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Constructive development of the Leiden house in the 13th and 14th centuries

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Introduction

Leiden, in the province of Zuid Holland in the western part of the Netherlands, grew from a village to a city in around 1200, confirmed by city rights granted, in all likelihood, by Dutch Count William I (1203–1222) between 1213 and 1217 [1], [2]. The settlement changed dramatically from a village with a more agricultural character to a fledgling market town [3]. In the 14th century and 15th century Leiden even developed into the largest city in the county of Holland. Knowledge of building in Leiden's past has grown enormously in recent decades through the systematic application of building archaeological research by the city of Leiden's building archaeological researchers. The work of researchers in Leiden covers the whole spectrum from survey and value assessment to documentation including the application of invasive methods, such as stratigraphic or dendrochronological research [4], [5]. Due to this research, much more is now known about how the city was built up [6], [7]. Leiden is fortunate in that many historic buildings have survived because the city has never been hit by devastation from a city fire or other catastrophes. The research has made it clear that the richly variegated and layered buildings are an unprecedented source of knowledge about building in the past. In recent years, the physical remains, and sometimes entire edifices, of nearly 150 structures from the 13th and 14th centuries have been rediscovered (Fig. 1). By combining archival data with archaeological and building archaeological sources, an increasingly clear picture of the development of Leiden is gradually emerging. In this period an interesting evolution takes place from a settlement dominated by wooden buildings to an urban living environment with structures in stone. The constructive development of these houses and its influences are the subject of this article.

State of research

Dutch house research has been dominated by a typological and material-constructional approach since the 1960s [8, pp. 12–17], [9]. The foundation for this was laid in two publications, *Middeleeuwse stenen huizen te Utrecht* (1963) by C.L Temmink Groll and *Het Nederlandse woonhuis van 1300–1800* (1969) by R. Meischke and H.J. Zantkuijl [10], [11]. The latter outlines two parallel developments; wooden
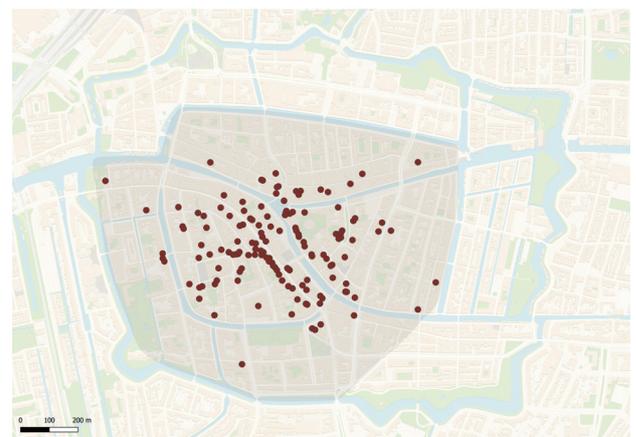

Fig. 1. Medieval Leiden (highlighted in gray) with locations of building remains from before approximately 1400 found during building archaeological research (map by P.J. De Vos, ELO)

Il. 1. Średniowieczna Lejda (obszar oznaczony na szaro) z lokalizacją pozostałości budynków sprzed 1400 r. odnalezionych podczas badań architektonicznych (rys. P.J. De Vos, ELO)

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houses with self-supporting timber frames that gradually evolved into houses with walls of brick and stone, houses in which a load-bearing timber frame was applied due to thinner walls [11, p. 115]. Meischke and Zantkuijl further developed their first 1969 overview study into the four-volume series entitled *Huizen in Nederland*, which appeared between 1993 and 2000 [12]–[15]. In this series, the Netherlands is divided into three global regions with different constructive development as a result of the difference in subsoil, i.e. peat, clay and sand. The regions defined are roughly the provinces of Noord Holland and Friesland in the northwest, Zuid Holland and Zeeland in the southwest, and Utrecht and Noord Brabant and the eastern provinces, but this schematic division does not indicate sharp boundaries. Since then, as a result of decentralisation, building archaeological research has intensified at a local level, though mainly for heritage purposes, but this has not led to an updated overview study. A recent attempt to synthesise is in Vernacular Architecture (2017) which presents a survey of the construction and geographical distribution of timber-framed town houses in the Netherlands before 1600 [8]. Several publications on the constructive configuration of medieval houses in Leiden itself have appeared in recent years, of which those in *Dwars door de stad* (2007), in *Hausbau in Holland, Jahrbuch für Hausforschung 61* (2010) and *Fachwerk in Europa, Jahrbuch für Hausforschung 68* (2022) deal with various aspects [6], [7], [16].

