



Een beslissingsboom voor koolstofarme woningrestauraties: woning Braem

Filip DESCAMPS

Daidalos Peutz bouwfysisch ingenieursbureau

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PRESENTATIE VAN DE SPREKER

Filip Descamps was titularis van cursussen over energie in gebouwen tot academiejaar 2021-2022 (VUB). In zijn onderzoek simuleerde hij de optimalisatie van verwarmings- en ventilatiesystemen.

Filip Descamps is partner van adviesbureau Daidalos Peutz. Hij is consultant ingenieur (bouwfysica, rationeel gebruik van energie, daglicht en duurzaamheid).

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Agentschap
Onroerend
Erfgoed

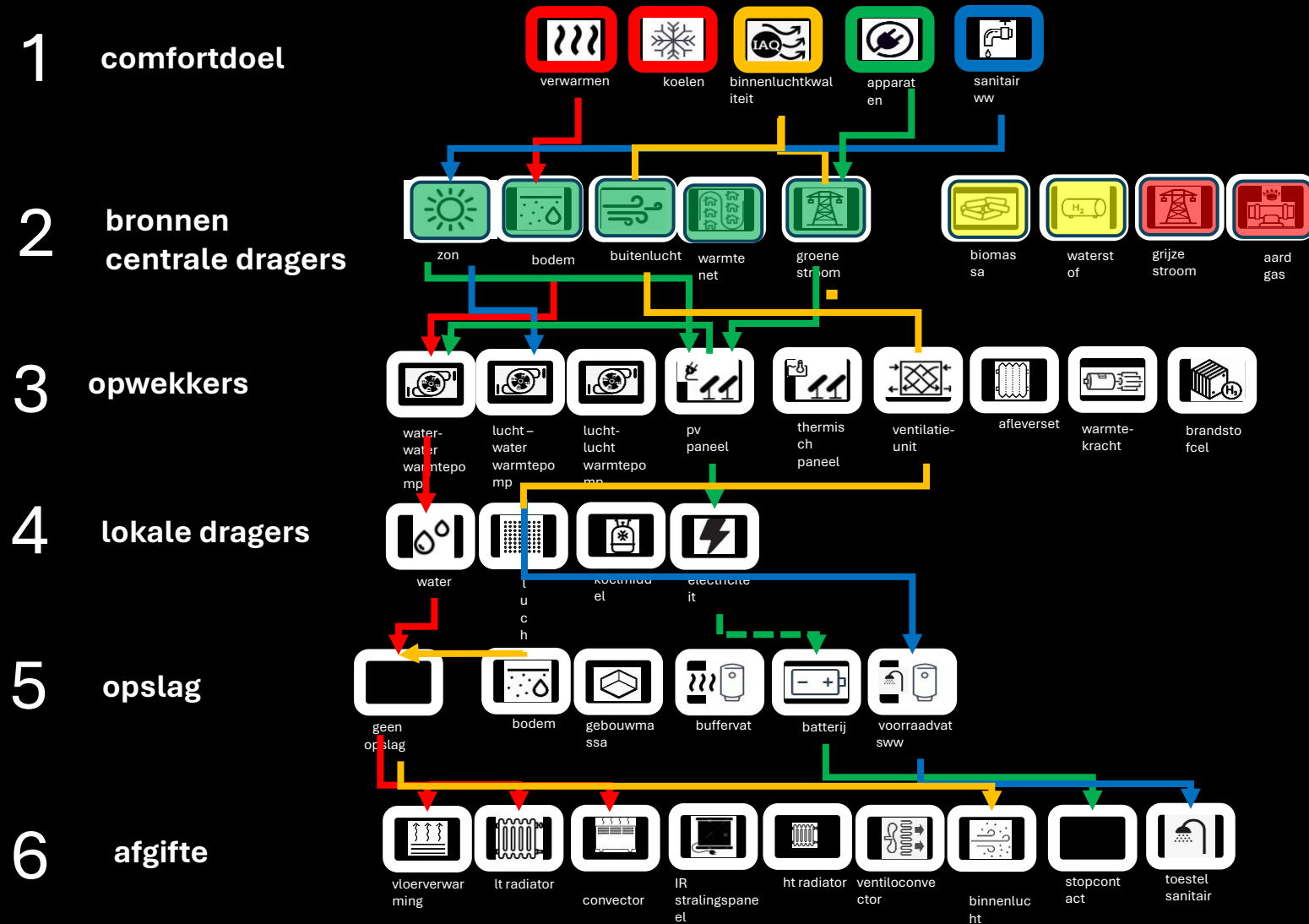


Vlaanderen
is erfgoed

Een beslissingsboom voor koolstofarme woningrestauraties: woning Braem

Systeemnaam: bodemwarmtepomp met gescheiden sww-bereiding via warmtepompboiler, pv panelen en ventilatiesysteem D

Doelpubliek: duurzame keuze voor de stadsrand en verder



Residentiële gebouwen met erfgoedwaarde bezitten architecturale, historische en culturele waarden die behouden moeten blijven, zelfs wanneer ze worden aangepast om te voldoen aan hedendaagse energieprestatie- en duurzaamheidsnormen.

De methodologie is opgebouwd in drie opeenvolgende stappen:

Stap 1: Erfgoedbeoordeling door de erfgoedadviseur: beoordelingskaders

Stap 2: Ontwerpvoorstellen door de ontwerper: een beslisboom

Stap 3: Feedback en definitief ontwerp

Assessment framework heat production		
Building area relevant for this schematic:		
criterion	legend	help
critterion 1 cultural heritage value	"+" little or no loss of cultural heritage value; "-" unacceptable loss of cultural heritage value	
Impact on cultural heritage value of exterior elements		
Is there an installation space against one of the facades, possibly with an enclosure if required?		Can an installation area be found against facades with an acceptable loss of cultural heritage value? Can an installation area be found outside the field of view from the street or ground level? Against a (rear) facade with no cultural heritage value?
Is there an installation space on the roof (or one of the roofs), possibly with an enclosure if required?		Can an installation area be found on the roof with an acceptable loss of cultural heritage value? Can an installation area be found outside the field of view from the street or ground level? Against a (rear) facade with no cultural heritage value?
Is there a position for visible penetrations through the building envelope?		Penetrations of the building envelope can be in facades, opaque parts of joinery or roofs. This includes the use of existing ventilation ducts or chimneys. The loss of cultural heritage value of invisible penetrations, such as those below ground level for e.g. water-to-water heat pumps or heat pumps on the plot, is assessed here with a "+".
Is it possible to provide the pipes and ducts on one of the facades in accordance with the relevant guideline from OE or is there an acceptable internal route?		Can routes be found with limited impact on cultural heritage value? If it is difficult to find a route on the outside wall, is it possible to provide this route on the inside? E.g. for an electricity cable from inverter/inverter cupboard to solar panels.
Impact on cultural heritage value of elements in the interior		
Is there an interior installation space possible of 4m³ or more?		
If you answered "no" to the previous question, is an interior installation space possible of 2m³?		
Impact on cultural heritage value of the plot or surroundings		
Is there a suitable installation area on the plot, sufficiently close to the building, possibly with enclosure if required?		Suitability here means: are there any secondary buildings, places on the plot, in the garden without cultural heritage value or landscape value? Is there any valuable landscaping (artistic/historical value) present in the project area? Can the planting or landscaping be subsequently restored to its original condition? Is a valuable tree present? Can we define the root zone and carry out the works beyond it?
Is there an area on the plot that does not contain significant archaeological deposits (surface or subsurface, per guidelines) or the root systems of heritage or valuable trees?	"+" no suspicion; "-" a suspicion	Are there places on the plot where drilling can be carried out?
Can you determine a feasible outdoor installation area?		
Can you determine a feasible indoor installation area?		
critterion score cultural heritage value:		
critterion 2 energy	"+" high energy performance and user comfort "-" limited energy performance and user comfort	
Equipment efficiency		
Possibility for production of domestic hot water		
According to the energy performance calculation methods or according to the occupants, is there a risk of summer overheating? (If you select 'no', this criterion will not be taken into account)		If no calculation is available, summer comfort of the occupants can possibly be probed. Examples of spaces where cooling is eventually desirable: large windows on S-E-W without shading, no possibility of night ventilation, many internal gains due to high occupancy,...
critterion score energy:		
critterion 3 environment/comfort	"+" an interesting choice in terms of impact on environment/comfort "-" an uninteresting choice in terms of impact on environment/comfort	
Amount (and type) of refrigerant		
Is there a risk on noise pollution in the outdoor environment?		Based on the location of the dwelling (whether situated in a residential area or a rural zone), an assessment is made of the acoustic pressure exerted by the installation on the surrounding environment.
Is there a risk on noise pollution in the home?		Impact of background noise on comfort in the dwelling.
Is there an impact on air pollution in the outdoor environment?		Based on the location of the dwelling (whether located in a residential area or a rural zone), an assessment is made of the impact of the installation on local air quality.*
critterion score environment/comfort:		

