

BIRKHAUSER

A DESIGN MANUAL

Sacred Buildings

Rudolf Stegers



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CONTRIBUTIONS BY

Dorothea Baumann

Negar Hakim

Roman Hollenstein

Eva-Maria Kreuz

Christina Niederstätter

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Preface

A design manual for office buildings describes the building of offices, a design manual for museums the building of museums. Does a design manual for sacred buildings describe the design of sacred buildings? The elusive quality of the sacral – a term that first arose in the mid-19th century – is difficult to capture within a space, let alone on a stage with an altar and ambo. Instead of talking about sacred buildings, one should really speak neutrally of spaces for worship.

To practice their rites Jews, Christians and Muslims are not dependent on having a building dedicated exclusively to worship. Nevertheless for many people the old synagogues, churches and mosques embody a power unlike any other buildings. This is a part of the intangible yet incredible aura and attraction of religion. Even today, spaces of worship with architectural aspirations must fulfil not only functional but also atmospheric expectations. They should help the 'user' to reach what the protestant theologian Paul Tillich described as "the state of being grasped by an ultimate concern."

To add to the difficulty of achieving a balance between the functional and the atmospheric – neither one nor the other should dominate – a clear rift has opened up since Modernism between the authentic experience of religion on the one hand and its aesthetic expression on the other. Since the 20th century that which unites private prayer and the glory of a building is no longer self-evident, but must instead each time be sought anew; this realisation and effort is required of any architect who wishes to design a space for worship, whether it be a synagogue, a church or a mosque.

The selection of spaces for worship in this book – each in their own way exemplary – is limited to those built from 1970 onwards. That of the 69 projects, only twelve are located in Germany is a factor of the history of church architecture. In no other country has there been so much debate, so much theorising on the architecture of churches in the 20th century than in Germany. And likewise nowhere else has seen so much radical practice: with the building of Rudolf Schwarz's axial Corpus Christi Church in Aachen and Otto Bartning's radial Church of the Resurrection in Essen in 1930, two buildings resulted, each of which follows their own paradigm and each of which represents an archetype.

This is not the first book of its kind to show the architecture of the three Abrahamic religions side by side. The catalogue that accompanied the exhibition "Architettura e spazio sacro nella modernità", part of the Venice Biennale in 1992/1993, introduced the reader to synagogues, churches and mosques in a single volume. This design manual for sacred buildings is, however, the first such book to concentrate on the practice and the requirements of designing new sacred buildings for worship.

While the design of a synagogue or a church is an enticing if somewhat infrequent task for architects, the building of mosques is increasing. After decades of clandestine existence, mostly in "back room mosques", Muslims are now gradually looking to establish their own roots and home in Europe. The relationship between the small Muslim sections of society on the one hand and the large Christian and secular sections of society on the other is therefore characterised by tension. Although the right to freedom of religious expression applies to everyone, in some places – particular where mosques are concerned – this freedom still has to be fought for.

As with any book, the Sacred Buildings Design Manual for is the product of many helping hands. My thanks to Ria Stein for the idea for this volume and the first discussions about its content; to Michael Wachholz for making contact with many of the architects and photographers; to Sabine Bennecke for overseeing the production and editing the texts; to Oliver Kleinschmidt for the elegant design and ensuring the technical quality of the images and plan material; to Marcus Nitschke for numerous discussions and pointers on the past and present of church architecture; to the staff of Bücherbogen on Savignyplatz, Berlin, for their help in compiling the bibliography. Additional thanks to all of the above for their endless patience.

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Rudolf Stegers

Berlin, October 2007

Church Architecture Past and Present

Faith and Religion in the Present Day



1 Francesco Garofalo, Sharon Yoshie Miura, Santa Maria Josefa Church, Rome, 2001

Throughout Europe, church building has always been shaped by a combination of architecture, theology and historical context. The interior and exterior architectonic constituents of a building, in other words its form and content, are always experienced as a whole. Still, today it is churches from the Romanesque, Gothic and baroque periods that most people regard as being archetypal Christian buildings. Despite the Reformation and its appeal against dogma – *ecclesia semper reformanda* – it was not until the Age of Enlightenment in the 18th century that any long-standing fundamentals were first challenged. Later, during the 19th and 20th centuries, the doctrine of Christianity became the subject of constant revision. Debates such as the relation between faith and reason on the one hand, or the law and the grace of God on the other, have resurfaced since then again and again. Whether or not one's perspective of the church is that of an insider or outsider, the authority and autonomy it embodies is a paradox, evident since long before the upheavals of the 1960s, that is resolved anew with each generation. And if one were to subscribe to the hypothesis put forward more recently by the Egyptologist Jan Assmann, then suddenly the Jewish, and not least the Christian and Islamic monotheisms stand accused of bringing about new forms of conflict in the world through their rejection of Cosmotheism or polytheism and the introduction of a "Mosaic distinction" – the establishment of criteria such as "right" and "wrong" or "true" and "false" in religion.

For a number of reasons – society's shift towards an ever more heterogeneous, hedonistic way of life, or an insistence on the absolute religious neutrality of governing bodies, i.e. the strict separation of church and state – Christianity, with its politically, culturally and socially anchored traditions, its rich history and imagery passed down from the Old and New Testaments through two thousand years of history, is gradually disappearing from our general background and education. In many countries, particularly in central and northern Europe, the greater part of the population no longer has any specific denominational allegiance and most people are no longer able to describe the differences between Catholicism and Protestantism. The Sunday communion is in decline, particularly in the larger cities, and no amount of media coverage of the Pope, church services after natural disasters or acts of terrorism seem capable of reversing this trend (Fig. 1).



2-3 Michael Gill, inflatable church, 2003, exterior and interior views

What does this process mean? What implications does this have for architecture, and for the building of churches? First of all, and this may surprise some readers, this does not mean that religion will die out. Rather, in modern societies, one can observe a tendency described by the sociologist Thomas Luckmann as "the invisible religion", a concept he elaborated back in the 1960s. This term describes the shift away from distinct denominations to more diffuse forms of religion, to syncretic, private forms of "belief". Such patchwork religions cater for a desire for self-expansion, to overcome one's boundaries and to usher the transformation of the self. The contemporary middle-class no longer seeks the experience of passage from the material to the spiritual – the transcendental experience – in belief, but instead in art, pop, sport and sex. All that remains of religion is the folklore (Figs. 2-3). In the seventies, this diffuse notion of belief as analysed by Luckmann revolved around people such as Jim Morrison and, in more recent times, around figures such as Harry Potter. Similarly, product marketing from the likes of Nike, Prada, Adidas or Louis Vuitton is no longer satisfied with encouraging customers to buy and wear shoes or clothes: their campaigns are successful only once they have won over customers as devotees of their products.

Historicism versus Modernity

Whether one considers oneself religious, atheist or simply "religiously musical", to use an expression from the sociologist Max Weber, one thing is certain: the opinion that, as an architect, one need only continue the tradition of church architecture and ignore this shift from away from distinct denominations towards diffuse religion, with all the changes this has entailed, will quickly lead to a dead-end



4-5 Quinlan Terry, Brentwood Cathedral, 1991, exterior and interior views

of ill-considered and therefore aesthetically mediocre historicism. The exhibition “Riconquistare lo Spazio Sacro. Riscoprire la Tradizione nell’Architettura Liturgica del XX Secolo”, held in autumn 1999 in the Sala Borromini of the Biblioteca Vallicelliana in Rome is a case in point. Despite the stated purpose of the exhibition in the title – the rediscovery, or indeed the re-conquest of 20th-century liturgical architecture – the exhibits on show amounted merely to a collection of neo-Romanesque, neo-Gothic and supposedly vernacular architecture, which the critics, expecting more serious treatment, scornfully dismissed as “Disney-fied” Christianity.

There are indeed very few good examples of contemporary church buildings that subscribe to a classicist, and therefore also historicist, ideal. Among those buildings, which through their sheer elegance explain why post-modern historicism enjoys such popularity in some circles, are Quinlan Terry’s Brentwood Cathedral in Great Britain (1991; Figs. 4-5) and Léon Krier’s Windsor Chapel in Vero Beach, Florida, USA (1999), the latter also serving as the city hall. The Windsor Chapel, a long, gleaming white and smooth-rendered building with steep pitched roof and green wooden interior, stands in the middle of a small New Urbanism settlement. Its stout architecture resembles both a Greek temple and a long barn. The repetition of similar elements, such as piers, cornices and windows, lends the building a monumentality entirely appropriate to its function as the religious and political centre of Windsor.

Leaving aside, for a moment, the escapism of the exhibition in Rome and the work of such traditionalists as Terry and Krier, and turning one’s attention instead to articles on church architecture that have been published in magazines, newspapers and books over the last ten to twelve years, it becomes clear that, despite the fracturing of religious sentiment and despite post-modern historicism, modern sacred buildings continue to evoke considerable public interest. Whilst the welfare and social work undertaken by both of the larger churches is without question highly valued, the building of sacred spaces represents another, more central form of presence in the world for Catholics and Protestants. In short, the church is a cherished part of both the city and the country. Given the numerous architectonic approaches, denominational manifestations and ecclesiastical groups, it is necessary to first consider the context in which a building will be seen by its users and the function it is to fulfil for its congregation, before embarking on any plan. This applies likewise to churches that are yet to be built, as well as to existing churches, whose conversion and adaptation to contemporary uses is becoming an ever more relevant task.

The Church in the City

The Image of Heavenly Jerusalem

The first Christians dwelt in the countryside. However, the missionary activities of the Apostles soon brought the new doctrine to the cities. Already in the early scriptures, the earthly Jerusalem was confronted with the heavenly Jerusalem. In the “Secret Revelation” set down by John the Apostle in Patmos, the city of Jerusalem was described as an elevated city of pure gold arranged within a square plan. Considering the eloquence of the text of the Apocalypse and its powerful imagery, it is little wonder that believers from Classical Antiquity to the Middle Ages were presented with the image of Heavenly Jerusalem again and again. It was evident in the churches of both the Romanesque and the Gothic periods, through their position on a hill, above a river or the market, through the towers at the church’s intersections and corners, through their length, breadth and height and through their scintillating diaphanous windows, which also served as a *biblia pauperum* (poor man’s Bible). The baldachins over statues of the saints on the west portal or on the pillars within often took the form of a city. Ultimately, every church was said to embody the image and appearance of Heavenly Jerusalem. Even the bronze Pentecostal doors beneath the Gothic canopies and pointed arches on the south portal of Cologne Cathedral, a work by Ewald Mataré from 1953, convey this same message. At the base, the city of Cologne burns, flames leaping from the houses. Only the cathedral withstands the inferno. At the top is a quadratic plan referring to the Heavenly Jerusalem.



6 Alfred Mahlau, "Lübeck" poster, 1934, detail

Eastward Orientation

Cologne Cathedral undoubtedly occupies a prominent position on the banks of the Rhine. Its location is, however, no exception. In the Middle Ages, churches stood in the centre of the towns and cities. This was the case not only for cities with cathedrals, whose towers on the west end dominated the urban skyline until the advent of high-rise building in the 20th century. It applied to almost every town, even when in Renaissance society the city halls, guilds and palaces began to vie with the church for attention. The eastward orientation of the churches – the altar always pointed towards Palestine, the "Holy Land" – also offered orientation in the literal sense of the word. In cities such as Lübeck, the entire spatial organisation of every square metre of the city centre is determined by its church. It is impossible to lose one's way – the church towers serve as a point of reference and provide an immediate indication of where one is (Fig. 6). Even in the late 19th century, the large churches erected in the new quarters outside the avenues and boulevards of the urban ring provided a similar focal point, often seating up to 1000 persons. Whilst these neo-Gothic or neo-Romanesque churches did not enjoy the same status as a cathedral – this role was now shared between the factories as "cathedrals of work", the railway stations as "cathedrals of transport", and the department stores as "cathedrals of affluence" – they nevertheless represented the focal point at the centre of their district.

The Centre of an Urban District

Today a modern church rarely enjoys such a dominant position in the urban realm, and when it does, it is most commonly of symbolic significance, such as Rudolf Reitermann and Peter Sassenroth's Chapel of Reconciliation in Berlin (2000; see pp. 154-55), which stands on the former highly-guarded strip between East and West Berlin. Besides such symbolic churches, new parish churches are also still being built in the centre of new urban districts. Of this type, often to be found in nondescript surroundings, the following five German churches are exemplary: Laurids and Manfred Ortner's Catholic St Edith-Stein Church and Protestant Emmaus Church in Bonn (1994); Augusto Romano Burelli's and Paola Gennaro's Church of Reconciliation in Potsdam (1997; see pp. 176-77); Bernhard Hirche's St John's Church Centre in Kronsberg, Hanover (2000); Johannes Kister, Reinhard Scheithauer and Susanne Gross' Church of St Maria Magdalena in Freiburg im Breisgau (2004; see pp. 178-81); Florian Nagler's Catholic St Florian's Church and Protestant Church of St Sophia in Munich (2005). Four of these churches are paired: whether, like in Bonn, two distinct churches, each with a cut-off elliptical plan positioned on the edge of a larger complex with other municipal buildings; whether, like in Potsdam, one church on the narrow side of the market square with a single space that can be divided for two parishes; whether, like in Freiburg am Breisgau, a concrete sculpture, the folds of which envelope two churches, uniting in a single flowing construction; or whether, like in Munich, a rectangular complex, which at first glance is concealed behind a 10 metre high wall, but which upon closer inspection leads to a tower and square, from which two separate churches can be reached, each of which reveals itself as such only from within.

The fact that, with the exception of Bernhard Hirche's church, all of the aforementioned buildings were erected as double-churches testifies not only to more widespread ecumenical practice, but also to the need to combine forces to make the most of limited budgets, and, despite adverse conditions, to create a strong symbol in the urban context, even to build bell towers. To this end, parishes team up with municipal or independent projects and develop a joint concept, which may contain sacred as well as secular uses, before finally commissioning a building. In Potsdam, for example, the complex contains spaces for the city and state libraries, an adult education centre and cafeteria; in Hanover the complex incorporates 16 dwellings.

The spaces used for the services themselves, whether for Catholic or Protestant services, are no longer the aesthetically neutral spaces they once were in the parish centres of the 1960s or 1970s. Instead, they now have an exclusively sacred function, a space dedicated to celebrating that "wholly other". However unremarkable the pure white exterior of St Florian's Church in Munich may appear, its interior is wondrous, in particular the play of glass and light in the 17 by 7 metre large yellow resurrection window behind the altar, created by the artist Hella De Santarossa.

Ecclesiastic Architecture from the 4th to the 19th Century

Axial and Radial Arrangement /The Development of Catholicism

A Ritual of Word, Bread and Wine

In contrast to the Jewish or Moslem rituals, where the act of worship is conducted solely through the spoken, read or chanted word, the Christian ritual has a dual character. It celebrates the “sacrifice” of Jesus and encompasses both communion in word and the receipt of bread and wine. The communion in word is expressed through the “proclamation” of the message of Jesus: firstly, through passages from the Gospels according to Matthew, Mark, Luke and John; secondly, through passages from the Epistles, letters from the Apostles to younger congregations in the Orient and Occident; thirdly, through a sermon by the priest in which the texts are “interpreted” theologically. The Holy Communion is expressed through the partaking of bread and wine, a symbolic re-enactment of the Last Supper, which Jesus shared with the disciples on the night before his death in Jerusalem. According to the Apostles Luke and Paul, he tells the disciples to “Do this in remembrance of me”, as a form of eternal commemoration.

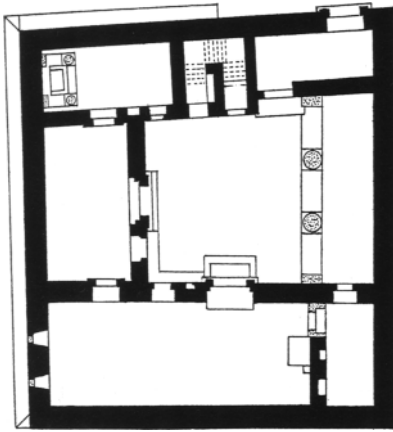
The dual character of the Christian ritual outlined here briefly – known as the “Holy Mass” among Catholics or “Church Service with Holy Communion” among Protestants – creates tensions between the spatial and built arrangement of almost any church. In the interior, the tension is between the focal elements, between the ambo or pulpit for the spoken word and the altar for the consecration. With regard to the plan, the tension is one of an axial versus radial architectural arrangement, between a longitudinal and transverse rectangle on the one hand and an oval, circle, octagon, hexagon, pentagon, square and triangle on the other. In terms of practice, one can associate the communion in word primarily with the spatial typology of the “lecture hall” and the communion of bread and wine primarily with that of the “dining hall”.

The House-Church

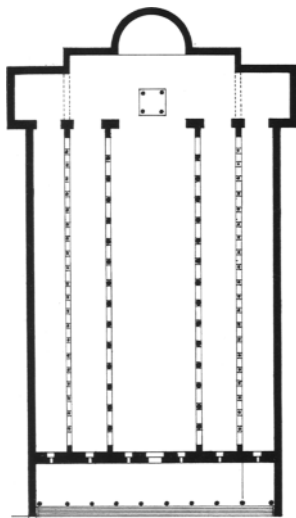
The opposition between “longitudinal” and “circular” plan arrangements began already in the early 4th century. Until then, Christian believers, who were persecuted under Roman rule, met to celebrate Communion in anticipation of the resurrection of Christ in the homes of their more well-to-do fellows. Some of these residences later became house-churches, for example in the years 232-33 in Dura Europos, in what is now Syria. In a converted building near the city wall, a 13 metre long and 5 metre wide hall was created with a raised pedestal in front of its east wall that must have been used by the Bishop, the pastoral head of one or more congregations, as a “cathedra” or official chair or seat (Fig. 7).

Longitudinal Arrangement in the West Roman Empire

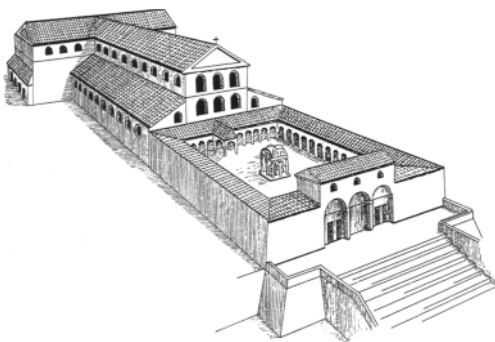
The secrecy of the Christian gatherings vanished after the year 312 when the Roman Emperor Constantine put an end to the persecution of Christians, declaring his political allegiance with the rapidly growing Christian community. Large churches began to be erected in cities throughout the Roman Empire. They took the form of a longitudinal market hall or “basilica” – a high central nave with aisles to the left and right, separated by columns, and an apse, a semicircular protrusion in the centre of the end of the nave. This form was deemed especially suitable since, unlike the temples, they had no previous religious significance and were therefore not associated with rituals that the Christians may have regarded as “idolatrous”. An institution that had hitherto been under the threat of law and forced to operate in hiding, the church now expanded rapidly to become a pillar of the Empire, and in 380 under Emperor Theodosius, the Christian belief in Jesus as the “Messiah” or “Christ”, as the “Lord’s Anointed” and redeemer, was declared the official state religion. By 440, four main basilicas had been erected in Rome and dedicated to the Apostles John, Peter and Paul and to the Holy Mary. San Giovanni in Laterano, San Pietro in Vaticano, San Paolo Fuori le Mura and Santa Maria Maggiore – also known as the Patriarchal Basilica – are works of imperial architecture; their form with three or five aisles is a product not of liturgy, the conduct of religious worship, but of the will of the Emperors to demonstrate their sovereignty over the West and East in stone, and to openly declare their claim to eternity (Figs. 8-9).



7 House-church, Dura Europos, 232/233, plan



8 San Giovanni in Laterano, Rome, 324, plan

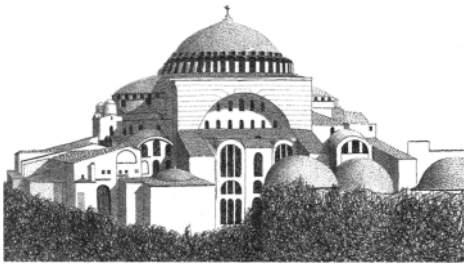


9 San Pietro in Vaticano, Rom, 326, view of its appearance in the early Middle Ages

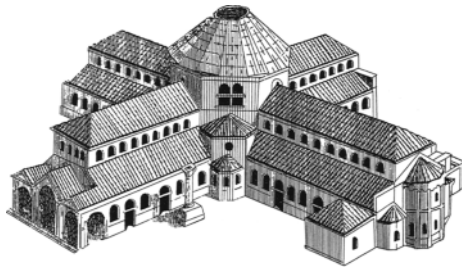
Circular Arrangement in the Eastern Roman Empire

The Hagia Sophia in Constantinople (537), designed by the mathematician Anthemius of Tralles and Isidore of Miletus, is an inspired gesture with which the Byzantine Emperor Justinian hoped to eclipse all that had gone before. The central space measures exactly 69.86 by 74.70 metres. The central dome rests on pendentives carried by four piers, each 31 metres apart. The outward thrust of the dome is supported by the buttresses of the aisles to the north and south, and by two half-cupola to the west and east (Figs. 10-11).

The Hagia Sophia marks a shift in the east from the “longitudinal” to the “circular” configuration. Not that all circular buildings necessarily have to be built on a circular plan; rather, they are characterised by a centripetal and centrifugal energy. Buildings of this type were also erected in Rome around the same time as its four Patriarchal Basilicas, for example Santa Constanza (ca. 360) and Santo Stefano Rotondo (ca. 470). However, both churches served not as places of communal worship but as a mausoleum and a baptistery, as places of burial and of baptism. From early on, a centralised architecture was more dominant throughout the entire Eastern Roman or Byzantine Empire – an empire ruled from Constantinople that evolved from the collapse of the Roman Empire and whose cultural roots were more strongly influenced by the Greek than the Latin. Here the old churches have a cruciform plan but with arms of equal length crowned by a large dome, sometimes one large and four smaller cupola. With the emergence of the Eastern Orthodox religions alongside Western Catholic Christianity, the circular form became more widespread and can be found today from Serbia to Syria, and even in far-off Armenia and Georgia (Figs. 12-15).



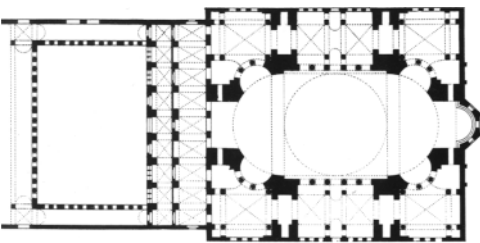
10 Anthemius of Tralles, Isidore of Milet, Hagia Sophia, Constantinople, 537, exterior view



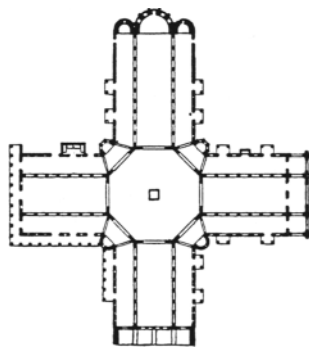
12 Pilgrimage Church of St Simeon, Qal'a Sim'an, ca. 500, exterior view



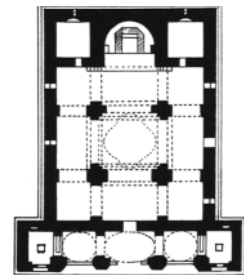
14 St Gayaneh Church, Echmiatsin, Armenia, 640, exterior view



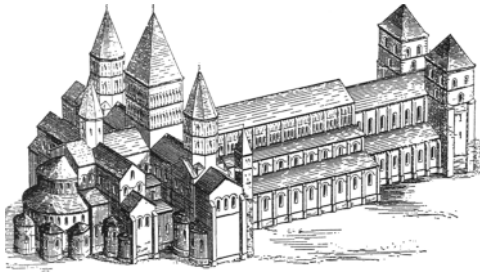
11 Anthemius of Tralles, Isidore of Milet, Hagia Sophia, Constantinople, 537, plan



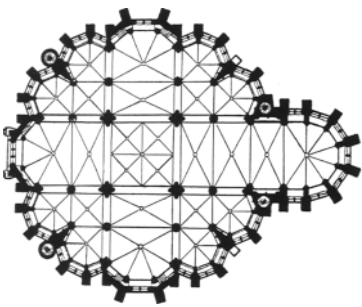
13 Pilgrimage Church of St Simeon, Qal'a Sim'an, ca. 500, plan



15 St Gayaneh Church, Echmiatsin, Armenia, 640, plan



16 Church in the Benedictine Abbey, Cluny, 1135, exterior view

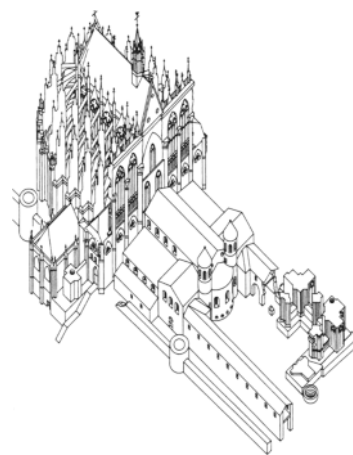


17 Church of Our Lady, Trier, ca. 1250, plan

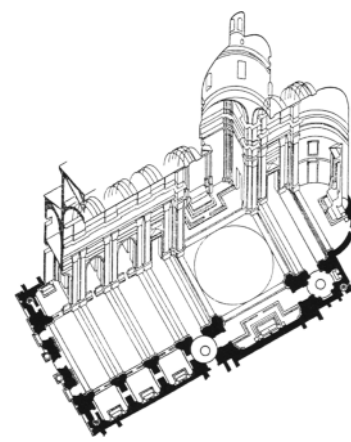
From the Romanesque to the Renaissance

In the meantime, the basilica flourished in its own manner throughout western Europe. In the transition to the Romanesque, a transept was added at right angles to the nave, the choir was placed behind the altar and the ceiling received a vaulted treatment (Fig. 16). The Gothic period refined the Romanesque even further, replacing the many towers with one or two principal towers and giving the heavy flat surfaces a light and sinewy character. A pure rotunda was uncommon. The crusading Order of the Knights Templar, who in the 12th and 13th centuries took it upon itself to assume custody of places of pilgrimage in Palestine, based its own buildings in London, Paris, Tomar and elsewhere on the octagon of the Church of the Nativity in Bethlehem and the circle of the Church of the Holy Sepulchre in Jerusalem. In the circular construction of the Church of Our Lady in Trier (ca. 1250), the axial and the radial characteristics conflict with one another; for the reconstruction and renovation of the church in 1953, Rudolf Schwarz chose to heighten this paradox still further by adding a new island with altar and tabernacle (Fig. 17). Similarly, the chapels arranged radially around the choir of cathedrals – for example the early 14th century polygonal arrangement of seven chapels around the high altar and the Shrine of the Three Kings in Cologne Cathedral – also belong to the category of centralised architecture, even though in the case of Cologne Cathedral access to the choir, which has a crystalline or crown-like appearance when seen from the banks of the river Rhine, was limited to the clergy until well into the 19th century and so thus not intended for communal use (Fig. 18).

