











# Fire Control

## High Pressure Water Mist and Controlled Ventilation

a n d r e a s f l o c k fire control

b e r n d k o n r a t h full scale fires

# Fire Control

## High Pressure Water Mist and Controlled Ventilation

Water and Air

Building Regulations and Objectives

Application in project Zoofenster in Berlin

Application in project Schlaues Haus in Oldenburg

Prospects

An aerial photograph of a forest fire. The ground is covered in a dense layer of smoke, which is a mix of dark blue and greenish-grey. The smoke is rising from the ground, creating a textured, wavy pattern. The overall scene is hazy and somewhat obscured by the smoke.

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# Fire Control

Water mist streaming downwards into the fire

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b e r n d k o n r a t h full scale fires

# Fire Control Water and Air

Smoke rising upwards driven by thermal updraft


a n d r e a s f l o c k fire control

b e r n d k o n r a t h full scale fires



## Fire Control Water and Air

Both effects directed towards each other: suppression of the thermal updraft

A photograph of a fire in a warehouse. The fire is in the center, with bright orange and yellow flames. The background is a dark, smoky environment. On the left, a metal ladder is leaning against a wall. On the right, a fire extinguisher is visible. The overall scene is dimly lit, with the fire providing the main light source.

## Fire Control Water and Air

Fire Control: Interaction of water and air in one direction

# Fire Control

## High Pressure Water Mist and Controlled Ventilation

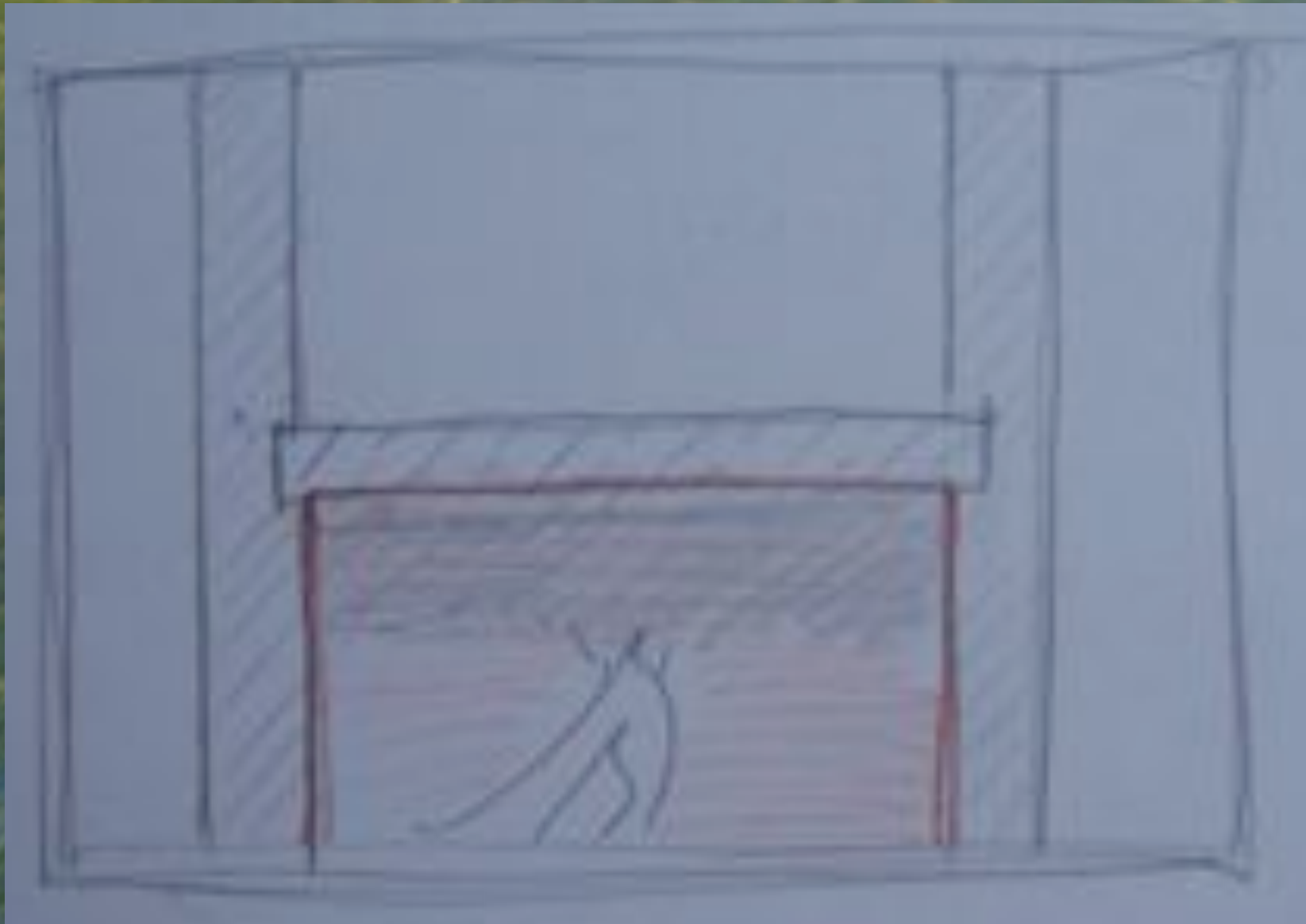
Water and Air

Building Regulations and Objectives

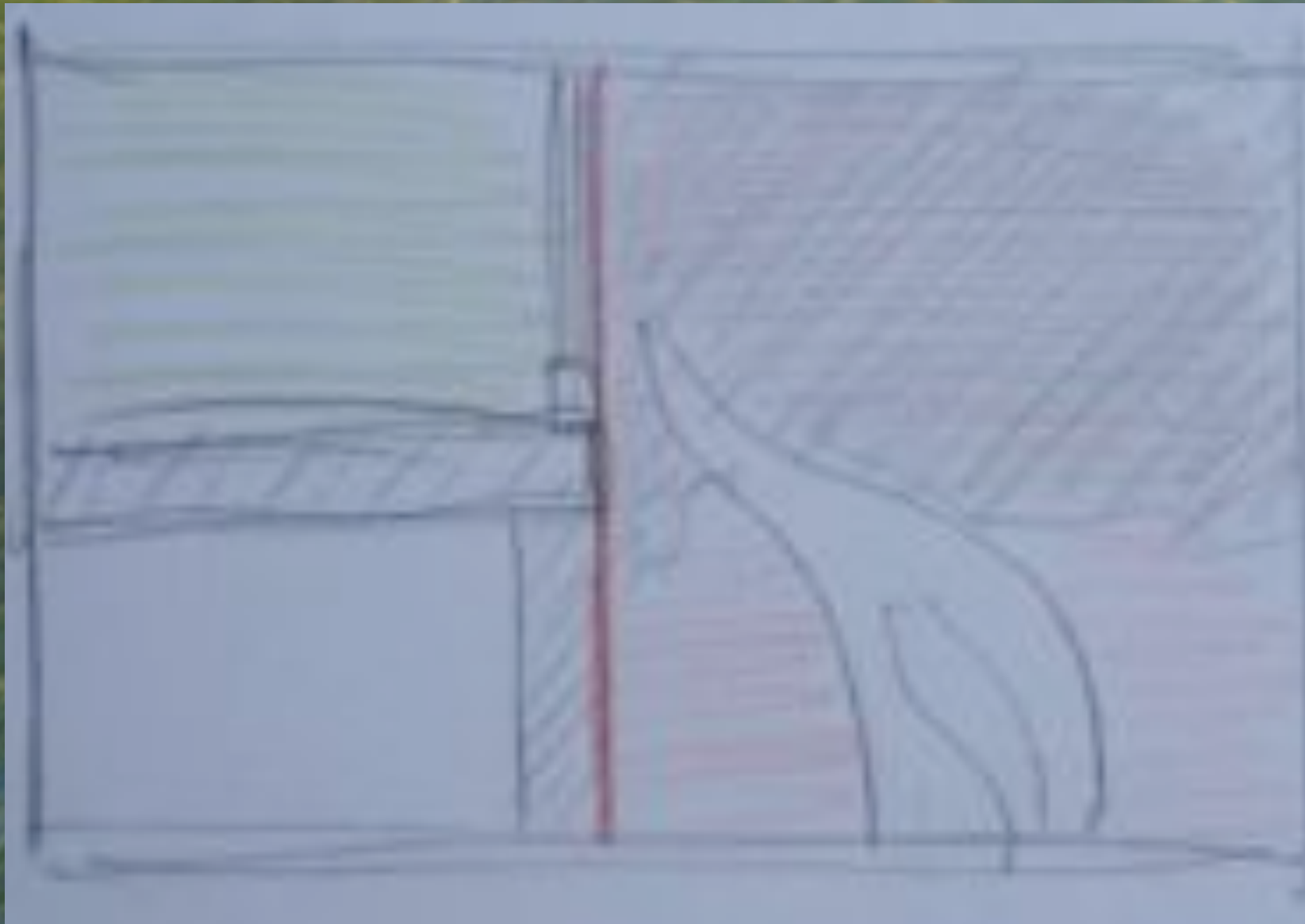
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Prospects



