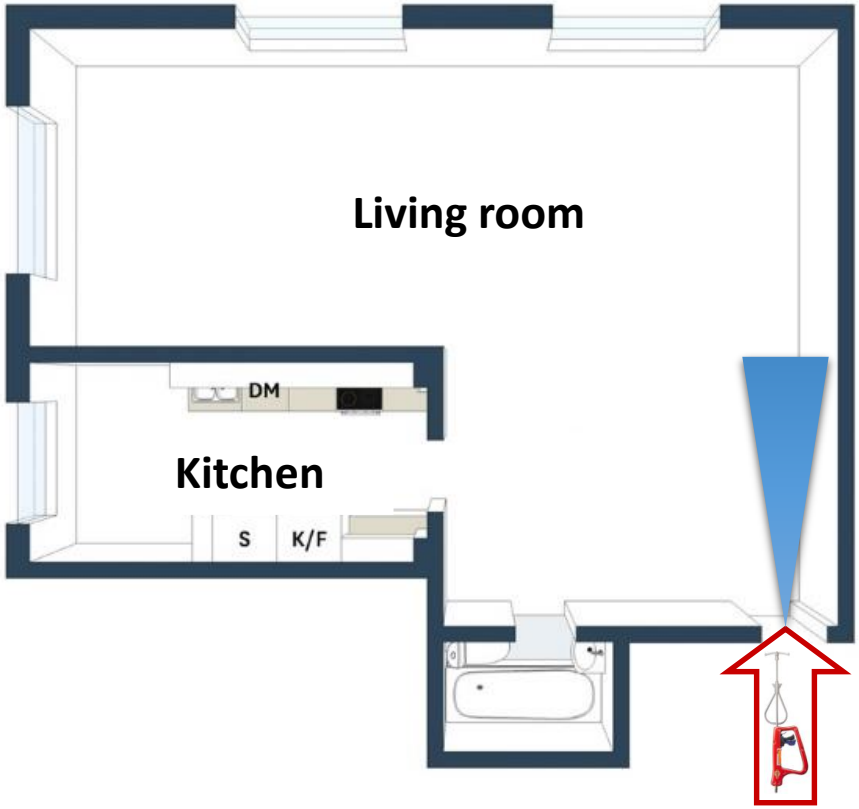
Example of tactic:

- Locate the fire room
- Perform the cutting extinguisher attack
- Pressurise adjacent premises
- Prepare for internal extinguishing
- Perform internal extinguishing

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

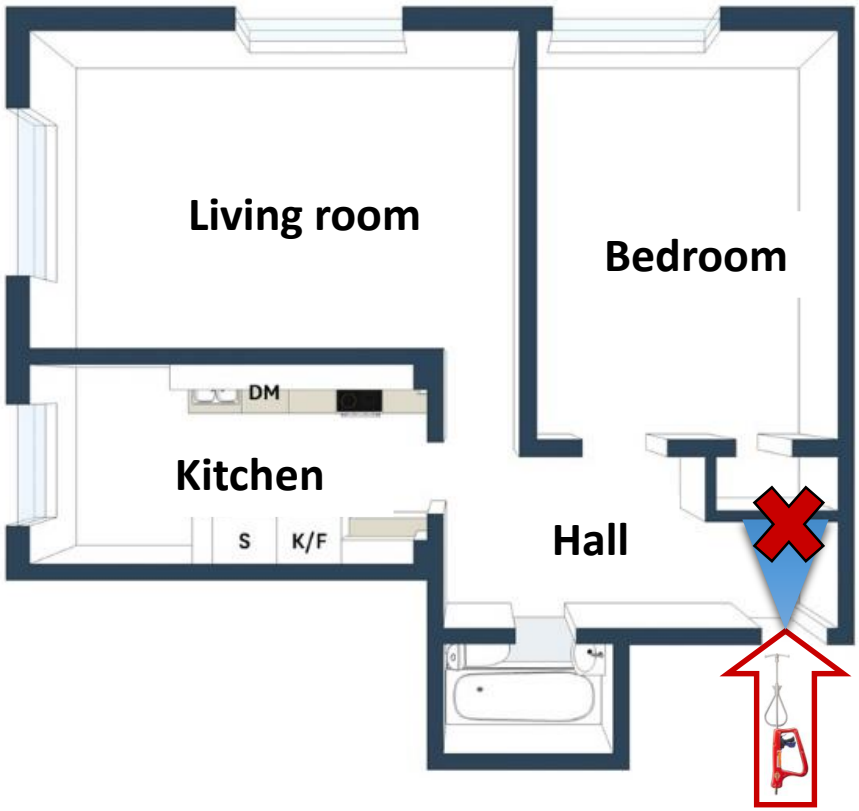
Cutting extinguisher attack for fires in enclosed spaces in apartment buildings

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

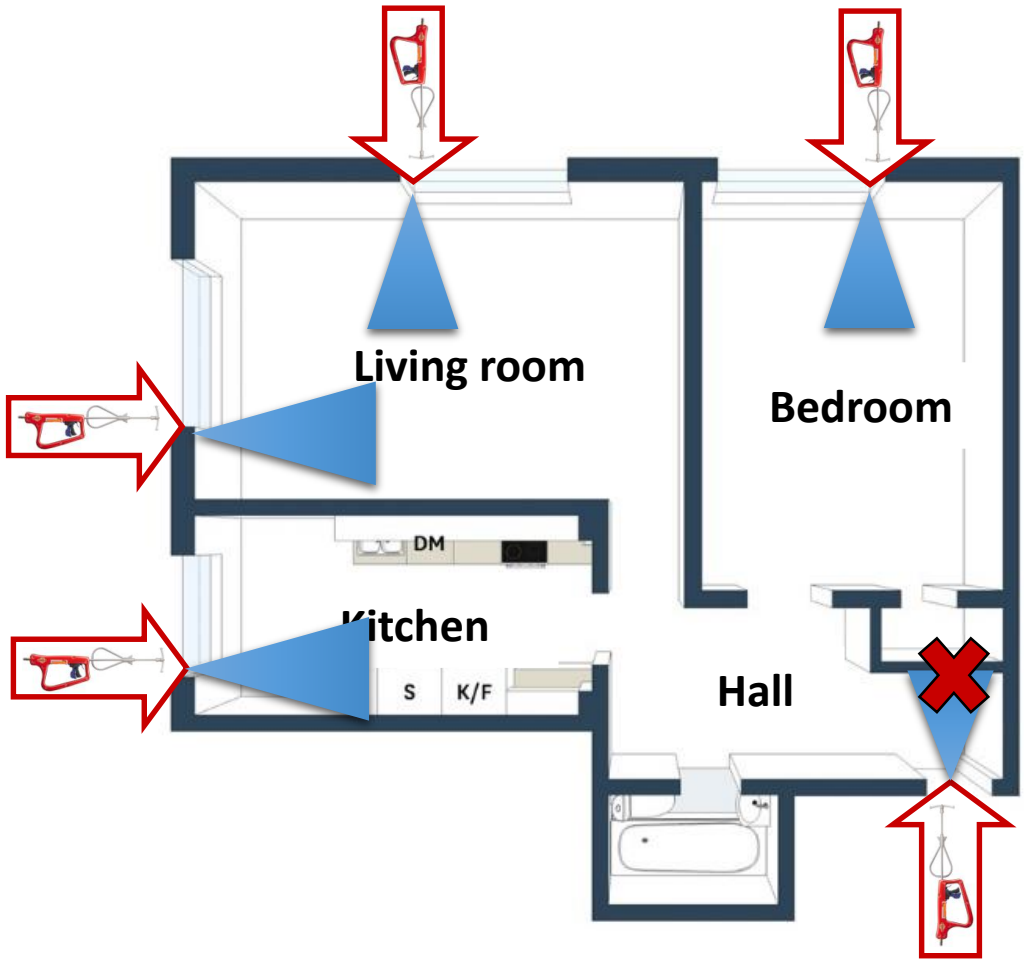
Cutting extinguisher attack via stair well is possible if there is an open plan layout in front of the apartment door

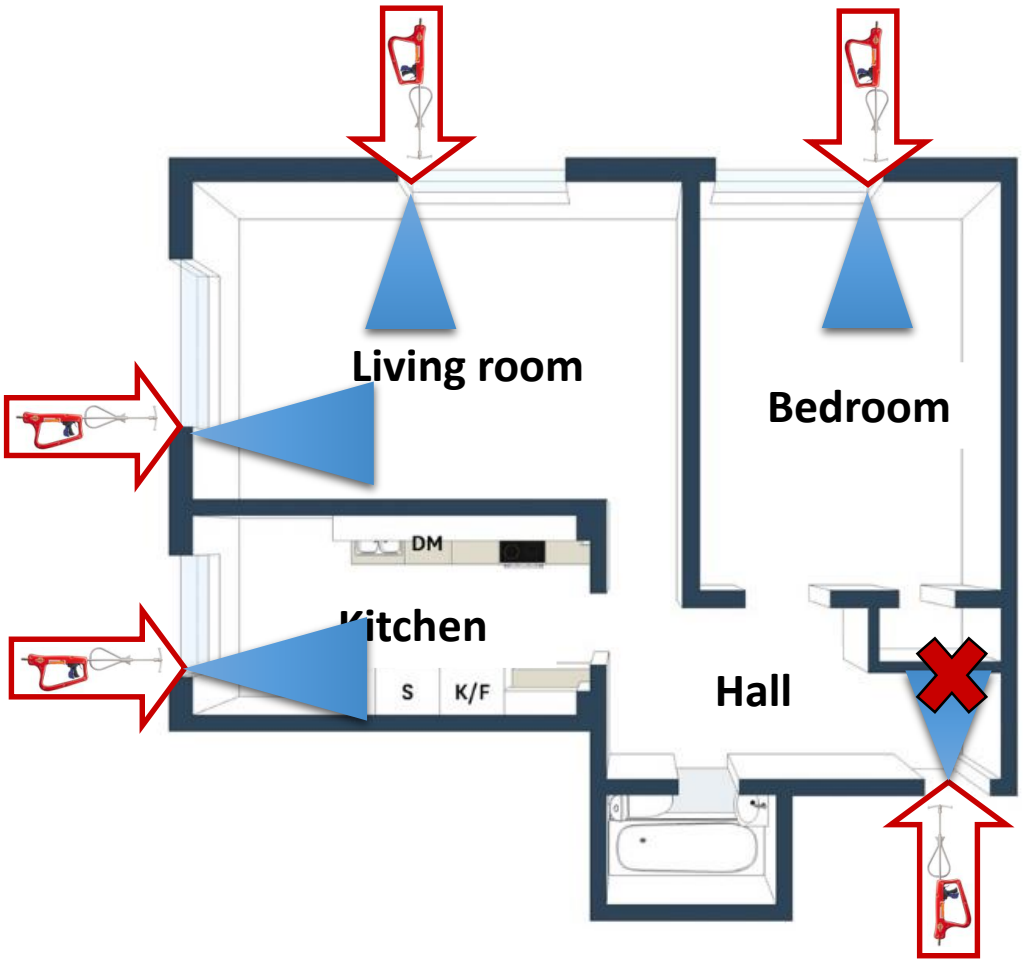


GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

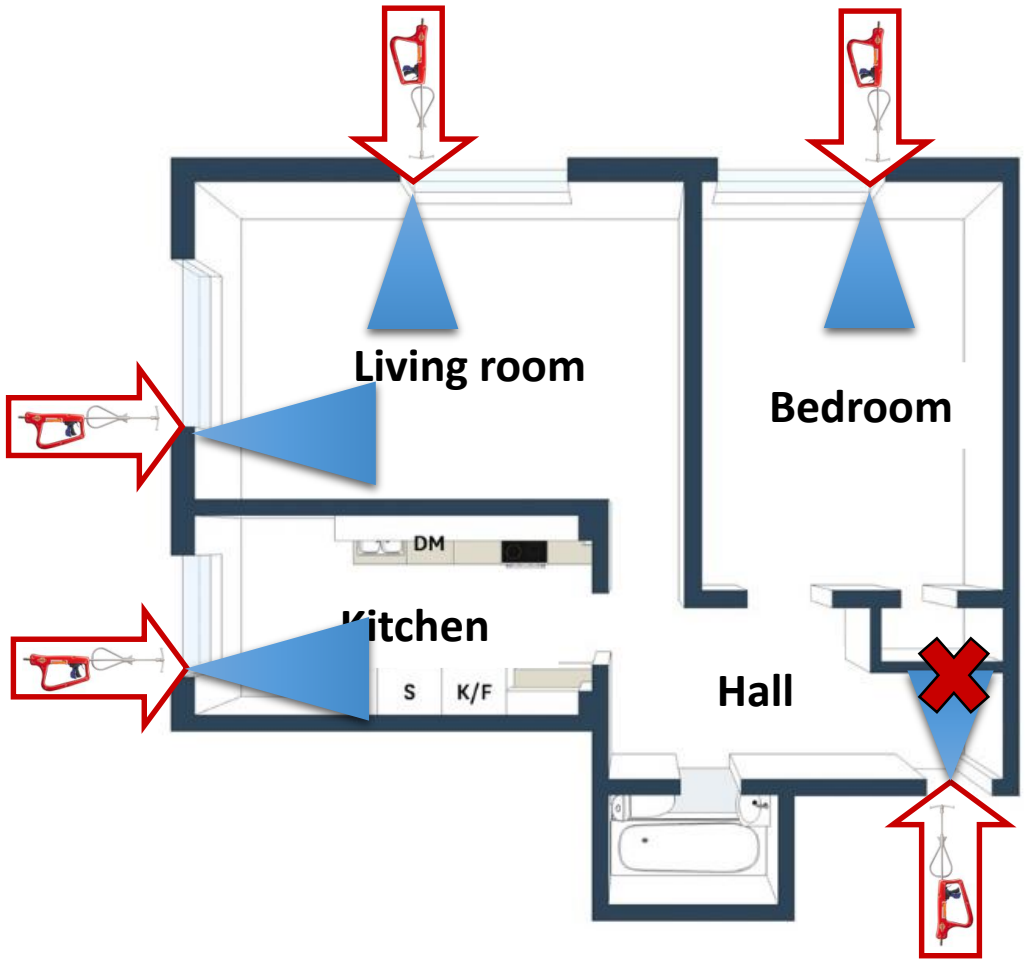
The apartment's plan layout can make the cutting extinguisher attack via the stair well difficult.

For this reason it may be appropriate to perform the cutting extinguisher attack from outside via window frames or balcony doors





The cutting extinguisher attack from the outside can be performed quickly for rooms on the ground floor and at basement level.

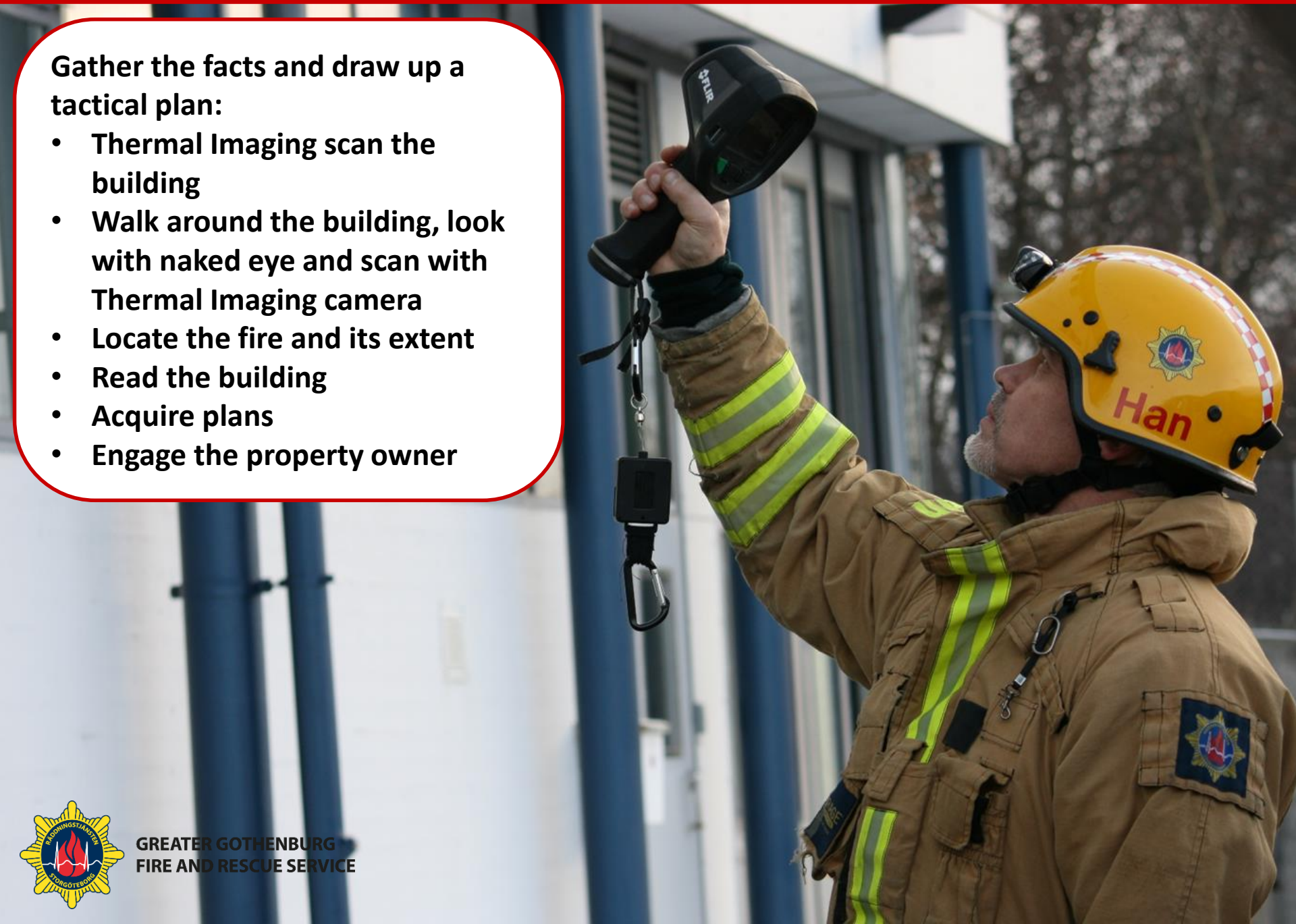


For cutting extinguisher attacks at a higher floor level, a portable ladder or vehicle-mounted crane is required.

Work primarily from the vehicle-mounted crane as this is the safest option.

Fire in enclosed space at higher floor level

1. Thermal Imaging scan the building and locate the fire room
2. Cutting extinguisher attack from the outside to fire affected rooms from portable ladder or vehicle-mounted crane
3. Pressurise the stair well and position fire fighters with breathing apparatus (BA) outside the fire affected apartment
4. When the cutting extinguisher has achieved the intended affect, ventilate from outside
5. Enter the apartment with the BA crew and commence internal extinguishing, extinguish any remaining seats of fire and embers.