The conflict between the longitudinal and the circular configurations reached a new level with the advent of the Renaissance. The discovery of perspectival representation of space and buildings, and the enthusiasm for Greek and Roman Antiquity, both of which should be seen in the context of the anthropocentric character of the time through its utopian vision of *uomo universale*, led to a renewed interest in buildings with a circular, oval or quadratic plan, often superimposed or in combination. Giacomo Barozzi da Vignola and Giacomo della Porta's Chiesa del Santissimo Nome di Gesù in Rome (1584), the mother church of the Jesuits that served as a model for many churches to come, sought to mediate between the two plan forms. The directionality of the axis from the portal to the altar is broken at the crossing where two smaller altars, the tambour and dome, direct one's attention to the left, to the right and upwards (Fig. 19). The pilgrimage church Santa Maria della Consolazione in Todi (1608), designed by local architects and evidently influenced by Donato Bramante, could hardly be more different. Located just outside the city, surrounded by the green Umbrian countryside, the radial arrangement of the church follows a cloverleaf or quatrefoil plan with a large central dome and, as if to eschew any kind of axuality, three smaller entrances not directly oriented towards the altar – the axis from the city-ward door points westwards past the altar into one of the recesses.



18 Cologne Cathedral, view of its appearance in 1322



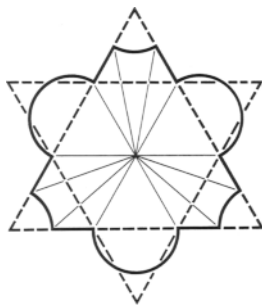
19 Giacomo Barozzi da Vignola, Giacomo della Porta, Santissimo Nome di Gesù, Rome, 1584, isometric projection

St Peter's Basilica

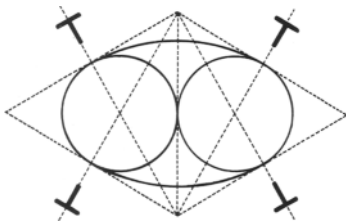
The conflict between axial and radial arrangements was most extreme in the construction of San Pietro in Vaticano, a process so rich in conflicting conceptual intentions that it took from 1506 to 1626 to complete. From Donato Bramante via Giuliano da Sangallo, Raffaello Santi, Baldassare Peruzzi, Antonio da Sangallo, Michelangelo Buonarroti to Carlo Maderno, it was a process that involved much argument and intrigue, amounting to an ongoing productive destruction and a veritable battle between the principles of radial and axial architecture; ultimately, the figure of the Latin cross with arms of different lengths, triumphed over that of the Greek cross, with arms of equal length (Figs. 20-24).



20-24 San Pietro in Vaticano, Rome, five projects, plans



25 Francesco Borromini, Sant' Ivo alla Sapienza, Rome, 1660, schematic plan



26 Francesco Borromini, San Carlo alle Quattro Fontane, Rome, 1667, schematic plan

In the 16th century, St Peter's Basilica was one vast building site. Right in the middle of this period – from 1545 to 1563 – the Council of Trent took place: this event marked the Catholic response to the theological and ecclesiological challenges of Protestantism and the beginning of the Counter-Reformation. Rome fought the “word” of the new religion using the “imagery” of the old. It is in this period that Michelangelo Merisi da Caravaggio's powerful scenes from the life of Jesus and his disciples were painted, so dramatic, even erotic, in their imagery that they shocked, even frightened, those who first saw them. In addition to Sant' Ivo alla Sapienza's triangle and hexagon (1660), San Carlo alle Quattro Fontane's longitudinal oval (1667) and Sant' Andrea al Quirinale's transverse oval (1671), this period also saw the dynamism of Francesco Borromini and Giovanni Lorenzo Bernini's duelling architectures, with their alternately convex and concave forms (Figs. 25-26). The church of the baroque became a throne hall, holding the layman at a distance, a place of Real Presence, the actual physical and literally shining manifestation of God on earth. The pious knelt in front of a monstrance made of precious metals, the centre of which they believed held the Body of Christ in the form of a consecrated wafer or Host.

Liturgy and Function /The Development of Protestantism

In the Service of the Congregation

It is well known from the history of San Pietro in Vaticano that St Peter's Basilica was financed in part by “letters of indulgence” sold by the Dominican friar Johann Tetzel in German cities on behalf of the elector and archbishop Albrecht of Brandenburg. The ability to purchase absolution for such serious sins as theft or manslaughter led Martin Luther to protest openly against such practice. His “95 Theses”, written in autumn 1517, mark the beginning of the Reformation. To begin with, they were a criticism of the “papal” institutions of Catholicism, for example the role of the Pope, whose imperious manner was also evident in the character of St Peter's Basilica. Certainly, Luther regarded St Peter's as a symbol of the corruption of true belief. Why build new churches, when there was no lack of churches? Accordingly, architecture played no noteworthy role in the unfolding of the Reformation, in which power and belief were later to enter into a new, uneasy relationship. Nevertheless, one can conclude from Luther's writings that every church is a function of its liturgy. The space of the church is for the communion of the congregation, for listening to the word of God, for praying and singing, for the sacrament of baptism and the Holy Communion. There is no church building that is holy in and of itself, or built with the intent of being holy. Luther did not share the view of the Benedictine abbot Bernhard of Clairvaux that “trees and stones will teach you what you can never learn from masters.”

27 Nickel Gromann, Chapel at Hartenfels Castle, Torgau, 1544.
interior view with altar and pulpit



The Chapel at Hartenfels Castle in Torgau

The first church to be erected according to the Lutheran notion of liturgy was built a quarter of a century after the beginning of the Reformation. It does not stand in the centre of a city, it is not freestanding and its purpose is not apparent from the outside. Nevertheless, the chapel at Hartenfels Castle – on the banks of the Elbe outside Torgau – was to remain a model for church building until well into the 19th century. It reflected the relationship between the Elector Johann Friedrich I of Saxony as client and Luther as an “adviser” on the liturgical concept of the building. Its form is a response to the experience of the divided medieval church service in which the lay congregation and clerics were separated: in the cities most churches were divided into three sections, the nave, the transept and choir, the latter of which was concealed behind a barrier and platform known as the rood screen. The congregation was allowed access to the nave and transept, but was barred from entering the choir; in front of the rood screen there stood a small altar, around half the normal height, and a pulpit next to one of the pillars. Men, women and children sat on chairs, turning to face alternately the altar or the pulpit. The sermon would often continue for a full hour. To fully comprehend Nickel Gromann’s chapel at Hartenfels Castle in Torgau (1544), one should bear this image in mind.

In Torgau, one enters from the courtyard through a portal and turns left into a 23 metre deep, 11 metre wide and 14 metre high room with a ground floor and lower and upper galleries that extend around all sides of the room. The strong delineation of the segmental arches, the diagonal-ribs and umbrella vaulting dispel the sense of a static space. The altar stands centrally in front of the narrower northwest end, while the pulpit stands in the centre of the long side to the northeast. One is aware of an attempt to arrange the congregation so that it faces one or the other place of focus and yet – although it forces the congregation to direct its attention to different places during the service – the galleries help to make both part of the same space. The seating in the lower and upper galleries surrounds the altar and pulpit on all sides; the removal of the choir put an end to the privilege of the clerics; the congregation shifted from the edges to the centre, the communion and word, sacrament and sermon took place in the centre; Luther was fully aware of all these Protestant innovations when he dedicated the chapel in the autumn of 1544 (Fig. 27).

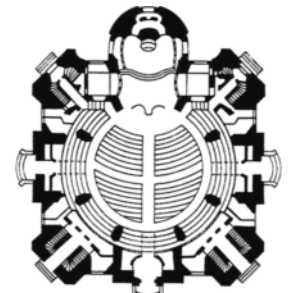
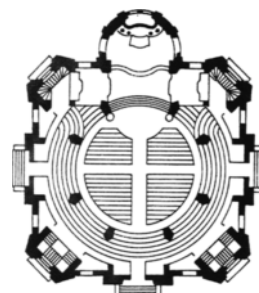
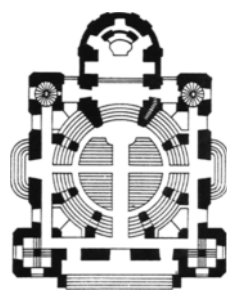
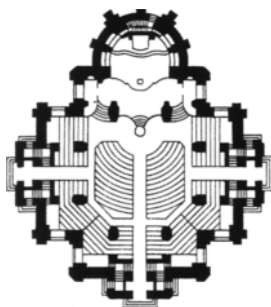


28 Friedrich Wilhelm Diterichs, Bethlechem Church, Berlin, 1737, interior view with Protestant high altar

However, one contradiction remained. Whilst the focal elements of the new church were represented primarily through their sculpted imagery – the altar through the retable, the pulpit through its relief – Luther swore by the word. “My dear friends,” began the opening words of his sermon, “we are now to bless and consecrate this new house to our Lord Jesus Christ ... you [the gathered assembly] too, should take hold of the aspergillum and the censer, in order that the purpose of this new house may be such that nothing else may ever happen in it except that our dear Lord Himself may speak to us through His holy Word and we in turn respond to Him through prayer and hymns of praise.”

The Gallery around the Altar and Pulpit

Whichever buildings the Protestants were able to use after the Peace of Augsburg in 1555 – whether Basilica with low side aisles, hall churches with side aisles of equal height, or aisleless hall churches – they initially used them as they were. Figures and likenesses of benefactors on altars that did not serve the “Praise of God” were soon removed. More major alterations ensued as the size of congregations grew to exceed the available space. Balconies and galleries were installed, often with little regard for the existing architecture, crossing windows and pillars; Gothic stonework and wooden baroque were thrust into at times bizarre coexistence. The often unhappy relationship between the focus of the sermon and the Eucharist was first overcome in the 17th century with the Protestant high altar. With the altar below and the pulpit above, this solution offered a single point of focus from which the galleries could extend on both sides, enclosing the room in a square, circle or oval. Friedrich Wilhelm Diterichs’ Bethlechem Church in Berlin (1737) was such a church that could seat up to 600 people (Fig. 28). George Bähr’s Church of Our Lady in Dresden (1743) also belongs to this type of church. Although, strictly speaking, it does not have a high altar, the ambo, font, altar and organ all lie on the same axis and can be seen simultaneously. The four liturgical elements are placed on a raised dais behind steps with a sweeping balustrade (Figs. 29–32). It is almost as if the cathedral choir had made a return, as if the Lutheran ideal of the church service had given way to the appeal of the aesthetic synergies of Catholic origin. Was the Church of Our Lady in Dresden a Protestant reaction to the Catholic Counter-Reformation?



29–32 George Bähr, Church of Our Lady, Dresden, four designs, 1727 to 1726

The Different Paths of the Reformed Church

Although the earlier German Reformers would probably have deemed the splendour of the Church of Our Lady in Dresden “papist”, they were not entirely hostile to the use of religious images. Luther may have been icono-critical, but he was not iconoclastic, as can be seen in the interior of the chapel at Hartenfels Castle in Torgau. The altar is decorated with a retable by Lucas Cranach the Elder, and the pulpit with several reliefs. The engravings have a specific purpose and are intended to illustrate and clarify the core elements of Lutheran theology – “through word alone”, “by grace alone”, “through faith alone” and “through Christ alone”. In contrast, the Calvinist Reformation in France, Switzerland, Scotland and Holland rejected any form of idolatry, leading to a wave of iconoclastic destruction of statues and images in churches during the third and sixth decades of the 16th century, most notably in Scotland and in Holland. Whilst the Lutheran church attempted to achieve a balance between the altar and the pulpit, placing greater emphasis on the sermon, for the Calvinists the pulpit had absolute priority. Instead of altars in the sense of a place of offering, Calvinist churches had the “Lord’s Table”, which is used only for the Sunday church service and Communion.



33 Jacques Perrissin, Temple de Paradis, Lyon, 1564, painting

The French reformers, better known as the Huguenots, with their trust in the scriptures and obedience to the word, built their “temples” in the form of lecture halls. In the course of the bloody persecution of the French reformers in the second half of the 16th century and again from the end of the 17th until the end of the 18th century, most of their temples were destroyed, including the Temple de Paradis, the Temple de Lys and the Temple des Terreaux in Lyon, a Huguenot stronghold. Fortunately, an authentic perspective attributable to an architect remains, namely Jacques Perrissin’s Temple de Paradis in Lyon (1564). It shows a plain round building, walled on the outside with a timber interior, its roof structure visible from within. The audience sits on simple benches. A balcony runs at half-height around the room. The pulpit is raised not quite in the centre of the room but visible from all sides. The service itself appears strangely relaxed with men and women coming and going. Even a dog has found a place to rest on the floor of the Temple de Paradis (Fig. 33).

The Quaker Meeting Houses

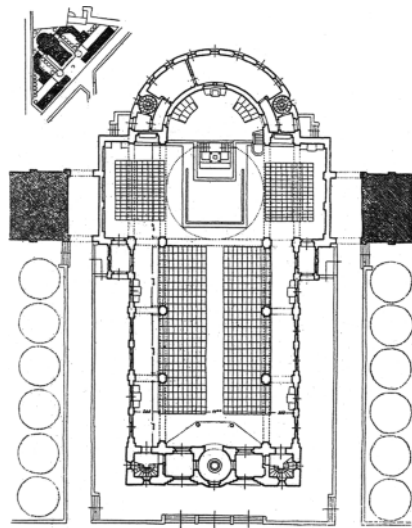
Of all the cults and rites, the rituals of the “Religious Society of Friends”, which split from the Anglican Protestant Church around 1650, appears even further removed. Known as “Quakers”, originally a derogatory name given to them for their fearful awe of God, this Christian faith employs neither altar nor pulpit. The rooms in which they meet for an open ceremony without protocol are simple, empty and white. For their often silently conducted prayers they need only chairs or benches. As such, little mention has been made of their buildings in the history of architecture. This is an omission, as a visit to Trevor Dannatt’s Friends Meeting House in Blackheath, London (1972; see pp. 128-29) or to Leslie Elkins’ Live Oak Meeting Home in Houston, Texas (2001), quickly shows. Both buildings have a large central skylight. In London it is an impressive “lantern”, in Houston it is a “Skyspace” by James Turrell.

The Development of Modern Church Architecture

From the 19th to the 20th Century

Neo-Romanesque and Neo-Gothic

In the ecclesiastic architecture of the 19th century, problems relating to liturgy receded into the background as greater emphasis began to be placed on the appearance of the building. It was not so much about the way in which the congregation came together, but about the aesthetic preferences for the Romanesque or Gothic. The battle of styles, as set forth by Augustus Welby Northmore Pugin in Great Britain in the first half of the 19th century and by Petrus Josephus Hubertus Cuypers in the Netherlands in the second half of the 19th century, developed into a heated, almost embittered rivalry between those who favoured the round arch and those who favoured the lancet arch. The radical attitude of the proponents of the Gothic, Pugin and Cuypers, is explained by the fact that both were Catholics living in a predominantly Protestant culture and felt that their "true" religion was under constant threat. However, one way or the other, rounded or pointed, both were an attempt to escape the times. The economic and technological innovations of the 19th century created new social friction, new classes and social groupings. The rapid development of society brought with it change and the need to adapt, something that not everyone was prepared to do. One need only think of the romantic dissidents, of the young German poet Novalis and his speech "Christendom or Europe" (1799). In place of the pressures of the here and now, they yearned for ages past, singing the praises of the Middle Ages in western Europe as the happiest "origins" of Christianity.

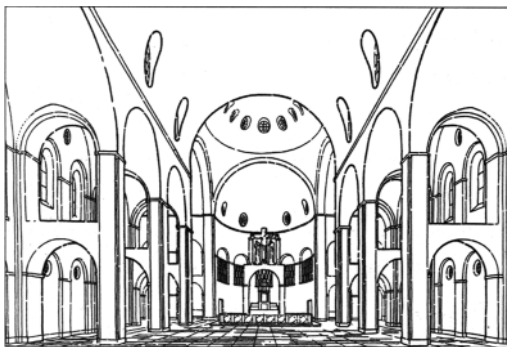


The Liturgy as Client

Decades came and went before architecture and design found new forms that were to embrace the genuine energy of the time – in other words until industrial production was used not just to manufacture old forms. Given the often radical conservatism of both Protestantism and Catholicism with regard to developments in society, it is surprising to note that the ideas and concepts of modernism began to influence church architecture almost as soon as they did residential and industrial building. In 1906, two events heralded a change: Cornelius Gurlitt's manual "Kirchen" (Churches) and the "Second Protestant Congress on Church Architecture" in Dresden. Although Gurlitt's voluminous publication still featured numerous engravings showing beautiful examples of neo-Romanesque, neo-Gothic, neo-baroque and Jugendstil buildings, the conference in Dresden stood under the motto "The Liturgy as Client", marking the beginning of a gradual abandonment of the hybrid mixtures of historicism.

From the "Christocentric" to Burg Rothenfels

In the same first decade of the 20th century, young Benedictine monks in monasteries in Rhineland and Flanders sought to revive the experience of communion in word and Eucharist. The spirit of the monks inspired young Catholic students, and the "Liturgical Movement" was formed. Their manner was not short on uplifting, religious revivalism, and they would have had little influence on architecture had it not been for the Gladbecker cleric Johannes van Acken and his manifesto from 1922 entitled "Christozentrische Kirchenkunst. Ein Entwurf zum liturgischen Gesamtkunstwerk" (Christocentric Ecclesiastic Art. A Proposal for a Liturgical Gesamtkunstwerk), which dealt with the topic with such persuasion that any religious architect should have felt compelled to serve the cause. Whether axial or radial, the altar should be the centre of every church, and the spatial arrangement and pictorial decoration should be entirely focussed on it. The nave should be cleared of pillars and columns; the side aisles should serve as mere pathways to the pews, the choir is to be shortened and widened, the altar brought forward from the rear wall and placed beneath the crossing, raised and enclosed by a rail and its position emphasised from above by a baldachin or circular chandelier: he backed these proposals with a call for the use of appropriate materials and construction methods. Iron and concrete, according to Acken, were a "wonderfully effective and compliant helper" (Figs. 34-35). However, despite his leanings towards the Deutscher Werkbund, which van Acken mentions explicitly, his opinions on contemporary culture were nothing other than anti-modern. His notion of a holistic liturgy drew not only



34-35 Carl Moritz, project for a christocentric church for an industrial city, Gladbeck, 1922, interior view, from the book "Christozentrische Kirchenkunst"



36 Rudolf Schwarz, Chapel at Burg Rothenfels am Main, 1928

on Richard Wagner's ideal of a synthesis of all art forms, but also the desire for deliverance from the here and now. As with Novalis before him, his writings reveal a nostalgia for the political and religious "Ordo" of the Middle Ages.

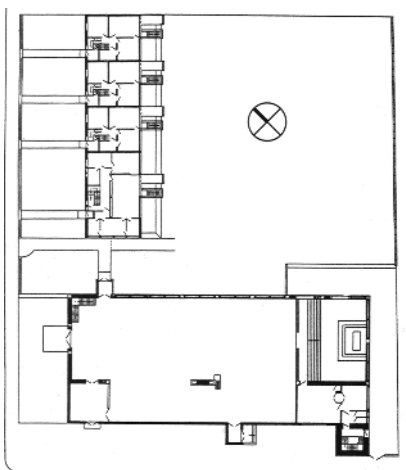
The Catholic "Quickborn" youth movement -- an "alliance" born out of the context of the "Life Reformerist Movement" in the early 20th century -- yearned similarly for the ages of old until the Catholic theologian and philosopher Romano Guardini and the young Catholic architect Rudolf Schwarz began to reconcile them with the urban society of the day. Rudolf Schwarz's conversion of the chapel and great hall at Burg Rothenfels am Main (1928) gave the Quickborn headquarters a modern form, shockingly modern for some. The room was cleared of all decoration and the walls whitewashed. The altar table and circular chandelier, both clearly still influenced by the Arts and Crafts Movement, stand out all the more against the plain white background (Fig. 36). In the great hall, the wiring for the tubular glass lighting on the ceiling and the arrangement of the wooden seating at floor level allow the large empty room to be used for lectures, congresses, song or prayer.

A Comparison of the Corpus Christi Church and the Church of the Resurrection

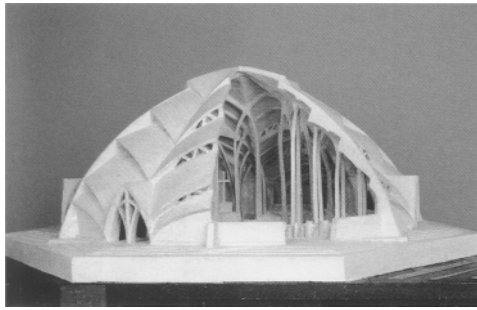
While in the 19th century, the opposition of axial and radial arrangements played a minor role, renewed attempts were undertaken in the 20th century to mediate between the longitudinal and circular plan forms. The rabbi and publicist Joseph Carlebach from Hamburg identified the difference between the two concepts most eloquently. In his essay of 1929 entitled "Die Architektur der Synagoge" (The Architecture of the Synagogue), he declared that all spaces could be divided into longitudinal or circular spaces. In the axial arrangement, the people would "disappear", while in the circular they would "appear"; in the former they are "passive", in the latter they are "active". By contrast, his assertion that the longitudinal space is "magical" and "aristocratic", while the circular is "rational" and "democratic" is an exaggeration not upheld by the experience of 20th century dictatorships. Nevertheless, a comparison of Rudolf Schwarz's Corpus Christi Church in Aachen (1930) and Otto Bartning's Church of the Resurrection in Essen (1930) -- the former Catholic and strictly axial, the latter Protestant and strictly radial -- proves instructive and shows that Carlebach's perception was not so mistaken.

The entrance vestibule, nave and side aisle of the Corpus Christi Church in Aachen together total a length of 48.4 and width of 20.7 metres. It covers an area of 1002 square metres and offers seating for 322 congregants. Its construction is a framework with compressed stone infill. Inside the pure rectangular space of the main nave, the floor is covered in bluestone and the walls and ceiling rendered throughout in white lime plaster, creating a strong contrast between dark and light, between earth and heaven. A church of this large size, wrote Schwarz in the journal "Die Form", is about anonymity and objectivity, mass and arrangement rather than proximity. And indeed, even from the vestibule, one is already aware of a strong directional pull from the entrance to the mountain that is the altar. One's gaze is drawn forward along a line that runs unerringly down the centre of the aisle. The pulpit, a small box-like protrusion from which priest and congregation can barely communicate, appears suspended from the edge of a section of wall in the centre of one of the long side walls of the nave and underlines the principle of the room: each and everyone should direct their feet and eyes towards the tabernacle and the crucifix alone. Its appearance, composure and material cladding have an almost chivalrous, noble quality: as if through the expression of order, a longing for leadership and governance is fulfilled in those assembled (Figs. 37-38).

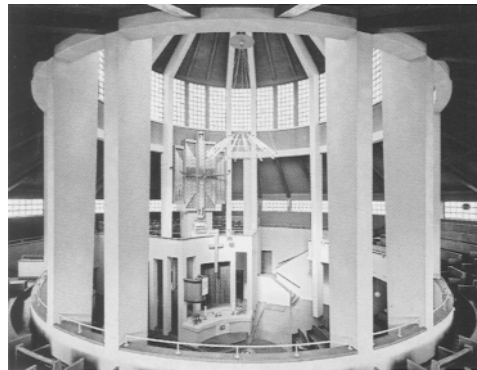
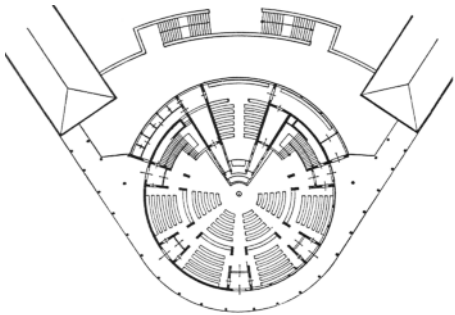
To better understand the importance of Otto Bartning's Church of the Resurrection in Essen, it is first necessary to consider a star-shaped church by the same architect, designed eight years earlier. Its organic, crystalline architecture continues a tradition of utopias, already envisioned and formulated Berlin after the First World War in by the members of the "Arbeitsrat für Kunst", "Novembergruppe" and "Gläsernen Kette". Otto Bartning shared a sense of Expressionism with these circles, who were likewise inspired by belief. However, as with so many projects in the early Weimar Republic, the church progressed no further than a model, drawing and description. The building was based on a star-shaped plan with seven points and a 28-metre diameter. Timber ribs and arches supported a giant dome, clad in scale-like sections of slate. In the interior, the preaching space occupied five-sevenths of the floor



37-38 Rudolf Schwarz, Corpus Christi Church, Aachen, 1930, plan of the church with associated buildings and interior view



39 Otto Bartning, project for a star-shaped church, 1922, model



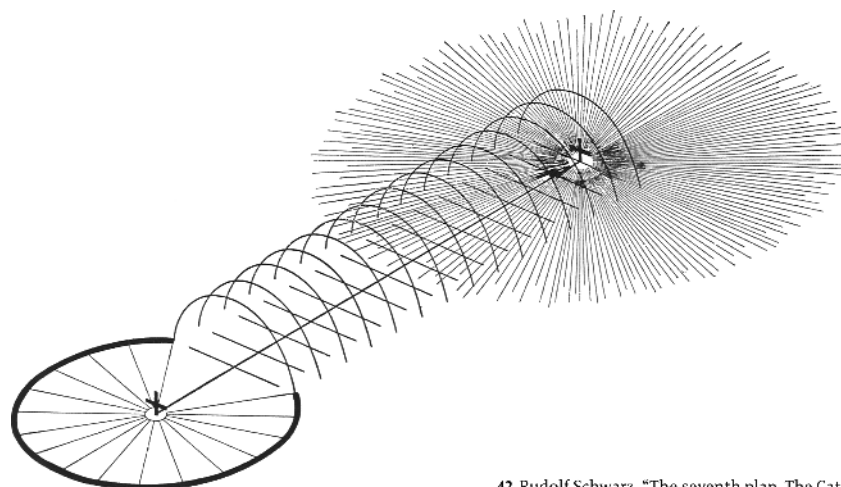
40-41 Otto Bartning, Church of the Resurrection, Essen, 1930, plan and interior view

area, the slightly raised communion space two-sevenths. The pulpit was arranged in the centre, the altar at the highest point of the centralised space of the church. The congregation would leave the preaching space together for the Communion (Fig. 39).

The progression from the star-shaped church to the Church of the Resurrection leads from the arched to the straight, from the hot-headed to the level-headed, from the expressionist to the functionalist form. The circular building in Essen has a diameter of 34 metres and an area of 907 square metres. The benches provide seating for a congregation of 700 over two levels, each divided into four segments of a semicircle. What remains from his previous design is the sublime unification of spiritual and spatial centrality for the church service and the division of the church into a larger preaching space and smaller space for the Communion. What have not survived are the material and the construction. The Church of the Resurrection has a framework of steel columns, each enveloped in grey concrete, with an infill of red brickwork. The structure is visible on both the outside and inside. The overall impression is of a sober rationality akin to the factory or office buildings in the Ruhr, except that in the church, this rationality is heightened dramatically by four tiers of rings and shafts (Figs. 40-41).