The construction of houses in Leiden in the 14th century

In building archaeological research, building constructions are important sources because they change over time in execution and material. Especially the research into the applied bricks and wood constructions has yielded a lot of knowledge about building in Leiden in the past. By means of dendrochronological research – a scientific dating method based on the annual rings of wood – information about the age and origin of wooden elements can be determined [6, pp. 18–20 and 50–54]. The study reveals a relatively clear picture of how Leiden buildings were erected before about 1400 [6], [17]. The preserved examples of many (remnants of) medieval buildings make it clear that they have a distinctive structural design. One of the oldest representative examples is Breestraat 113, dating from 1347 (d, signifies dendrodate) (Fig. 2a)[1]. Behind an older house with thick brick walls stands a rectangular building with basement, two storeys and an attic. The basement has a brick vault construction with a central column. Above that, the construction consists of relatively thin brick walls combined with a timber frame. The roof is a rafter roof supported by trusses, which form a structural whole with the timber frame below. A slightly later example is Pieterskerkhof 40 (Fig. 2b). The building has an older

brick phase to which an extension was added in 1383 (d). This extension has two storeys with relatively thin walls in combination with a timber frame. The attic has a rafter roof supported by a roof construction with trusses, which is again a continuation of the timber frame below. Also Breestraat 123 from 1393 ± 6 years (d), Langebrug 55 from 1400 ± 6 years (d), Nieuwe Rijn 60 from 1404–1416 (d) and Breestraat 95 from 1405–1411 (d) are representative examples of this characteristic structural design (Fig. 2c–4). This design with a load-bearing timber frame combined with thin brick walls is the structural form of medieval houses in Leiden, regardless of the discrepancy between them in shape, size and number of storeys[2]. This constructive concept appears to be rooted in older construction principles and is a regional combination of wood and stone construction.

An older construction principle (up to 1300)

Leiden developed from a more agricultural to an urban settlement in the wave of urbanization in the Western Netherlands in the 12th and especially the 13th century [17, pp. 249–263]. Its location and shape were determined by the course of the Rhine River and an intersection of streets and waterways [18], [19]. Initially, the settlement was characterized by wide and elongated plots with detached buildings, sometimes separated by ditches [20, pp. 322–324, 329 and 335, 336]. Early buildings are only known from archaeological research and the findings indicate buildings in wood or half-timbered work. An excavation at the Aalmarkt from 2007 also provided important insights into early construction in Leiden [20, pp. 162–171 and 321–336]. From layers of accumulation on the embankments of the Rhine that were started shortly before 1200, in itself a clear indication that there was a need for space within the early settlement, it became clear that at the end of the 13th century the basic construction consisted of posts that were anchored in the ground, but that around 1300 this changed to brick foundations with the supporting structure on top. Foundations on piles will also have occurred. From the percentages of loam in the various embankment layers it could be deduced that until the end of the 13th century the buildings will have had mainly wattle and daub walls and thatched roofs, and that from the late 13th century onwards, plank façades will have predominated. Structural elements of wooden or timber framed buildings were also found, both from the 13th and 14th centuries. For the 14th century, remnants of roof and floor tiles could be determined to be indications of stone floors and roofs. The Leiden people apparently first built with locally sourced building materials, for example loam, wood and thatch, but soon had to switch to other building materials due to increasing urbanization, especially from the end of the 13th century. Up to now,

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[1] An even older, similar example was recently found, i.e. Nieuwe Rijn 14 from circa 1335 (d), but this research is ongoing and is not shown here.