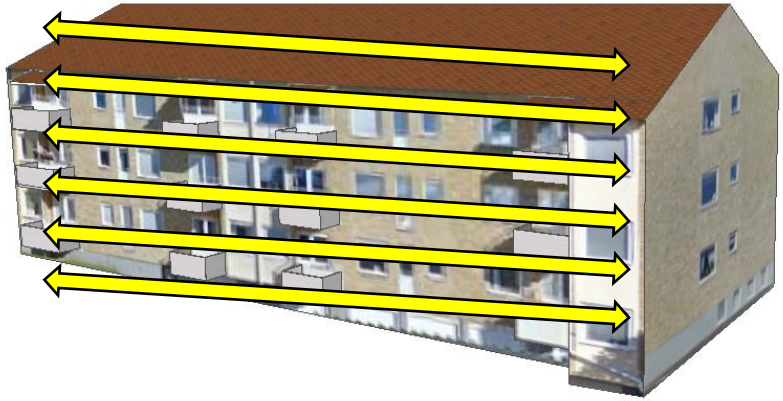


Gather the facts and draw up a tactical plan:

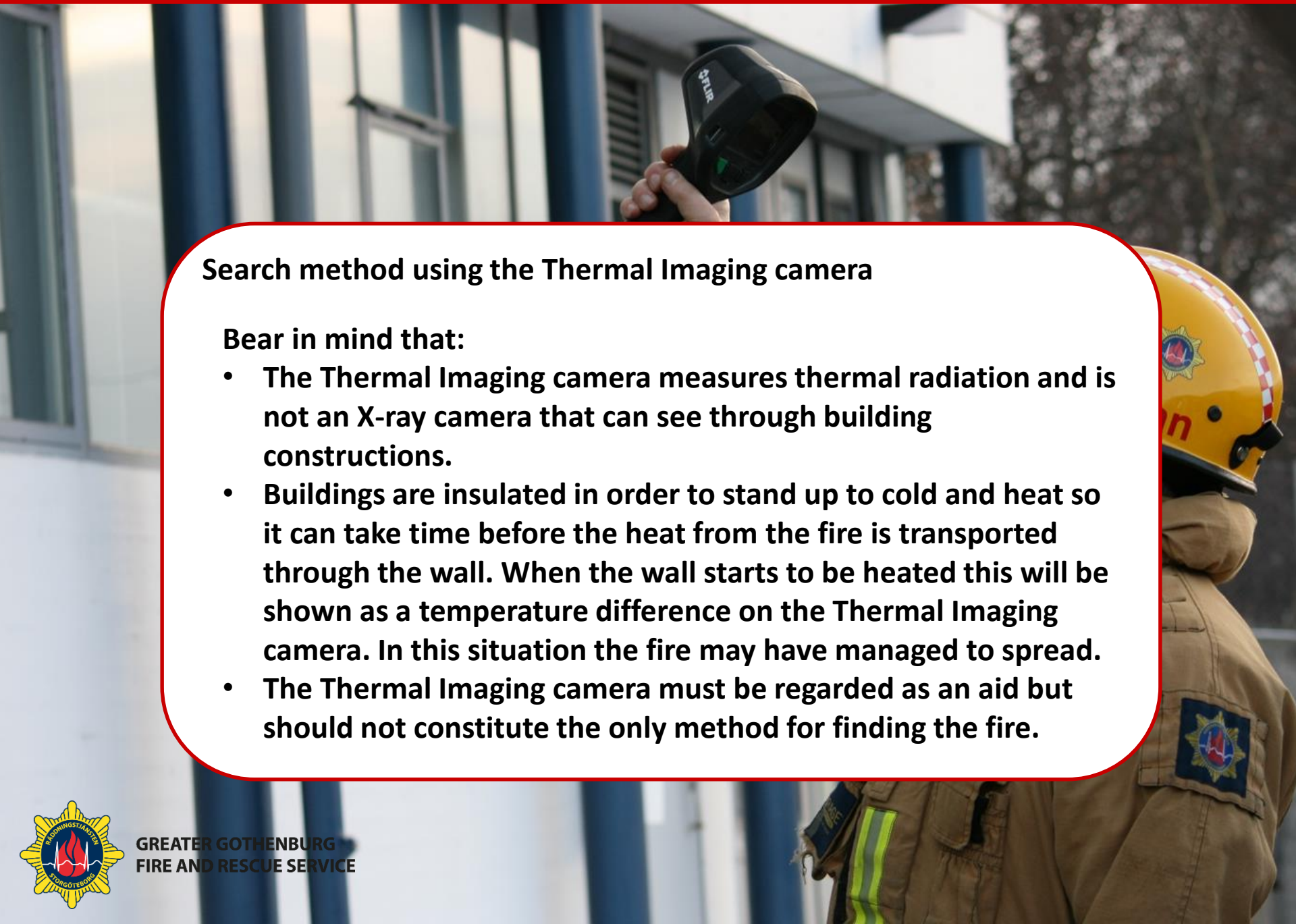
- **Thermal Imaging scan the building**
- **Walk around the building, look with naked eye and scan with Thermal Imaging camera**
- **Locate the fire and its extent**
- **Read the building**
- **Acquire plans**
- **Engage the property owner**

Search method using the Thermal Imaging camera

Search method using the Thermal Imaging camera



Scan the entire building using the Thermal Imaging camera in order to locate the fire space.

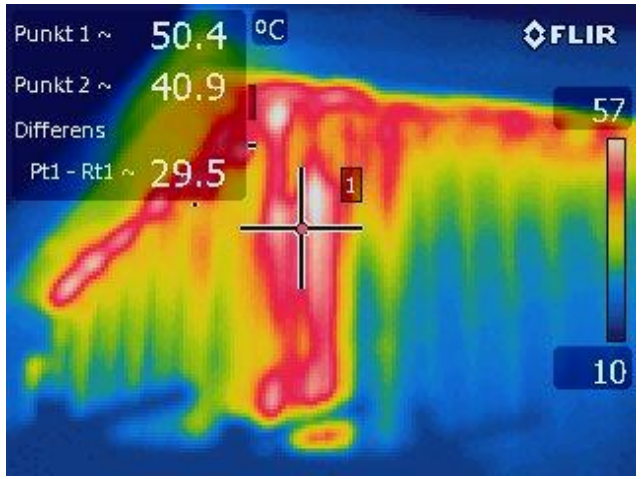


Search method using the Thermal Imaging camera

Bear in mind that:

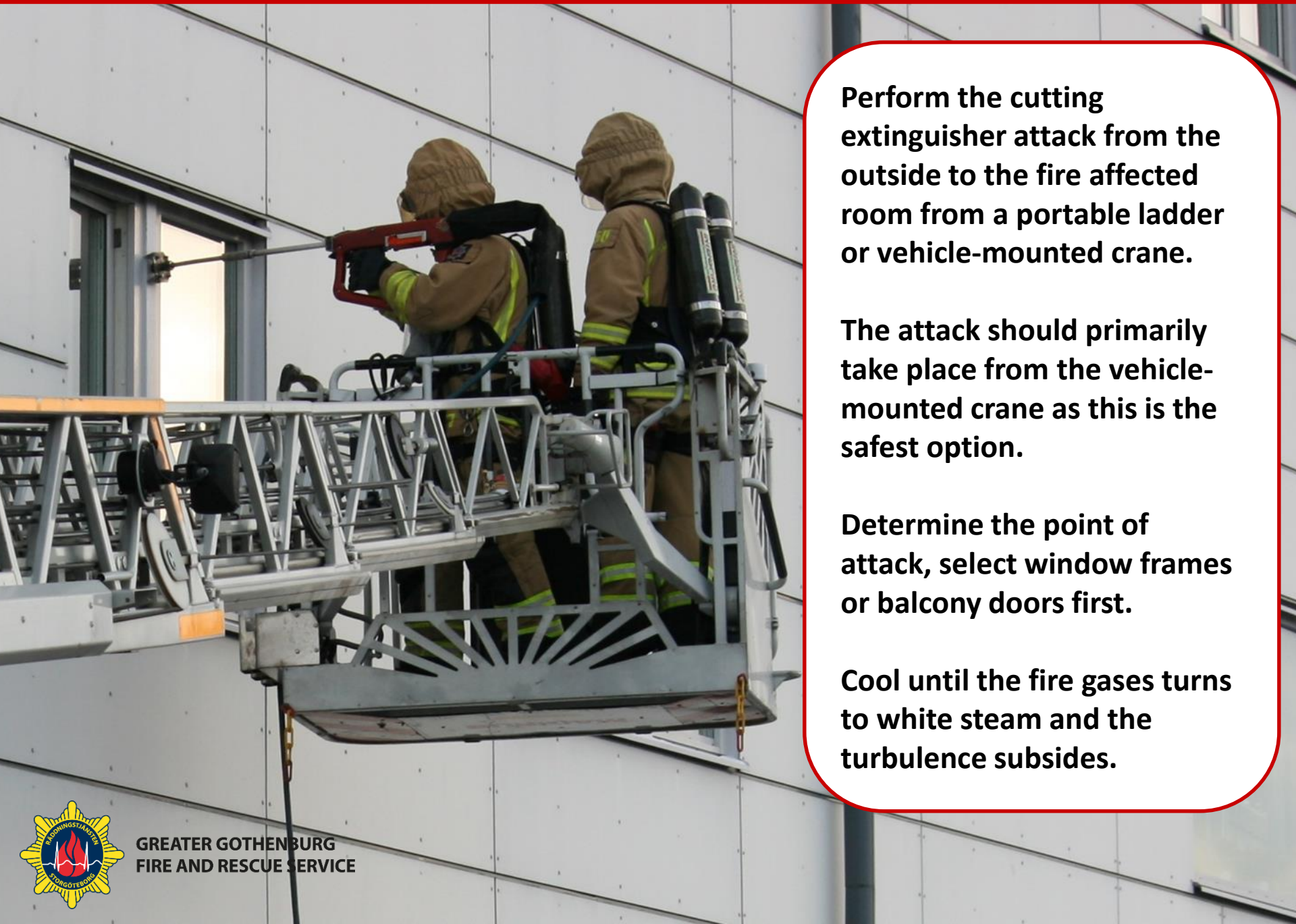
- **The Thermal Imaging camera measures thermal radiation and is not an X-ray camera that can see through building constructions.**
- **Buildings are insulated in order to stand up to cold and heat so it can take time before the heat from the fire is transported through the wall. When the wall starts to be heated this will be shown as a temperature difference on the Thermal Imaging camera. In this situation the fire may have managed to spread.**
- **The Thermal Imaging camera must be regarded as an aid but should not constitute the only method for finding the fire.**

Search method using the Thermal Imaging camera



Locate the fire room and perform the cutting extinguisher attack

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE



Perform the cutting extinguisher attack from the outside to the fire affected room from a portable ladder or vehicle-mounted crane.

The attack should primarily take place from the vehicle-mounted crane as this is the safest option.

Determine the point of attack, select window frames or balcony doors first.

Cool until the fire gases turns to white steam and the turbulence subsides.

Pressurise the stair well in order to counteract the spread of fire at the same time as the cutting extinguisher attack is in progress.

If the stair well is filled with smoke, a smoke-free environment must be created.

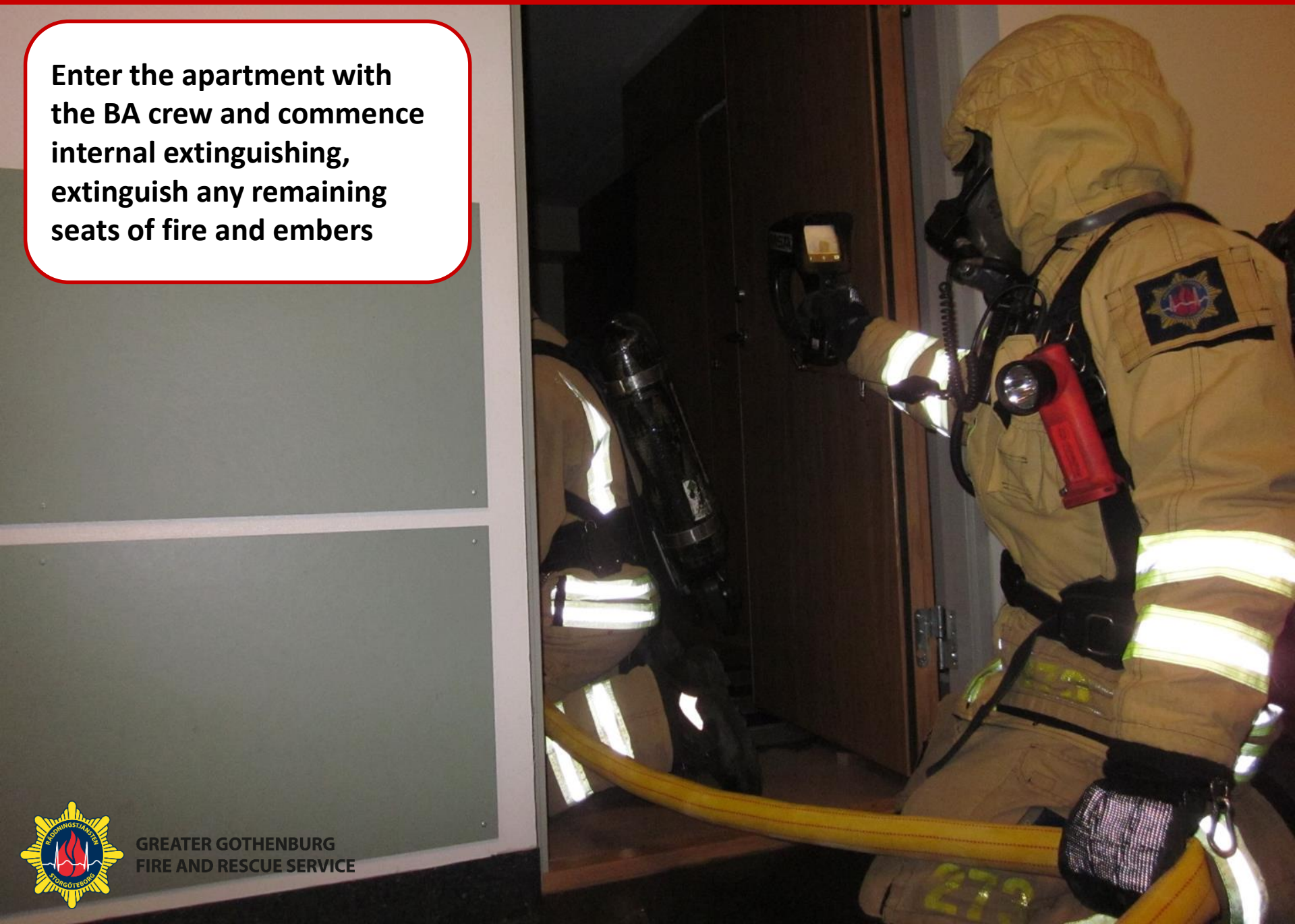
Prepare for internal extinguishing

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Position fire fighters with BA in the stair well outside the fire affected apartment


When the cutting extinguisher has achieved the intended effect, create exhaust air opening from outside.

Enter the apartment with the BA crew and commence internal extinguishing, extinguish any remaining seats of fire and embers



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

- Consider what is behind the wall, floor or ceiling!
- Check that nobody is behind the cutting surfaces
- Coordination is important during an intervention as personnel are inside the building

Important experiences from interventions

In a house fire, there is a fire in the basement which serves as a garage for cars. In this case there are two cars in the closed garage. Upon arrival, scan the building using the Thermal Imaging scanner and commence cutting extinguisher attack at the hottest point.

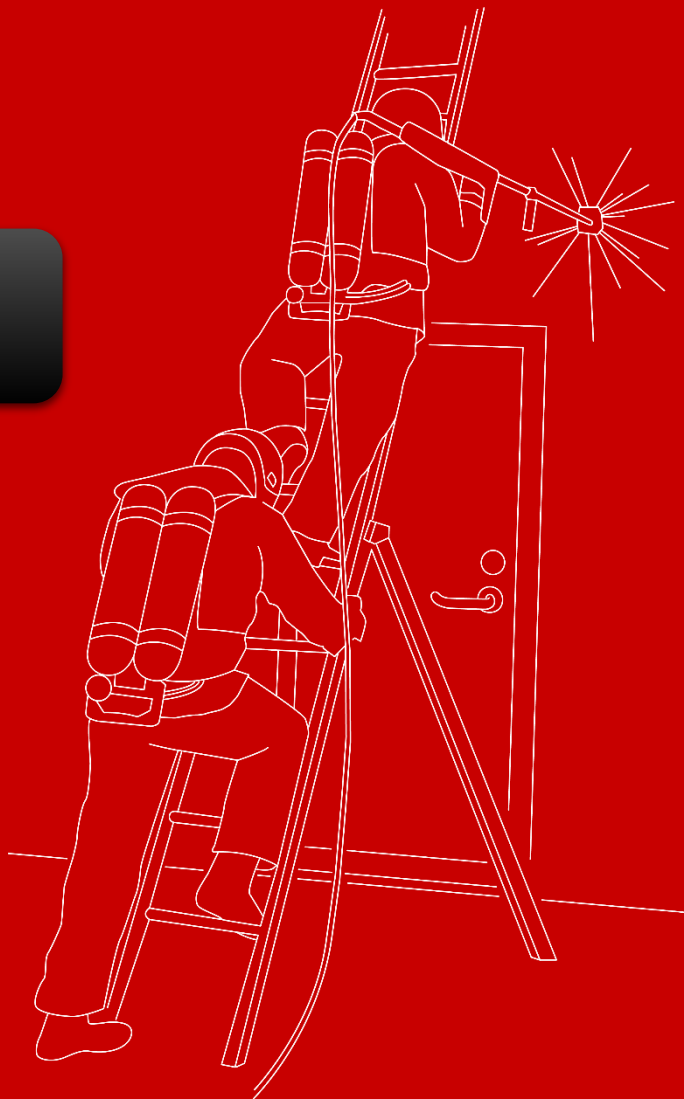
Important experiences from interventions

Perform the cutting extinguisher attack for approx.: 6–7 minutes while at the same time pressurising the other floor levels in order to counteract the spread of fire. The BA crew enter the basement level, when the fire has been extinguished, the fire gases have been made inert and the temperature has been lowered. It has become a safer working environment for the fire fighters with BA who have not been exposed to the same risks had internal extinguishing been the first choice of method for this intervention.

Important experiences from interventions

- Locate the fire
- Read the building
- Choose your method based on the situation, sometimes the cutting extinguisher attack is suitable, in other cases there may be more suitable alternatives
- When employing the cutting extinguisher attack for fires in enclosed spaces, be patient, allow the cutting extinguisher to take effect so that the fire gases become inert before commencing internal extinguishing

Return to main menu



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Structural fires

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Fire in a building

Building fires can start and spread in several different ways. Common reasons why fires start are ovens that people forget to switch off, chimney fires, technical faults in electrical appliances or that someone starts a fire on purpose.

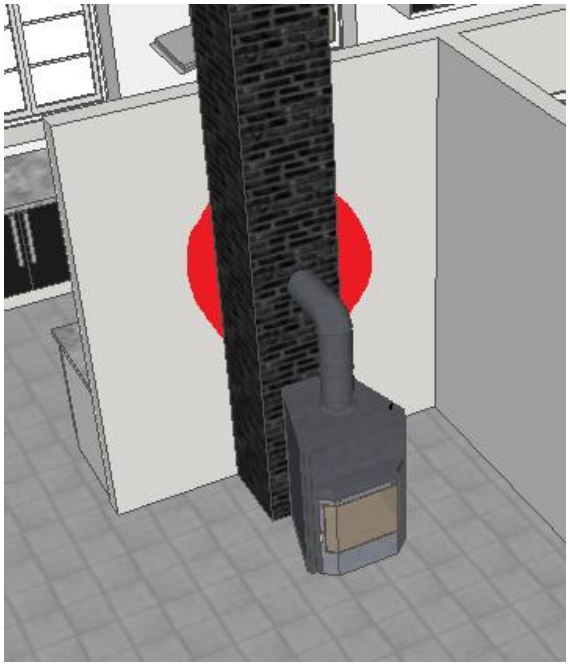
Structural fires

Fires can start and spread in double floors, floors, walls, ceilings and concealed spaces such as air gaps, pipe trenches or ventilation shafts.

In these instances the fire is considered to be a structural fire.