Rudolf Schwarz's "The Seventh Plan"

By the time Rudolf Schwarz's book "Vom Bau der Kirche" (The Church Incarnate, 1938) was published, long after the dedication of the "authoritarian" Corpus Christi church and the "egalitarian" Church of the Resurrected, sacred architecture in Europe had reached a new low. In Germany, Austria, Hungary, Italy and Spain the fashion had turned to a new, heavier Romanesque, their designers bowing to the preferences of their respective regimes. Rudolf Schwarz's book, however, adopts a standpoint of its own. Abstract, idealised plans depict the spatial relationship between man and God; his seven "plans" – no elevations or sections – return to the theme of the longitudinal or circular arrangement. The final plan is entitled "The Cathedral for all Time" and subtitled "The Entirety" (Fig. 42). In a language we are no longer used to – unafraid of solemnity and somewhat unhurried – the author appears to comprehend the liturgy as movement and attempts to mediate between the axial and the radial: "To begin with, all lies in silent sanctuary, turned inward on itself. Then, an opening appears high at the apex or at a point in the periphery. The closed form breaks open, its inside parts and the figure escapes into the open. The space leaves its form, the journey begins. Ascending strongly at first, it gradually tires as it approaches the dead point at the centre of the apex, where opposing forces gather, and it finally comes to rest. The opposition outweighs. Movement is inhibited, stagnates and stops, time stands still, and there, where it came to rest, the figure unfolds to form a new space. A new centre arises and around the new sphere a new world has gathered."



42 Rudolf Schwarz, "The seventh plan. The Cathedral for all Time. The Entirety", 1938, from the book "Vom Bau der Kirche" (The Church Incarnate)

The Second Half of the 20th Century

A Sign of New Beginnings

The most decisive turning point in the history of church architecture in the modern age was the “ground zero” after the Second World War. The experiences of fascism and war awoke a strong desire for spirituality and new spiritual orientation. This desire overrode all previous debates on the search for communal space in church architecture from the twenties and early thirties. During the Weimar Republic, the discussions were primarily youth-led or within the church, with the aim of reviving the liturgy in both Protestantism and Catholicism. However, in West Germany – particularly in the fifties but also in the sixties – church building became a symbol for a new beginning. More so than the design of museum or theatre buildings, which were far less common at that time, church architecture was the medium through which the avant-garde architect expressed himself.



43 Basil Spence, Cathedral, Coventry, 1962, model

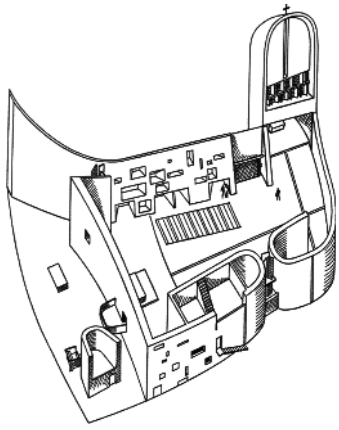
Likewise, the reconstruction of the cathedrals as well as the central and urban churches was a sign of new beginnings throughout the rest of Europe. The rejection of historical reconstruction and the conservation of churches in their ruined state, such as the Kaiser Wilhelm Memorial Church in Berlin by Egon Eiermann (1961) or Coventry Cathedral by Basil Spence (1962; Fig. 43) reflected the spirit of the times. A painstaking, historically grounded and correct reconstruction, such as the one undertaken for the Baroque Church of Our Lady in Dresden by George Bähr (2005), would have been met with vociferous protest in the fifties, not just from architects, but also from the majority of the public. By contrast, half a century later, many people regard the approach taken in Dresden as a viable means of re-establishing historical continuity in a fractured urban environment. Around the same time, a similar discussion ensued in Cologne on whether to clad the dark red patch of brick filling on the north west tower of Cologne Cathedral with sandstone from Oberkirchen – work that was eventually undertaken in 2005. As a result, a permanent reminder of the war that was undertaken in 1943 to prevent the tower from collapsing, disappeared from view.

Otto Bartning’s “Emergency Churches”

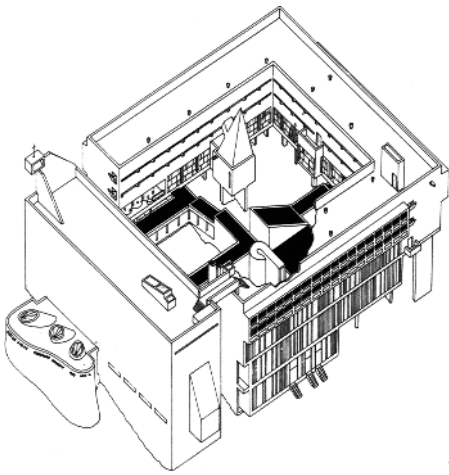
Church attendance rose most dramatically after the founding of the German Empire in 1871 and after the end of the First World War in 1918; the same pattern emerged in the years directly following the Second World War. In Germany, which was still occupied by the four Allied forces, solutions addressing the increased need for pastoral care were soon developed. The first steps towards a new sacred architecture were made by the Protestants between 1948 and 1951, in the form of emergency churches. Otto Bartning devised four types that seated between 350 and 500 people. Although his designs drew on earlier building forms, he was careful to differentiate his historical references clearly from the vulgar, classicist monumental architecture of the thirties and forties. Yet behind the traditional appearance of Bartning’s designs was a carefully thought-out, industrially fabricated modular system, one that provided the parishes with the basic elements for their construction: timber wall and roof trusses, purlins and panelling for the roof, doors and windows for the walls. The prefabricated elements were delivered to the building site and erected within a period of one to three weeks. The non-load-bearing walls were then added using locally-available material, sometimes rubble from the war. The concept depended on local contribution and has proved strong enough to last to the present day. Although only conceived of as temporary structures, the churches in cities such as Stralsund, Rostock, Wismar, Berlin, Leipzig, Dresden, Bochum, Essen, Dortmund as well as Nuremberg, Stuttgart and Munich all still exist today and have become anchored in the local collective memory as testimonies of a time of new beginnings. In some respects, their aesthetic as well as functional qualities can still stand as models today.

The Language of the Masters and the Mediocrity of Imitation

Comparable with the development in France, Italy and Scandinavia, hundreds of churches were built in West Germany, some larger some smaller. In 1958, Richard Biedrzyński wrote that, in Germany, the Protestant Church had built as many churches since the war as it had altogether during the Reformation. In 1973, Hugo Schnell reported that “in most Catholic diocese a church was being dedicated al-



44 Le Corbusier, Chapel of Notre Dame du Haut, Ronchamp, 1955, isometric projection



45 Le Corbusier, Monastery of Sainte Marie de La Tourette, Eveux-sur-Arbresle, 1961, isometry

most every Sunday". Most influential, whether for their details, *béton brut* and rough plaster, their colour and skilful, near mystical handling of layout and lighting were Le Corbusier's Chapel of Notre Dame du Haut in Ronchamp, France (1955) and his Sainte Marie de La Tourette Monastery in Eveux-sur-Arbresle, France (1961).

Besides Le Corbusier's masterful language (Figs. 44-45), a plethora of styles abounded that, without resorting to the arbitrary, exceed all categorisation. Almost any conceivable plan and elevation, material form or construction was built. There were numerous churches with sharp corners: in the form of a T or an L, a long or a squat rectangle, a square plan, pentagon, hexagon or octagon; numerous churches with gentle curves: in the form of a semicircle, a whole circle, an oval, an ellipse or parabola. In addition, there were open tented arrangements, enclosed fortresses, sweeping arches, spiky crowns, shed roofs, pitched roofs and flat roofs – a multiplicity that Rudolf Schwarz, at the height of his work after the dedication of his Church of St Michael in Frankfurt am Main (1954) and the Church of St Anna in Düren (1956), was to sharply criticise in a lecture entitled "Architektur als heiliges Bild" (Architecture as Holy Image) held at the 77th Annual German Catholic Congress in Cologne in 1956: "The architects of the day are getting carried away with their new freedom and suppose now that they may build whatever comes to mind. The temptations of a new craftsmanship is laid out before their eyes, one that makes it possible to produce endless varieties of forms and shapes, and yet to say virtually nothing, an activity encouraged by journalism insufficiently learned in things of such complexity."

The ongoing "flamboyance without spiritual reason", in Rudolf Schwarz's words, reached its zenith in 1960 (Figs. 46-48). From then on, a sculptural architecture emerged, which in West Germany in the sixties is most commonly associated with the name Gottfried Böhm. The latecomers among this new plasticity include Walter Maria Förderer's Church of St Nicholas in Hérémence, Switzerland (1971), Fritz Wotruba's Church of the Holy Trinity in Vienna, Austria (1976), and Giovanni Michelucci's Church of the Immaculate Conception in Longarone, Italy (1978), whose dynamism have only been equalled more recently in the work of Zaha Hadid. At the same time, however – in the wake of Le Corbusier's Sainte Marie de La Tourette on the one hand and the work of the American architect Paul Rudolph on the other – numerous churches arose in the form of hard grey cubes and rectangles with circular roof-lights, sturdy rainspouts and with a liberal use of decorative shuttering on bare concrete.

The provision of church buildings in the parishes and residential areas, particularly in the new housing estates as well as in the inner cities, remained a priority for the churches throughout the sixties. It was important to show presence in the cities, to send a signal. In addition to the completed buildings, the very act of building became a symbol of the church searching for a new identity – after the end of the "union of throne and altar" and not least after the end of its entanglement in the Third Reich – within the new pluralist society of the West German Republic, with the aim of becoming a fourth pillar alongside the political parties, associations and unions.



46 Rudolf Schwarz, St Joseph's Church, Cologne, 1954

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47 H. Waltenberg, O. Schmitt, H. Brunner, entrance to the main station, Cologne, 1957

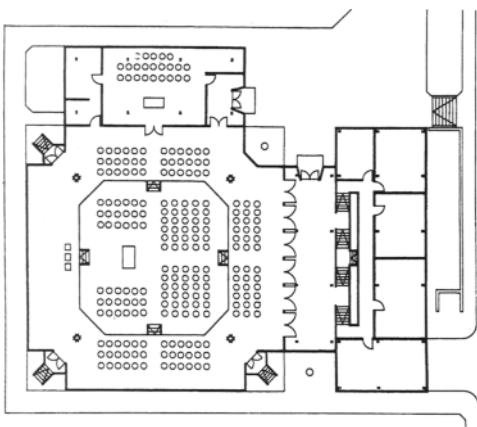
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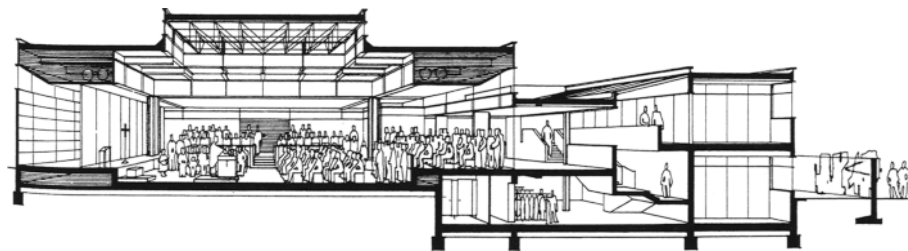
48 Hans Pörkert, St Barbara's Church, Hürth-Gleuel, 1959

The Developments in Socialist Europe

In the socialist states of central and eastern Europe, church building after 1945 was faced with incomparably more difficult conditions. Given the pronounced atheism of the ruling communist parties on the one hand and the constant economic shortages on the other, the state building of new churches was in most cases not a priority, and the parishes had little option but to concentrate on maintaining what was already available. Only in strongly Catholic Poland did a series of new churches come about, most notably the Church of the Ark of Our Lord in Nowa Huta, Krakow, designed by Wojciech Pietrzyk and Jan Grabacki in the fifties but only completed in 1977, in which the legacy of Le Corbusier is clearly evident. In East Germany, where over the course of 40 years of socialist rule, the majority of citizens lost contact with or turned their back on the church, a comparatively limited church building programme was undertaken. With the exception of a few new projects, the German Democratic Republic concentrated primarily on maintaining what already existed and the conservation of the rich heritage of urban and rural churches. The modesty of the roofs, mostly constructed by engineers to protect the churches from further dilapidation, appear as symbolic today as the concept of the "Winterkirche". The Winterkirche was a heated room beneath the galleries and organ, separated from the nave by a glass wall, which made it possible for parishes to use the churches all year round.



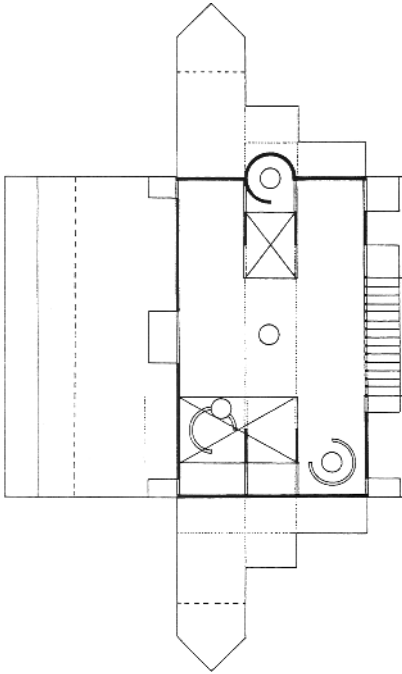
49-50 Ferdinand Schuster, St Paul's Church, Graz, 1970, plan and longitudinal section



The Ideal of the Parish Centre

As part of the general movement towards the reform of political and cultural conditions in the late sixties that began with the student revolts but soon encompassed most of society, the parish centre with its multipurpose hall gained increasing popularity. A church is neither the built manifestation of the Communion nor a place of secret worship, according to the argumentation of the day; rather, inspired by John's rendition of Jesus' words "In my father's house are many rooms", it should be understood as the place where believers gather in the name of the Lord. For architecture, this conceptualisation meant that many clients were more willing to forego specific sacred symbols and the design of many churches – Ferdinand Schuster's St Paul's Church in Graz, Austria (1970) by way of example – began to resemble that of a barrier-free cultural centre composed of steel and glass. The tradition of typology, the clarity of axial or radial plans, or of bell towers and main portals, not to mention images such as the "tabernacle" or "place of refuge" were suddenly no longer desired, replaced rather by a church that could be used on Sundays and weekdays alike for a whole variety of purposes. The architecture became primarily functional, as can be seen in Schuster's red and brown coloured main hall (Figs. 49-50). This de-sacralisation signalled a democratisation of congregational life, and, combined with a conscious expansion of activities into the realms of education, child, youth and women's groups as well as politics, it fulfilled the ambitions of the church to become an institution at the heart of society.

The best of these mostly Protestant parish centres, including James N. Thorp's extension to the Central Methodist Church in Morley near Leeds in England (1970; see pp. 124-127), are described in Rainer Disse's book "Kirchliche Zentren" (Church Centres, 1974). However, with all due respect to the aims of an open parish, many of the flexible, extensible or divisible structures designed with maximal active use in mind have not proven themselves in practice. The stipulation to conduct different functions in the same space, and in so doing, dissolving the boundary between the sacred and the secular, has in many cases led to spaces that no one particularly likes. The use of the zone around the altar during the week by a series of charity work groups or dance troupes has provoked general disapproval not only



51 Ottokar Uhl, St Judas Thaddeus Church, Karlsruhe, 1989, plan with projections of the elevations.

among the older generation of churchgoers. Today, most churches now ask architects for designs that incorporate a sacred space conceived solely for the purpose of the church service. The ability to extend this space as required – to enlarge it five or ten times a year for especially well-attended church services – is often accepted or even mandated by many parishes. However, adaptability should be provided without the need for excessive and mechanically temperamental sliding walls. As is often the case, such elements offer too much variability. In practice, only two or three variants are usually employed for dividing the room according to the nature of the gathering.

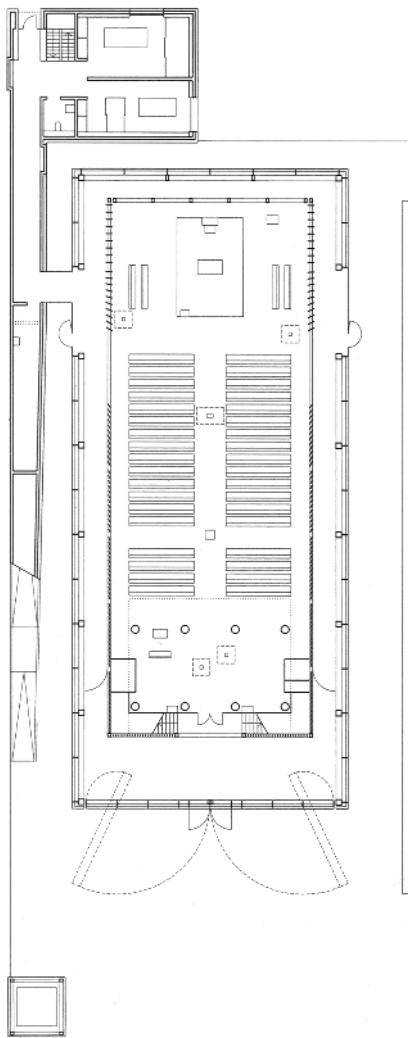
The Example of St Judas Thaddeus Church

The architect Ottokar Uhl draws on this experience for the design of the St Judas Thaddeus Church in Karlsruhe (1989). The Catholic parish centre encompasses a multi-purpose hall, a children's nursery and the pastor's residence and office – a typical spatial programme for this kind of a complex. The distinctive long narrow building adjoining a suburban market square has a main hall with pitched roof and is clad entirely in light-grey concrete blocks. The building volume and interior are separated into short, medium and tall sections. The short section serves as the entrance and porch, the medium section provides space for weekday functions, the tall section the sacred space for the Sunday Mass, and all three are used together for celebrations on public church holidays. The altar stands in the centre and is surrounded by removable seating instead of benches. The complex also contains three chapels at the edge of the room, rounded "paravents" made of glass-block partitioning that contain the tabernacle and the font, and can be used for silent prayer. The interior of this central space has no partition walls whatsoever and is accordingly always experienced as a whole; the sections are experienced through the stepped ceiling. The lower and medium-height zones and the medium-height and tall zones (the latter inherently connected via the balconies at the sides) can, but need not function together as a unified liturgical space. The St Judas Thaddeus church is flexible. Its space can expand or contract according to requirements without the need for folding screens or curtains to separate the space (Fig. 51).

The Renaissance of Church Building Between Invention and Reality

In contrast to this development, some predominantly Catholic countries began to actively undertake church building. An example of such activities are the thousands of churches built in Poland since the early 1980s after the loosening of state restrictions due to the strong Solidarity movement. In responsiveness to the wishes of the parishes and with delight in architectural experimentation, these buildings demonstrate an almost excessively wilful symbolism. Surrounded by vast estates with rows of slab housing blocks and high-rise towers, these large churches, sometimes seating up to 4000 people, serve as a "vehicle of belief with which one can cross the obstacles of the world," to use the words of the Polish architectural historian Cezary Was. The spectrum of forms ranges from the heavenward spiralling stonework of Henryk Buszko and Aleksander Franta's Elevation of the Holy Cross Church in Katowice (1994), to the space-station-like appearance of Witold Ceckiewicz's Divine Mercy Pilgrimage Church in Krakow (2002).

Unlike Poland and the Ukraine, in which thousands of churches have been built since the nineties, development in western European states has been very different. Although new sacred architecture is now receiving greater attention than in the the mid-seventies to the mid-eighties, the apparent "renaissance of church architecture" was primarily – with the exception of Italy – a phenomenon limited to the media, which devoted more attention to the subject than previously. In truth, the number of new churches built between Helsinki and Lisbon is small, and pales in comparison to the sheer quantity built in eastern Europe. That the majority of the new church buildings in western Europe in the eighties as well as in the nineties were ascribed to one of the three programmes attributed to "High Tech", "post-modernism" and "deconstructivism", should be no surprise given the prevailing conditions for architectural production. Even those who distrust keywords and dislike the labels of popular architectural journalism will see upon closer examination that Volker Giencke's St Florian's Church in Aigen im Ennstal, Austria (1992; see pp. 98-99) can be classified "High Tech" due to its use of steel and glass, Francisco Javier



52 Markus Allmann, Amandus Sattler, Ludwig Wappner, Church of the Sacred Heart, Munich, 2000, plan

Bellosillo Amunátegui's Church and Chapel in the Parque de San Francisco in Almazán, Spain (1987; see pp. 86-89) can be associated with "postmodernism" due to its historical references, and Sol Madrideojos Fernández and Juan Carlos Sancho Osinaga's Chapel for a Country Estate and Hunting Lodge in Valleacérón, Spain (2000; see pp. 112-13) can be tied to "deconstructivism" due to its complex geometry.

The strongest influence on the design of sacred architecture from the nineties onwards was not, despite the media attention it garnered, the work of Mario Botta (neither the Cathedral of the Resurrection in Evry, France (1995), nor the St John the Baptist Church in Mogno, Switzerland (1996), with its distinctive elliptical upper face resulting from a diagonal cut through a cylinder), but Peter Zumthor's Catholic Sogn Benedetg Chapel in Somvix, Switzerland (1988; see pp. 94-95), and Tadao Ando's Presbyterian Chapel of the Light in Ibaraki, Japan (1989; see pp. 96-97). Both buildings exercise a combination of the archaic and the modern, and exhibit a radical aesthetic restraint, both in terms of their geometry as well as their materiality and construction. Put simply, for Zumthor this approach results in a wooden droplet, for Ando a concrete box. Architectural journalism was quick to ascribe these and other buildings the label of "minimalism", without, of course, noting that the work of Zumthor, Ando and their numerous followers has only limited parallels to the art of Carl Andre, Dan Flavin and Donald Judd.

However, more important than these stylistic references is the impression that the Sogn Benedetg Chapel and the Chapel of the Light share an understanding of the church service as one where the priest stands on his side and the congregation on the other, as if in the liturgy they oppose rather than stand with one another. These two celebrated buildings by Zumthor and Ando are not alone in their surprisingly conservative conception of church communion. In more recent guidelines for the building of churches, one can observe a veritable renaissance of tradition. Of the buildings that follow such principles, it is not uncommon to find that they involve innovative material or technical solutions and complex constructions in steel, wood, glass and concrete: for example, Markus Allmann, Amandus Sattler and Ludwig Wappner's Church of the Sacred Heart in Munich, Germany (2000), Richard Meier's Jubilee Church Dio Padre Misericordioso in Rome, Italy (2003), and Matti Saaksenaho's St Henry's Ecumenical Art Chapel in Hirvensalo, Turku, Finland (2005). From a liturgical standpoint these buildings – all axial churches with static longitudinal orientation – subscribe to conventional notions of the Holy Mass and Communion service as a kind of spectacle (Fig. 52).

A Desire for Atmosphere and the Sacred

According to an observation attributed to Egon Eiermann, once in a lifetime every architect longs to design a chair as well as a church. The assumption is that, for tasks like these, the usual constraints of efficiency and commercial viability for investors and developers do not apply, that building regulations are more relaxed and that forms are less restricted than they are for offices or residential buildings. The particular interest in the design of sacred buildings is also a factor of the unusual and rare nature of the task. Sometimes the interest is also driven by a desire to create something of architectural permanence – to quote Adolf Loos, something monumental. In any case, it appears that the search for "atmosphere" and for the "sacred" in architecture is a strong motivator for architects today. Whatever sacred may be, it should be made apparent through design: through dimension and number, i.e. proportion; through extreme purity or extreme coarseness of a particular material, so that it is beyond all use and for its own sake; through something incredibly weightless or something tremendously massive, where the force behind it is not apparent to the eye; through translucent rather than transparent surfaces, in which light can simply be light and not have to illuminate this or that object.

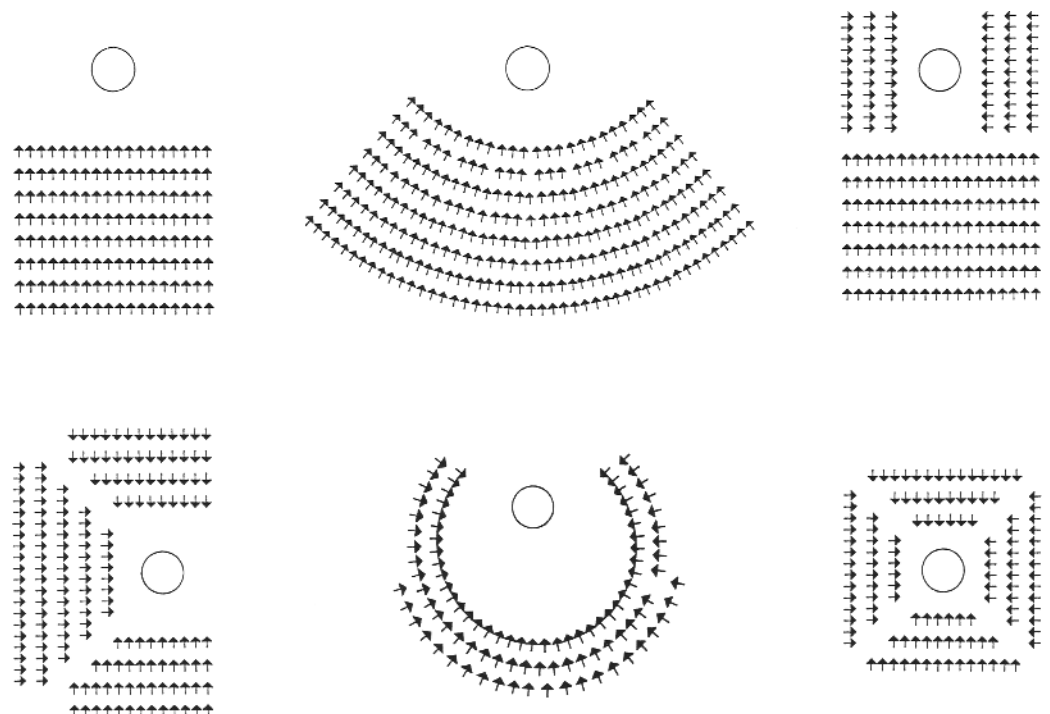
The average church client's understanding for such aspects is limited. The communication of architectural principles by the architect should be part of a critical dialogue between both partners. A proper balance between the participation of the client and the creativity of the designer is an essential part of the planning process. It is about repeated attempts to find new answers, for example, to questions such as: Should the character of the church congregation be immediately apparent from outside as well as inside? Should a church be more representational or more functional? Should it be sublime? Should it be comfortable? Does everyone have to find it beautiful?

At the Beginning of the 21st Century

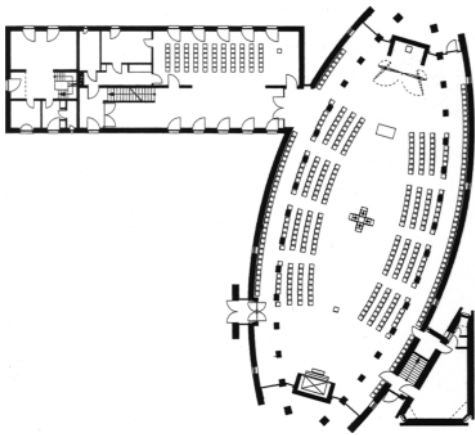
Liturgy in Reform and its Criticism

In the years of urban reconstruction after the war, the Second Vatican Council that took place from 1962 to 1965 heralded the most significant reforms to the Catholic church service since the Council of Trent. Although a number of new churches – most notably Emil Steffann’s St Laurentius Church in Munich (1955) – had more or less anticipated the new order of the Mass thanks to their strongly centralised orientation, it was not until 1965 that the “Constitution on Sacred Liturgy” came into force. Of particular importance was a paradigm shift from the viewpoint of the clergy to the viewpoint of the people, from the cleric’s church to the people’s church. It was clear that this was to have implications for each and every Catholic church. From this point onwards, the altar was to be placed apart from the apse wall and emphasised only by a low podium. The ambo replaced the pulpit and was to be placed to the left or right of the altar. Fixed seating for the priest, the deacon and altar boys were to be positioned slightly behind or beside the altar. Likewise, the tabernacle for the safekeeping of the consecrated Hosts, which represent the bread of the Last Supper, was to be placed behind or beside the altar.

