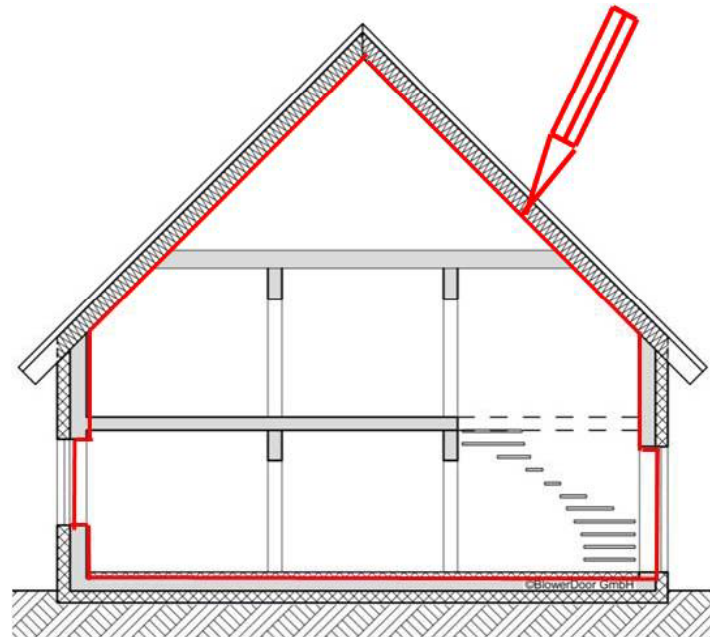


The way to good air tightness: The air barrier design



„ A house is built by wisdom and preserved by reason.“

Advantages of airtight construction

- Ensuring energy efficiency
- Protection against convectively caused structural damage
- Improvement of sound insulation
- Prerequisite for proper functioning of ventilation systems
- Ensuring good indoor air quality
- Functioning smoke and fire protection
- Increased living comfort by avoiding draughts



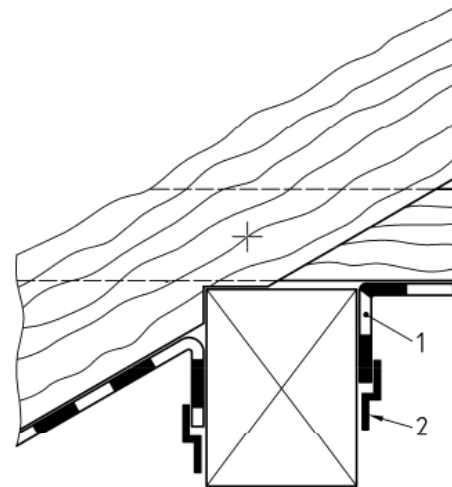
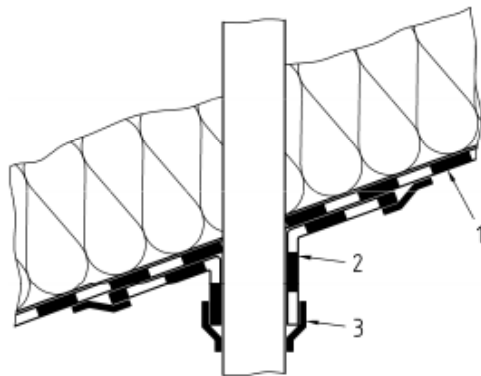
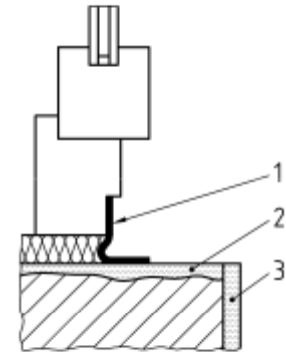
Source: Rabenau / Hannoversche Allgemeine Zeitung

If you know how to do – it is easy



For examples shows the German standard DIN 4108-7 the design of important details as