[2] Leiden also had many single-story medieval houses, but due to later enlargements, almost all of them, except for the building walls, have been greatly altered and are not shown here as examples.
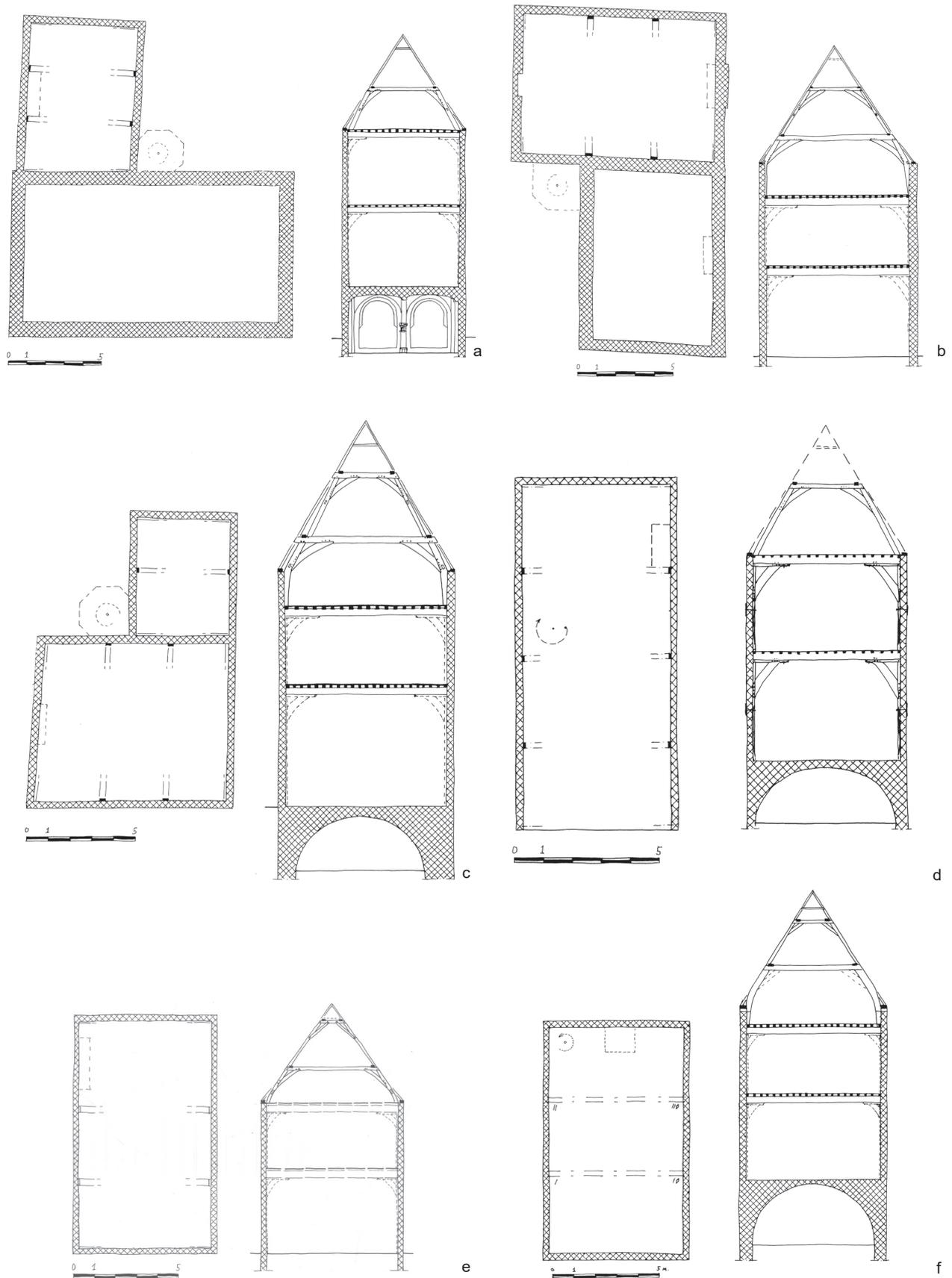
Fig. 2. Leiden, examples of stone houses with timber-frame construction, plan and cross-section: a) Breestraat 113 from 1347 (d),
b) Pieterskerkhof 40 from 1383 (d), c) Breestraat 123 from 1393 ± 6 (d), d) Langebrug 55 from 1400 ± 6 (d),
e) Nieuwe Rijn 60 from 1404–1416 (d), f) Breestraat 95 from 1405–1411 (d) (drawing by E.D. Orsel, ELO)

Il. 2. Lejda, przykłady domów murowanych z konstrukcją drewnianej ramy szkieletowej, rzut i przekrój: a) Breestraat 113 z 1347 r. (d),
b) Pieterskerkhof 40 z 1383 r. (d), c) Breestraat 123 z 1393 ± 6 r. (d), d) Langebrug 55 z 1400 ± 6 r. (d), e) Nieuwe Rijn 60 z lat 1404–1416 (d),
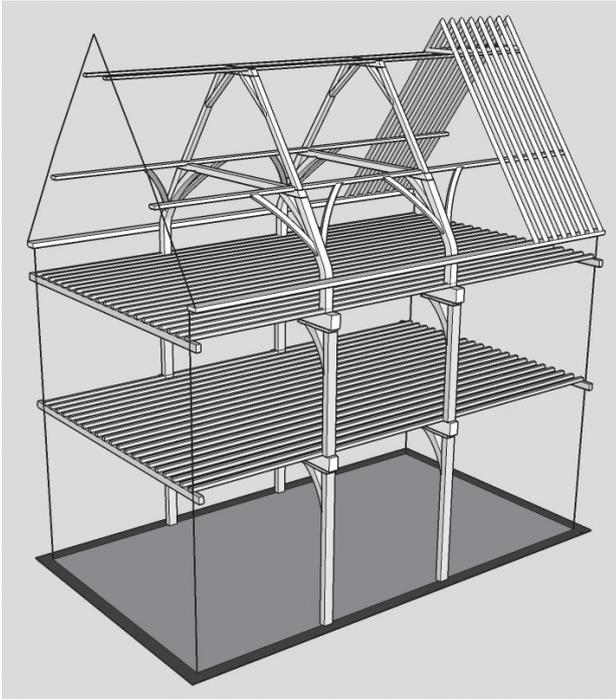f) Breestraat 95 z lat 1404–1411 (d) (rys. E.D. Orsel, ELO)

Fig. 3. Leiden, House Nieuwe Rijn 60 from 1404–1416 (d)
– axonometrics of a timber frame structure (drawing by E.D. Orsel, ELO)

Il. 3. Lejda, Dom Nieuwe Rijn 60 from 1404–1416 (d) – aksonometria
konstrukcji drewnianej ramy szkieletowej (rys. E.D. Orsel, ELO)

Fig. 4. Leiden, House Langebrug 55 from 1400 ± 6 (d)
– timber-frame brace detail (photo by E.D. Orsel, ELO)

Il. 4. Lejda, Dom Langebrug 55 z 1400 ± 6 (d)
– detal zastrzału ramy drewnianej (fot. E.D. Orsel, ELO)

building archaeological research has found almost no traces or components of medieval wooden or timber frame buildings. This can be explained on the one hand by the regulations of the city government, especially those aimed at limiting the danger of fire in the densely built-up city, and on the other hand by the good and ample availability of bricks and stone roofing materials due to their production in the immediate vicinity of Leiden. It is these two influences that have greatly accelerated the process of building in stone in Leiden.