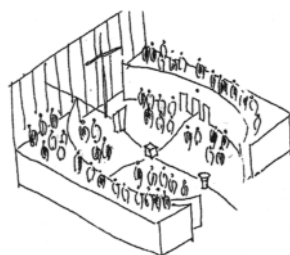
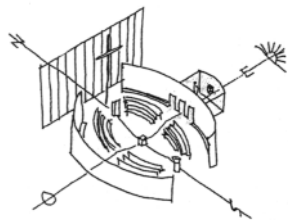
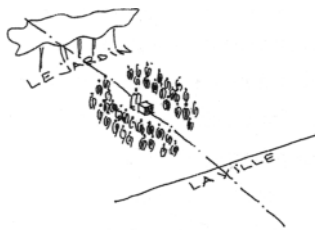
Today, the architecture of Catholic and Protestant churches differs only marginally. The principal elements – altar, ambo and baptistry – are considered as a whole in both denominations. The space for the liturgy of the word and of the Eucharist must allow a certain amount of scope for flexibility. The church service of each denomination encompasses, on the one hand, the eccentric orientation, on the other, the concentric assembly of the congregation (Figs. 53-58). Only the differentiation between the axial and the radial, and with it the similar but not identical differentiation between “unified” and “partitioned” as defined by Otto Bartning, remain as a distinctive criteria. Unified spaces, those which are experienced as a whole, include for example Rudolf and Esther Guyer’s Glaubten Church in Zurich, Switzerland (1972; see pp. 132-33), E. Fay Jones’ Thorncrown Chapel in Eureka Springs, Arkansas, USA (1980; see pp. 80-81), Shigeru Ban’s Paper Church in Kobe, Japan (1995; see pp. 146-47), and Anssi Lassila’s Protestant Church in Käsämäki, Finland (2004; see pp. 162-63). Partitioned spaces, i.e. spaces in which the parts of the space are emphasised over the whole, include for example Glauco Gresleri’s and Silvano Varnier’s Our Lady of Lourdes Church in Navarons di Spilimbergo, Italy (1970; see pp. 118-21), Paulo Archias Mendes da Rocha’s Chapel of St Peter in Campos da Jordão, São Paulo, Brazil (1989; see pp. 138-41), Steven Holl’s Chapel of St Ignatius in Seattle, Washington, USA (1997; see pp. 108-09), as well as Peter and Gabriele Riepl’s Church of St Francis Church in Steyr, Austria (2001; see pp. 160-61).



53-58 Schematic plans of church arrangements showing the development from axial to eccentric character and radial to concentric character



59 Dieter G. Baumewerd, St Christopher's Church, Westerland, Island of Sylt, 2000, plan



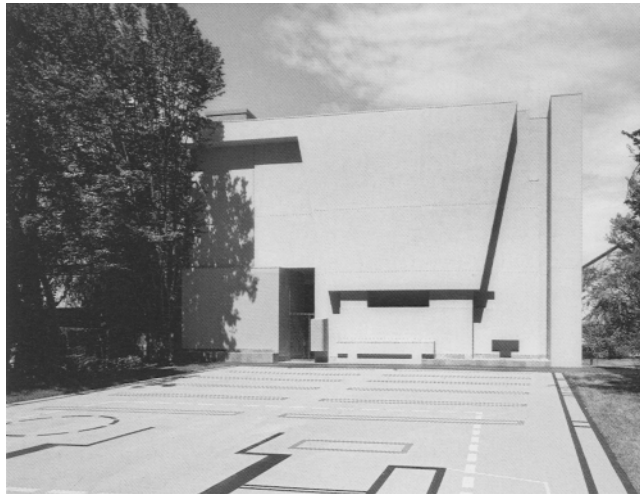
60-62 Corinne Callies, Jean-Marie Duthilleul, St Francis of Molitor Church, Paris, 2005, sketches showing the relationship between exterior and interior space

The aforementioned "Constitution on Sacred Liturgy" was not entirely well-received. The British novelist and essayist Evelyn Waugh, author of "Brideshead Revisited," was unhappy about the eradication of Latin from the church service. The philosopher Robert Spaemann lamented the abandonment of the old Requiem mass, which now only survives in the music of Wolfgang Amadeus Mozart and Krzysztof Penderecki. In recent times, the number of critical voices has risen. The Frankfurt author Martin Mosebach, for example, regards many symbols of belief as lacking in ritual, speaking of a "heresy of informality". Others share his discontent, asserting that nowhere is solemnity still to be found, only informal togetherness. However, these at times forceful speeches betray a lack of familiarity with everyday practice, and their attitude resembles more that of aesthetes and cynics who define religion in terms of the elation and fear of childlike belief and – with the demise of all social utopias after 1989 – they seek silent consolation in hard times.

The Ideal of "Communio"

Those who call for a return to the old rites do not solely demand a revival of the use of Latin but also imply the rejection of the idea of "active participation" in the liturgy. After Pope Pius X introduced this term at the beginning of the 20th century, it was rapidly adopted by all reformers of the liturgy. So too the proponents of "Communio," represented first and foremost in Germany by the theologians Albert Gerhards, Klemens Richter and Thomas Sternberg, who with the name of their liturgical concept clearly advocate the notion of active participation but, some 40 years after the last council, wish to improve on the church's spatial constellation. Whether axial or radial in arrangement, in most churches the altar and ambo stand on a low podium, or "island". This does not sufficiently dispel the impression of a stage. The bipolar character of the liturgy of the word and of the Eucharist – specifically of table and lectern – is, they argue, best fulfilled by an elliptical architecture. If one leaves the centre vacant in anticipation of the presence of God, and places the altar at the focal point at one end of the ellipse and the ambo at the other, with the congregation arranged in a gentle arc along each long side of the ellipse, this arrangement of man and space provides a clearer appreciation of the substance of the mass than is possible with the conventional arrangement. Confrontation between the priest and the congregation gives way to integration. The congregants can look one another in the eye, they can even wander with their chairs back and forth from table to lectern to table. There is perhaps a danger that by arranging the congregation to face one another, seated or standing along the long walls, the informal nature of the gathering becomes more forced. In principle, the Communio concept recalls the medieval arrangement of the choir. At that time, the altar and ambo were placed behind the rood screen at either end of the aisle flanked on the left and right by two facing rows of seats. What was previously the prerogative of the clergy is now granted to all.

Dieter G. Baumewerd's St Christopher's Church in Westerland on the island of Sylt (2000) is most probably the first new church to be built according to the Communio concept. The interior of the brick and concrete outer shell is articulated by a regular arrangement of closely-spaced columns and windows along the long sides. The organ, ambo, font, altar and tabernacle are arranged along the central axis of the ellipse, the font in the centre, the ambo and altar in the focal points towards each end of the ellipse (Fig. 59). The benches arranged along both long sides of St Christopher's Church provide seating for around 400 people. By comparison, Franck Hammoutène's Our Lady of the Pentecost Church (2001; see pp. 158-59) seats approximately 320, and Corinne Callies and Jean-Marie Duthilleul's St Francis of Molitor Church (2005) around 420 visitors (Figs. 60-62). Both of these buildings are in Paris and both are mentioned for their application of the Communio concept. Unlike St Christopher's Church, however, the elliptical form in both Paris projects is not evident from the exterior. Our Lady of the Pentecost features a room-height and room-width glass window behind the altar, lending this end more importance than that of the ambo – for this reason, the main space could quite easily be changed to an axial processional arrangement.



63-64 Claudia Meixner, Florian Schlüter, Martin Wendt, Dornbusch Church, Frankfurt am Main, 1962/2005, exterior and interior view

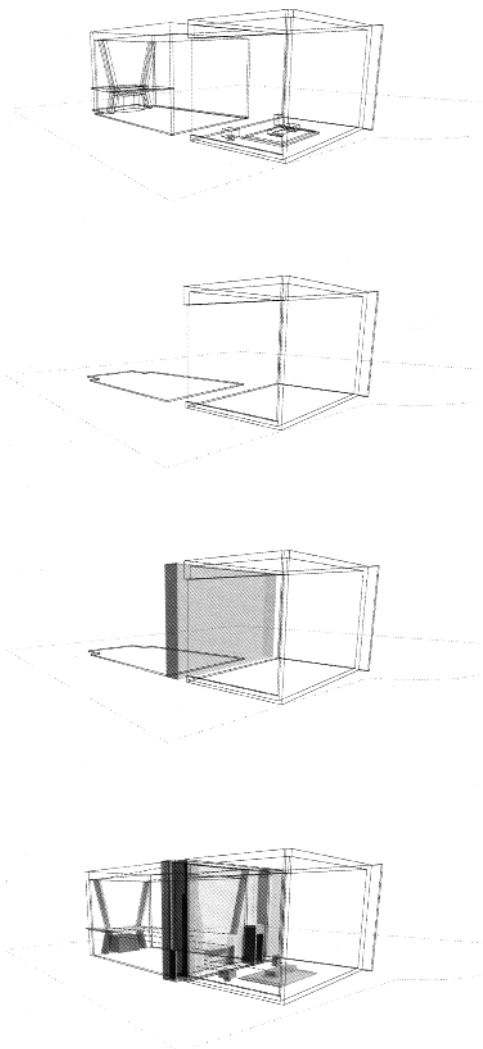
Conversion or Demolition

Notwithstanding the interest in the “Communio” as an advanced liturgical model, one should not be blind to the fact that the building of new churches has become rare. In view of the fact that more and more people are no longer denominational – and accordingly that the tax income of both the Catholic and Protestant churches is falling, at least in a nation such as Germany – the options of conversion or demolition of church buildings have become a necessary reality. What make both options so difficult, or even painful, are practical problems on the one hand and a sense of loss, not only of religion but also of architecture, on the other. Once a church has become a restaurant, discotheque, residence, shopping centre or car park, as is happening in the Netherlands and United Kingdom, all is lost: after that there can be no return to the status ante quo.

In Luther’s “Kirchenpostille” (Church Postils, 1522), he writes: “Then for no other purpose are churches to be built, so far as there is a cause, as for Christians to come together, to pray, hear the sermon and receive the sacrament. And where this cause should expire, the same church should be torn down, as one does with other houses, when they are no longer of use.” Without doubt, Luther’s opinion is theologically plausible. In 21st-century everyday life, however, the conversion or demolition of churches is a matter of concern for society as a whole. The strengthening of “collective memory”, to quote the sociologist Maurice Halbwachs, only serves a standpoint in which preservation and transformation go hand in hand.

The Example of Dornbusch Church

There are few examples of the conversion of existing churches from the second half of the 20th century. An example is Dornbusch Church in Frankfurt am Main (1962/2005), which with the help of the architects Claudia Meixner, Florian Schlüter and Martin Wendt underwent a process of demolition, conversion and rebuilding, without damaging the sacred function and sacred character of the snow-white building. The long rectangular box has shrunk to half its original size, seating 180 instead of the original 600 persons. The choir, the blank north wall and the east wall with its coloured glass mural by Hans Adam remain. The south wall is new. Outside positive, inside negative, the two metre deep sculptural relief wall represents an impression of the former balcony, altar, pulpit and font. The strong plasticity of the wall is inspired by the moulded packaging material used to protect consumer goods, and perhaps also the work of the London-based artist Rachel Whiteread. The position of the demolished elements is marked on the square in front of the church. Everything is memento, and yet with an impression of the future (Figs. 65-68).



65-68 Claudia Meixner, Florian Schlüter, Martin Wendt, Dornbusch Church, Frankfurt am Main, 1962/2005, schematic drawing of the reduction of the church

The Sacred and its Relevance for Church Architecture Today

The Spatial Manifestation of the Sacred

The Contribution of Ethnology

All religiously inspired activities originate not from a notion of divinity, but from the sacred. Probably the earliest analysis of what constitutes the sacred was made by the English missionary and ethnologist Robert Henry Codrington at the end of the 19th century in Melanesia. The sacred is defined by the terms “mana” and “tapu”, meaning “power” and “prohibition”.

The sacred resides in people or objects, and is a social energy of great power for “good” or “evil” alike. It is a primordial category of higher ambivalence and complexity, a category of sensitivity, a fleeting and intense phenomenon that can never be described in itself but only in relation to a reaction it inspires. The sacred is therefore sacred only in a particular place, at a particular time and for particular people. The French sociologist Roger Caillois came up with an instructive comparison to describe the attraction, repulsion, elation or fear associated with the sacred. In the presence of the sacred, a believer feels the same as a child does in the presence of fire. Unfamiliar with the element, one feels at once a desire to warm oneself and a fear of burning oneself.

The Greek and Latin languages, which differ in this aspect from Hebrew, draw a distinction between an objective and subjective existence of the sacred. On the one hand, it is permanently embodied in particular places, for example in Greek termed “hieros”, in Latin “sacer”; on the other, it is something brought forth by particular people, in Greek “hosios”, in Latin “sanctus”. Catholicism emphasises the “hieros” and “sacer”, Protestantism “hosios” and “sanctus”.

Rudolf Otto and Mircea Eliade’s Contribution

In the debate on the sacred, the Protestant theologian and indologist Rudolf Otto introduced a new term, that of the numinous, in his book “The Idea of the Holy – On the Irrational in the Idea of the Divine and its Relation to the Rational” (1917). He defines the numinous as what remains of the sacred once it has been stripped of the moralistic, aesthetic and discursive attributes with which it has been invested. The numinous is the very core of the sacred, the “mysterium tremendum et fascinans”, that “wholly other”. Over the course of his book, switching back and forth between the religious and the aesthetic, Otto describes how the contrast between “tremendum” and “fascinans” is best brought out through the sublime as a mixture of fearsomeness and beauty. It is for this reason that architecture employs such means as the monotone, the uniform, the edgeless, the endless, light, dark and emptiness.

Exactly 40 years after Otto’s book “The Idea of the Holy”, Mircea Eliade, a Romanian Catholic philosopher, publicist and teacher who later taught in the United States, published his book entitled “The Sacred and the Profane. The Nature of Religion” (1957), a short volume that is still influential today, in part due to its accessible language. Eliade’s book is of interest to architects for his concept of “Hierophany”, or the manifestation of the sacred in time and space. Trees, forests, groves, mountains; springs, rivers, lakes, oceans; stones, gorges, grottoes, caves; not to mention the heavens and the sidereal regions: such places were not only revered by ancient cultures for their own sake, but because they were able to manifest what was sacred. True belief – also in Christ – lies in two worlds, in the structured space of the sacred, and in the chaotic space of the profane.

With regard to the phenomenon of the sacred, both Otto and Eliade emphasise the substantial over the functional. Both adopt a tone approaching that of the Revelation; in both a degree of disdain for the non-religious reader is apparent. What each writes about – the “sensus numinis” on the one hand, “hierophany” on the other – can be neither proven nor refuted. One can safely only say that today – given the degree to which society is secularised – no individual, regardless of how religious he is, would claim to have such a sense for the numinous that he could proceed to divide urban space into zones for the sacred and zones for the profane. It would also be possible to argue against religio-centric phenomenology in other ways. If one follows the theological and philosophical line of argument from the



69 Kaiser Wilhelm Memorial Church, Berlin, advertising wrapped around the building, 1999

12th to the 21st century that leads from Joachim of Fiore via Thomas Müntzer and Gotthold Ephraim Lessing to Ernst Bloch and Gianni Vattimo, then secularisation – along with the abolition of the sacred and of transcendence! – does not bring shame upon us, but rather is a permanent process of the deliverance of mankind that began with the “Kenosis,” the renunciation or de-deification and personification of Jesus, as described by Paul the Apostle in his letter to the Philippians.

Michel Foucault’s Contribution

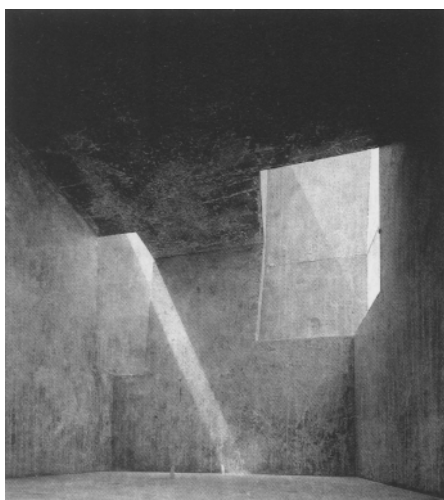
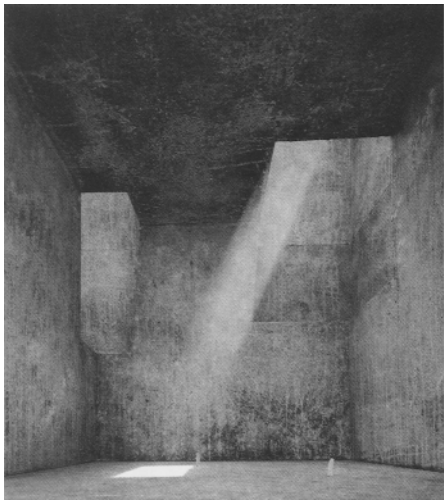
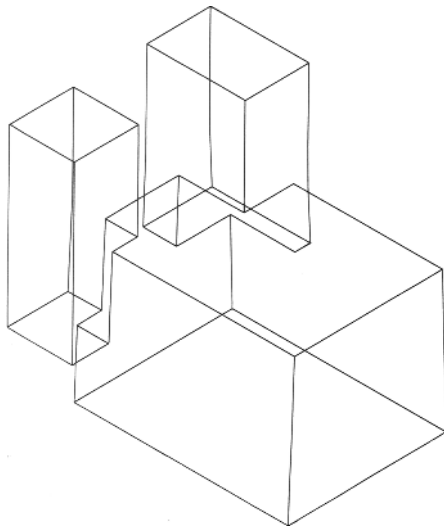
That one can come to a better appreciation of spaces worthy of being called sacred through a lecture given by Michel Foucault becomes apparent only after closer analysis of the French philosopher’s thinking. “Heterotopias” is the name Foucault gives in his essay “Of Other Spaces” (1967) to places that serve as “counter-sites” of society, because there the usual social and cultural conditions are suspended at least temporarily in favour of other uses. In this context, considering that the author might have easily also referred to churches – not just colonies and barracks, but also brothels and cemeteries – the question arises as to whether the sacred encompasses a similar potential for critical distance, resistance and defiance. Does the sacred create spaces outside those of the rational, efficient and increasingly market-driven society? Are there spaces that precede or follow such spaces, or are they just places of transitory stasis, of temporary respite from the insufferable demands of the modern city in an age of increasing consumerism? One way or the other, the sacred remains an intensely if quietly contested “terrain vague”. The market economy creates on the one hand new, simulated sacred spaces; on the other it seeks old, authentically sacred spaces with a view to shaping them to its own purposes, in short to exploit them (Fig. 69).

The Atmosphere of the Sacred “Kunstreligion” and the Romantics

As mentioned at the outset, the experience of passage from the material to the spiritual, that is, the experience of transcendence, is no longer sought in religion but in other areas. This inclination goes back further than the tendencies identified by Thomas Luckmann in the early 1960s. As early as the transition from the 18th to the 19th century, a circle of young German poets sought to place religion and art on equal footing, arguing that, in both, the intensely personal relates to the overwhelming universal in a form of revelation, provoking a “you must change your life” response in the viewer. The Protestant theologian Friedrich Daniel Ernst Schleiermacher described this stimulation of religious feeling through aesthetics as “Kunstreligion” (art-as-religion). In his writings “On Religion: Speeches to its Cultured Despisers” (1799), this stirring preacher wrote that “religion and art stand together like kindred beings, whose inner affinity, though mutually unrecognised and unsuspected, appears in various ways.” That art could make people religious was, of course, a false impression. Of the two “spirits”, religion gradually grew weaker and art stronger. No one felt this more decidedly than Friedrich Nietzsche. In his aphorisms entitled “Human, All too Human” (1878) he writes, that the “growth of the Enlightenment” has sown “fundamental mistrust” and discredited religion. Art takes its place: “It takes over many feelings and moods engendered by religion, lays them to its heart, and itself becomes deeper.”

Atmosphere as Desideratum

With the developments of the 20th century, the talk of “sensus numinis” and “hierophany” has waned in significance and “Kunstreligion” has lost much of its enthralling innocence. There is reason enough to label it a delusion of aesthetes, which ultimately served the propaganda of politics as a repressive “Gesamtkunstwerk”. Similarly, there is reason enough to separate religious and aesthetic experience. Nevertheless the works of Otto, Eliade and Schleiermacher make worthwhile reading for architects. The considerations in their writings of the sacred in space and the function of aesthetics with regard to religion is instructive in the search for an answer to the question: What makes a space in a church into a space of the church?



70-72 Eduardo Chillida, cave project inside Mount Tindaya, Fuerteventura, Canary Islands, 1996, isometric projection of the cavern with the two open light shafts and model of the interior with a simulation of different daylight

From a Vitruvian standpoint, the only aspect of relevance here is “venustas”. For a building to be used as a place of religious worship, it seems that it need only exhibit a certain grace – regardless of whether we regard it as holy or not! To use a word that first came about in the 19th century, it should be “sacral”. That is not changed by the experience that the production of atmosphere through architecture often leads to a false sense of pathos and drama, resulting simply in kitsch – partly because on the one hand architects tend to underestimate the subjective-psychic component of atmosphere, and on the other overestimate its objective-physical component. However, only those who view church architecture from a purely functionalist, or, to put it polemically, orthodox Lutheran viewpoint, would deny the role of atmosphere as desideratum.

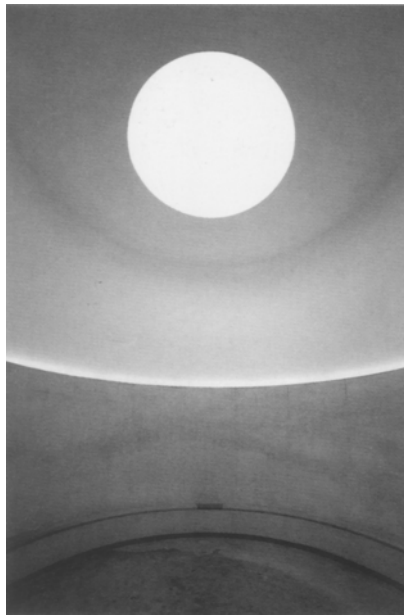
The Contribution of Art

Let us take a look at art and its means of creating atmosphere, leaving aside for the moment more recent examples of quasi-sacral museums such as Peter Märkli’s La Congiunta Museum and Foundation in Giornico, Switzerland (1992), which resembles an abstract, concrete Roman basilica, or Tadao Ando’s Langen Foundation Museum near to Insel Hombroich (2004), which employs a three stage-approach – an assembly courtyard, a descent into dark depths and an ascent into the light – to create an appropriate mood. Instead, let us examine artists whose work is attributed to Minimal Art, Arte Povera and Land Art. In many cases, their explorations of space, emancipated from functional requisites, produce forms that operate using religious phenomena, sometimes without the artists’ knowledge. Extreme materiality in solid, heavy, opaque chthonic objects on the one hand, or extreme immateriality as loose, light, lucid, spheroid objects on the other: both with the intent of emphatic immersion rather than distanced reception, for engaging with rather than comprehending. Many of these spaces – in Richard Long’s or Chris Drury’s Land Art it is often little more than the making of a place with stones and driftwood – avoid urban contexts and express themselves through earth, water, fire, air and light. If one has to describe them verbally, one might use adjectives such as anonymous, autonomous, holistic, enigmatic, elemental or monumental. All of these places, to quote a passage from Walter Benjamin’s “Arcades Project”, oscillate between trace and aura: “The trace is an appearance of closeness, no matter how distant the thing that leaves it behind. Aura is the appearance of distance, no matter how close the thing that calls it forth. In the trace we gain possession of the thing; in the aura, it takes possession of us.”

Among the spaces that convey something of such closeness and distance, and with them bring forth a semblance of the sacred, there are some with a lot and some with little architecture. With regard to atmosphere and aura, interested architects can learn something from Eduardo Chillida’s cave project for Mount Tindaya on Fuerteventura, Canary Islands (1996), or from James Turrell’s tunnels and caverns in and around the crater of Roden Volcano in Arizona, USA (2006), or from Elizabeth Diller and Ricardo Scofidio’s foggy cloud structure that goes by the name of the “Blur Building” on Neuenburger Lake near Yverdon-les-Bains, Switzerland (2002), or from Gerhard Merz’s illuminated pavilion in Hanover’s main freight railway station (2000). The central themes for Chillida are earth and light, for Turrell sky and light, for Diller and Scofidio water and air, and for Merz the intensification of classical modernism in glass, neon, steel and concrete.

Eduardo Chillida’s Cavern in Montaña Tindaya

With a height of 401 metres, Montaña Tindaya, long regarded as sacred, towers over a desolate landscape not far from the Atlantic. In the trachyte of the shallow cone of the mountain, Eduardo Chillida proposed an approximately 80 metre long tunnel leading to a nearly 50 metre long cavern inside the mountain. Two shafts bored from the surface vertically into the mountain were intended to shed both direct and diffuse light, day and night, into the rust-brown interior of the cavern, intensified by its emptiness and silence. Chillida spoke of his project as a sculpture, comparing his work with the creation of megaliths such as Stonehenge or Avebury, which are said to have served ritualistic purposes. The similarity of the cavern projects to pyramids and catacombs is undeniable (Figs. 70-72).



73-74 James Turrell, Skyspace Piz Uter, Zuoz, 2005, exterior and interior view

James Turrell's "Skyspaces"

While in Tindaya, the sun and the moon would have shed their light onto the floor and walls of the terrestrial architecture, illuminating the texture of the stone in all its glory, the space under Turrell's numerous "skyspaces" serve only to facilitate a view skywards. Floors, walls and ceiling are all uniformly coated with a matte colour. The openings of the "skyspaces" are circular, oval, square or rectangular in form. They are neither shallow boxes nor baroque lanterns, but just frames with thin, sharply defined edges. They create the impression that a section of the atmosphere is present on the ceiling, that the heavens are on earth, that the distant has been brought closer, as if one could touch it with one's hands. In some respects, a skyspace resembles a "Ganzfeld" (total field), an indistinct homogenous surface of light without focus or contour located in a room utterly free of any other visual or acoustic phenomena. The sensory deprivation of the viewer prepares him for another form of perception: whether in "Elliptic Ecliptic" in Tremeneheere, UK (1999), a building made of wood and metal erected on the occasion of the last solar eclipse; whether in "Piz Uter" in Zuoz, Switzerland (2005), a building made of concrete and stone rubble that stands next to the Hotel Castell or in the "Eye of Roden Crater" in the desert landscape of Arizona, USA (2006), a huge complex of nine skyspaces that is regarded as Turrell's magnum opus (Fig. 73-74).