Structural fires

Chimney fires may ignite the surrounding structure and fire and smoke may spread as a result.



Heat spread

Structural fires

It is common that fires in enclosed spaces spread further within the building's structure. Work on the final extinction of the fire mainly concerns getting structural fires under control.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Structural fires

By using the Thermal Imaging camera in combination with the cutting extinguisher, it is possible to identify and quickly tackle structural fires.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Basic principle

A basic principle for structural fires is to get the extinguishing medium on to the fire before exposure.

The fire services often “hunt” the fire, for example, floor joists as the fire oxygenates and spreads further during exposure work. Therefore the exposure should be preceded by an extinguishing intervention with e.g. cutting extinguishers, water fog nails or CAFS nozzle.

Tactic for structural fires

1. Locate the fire using Thermal Imaging scanning
2. Read the building to secure its structure
3. Choose your method depending on the situation
4. If the cutting extinguisher attack is your method of choice, the fire should be “encircled” with short pulses at the outer edge of the fire area
5. Work your way into the fire area with short pulses
6. Check the effect using the Thermal Imaging camera
7. Expose the fire area to ensure the extinguishing effect

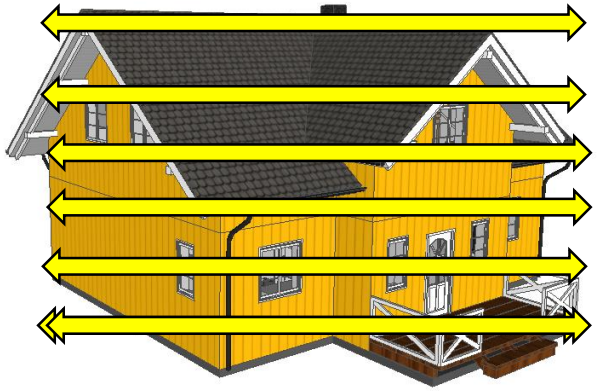
Scan the building using the Thermal Imaging camera both internally and externally in order to locate structural fires.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

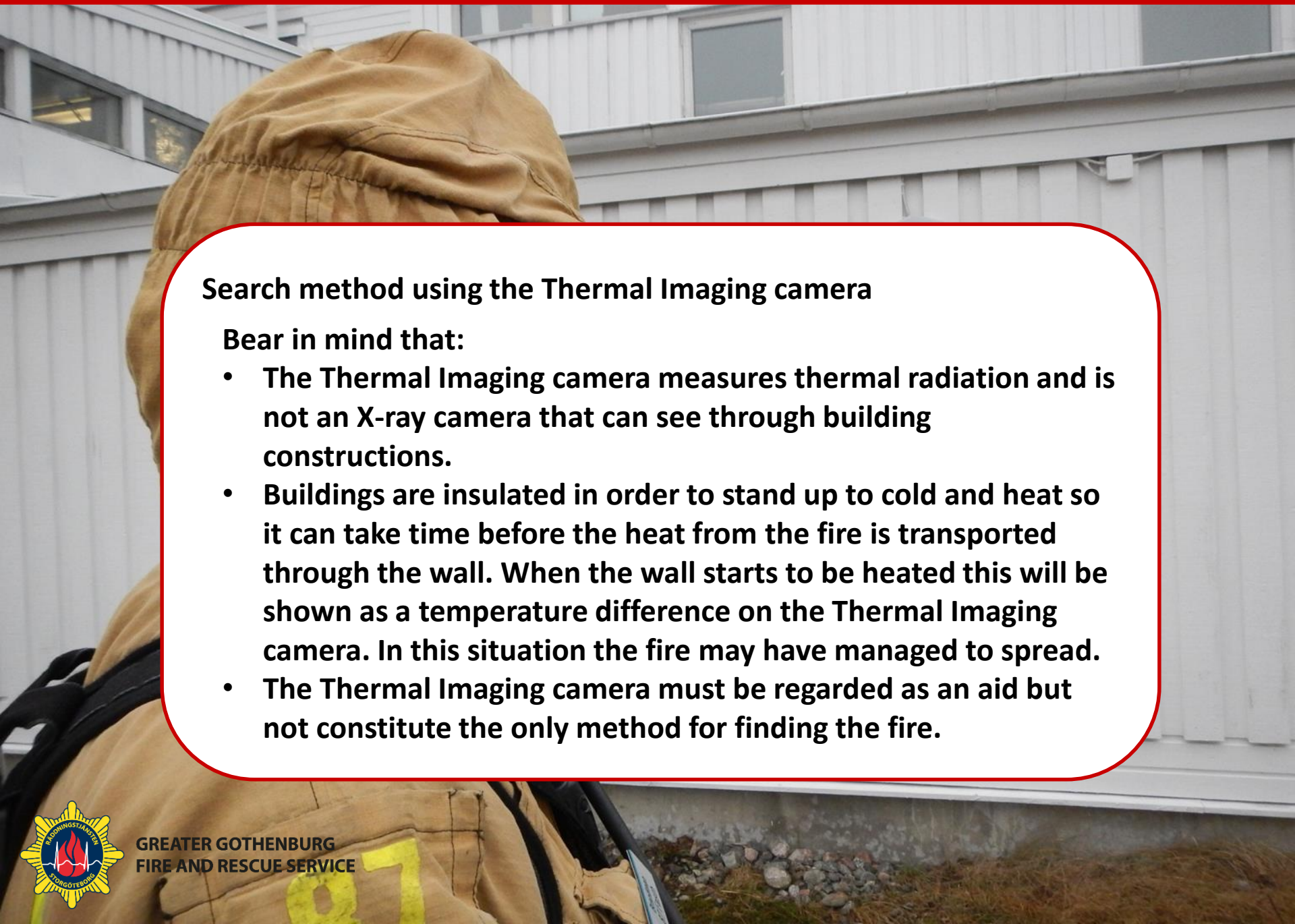
Search method using the Thermal Imaging camera

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Search method using the Thermal Imaging camera



Scan the entire building from the outside or the room internally using the Thermal Imaging camera in order to locate fires in the structure.

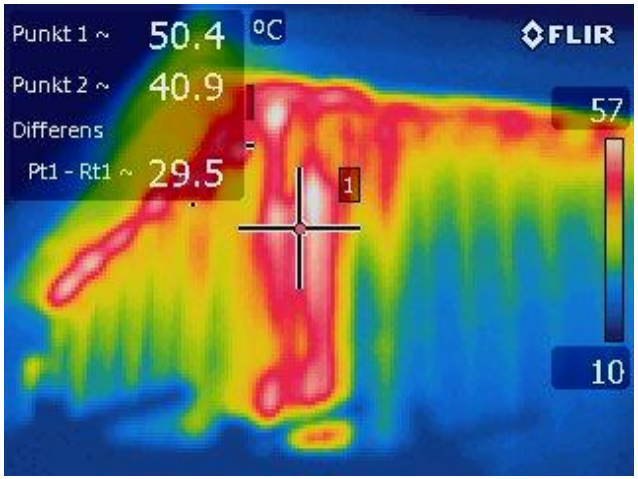


Search method using the Thermal Imaging camera

Bear in mind that:

- **The Thermal Imaging camera measures thermal radiation and is not an X-ray camera that can see through building constructions.**
- **Buildings are insulated in order to stand up to cold and heat so it can take time before the heat from the fire is transported through the wall. When the wall starts to be heated this will be shown as a temperature difference on the Thermal Imaging camera. In this situation the fire may have managed to spread.**
- **The Thermal Imaging camera must be regarded as an aid but not constitute the only method for finding the fire.**

Search method using the Thermal Imaging camera



Locate structural fires and take appropriate measures.

Read the building both from the outside and inside in order to secure its structure.

Walk around the building, look with naked eye and scan with Thermal Imaging camera

Seek facts from the owner or plans

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Choose your method based on the situation, sometimes the cutting extinguisher attack is suitable, in other cases there may be more suitable alternatives. Consider the placement of the vehicle so it is possible to carry out the tactical measures.

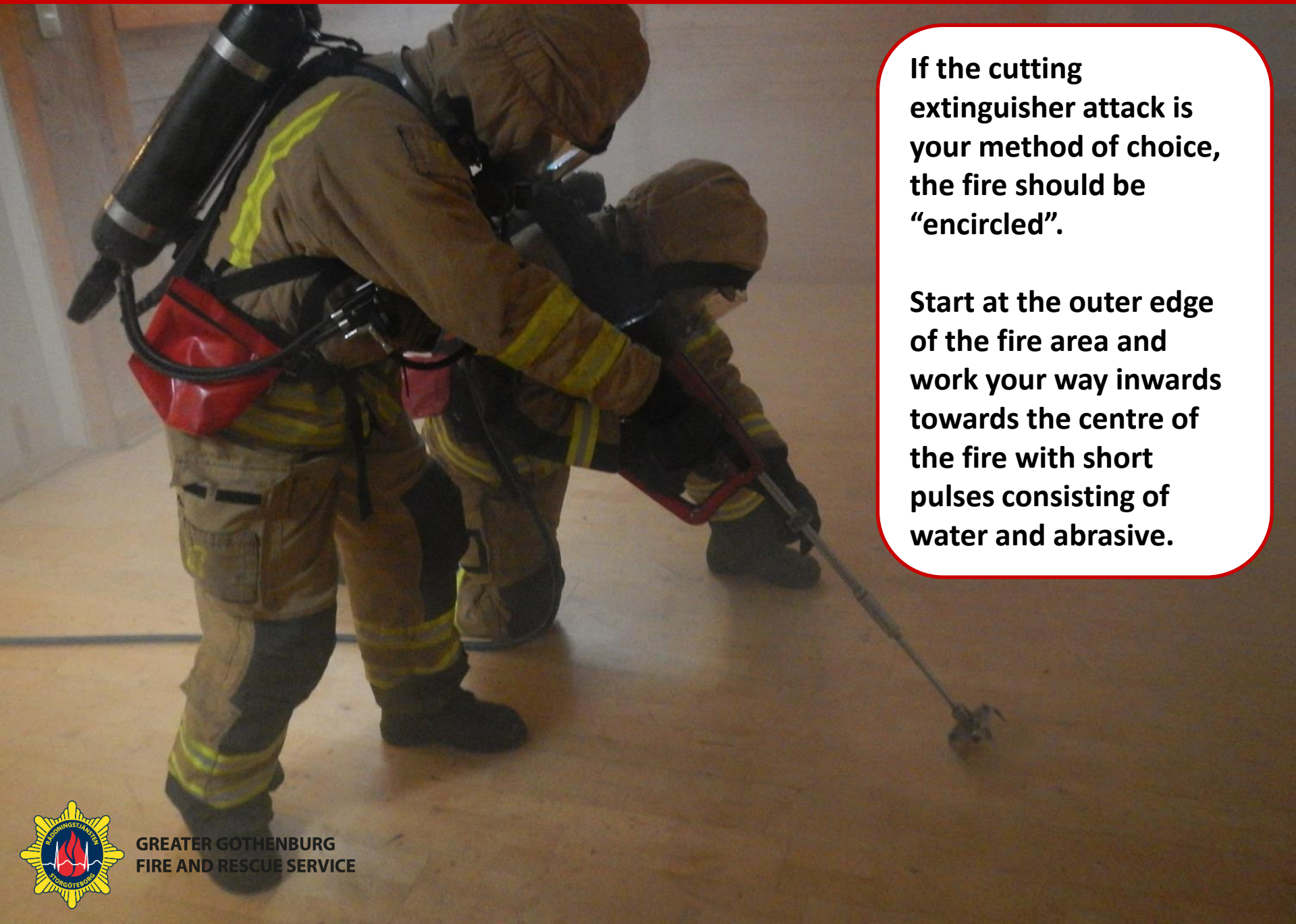
Cutting extinguisher

Water fog nail

CAFS nozzle

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Cutting extinguishing tactic – Fire in a building

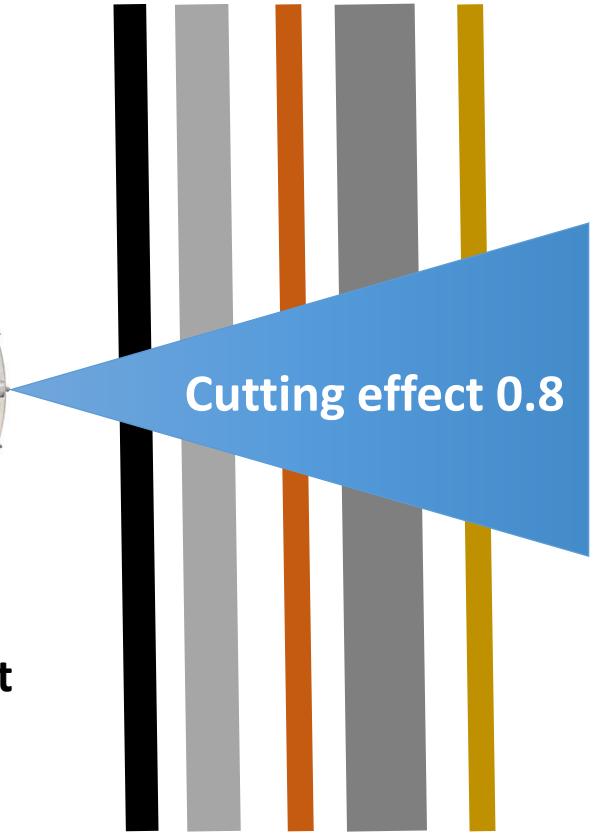


If the cutting extinguisher attack is your method of choice, the fire should be “encircled”.

Start at the outer edge of the fire area and work your way inwards towards the centre of the fire with short pulses consisting of water and abrasive.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Consider that the cutting extinguisher has a direct cutting effect, for various materials, of up to 0.8 metres from the nozzle.



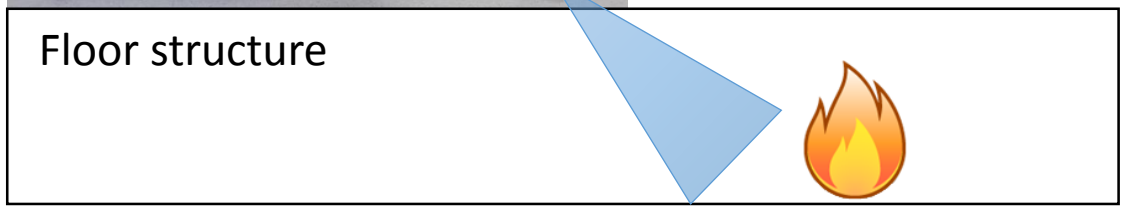
Therefore use short pulses for structural fires to ensure you do not cut through floor structure for example.

Avoid cutting from straight above because there is a risk of cutting through ceilings, floors and walls.

However, this working position may be suitable from a working environment perspective for known and thick floor structures or where the purpose is to cut through the structure.

Cut at an angle towards the foundation. Start at the outer edge of the fire area and work your way forwards with short pulses towards the centre of the fire.

Avoid damaging the underlying constructs that are not fire affected. Consider other methods if there is potential to cut through the soffit. Use for example Water fog nail or CAFS nozzle.



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

- Consider what is behind the wall, floor or ceiling!
- Check that nobody is behind the cutting surfaces
- Coordination is important during an intervention as personnel are inside the building

Check the extinguishing effect using the Thermal Imaging camera

Continue to look for fires in the structure

Cutting extinguisher attack

Short pulses

Double check

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

The lance extender can be used to achieve a longer range.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Communication is paramount!

Appoint personnel who check and communicate the effect to the cutting extinguisher operator.

This is to avoid cutting and water damage to the space that is not affected by the fire.

Cutting and water damage

Expose the fire area after the cutting extinguisher attack in order to ensure that the fire been completly extinguished.

Make sure you have extinguishing medium at hand to be able to put out fires that flare up

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Avoid using the fan for structural fires as this oxygenates flameless combustion and pushes the fire further into the structure.

Important experiences from interventions

A house is struck by lightning which causes two separate fires in the structure. One of the fires is inside the wall by the stairs on the second floor. The other fire is in the ceiling structure.

Upon arrival the location and extent of the fires are unknown.

Important experiences from interventions

The fire that is in the wall is located quickly using the Thermal Imaging Camera and is extinguished by fire camera and is extinguished by fire fighters with BA.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Important experiences from interventions

The fire that is in the ceiling structure is considerably harder to locate. An extensive extinguishing attempt is made with both cutting extinguishers and water fog nail without having any appreciable effect.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Important experiences from interventions

The fire in the ceiling structure appears to be located in a void (air gap). The initial extinguishing intervention is unsuccessful as the cutting extinguisher cuts through the entire ceiling structure and causes damage to the underlying room which has not been exposed to fire or smoke.

Damage caused by the cutting extinguisher

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Important experiences from interventions

The fire in the ceiling structure is eventually found and can be extinguished but there is water damage in the room that was not fire or smoke damaged.

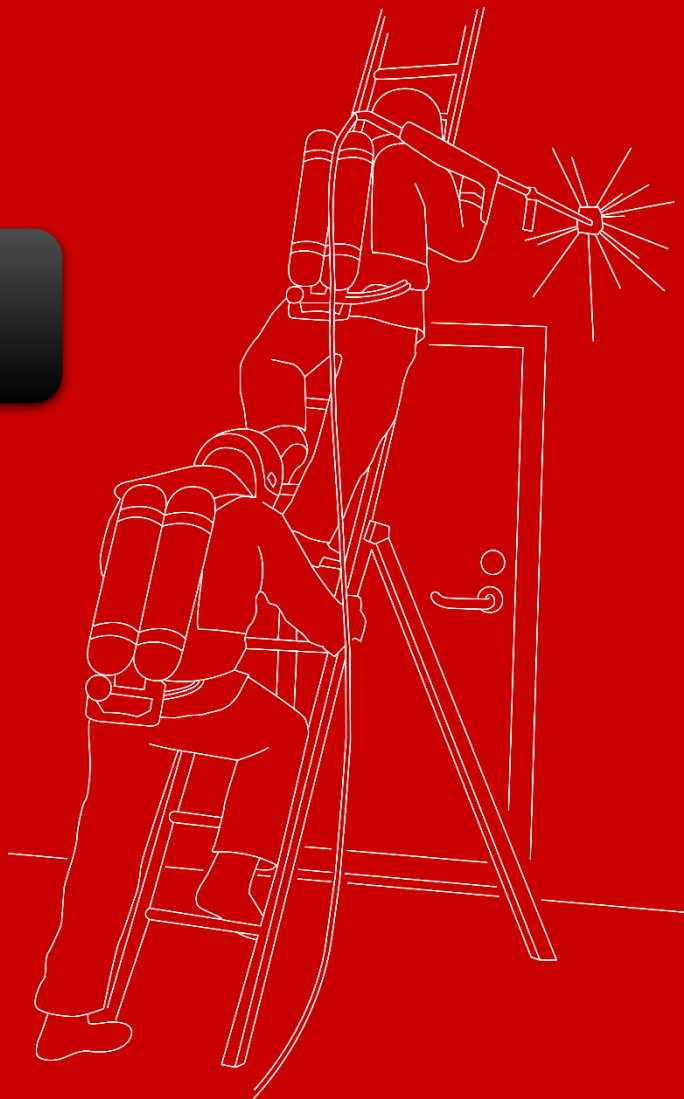
GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Important experiences from interventions

- Read the building and secure its structure!
- Locate the fire
- Choose your method based on the situation, sometimes the cutting extinguisher attack is suitable, in other cases there may be more suitable alternatives
- Extinguish the fire and check carefully that it Is completely extinguished

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Return to main menu



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Fires in attics and roofs

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

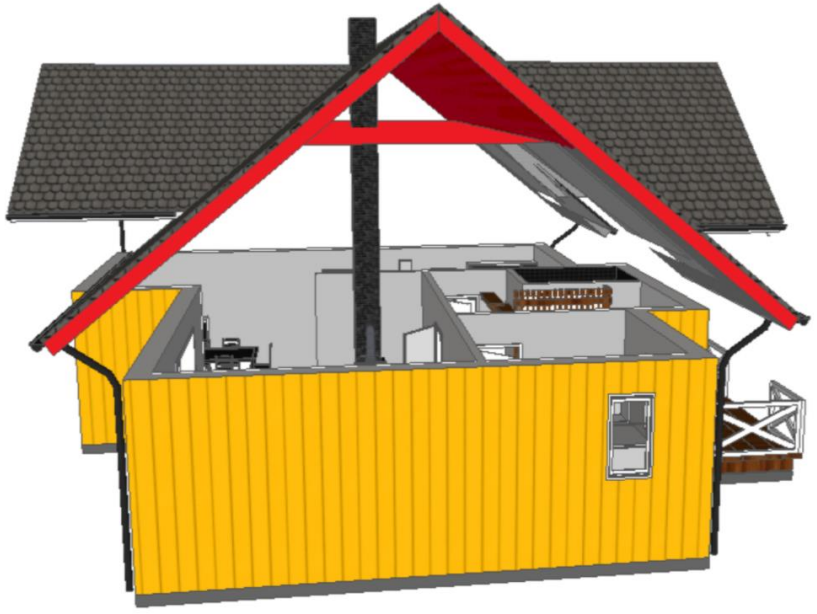
Fire in a building

Building fires can start and spread in several different ways. Common reasons why fires start are ovens that people forget to switch off, chimney fires, technical faults in electrical appliances or that someone starts a fire on purpose.