Regulation

The burgeoning city had an undeniable appeal and the population continued to grow as did the city size. The increasing population made it necessary to gradually divide or subdivide the large pre-urban plots. Thus, at the end of the 13th century the characteristic urban structure of blocks of buildings surrounded by plots of land with buildings emerged (Figs. 5a–c) [20, pp. 329 and 335, 336], [6, p. 117], [7]. A growing, densely populated city also meant more regulation, the task of the urban government. The government tried to steer the daily administration in the right direction with regulations such as municipal by-laws. Because Leiden developed in the 13th century into a fledgling city with a center function and a multitude of economic activities, there was also room for the emergence of craft guilds, for example carpenters or bricklayers [18, pp. 95–97]. However, it was not until 1393 that a law on the guilds was drawn up, including guild law, which meant that only guild members were allowed to practice a particular craft. This protectionist system was intended to keep out competition from craftsmen from outside Leiden. The city regulation books included many rules about building in the city. Provisions on how to build were aimed at preventing fire, one of the major dangers in a growing, densifying city. The medieval wooden or half-timbered houses with thatched roofs were very susceptible to fire [21], [22]. As early as 1292, the first fire safety regulations are said to have been enacted by the city [23, p. 271]. In the fire safety regulations as a result of urbanization, the transition from locally sourced, often fire-hazardous, building materials, such as thatch, wood and loam, to manufactured and imported materials, such as bricks, roof tiles and slates, can be observed.

The oldest preserved Leiden regulation book from 1406 states that any house with walls more than 16 feet (approx. 5 m) high must have a "hard" roof of slates or tiles [22, p. 217]. This regulation book also states that every house without a hard roof had to be "gheliemt" (covered with loam) within half a year. Covering the underside or top of thatched roofs with loam reduced their vulnerability to fire. In 1444 the wall height was lowered from 16 feet to 14 feet (almost 4.40 m) and in 1447 even further to 9.5 feet (almost 3 m) [24, pp. 39–41], [21]. In 1450 thatched roofs were completely forbidden for new buildings or buildings to be renovated. The city council went even further and announced that by means of a "looting and cavelinge" (lottery and designation) every year a number of houses had to be replaced entirely by houses with stone façades
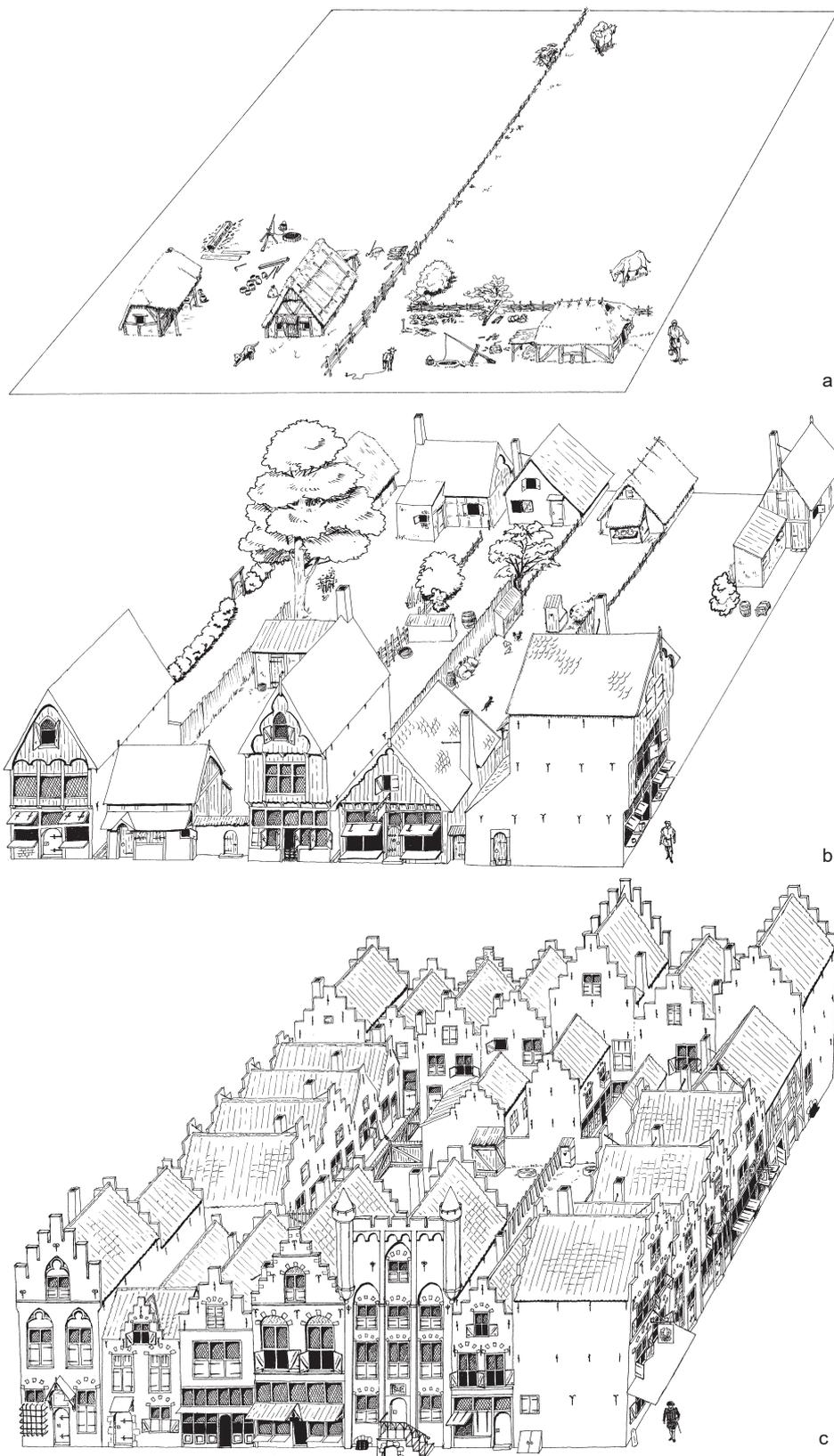
Fig. 5. Leiden, building block,
axonometric: a) pre-urban,
b) in the 13th century,
c) around 1400
(drawing by C. van Hees, ELO)