Elizabeth Diller and Ricardo Scofidio's "Blur Building"

Elizabeth Diller and Ricardo Scofidio's nebulous architecture has a very different character to the preceding works by Chillida and Turrell: the term "architecture" is hardly applicable to this "building". Built for the "Swiss Expo.02", its physical construction consisted of a light steelwork frame raised on stilts above Neuenburger Lake. Measuring 100 by 60 by 20 metres with a smaller lower platform and a larger mid-level platform connected by a stair and lift, it was reachable from the shore via a narrow fibreglass bridge. 31,400 minute nozzles sprayed a fine mist of water, which together with the air over the lake joined to form a fog that enveloped the steel structure entirely in whiteness, which quickly came to be known as a "cloud" or "wondercloud". Completely without mass or envelope or any solid form, the "Blur Building" entirely blurs all sensation of left, right, front, back, up and down. "The Economist" referred to it as "Heaven's Gate"; according to the US journal "Architecture", Diller and Scofidio had "slipped into the role of God" and brought "a slice of heaven back to earth". The actual experience of the Blur Building is more like that of purgatory. Enveloped in a thin blue coat, visitors could trek through the mist until finding their way to the "Angel Bar" on the third upper gallery, where they could refresh themselves with expensive pure bottled water from the likes of Perrier and San Pellegrino.

Gerhard Merz's Pavilion

The last of the projects that experiment with the phenomenon of near and far is a pavilion by Gerhard Merz, built on the occasion of the "Expo 2000" in Hanover's former main freight station. While Chillida, Turrell, and in a sense Diller and Scofidio, all negate the technical, Merz displays industrially fabricated materials explicitly. His use of large-format glass panes and steel profiles was part of his programme to refine acquired materials, a continuation of the achievements of the 20th century. His pavilion in the old railway building – its ramp functioning as a podium, its hall as baldachin – measured precisely 42.50 by 18.31 by 3.58 metres and was a subtle criticism of the frenzied circus grounds of the Expo. Five bands of light containing thousands of neon tubes immersed the external open pavilion with its 7:3 proportions and the inner closed pavilion with its 5:1 proportions in an almost painfully bright white and greenish light. Visitors wandering along the grey concrete floor of the corridors running along each side of the milky-white, centrally arranged rectangular forms, saw the cuboids through the glass panels of the outer wall first doubled, then tripled. The inner, opaque pavilion appears to force its way into the empty railway station, displacing all signs of work and transport. A product of reflection and transparency, it dips all that is around it – the patches, puddles and cracks on the deserted platforms – in a thin haze. Eloquent observers interpreted the temporary insertion as



75 Gerhardt Merz, Pavilion. Hanover, 2000

a celebration of reason, a mixture of rationalism and suprematism, an homage to Ludwig Mies van der Rohe and Kasimir Malevich. The dominant insertion presented itself as a secret without a secret. However, its pure emptiness and empty purity also offered more: the semblance of the sacred as a *mysterium tremendum et fascinans* (Fig. 75).

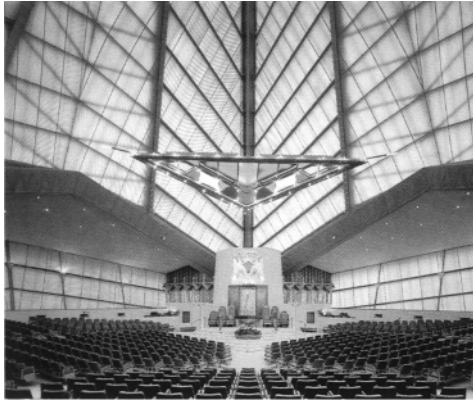
The architecture of the artists presented here embodies the character of shrines and altars. One appears to be in waiting for the celebration of a ceremony. It is this atmosphere that may offer the stray believers – those who avoid the objectification and discipline of denomination – a beautiful, perhaps eerily beautiful domicile. It is this aura that is capable of captivating those who are “religiously musical”, to recall Max Weber’s phrase. The meditative architecture of these “Houses of Stillness” provides an introduction to church architecture. But, however great one’s appreciation of atmosphere and aura is, architects should not forget that a church is not a work of art. No congregation is served by an overly aestheticised compulsion to appreciate the sacred in space, not least given the fact that the notion of the church as a sacred building does not bear theological scrutiny.

Otto Bartning entitled the penultimate chapter of his book “Vom neuen Kirchbau” (On New Church Architecture, 1919), “Sign of the Times”. In it he asks, “Is the longing for sacred buildings perhaps just a longing for architecture, an aesthetic avatism? Will the new church also have a new congregation? Are we perhaps nurturing the seed just for the sake of the skin or do we really want the skin without the seed?” And then, more unequivocally: “Only where a seed is germinating will a skin form organically, only where there is an idea, will a living form arise.”

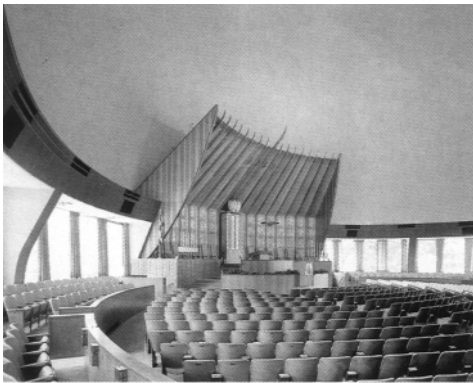
- Abruzzini, Eugenio:** Architecture, in: Sartore, Domenico, Triacca, Achille M. (Ed.): Dictionnaire Encyclopédique de la Liturgie, Vol. IA - L, Turnhout 1992, pp. 69-
- Acken, Johannes van:** Christozentrische Kirchenkunst. Ein Entwurf zum liturgischen Gesamtkunstwerk, Gladbeck 1922
- Adam, Adolf:** Wo sich Gottes Volk versammelt. Gestalt und Symbolik des Kirchenbaus, Freiburg im Breisgau 1984
- Adam, Adolf:** Grundriss Liturgie, Freiburg im Breisgau 1985, XXI. Kapitel, Der liturgische Raum (Kirchenbau), pp. 296-
- Architektur und Wettbewerbe, no. 20/1956,** Kirchen und Gemeindezentren, no. 27/1959, Kirchen von heute, no. 44/1965, Kirchliche Gemeindezentren, no. 54/1968, Kirchen, no. 92/1977, Kommunale und kirchliche Zentren, no. 115/1983, Gotteshäuser, Gemeindehäuser, Klöster, Friedhöfe, no. 133/1988, Die Kirche als Bauherr, no. 174/1998, Bauen für die Kirche, no. 192/2002, Friedhöfe Krematorien
- Architettura europea 2001.** Una chiesa per Milano. Concorso europeo per la progettazione di un nuovo complesso parrocchiale a Milano Quarto Oggiaro, Casabella, no. 692/2001, supplement
- Architettura e spazio sacro nella modernità,** exhibition catalogue, Milan 1992
- Assmann, Jan:** Die Mosaikische Unterscheidung. Oder der Preis des Monotheismus, Munich and Vienna 2003
- Auerochs, Bernd:** Die Entstehung der Kunstreligion, Göttingen 2006, pp. 91-. pp. 438-
- Baecker, Dirk (Ed.):** Kapitalismus als Religion, Berlin 2003
- Barañano, Kosme María, Fernández Ordóñez, Lorenzo (Ed.):** Montaña Tindaya. Eduardo Chillida, exhibition catalogue, Fuerteventura 1996
- Bartning, Otto:** Vom neuen Kirchbau, Berlin 1919
- Bartning, Otto:** Vom Raum der Kirche. Aus Schriften und Reden, Braunschweig 1958
- Benjamin, Walter:** Das Passagen-Werk, in: Tiedemann, Rolf, Schwepenhäuser, Hermann (Ed.): Walter Benjamin. Gesammelte Schriften, Vol. V.1, Frankfurt am Main 1982, pp. 560-61
- Beny, Roloff, Gunn, Peter:** The Churches of Rome, London 1981
- Bergthaler, Wolfgang (Ed. et al.):** Funktion und Zeichen. Kirchenbau in der Steiermark seit dem II. Vatikanum, Graz and Budapest 1992
- Biedrzyński, Richard:** Kirchen unserer Zeit, Munich 1958
- Böhme, Gernot:** Atmosphäre. Essays zur neuen Ästhetik, Frankfurt am Main 1995, Abschnitt Atmosphäre als Grundbegriff einer neuen Ästhetik, pp. 21-
- Böhme, Gernot:** Architektur und Atmosphäre, Munich 2006, Abschnitt Atmosphären kirchlicher Räume, pp. 139-
- Böhme, Hartmut:** Architektur im postreligiösen Zeitalter, in: Der Architekt, no. 3/2001, pp. 16-
- Bourdieu, Pierre:** Piété religieuse et dévotion artistique. Fidèles et amateurs d'art à Santa Maria Novella, in: Actes de la recherche en sciences sociales, no. 105/1994, pp. 71-
- Brandenburg, Hugo (et al.):** Kirchenbau, in: Müller, Gerhard (Ed.): Theologische Realenzyklopädie, Vol. XVIII Katechumenat / Katechumenen - Kirchenrecht, Berlin and New York 1989, pp. 421-
- Bredenkamp, Horst:** Sankt Peter in Rom und das Prinzip der produktiven Zerstörung. Bau und Abbau von Bramante bis Bernini, Berlin 2000
- Brereton, Joel P.:** Sacred Space, in: Eliade, Mircea (Ed.): The Encyclopedia of Religion, Vol. 12, New York and London 1987, pp. 526-
- Bright, Richard:** James Turrell Eclipse, London and Ostfildern-Ruit 1999
- Brock, Bazon:** Kunstreligion und Aufklärungspathos. Zwischen Kunst als Kirche und Kirchenkunst, in: Blume, Anna (Ed.): Was bleibt von Gott? Beiträge zur Phänomenologie des Heiligen und der Religion, Freiburg im Breisgau and Munich 2007, pp. 187-
- Brülls, Holger:** Johannes van Acken, in: Roloff, Hans-Gert (Ed.): Die Deutsche Literatur. Biographisches und bibliographisches Lexikon, Reihe VI Die deutsche Literatur von 1890 bis 1990, Abteilung A Autorenlexikon, Vol. 1, Bern 1991, pp. 152-
- Brülls, Holger:** Neue Dome. Wiederaufnahme romanischer Bauformen und antimoderne Kulturkritik im Kirchenbau der Weimarer Republik und der NS-Zeit, Ph.D. thesis, Berlin and Munich 1994
- Bruschi, Arnaldo (Ed.):** Il tempio della consolazione a Todi, Milan 1991
- Bürgel, Rainer, Nohr, Andreas:** Spuren hinterlassen. 25 Kirchbautage seit 1946, Hamburg 2005
- Caillois, Roger:** Man and the Sacred, Westport, Connecticut 1980
- Canon Law Society of Great Britain and Ireland (Ed.):** The Canon Law, Dublin 1995, Can. 934, 936, 938, 940, 1205, 1210-1212, 1214-1229, 1235-1239
- Carlebach, Joseph:** Die Architektur der Synagoge, in: Gillis-Carlebach, Miriam (Ed.): Joseph Carlebach, Ausgewählte Schriften Vol. II, Hildesheim and New York 1982, pp. 1229-
- Carpicci, Alberto Carlo:** La fabbrica di San Pietro. Venti secoli di storia e progetti, Florence 1983
- Catoir, Barbara:** Leere und Fülle, Meer und Gestirne. Chillidas Tindaya-Projekt, in: Schierz, Kai Uwe, Opitz, Silke (Ed.): Unaussprechlich Schön. Das mystische Paradoxon in der Kunst des 20. Jahrhunderts, exhibition catalogue, Cologne 2003, pp. 198-
- Christ-Janer, Albert, Mix Foley, Mary:** Modern Church Architecture. A Guide to the Form and Spirit of 20th Century Religious Buildings, New York 1962
- Colpe, Carsten:** Die wissenschaftliche Beschäftigung mit "dem Heiligen" und "das Heilige" heute, in: Kamper, Dietmar, Wulf, Christoph (Ed.): Das Heilige. Seine Spur in der Moderne, Frankfurt am Main 1987, pp. 33-
- Colpe, Carsten:** Über das Heilige. Versuch, seiner Verkenntung kritisch vorzubeugen, Frankfurt am Main 1990
- Cramer, Ned, Vitali, Massimo:** All Natural. Diller and Scofidio's Blur Building for the Swiss Expo 02 in Yverdon-les-Bains, in: Architecture, no. 7/2002, title, pp. 53-
- Crosbie, Michael J.:** Architecture for the Gods, Mulgrave 1999
- Crosbie, Michael J.:** Architecture for the Gods, Book II, Mulgrave 2002
- Crosbie, Michael J.:** Houses of God, Religious Architecture for a New Millennium, Mulgrave 2006
- Debuyt, Frédéric:** Dix petites églises pour aujourd'hui. Suivi de Philosophie de la promenade, Ottignies 1999
- De Righi, Roberta:** Roden Crater. James Turrell, in: Baumeister, no. 8/2001, pp. 42-
- Diller, Elizabeth:** Blur / Babble, in: Davidson, Cynthia C. (Ed.): Anything, Cambridge and London 2001, pp. 132-
- Disse, Rainer:** Kirchliche Zentren, Entwurf und Planung Vol. 24, Munich 1974
- Eliade, Mircea:** The Sacred and the Profane, New York and Evanston 1961
- Erne, Thomas:** Spielräume des Glaubens. Zur Bedeutung des Raums für eine ganzheitliche Gottesdienstpraxis, in: Ta Katoptrizomena. Magazin für Theologie und Ästhetik, no. 16/2002, www.theomag.de/16/te3.htm
- Failing, Wolf-Eckart:** "In den Trümmern des Tempels". Symbolischer Raum und Heimatbedürfnis als Thema der Praktischen Theologie. Eine Annäherung, in: Pastoraltheologie, no. 8/1997, pp. 375-
- Fischer, Ole W.:** "Alle reden vom Wetter ...". Atmosphärische Räume zwischen kritischer Lektüre und projektiver Praxis, in: Arch plus, no. 178/2006, pp. 76-
- Foos, Peter:** Gerhard Merz. Passage: Logik und Sensation, Hanover 2000
- Foucault, Michel:** Les Hétérotopies, in: Foucault, Michel: Les Hétérotopies. Le Corps Utopique, Frankfurt am Main 2005, pp. 37-
- Fredericksen, Eric:** Roden Crater, in: Architecture, no. 4/2002, pp. 90-
- Freigang, Christian (et al.):** Kirchenbau, in: Betz, Hans Dieter (Ed. et al.): Religion in Geschichte und Gegenwart. Handwörterbuch für Theologie und Religionswissenschaft, Vol. 4 I - K, Tübingen 2001, cc. 1059-
- Frings, Marcus (Ed.):** Die Sternkirche von Otto Bartning. Analyse Visualisierung Simulation, Weimar 2002
- Fujiki, Takao (Ed.):** Religious Facilities. New Concepts in Architecture and Design, Tokyo 1997
- Gehlen, Rolf:** Raum, in: Cancik, Hubert (Ed. et al.): Handbuch religionswissenschaftlicher Grundbegriffe, Vol. IV Kultbild - Rolle, Stuttgart 1998, pp. 386-. pp. 391-
- Gehring, Ulrike:** Bilder aus Licht. James Turrell im Kontext der amerikanischen Kunst nach 1945, Heidelberg 2006
- Gerhards, Albert (Ed. et al.):** Communio-Räume. Auf der Suche nach der angemessenen Raumgestalt katholischer Liturgie, Regensburg 2003
- Gieselmann, Reinhard:** Neue Kirchen, Stuttgart 1972
- Gil, Paloma:** El templo del siglo XX, Barcelona 1999
- Der Glaube und der alte Ritus,** articles by Durs Grünbein, Ulla Hahn, Eckhard Henscheid, Sibylle Lewitscharoff, Martin Mosebach, Harald Schmidt, Robert Spaemann, Martin Walser, Hans Zender, in: Süddeutsche Zeitung, 7. 3. 2007, p. 15
- Götz, Wolfgang:** Zentralbau und Zentralbautendenz in der gotischen Architektur, Berlin 1968
- Grimal, Pierre, Rose, Caroline:** Die Kirchen Roms. Glanzvolle Symbole der Ewigkeit, Stuttgart and Zurich 1997
- Gurlitt, Cornelius:** Handbuch der Architektur. 4. Teil Entwerfen, Anlage und Einrichtung der Gebäude. 8. Halbband Kirchen, Denkmäler und Bestattungsanlagen. Heft 1 Kirchen, Stuttgart 1906
- Hancke, Hansjochen:** Die Torgauer Schloßkirche und die Burgkapelle St. Martin, in: Schock-Werner, Barbara (Ed.): Burg- und Schloßkapellen. Kolloquium des Wissenschaftlichen Beirats der Deutschen Burgenvereinigung, Marksburg / Braubach and Stuttgart 1995, pp. 133-
- Heathcote, Edwin, Spens, Jona:** Church Builders, London 1997
- Heaven's gate.** Experiments in architecture, in: The Economist, 24. 8. 2002, pp. 63-64
- Heering, Michael:** Auferstehungskirche Essen, Kirchenführer, Lindenberg 1998
- Hölscher, Andreas:** Bilder der Stadt. Eine neutestamentliche Relecture, in: Herzig, Andreas, Sauermost, Burkard (Ed.): Unterm Himmel über Berlin. Glauben in der Stadt, Berlin 2001
- Hoffmann, Volker (Ed.):** Der geometrische Entwurf der Hagia Sophia in Istanbul. Bilder einer Ausstellung, Bern 2005
- Humphrey, Caroline, Vitebsky, Piers:** Sacred Architecture, London 2003
- Hurley, Richard, Cantwell, Wilfrid:** Contemporary Irish Church Architecture, Dublin 1985
- Jetsonen, Jari, Jetsonen, Sirkkalisa:** Sacred Spaces. Modern Finnish Churches, Helsinki 2003
- Kahle, Barbara:** Deutsche Kirchenbaukunst des 20. Jahrhunderts, Darmstadt 1990
- Kidder Smith, George Everard:** The New Churches of Europe, London 1964
- Knapp, Gottfried:** Arenen der fließenden Farben. Zwei exemplarische Lichtkunstwerke des Amerikaners James Turrell in den Schweizer Ortschaften Zug und Zuoz, in: Süddeutsche Zeitung, 24. 1. 2006, p. 15
- Kraft, Sabine:** Räume der Stille, Marburg 2007
- Krause, Hans-Joachim:** Die Schlosskapelle, in: Stockhausen, Tilman von (Ed.): Torgau. Stadt der Renaissance, Dresden 2003, pp. 38-
- Küster, Ingrid:** Otto Bartning als Kirchbaumeister, Ph.D. thesis, Bonn 1982
- Kunstverein Hannover (Ed.):** Gerhard Merz, exhibition catalogue, Hanover 2000
- Kurrent, Friedrich (Ed.):** Kathedrale unserer Zeit. Diplomarbeit nach dem Sommersemester 1995, exhibition catalogue, Salzburg and Munich 1997
- Langmaack, Gerhard:** Evangelischer Kirchenbau im 19. und 20. Jahrhundert. Geschichte Dokumentation Synopse, Kassel 1971
- Laurent, René:** Promenade à travers les temples de France, Montpellier 1996
- Lehnerer, Thomas:** Die Kunsttheorie Friedrich Schlegels, Stuttgart 1987, pp. 338-
- Lienhardt, Conrad (Ed.):** Ottokar Uhl Werk Theorie Perspektiven, Regensburg (n.d.) 2000
- Lienhardt, Conrad (Ed.):** Sakralraum im Umbruch. Kirchenbau der Katholischen Kirche in Oberösterreich seit 1948, Regensburg 2004
- Luckmann, Thomas:** The Invisible Religion. The Problem of Religion in Modern Society, New York 1967
- Ludwig, Matthias, Mawick, Reinhard (Ed.):** Gottes neue Häuser. Kirchenbau des 21. Jahrhunderts in Deutschland, Frankfurt am Main 2007
- Luther, Martin:** Kirchenpostille 1522, in: D. Martin Luthers Werke. Kritische Gesamtausgabe, Vol. 10/1/1, Weimar 1910, p. 252
- Luther, Martin:** Predigt am 17. Sonntag nach Trinitatis, bei der Einweihung der Schloßkirche zu Torgau gehalten, in: D. Martin Luthers Werke, Kritische Gesamtausgabe, Vol. 49, Weimar 1913, pp. 588-
- Lyotard, Jean-François:** Das Erhabene und die Avantgarde, in: Merkur, no. 2/1984, pp. 151- Also in: Kunstforum International, no. 75/1984, pp. 121-
- Lyotard, Jean-François:** Der Augenblick, Newman, in: Baudson, Michel (Ed.): Zeit. Die vierte Dimension der Kunst, exhibition catalogue, Weinheim 1985, pp. 99-. Also in: Barck, Karlheinz (Ed. et al.): Aisthesis. Wahrnehmung heute oder Perspektiven einer anderen Ästhetik, Leipzig 2002, pp. 358-

