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DETAIL

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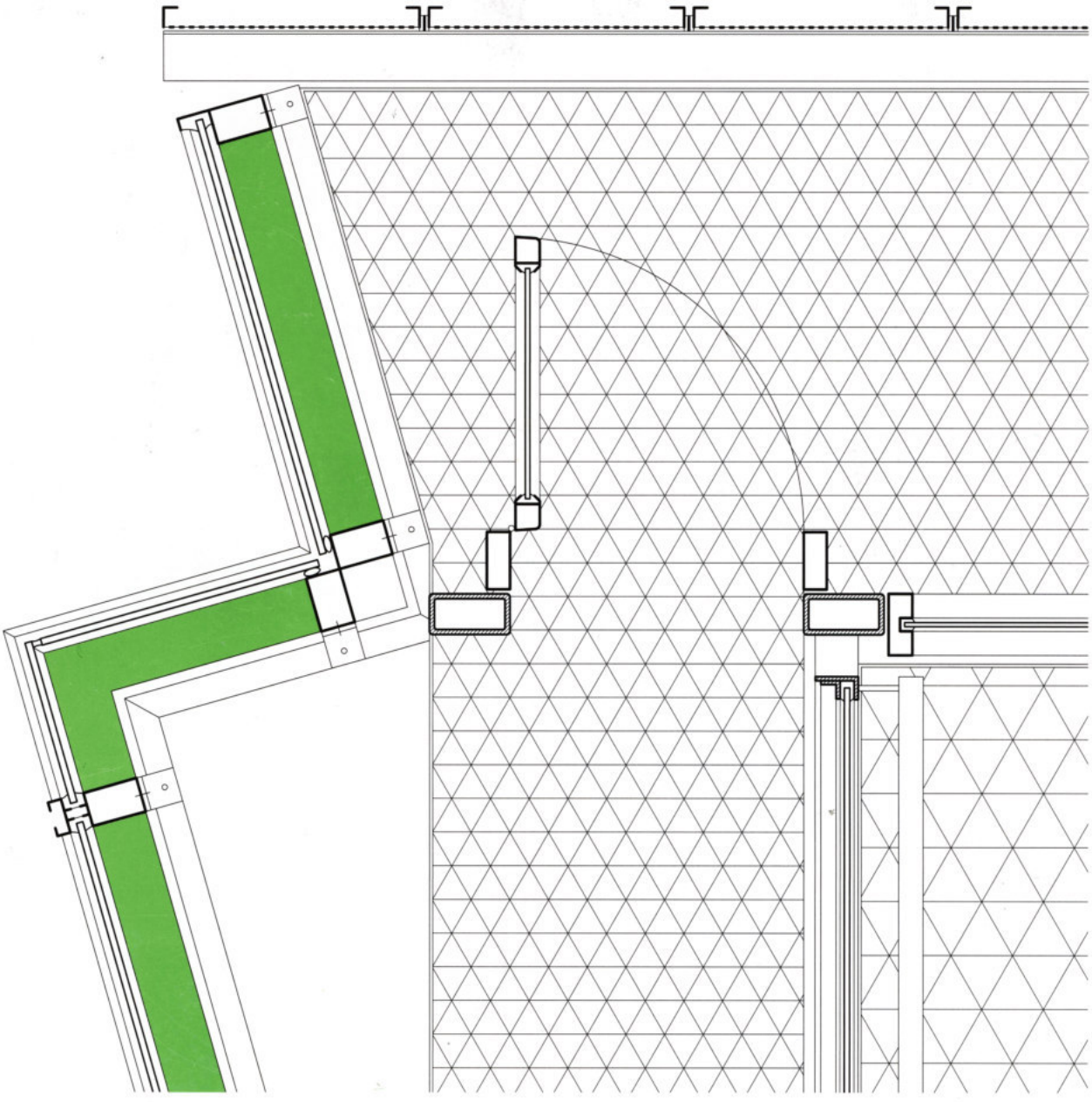
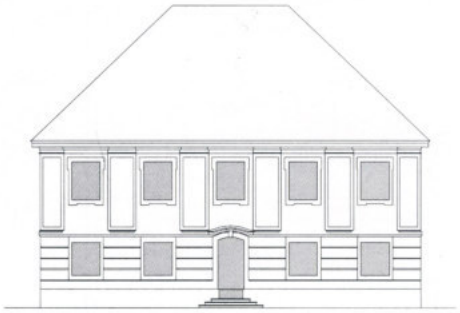