Ceilings: protective barrier / Resistance against fire spread



Escape routes: Protection from heat and smoke

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# Fire Control Building Regulations

Protective barrier: ceilings

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# Fire Control Building Regulations



Protective barrier: escape routes

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# Fire Control Building Regulations

Mobile protective barrier: curtains

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An aerial photograph of a city, likely Berlin, showing a large green park (Tierpark Berlin) in the center. The city buildings are visible in the foreground and background, with a hazy sky above.

## Fire Control Zoofenster

Location: Western city centre, near Bahnhof Zoo

Surface area: ca. 4.100 m<sup>2</sup>

Height according to MBO: ca. 110 m

Occupancy: hotel / offices

Installation: reception hall



# Fire Control Zoofenster

Installation: reception hall

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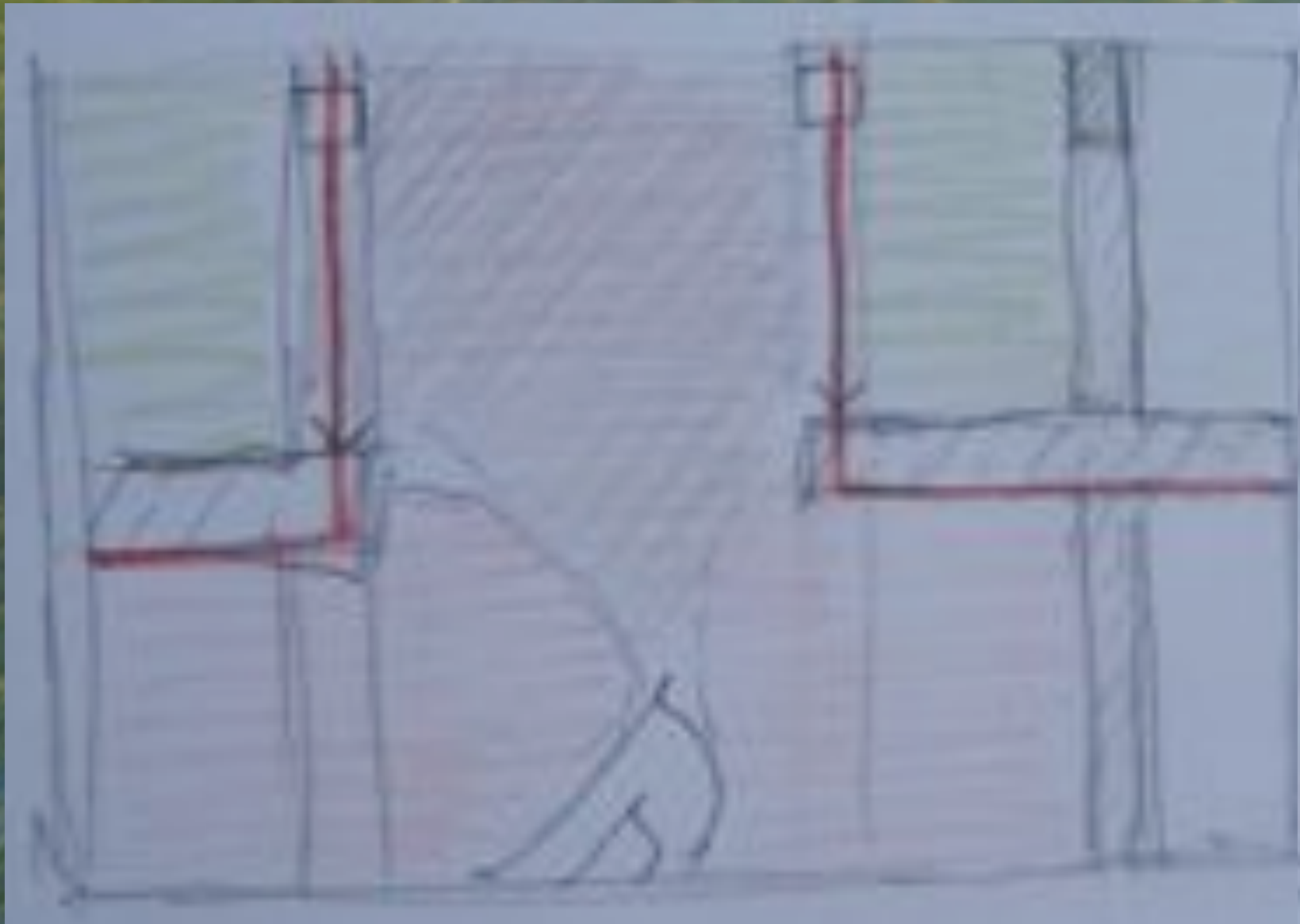