- MacFarlane, Donald:** Pierre Cuyppers and the "Catholic Style" in the Netherlands, Master of Arts Thesis, unpublished manuscript, Freie Universität Berlin 2003
- Machado, Rodolfo, el-Khoury, Rodolphe:** Monolithic Architecture, in: Machado, Rodolfo, el-Khoury, Rodolphe (Ed.): Monolithic Architecture, exhibition catalogue, Munich and New York 1995, pp. 10-
- Magirius, Heinrich:** Die Dresdner Frauenkirche von George Bähr. Entstehung und Bedeutung, Berlin 2005
- Maguire, Robert, Murray, Keith:** Modern Churches of the World, London and New York 1965
- Mertin, Andreas:** Freiräume(n)! Zur Diskussion um den religiösen Raum, in: Ta Katoptrizomena, Magazin für Theologie und Ästhetik, no. 16/2002, www.theomag.de/16/am51.htm
- Mertin, Andreas:** Von der Utopie zur Heterotopie. Das Christentum als Muse von Utopien?, in: Ta Katoptrizomena, Magazin für Theologie und Ästhetik, no. 20/2002, www.theomag.de/20/am57.htm
- Mertin, Andreas:** Kirchenbau als Freiraum. 10 Thesen zum religiösen Raum, in: Kunst und Kirche, no. 3/2005, pp. 166-
- Meyer, Hans Bernhard:** Was Kirchenbau bedeutet. Ein Führer zu Sinn, Geschichte und Gegenwart, Freiburg im Breisgau 1984
- Molderings, Herbert:** Gerhard Merz. Ein Künstler des Agnostizismus, Hannover 2000
- Mosebach, Martin:** Häresie der Formlosigkeit. Die römische Liturgie und ihr Feind, Munich 2007
- Müller, Ernst:** Religion / Religiosität, in: Barck, Karlheinz (Ed. et al.): Ästhetische Grundbegriffe. Historisches Wörterbuch in sieben Bänden, Vol. 5 Postmoderne - Synästhesie, Stuttgart and Weimar 2003, pp. 227-
- Murphy, Diana (Ed.):** Blur. The Making of Nothing. Diller and Scofidio, New York 2002
- Nietzsche, Friedrich:** Menschliches, Allzumenschliches. Ein Buch für freie Geister, Vol. 1, in: Colli, Giorgio, Montinari, Mazzino (Ed.): Nietzsche Werke, Kritische Gesamtausgabe, Vol. 4/2, Berlin 1967, no. 150, p. 146
- Nitschke, Marcus:** Heilige Zeichen – heilige Räume? Symbole im interreligiösen Kontext, in: Kunst und Kirche, no. 2/2000, pp. 78-
- Noever, Peter (Ed.):** James Turrell. The Other Horizon, exhibition catalogue, Ostfildern-Ruit 2001
- Nohr, Andreas:** Vom Umgang mit Kirchen. Streit um die Pforten des Himmels?, Hamburg 2006
- Die 48 Notkirchen in Deutschland,** Heidelberg 1949
- Novalis: Die Christenheit oder Europa,** in: Mühl, Hans Joachim, Samuel, Richard (Ed.): Novalis. Werke, Tagebücher und Briefe Friedrich von Hardenbergs, Vol. 2 Das philosophisch-theoretische Werk, Munich and Vienna 1978, pp. 731-
- Nuove chiese italiane.** 22 progetti per nuove chiese commissionati dalla conferenza episcopale italiana. Concorsi per nuovi complessi parrocchiali nelle diocesi di Milano, Perugia e Lecce 1998-1999, Casa Beila, no. 671/1999, supplement
- Nuove chiese italiane due.** 26 progetti per nuove chiese commissionati dalla conferenza episcopale italiana. Concorsi per nuovi complessi parrocchiali nelle diocesi di Bergamo, Porto - Santa Rufina (Roma) e Potenza - Muro Lucano - Marsico Nuovo 1999-2000, Casabella, no. 682/2000, supplement
- Nuove chiese italiane tre.** 24 progetti per nuove chiese commissionati dalla conferenza episcopale italiana. Concorsi per nuovi complessi parrocchiali nelle diocesi di Modena - Nonantola, Foligno e Catanzaro - Squillace 2000-2001, Casabella, no. 694/2001, supplement
- Orte Architekturnetzwerk Niederösterreich,** Nitschke, Marcus (Ed.): Raum und Religion. Europäische Positionen im Sakralbau, Deutschland, Österreich, Polen, exhibition catalogue, Salzburg and Munich 2005
- Otto, Rudolf:** The Idea of the Holy. An Inquiry into the Non-rational Factor in the Idea of the Divine and its Relation to the Rational, Oxford 1977
- Project Russia,** no. 22/2001, Religion
- Rast, Rudolf (Ed.):** Architecture. Expo. 02. Schweizerische Landesausstellung, Basel 2003, pp. 92-, pp. 140-, pp. 374-, p. 418-, p. 483, p. 488
- Religious Buildings.** An Architectural Record Book, New York 1979
- Restorff, Jörg:** Eine Bergkapelle, geweiht dem Licht. James Turrells "Skyspace Piz Uter" für das Hotel Castell in Zuoz, in: Kunstzeitung, no. 116/2006, p. 30
- Reymond, Bernard:** L'Architecture religieuse des protestants. Histoire, caractéristiques, problèmes actuels, Geneva 1996
- Reymond, Bernard:** D'où le temple Paradis (1564-1567) tenait-il son modèle?, in: Bulletin de la Société de l'Histoire du Protestantisme Français, Vol. 145/1999, pp. 263-
- Richardson, Phyllis:** New Sacred Architecture, London 2004
- Richter, Klemens:** Kirchenräume und Kirchräume. Die Bedeutung des Kirchenraums für eine lebendige Gemeinde, Freiburg im Breisgau 1998
- Roberts, Nicholas W.:** Building Type Basics for Places of Worship, Hoboken/New Jersey 2004
- Robin, Suzanne:** Eglises modernes. Evolution des édifices religieux en France depuis 1955, Paris 1980
- Rosponi, Cristiano, Rossi, Giampaolo (Ed.):** Riconquistare lo spazio sacro. Riscoprire la tradizione nell'architettura liturgica del XX secolo, exhibition catalogue, Rome 1999
- Rossmann, Andreas:** Nach sechzig Jahren. Kölner Domplombe wird besichtigt, in: Frankfurter Allgemeine, 16. 1. 2004, p. 38
- Santifaller, Enrico:** Dornbuschkirche. Rück-, Um- und Neubau in Frankfurt/Main, in: Bauwelt, no. 26/2005, pp. 24-
- Schleiermacher, Friedrich:** On Religion. Speeches to its Cultural Despisers, Cambridge 1996
- Schnell, Hugo:** Der Kirchenbau des 20. Jahrhunderts in Deutschland. Dokumentation Darstellung Deutung, Munich and Zurich 1973
- Schwarz, Rudolf:** Erneuerung des Kirchenbaus?, in: Die Form, no. 23/22/1930, pp. 545-
- Schwarz, Rudolf:** Liturgie und Kirchenbau. Eine Gastvorlesung an der Technischen Hochschule in Aachen, in: Baukunst und Werkform, no. 2/1935, pp. 87-
- Schwarz, Rudolf:** Architektur als heiliges Bild. Vortrag beim 77. Deutschen Katholikentag Köln 1956, in: Baukunst und Werkform, no. 3/1957, pp. 150-
- Schwarz, Rudolf:** The Church Incarnate. The Sacred Function of Christian Architecture, Chicago 1958
- Schwarz, Rudolf:** Kirchenbau. Welt vor der Schwelle, Heidelberg 1960
- Schwebel, Horst:** Die Kunst und das Christentum. Geschichte eines Konflikts, Munich 2002, pp. 173-
- Schwebel, Horst:** Kirchenbau, heiliger Raum und architektonische Gestalt, in: Ta Katoptrizomena, Magazin für Theologie und Ästhetik, no. 42/2006, www.theomag.de/42/hs4.htm
- Schwebel, Horst (Ed.):** Über das Erhabene im Kirchenbau, Symposium, Münster 2004
- Schwebel, Horst, Ludwig, Matthias (Ed.):** Kirchen in der Stadt, Vol. 1 Erfahrungen und Perspektiven, Marburg 1994
- Schwebel, Horst, Ludwig, Matthias (Ed.):** Kirchen in der Stadt, Vol. 2 Beispiele und Modelle, Marburg 1996
- Seidl, Ernst (Ed.):** Lexikon der Bautypen. Funktionen und Formen der Architektur, Stuttgart 2006
- Spangenberg, Peter M.:** Aura, in: Barck, Karlheinz (Ed. et al.): Ästhetische Grundbegriffe. Historisches Wörterbuch in sieben Bänden, Vol. 1 Absenz - Darstellung, Stuttgart and Weimar 2000, pp. 400-
- Stanzl, Günther:** Längsbau und Zentralbau als Grundthemen der frühchristlichen Architektur. Überlegungen zur Entstehung der Kuppelbasilika, Vienna 1979
- Steger, Bernhard:** Vom Bauen. Zu Leben und Werk von Ottokar Uhl, Vienna 2002, p. 120, pp. 125-, p. 245
- Stegers, Rudolf:** Räume der Wandlung. Wände und Wege. Studien zum Werk von Rudolf Schwarz, Brunswick and Wiesbaden 2000
- Stegers, Rudolf:** Fluchtpunkt Baustoff. Minimalismus zwischen Architektur und Religion, in: Centrum. Jahrbuch Architektur und Stadt 2001/2002, Darmstadt 2001, pp. 140-
- Stock, Alex:** Zwischen Tempel und Museum. Theologische Kunstkritik. Positionen der Moderne, Paderborn 1991
- Stock, Wolfgang Jean (Ed.):** European Church Architecture 1950-2000, Munich 2002
- Stock, Wolfgang Jean:** Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004
- Stock, Wolfgang Jean:** European Church Architecture 1900-1950. Towards Modernity, Munich 2006
- Strasser, Peter:** Geborgenheit im Schlechten. Über die Spannung zwischen Kunst und Religion. Essay, Vienna 1993
- Tillich, Paul:** Kult und Form. Vortrag, gehalten bei der Eröffnung der Ausstellung des Kunst-Dienstes in Berlin am 10. November 1930, in: Die Form, no. 23/24/1930, pp. 578-. Also in: Kunst und Kirche, no. 3/1986, p. 186-. Also in: Paul Tillich. Hauptwerke, Vol. 2 Kulturphilosophische Schriften, Berlin and New York 1990, pp. 127-
- Tillich, Paul:** Systematic Theology, Vol. 1, London 1953
- Torgauer Geschichtsverein (e.V.),** Evangelische Kirchengemeinde Torgau (Ed.): Die Schloßkirche zu Torgau. Beiträge zum 450jährigen Jubiläum der Einweihung durch Martin Luther am 5. Oktober 1544, Torgau 1994
- Tscherkes, Bohdan:** Genetische manipulative. Moderne architectuuren sculptuur in Oekraïne, in: Archis, no. 2/2000, pp. 26-
- Turner, Harold W.:** From Temple to Meeting House. The Phenomenology and Theology of Places of Worship, The Hague 1979
- James Turrell.** Roden Crater, in: Lotus International, no. 114/2002, pp. 10-
- Tworuschka, Udo:** Was ist ein heiliger Ort? Deutungsansätze der Religionsphänomenologie, in: Kunst und Kirche, no. 2/2000, pp. 60-
- Untermann, Matthias:** Der Zentralbau im Mittelalter. Form Funktion Verbreitung, Darmstadt 1989
- Ursprung, Philip:** Weißes Rauschen. Elizabeth Dilleys und Ricardo Scofidios Blur Building und die räumliche Logik der jüngsten Architektur, in: Kritische Berichte, no. 3/2001, pp. 5-
- Ursprung, Philip:** Alles oder Nichts? Diller und Scofidios Blur Building, in: Lammert, Angela (Ed. et al): Topos Raum. Die Aktualität des Raumes in den Künsten der Gegenwart, Nuremberg 2005, pp. 99-
- Valentini, Giuseppe, Caronà, Giuseppe:** Domus ecclesiae. L'edificio sacro cristiano. Morfologia funzioni espressione, Bologna 1969
- Vattimo, Gianni:** After Christianity, New York 2002
- Volp, Rainer:** Liturgik. Die Kunst, Gott zu feiern, Vol. 1 Einführung und Geschichte, Gütersloh 1992, pp. 314-
- Wagner, Thomas:** Lunilux oder: Die Suche nach Erhabenheit. Das wahre Licht ist nicht von dieser Welt. Gerhard Merz im aufgelassenen Güterbahnhof und im Kunstverein Hannover, in: Frankfurter Allgemeine, 20. 6. 2000, p. 57. Also in: Wagner, Thomas: Freihändig. Wahrnehmungen der Kunst, Ostfildern 2006, pp. 87-
- Wang, Wilfried:** In Search of Aura, in: Machado, Rodolfo, el-Khoury, Rodolphe (Ed.): Monolithic Architecture, exhibition catalogue, Munich and New York 1995, pp. 62-
- Wein, Horst:** Interreligiöse Räume – eine aktuelle Bauaufgabe?, in: Kunst und Kirche, no. 2/2000, pp. 100-
- Werner, Christof Martin:** Sakralität. Ergebnisse neuzeitlicher Architekturästhetik, Zurich 1979
- Wessel, Klaus:** Dura-Europos, in: Wessel, Klaus (Ed.): Reallexikon zur byzantinischen Kunst, Vol. 1 Abendmahl - Dura-Europos, Stuttgart 1966, cc. 1217-
- Weyres, Willy, Barning, Otto:** Kirchen. Handbuch für den Kirchenbau, Munich 1959
- Widder, Erich:** Europäische Kirchenkunst der Gegenwart. Architektur, Malerei und Plastik, Linz 1968
- Williams, Guy:** Augustus Pugin versus Decimus Burton. A Victorian Architectural Duel, London 1990
- Wittmann-Englert, Kerstin:** Zelt, Schiff und Wohnung. Kirchenbauten der Nachkriegsmoderne, Lindenberg im Allgäu 2006
- Wöhler, Till:** Neue Architektur. Sakralbauten, Berlin 2005
- Zänker, Jürgen:** Die Wallfahrtskirche Santa Maria della Consolazione in Todi, Ph.D. thesis, Bonn 1971
- Zahner, Walter:** Rudolf Schwarz Baumeister der Neuen Gemeinde. Ein Beitrag zum Gespräch zwischen Liturgietheologie und Architektur in der Liturgischen Bewegung, Münsteraner Theologische Abhandlungen Vol. 15, Theol.D. thesis, Altenberge 1992
- Zahner, Walter:** Zukunft des deutschen Kirchenbaus. Teilvitalisierender Abriss als Alternative zum Totalverlust, in: Deutsche Bauzeitung, no. 2/2007, pp. 50-

Synagogue Architecture in the Recent Past and Present



1 Frank Lloyd Wright, Temple Beth Shalom, Elkins Park, Pennsylvania, 1957, interior view



2 Erich Mendelsohn, Park Synagogue, Cleveland, Ohio, 1953, interior view



3 Fritz Landauer, Synagogue, Plauen, 1930, interior view, virtual reconstruction

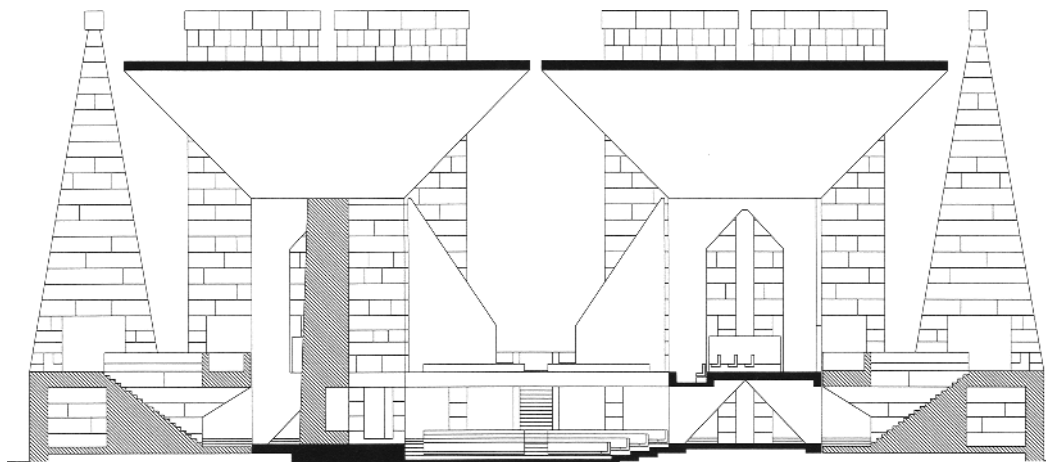
Frank Lloyd Wright's spectacular design for the Beth Shalom Temple in Elkins Park, Pennsylvania (1957), whose form resembles a glazed ark, heralded a greater awareness of modern synagogue architecture outside of Jewish circles. However, with the exception of its sculptural form, a late echo of the crystalline expressionism of Bruno Taut, it offered few new impulses for synagogue architecture. Like many synagogue spaces designed for the reformed ritual, the central prayer hall, which lacked a women's gallery, could have served equally well for Christian rituals (Fig. 1). Nevertheless, the prominence achieved by Wright's building encouraged other Jewish congregations to build symbolic synagogues, paving the way for others such as Percival Goodman, perhaps the most prolific synagogue architect of the 20th century.

Synagogue Architecture in the 20th Century

A year before Wright's synagogue in Elkins Park, Goodman had completed the Temple Beth Shalom in Miami Beach, Florida. Covered by a sort of celestial dome and illuminated by coloured glass arcade windows typical of the fifties, the synagogue makes reference to the large dome of Erich Mendelsohn's Park Synagogue in Cleveland, Ohio (1953). In this seminal building of modern Jewish sacred architecture in North America, the holy area containing the Torah roll, known as the "Ark of the Law", is highlighted by a baldachin, recalling the tent of the tabernacle that provided the Israelites an enclosure for the Ark of the Covenant during their wanderings in the desert (Fig. 2). Similarly, in Philip Johnson's Temple Knesset Tifereth Israel in Port Chester, New York (1956), a steel structure clad with concrete and glass panels, the interior features an arching baldachin that can also be read as a re-interpretation of the tabernacle. This Jewish architectonic symbol, popular particularly among the liberal, reformed and conservative congregations, is most powerfully expressed in the monumental, tent-like interior of the Congregation Israel Synagogue by Minoru Yamasaki in Glencoe, Illinois (1964), or the roof of the Mount Sinai Synagogue, shaped like a folded cloth, by Sidney Eisenshtat in El Paso, Texas (1962).

In search of a suitable architectonic expression, such buildings soon began to recall the imagery of Noah's ark, the tabernacle or the Temple in Jerusalem, breaking with the historicist tradition that had characterised synagogue architecture in Europe and America since its emancipation by the reform movement in the early 19th century. At that time, seminal buildings such as Gottfried Semper's Synagogue in Dresden (1840) were erected. On the one hand, its Romanesque exterior strove for assimilation, while on the other hand, its Moorish-inspired sacred interior reminded the believers of their Middle Eastern origins. Soon after, such oriental forms began to appear on synagogue exteriors expressing a newly awakened self-awareness, as can be seen in the richly decorated synagogues in Berlin, Budapest or in some American cities. Such exuberant decoration, also evident in art deco synagogues like the Israelitische Religionsgesellschaft by Walter Henauer and Ernst Witschi in Zurich (1924), first began to disappear with the advent of classical modernism – for example, in Fritz Landauer's synagogue in Plauen (1930) whose exterior was a plain white box resting on a red plinth (Fig. 3).

After the Second World War, the migration of many affluent Jews to the American suburbs caused a boom in synagogue architecture in which the buildings described earlier arose. In Europe, however, after the trauma of the Shoah, the congregations stagnated as many of the survivors emigrated to Israel. In Israel, only a few notable sacred buildings were erected – for example the inflated parachute-like Israel Goldstein Synagogue at the Hebrew University in Jerusalem by Heinz Rau and David Reznik (1957), or Zvi Hecker's Military Academy Synagogue in the Negev desert, a form of Brutalist architecture erected some ten years later. Architecturally interesting congregational synagogues are rare in Israel, as formal aspects do not play an important role for orthodox Jews and because secular Israelis rarely form congregations with their synagogues. However, in the newly erected towns, a few interesting sacred buildings can be found, for instance the two synagogues by Nahum Solotow in Beer Sheba (1961 and 1979).



4 Louis Kahn, Hurva Synagogue, Jerusalem, First project, 1967-1974, longitudinal section

Pioneering New Buildings from Louis Kahn to Mario Botta

One of the most significant and internationally acclaimed attempts to design the synagogue as a sacred, even mystical space was Louis Kahn's project for the new Hurva Synagogue in the Jewish quarter of the Old City of Jerusalem, which was undertaken between 1967 and 1974 in order to replace the earlier synagogue of the same name that was destroyed in the War of Independence of 1948. In contrast to the church-like sanctuaries of the grandiose American synagogues, Kahn's Hurva Synagogue sought to re-interpret the traditional orthodox interior as a square space with a women's gallery, gently illuminated by modulated light (Fig. 4). Later, Moshe Safdie referred to the temple-like spatial disposition of Kahn's "World Synagogue", as the then-mayor Teddy Kollek called it, in his own design for a synagogue for the Porat Yosef Yeshiva in Jerusalem.

Kahn's project was studied with interest in western Europe, not least because very few interesting Jewish sacred buildings at the time had been built according to orthodox customs – by way of example, Walter Sonanini's modern box-like Agudas Achim Synagogue with its coloured vertical windows, built in Zurich in 1960. West Germany was an exception. After the Holocaust, the cautiously reforming congregations built small synagogues in the manner of their American cousins, among them such noteworthy buildings as Dieter Knoblauch and Heinz Heise's igloo-like synagogue in Essen (1959), or the half-oval synagogue by Hermann Guttman in Hanover (1960; Fig. 5), which followed an orthodox Ashkenazi spatial arrangement. However, the most extraordinary new building of this time in Europe was Angelo di Castro's freestanding polygonal architectural sculpture with a tent-like interior, which was built to replace its destroyed predecessor in Livorno in 1962.

It was not until some 35 years after Guttman and di Castro's buildings that the Ticinese architect Mario Botta was to achieve a new masterpiece of European synagogue architecture. Commissioned by a pair of Swiss benefactors, the Cymbalista Synagogue was not built on the "old continent" at all but on the campus of Tel Aviv University (see pp. 194-195). This monument with its cosmic symbolism of twin cuboid and cylindrical towers appears as an interpretation of the Temple of Solomon, primarily due to its two entrance columns commemorating Boaz and Jachin. It can also be regarded as a quint-essential example of Jewish sacred architecture alongside earlier predecessors such as the Altneushul (Old-New Synagogue) in Prague, the holy sites at Córdoba and Toledo and Louis Kahn's project for the Hurva Synagogue.



5 Hermann Guttman, Synagogue, Hanover, 1960, interior view

The baldachin-like roofed-over space of the synagogue illuminated by segment-shaped roof lights that echoes an almost identical volume for an assembly hall in the west tower, can be regarded as typologically ideal. A raised platform known as the bimah (stage) or almemor (pulpit), which is used for reading from the Torah roll is positioned in the centre of the space. The seating is arranged around these according to the Sephardic tradition. The women's section is symbolically separated from the men's seating by a step and balustrade, as was common in ancient synagogues. The aron ha-kodesh (the holy shrine) in which the Torah rolls are kept is placed in front of the mizrah wall, the rear wall that faces Jerusalem. To one side stands the pulpit from which the prayer service is led and the ner tamid (the "eternal lamp") lights from the wall.

The Design of the Synagogue Space

Botta's synagogue unites all the important elements of a Jewish service. Ever since the destruction of the Second Temple in 70 CE, this service has centred on readings from the Torah and communal prayer. A so-called minyan, a gathering of any group of ten men over the age of 13, is all that is formally required for a Jewish service to take place; the space or form of the synagogue itself is less important. The basic form developed during the late Hellenic period from the typology of the basilica and has changed according to regional building traditions over the centuries. Ideally, it should be lit from above and the seating arranged such that there is sufficient space for the transport of the Torah from the shrine to the bimah.

As the shrine and bimah come into contact with the Torah, the most holy element of the Jewish service, they are often richly decorated. The shrine is usually slightly raised and located in front of or in a niche in the mizrah wall, which always faces towards Jerusalem. In an orthodox Ashkenazi synagogue, which follows central and eastern European tradition, the bimah is placed in the centre of the room, the chairs or benches surrounding it in a U-form. In a Sephardic synagogue, which follows the Spanish tradition, the bimah is raised and placed at the opposite end of the room from the shrine. The seating is arranged along both sides of the central axis along which the Torah is transported. In the synagogues of more liberal Jewish congregations, the shrine, bimah, the pulpit for the person leading prayers and the seat of the Rabbi are all arranged on a raised platform in front of the mizrah wall.

In liberal reformed synagogues, which in the United States are often called "Temples", there is no distinct spatial separation of genders, the seating being arranged much like a lecture hall. Should such a synagogue have a gallery, this is either for the organ or for additional capacity. By contrast, in orthodox synagogues, the men's and women's seating areas must be separated, usually by locating the women's section on a gallery. Other solutions are also possible, as shown by the ancient traditional division chosen in the Cymbalista Synagogue. In the Middle Ages, the women's section in Ashkenazi synagogues was separated by a glazed screen as can be seen in the synagogue in Worms, the Altneuschul in Prague, or the Old Synagogue in Krakow. In Spain at around the same time, women's galleries were already typical as can be seen, for example, in Córdoba or Toledo. Galleries can also be found in Renaissance and baroque synagogues founded in Italy, southern France or Amsterdam by Iberian Jews who had fled persecution, before they also became popular in Ashkenazi congregations in the 19th century.

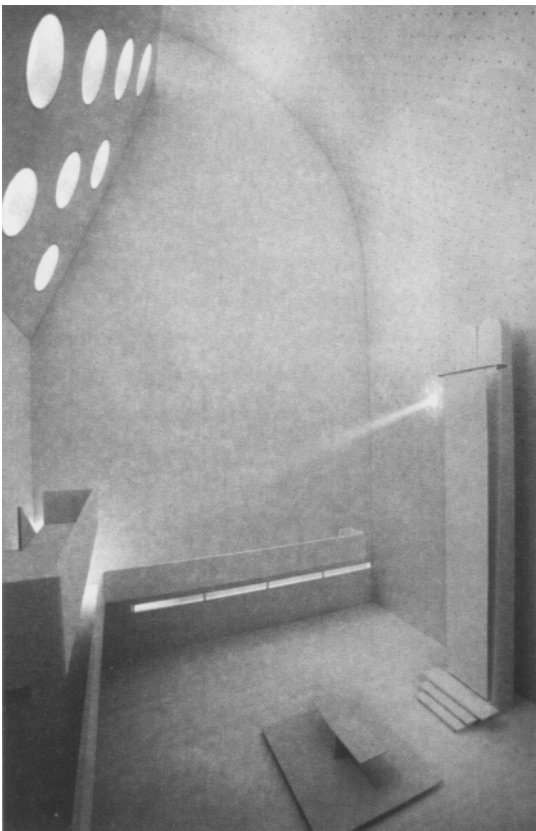
A Theory of Synagogue Design

In addition to these fundamental elements of Jewish sacred spaces, one also finds symbolic objects, for example the aforementioned eternal lamp, the seven-armed candelabrum that commemorates the Menorah of the Temple in Jerusalem, the tablets of the commandments or the pair of columns commemorating Boaz and Jachin in the Temple of Solomon. In many cases, these symbols, together with a richly decorated Torah shrine, are used to make synagogue spaces that have a more church-like character appear identifiably Jewish. Troubled by this watering down of tradition, Salomon Korn, an architect and currently the vice president of the Central Council of Jews in Germany, published a treatise entitled "Synagoge '88" in the catalogue accompanying the exhibition "Die Architektur der Synagoge"

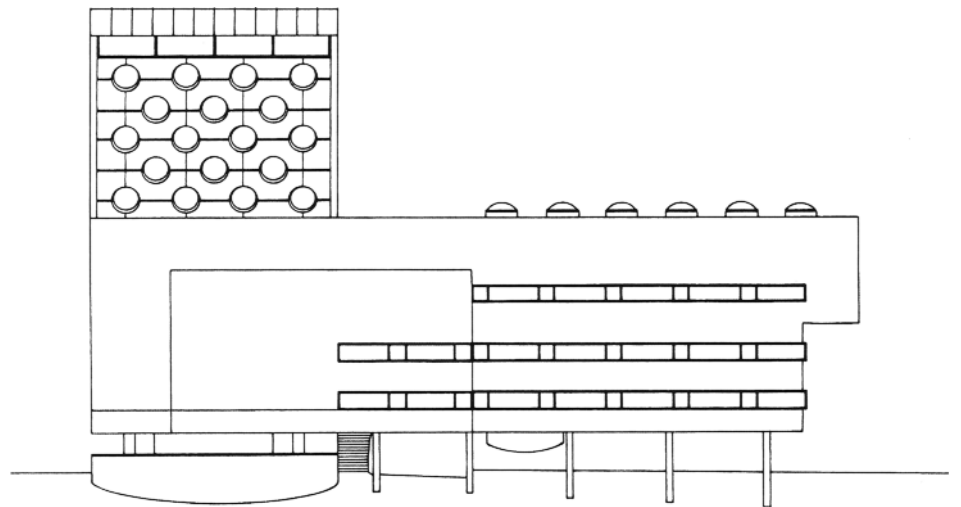
(Synagogue Architecture) held in Frankfurt in 1988. His theory on the contemporary design of Ashkenazi synagogues was to become influential throughout the German-speaking world.

Korn held the notion that there is no specific Jewish form of sacred building, but argued that Ashkenazi orthodox synagogues do have an “original spatial arrangement”. The central position of the bimah and the position of the Torah shrine embedded in the mizrah wall necessitate a dual spatial arrangement that is both centralised and longitudinal. Faced with the resultant “spatial antinomy” of the synagogue, architects should create a hybrid continuum in the form of a centralised yet elongated building, or an elongated yet centralised building. The women’s galleries could be made to serve this purpose. An architectonic expression of the tension between the “temporary” tabernacle and “permanent” temple offers further potential. A baldachin suspended from the stone exterior skin could emphasise the longitudinal axis towards the Torah shrine, while a light positioned above the bimah could accentuate the centre. Furthermore, the various components of synagogues should be translated into a contemporary architectural language.

Korn’s guidelines were published at precisely the right moment. Shortly after, as a result of the upheavals in communist eastern Europe, tens of thousands of Jews migrated to Germany from the former nations of the Soviet Union, necessitating the building of further Jewish congregational buildings, thereby making Germany the centre of innovative synagogue architecture. The most impressive proof of this development was the architectural competition held in 1997 for the building of a Jewish community centre on the site of the former synagogue in Dresden, which included entries from internationally renowned architects such as Zvi Hecker, Daniel Libeskind, Heinz Tesar and Livio Vacchini (Figs. 6-7). The range of designs submitted would make, in and of themselves, an instructive pattern book of contemporary synagogue architecture.



6 Heinz Tesar, Synagogue, Dresden, project, 1997, interior view of model



7 Heinz Tesar, Synagogue, Dresden, project, 1997, elevation

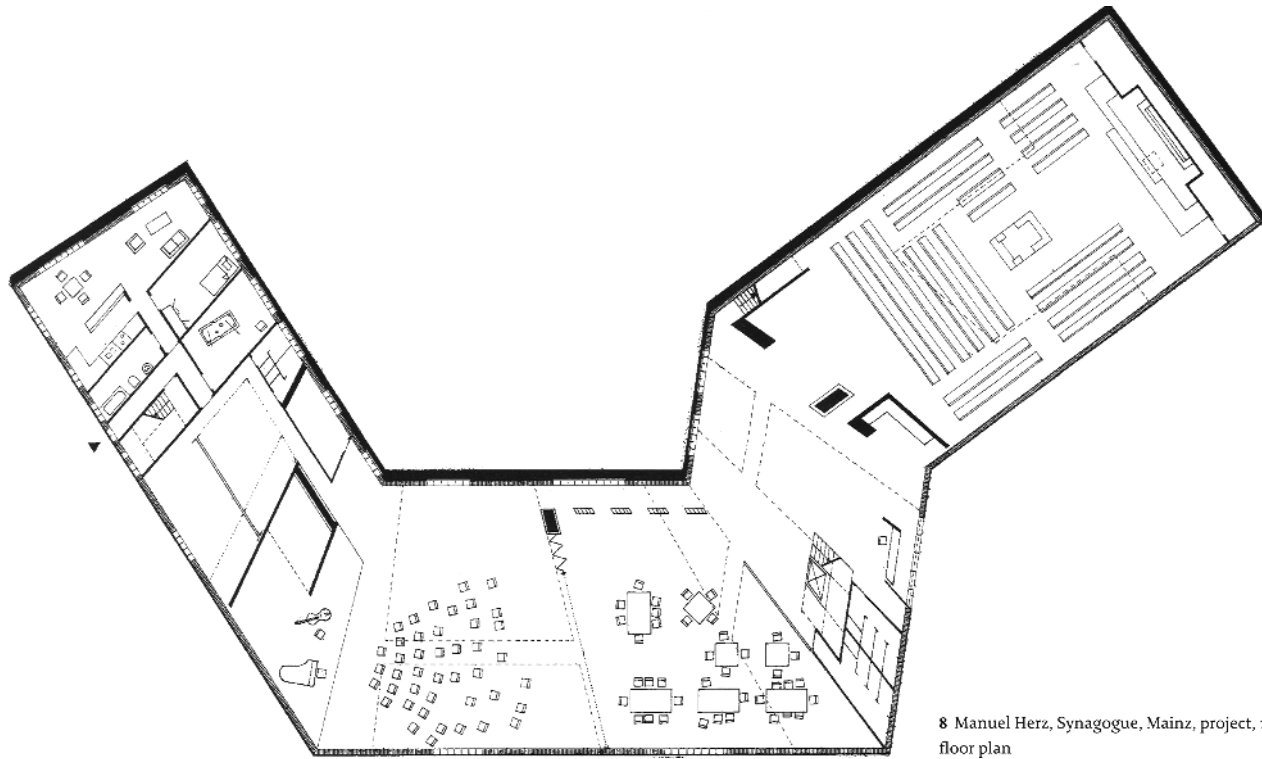
In Dresden, the third-placed project by Wandel Hoefer Lorch and Hirsch (see pp. 200-01) was selected. Drawing on Korn's theory, the team of young architects created a complex that, like Botta's synagogue, consists of two bipolar stone volumes. The community centre, with a frontage like a glass cabinet, looks out over the central courtyard towards the almost hermetically sealed cuboid form of the synagogue – reached from the southwest – which twists gradually eastwards with each course of block work. Within this outer volume, a baldachin-like cloth of gold shimmering thread is draped over the sanctuary, enclosing the Torah shrine, the bimah and women's gallery, which are inserted beneath it like pieces of furniture. Illuminated almost mysteriously by a skylight, the inner space of the synagogue refers to the tabernacle, its monolithic stone exterior to the Temple of Jerusalem, expressing in their opposition what Korn described as the "conflict between stability and fragility, between the permanent and the transitory". Although dictated in part by theory, the design for Dresden has resulted in an atmospheric building and a space that, like Kahn's designs for Hurva, is characterised by spirituality, mysticism, light and shadow.