- demands
- materials
- design
- example details



Legend

- 1 air barrier membrane
- 2 single-sided tape

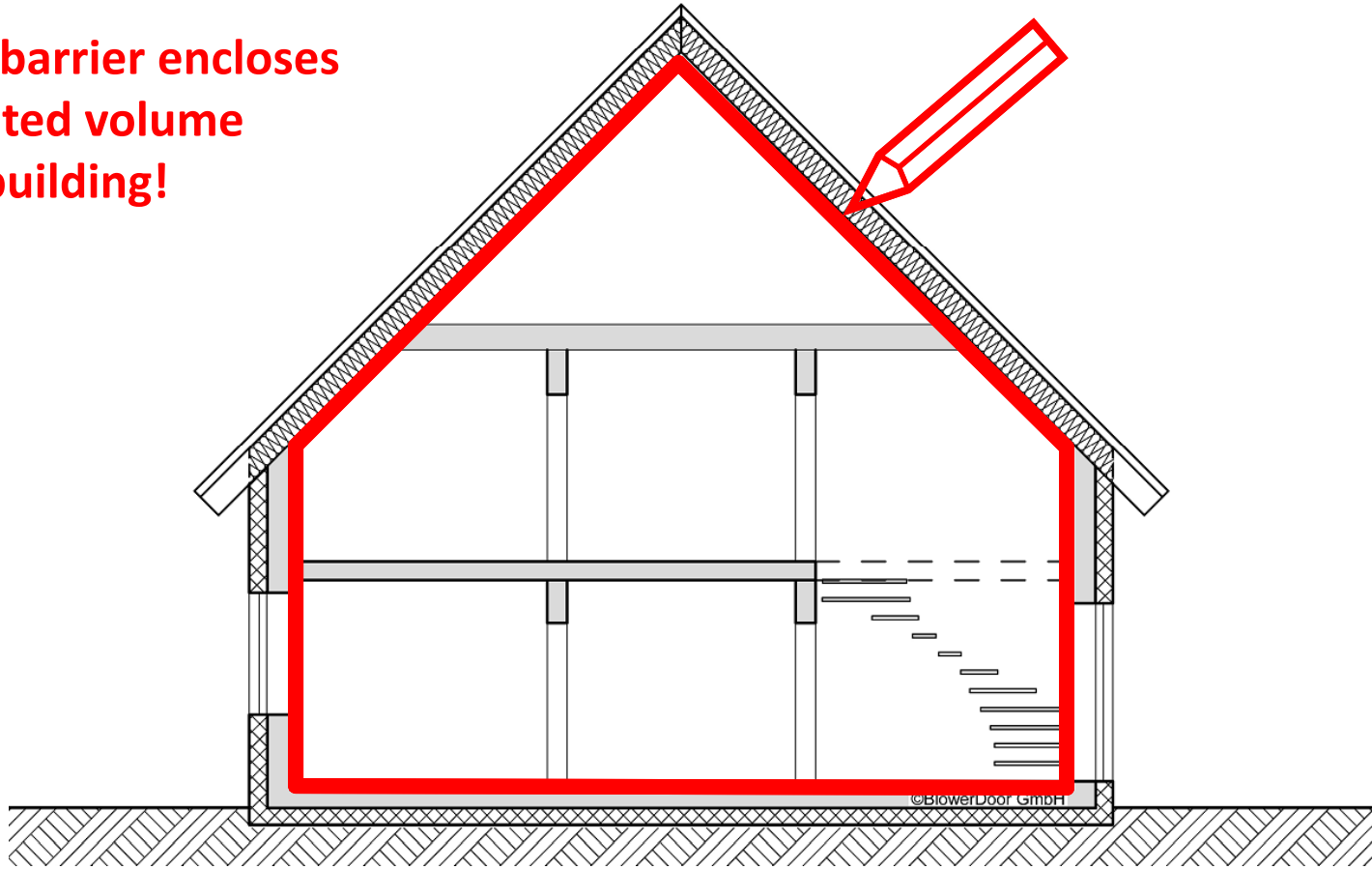
Example for connecting the air barrier membranes to a purlin/roof beam.