warmteopwekking

Assessment framework ventilation		
Building area relevant for this schematic:		
criterion	legend	help
critterion 1 cultural heritage value		
Impact on cultural heritage value of exterior elements		
Can a design be considered in which the integration of an adjustable air supply grille in or around the external joinery of living spaces, bedrooms, or the hallway is detailed?	"+" possible; "-" yes, perhaps; "+" impossible	The presence of historical roller shutter boxes or external solar shading elements can facilitate the integration of air supply grilles. It is often feasible to position the window slightly deeper within the structural opening, thereby creating a supply slot at the top of the frame. Window casings frequently offer the potential for integrating adjustable air supply grilles. Refer to the external joinery assessment framework. In the case of secondary glazing or frame, integration is not possible.
Are there any historically integrated natural ventilation grilles in one or more facades? Could new small openings be integrated, typically smaller than 25x25 cm?	"+" yes; "-" no; "+" could possibly be added; "-" not available or impossible to add	Existing (historical) grilles can be reused, provided they are made properly adjustable. Attention must be paid to potential draught issues related to the positioning of the existing grilles.
Are there any cellar openings or a light well (English courtyard) available?	"+" yes; "-" no; "+" could possibly be added; "-" not available or impossible to add	Cellar openings or light wells can facilitate the creation of air supply and/or exhaust openings.
Are there local possibilities for integrating larger ventilation grilles (typically larger than 25x25 cm) into joinery elements or opaque facade components (such as windows, doors, gates, or dormer windows)?	"+" possible; "-" yes, perhaps; "+" impossible	
Impact on cultural heritage value of interior elements		
Can a space of 2 x 1 x 2 m³ be made available for a technical storage room, in addition to the space required for the central climate control system?	"+" possible; "-" yes, perhaps; "+" impossible	It is important that the location of the ventilation unit allows for a straightforward connection to external grilles and is situated close to any potential vertical shaft. For a ventilation system with mechanical exhaust only, a quarter of the volume mentioned here is required, making integration significantly easier.
Are there any rooms with high occupancy or elevated indoor air pollution levels where a local ventilation unit could be integrated into the interior?	"+" possible; "-" yes, perhaps; "+" impossible	Spaces with high occupancy are not commonly found in residential buildings. These typically include professional workspaces or rooms intended for hosting parties or lectures. Spaces with high levels of indoor air pollution are typically workshops or wellness areas.
Are any ducts integrated into the existing chimney systems for natural ventilation or smoke extraction? Are some chimney flues that were originally intended for smoke extraction no longer in use?	"+" yes; "-" no	Compare the number of outlets in the chimney system with the number of connection points for heat-generating appliances. If there are more outlets than flue ducts, verify which ducts were originally intended for natural ventilation exhaust. These ducts typically included indoor grilles. Ventilation ducts can also be installed within former flue ducts by means of an internal lining. The gross width of a chimney duct is typically 30 cm (with an internal dimension of 20 cm).
Are there local opportunities to integrate a new vertical duct or shaft, typically measuring 25x60 cm, to connect the various floors of the building?	"+" possible; "-" yes, perhaps; "+" impossible	Is it possible to integrate a new vertical shaft? Can the new shaft be positioned in such a way that horizontal duct runs are minimized and the need for suspended ceilings along duct routes is limited? If there is only one level, this question is not applicable. In a ventilation system with mechanical extraction only, the vertical shaft can have smaller dimensions.*
Are there local opportunities to integrate a horizontal duct trajectory—either built into or mounted onto the structure—along interior walls or within ceiling spaces?		In some cases, it is possible to keep horizontal duct runs visible, or to integrate them into fixed furniture or locally lowered ceilings. In a ventilation system with mechanical exhaust only, there are fewer horizontal air duct runs.
critterion score cultural heritage value:		
critterion 2 energy	"++" very high energy performance and comfort; "+" high energy performance and comfort; "-" moderate energy performance and comfort; "--" low energy performance and comfort	
The selection of this scenario leads to:		
fast recovery efficiency		
maintenance effort		
electric auxiliary energy use		
critterion score energy:		
critterion 3 environment/comfort		
The selection of this scenario leads to:		
Impact on summer comfort		Heat recovery of cooled indoor air (cold recovery) is possible in a balanced ventilation system with mechanical supply and extraction.
Impact of outdoor air pollution or nuisance caused by external noise (industrial noise, traffic noise)		noise: https://omgeving.vlaanderen.be/nl/Alkamot-en-milieue/gezonde-veilig-en-aantrekkelijke-leefomgeving/geluid/geluidbelastingenkwartaal , outdoor air quality: https://www.vmm.be/nl/leefomgeving/evaluatie-luchtkwaliteit
Impact on indoor noise pollution		Decentralized ventilation systems reduce the need for ducts.
critterion score environment/comfort:		

ventilatie/binnenluchtkwaliteit

Assessment framework heating elements		
Building area relevant for this schematic:		
criterion	legende	help
critterion 1 cultural heritage value		
Selecting these heating elements results in:		
Do the existing emission elements have cultural heritage value?		This applies both to radiators or, for example, stoves, as well as to grilles of warm air heating systems and similar installations
Does the existing floor finish have cultural heritage value?		Parquet floors, terrazzo floors, marble or ceramic tiles, etc.
The presence of a wall cladding or decorative element with cultural heritage value. Opting for these heating elements leads to the following implications:	"+" little or no loss of cultural heritage value; "-" acceptable loss of cultural heritage value; "--" unacceptable loss of cultural heritage value	Wallcovering, fabric wall coverings, authentic wallpaper, gilt leather, original joint layers or decorative painting, etc. In some cases, a wall finish can be dismantled and reassembled; this is then indicated as "+".
Presence of a valuable ceiling finish or decorative ceiling elements. Selecting this type of emission system results in:	"+" little or no loss of cultural heritage value; "-" acceptable loss of cultural heritage value; "--" unacceptable loss of cultural heritage value	Mouldings in plaster or other materials, ceiling paintings, wooden ceilings, etc.
The overall visual impression of the space:	"+" little or no loss of cultural heritage value; "-" acceptable loss of cultural heritage value; "--" unacceptable loss of cultural heritage value	For example, the retention or addition of visually intrusive objects or volumes.
critterion score cultural heritage value:		
critterion 2 energy		
Selecting these heating elements results in:		
enables operation with low-temperature heating systems	"+" high energy performance and user comfort "-" limited energy performance and user comfort	Certain heating elements are more suitable for low-temperature heating than others. Consult the energy performance certificate. If it indicates a risk of overheating, select 'yes'. If there is no risk of overheating (answer 'no'), the cooling option is not relevant and this criterion is no longer applicable.
opportunity for cooling if desired – Support question: Is there a risk of overheating in the dwelling according to the energy performance calculation method or as perceived by the occupants		
critterion score energy:		
critterion 3 environment/comfort		
Selecting these heating elements results in:		
Impact on indoor noise pollution		Impact on indoor noise levels.