In contrast, one of the most prolific synagogue architects in Europe, Alfred Jacoby, pays little heed to Korn's theory. In the last 17 years he has built seven Jewish community centres in Aachen, Chemnitz, Darmstadt, Heidelberg, Kassel, Cologne and Offenbach. In the new synagogue in Chemnitz (2002) the Torah shrine is elevated above the congregation, crowning the oval shaped synagogue in a cabinet-like enclosure that can be seen from outside. This suggestive building, its form fusing the axial with the radial, and – contradicting Korn – featuring a liberally designed interior, is a far cry from his earlier synagogue project for Aachen. In Aachen, the unconventional solution proposed by the Swiss architect Roger Diener would have been a more interesting choice. Taking the form of a simple hall lit from above, his design eschewed the traditional use of the gallery as a means of achieving the orthodox separation of men's and women's seating areas, and instead proposed – drawing on the Romanesque principle of additive forms as illustrated in Worms – locating the women's section in a perpendicular addition on the north side of the synagogue that opened onto the main space. By arranging this space directly opposite the bimah, he emphasised the central point of the otherwise longitudinal building, resolving the "spatial antimony" of the synagogue in an original manner.

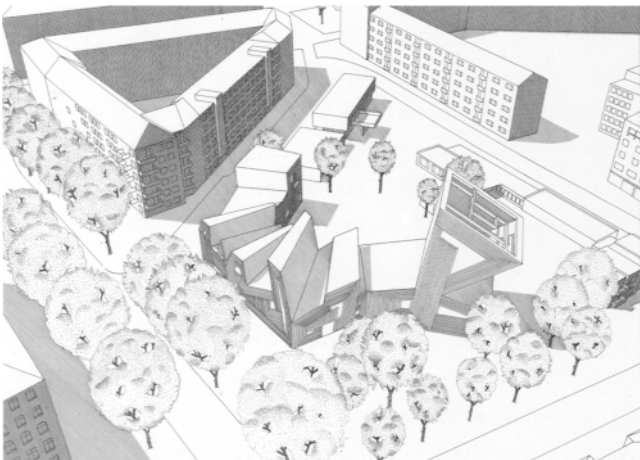
Architectonic Symbols in Germany

In 1999, Manuel Herz, who previously worked with Daniel Libeskind on the competition entries for the synagogues in Dresden and Duisburg, caused a sensation with his winning design for the synagogue in Mainz. This project, scheduled to begin construction in 2008, promises to be one of the most architecturally interesting Jewish centres in Germany. The striking appearance of the sacred space and community centre is based on a stylised representation of the five Hebrew letters of the word "Qedushah", (blessing), elevating the complex from the worldly to the sacred. Inspired by the object-quality of the Hebrew letters, Herz employs them "almost like building blocks". The synagogue is represented by the Hebrew character K or "qof", whose triangular shape opens upwards towards the heavens, while the letters "daled", "waw", "shin", and "he" define the outline of the entrance foyer, community rooms and school. The result is an urban ensemble, a miniature city, in which the synagogue is the tallest building. Its funnel-like roof floods the bimah with light, defining the focus of the elongated building and thereby resolving the spatial antinomy of the synagogue. Finally, the exterior cladding in turquoise brickwork refers to Jewish oriental tradition (Figs. 8-10).

A second project that shares a reference to writing, expressiveness and abstract symbolism is Zvi Hecker's Jewish community centre in Duisburg (1999; see pp. 198-99). Five extending concrete arm-like portals represent the open pages of the Book of Books, which according to Hecker is responsible for upholding Jewish identity in the Diaspora over the millennia. The triangular space of the synagogue tapers towards the raised platform with Torah shrine and bimah, and is closely interwoven with the plan of the community centre, occupying only a modest part of the overall complex. From the outset, Hecker, a worldly-minded Israeli, saw the needs of the predominantly immigrant congregation as being of central importance – so much so that here the modern tendency "from temple to community centre" has resulted in a complex where the synagogue no longer forms the heart of the building.



8 Manuel Herz, Synagogue, Mainz, project, 1999, floor plan



9 Manuel Herz, Synagogue, Mainz, project, 1999, view of the synagogue in its urban context

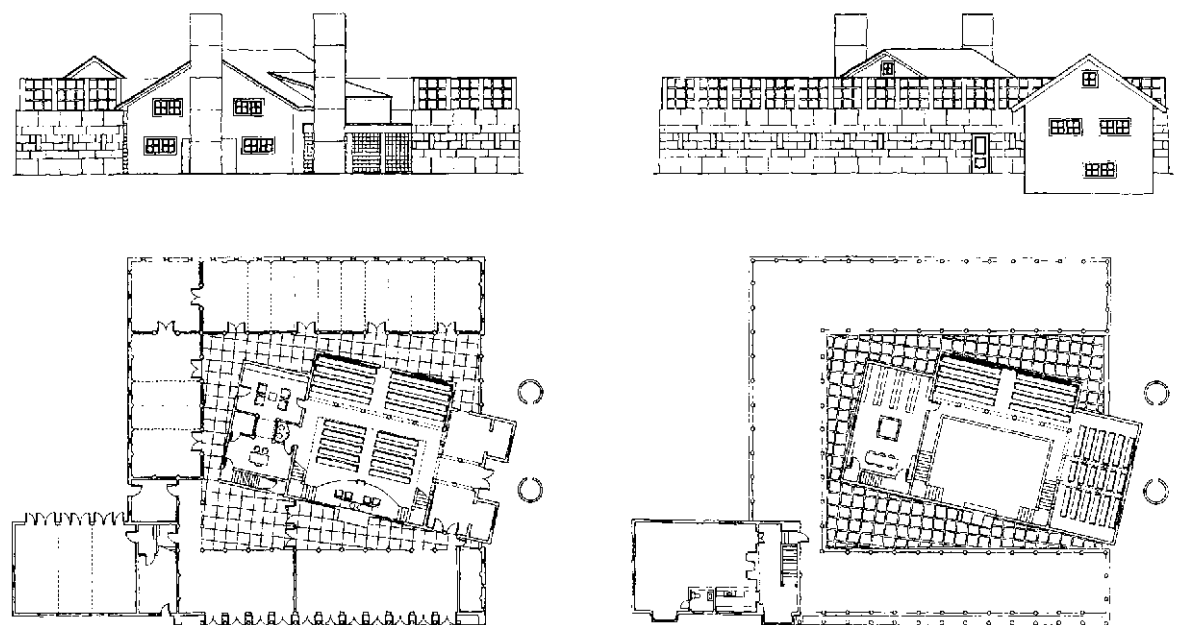


10 Manuel Herz, Synagogue, Mainz, project, 1999, pattern of the external cladding

A diametrically opposed solution was adopted by the architects Wandel Hoefer Lorch, in their design for the Ohel Jakob Synagogue in Munich. Here, the synagogue serves as the sculptural focus of a complex that also includes a community centre and Jewish museum. Since its completion in spring 2007, the ensemble represents the largest Jewish centre in Europe. Of the three distinct but closely spaced volumes arranged around the Jakobsplatz, the multifunctional community centre adjoins an existing building forming a courtyard and fusing with the historical structure of the city, and allowing the minimalist sculptural form of the freestanding synagogue to take centre stage. Illuminated at night and shrouded in a mesh-like tessellation of the Star of David, a glazed lantern appears to rise out of a high rough-hewn travertine plinth that recalls the Wailing Wall – a visible expression of the relationship between the tabernacle and temple. Light from above floods into the wood-clad warm interior of the synagogue. Here the women's seating area is slightly raised and runs along both long sides of the room, following a similar arrangement to that adopted by Mario Botta in Tel Aviv.

Tradition Over Experimentation in the United States

The artistic experimentation with architectonic signs and symbols evident in contemporary European synagogue architecture has little in common with the unassuming utility of recent synagogue architecture in the U.S. For the most part, American synagogue architecture has proceeded without a specific theory of Jewish sacred architecture. The last noteworthy attempt in this respect was Stanley Tigerman's treatise-like concept for the Or Shalom Temple in Chicago, Illinois (1986; Figs. 11-14). By placing a barn-like prayer room within a hall of columns, Tigerman predates Korn in his attempt to unite the two contradictory ancient Jewish symbols of the tabernacle and the temple. Furthermore, through this synthesis of the temporary and the eternal, he attempts to express "the anxiety of an exilic people in an alien land".



11-14 Stanley Tigerman, Temple Or Shalom, Chicago, Illinois, project, 1986, views from the east and west, ground and upper floor plans

Nevertheless, in the last 20 years, some impressive buildings have been built. A notable example is Norman C. Jaffe's Gates of the Grove reform synagogue in East Hampton, New York (1989; see pp. 190-91), whose shingle-clad form recalls the wooden synagogues of eastern Europe and whose interior sets up a tension between the Torah shrine and the central bimah. In the United States, truly innovative synagogue buildings and projects are few and far between. This is all the more surprising given the shift towards congregations that cater for ever more individual needs and the growth of the Jewish population in the Southwest, which has necessitated the building of more synagogues. Of these, William P. Bruder's Temple Kol Ami in Scottsdale, Arizona (1994; see pp. 192-93) is an interesting example. Although the space of the synagogue appears more like that of an unassuming association meeting hall, the community centre, which is conceived as a small village, communicates an atmosphere of warmth and shelter. More recently, a renewed interest in the old Ashkenazi spatial arrangement, as already manifested in East Hampton, can be observed in the United States. Projects such as the Agudas Achim Synagogue in Austin, Texas by David Lake and Ted Flato (2001) testify to this. The decorative interior design once so popular in liberal synagogues such as Ben Shahn's stained-glass window in the sculptural Temple Beth Zion by Wallace K. Harrison and Max Abramovitz in Buffalo, New York (1967), or Louise Nevelson's relief-like white shrine wall (Fig. 15) in Armand Bartos' Temple Beth El in Great Neck, New York (1970), is becoming less common. Such artistically fertile times also brought forth organic buildings such as Kenneth Triester's Gumenick Chapel of the Temple Israel in Miami, Florida (1969), which resembles a giant concrete sculpture. Whereas in the United States such fusions of art and sacred building have now largely become outmoded, the trend towards sculptural experiments in synagogue architecture in Europe remains as popular as ever.

15 Wallace K. Harrison, Max Ahramovitz, Temple Beth Zion, Buffalo, New York, 1967, interior design by Ben Shahn



SELECTED BIBLIOGRAPHY

Brülls, Holger: Räume für die Rede vom redenden Gott. Probleme zeitgenössischer Synagogenarchitektur in Deutschland. in: *Kunst und Kirche*, no. 4/2001, pp. 215-

Calabi, Donatella: L'emancipazione degli ebrei e l'architettura della sinagoga. Qualche esempio in Europa, in: *Architettura e spazio sacro nella modernità*, exhibition catalogue, Milan 1992, pp. 73-

Carlebach, Joseph: Die Architektur der Synagoge, in: Gillis-Carlebach, Miriam (Ed.): *Joseph Carlebach, Ausgewählte Schriften Vol. II*, Hildesheim and New York 1982, pp. 1229-

Grimmer, Vera: Heinz Tesar. Dva projekta za pamcenje, in: *Oris*, Nr. 6/2000, pp. 102-

Gruber, Samuel D.: *American Synagogues. A Century of Architecture and Jewish Community*, New York 2003

Guttman, Hermann Zvi: Vom Tempel zum Gemeindezentrum. Synagogen im Nachkriegsdeutschland, Frankfurt am Main 1989

Hammer-Schenk, Harold: Synagogen in Deutschland. Geschichte einer Baugattung im 19. und 20. Jahrhundert (1780-1933), 2 volumes, Hamburg 1981

Harlap, Amiram: *Synagogues in Israel. From the Ancient to the Modern*, n.p. 1984

Herz, Manuel: Licht der Diaspora. Jüdisches Gemeindezentrum Mainz, in: *Kunst und Kirche*, no. 4/2001, pp. 249-

Gespräch mit Architekt Manuel Herz, in: *Kunst und Kirche*, no. 4/2001, pp. 252-

Hollenstein, Roman: Citadel of Faith. Mario Botta's Cymbalista Synagogue in Tel Aviv, in: Mario Botta. *The Cymbalista Synagogue and Jewish Heritage Center*, Milan 2001, pp. 25-

Kent, Robin: The Tabernacle. The Oldest Building Specification known written by Moses under God's Instruction, in: *RIBA Journal*, no. 5/1985, pp. 20-

Korn, Salomon: Synagoge '88 - ein Entwurf, in: Schwarz, Hans-Peter (Ed.): *Die Architektur der Synagoge*, exhibition catalogue, Stuttgart 1988, pp. 344-

Krinsky, Carol Herselle: *Synagogues of Europe. Architecture, History, Meaning*, New York and London 1996

Larson, Kent: Louis I. Kahn. *Inbuilt Masterworks*, New York 2000, pp. 124-, p. 231

Luzzatto, Amos: Lo sviluppo della struttura sinagogale, in: *Architettura e spazio sacro nella modernità*, exhibition catalogue, Milan 1992, pp. 82-

McCarter, Robert: *Louis I. Kahn*, London and New York 2005, pp. 412-, p. 502

Meek, Harold A.: *The Synagogue*, London 1995

Nerdinger, Winfried (Ed.): *Heinz Tesar Architektur*, exhibition catalogue, Munich and Milan 2005, pp. 210-, p. 294

Sachs, Angeli, van Voolen, Edward (Ed.): *Jewish Identity in Contemporary Architecture*, Munich 2004

Schwarz, Hans-Peter (Ed.): *Die Architektur der Synagoge*, exhibition catalogue, Stuttgart 1988

Seidl, Ernst (Ed.): *Lexikon der Bautypen. Funktionen und Formen der Architektur*, Stuttgart 2006, articles on Mikwe pp. 354- and Synagoge pp. 480-

Stolzman, Henry, Stolzman, Daniel: *Synagogue Architecture in America. Faith, Spirit and Identity*, Mulgrave 2004

Synagogen in der Schweiz, in: *Kunst und Architektur in der Schweiz*, no. 2/2005, pp. 1-

Technische Universität Darmstadt, Fachgebiet CAD in der Architektur (Ed.): *Synagogen in Deutschland. Eine virtuelle Rekonstruktion*, exhibition catalogue, Basel 2004

Terracina, Sergio: Nota su alcune sinagoghe costruite in Germania dal 1945 ad oggi, in: *Architettura e spazio sacro nella modernità*, exhibition catalogue, Milan 1992, pp. 95-

Turner, Harold W.: From Temple to Meeting House. The Phenomenology and Theology of Places of Worship, The Hague 1979, pp. 47-, pp. 278-, pp. 369, pp. 383-84

Zaggia, Stefano: Itinerario attraverso l'architettura della Sinagoga Europea nella modernità, in: *Architettura e spazio sacro nella modernità*, exhibition catalogue, Milan 1992, pp. 86-

Mosque Architecture Past and Present

The mosque is a symbol of Islam and the most important building type in the Islamic world, which today encompasses 40 countries and a fifth of the world's population. Of all the Abrahamic religions, it is Islam that is currently expanding most rapidly. So what should a building look like whose name when translated means a "place of prostration"? The task of designing an architectonic form for the worship of a god that is invisible and in addition is prohibited from depiction has never been easy. On the one hand, their creators were afraid to construct glorious constructions for fear of falling into idolatry. On the other hand, their buildings could be no less monumental than those of the Christian faith. The difficulty arises as a result of the Islamic prohibition of figurative representation: the Hadith, the book of the words and deeds of the prophet Muhammad, states: "The makers of these pictures will be punished on the Day of Resurrection and it will be said to them, 'Give life to what you have created.'" Or elsewhere in the same book: "Such people as paint these pictures will receive the severest punishment on the Day of Resurrection." Accordingly, Islam – unlike Christianity – is characterised by a lack of visual symbols. A further difficulty is that Islamic architecture, which is highly contextual and predominantly characterised by small elements, does not lend itself to being a source of inspiration for monumentality.

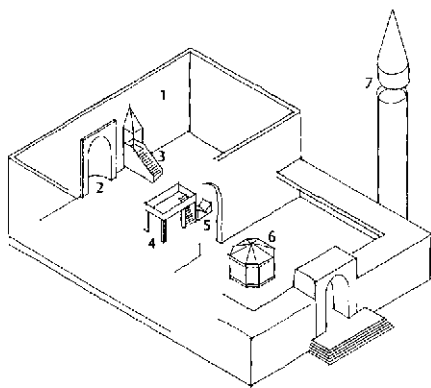
The Formation and Expansion of Islam

In the year 570, Muhammad, the prophet of the third monotheistic religion, was born in Mecca, the son of a merchant. At the age of 40, whilst meditating, Muhammad first heard the Archangel Gabriel's voice commanding him to recite in the name of Allah. Muhammad began preaching for the "One and Only God" but was initially largely met with ridicule and hostility. Under the threat of death, he left Mecca and went into exile, migrating with a small group of followers in 622 to the oasis settlement of Yathrib. There, in what later became known as Medina, he founded the first Muslim state. After the death of the prophet in 632, the new religion spread throughout the Arabian Peninsula and beyond, into North Africa and southern Spain. Later, Islam expanded further throughout the Persian Sassanid Empire and extended as far as India. Within a century of the foundation of the new religion, the Koran and the Sharia – the body of Islamic religious law that describes ritual obligations such as prayer, fasting, charity and pilgrimage – had spread under the rule of Muhammad's successors, the Caliphs, over an extensive territory.

The Mosque as the Centre of Religious Life

Muslims are less dependent on buildings devoted to worship than Jews and Christians. The rite of prayer is itself sufficient, whether undertaken at home or in the open. Prayer in a group, however, is considered more virtuous. A mosque is primarily a hall in which men and women kneel in rows on the floor and prostrate themselves in prayer in the direction of Mecca. By the 7th century, the following elements were already constituent parts of a mosque: the qibla wall which faces in the direction of Mecca; the mihrab, a niche or depression in the qibla wall from which the Imam leads prayers; and the minaret, a high tower from which the call for prayer is more audible. A mobile lectern, or kursi, on which the Koran was placed was also common. For Friday prayers, a minbar, a pulpit raised on several steps was created, sometimes along with a dikka, a raised tribune in the centre of the room from which the Imam's prayers are repeated for the rows at the back. Fountains located in a forecourt allowed Muslims to conduct ritual purification before prayers. These usually offered sufficient space for several people to wash themselves with cold running water (Fig. 1).

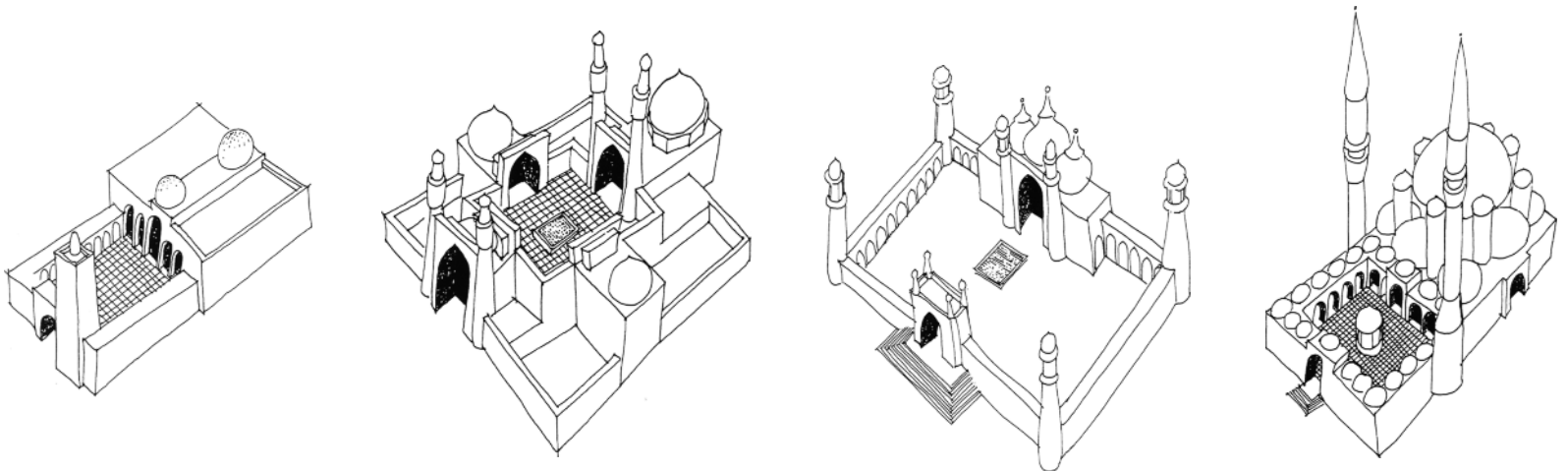
Over and above its essentially religious importance, the mosque also serves a social function, which largely determines the programming of its remaining spaces. The mosque is not solely for prayer but is also visited on social and family occasions. Believers are served tea and dates and therefore even the smallest of village mosques has a place for preparing tea. Larger mosques include spaces for religious instruction, to teach courses on the local language and seminars on cultural integration. In addition, there are rooms for women who are forbidden from prayer during menstruation and in the first 40 days after giving birth.



1 Martin Frishman, diagram of a mosque and its principal elements: qibla wall (1), mihrab (2), minbar (3), dikka (4), kursi (5), fountain (6), minaret (7), portal (8)

The Four Types of Mosques

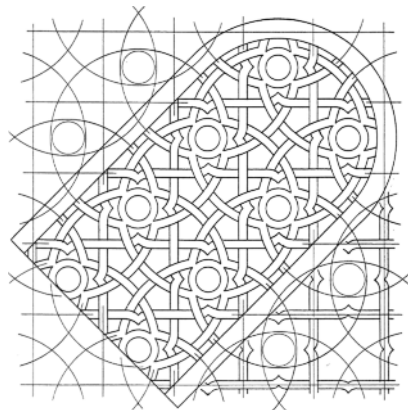
Over the course of the history of Islam, four basic types of mosques have arisen in western and central Asia and in North Africa: the Arab hypostyle mosque, the Persian four-iwan mosque, the Indian three-dome mosque and the Turkish central-dome mosque (Figs. 2-5).



2-5 Martin Frishman, schematic overview of the four types of mosques: Arab hypostyle mosque (1), Persian four-iwan mosque (2), Indian three-dome mosque (3), Turkish central-dome mosque (4)

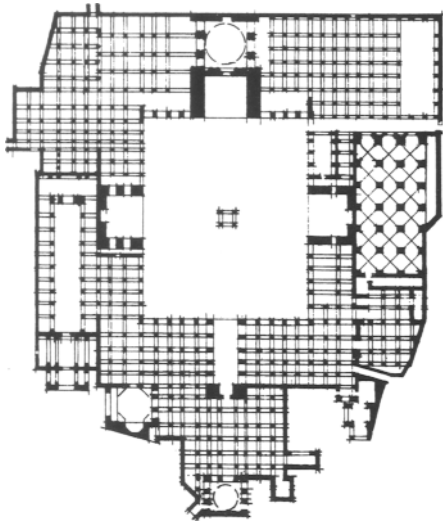
The Arab Hypostyle Mosque

In light of the rapid expansion of the Islamic community during the lifetime of the prophet, the need for built constructions providing space for undisturbed communal prayer soon arose. The first mosque was built at Muhammad's behest in Yathrib. Enclosed by an earthen wall, it was a typical Arabian courtyard dwelling on a square plan. From here, the muezzin chanted the call for prayer. The first mosques built in the decades immediately thereafter all followed the same simple pattern of the original mosque in Yathrib. For example, the Mosque in Kairouan in Tunisia (670) differs only dimensionally from the first mosque. As with all later mosques, the dualism of interior courtyard and prayer hall was maintained. The building had neither an external wall nor a main gate, but exhibited two new elements: the qibla wall and mihrab on the one hand, the minaret on the other. This tower was to become emblematic for mosques in general. The minaret was built on a square plan and topped with a ribbed dome. This form of mosque gradually acquired lasting validity throughout North Africa.



6 Geometric window pattern in the Umayyad Mosque, Damascus, 705-715

As the position of the Islamic rulers stabilised in the 7th and 8th centuries, they began to consider new forms. Keeping in mind the prohibition of figurative representation, they began to develop ornamentation. The design of the mihrab acquired ever more complex geometric structures; sumptuous decorations began to cover the surfaces of the prayer niche. Such decorations can be seen clearly in the Umayyad Mosque in Damascus, Syria (705-715). Its basic form followed that of the original mosque but its vaulting, columns and windows gave it a magnificent appearance (Fig. 6). It became a model for Islamic symbolism. As the central authority of the caliphate began to wane in the 11th and 12th centuries, their power was distributed among a series of new states that formed between Morocco and India. The change in political structure led to regional variations in the architecture of mosques. In the centuries that followed, diverse syntheses of Islamic and regional elements arose. Each Islamic state developed its stylistic identity, partly in response to local climate, partly with regard to locally available materials and traditional craftsmanship.