Preparation of the air barrier design

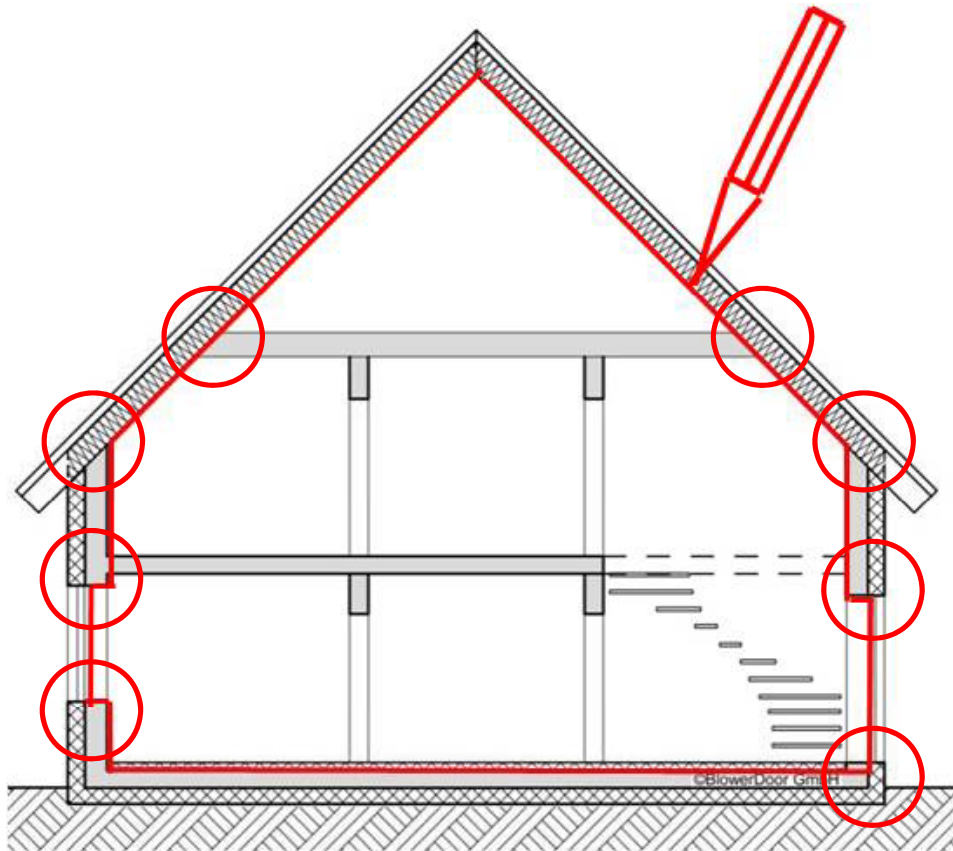
- **Planning the air barrier**
 - Planning rough concept
 - Establishing a detailed plan of the air barrier
- **Request for quotation and commissioning**
- **Interdisciplinary coordination meeting**
- **Monitoring the execution**


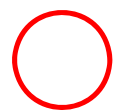
Rough planning: Drawing red line in plans

The air barrier encloses the heated volume of the building!