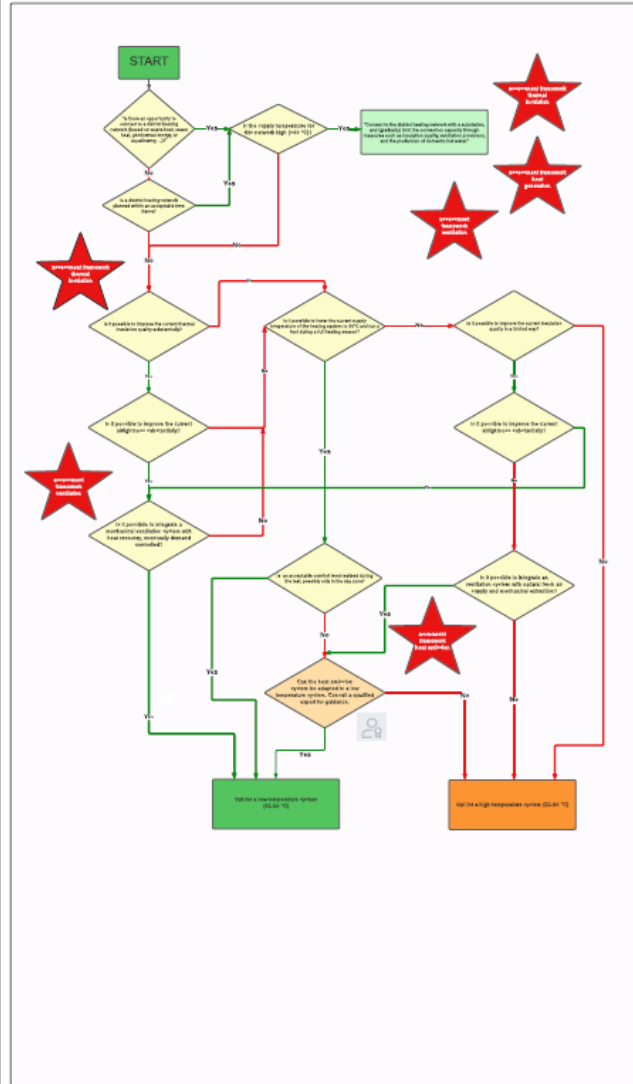
verwarmingselementen

Afwegingskader: evaluatie op culturele erfgoedwaarde, energieprestatie en milieu-impact

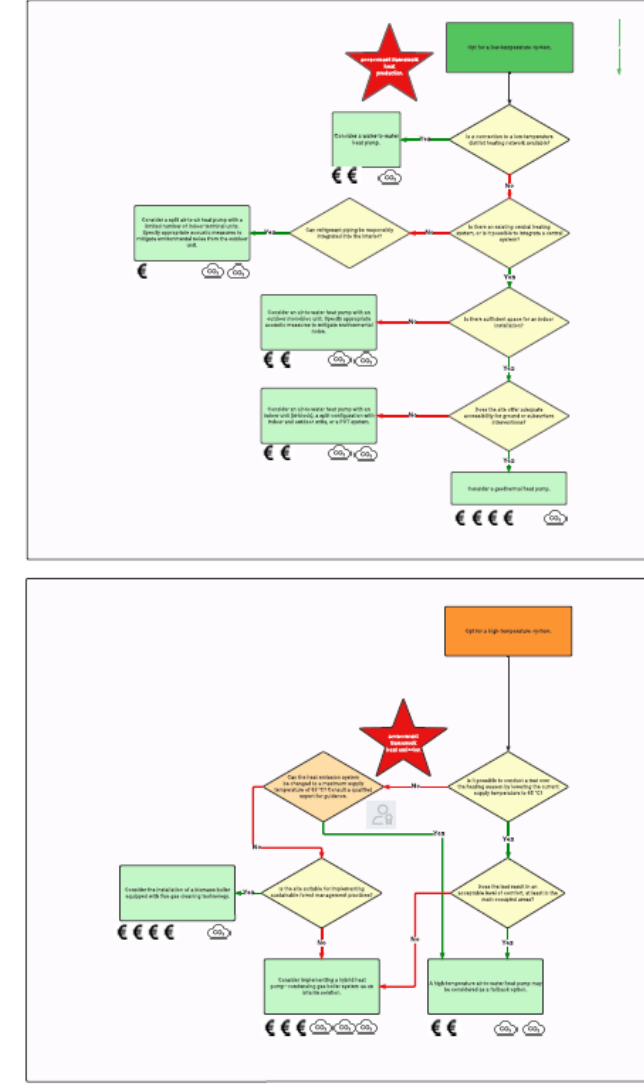
Assessment framework ventilation

Can a space of 1 x 1 x 2 m ³ be made available for a technical storage room, in addition to the space required for the central climate control system?	"+": possible, "±": yes, perhaps, "-": impossible	<i>It is important that the location of the ventilation unit allows for a straightforward connection to external grilles and is situated close to any potential vertical shaft. For a ventilation system with mechanical exhaust</i>
Are there any rooms with high occupancy or elevated indoor air pollution levels where a local ventilation unit could be integrated into the interior?	"+": possible, "±": yes, perhaps, "-": impossible	<i>Spaces with high occupancy are not commonly found in residential buildings. These typically include professional workspaces or rooms intended for hosting parties or lectures. Spaces with high levels of indoor air pollution</i>
Are any ducts integrated into the existing chimney systems for natural ventilation or smoke extraction? Are some chimney flues that were originally intended for smoke extraction no longer	"+": yes, "±": no	<i>Compare the number of outlets in the chimney system with the number of connection points for heat-generating appliances. If there are more outlets than flue ducts, verify which ducts were originally intended</i>
Are there local opportunities to integrate a new vertical duct or shaft, typically measuring 25x60 cm, to connect the various floors of the building?	"+": possible, "±": yes, perhaps, "-": impossible	<i>Is it feasible to integrate a new vertical shaft? Can the new shaft be positioned in such a way that horizontal duct runs are minimized and the need for suspended ceilings along duct routes is limited? If there is only one</i>
Are there local opportunities to integrate a horizontal duct trajectory—either built into or mounted onto the structure—along interior walls or within ceiling spaces?	"+": possible, "±": yes, perhaps, "-": impossible	<i>In some cases, it is possible to keep horizontal duct runs visible, or to integrate them into fixed furniture or locally lowered ceilings. In a ventilation system with mechanical exhaust only, there are fewer horizontal air</i>

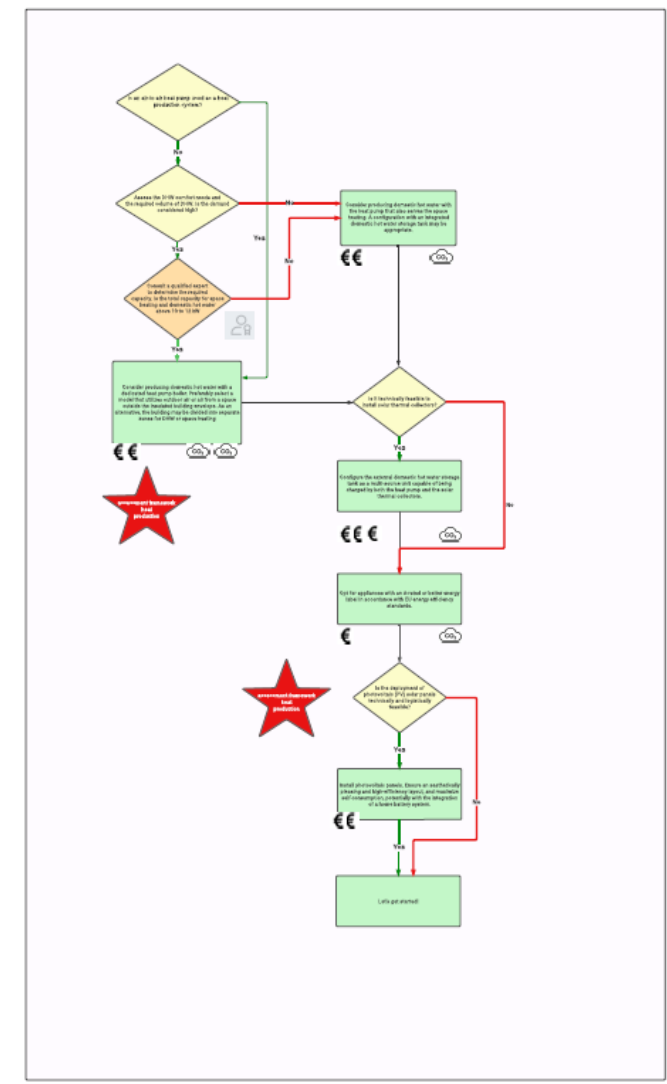
Thermal insulation & IAQ



generation of heat



DHW and solar systems



step 2: beslisingsboom

Afwegingskader en beslissingsboom voor koolstofarme woningen met erfgoedwaarde

Woonhuis en atelier architect Renaat Braem

- Context
- Plannen
- Exterieur
- Interieur

Welke beslissingen worden in het afwegingskader en in de beslissingsboom geformuleerd en begeleid?