Fires in attics and roofs

Fires in attics and roofs are as a rule a result of a room and/or structural fire.

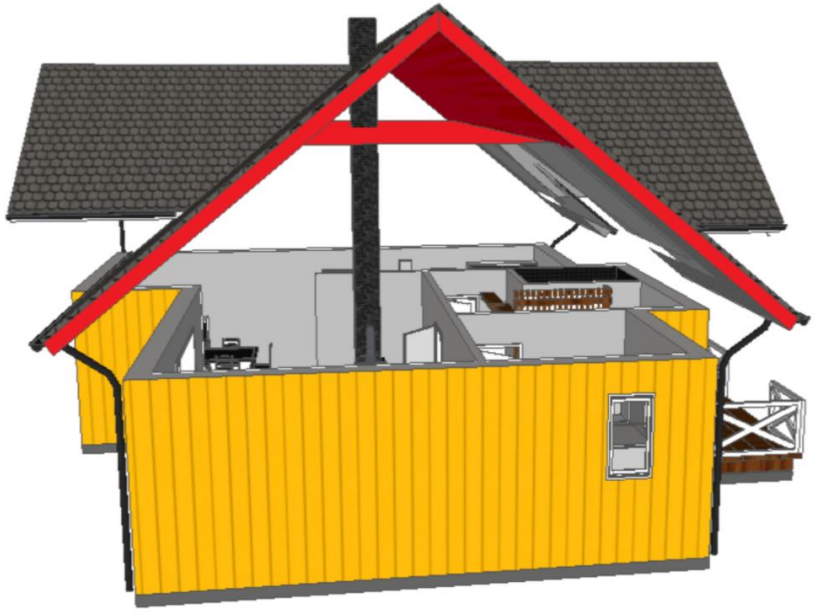
Non-sectioned attics and insufficient fire protection can cause a fire to spread quickly.



Fires in attics and roofs

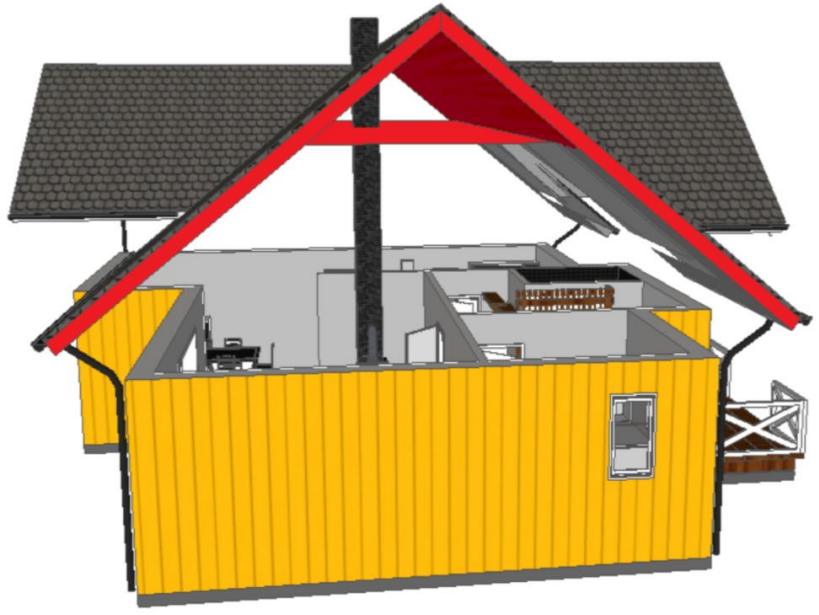
Fires in attics and roofs are often difficult and complicated interventions with major fire, smoke and water damage.

In many instances attic fires generate risky working situations such as e.g. working at height and BA.



Fires in attics and roofs

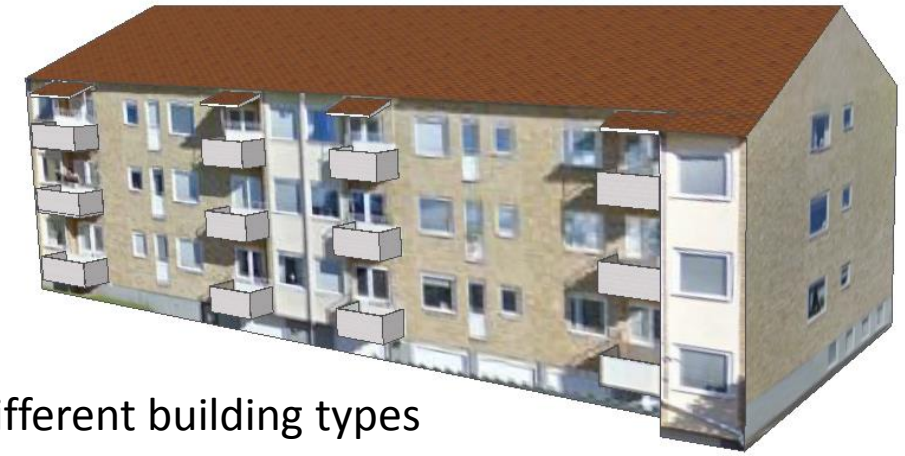
By working with the Thermal Imaging camera and cutting extinguisher from a vehicle-mounted crane, or from within the building, a safer working environment can be maintained while at the same time the attack can start quickly and effectively.



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

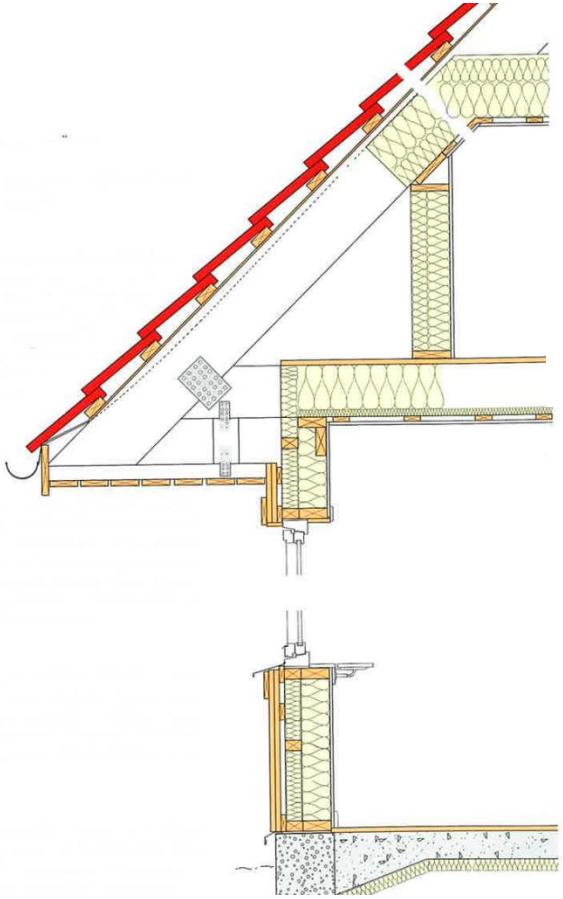
Different objects, different scenarios

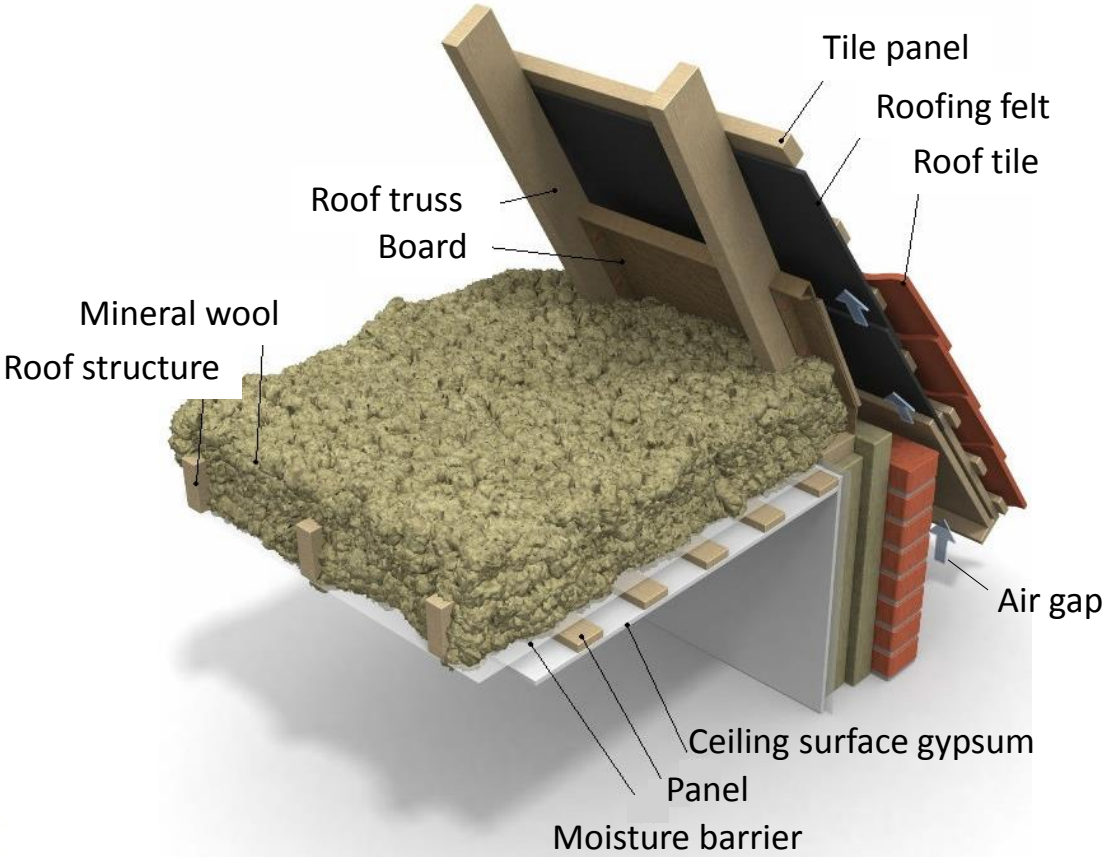
Fires in attics and roofs may occur in all possible types of buildings and ceiling structures. Even the sequence in which the fire occurs may vary, from the early onset of a fire to a fully developed attic fire. Depending on the situation, the emergency services must take appropriate tactical measures to provide the assistance that is required.



Examples of different building types

Example of ceiling structure

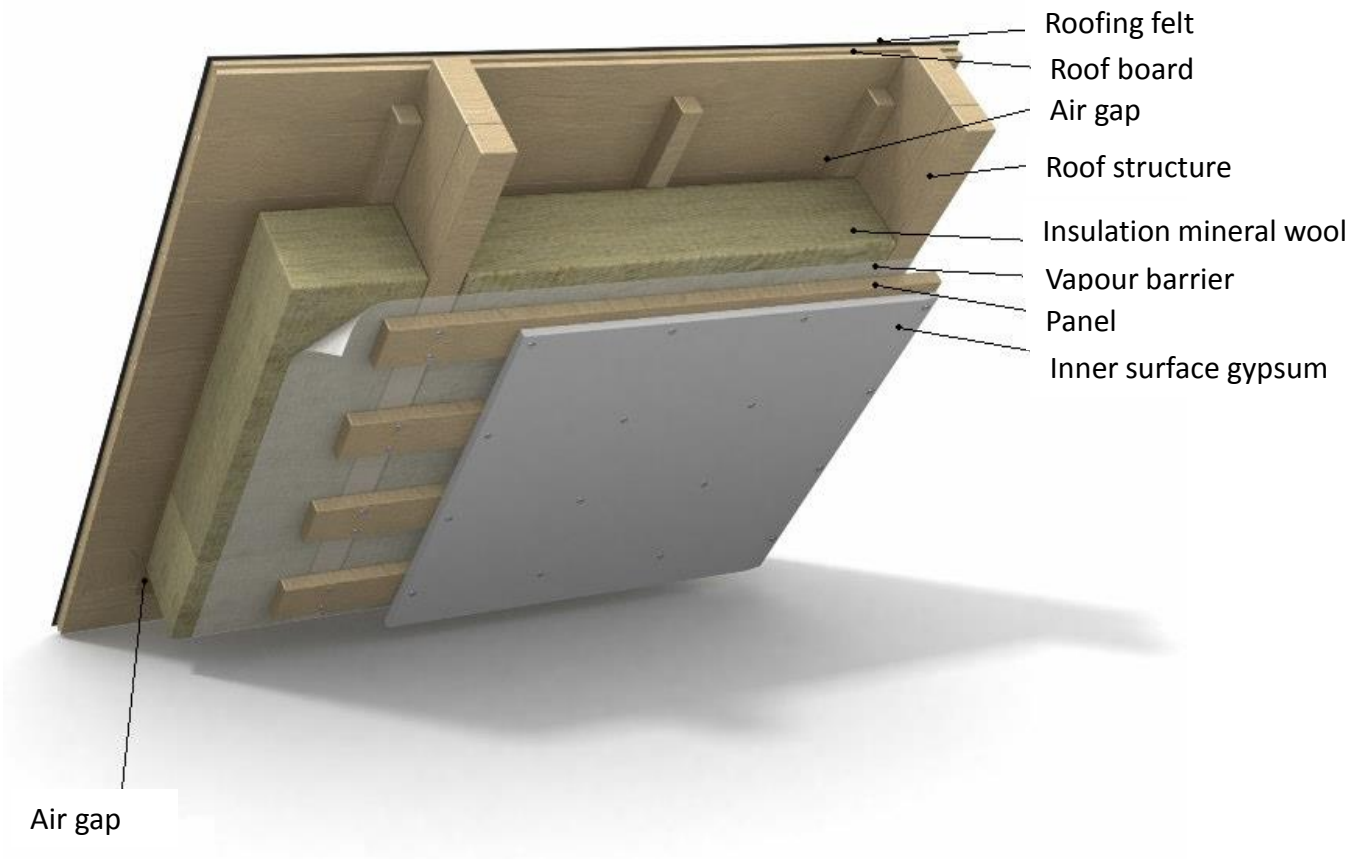


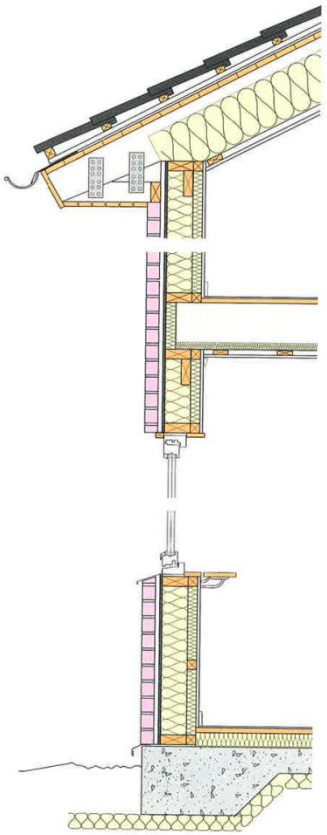


GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

From “How houses burn”

Example of ceiling structure



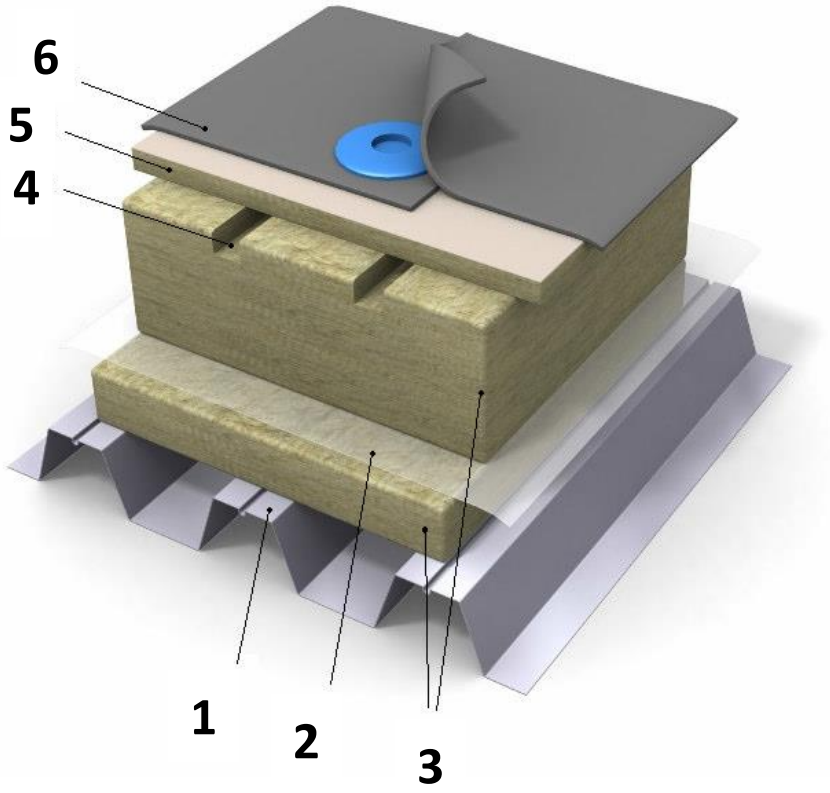


GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

From “How houses burn”

Example of ceiling structure

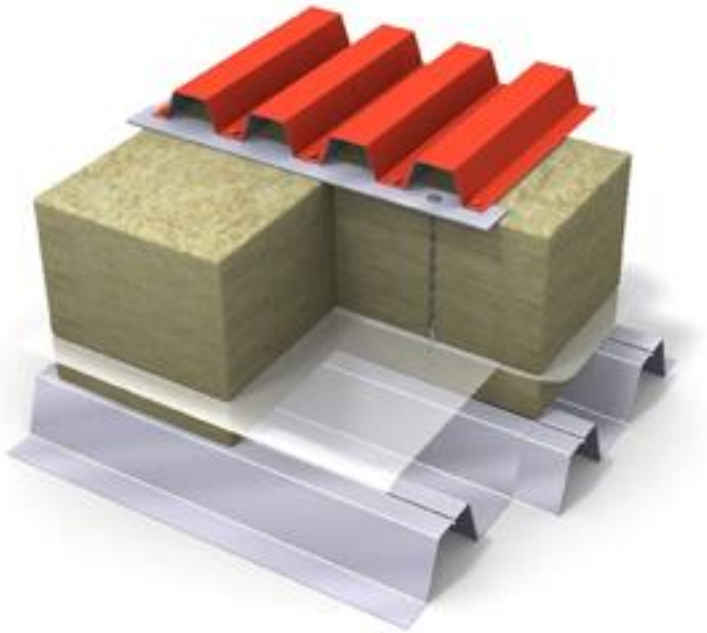
1. Load-bearing support
   - Normally trapezoidal sheet with large span widths, 6–8 m
2. Vapour barrier
3. Several layers of insulation
4. Ventilated head gap
5. Roof board
6. Top felt