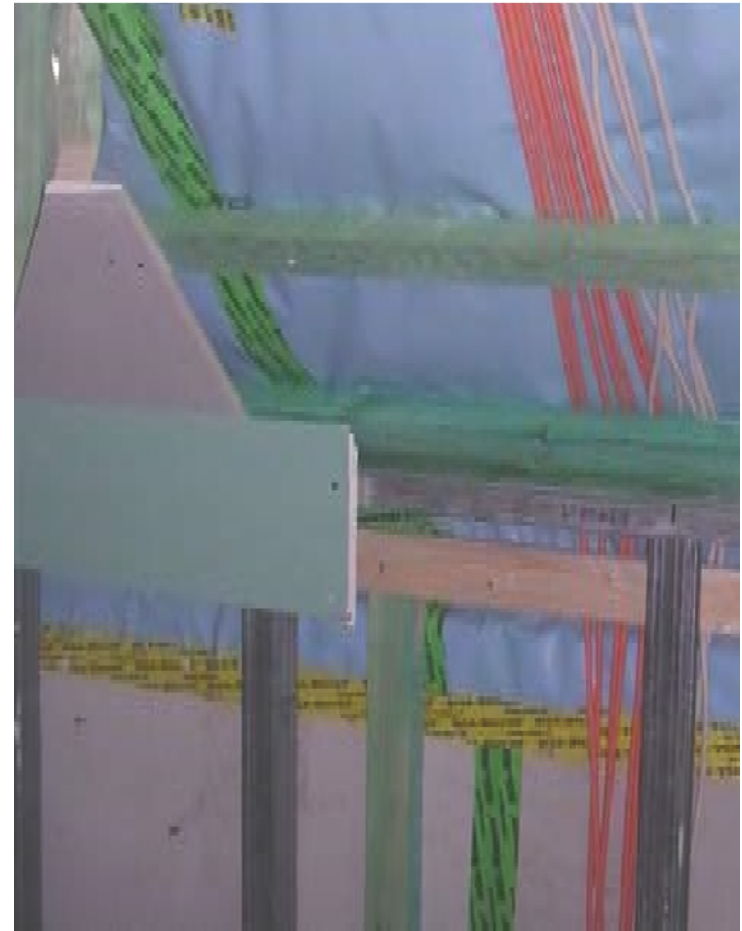
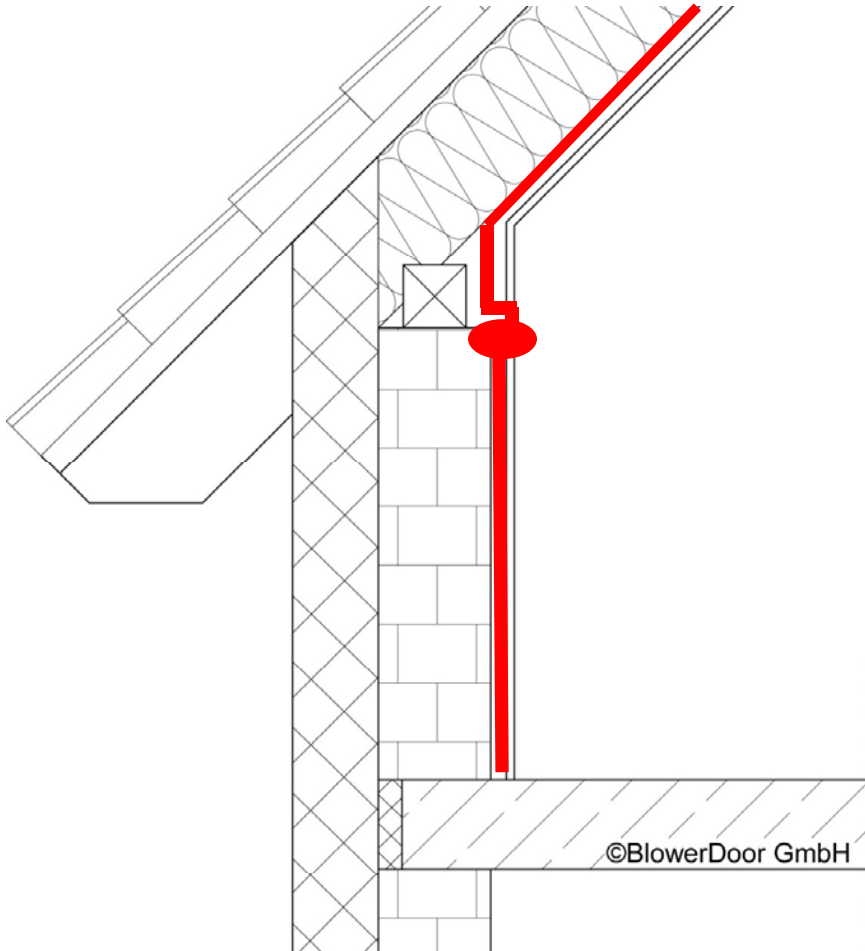
Localization of relevant details



-  **air barrier**
-  **detailed planning necessary**



Detailed planning: Component transitions / material changes



Detailed planning: Cable and Pipe lead-through

Product examples for airtight lead-throughs



Source: proclima, Kaiser, Eisedicht

Detailed planning: Building equipment



Closed kitchen hood outlet



Kitchen hood in operation



Heating boilers and Chimneys should always be planned independent of room air.