Easy Moving

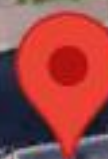


Ilhofstraat

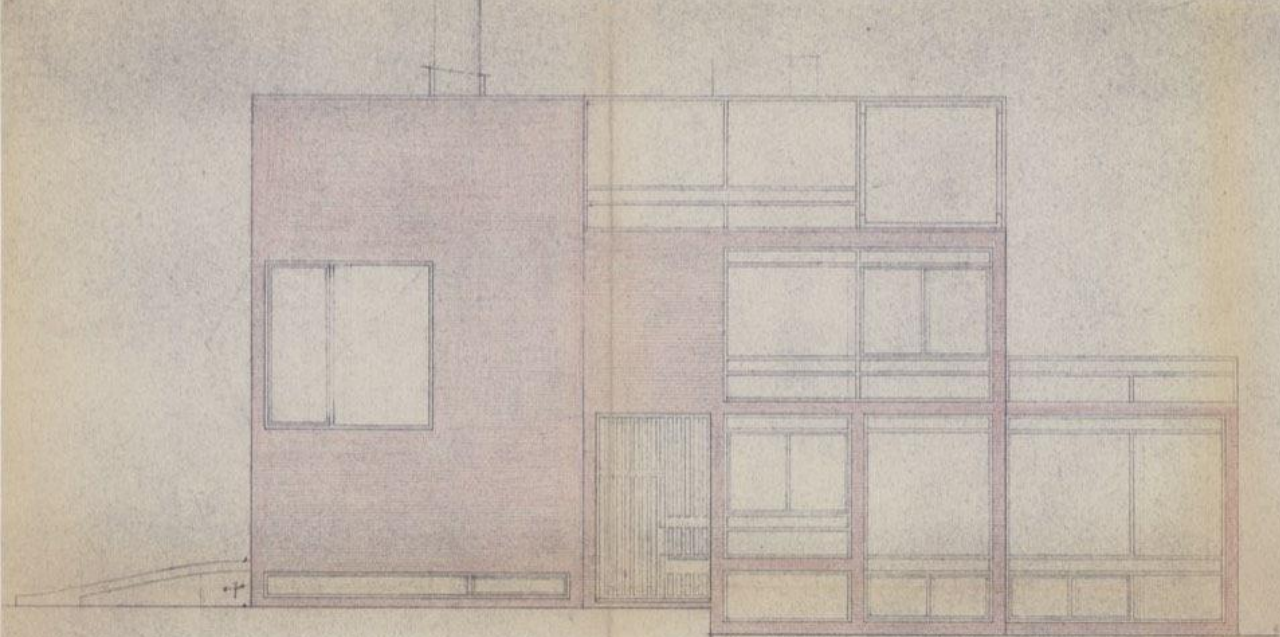
Menegemlei

Menegemlei

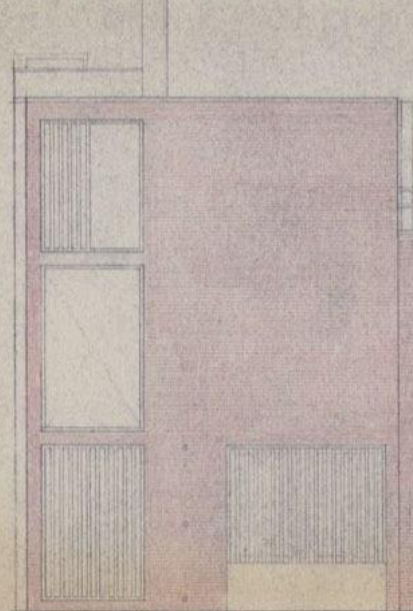
Gouverneur Holvoetlaan



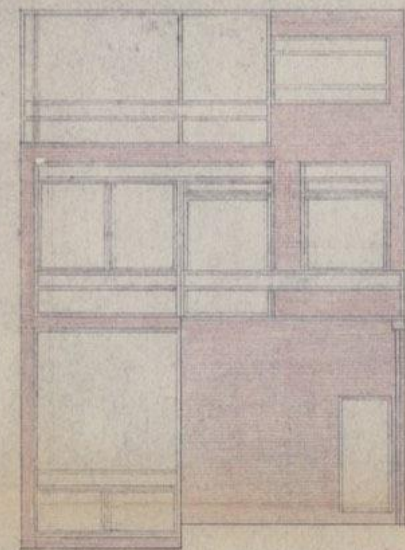
Renaat Braem Huis
Onlangs bekeken



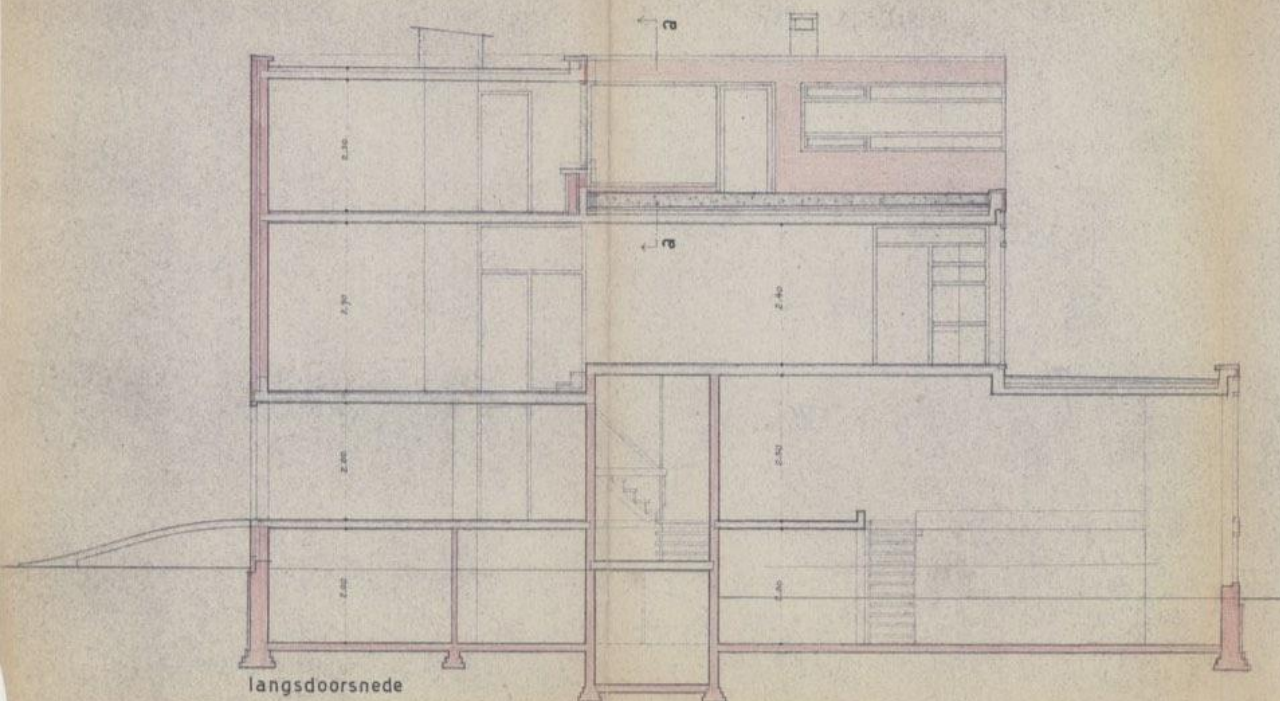
zijgevel



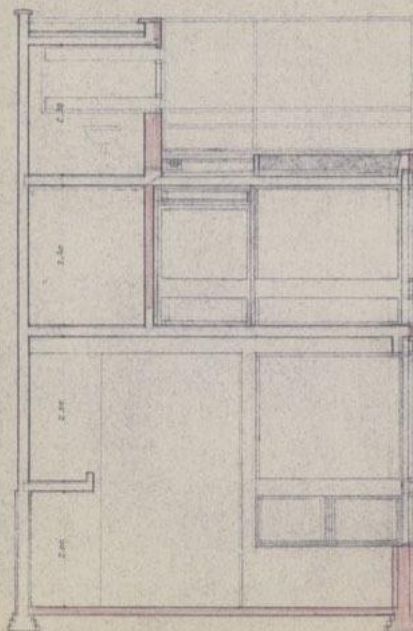
voorgevel