Parish in Ampermoching

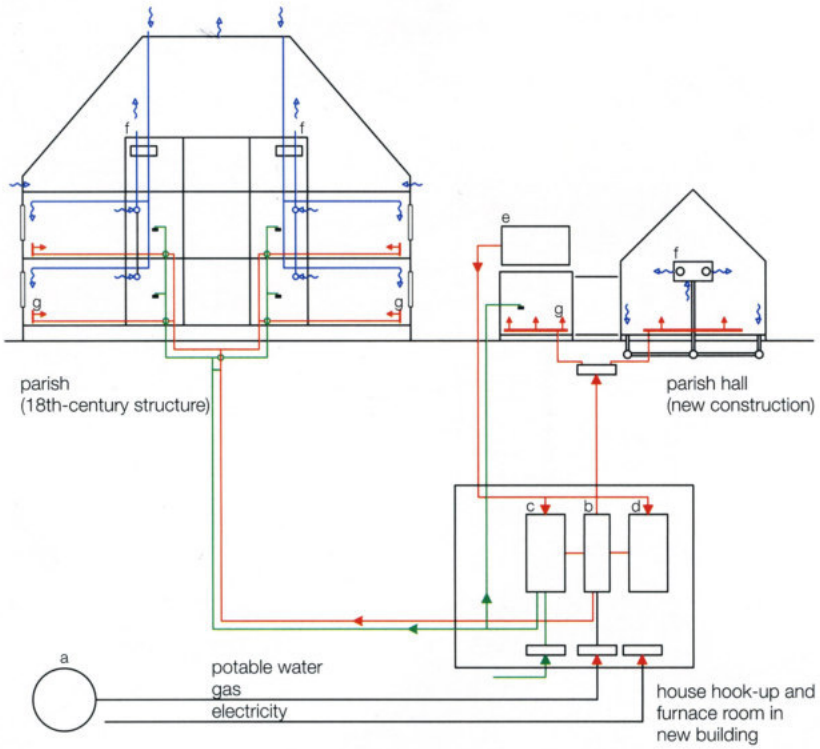
Architects:
Clemens Richarz and Thomas Strunz,
Munich
Structural engineers:
Friedrich Hamp, Munich
Others involved in the project: see page 104

Today the parish, designed in 1724 by the baroque master-builder Johann Baptist Gunetzrhainer, is part of a parish centre, which includes, next to the existing village church, a parish hall completed in 2000. During this new construction, the eighteenth-century parish was also refurbished and returned to its original baroque form.
The existing decrepit roof framing was dismantled; in its place the hip roof Gunetzrhainer had originally foreseen (see the intended design, dated 1724) was erected. In addition the baroque spatial structure and the corresponding facade geometry were reinstated. The entire floor-plan organisation has been generated based on a precise geometric structure. On the ground storey are the parish office and group rooms, on the upper storey apartments. The attic was not fitted out during this phase, and is used as storeroom. The design of the new roof framing was developed, however, with upgrade to this effect in mind.
The refurbishment was two-pronged: the measures were active and passive. The latter were directed at the building envelope. The 40–60 cm thick masonry construction was intact and structurally sound, capable of supporting the loads from the new free-span roof framing. Only a small number of rafters had to be replaced, and a ring armature was erected in concrete. The building possessed no insulation whatsoever; some of the windows were equipped with single-pane glass, others were double-glazed. A precise architectural survey determined that the exterior walls were approximately 6–8 cm out of plumb. The irregularities in the exterior wall were evened out with a 6–14 cm thick thermal-insulation rendering, applied in a number of coats. However, with this process a uniform interior wall surface temperature is not attained, a condition which could, at increased humidity, result in fungus problems, particularly at the geometric thermal bridges. The controlled ventilation in the spaces where people spend longer periods of time (see next paragraph)