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

From “How houses burn”

Example of ceiling structure



From “How houses burn”

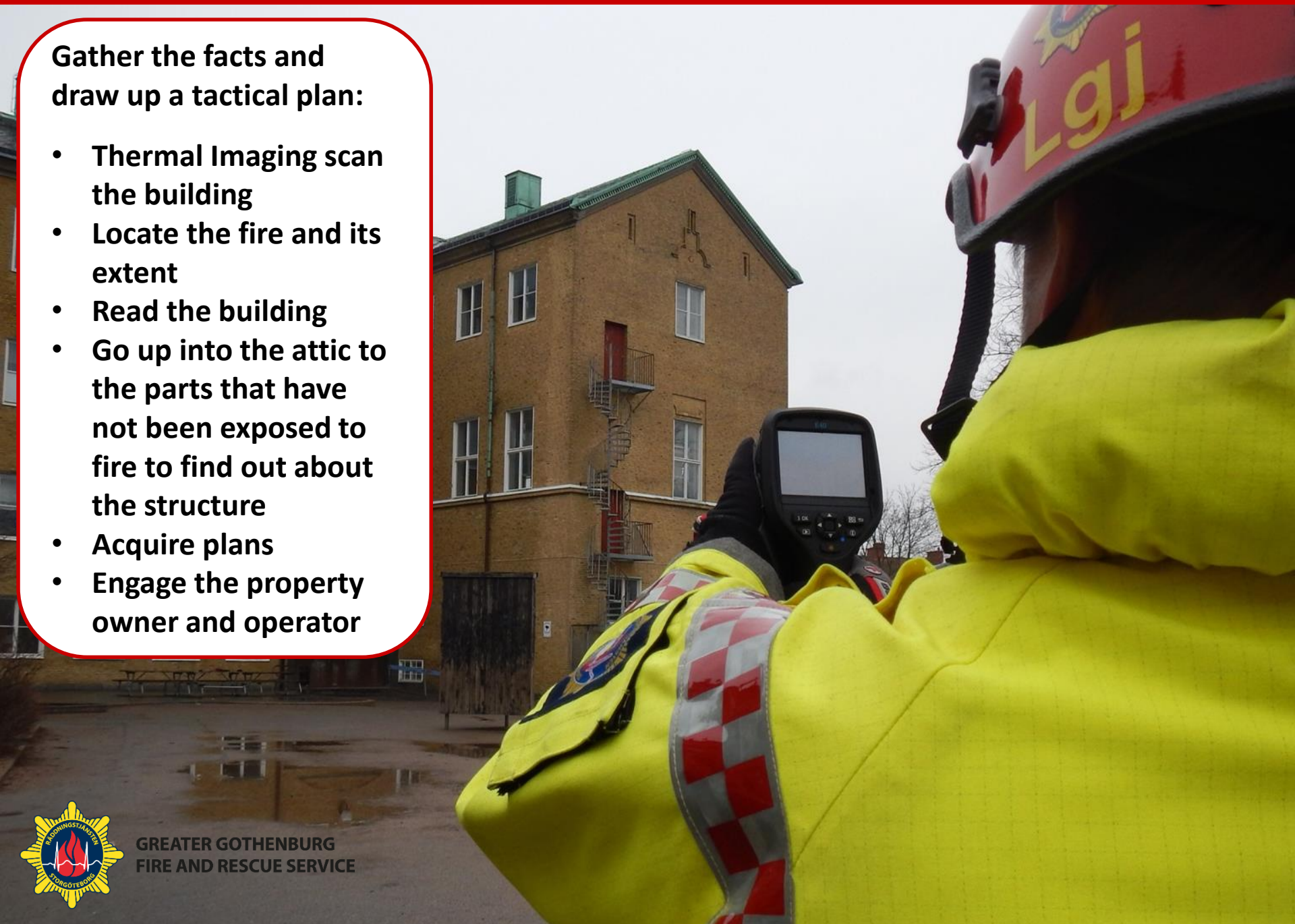
GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

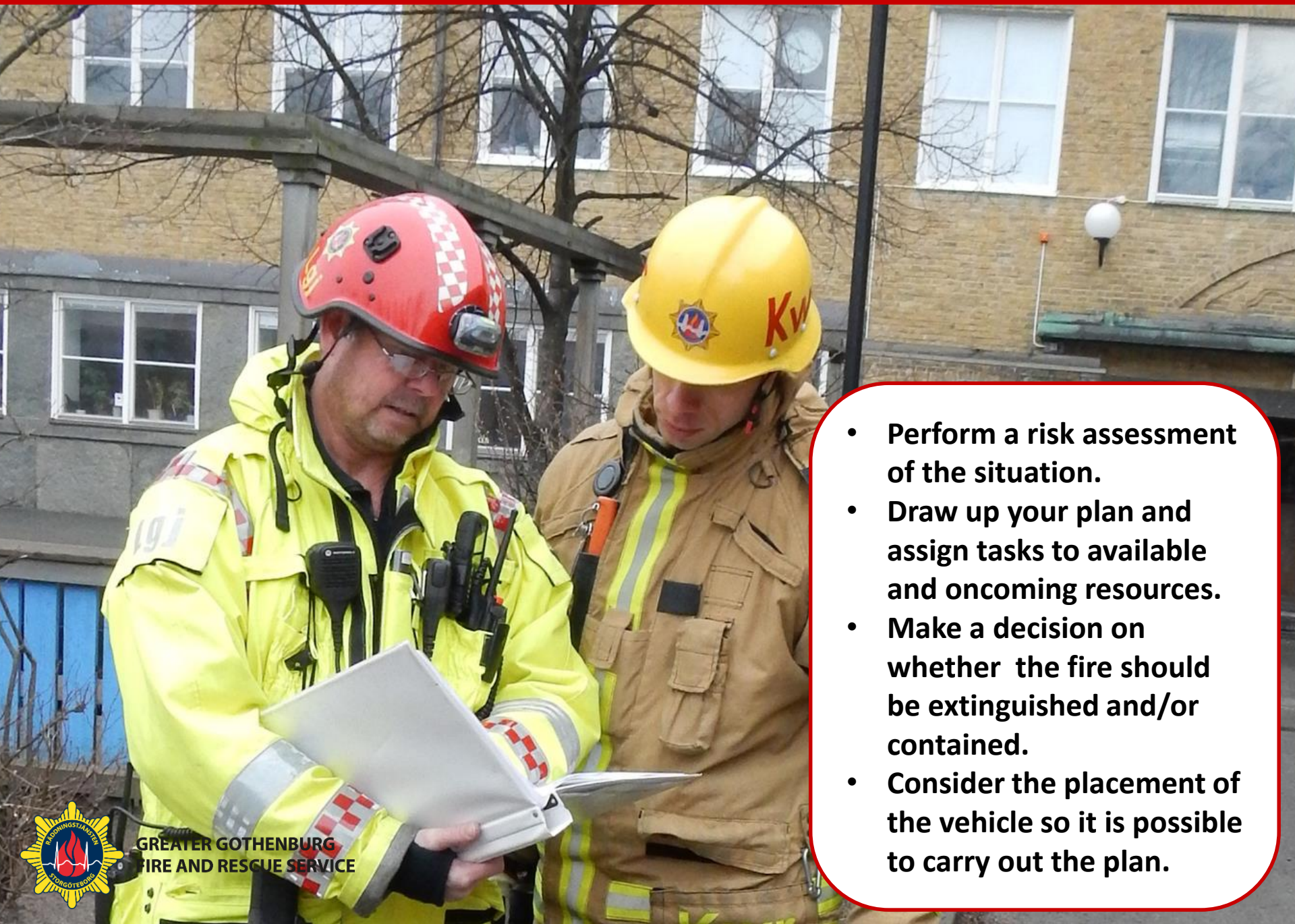
Initial tactic

1. Locate the fire using Thermal Imaging scanning
2. Gather the facts and draw up a tactical plan
3. Choose your method and communicate your plan

Gather the facts and draw up a tactical plan:

- **Thermal Imaging scan the building**
- **Locate the fire and its extent**
- **Read the building**
- **Go up into the attic to the parts that have not been exposed to fire to find out about the structure**
- **Acquire plans**
- **Engage the property owner and operator**





- Perform a risk assessment of the situation.
- Draw up your plan and assign tasks to available and oncoming resources.
- Make a decision on whether the fire should be extinguished and/or contained.
- Consider the placement of the vehicle so it is possible to carry out the plan.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Extinguish or contain the fire?

Depending on the situation, e.g. the extent of the fire, available resources, the structure of the building, etc. the leader of the operation states their objective for the intervention. For attic fires this often concerns extinguishing and/or containing the fire:

- **Extinguish the fire,** for the purpose of containing the fire in the room of origin.
- **Contain the fire,** for the purpose of containing the spread and for managing the outer boundaries of the fire.

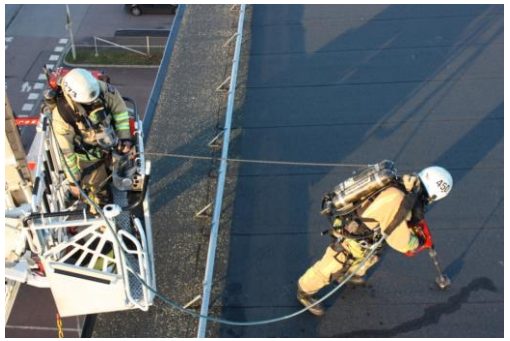
Tactic for the purpose of extinguishing the fire

Tactic for the purpose of extinguishing the fire is chosen as a method depending on the situation, sometimes the cutting extinguisher attack is suitable, in other cases there may be more suitable alternatives. Normally the tactic is based on a combination of different methods.

Tactic for the purpose of extinguishing the fire

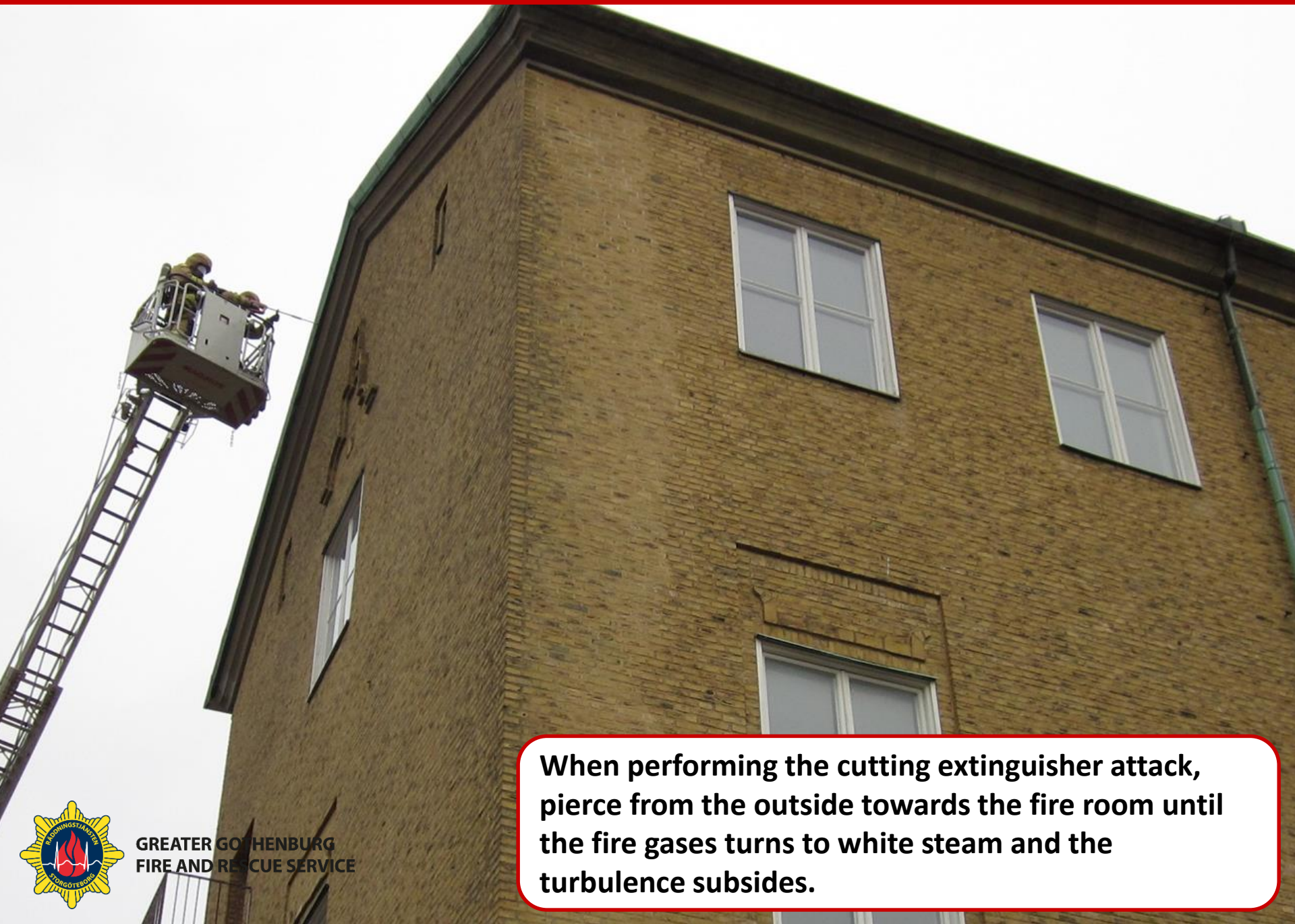
1. When performing the cutting extinguisher attack, pierce from the outside towards the fire room until the fire gases turns to white steam and the turbulence subsides.
2. Pressurise threatened spaces to counteract the spread of fire
3. Post fire fighters with BA adjacent to fire affected spaces
4. Create a ventilation point and ventilate the attic if required
5. Start internal extinguishing, extinguish any remaining seats of fire and areas of combustion

<u>When working at height:</u>
Work primarily from the vehicle-mounted crane's cabin.



Secure yourself first of all to the vehicle-mounted crane's cabin if you are climbing onto the roof.

Avoid working from portable ladders.



When performing the cutting extinguisher attack, pierce from the outside towards the fire room until the fire gases turns to white steam and the turbulence subsides.

Cut primarily in the building's gable as this provides good access to the attic space, especially if the attic is not sectioned.

If the attic is sectioned, the attack should take place directly at the fire affected compartment:

- If the attack takes place from outside, this should be performed from an aerial appliance.
- If the attack takes place from inside, this should be performed from an adjacent section from the floor level underneath the fire room

If you achieve no extinguishing effect, this may mean that you are cutting into a roof truss for example. Try changing the point of attack, it may be enough to move the cutting extinguisher's nozzle by 10 centimetres.

Consider that the water jet is relatively uniform up to approx.: 5 metres from the nozzle where the first dispersal of the jet takes place. At approx.: 7 metres from the nozzle the jet is completely dispersed. Try to ensure that the water jet disperses completely in order to achieve the best extinguishing effect, angle the cutting extinguisher if required.

Image from the Swedish Civil Contingencies Agency's (MSB) report: The cutting extinguishing concept's operative use

Thermal Imaging scan and study the building from a vehicle-mounted crane in order to gain a better overview of the situation.

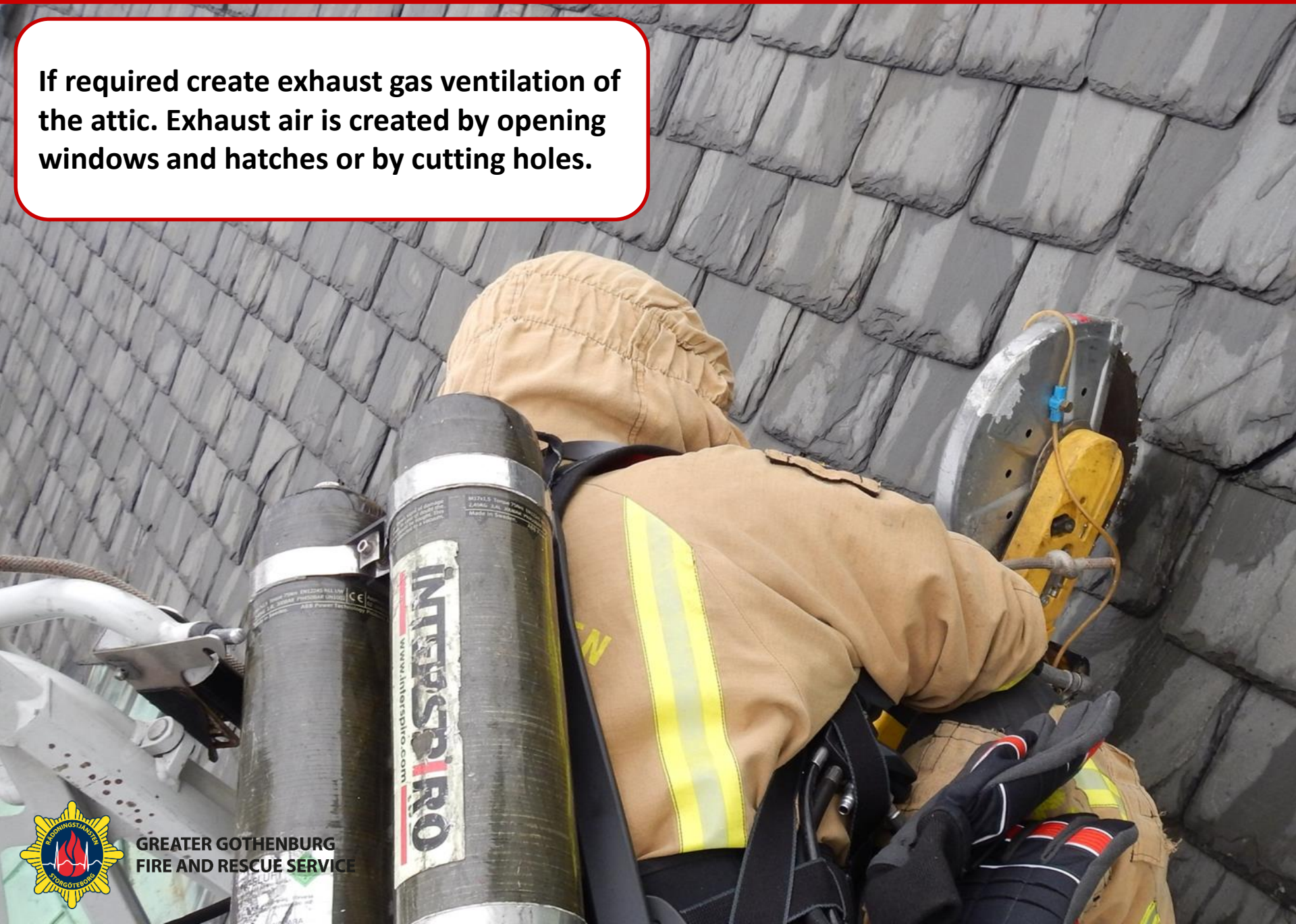
GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Pressurise the stair well and threatened rooms in order to counteract the spread of fire while the cutting extinguisher attack is taking place.