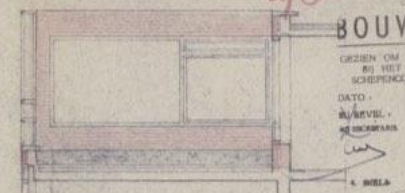
achtergevel



langsdoorsnede



dwarsdoorsnede



doorsnede a-a

16241
a/coll. 21.11.55

BOUWPOLITIE

ORDELEN OM GEVOEGD TE WORDEN
BIJ HET RESULTAAT VAN HET
SCHEPENCOLLEGE VAN DEURNE

DATO: 4 JAN 1956

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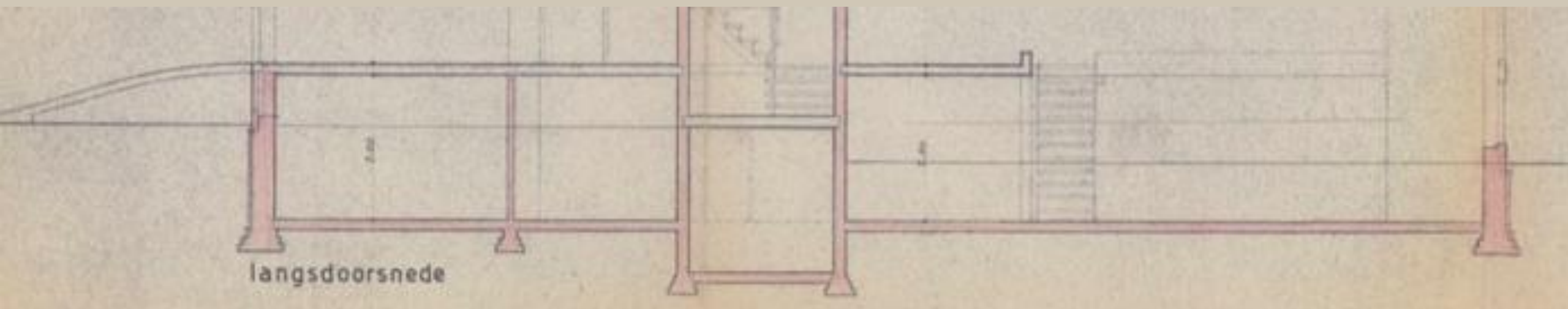
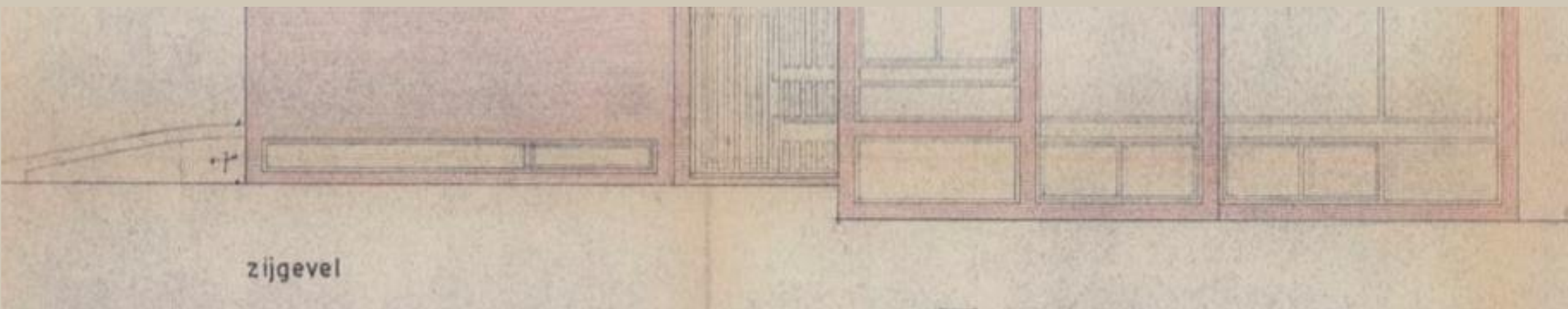