Il. 5. Lejda, kwartał zabudowy,
aksonometria:
a) sprzed pojawienia się
zabudowy murowanej,
b) w XIII w.,
c) z około 1400 r.
(rys. C. van Hees, ELO)

and a hard roof. Before that, in 1446, the city had begun granting subventions to replace a weak roof with a hard roof [24, pp. 39–41], [23, p. 270]. This makes it clear that in Leiden from the end of the 13th century and the middle of the 15th century the process of building in wood to building in stone was influenced by fire safety regulations.

The street scene changed from wooden or timber-framed houses to stone houses with slate or tile roofs. Incidentally, later stipulations by the city council show that this is too positive a picture, as regulations and subsidies to get thatched roofs out of the city continued to be necessary until the early 17th century [23, pp. 270–274].

Building materials

So far, just over twenty building structures in Leiden have been dated by dendrochronological examination before circa 1400. The oldest dated wood in a building dates to 1306 ± 6, but this unfortunately concerns reused material in a 16th-century roof of Breestraat 113. In the mid-15th-century roof of the Walloon Church, parts of a roof from 1314–1320 were reused, and in the late 16th-century roof of Nieuwsteeg 3, parts of a roof with wooden barrel vault from around 1325. The earliest dated complete wood structure in Leiden is the roof of the house Nieuwe Rijn 14 from around 1335. The dendrochronological results also reveal the region from which the wood originated. They systematically show that it concerns imported material, particularly from the German region of Westphalia or Emsland [17, p. 53]. The trees felled there were transported in rafts via the rivers and came to Leiden via the Dordrecht stacking market. Often traces of the raft transport can still be seen in the structural components, such as raftholes and markings.

Brick and masonry are also sources of information for the building archaeologist. Brick seems to have developed as a building material in Holland in around 1200 [25]. It was a locally manufactured product that was a good alternative to the expensive natural stone that had to be imported from elsewhere. The location of Leiden was beneficial, because right outside the city Leiden good, suitable clay as raw material and peat as fuel was available along the Rhine and the river could be used as a transport route. Moreover, the brickmaker could rely on the growing population in Leiden to have sufficient employees [26, p. 37]. Soon brickyards were established that began to produce bricks, roof tiles and pavers on a large, industrial scale that were used locally in Leiden but were also exported. As early as 1283 a "steenplaats" (stone place) near Boshuizen, just west of Leiden, was mentioned [26, p. 14]. Brickyards were not owned by the city, as they often were elsewhere, but were private commercial enterprises of the urban bourgeoisie [26, pp. 26–48].

Based on the size of the brick and the masonry bond, building walls can be dated, albeit with some caution. By combining building archaeological research including dendrochronological research with archaeological and historical sources, it has become possible to establish a relative brick chronology of the brick used in Leiden. In short, the larger the brick, the older it is. While around the 13th century hand-formed bricks had a size of 30 × 15 × 7.5/8 cm, in around 1400 the brick has already been reduced to about 22 × 11 × 4.5 cm [27], [6, pp. 125–128]. Smaller bricks could be produced more quickly and cheaply, had a higher quality, were more convenient for the mason and better suited to the thin walls of houses [6, p. 125]. It were the private brickmakers who determined the format and although the city council tried to influence the quality and format of product, this had little effect, possibly even because the brickmakers belonged to the urban elite who were also represented on the city council. The industrial production and the large supply of bricks may even have made it more accessible for the builders in Leiden than wood that had to be brought in from far away.