If the stair well is filled with smoke, a smoke-free environment must be created.

Prepare for internal extinguishing

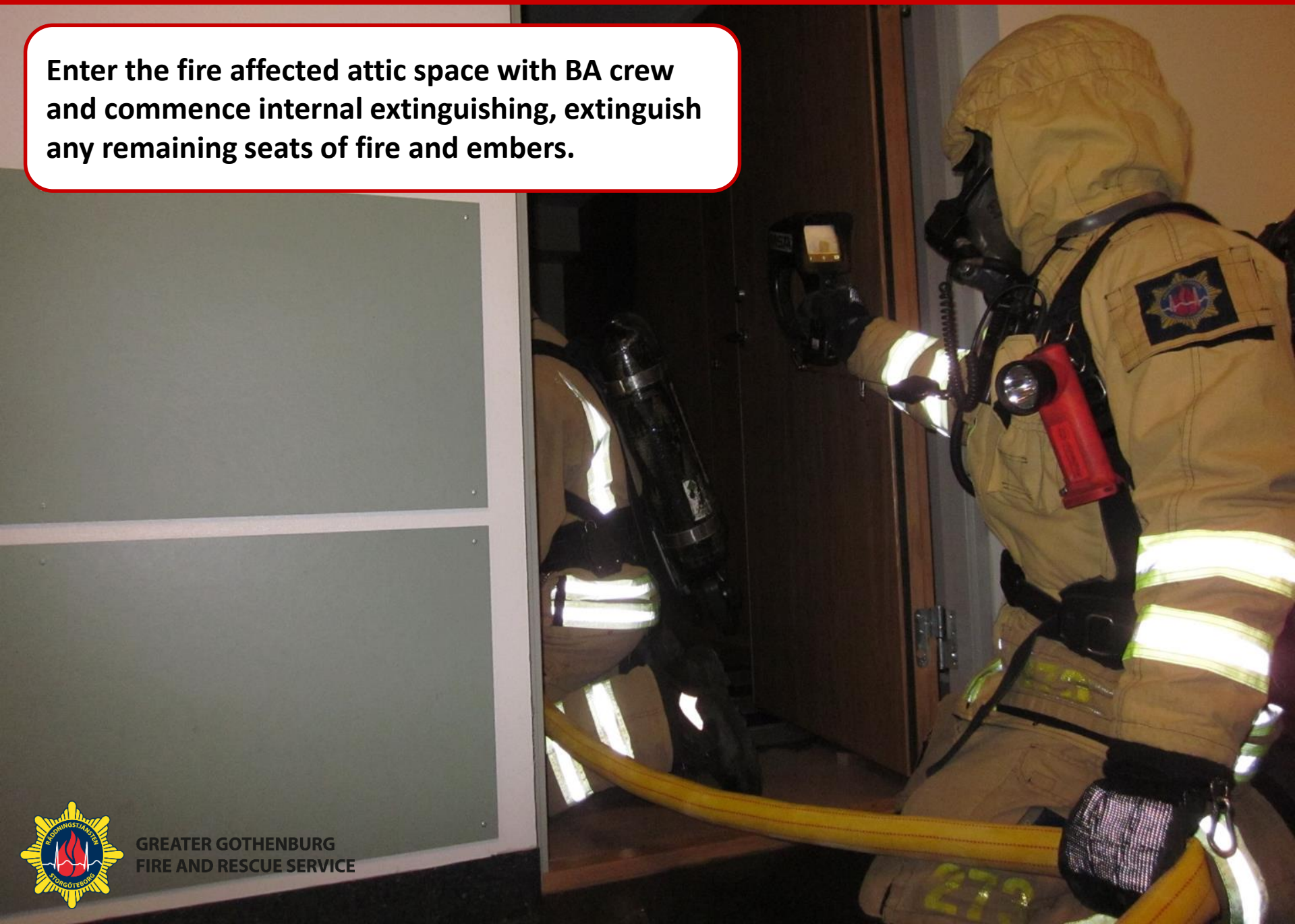
GREATER GOTHENBURG
FIRE AND RESCUE SERVICE



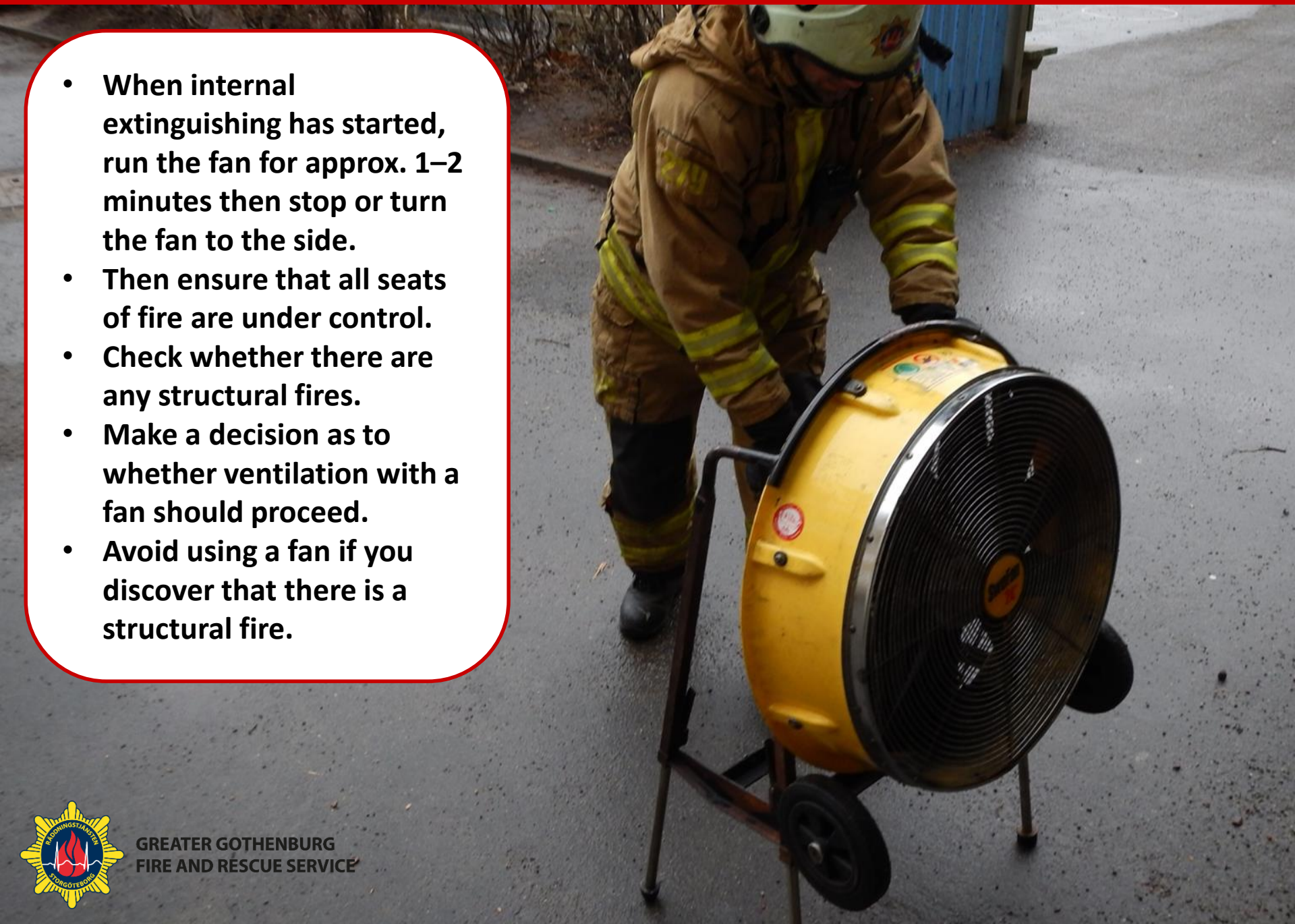
If required create exhaust gas ventilation of the attic. Exhaust air is created by opening windows and hatches or by cutting holes.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Enter the fire affected attic space with BA crew and commence internal extinguishing, extinguish any remaining seats of fire and embers.



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE



- When internal extinguishing has started, run the fan for approx. 1–2 minutes then stop or turn the fan to the side.
- Then ensure that all seats of fire are under control.
- Check whether there are any structural fires.
- Make a decision as to whether ventilation with a fan should proceed.
- Avoid using a fan if you discover that there is a structural fire.

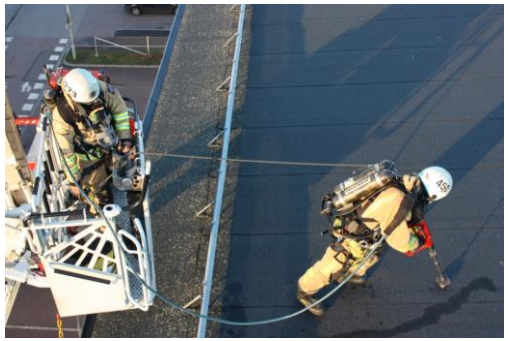
Tactic for the purpose of containing the fire

Tactic for the purpose of containing the fire is chosen as a method depending on the situation, sometimes the cutting extinguisher attack is suitable, in other cases there may be more suitable alternatives. The purpose is to contain the spread and manage the outer boundaries of the fire according to the principle “this far and no further”.

Tactic for the purpose of containing the fire

1. Use the cutting extinguisher to maintain a designated delay line
2. Pressurise threatened spaces to counteract the spread of fire
3. Post fire fighters with BA adjacent to fire affected spaces in order to protect the designated containment lines
4. Create cross-sectional ventilation if required in order to stop the spread of the fire in the attic space

<u>When working at height:</u>
Work primarily from the vehicle-mounted crane's cabin.



Secure yourself first of all to the vehicle-mounted crane's cabin if you are climbing onto the roof.

Avoid working from portable ladders.

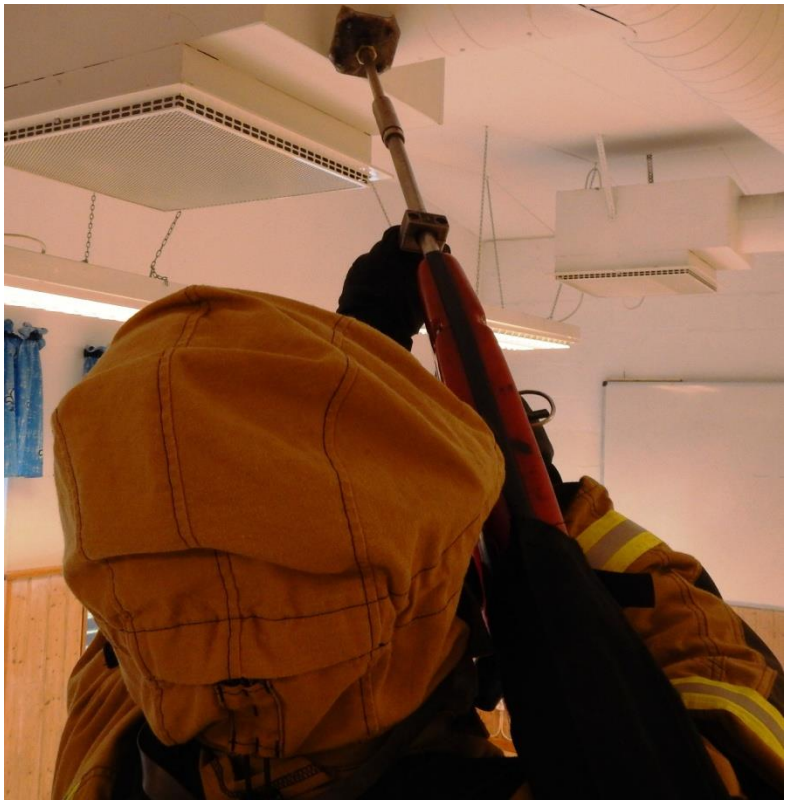
- Perform delay measures with the cutting extinguisher attack
- Measure the effect using the Thermal Imaging camera and by studying the fire gases

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

The purpose of the delay line is to directly or indirectly affect the fire in order to reduce the speed at which it spreads and thereby create time for the creation of e.g. a containment line or other necessary measures. A delay line can be created with e.g. water fog spear and/or cutting extinguisher.

Cutting extinguisher attack from the outside should primarily be performed from an aerial appliance as this is the safest option.

If the attack takes place from inside, this should be performed from an adjacent section or from the floor level underneath the fire room.



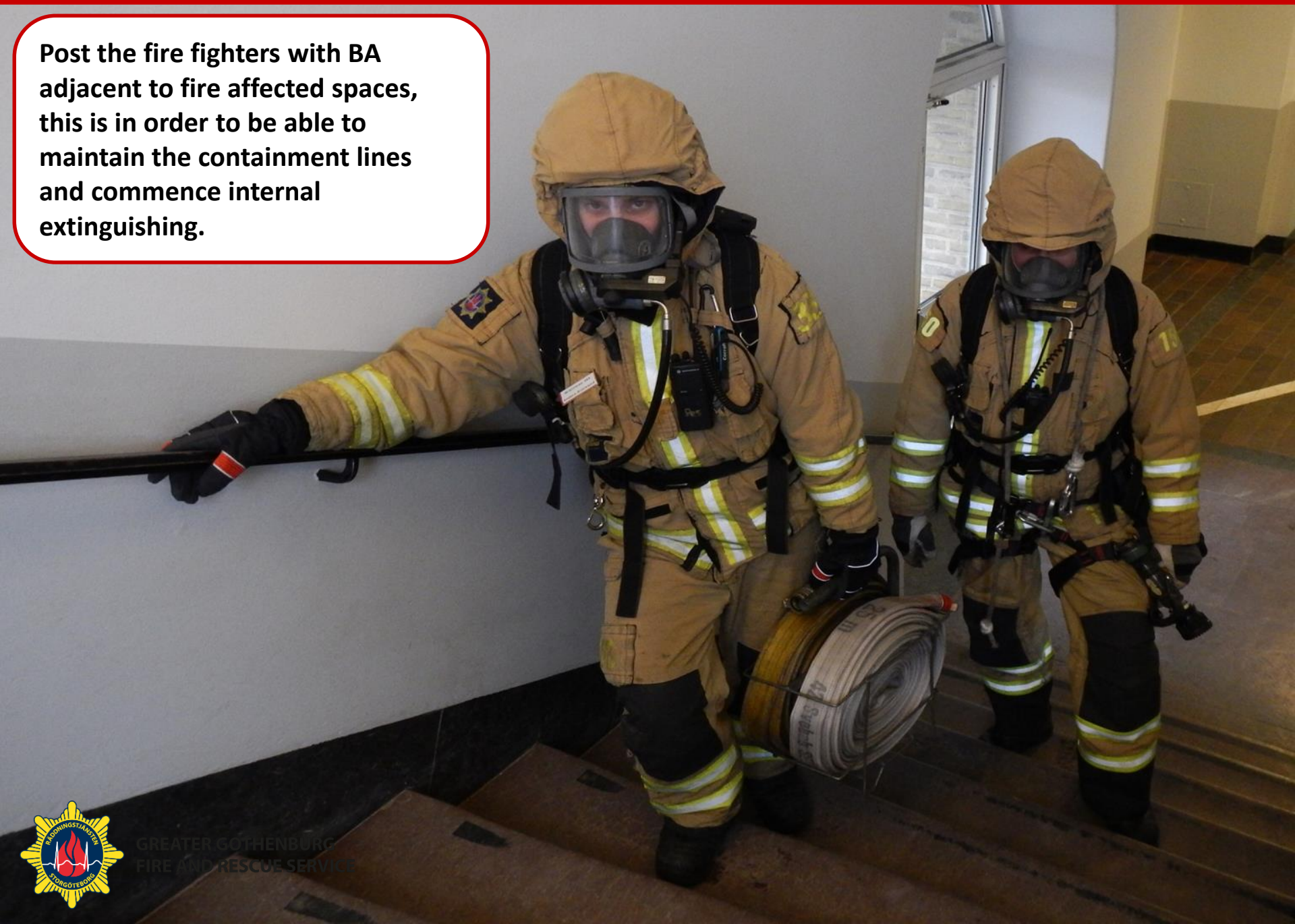
Cutting extinguishing tactic – Fire in a building

Pressurise the stair well and threatened rooms in order to counteract the spread of fire while the cutting extinguisher attack is taking place.

If the stair well is filled with smoke, a smoke-free environment must be created

Prepare for internal extinguishing

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE



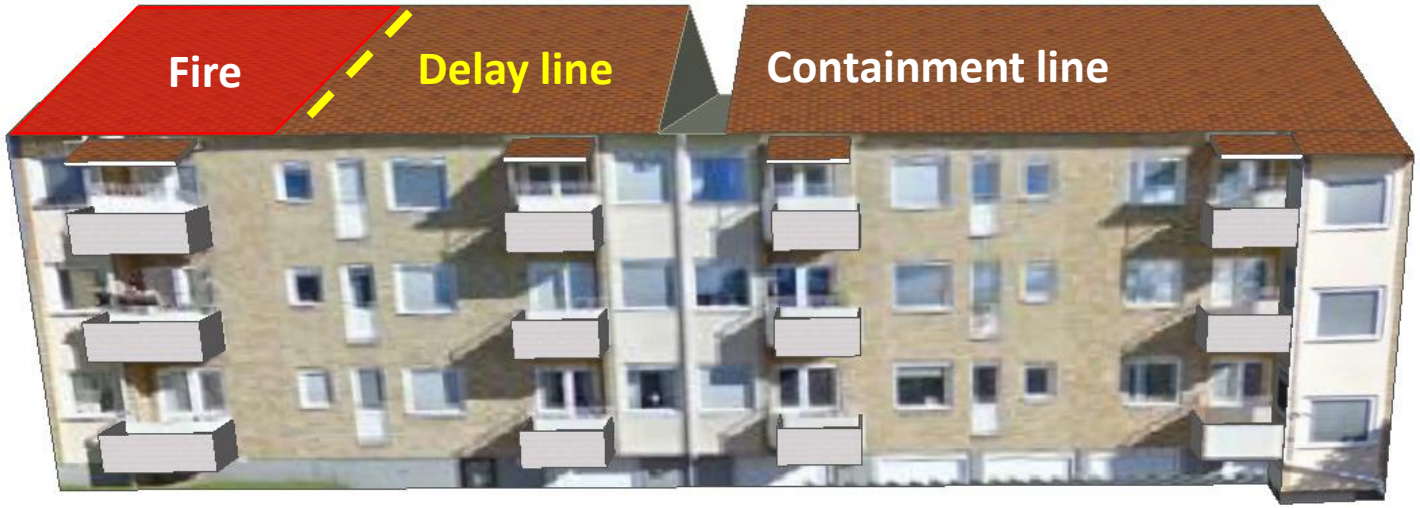
Post the fire fighters with BA adjacent to fire affected spaces, this is in order to be able to maintain the containment lines and commence internal extinguishing.

If required a containment line is created in the form of cross-sectional ventilation, this is in order to stop the spread of the fire in the attic space.