a n d r e a s f l o c k    f i r e c o n t r o l

b e r n d k o n r a t h    f u l l s c a l e f i r e s





Permitted design: Protection of the first floor escape routes with curtains



## Fire Control Zoofenster

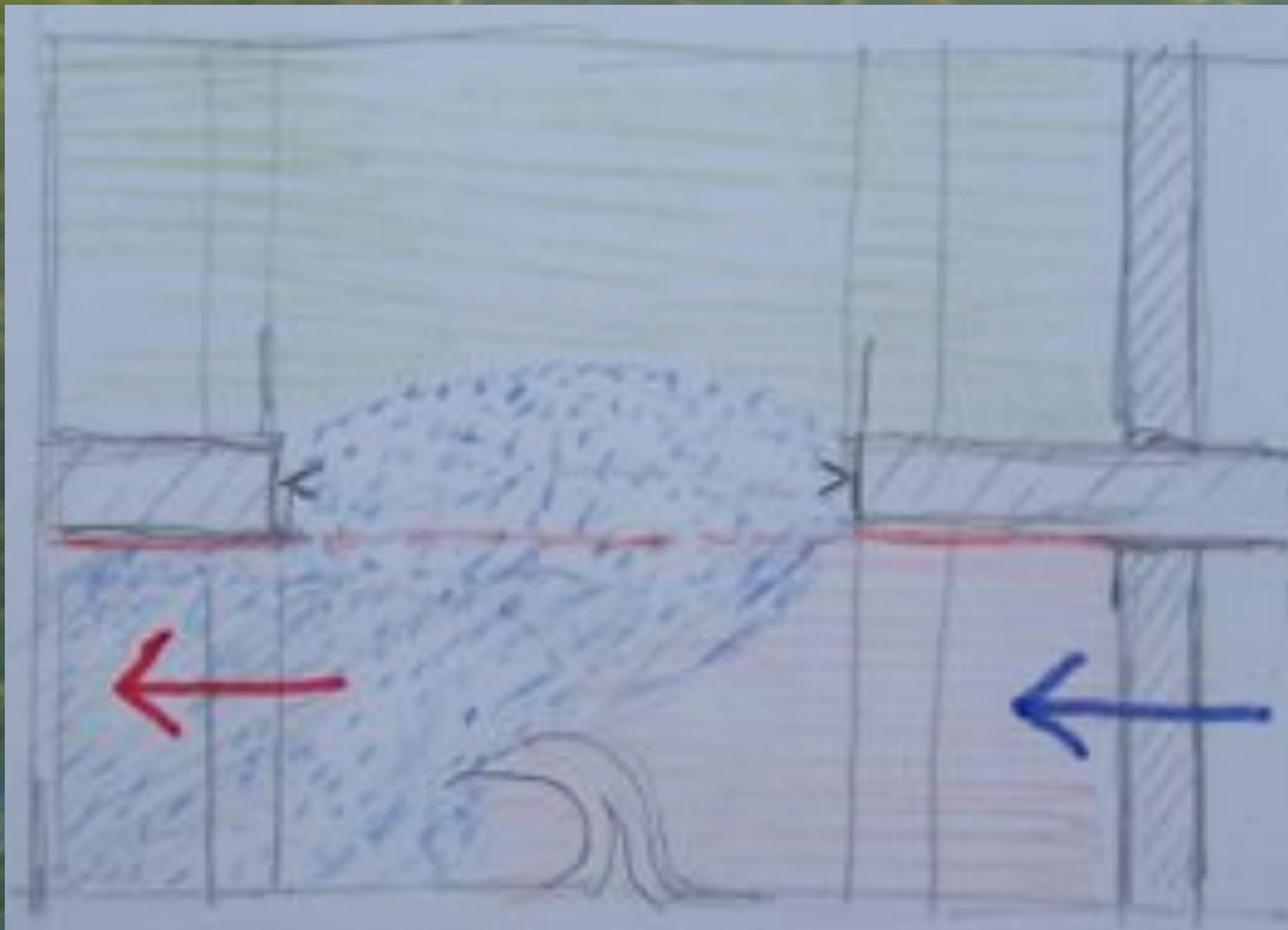
Requirement: Protection of escape routes