Source: Company "Naber", Nordhorn, Germany

Detailed database of the FLiB*

*) Fachverband für Luftdichtheit im Bauwesen;
Association of Airtightness in Architecture, Germany

<https://www.luftdicht.info/grobkonzept.php>

The screenshot shows the website interface with a navigation menu on the left and a main content area. The menu includes: Mauerwerksbau, Dach, Traufe, Mittelpfette, First, Ortgang, Bodeneinschubtreppe, Dachflächenfenster, Decke, Fenster, Wände, Durchdringungen, and Allgemeine Hinweise. The main content area displays a technical diagram of a roof cross-section with the following text:

- Aufsparrendämmung, durchlaufende Sparren, mit Stellbrett
- Aufsparrendämmung, durchlaufende Sparren, Gefache ausgemauert
- Aufsparrendämmung mit Stichsparren
- Zwischensparrendämmung

The diagram is labeled 'Aufsparrendämmung, durchlaufende Sparren, mit Stellbrett' and shows a cross-section of a roof with rafters, insulation, and a red air sealing line. A legend below the diagram lists: 1 Luftdichtheitsbahn, 2 Klebeband, Klebmasse, ggf. Anpresslatte.

The technical drawing is titled 'FLiB-Prinzipdetail 1_1_3_3 Dach' and shows a cross-section of a roof with rafters and insulation. A red line indicates the air sealing path. A red box highlights: 'Musterdetail aus FLiB Detaildatenbank: http://luftdicht.info/detaildatenbank'. The drawing is labeled 'Aufliegende Kehlbalkendecke'.

Notwendige Materialien

- 1 Luftdichtheitsbahn
- 2 Klebeband, Klebmasse, ggf. Anpresslatte

Notwendige Ausführung

- Die Luftdichtheitsbahn wird unterseits der Dämmung verlegt.
- Die Luftdichtheitsbahn wird an die Pfette angeschlossen. Alternativ kann die Pfette umschlauft werden.
- Wird die Luftdichtheitsbahn an die Pfette angeschlossen sind Fisse der Pfette zu schließen.
- ACHTUNG:** Die Anbindung der Luftdichtheitsbahn um die Pfette an die Giebelwand bedarf einer sorgfältigen Planung.

Hinweise

- Bei dem Einsatz von Bodenlücken siehe Detail Bodenlücke.
- Der unbeheizte Spitzboden muss ausreichend belüftet werden.
- ACHTUNG:** Ein alleiniges Anputzen der Pfette im Giebelbereich stellt keine dauerhafte Lösung dar!

Allgemeine Verarbeitungshinweise beachten

ACHTUNG: Diese Prinzipskizze muss auf die jeweilige projektbezogene Eignung überprüft werden!

Quelle: Fachverband Luftdichtheit im Bauwesen e. V. • Kalkulstraße 2-4 • 12489 Berlin • info@flib.de • www.flib.de • www.luftdicht.info

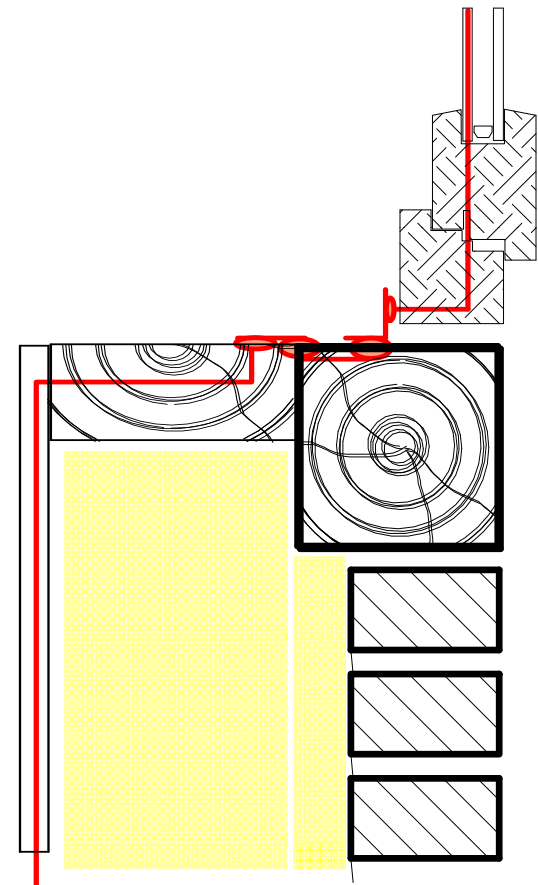
Detailed planning: Example of refurbishment