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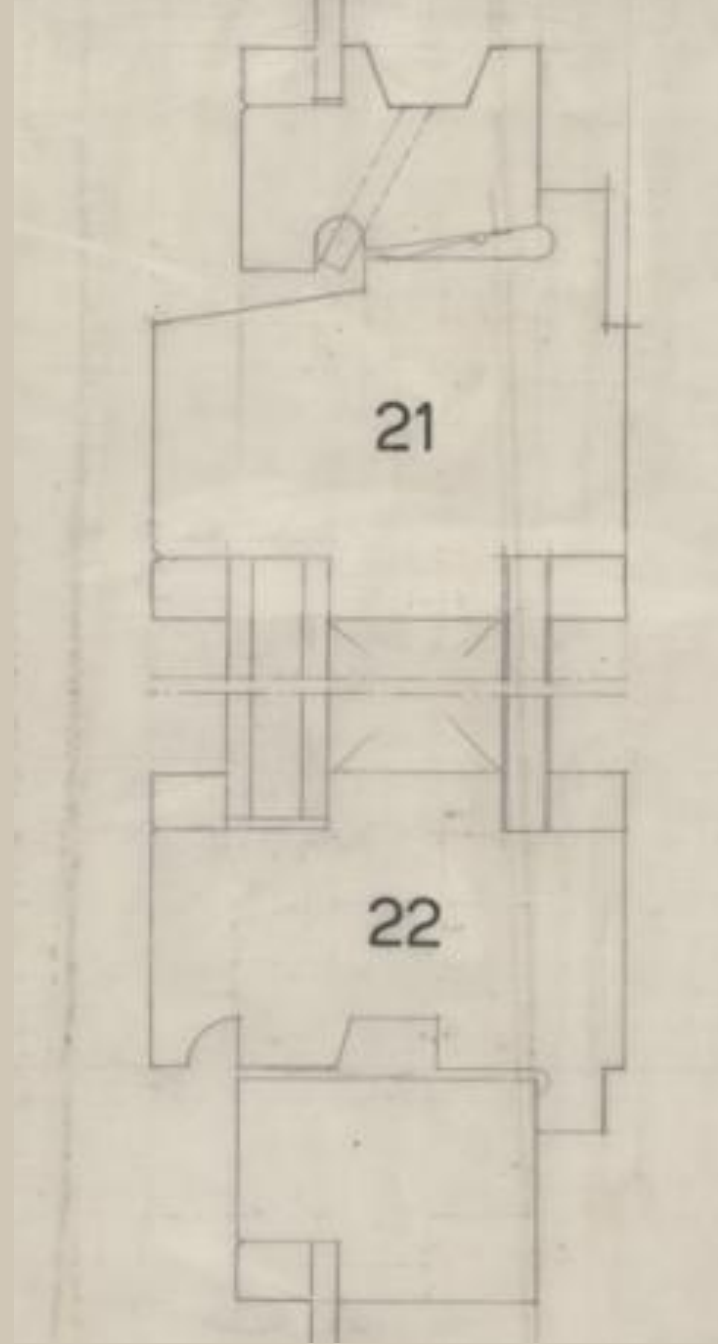
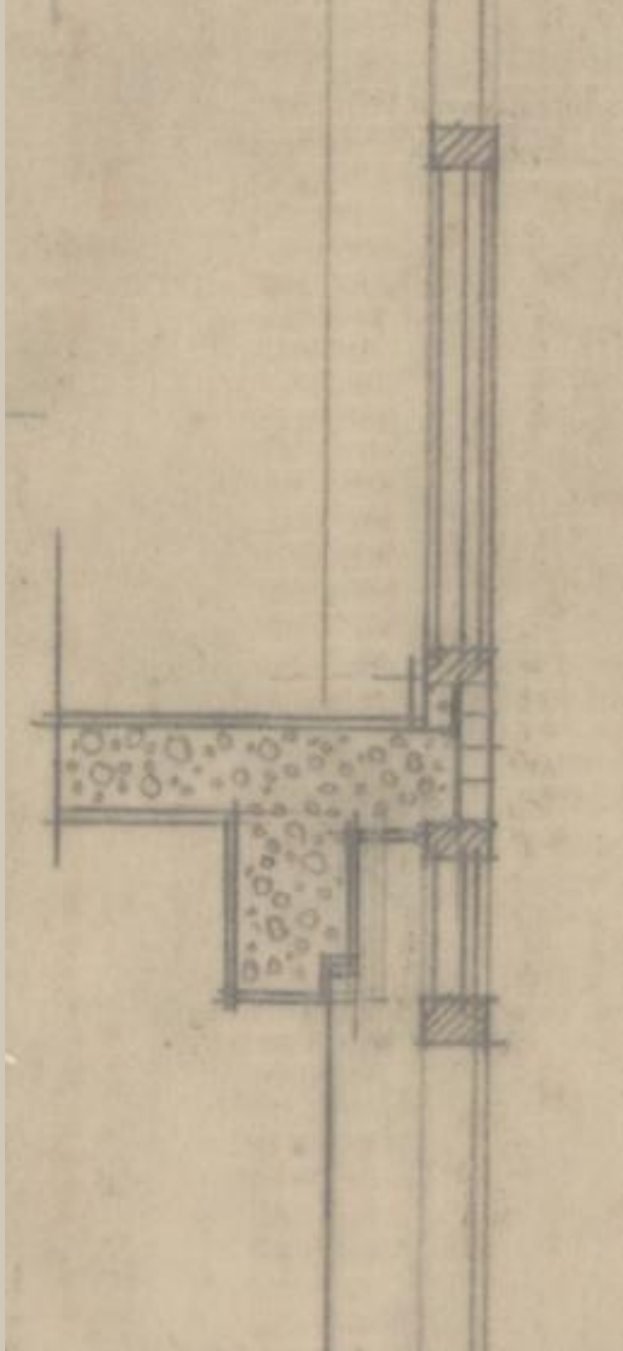
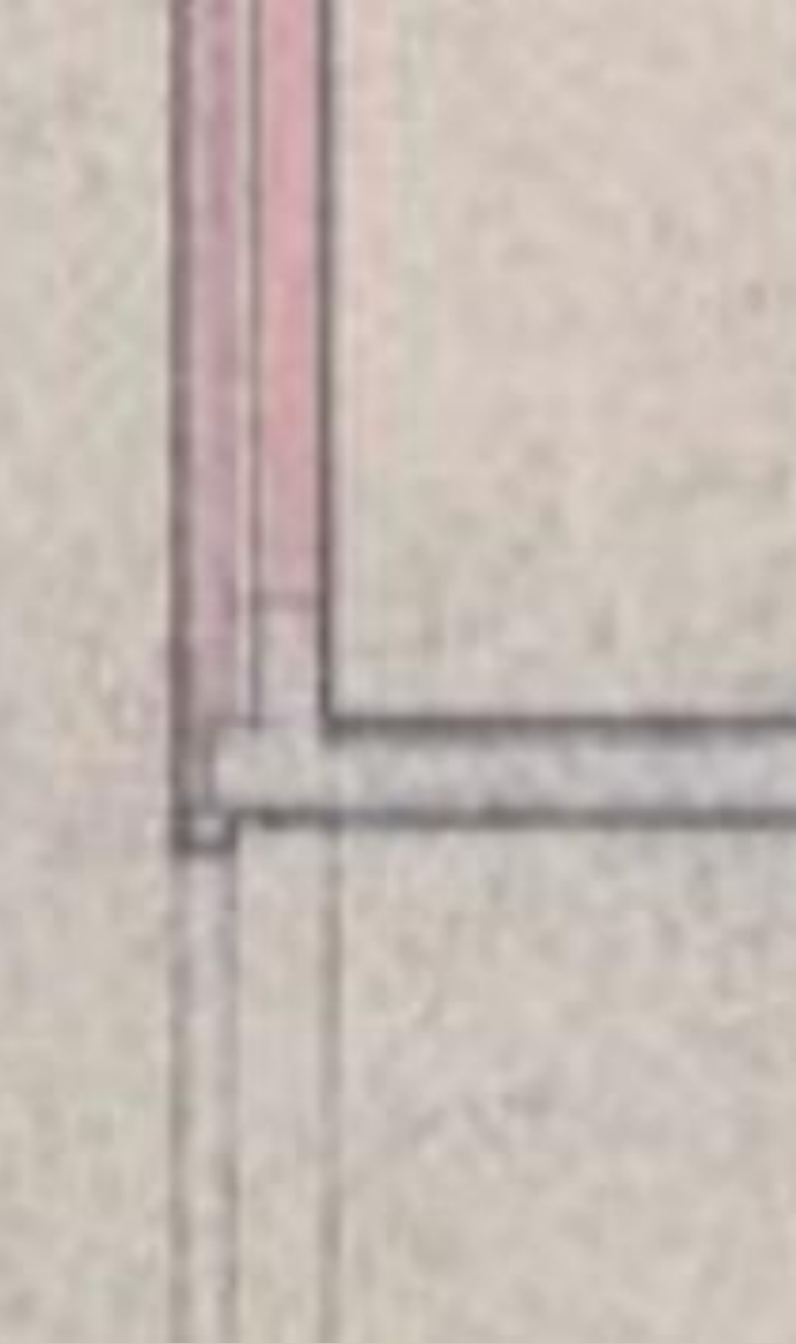
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100	braem manageliet	
3	bouwheer: renaat braem, jozef verbovenlei 102 deurne	
	arch. renaat braem, p.r.a. 286 t. 39.68.09	
27-9-55	wijziging gevels	<i>Renat Braem</i>



