Requirement: Ceiling as a barrier against heat and smoke

Reception Hall: Objectives

a n d r e a s f l o c k fire control


b e r n d k o n r a t h full scale fires



Achieving the objectives with water mist

a n d r e a s f l o c k fire control

b e r n d k o n r a t h full scale fires



Fire Control  
Zoofenster

Full Scale Fire Simulations

a n d r e a s f l o c k fire control

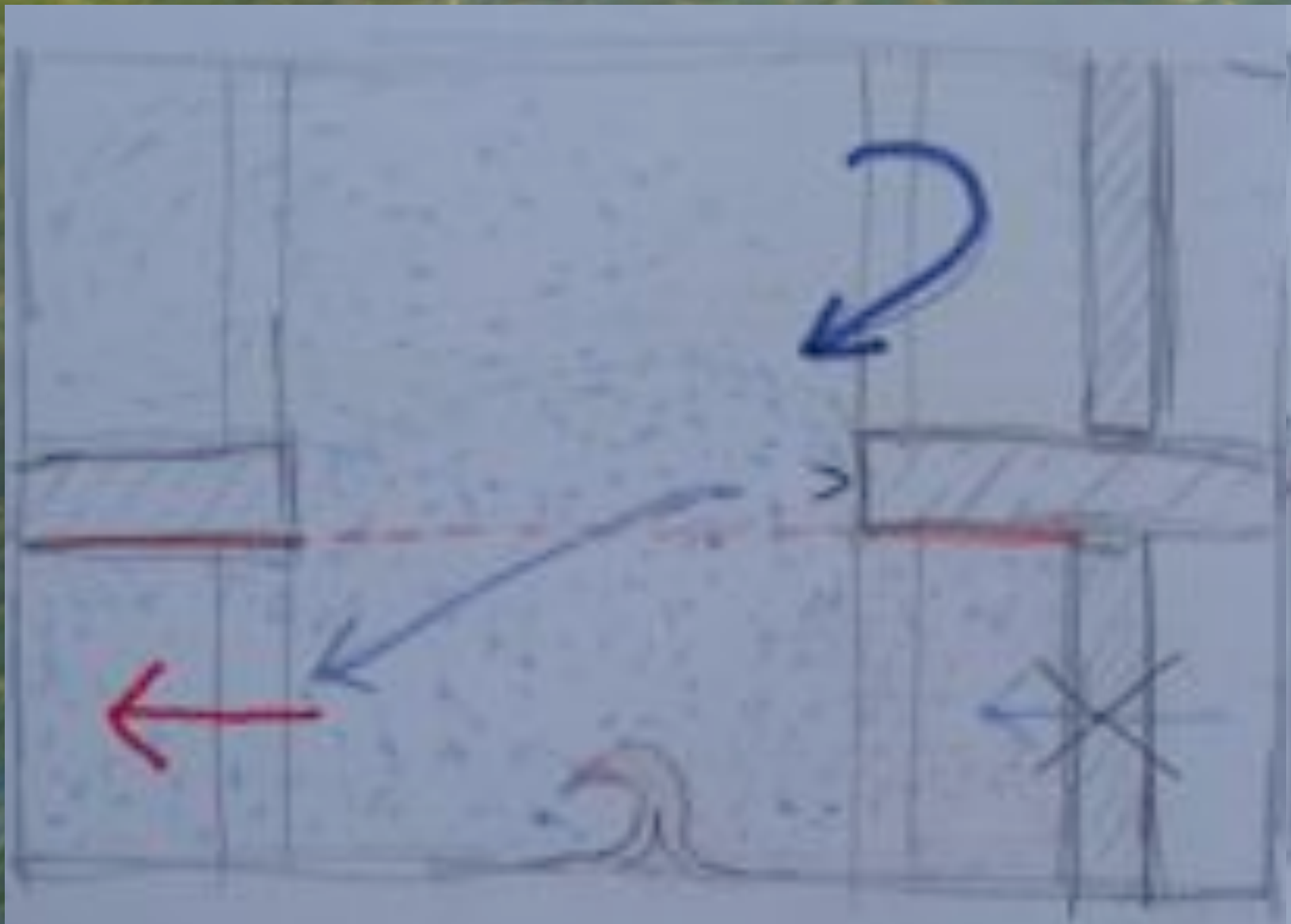
b e r n d k o n r a t h full scale fires