The first buildings to be built with brick masonry were the important ones. Early buildings with brick in Leiden are the Gravensteen from 1183–1199 and the Burcht from the 13th century [25]. Shortly thereafter, citizens also applied brick to their homes, as in the oldest, presumably 13th-century construction phase of Breestraat 113 and Pieterskerkhof 40 (Figs. 2a, b and 6b). Early brick houses are found mainly in the oldest parts of the city center. They are often imposing two-storey houses, but stone buildings also stood in the periphery, often more modest with one storey, such as Haarlemmerstraat 254 and Molensteeg 2a [28], [6]. Building in stone thus seems to have become more common around the time that the 1450 regulation book required stone façades, although wooden, thatched houses were still prevalent until the early 17th century. The estimate of the total number of houses in Leiden around 1400 is about 1000. Building archaeological research has shown that at least 150 structures were already built with brick. Leiden therefore had an early process of building in wood to building in stone.

The earliest wooden houses had walls and roofs made of natural materials such as wood, loam and thatch, and a structure of dug-in timber frame trusses (Fig. 6a). Because of the availability of construction timber, the width of these buildings was around a pragmatic 6 m, with maximums up to about 9 m [29, p. 341]. Between the wooden houses, a so-called "osendrup", a narrow corridor, was present to prevent the spread of fire, but also because thatched roofs do not have gutters and therefore need to be at some distance [29, p. 347], [6, p. 119]. The process of urbanization in the 13th century also resulted in the emergence of local craft specializations, which allowed skilled carpenters to improve truss construction and transition from trusses with dug-in posts to stable wood-frame trusses without dug-in posts. The simplest single-aisle wood-frame houses will not yet have had a full ceiling [22, p. 216]. The smoke from the open fire of the so-called "vrije haard" (free standing hearth) could be drawn away into the roof. In Leiden, at the Steenschuur, a house with a "vrije haard" dating from the period 1350–1425 has been excavated [30, pp. 90–92]. The Leiden regulations book of 1446 mentions that a fireplace that one "ommegaen mach" (can go around) was permitted [6, pp. 118–120]. This is unchanged in the regulation books of 1508 and 1545 and the simple house type with the "vrije haard" occurred in Leiden well into the 16th century. Indications for early timber frame buildings are known in Leiden mainly from archaeological research, in building archaeological research only a few indications of this have been found.

A new construction principle

During urbanization in the 13th century, craftsmen combined the wood building and stone building traditions to create the so-called stone house with timber frame (Figs. 6a–c). From the wood building tradition, the timber frame retained its primary load-bearing function, and the brick cladding initially needed only to prop itself up. The stone houses with timber frame generally had walls of one or one and a half brick thickness [27]. The buildings had a distinctive modular structural composition in bays, with

timber frame trusses spaced about two to three feet apart. The wall or truss posts of the timber-framed house and those of the stone house with timber-framed are distinct from each other. The timber frame house was constructed with fairly square posts. The stone house with timber frame, with its cohesive construction, had thin wall posts. These rectangular posts were usually only partially incorporated into the thickness of the wall or stood against it. The combination of timber frame construction with the stone walls from the stone building tradition had the advantage that the timber frame braced the house in a transverse direction, while the brick sidewalls absorbed the longitudinal stability. The big advantage was that it was possible to build in a fire-safe manner, but with much thinner walls of one- or one-and-one-half brick thickness, whereby the load-bearing timber frame provided a structurally stable building [17, pp. 249–263]. This also meant a saving on brick. An additional benefit resulting from the sturdier supporting structure seems to be the greater load capacity of the floor(s). Due to fire safety regulations, including subsidy schemes, the houses were given "hard" stone roofs as much as possible. The stone roofs were much heavier than thatched roofs, and a supporting roof truss structure became necessary and was introduced as an innovation by carpenters for this purpose. The construction with transverse roof trusses was a continuation of the timber frame and was also structurally related to it. An advantage of the stone roofing was the possibility of making gutters. This eliminated the need for the "osendrup" required with thatched roofs and allowed the use of joint stone walls between the houses. The result was a practical use of the entire plot width, an economic advantage in the densely built-up city. The construction method of the stone house with timber frame flourished in Leiden between about 1300 and 1600 [6].

The development of construction methods outlined is not limited to Leiden, but is representative of a much larger Dutch region that extends broadly across the current provinces of Zuid Holland and Zeeland, and into the neighbouring provinces of Noord Holland, Utrecht and Noord Brabant [14, pp. 8–41], [9].