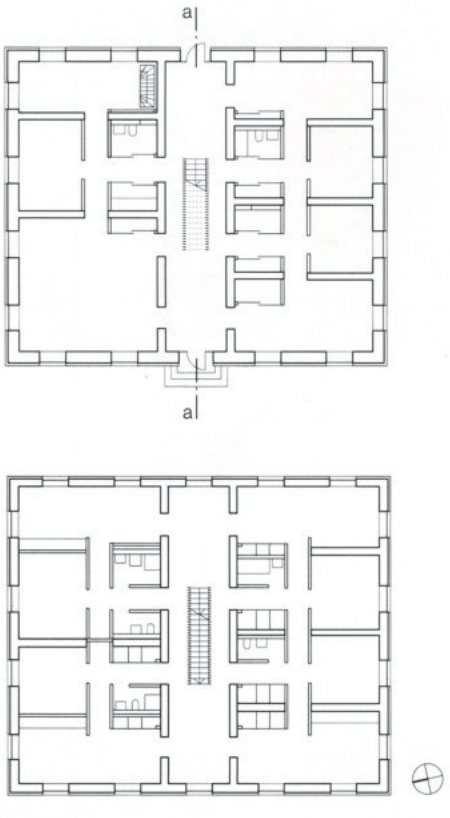


does its part: the consistent air exchange maintains a relative humidity so low, that building components with low surface temperatures are not vulnerable. The upper side of the floor on the ground story was furnished with thermal insulation, the unheated attic's ceiling deck is now insulated between the rafters and in the floor assembly in the attic. All windows were replaced and furnished with wooden interior folding shutters, which serve to darken the room as needed, and provide additional thermal protection at night.

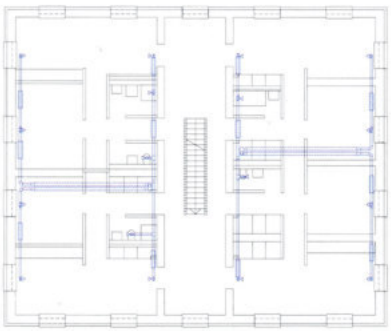
Prior to the refurbishment the parish was heated with oil central heating, which was located on the ground storey. The heating system in the new parish hall also supplies the renovated parish. The condensing boiler, operated on liquefied petroleum gas (LPG), receives additional heat from solar collectors for the hot-water supply as well as for heating water to be piped through the radiators. To limit ventilation heat loss and to ensure hygienic air quality, controlled ventilation with heat recovery is employed. The active measures pertained to the buildings' climate control systems. The supply air is drawn at the roof's ridge, while the exhaust air flows first into the attic and subsequently, propelled by the attic space's natural ventilation, makes its way to the exterior. The warm exhaust air causes a perceptible rise in temperature in the attic, which then reduces the thermal losses attributable to the system boundary at of the upper storey's ceiling deck. For this building the energy-conservation-ordinance verification required in Germany can only be attained by applying the laborious overall energy-balance evaluation, because the individual building components (opaque exterior wall surfaces) do not meet minimal requirments. In the overall energy-balance evaluation the minimum standard for the primary energy load Qp and for the heat loss due to transmission HT' of the envelope may each be exceeded by 40 %, when the measures were taken to augment an existing building.



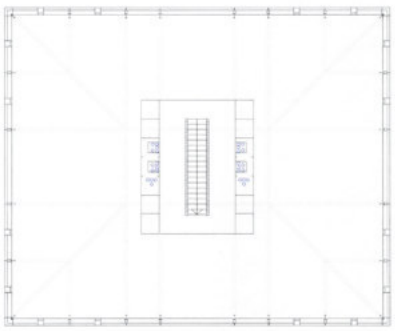
System diagram
a LPG tank
b condensing boiler
c service-water tank
d buffer tank
e solar collectors
f ventilation with heat recovery
g heat transfer



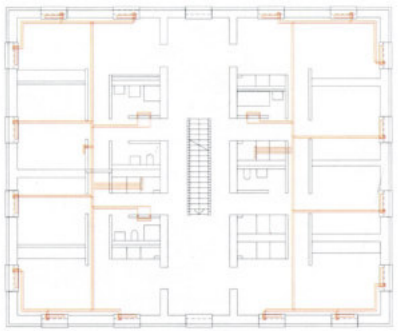
Layout plans
Elevation (1724)
scale 1:400