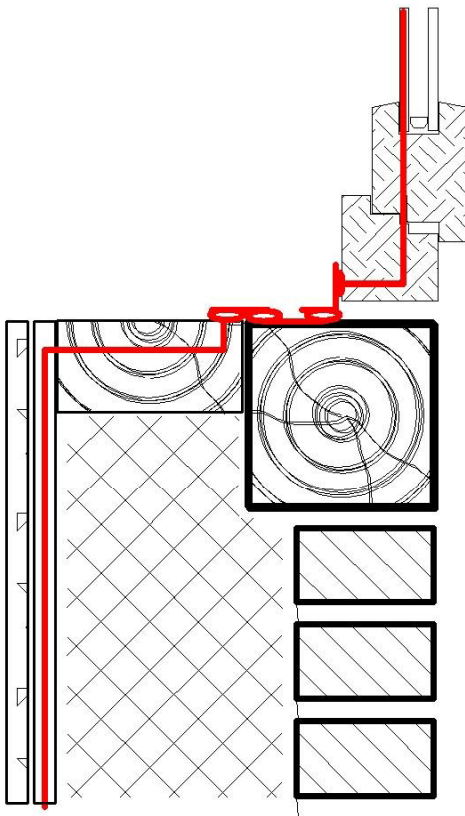
Remediation measures:
New windows and
insulation

Requirements for the air barrier design

- Detailed drawings
- Materials to be used
- Special instructions for execution
- Name the persons responsible



Quality control during the construction phase

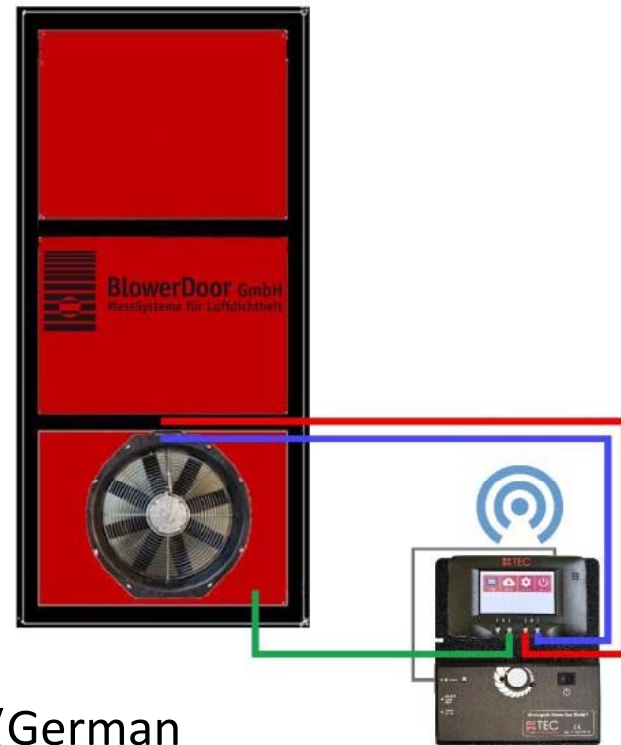


“Planning without control is pointless, control without planning impossible.”
(Jürgen Wild)

Quality control during the construction phase



Leakage detection with thermal anemometer



- Quality inspection recommended by KfW (German state-owned development bank)
- Low-cost and reliable proof of quality for building owners
- Acceptance serves to secure the contractor.

Quality control and BlowerDoor final measurement



Visual inspection



Monitoring during
construction process:
BlowerDoor test at
depressurization



BlowerDoor final
measurement
according to ISO 9972
or DIN EN 13829

Literature and Links (in German language)

- Guideline for air barrier concept (May 2019)
- FLiB Air Barrier Concept (Juli 2019)
with examples
→ <https://www.flib.de/publikationen.php>
(from: Fachverband für Luftdichtheit im Bauwesen (FLiB e. V.) ; Association of Airtightness in Architecture, Germany)
- Information about a good air barrier design
→ <https://www.luftdicht.info/>

Ask the BlowerDoor Team
for a brochure for no charge
E-Mail our colleague Alexancer:
kiss@blowerdoor.de