Conclusion

Based on building archaeological research it can be established that from about 1300 in the growing city of Leiden a new construction principle emerges from the older wood and stone building traditions. With the constructive combination of the stone build house with the timber frame build house, the so-called stone house with timber frame emerges. With this new construction principle with relatively thin brick walls, timber framing and roof truss, the craftsmen, influenced by the available building materials, respond inventively to both the demand of the growing bourgeoisie and that of the city administration for quality and fire-safe buildings in a nascent city. In around 1400, Leiden residents who could afford it lived in a stone house with a structural timber frame, with the city government subsidizing the stone roofing in the pursuit of a fire-safe city. Through his house, the Leiden citizen
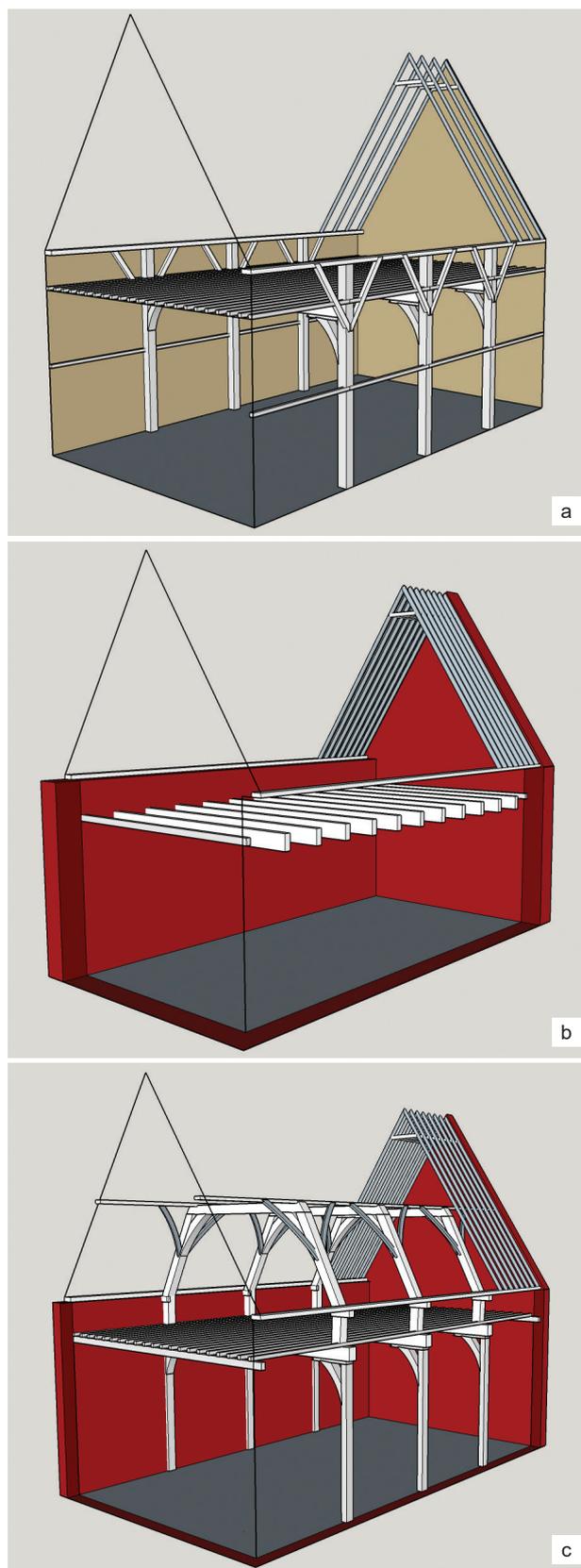
Fig. 6. Types of house construction, axonometry:
a) timber-framed house, b) stone house,
c) stone house with timber-frame (drawing by E.D. Orsel, ELO)

Il. 6. Rodzaje konstrukcji domów, aksonometria:
a) dom o drewnianej konstrukcji szkieletowej,
b) kamienny dom murowany,
c) dom o konstrukcji murowanej z drewnianą ramą szkieletową
(rys. E.D. Orsel, ELO)

expresses his status and living wishes according to his ability. Many houses had only the 1st floor and an attic, but there were also houses with an upper floor and a large storage cellar[3]. The houses stand in a row on the street, in a city whose street pattern has been preserved to this day. They no longer show in the present street scene, but this medieval Leiden is still present in the current inner city, hidden behind younger façades [6], [4].