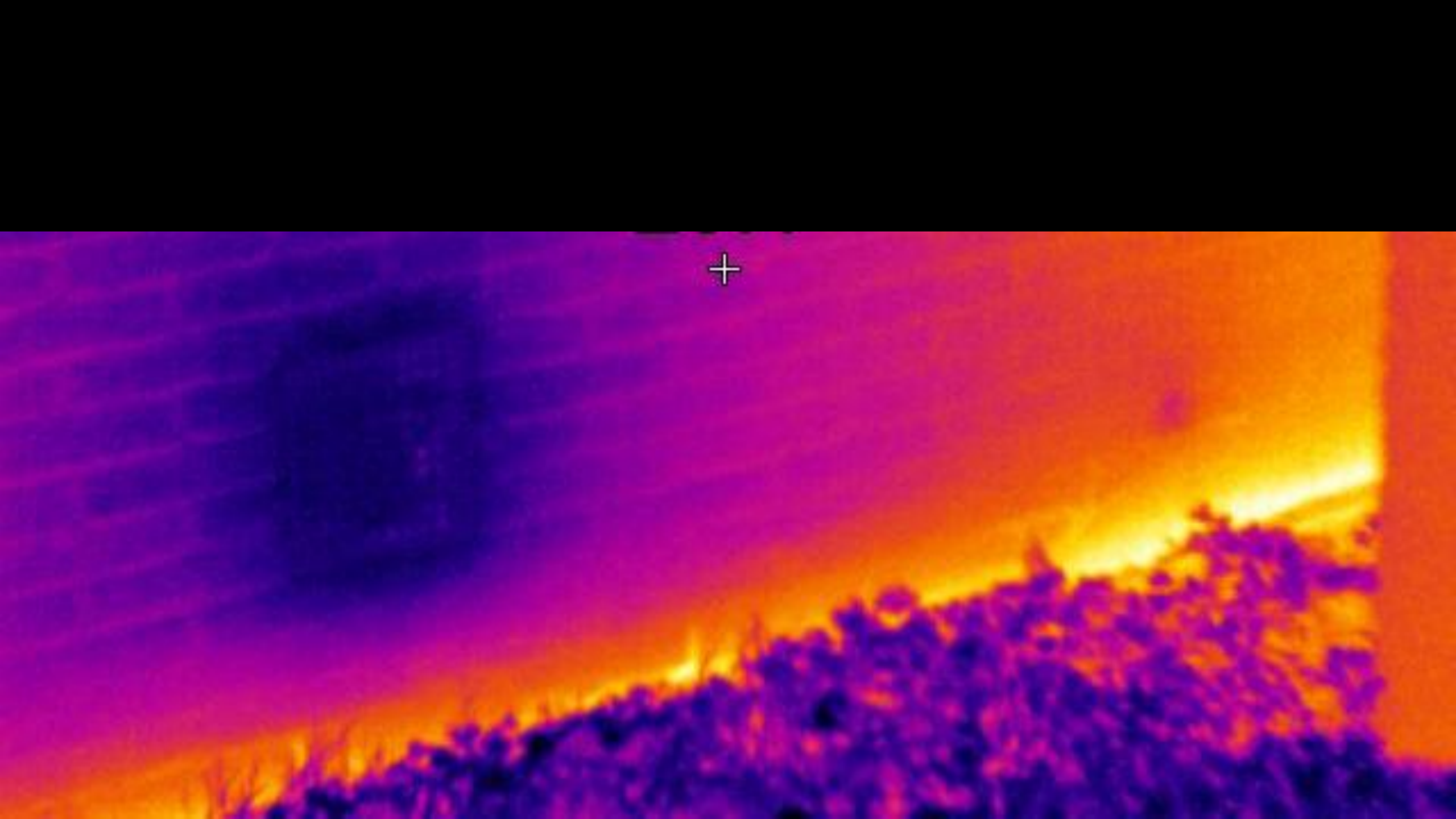


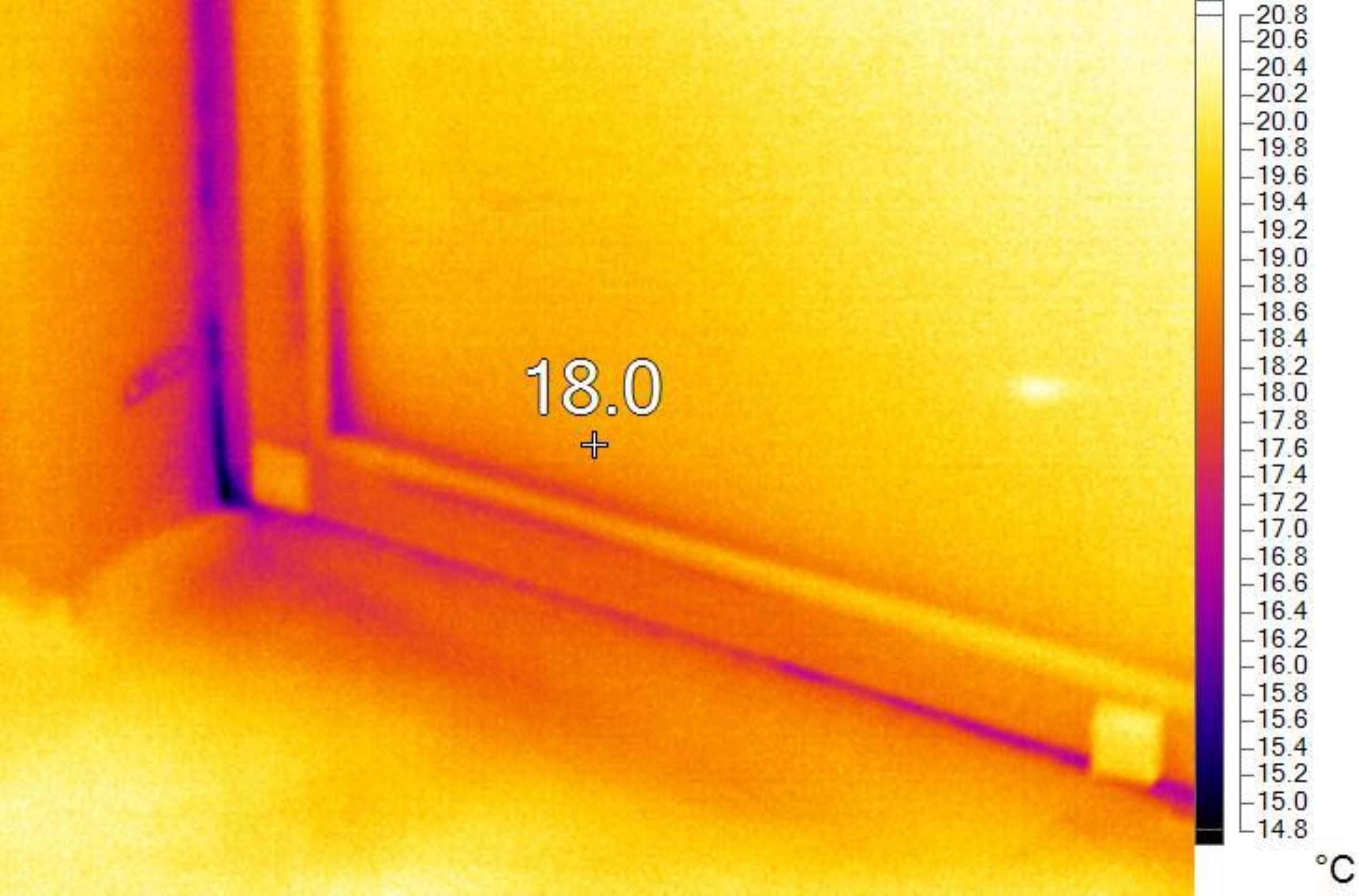


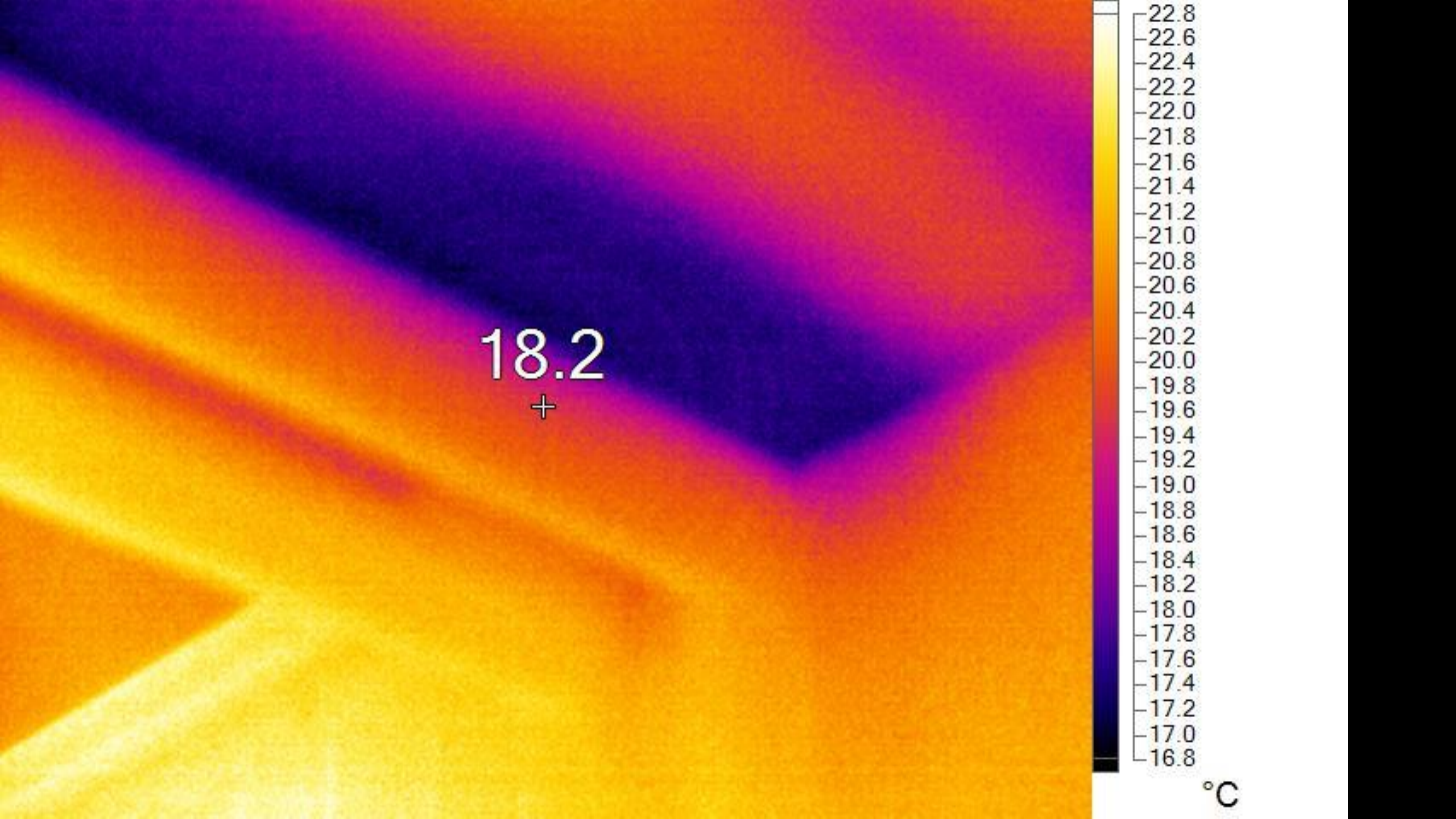




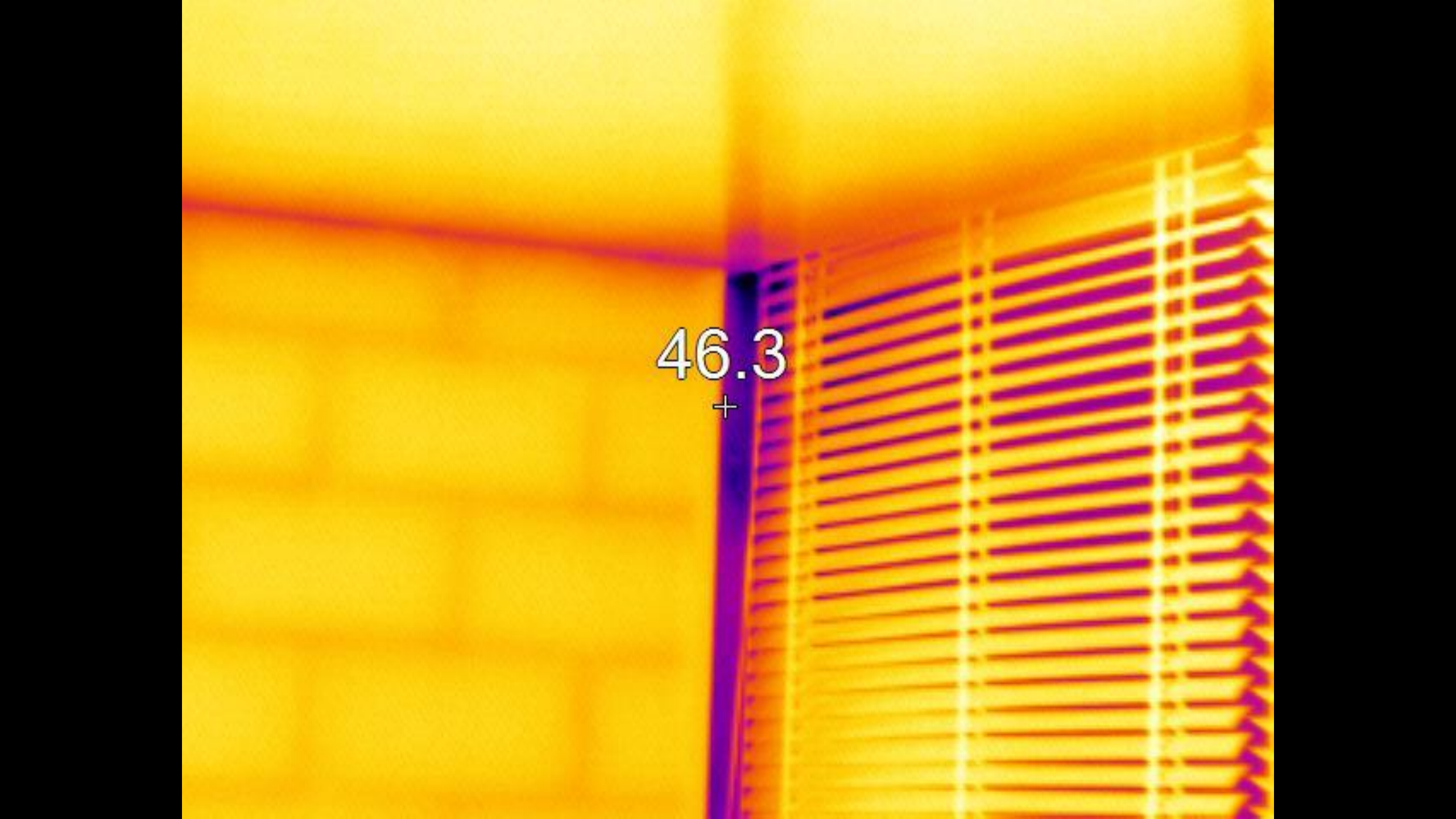








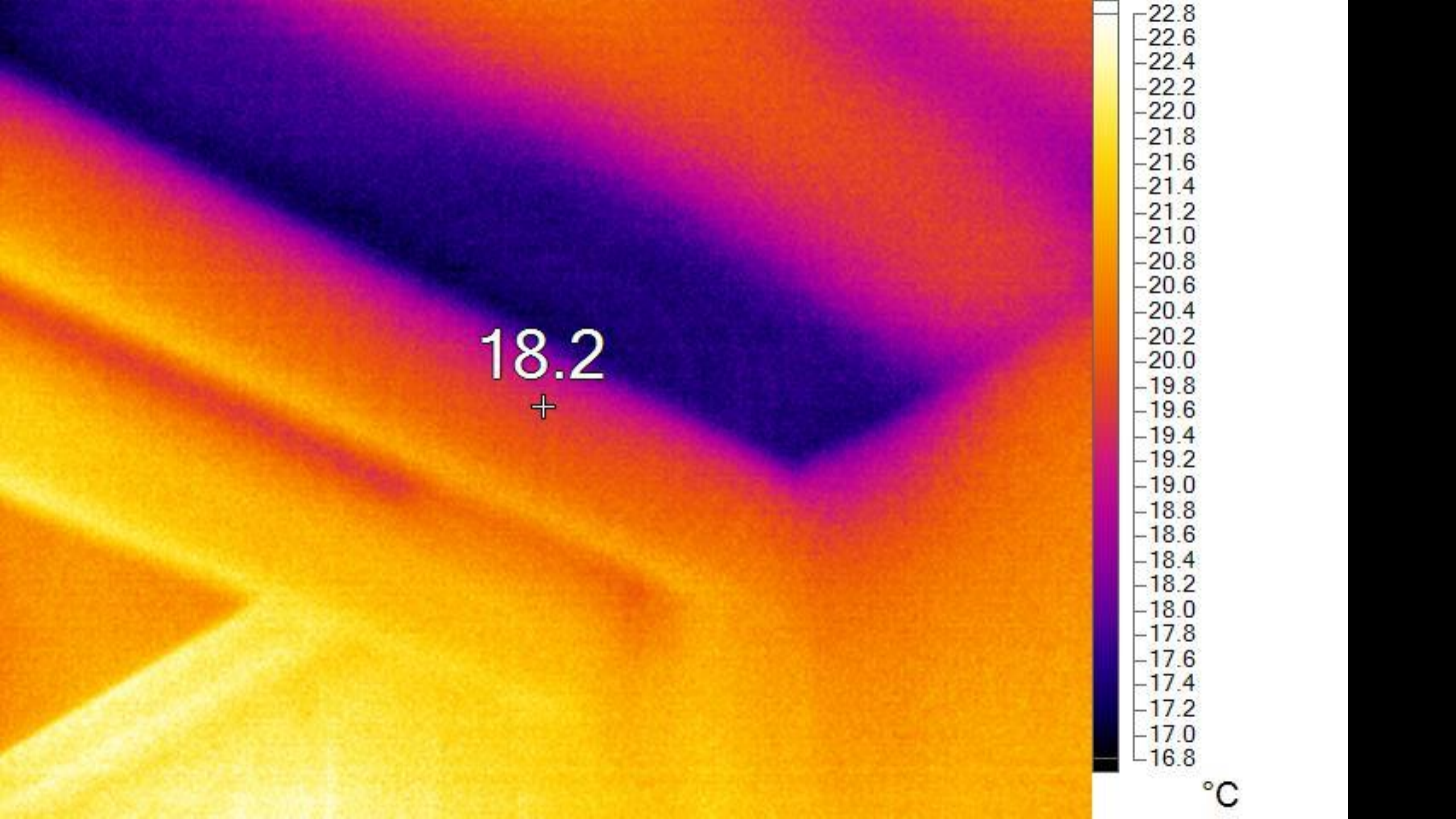


A thermal image showing a building's exterior wall and a window. The wall is a uniform yellow-orange color, indicating a moderate temperature. The window is a dark, vertical rectangular area. To the right of the window is a large, multi-paned glass structure, possibly a sunroom or a large window, which shows a grid of horizontal and vertical lines. The temperature reading '46.3' is displayed in white text, with a small white crosshair symbol below it, positioned over the dark window area.

46.3
+











fit for 2050		cultural value energy environment		
air-to-air heat pump	dismissed	-	-	-
DHW heat pump	possible	+	+	+/-
air-to-water heat pump (building-related)	dismissed	-	+/-	-
air-to-water split heat pump (plot)	possible	+	+/-	-
air-to-water heat pump (building-related,	dismissed	-	+/-	+/-
air-to-water heat pump plot (monoblock)	possible	+	+/-	+/-
geothermal heat pump (vertical)	preference	+	+	+/-
geothermal heat pump (horizontal)	preference	+	+	+/-
thermal solar system	preference	+/-	+	+
electric solar system (PV)	preference	+/-	+	+
district heating network	preference	+	+/-	+
interim solutions		cultural value energy environment		
biomass boiler	dismissed	+/-	+/-	-
hybrid heat pump	dismissed	-	+/-	-
condensing gas boiler	possible	-	-	+/-

ep 1: assessment framework

Literature

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Filip DESCAMPS

Bestuurder

Telefoon: 016 35 32 77

Email: info@daidalospeutz.be

Daidalos Peutz bouwfysisch ingenieursbureau bv

www.daidalospeutz.be