Fire Control  
Zoofenster

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b e r n d k o n r a t h full scale fires



High pressure water mist and controlled ventilation: observations

# Fire Control

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# Fire Control Schlaues Haus

Location: Schlossplatz in the centre of Oldenburg

Surface area 319 m<sup>2</sup>

Height according to MBO: ca. 11,50 m

Occupancy: science communication centre , tourist information

Installation: ceiling openings

a n d r e a s f l o c k fire control

b e r n d k o n r a t h full scale fires











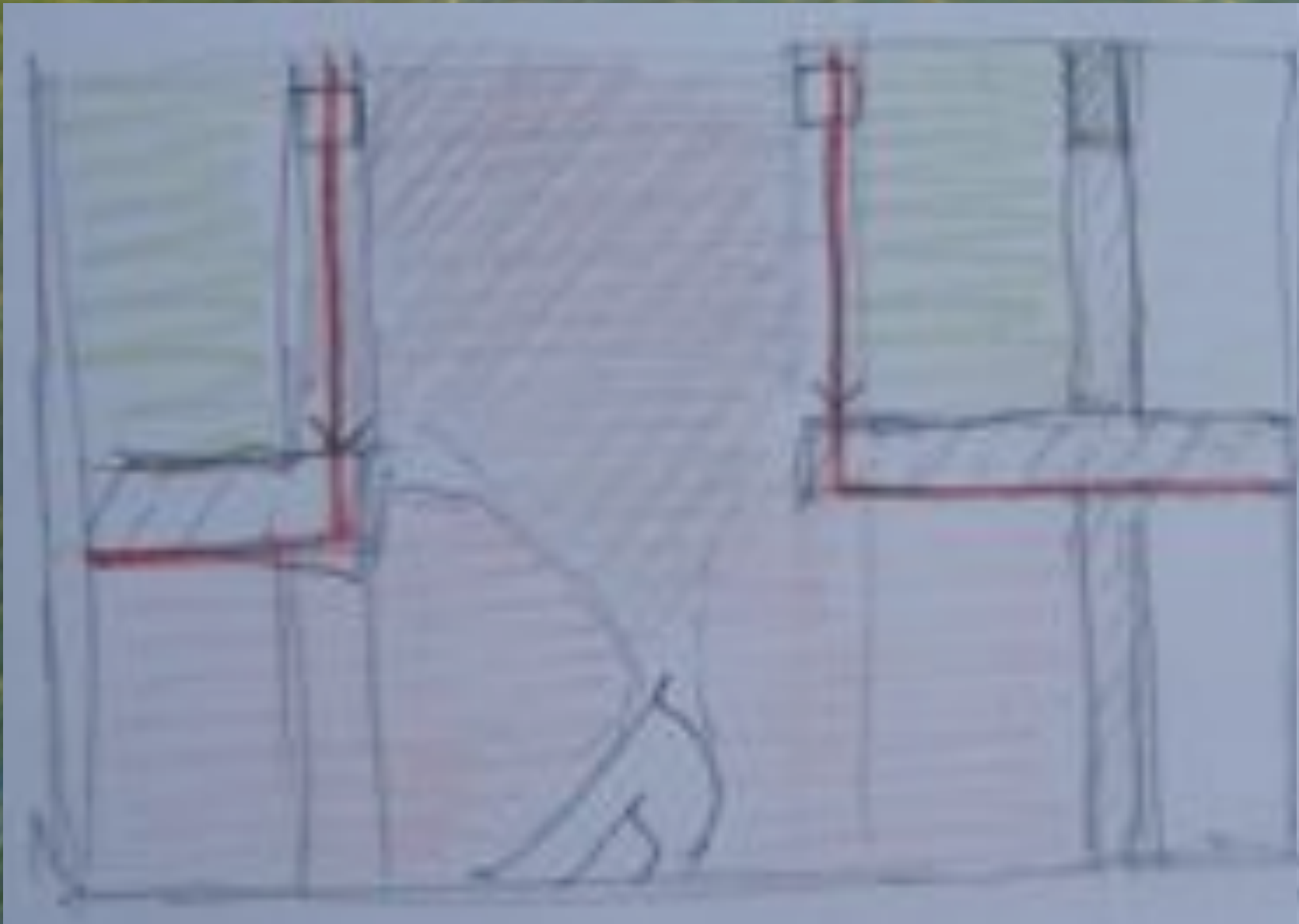
# Fire Control Schlaues Haus

Installation: ceiling openings



a n d r e a s f l o c k fire control

b e r n d k o n r a t h full scale fires



Standard solution design: Protection of the escape routes with protective curtains



# Fire Control Schlaues Haus

Requirement: Ceiling as a protective barrier

Requirement: Protection of escape routes

Ceiling openings: Requirements



# Fire Control Schlaues Haus

Setting up the effects vertically