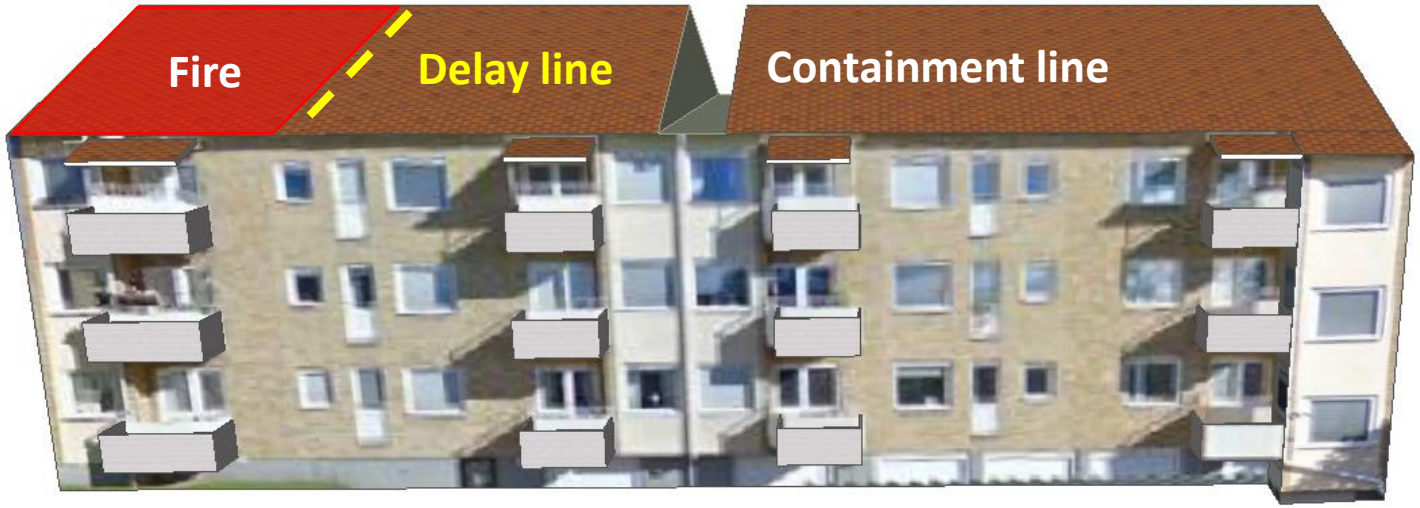
GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

The purpose of the containment line is to:

- **Contain the spread of the fire.**
- **Gain control over the outer boundaries of the fire.**
- **Enable visual monitoring and to manage the entire surface beyond which the fire must not spread. The fire space should also be ventilated from fire gases.**



A containment line is drawn up by creating a fire break within part of the roof structure, normally on the fire affected part of a building. Cross-sectional ventilation should be at least 1 metre wide and the entire roof construction must be removed all the way down to the eaves on both sides of the ridge.



Important experiences from interventions

- Attic fire in terraced house where the fire increases significantly during the establishing phase. Upon arrival the cutting extinguisher is not in place; the water fog nail is deployed to try to contain the fire. Roof hatches are opened and external extinguishing is started in the attic space.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Important experiences from interventions

- Discussion is had concerning making a hole in the attic space but a decision is made to wait for the cutting extinguisher.
- When the cutting extinguisher arrives the attack is performed from outside in the gable end of the building.

Important experiences from interventions

- The cutting extinguisher attack has a direct effect which is shown as the smoke emerges through the roof runners, and is replaced with water vapour.

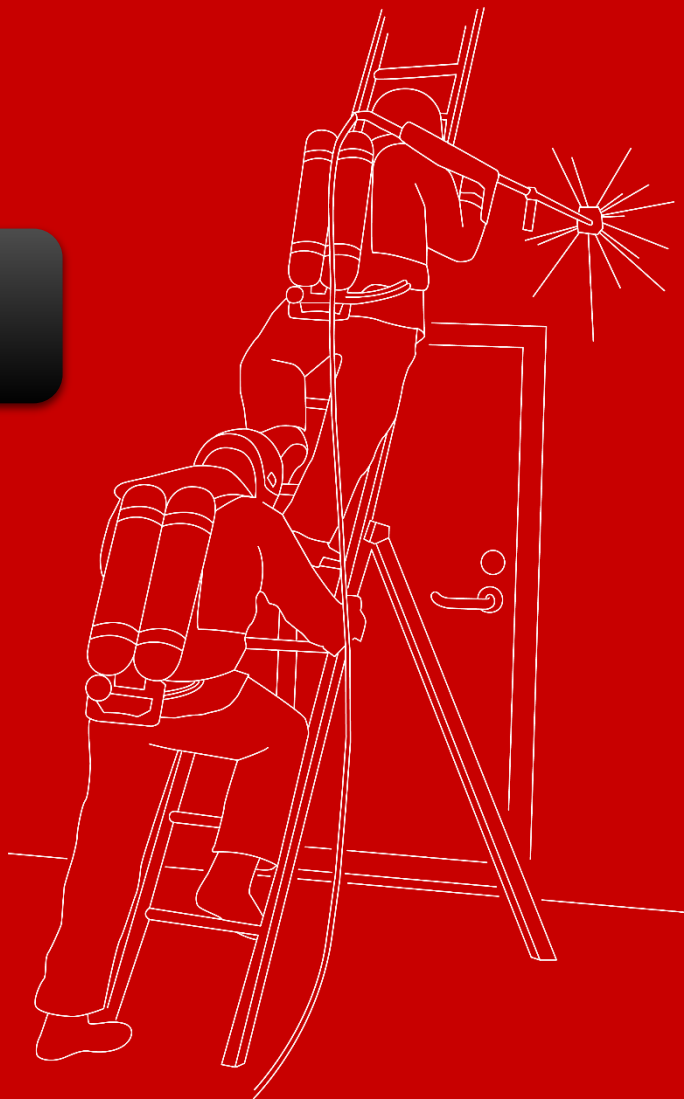
Important experiences from interventions

- When the fire is under control, the intervention continues with exposure and final extinction.

Important experiences from interventions

- Read the building and secure its structure
- Locate the fire and its extent
- Choose your method based on the situation, sometimes the cutting extinguisher attack is suitable, in other cases there may be more suitable alternatives
- Extinguish and/or contain the fire

Return to main menu



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Fires in premises with large volumes

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Fires in premises with large volumes

Fires in premises with large volumes can be very difficult for the emergency services to manage. A high fire load and risky work situations are commonly prevalent in these interventions.

Fires in premises with large volumes

Examples of buildings with large volumes:

- Industrial buildings
- Sports halls
- Ware houses
- Production halls

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Fires in premises with large volumes

The cutting extinguisher attack is a risk reducing measure which can be used both in order to extinguish and/or contain the fire for a safer working environment. In order to increase the effect, several cutting extinguishers can be used at the same time.

Initial tactic

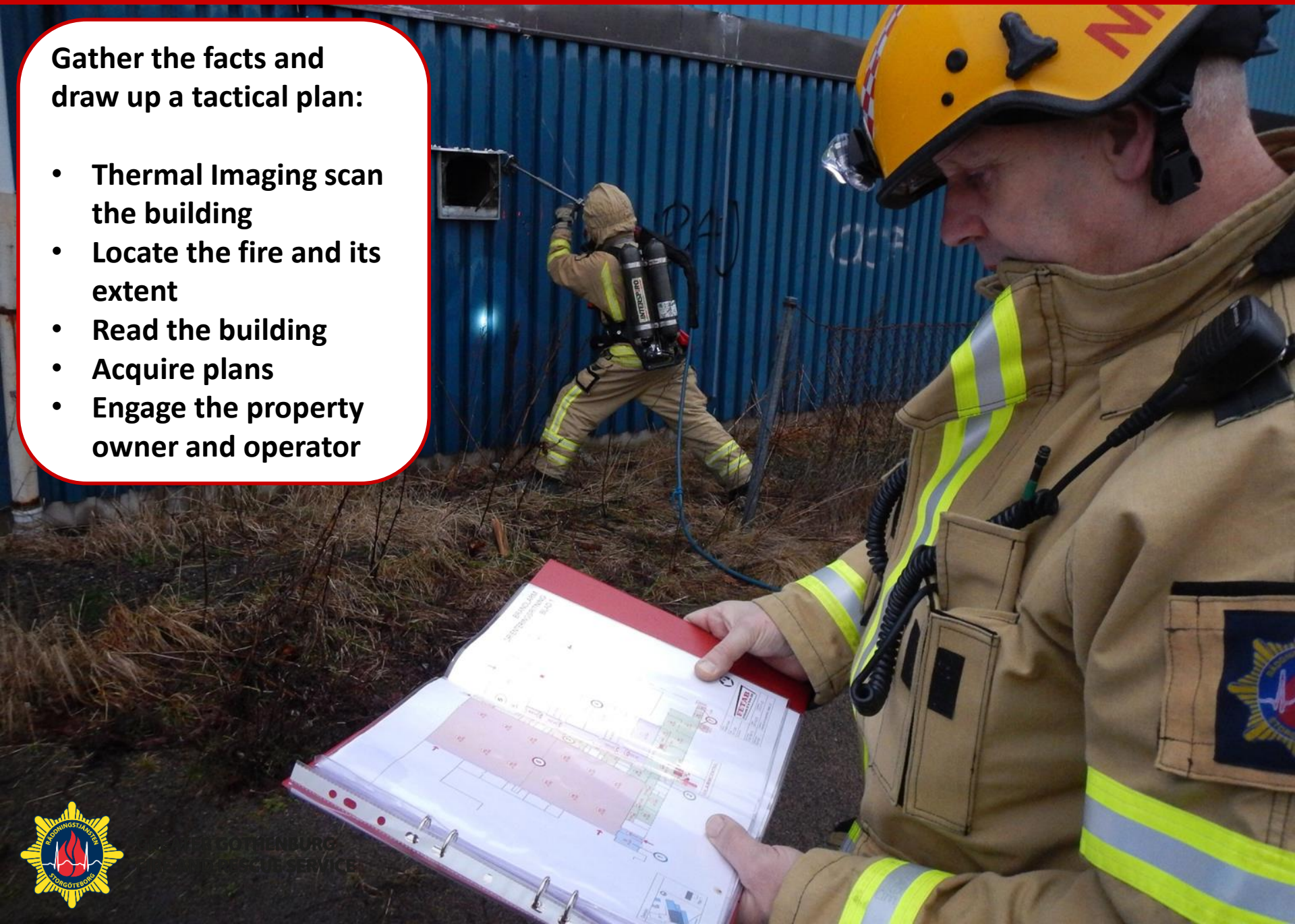
1. Immediately start cooling to “buy time”
2. Gather the facts and draw up a tactical plan
3. Choose your method and communicate your plan

Start cooling the fire exposed part or an obvious containment line in order to “buy time”.

Find the hottest point

Start cooling

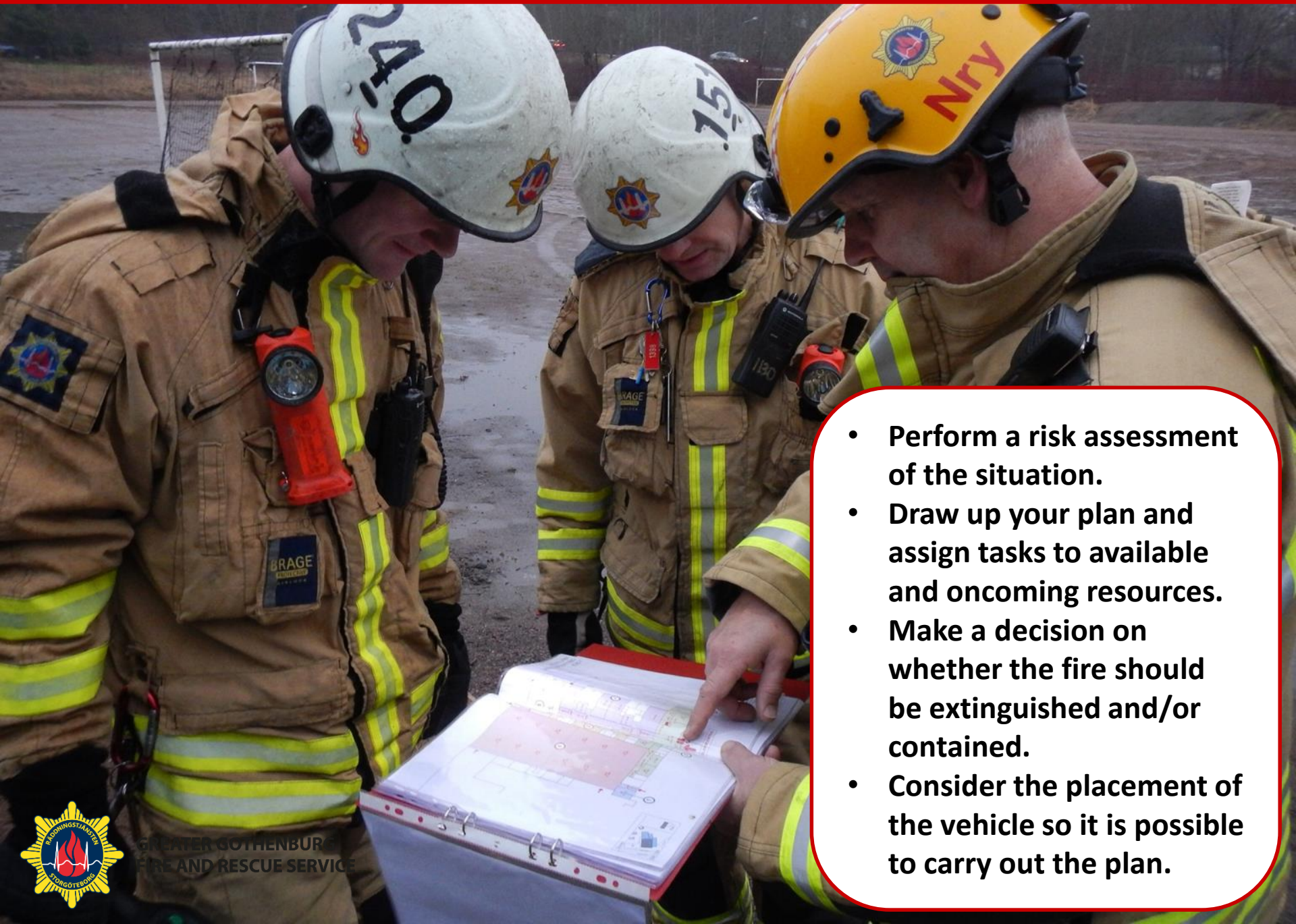
GREATER GOTHENBURG
FIRE AND RESCUE SERVICE



Gather the facts and draw up a tactical plan:

- Thermal Imaging scan the building
- Locate the fire and its extent
- Read the building
- Acquire plans
- Engage the property owner and operator

Cutting extinguishing tactic – Fire in a building



- Perform a risk assessment of the situation.
- Draw up your plan and assign tasks to available and oncoming resources.
- Make a decision on whether the fire should be extinguished and/or contained.
- Consider the placement of the vehicle so it is possible to carry out the plan.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Extinguish or contain the fire?

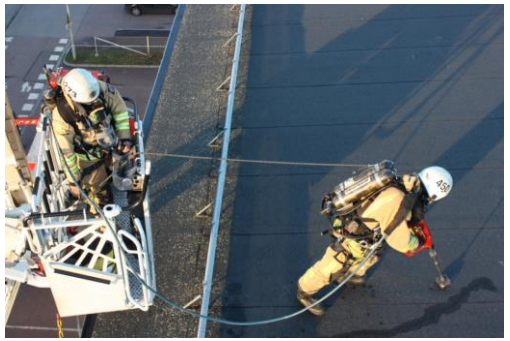
Depending on the situation, e.g. the extent of the fire, available resources, the structure of the building, etc. the leader of the operation should establish their objectives for the intervention. This often concerns extinguishing and/or containing the fire:

- **Extinguish the fire**, for the purpose of extinguishing the fire in the fire room.
- **Contain the fire**, for the purpose of containing the spread and for managing the outer boundaries of the fire.

Tactic for the purpose of extinguishing the fire

1. Coordinate the cutting extinguisher attack with several cutting extinguishers for the purpose of “boxing in” and extinguishing the fire
2. Pressurise the adjacent threatened spaces in order to limit the spread of fire
3. The cutting extinguisher attack can be performed in combination with other methods such as water fog nail, CAFS and internal extinguishing for example
4. Ventilate the fire affected space when the extinguishing intervention has had an effect

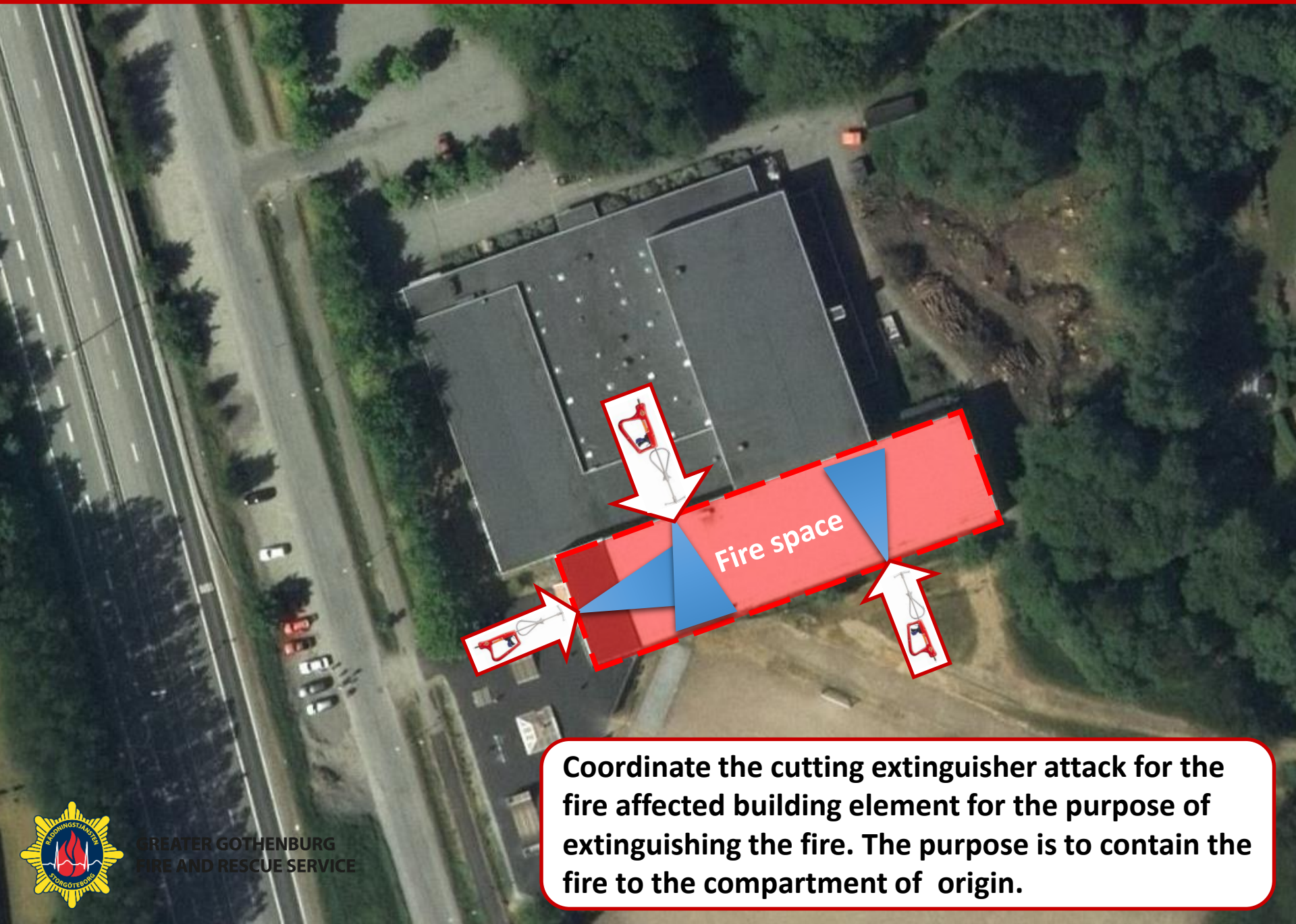
<u>When working at height:</u>
Work primarily from the vehicle-mounted crane's cabin.