Summary

As one of the largest medieval cities in the Netherlands, Leiden is an important source for building archaeological research. Because the city has never suffered major destruction, caused by city fires or wars for example, there is a richly layered historic city centre. During structural building archaeological research by the municipal building archaeologists of Erfgoed Leiden, the remains of approximately 150 buildings from before 1400 have been documented. In combination with dendrochronological, archaeological and historical data, it can be established that from around 1300 onwards, a new construction principle emerged that evolved from the older timber and stone building traditions. The constructive combination of the stone house with the timber frame build house with its characteristic timber-frame construction gives rise to the so-called stone building with timber-frame. This development is the result of the urbanisation of Leiden in the 13th century with the growth of the population, urban densification and the creation of guilds. The issuing of fire prevention measures and the payment of subsidies by the city government aimed at fireproofing stone walls and roofing materials also played an important role. The development was also determined by the availability of building materials. According to the dendrochronological data, construction wood had to be imported from Westphalia or Emsland (Germany). Natural stone was not available locally and had to be brought in from far away, until in the 13th century a flourishing brick industry developed along the Rhine, just outside the city gates of Leiden. With the new architectural principle of relatively thin brick walls, structural timber framing and trusses, the craftsmen, influenced by the available building materials, respond inventively to both the demand of the growing bourgeoisie and that of the city administration for high-quality and fire-safe buildings in a nascent city. The timber frame and the trusses provide the load-bearing structure and the stone walls and roofing the fire safety. In around 1400, the Leiden citizen who could afford it lived in a stone house with a structural timber frame, with the city council subsidising the stone roofing in the pursuit of a fire-safe city. Many houses had only the ground floor and an attic, but there were also houses with an upper floor and a large storage cellar. The houses stand in a row on the street, in a town whose street pattern has been preserved to this day. They are no longer visible in the street scene, but this medieval Leiden, hidden behind younger façades, is still present in today's city centre as an important source for historical research.

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[3] The imposing two-story houses in particular have been preserved in Leiden because they were well suited to later modifications in the centuries to follow.

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Abstract

Constructive development of the Leiden house in the 13ᵗʰ and 14ᵗʰ centuries

Leiden is one of the largest medieval cities in the Netherlands. Because the city has never suffered major devastation, for example caused by city fires or wars, there is a rich layered historic city centre. This article discusses the constructive development of Leiden houses in the 13ᵗʰ and 14ᵗʰ centuries and its influences.

In recent years, building archaeological research has uncovered the remains of approximately 150 buildings from before or about 1400. Based on this, and in combination with archaeological data, the constructive development of the Leiden house in the 13ᵗʰ and 14ᵗʰ centuries can be outlined. Based on dendrochronologically dated examples, the origin of a typical timber-frame house with brick façades can be established, a confluence of older timber- and stone-building traditions. It is a building type that remains the popular building type in Leiden and far beyond until about 1600. This development is related to the urbanization of Leiden in the 13ᵗʰ century with urban densification, population growth and the emergence of guilds. The issuing of fire prevention measures by the city council and the payment of subsidies also play an important role. The development is also determined by the availability of building materials. According to dendrochronological data, construction timber has to be imported from afar, from Westphalia or Emsland (Germany). Natural stone was not available locally and had to be supplied from far away regions in Germany or Belgium, until a flourishing brick industry developed along the Rhine in the 13ᵗʰ century, immediately outside the city gates of Leiden. By inventively combining brick walls and a wooden supporting structure by specialized carpenters, high-quality and fire-safe houses were created, responding to the demands of the growing citizenry and the city authorities in a nascent city.

Key words: Leiden, building archaeology, construction history, medieval houses

Streszczenie

Rozwój konstrukcji domów w Lejdzie w XIII i XIV w.

Lejda jest jednym z największych średniowiecznych miast w Holandii. Ze względu na to, że miasto nie doznało większych zniszczeń spowodowanych przez pożary lub wojny, centrum zachowało wiele historycznych budowli. W artykule omówiono rozwój konstrukcji domów lejdejskich w XIII i XIV w. oraz jego wpływy.

Podczas badań architektonicznych prowadzonych w ostatnich latach udokumentowano pozostałości około 150 budynków wzniesionych do około 1400 r. Na tej podstawie oraz w połączeniu z wynikami badań archeologicznych można nakreślić zarys rozwoju konstrukcji domu w Lejdzie w XIII i XIV w. Dzięki wynikom badań dendrochronologicznych możliwe jest ustalenie pochodzenia typu domu o konstrukcji szkieletowej z murowanymi fasadami z cegły, będącego połączeniem starszych tradycji budownictwa drewnianego i kamiennego. Ten rodzaj domu stał się popularnym typem budynku w Lejdzie oraz poza jej granicami do około 1600 r. Rozwój tego rodzaju zabudowy związany jest z urbanizacją Lejdy w XIII w., wzrostem liczby jej ludności i powstaniem cechów. Ważną rolę odgrywało również wydawanie przez radę miejską przepisów zapobiegających pożarom oraz wypłacanie dotacji na ten cel. O rozwoju decydowała również dostępność materiałów budowlanych. Według danych z badań dendrochronologicznych drewno budowlane sprowadzano z dalekiej Westfalii lub Emsland (Niemcy). Kamień naturalny nie był lokalnie dostępny i dlatego też musiał być sprowadzany z daleka, z regionów Niemiec lub Belgii, aż do momentu pojawienia się w XIII w. cegielni rozmieszczonych wzdłuż Renu, tuż za bramami miasta Lejdy. Dzięki nowatorskiemu połączeniu ceglanych ścian i drewnianej konstrukcji nośnej przez wyspecjalizowanych cieśli powstały wysokiej jakości i bezpieczne pod względem pożarowym domy, odpowiadające zapotrzebowaniu rosnącej liczby mieszkańców i władz rodzącego się miasta.

Słowa kluczowe: Lejda, archeologia budowli, historia budownictwa, domy średniowieczne