A large fire simulation in a dark room, with a table in the foreground. The fire is bright orange and yellow, with a large plume of smoke rising from it. The table is dark and has a few items on it, including what looks like a fire extinguisher. The background is dark, making the fire stand out.

# Fire Control Schlaues Haus

Full Scale Fire Simulations

a n d r e a s f l o c k fire control

b e r n d k o n r a t h full scale fires

# Fire Control Schlaues Haus

Preparation tests



a n d r e a s f l o c k fire control

b e r n d k o n r a t h full scale fires



a n d r e a s f l o c k fire control

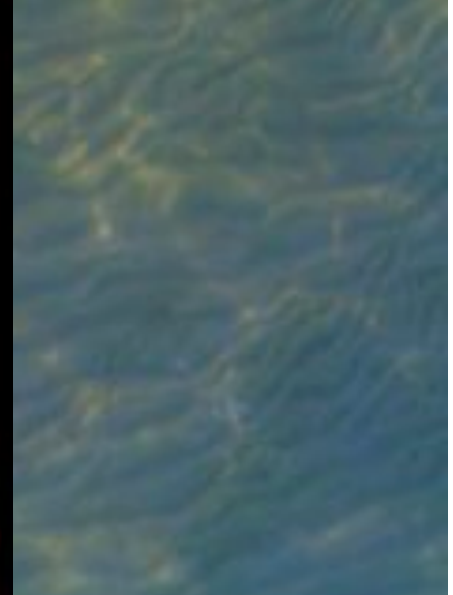
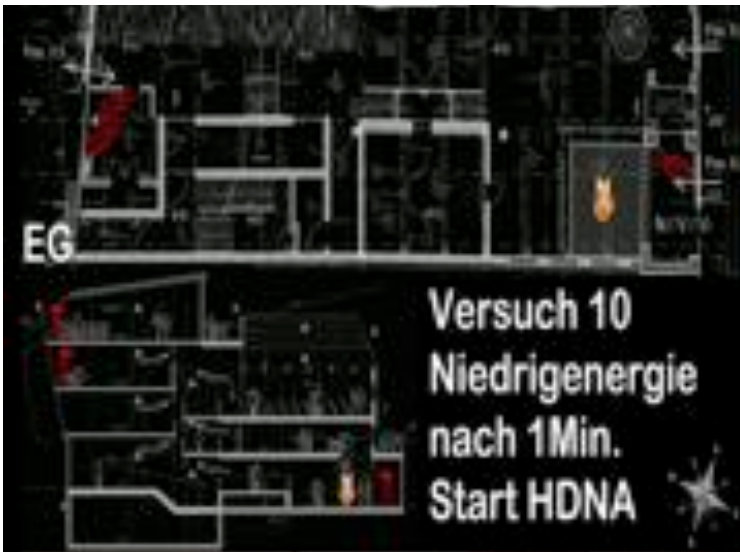
b e r n d k o n r a t h full scale fires



V - 2 / 2-N - BKA / Incoming air: ground floor level / small wind guidance

a n d r e a s f l o c k fire control

b e r n d k o n r a t h full scale fires



V - 10 / 2 - N - BKA / Incoming air: all levels

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# Fire Control Prospects

Fire Control: High pressure water mist and controlled ventilation

- > Systematic studies of physical effects > test series
- > Description and explanation > Dissertation
- > Widening the fields of application > Tunnels, high racks, servers





Idee und Vortrag

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