Secure yourself first of all to the vehicle-mounted crane's cabin if you are climbing onto the roof.

Avoid working from portable ladders.

Cutting extinguishing tactic – Fire in a building



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Coordinate the cutting extinguisher attack for the fire affected building element for the purpose of extinguishing the fire. The purpose is to contain the fire to the compartment of origin.

Coordinate the cutting extinguisher attack from several different directions

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Coordinate the cutting extinguisher attack from several different directions

It is paramount that all measures are coordinated.

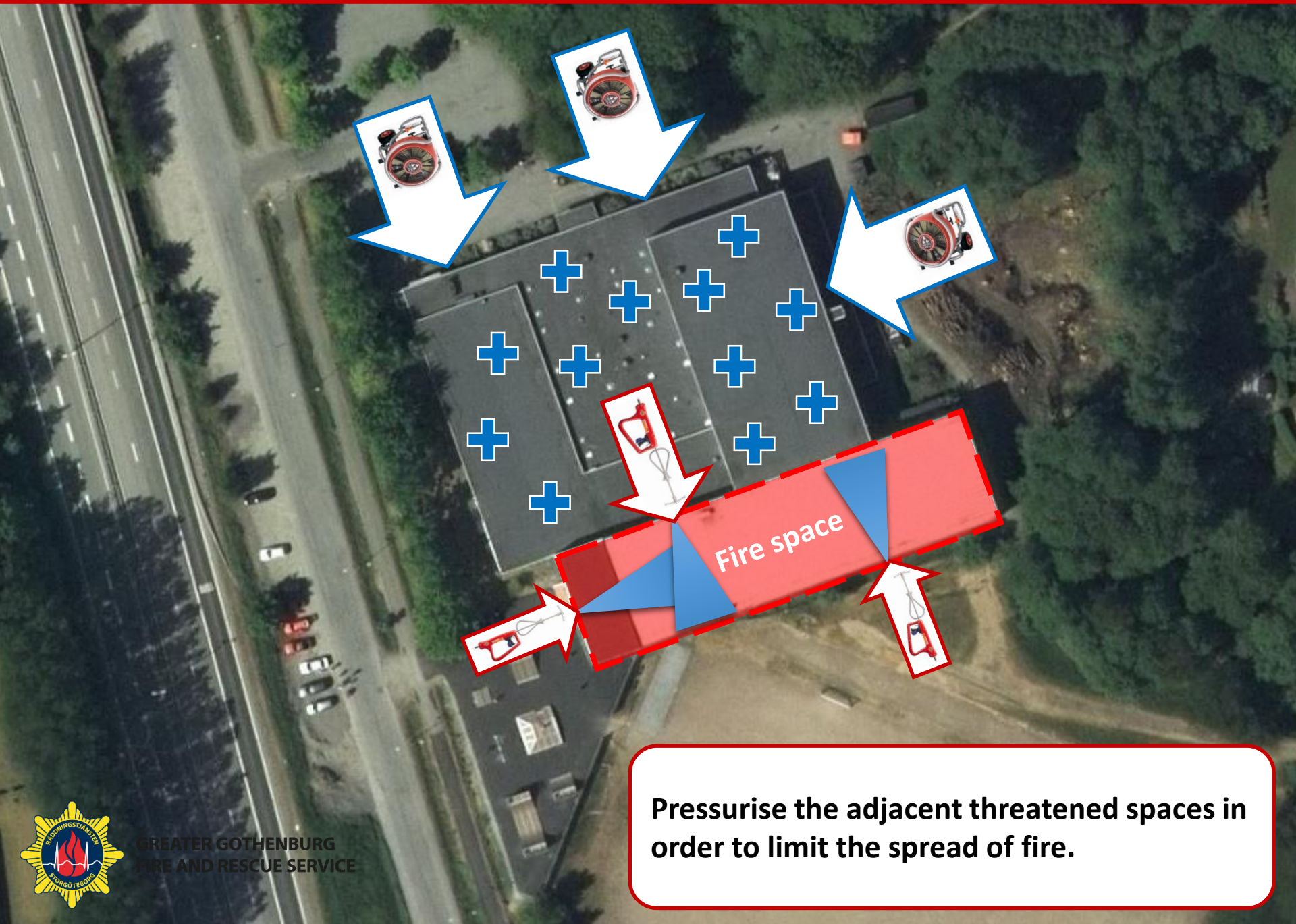
The operational management also needs to take account of the need for endurance as the intervention may take a long time. Ensure early on in the intervention that there will be relief for the cutting extinguisher operators.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Thermal Imaging scan and study the building from a vehicle-mounted crane in order to gain a better overview of the situation.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Cutting extinguishing tactic – Fire in a building



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Pressurise the adjacent threatened spaces in order to limit the spread of fire.

Pressurise the adjacent threatened spaces in order to limit the spread of fire.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Cutting extinguishing tactic – Fire in a building

The cutting extinguisher attack can be performed in combination with other methods such as water fog nail, CAFS and internal extinguishing for example.

GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

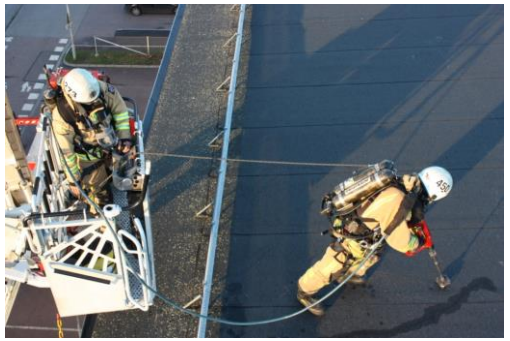
- Consider what is behind the wall, floor or ceiling!
- Check that nobody is behind the cutting surfaces
- Coordination is important during an intervention as personnel are inside the building

Ventilate the fire affected space when the extinguishing intervention has had an effect

Tactic for the purpose of containing the fire

1. Cool the designated containment lines with one or more cutting extinguishers
2. Pressurise the adjacent threatened spaces in order to counteract the spread of fire
3. Try also to cool the fire affected compartment

<u>When working at height:</u>
Work primarily from the vehicle-mounted crane's cabin.



Secure yourself first of all to the vehicle-mounted crane's cabin if you are climbing onto the roof.

Avoid working from portable ladders.

Cutting extinguishing tactic – Fire in a building

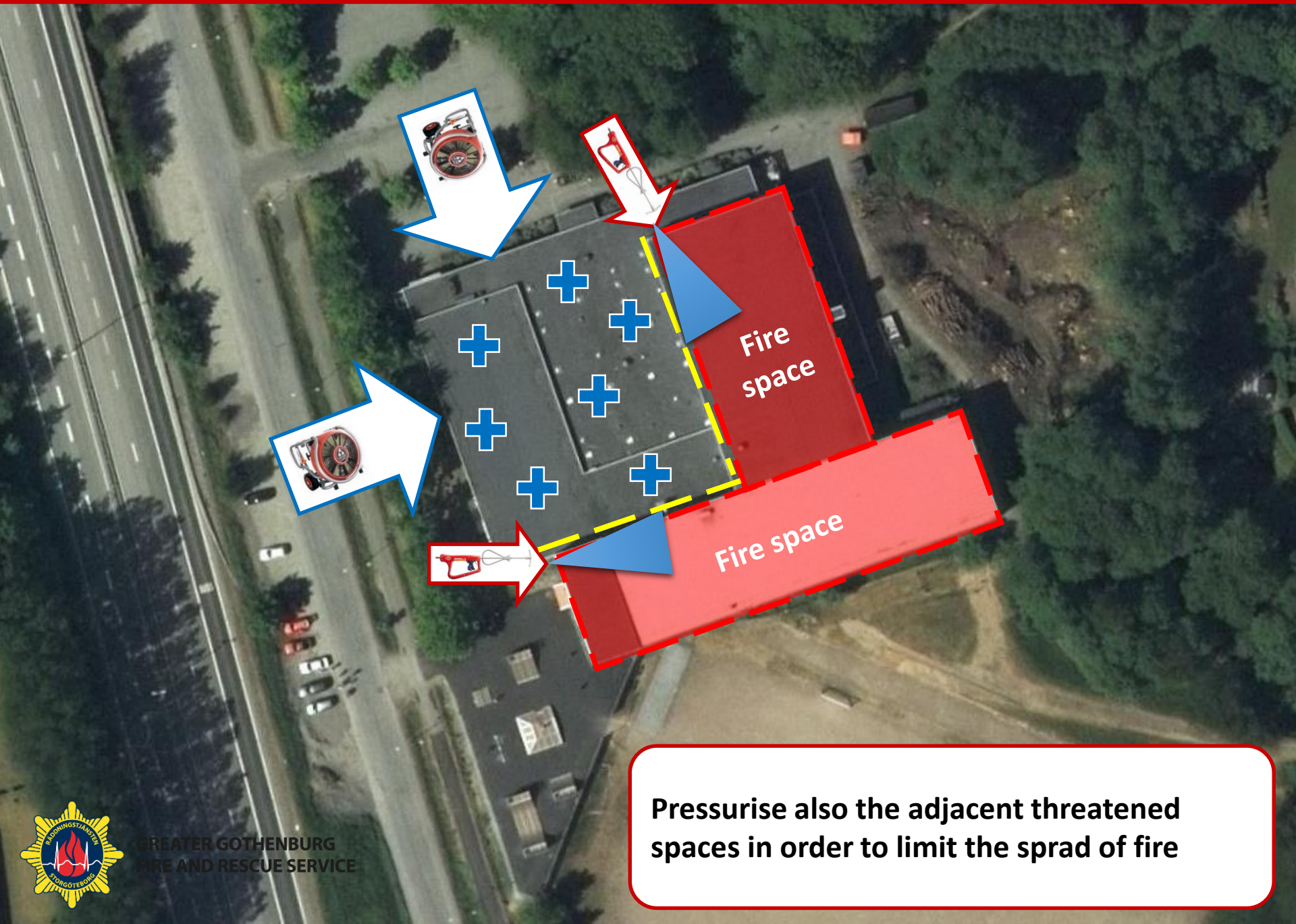
GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Cool the designated containment lines with one or more cutting extinguishers

Cool the containment lines:

- **From outside the building towards the fire affected containment line**
- **From inside the adjacent compartment through the fire affected containment line**
- **From outside the building towards the adjacent space when the fire starts to penetrate the containment line**

Cutting extinguishing tactic – Fire in a building



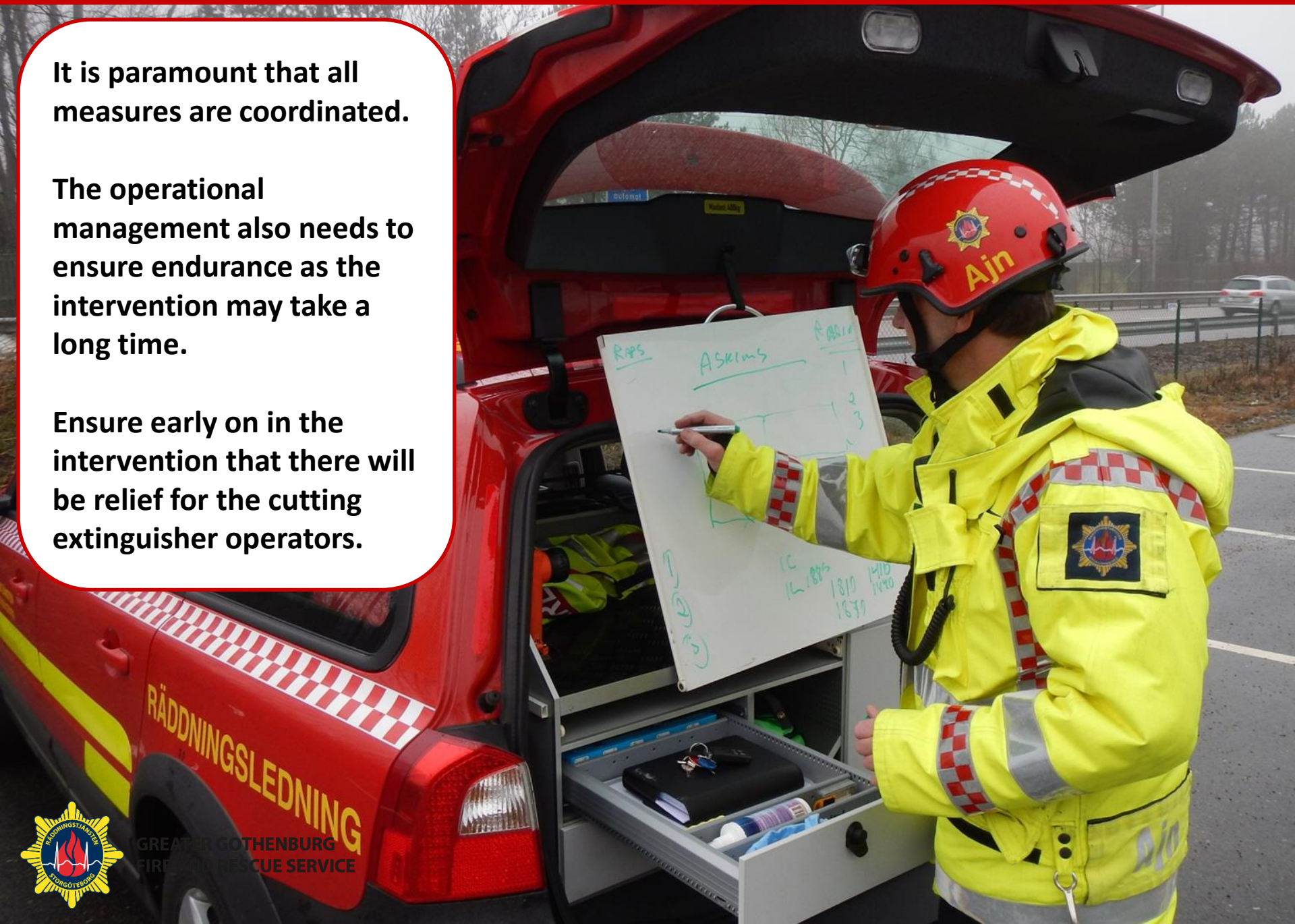
GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Pressurise also the adjacent threatened spaces in order to limit the sprad of fire

Overpressurize threatened spaces

Cool spaces in fire

Cool containment line



It is paramount that all measures are coordinated.

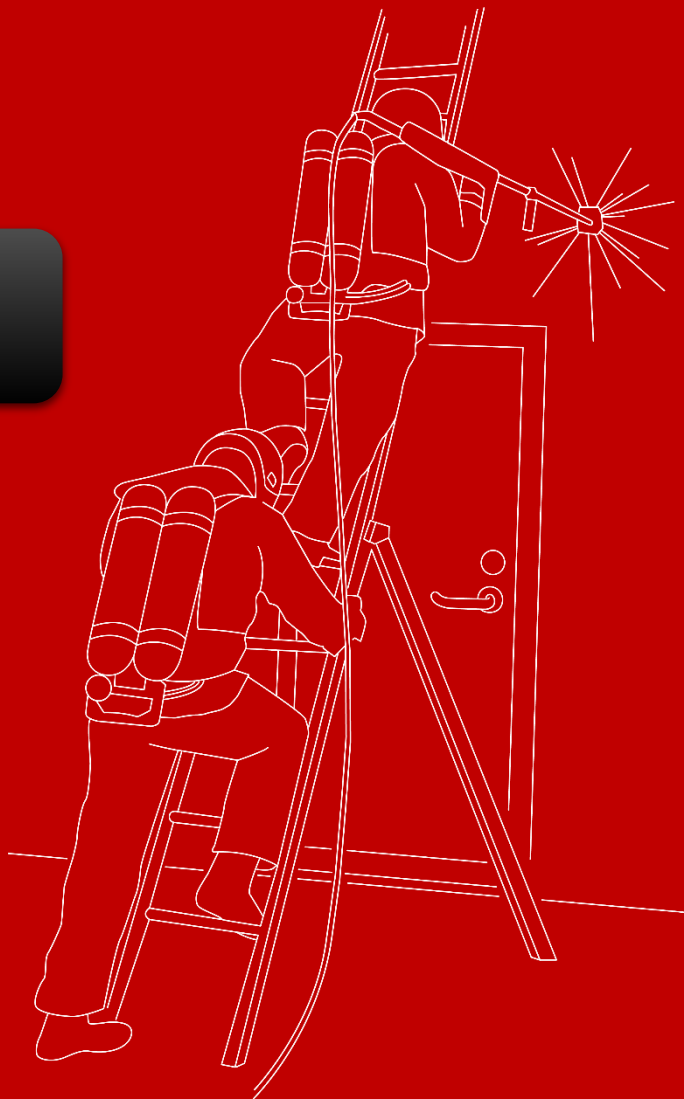
The operational management also needs to ensure endurance as the intervention may take a long time.

Ensure early on in the intervention that there will be relief for the cutting extinguisher operators.

Summary

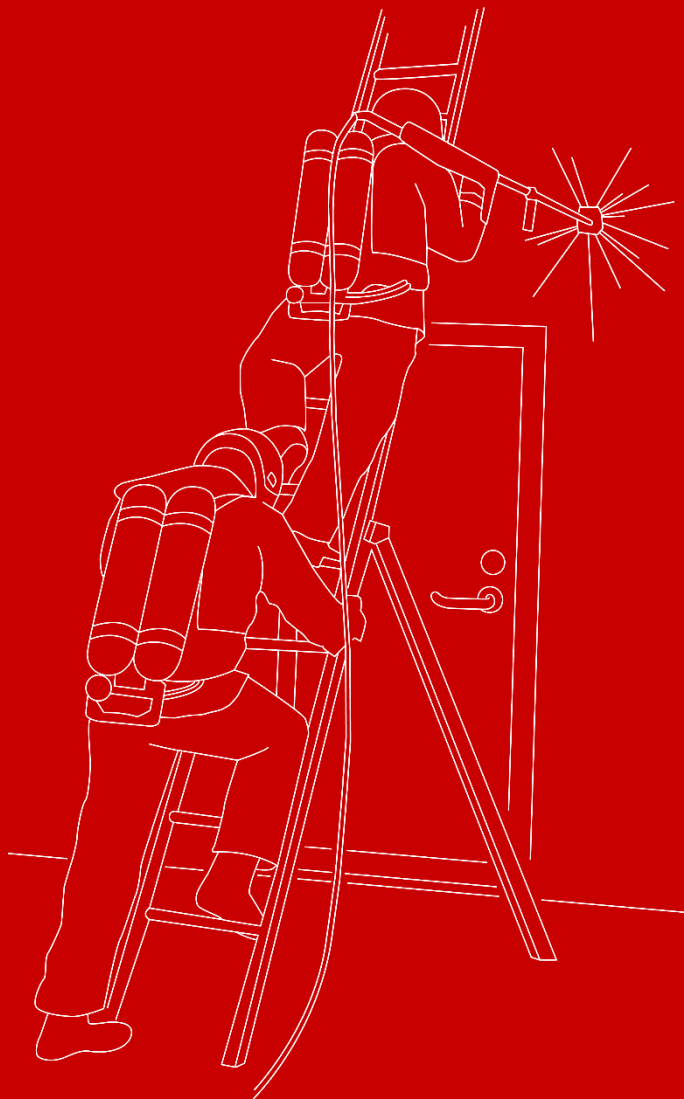
- Read the building and secure its structure
- Locate the fire and its extent
- Choose your method based on the situation, sometimes the cutting extinguisher attack is suitable, in other cases there may be more suitable alternatives
- Extinguish and/or contain the fire

Return to main menu



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE

Security
Safety
Attention



GREATER GOTHENBURG
FIRE AND RESCUE SERVICE