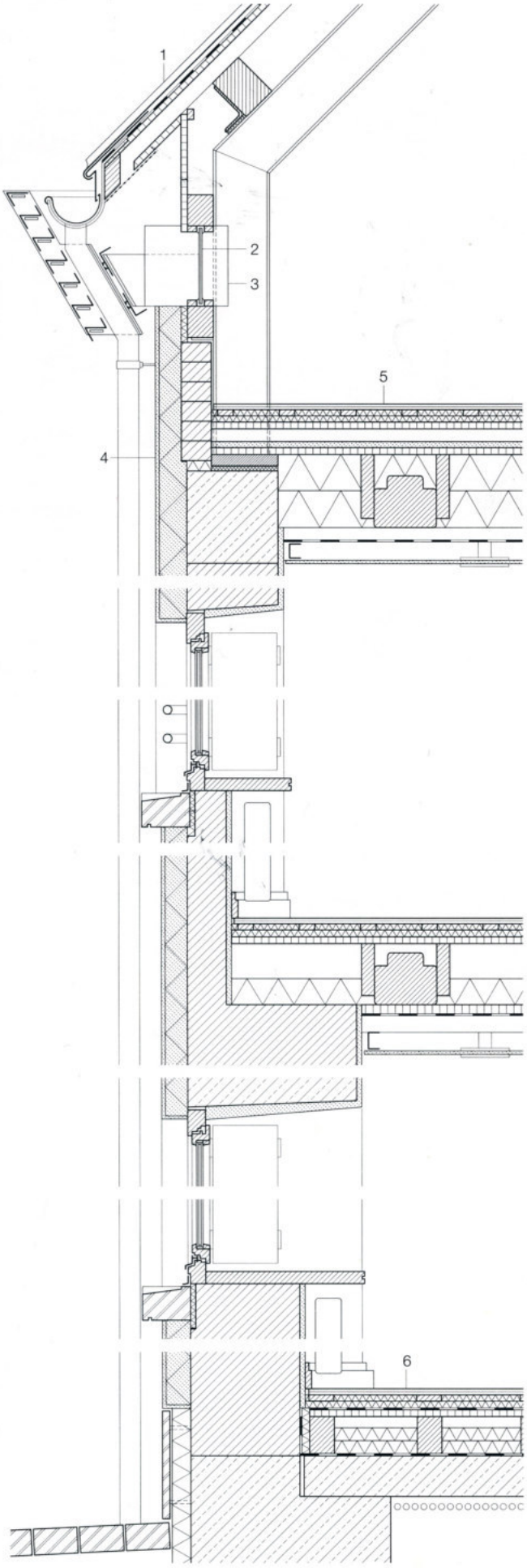
Ventilation system on the upper floor (ground floor analogous): from the perspective of ventilation technology, the floor plan is organised in four parts, each corresponding to one device. Due to the individual connection to the four groups of rooms, the sound transmission between the areas is reduced substantially. The supply-air ducts are located in the suspended ceiling, the air vents are situated above the windows. The air is removed via the washrooms at the building's core, so that air flows optimally through the rooms.

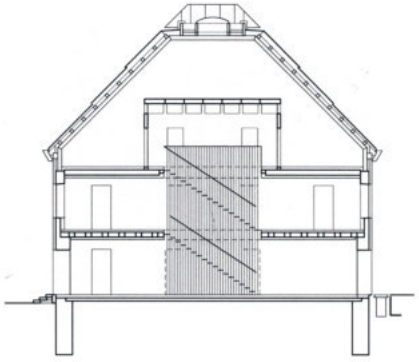


Ventilation equipment in the attic. The individual devices are accommodated in two closet walls, which make up the upper boundary of the stairwell to the attic. Thus, dividing the attic space at a later point in time is feasible, also with respect to ventilation systems.



Heat distribution and transfer. The heat emission ensues via heat-pipe radiators, which were located under the respective windows. Because the heating elements all have the same dimensions, the flow temperature is determined by the room with the largest heat load. As a result of the consistent arrangement of the windows, the aperture size corresponds proportionally to the room size, so that the solution selected is in accordance with the formal requirements and attuned to the heating system.





Section scale 1:400
Detail section scale 1:20

1 0.7 mm titanium-zinc preweathered separating layer, 24 mm boarding
60/80 mm battens
100/160 mm rafters
IPE 220 steel beam
2 10 mm acrylic glass
3 200/200 mm plywood ventilation encasement
4 wall construction
60–140 mm thermal-insulation rendering
400–600 mm brick masonry construction
30 mm calcinated gypsum plaster
5 20 mm larch planks, mineral wool between 20 mm wood bearers
22/20 mm impact-sound insulation mineral wool
22 mm particle board
40 mm battens
2× 10 mm two-ply fire-protection boards
22 mm boarding
240 mm ceiling beam with laterally mounted boards for levelling mineral wool between
40/60 mm battens, vapour retarder
60/80 mm channel
15 mm plasterboard
6 20 mm larch planks
mineral wool between
20 mm bearing members
22/20 mm impact-sound insulation, mineral wool, vapour retarder
22 mm particle board
80 mm mineral wool between
120/80 mm squared timbers
bituminous sealing layer
120 mm floor slab