7 Friday mosque, Isfahan, late 11th century till 14th century, floor plan

The Persian Four-Iwan Mosque

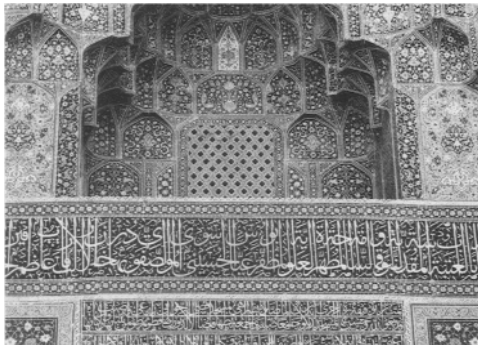
In Persia, the master builders integrated references to the four-iwan construction of the pre-Islamic palaces. The basic arrangement derives from four vaulted gates arranged axially around a courtyard in the form of a cross. This axial cross arrangement – which weakens the dominance of the qibla wall facing Mecca – was adopted throughout all provinces of the land. The Friday mosque at Isfahan is an example of the pinnacle of this development. More than any other building, it reflects the history of mosque architecture in Persia. Up until the 11th century, it retained the basic Arab arrangement of courtyard and hypostyle hall, before it was converted and rebuilt according to the four-iwan plan in the 12th century (Fig. 7).

The fascination with geometry was prevalent in Persia, too. The clarity of its rules were regarded as a metaphor: ornament in mosques became synonymous with the heavenly and eternal (Figs. 8-9). To heighten the glory of the buildings still further, the architects embellished them with written script. In no other culture has calligraphy been refined to such extents. The clearly visible inscriptions express the words of God through verses from the Koran. Painstakingly applied by hand, numerous artistic scripts and inscriptions were created and used to decorate tiles, stones, walls, niches, domes, portals and minarets.

The Indian Three-Dome Mosque

In the 11th century, Muslim warriors invaded India. After the fall of Peshawar, the path to the River Ganges lay open. The area was settled by Muslims and the Delhi Sultanate was founded. To declare the authority of Islam, a mosque was erected whose minaret was conceived as a symbol of conquest; after later extensions, the tower reached 72.5 metres into the sky. The mosque in Delhi and other buildings represent a distant continuation of older Persian forms.

The Islamic architecture of the Indian subcontinent became increasingly informed by the influence of local and regional building traditions and craftsmanship, in part brought in by Hindu workmen and builders. In the Delhi Sultanate, for example, the brickwork typically used throughout Persia was replaced by stone. In the 15th and 16th centuries, when India was under the reign of the Mughal Empire, one of the most important styles of Islamic architecture arose: a fusion of the Hindu and Islamic traditions, resulting in a mosque type with three domes and an extensive, walled courtyard. The Jama Masjid mosque in Delhi is an example of such a symbiosis. The decorative building has three imposing entrances, four short towers and two 40 metre high minarets longitudinally banded with red sandstone and white marble. Up to 25,000 believers can pray in its courtyard at one time.



8 Imam Mosque, Isfahan, 17th century, ceramic ornamentation around the main entrance

The Turkish Central-Dome Mosque

As far back as the 9th century, Turks already played a role in Islamic politics as palace guards or governors. Like their neighbours, they too sought to find their own expression for their mosques. As a result, a new synthesis arose in Asia Minor. The plan was based – like the original mosque of the prophet – on a regular hypostyle hall. However, each square was covered with a small hemispherical dome, as can be seen, for example, in the Ulu Camii in Bursa, Turkey (1396-1400). Its compact outward appearance, 20 domes and two minarets give the building a particularly monumental appearance.

With the founding of the Ottoman Empire in the 14th century, domes acquired greater importance. The conquest of Constantinople in 1453 heralded new trends in Turkish architecture. The Hagia Sophia Church, erected under the Byzantine Emperor Justinian in the 6th century, was converted into a mosque soon after the capture of the city on the Bosphorus. The powerful urban presence of Hagia Sophia in the city inspired Koca Mimar Sinan, Suleiman II the Magnificent's royal architect, to develop a Muslim counterpart to the genuine Christian original (Fig. 10). With his design, the elements of the shell and dome acquired lasting importance and have become typical for mosques throughout the Ottoman Empire (Fig. 11). Centralised cubic buildings were designed, crowned by a dome and surrounded by half-cupolas. The central space opened out onto a similar-sized courtyard of fountains

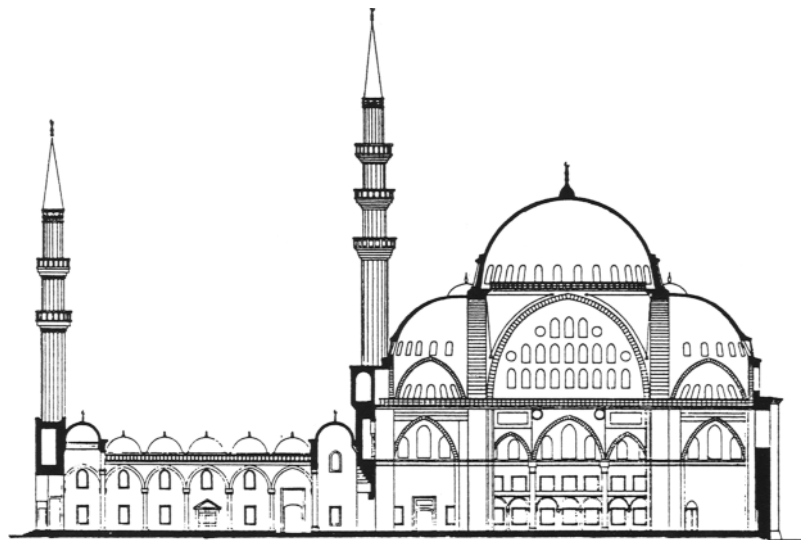


9 Imam Mosque, Isfahan, 17th century, metal ornamentation on the entrance door

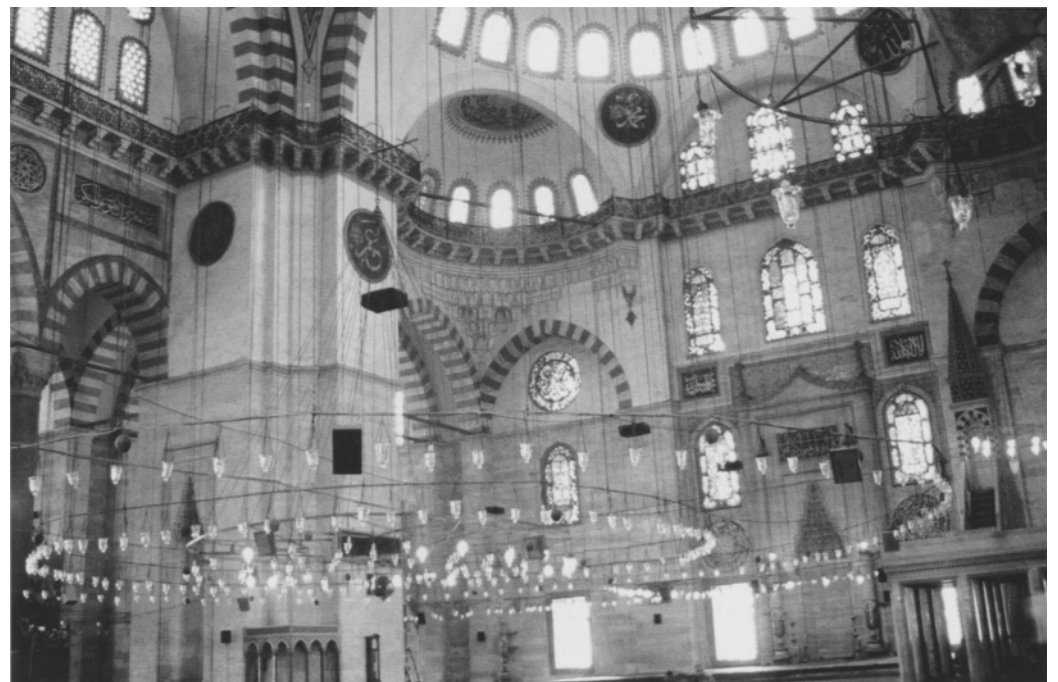
surrounded by arcades covered with small domes. The prayer space was often emphasised through the elegant stacking of stepped half-cupolas, contrasting markedly with the needle-like minarets. With its six slender minarets, the Sultan Ahmed Mosque in Istanbul (1609-1617) – also known as the Blue Mosque – is regarded as one of the most spectacular achievements of its time.

20th-Century Mosque Architecture in the Islamic World

At the beginning of the 20th century, Islamic architecture was confronted not only with a series of technical advances but also the increasing spread of western modern architecture. In addition, the commissioners of new large mosques often had personal and political agendas. Should the design of a mosque be based as far as possible on clear, pure forms? Should it perhaps, like the radical avant-garde in Europe, refrain from ornament altogether? Is it perhaps better, after all, to continue historical elements into the present day? Is it possible to find a golden mean between regional tradition on the one hand and modernist architecture on the other?



10 Koca Mimar Sinan, Sultan Suleiman Mosque, Istanbul, 1548-1559, longitudinal section



11 Koca Mimar Sinan, Sultan Suleiman Mosque, Istanbul, 1548-1559, prayer hall beneath the central dome



12 Hassan Fathy, Mosque, New-Gourna, 1945-1948



13 Lassine Minta, Great Mosque, Niono, 1973

Preserving Regional Traditions

The most common response to the advancement of modernism was to demand that mosque architecture be kept free of western influences. This position has many supporters throughout all the Islamic nations. Many architects designed buildings using familiar architectonic forms, relying on traditional materials and forms of construction. Of these, one of the most well known was the Egyptian architect Hassan Fathy, who throughout his lifetime upheld regional tradition and avoided modern western influences in his work. In his own research, he came to the conclusion that earth was the most appropriate building material for his home climate. His design for the mosque for the rural community of New-Gourna in Egypt (1945-48) was made of adobe brickwork (Fig. 12). The Dar al Islam Mosque in Abiquiu, New Mexico (1981), used the same building methods, incorporating forms from Nubian architecture (see p. 210-11). Fathy's work inspired many architects in the Islamic nations, for example Lassine Minta's Great Mosque of Niono, Mali (1973, Fig. 13) whose earth construction resembles in many ways the Great Mosque in Djenné, Mali.

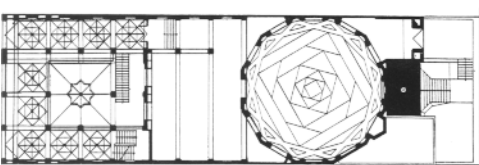
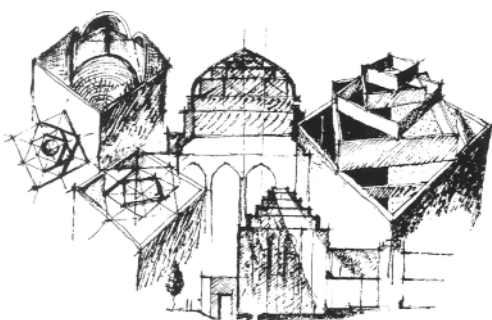
To maintain the purity of a particular regional architectural vocabulary, technical advances have been avoided in the construction of buildings. However, not all architects have been quite so stringent. The regionalism practised by many of those who spoke out in favour of historical continuity is, in fact, limited largely to formal language. For example, in the village mosque in Mahder, Algeria (1975-1980), the Egyptian architects Hanny and Abdel Rahman Miniawi refer to the local idiom through the character of the walls, arches and vaults while simultaneously using concrete for the construction.

The design of national mosques is fraught with further difficulties. Here, political interests can override all other factors: the patron's desire to see his power set in stone. The 200 metre long and 100 metre wide King Hassan II Mosque in Casablanca, Morocco (1986-1993) is such a mosque. It is the second largest place of worship in the world and can accommodate 25,000 people on three levels. The commission to design a building that was at once authentic as well as monumental was given to the French architect Michel Pinseau. Regional traditions are immediately apparent as soon as one sees the building. The minaret, the interior with its pattern of multifoil arches and the form of the capitals and vaulting refer to the Maghreb architecture of bygone centuries. However, the roof of the prayer hall, which can be opened hydraulically, and a laser beam pointed towards Mecca demonstrate that, for all its historical references, the possibilities of present day technology have not been ignored.

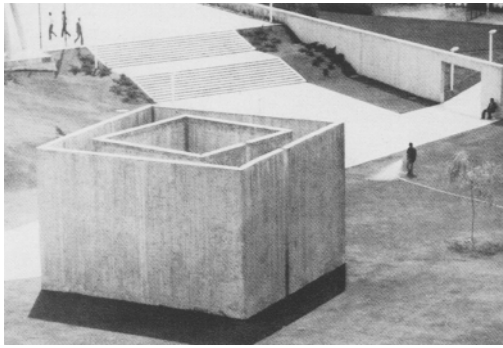
Mediating Between the Global and the Local

In addition to those mosques whose architects rely wholly on regional tradition, the design of other mosques reflects a dialogue between global tendencies and local particularities. The Al-Ghadir Mosque in Tehran, Iran, is a good example of this tension between continuity and transformation. Designed and built between 1977 and 1987 – the Islamic Revolution took place at the beginning of this period – the building by the architect Jahangir Mazlum employs neither the four-iwan arrangement nor dome and minaret. Instead, Mazlum crowned a dodecagonal prayer hall with a series of stacked and rotated squares that grow successively smaller with each level, creating the impression of a prismatic faceted dome (Figs. 14-15). Although the ceiling mosaic and decorative stone borders with their glazed blue tiles and arabic script are traditionally found in Iranian buildings, they have a distinctly modern appearance when juxtaposed with the yellow brickwork.

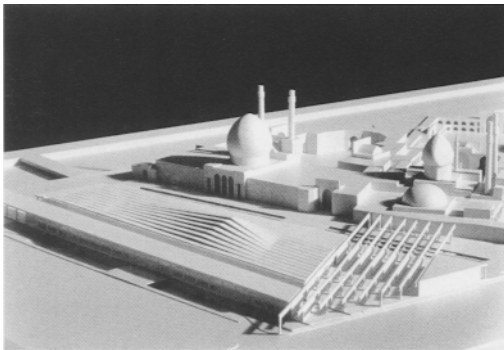
The competition for the design of the Istiqlal Mosque in Jakarta, Indonesia (1955-1984), which took place soon after the nation was founded, asked not only for the design of a symbolic landmark but also stipulated the use of durable and locally available materials. The winning design by Frederich Silaban employs forms typical of monumental Soviet architecture and modern Turkish architecture. References to Ottoman architecture are not uncommon in Indonesia and this explains Silaban's abstraction of the needle minaret.



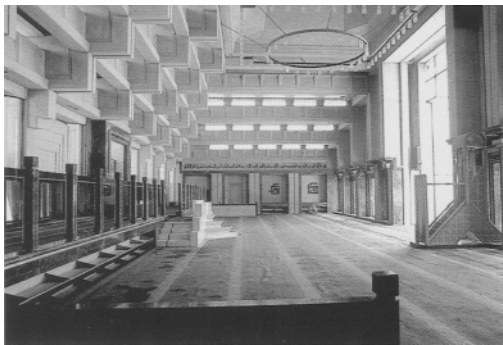
14-15 Jahangir Mazlum, Al-Ghadir Mosque, Tehran, 1977-1987, concept sketch and floor plan



16 Kamran T. Diba, prayer space in the grounds of the Carpet Museum, Tehran, 1978



17 Seyed Hadi Mirmiran, Extension to the pilgrimage site, Qom, 2001, design



18 Altug, Behruz und Can Çiniçi, National Assembly Mosque, Ankara, 1985-1989, prayer hall

Moving Away from Tradition and Towards Modernism

In other mosques a more critical attitude towards tradition can be seen. Kamran T. Diba, the architect of the buildings on the campus of Jondishapour University in Ahvaz, Iran (1971-1975), wanted to establish a specifically Iranian contribution to modernism. The complex, constructed of yellow brickwork, has no dome, no minaret and no ornamentation whatsoever on its walls (see pp. 204-05). A few years later he designed a prayer room in the grounds of the Carpet Museum in Tehran (1978) in the form of two plain cubes open to the sky, one enclosing and one enclosed (Fig. 16). The outer square relates to the geometry of the museum complex, the inner square is rotated to face towards Mecca. The mihrab is punctuated by a full-height vertical slot that penetrates the two walls of the concrete structure.

A more recent example of this kind of architecture is the plan for the extension to the pilgrimage destinations in Qom, Iran (2001). The architect Seyed Hadi Mirmiran was inspired by the visual phenomena and the values of his homeland. His design is modern but makes reference to natural forms, for example the waves formed by the wind in the desert sand or the surface of the nearby salt flats (Fig. 17).

In a country such as Turkey that regards itself as being politically secular, it is not surprising when in the design of important architectural buildings both the commissioning body and the architect distance themselves from Ottoman tradition. This was the case with the building of a new mosque in the direct vicinity of Clemens Holzmeister's National Assembly building in Ankara. Despite some protest, it was agreed early on that the mosque should have a modern character. The architects Altug, Behruz and Can Çiniçi designed a low, elongated building made of reinforced concrete with a stepped roof reminiscent of a low pyramid (1985-1989). There is no minaret, and the broad mihrab is formed out of clear, curved plexiglass. As a result, the prayer hall is illuminated almost entirely by light coming from the direction of Mecca (Fig. 18).

20th-Century Mosque Architecture in the Nations of the Diaspora

In the Islamic nations, references to local traditions in the building of mosques are commonplace. Architectonic regionalism has, however, also been transported into the nations of the Diaspora, and the formal canons of Islamic nations from Morocco to India are upheld in Europe in particular. Erich Elin-gius and Gottfried Schramm's design for the Shia Imam Ali Mosque in Hamburg (1960-1965), for instance, exhibits stronger parallels to traditional Muslim houses of worship in Iran than the Al-Ghadir Mosque in Tehran or the mosque on the campus at Jondishapour University in Ahvaz. Similarly, Hubert Geisler and Mehmed Bedri Sevinçsoy's design for the Sunni Yavuz Sultan Selim Mosque in Mannheim (1995) is heavily influenced by the architectural vocabulary of the Ottoman Empire.

The height of the mosques in the Diaspora and their roof form is usually determined by the prevailing architectural conventions of the context, as neither of these is governed by any specific Islamic tradition. Tradition states simply that an open space for prayer sheltered by a roof is most appropriate. The spartan enclosure in the grounds of the Carpet Museum in Tehran and the elaborate high-tech roof over the courtyard of the King Hassan II Mosque in Casablanca could hardly contrast more, however both offer progressive solutions.

On the other hand, with regard to the position, form, height and number of minarets, regional traditions do provide a source of inspiration. For example, the two aforementioned West German mosques differ clearly in their approach. The mosque in Hamburg follows the Safavid tradition with two minarets, one on each side of its sizeable portal, whereas the mosque in Mannheim is flanked by only one minaret. The Sunni or Shia, Arab or Persian origin of a community is also displayed on the pinnacle of the minaret in the form of a half-moon or through walls decorated with the script of Allah. Such differences are sometimes also to be found in wall decorations elsewhere: the names of the first three Caliphs appear in Sunni mosques but never in Shia mosques.

The Spatial Programme and Arrangement of Modern-Day Mosques

Regardless of the architectonic aspirations of the design of mosque and regardless of whether it will be built in an Islamic nation, in a desert settlement or a city in the Diaspora, the prayer ritual is always the same.

The Path to Prayer

Once the Muezzin chants the call to prayer, the faithful make their way to the mosque. They enter through the main entrance, in many cases into a vestibule. From there they pass through to a forecourt or roofed-over entrance hall where the paths of the men and women separate. If one wishes to speak with one's god, it is necessary to first wash one's face, arms, hands and feet. For this reason, fountains were of great importance in the very first mosques. Today, fountains for ablutions are still installed in front of the prayer hall, though nowadays their value is more aesthetic.

After the ritual washing, the believer is ready for prayer. The path to the prayer hall is, however, not a straight line. Instead, one is led indirectly – through the forecourt, corridors or stairs – gradually towards the entrance. Here both men and women take off their shoes, placing them in cupboards, racks or similar. In larger mosques there are separate cloakrooms for men and women. Wheelchair-bound believers are likewise allowed to pray and washing facilities for themselves and the wheels of their chair as well as separate entrances are not uncommon.

The Prayer Hall

Some buildings provide separate entrances for men and women. These are never positioned on the qibla wall but at the sides opposite one another. From here, one can immediately see the mihrab without disrupting those already praying. Muslim believers enter the room, usually covered with carpets, and join the rows of those already praying behind the Imam. The rows are always parallel and face the qibla wall. The first row begins about 1.25 metres behind the Imam. The depth and width of the room can be calculated on the basis of this distance and the number of believers the hall should accommodate. The floor plan can follow any geometric form as long as it does not resemble that of another religion, e.g. not a cross or a six-pointed star. A rectangle oriented towards Mecca is still the most popular form and relates to the original mosque in Medina. Alternative solutions such as the polygon of the Al-Ghadir Mosque in Tehran or the rotunda of the Yavuz Sultan Selim Mosque in Mannheim are examples of other possible non-rectangular forms. Regardless of the floor plan, the mihrab should always be situated in the centre of the qibla wall.

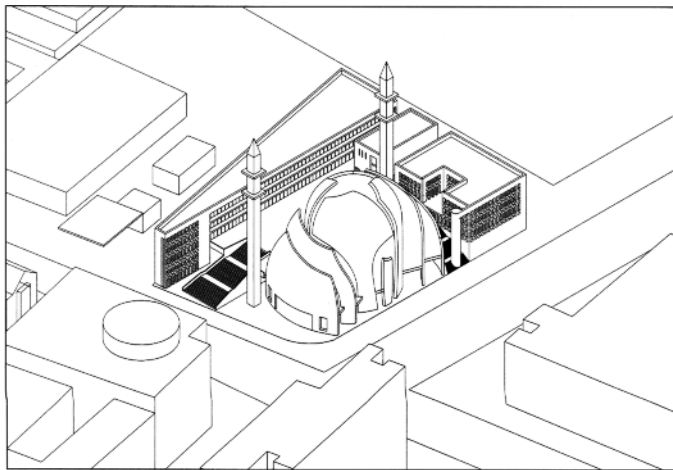
Architects soon realised that the number of people taking part in prayers could be increased by expanding the prayer hall by using the ancillary spaces around it. In some mosques, in particular the large Friday mosques, it is even possible for people to pray in rows outside in the forecourt. In extreme circumstances, the street outside can be closed off and covered in mats, transforming the entire area into an open space for prayer.

The Imam takes up position in the mihrab – this niche is often also a little lower than the floor level of the prayer hall – and begins to intone prayers. The rows of believers behind him follow his lead. The prescribed separation of men and women is achieved in smaller mosques by allowing women to form rows behind the men. If the rows of men and women are arranged next to each other, curtains or screens can be used to separate the sexes. In larger mosques, more complex solutions with separate entrances for men and women are often used.

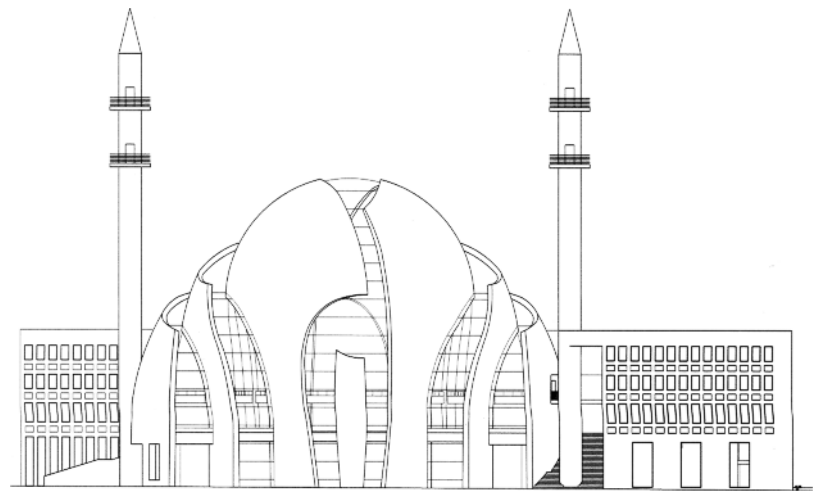
The formation of rows differs between the Sunni and Shia Muslims. While for the Shia, the rows must be connected to the Imam during congregational prayer, this contact is not absolutely essential for the Sunni mosques. In Sunni prayer houses there are sometimes several storeys or a gallery for women; in Shia mosques, extensions to the prayer hall to accommodate women are usually at the same level. Connection in this sense means that each Muslim can touch his or her neighbour – to the

left and right as well as in front and behind – after prayers. The floor should therefore neither fall nor rise. The need to be able to hear the Imam’s prayer is achieved nowadays with the help of technical equipment.

Building a mosque in an Islamic nation, where the architect is required to mediate between regional and global ideas, remains a difficult task. In the lands of the Diaspora, this task can be even more difficult, as the recent discussions regarding Gottfried and Paul Böhm’s design for the mosque in Cologne have demonstrated (2006; Figs. 19-20). Projects in Europe must unite what at first glance seems difficult to achieve: on the one hand the values and aspirations of the community, whose members often wish to see their new mosque resemble those of their homelands; on the other, the values and wishes of the local inhabitants, who often know little about the Muslim religion.



19 Paul Böhm, Cologne Mosque project, 2006, isometric view



20 Paul Böhm, Cologne Mosque project, 2006, view from the southeast

SELECTED BIBLIOGRAPHY

- Creswell, Kippel Archibald Cameron:** *A Short Account of Early Muslim Architecture*. Revised and Supplemented by James A. Allan, Aldershot 1989
- Frishman, Martin, Khan, Hasan-Uddin (Ed.):** *The Mosque. History, Architectural Development and Regional Diversity*, London 1994
- Ghanimeh, Ali Abu:** *La moschea fra tradizione e rinnovamento*, in: *Architettura e spazio sacro nella modernità*, exhibition catalogue, Milan 1992, pp. 62-
- Garaudy, Roger:** *Mosquée, Miroir de l'Islam*, Paris 1985
- Grover, Razia:** *Mosques*, London 2006
- Hillenbrand, Robert:** *Islamic Architecture. Form, Function and Meaning*, Edinburgh 1994
- Holod, Renata, Khan, Hasan-Uddin:** *The Mosque and the Modern World. Architects, Patrons and Designs since the 1950s*, London 1997
- Khan, Hasan-Uddin:** *Panorama e tendenze dell'architettura della moschea*, in: *Architettura e spazio sacro nella modernità*, exhibition catalogue, Milan 1992, pp. 209-
- King, Geoffrey R.D.:** *The Historical Mosques of Saudi Arabia*, London and New York 1986
- Korbendau, Yves:** *L'Architecture Sacrée de l'Islam*, Paris 1997
- Kraft, Sabine:** *Islamische Sakralarchitektur in Deutschland. Eine Untersuchung ausgewählter Moschee-Neubauten*, Münster 2002
- Limon, Ihsan D.:** *Islamische Kultstätten des 20. Jahrhunderts im europäischen Raum*, part 1, part 2 Materialien, thesis, Kaiserslautern 2000
- Metcalfe, Barbara Daly (Ed.):** *Making Muslim Space in North America and Europe*, Berkeley, California 1996
- Mosque Architecture.** *Proceedings of the First International Conference on Mosque Architecture*, Tehran 1998
- Mosque Architecture.** *Proceedings of the Second International Conference on Mosque Architecture*, Tehran 2000
- Neufert, Ernst:** *Architect's data*, Oxford 2000
- Pellitteri, Antonino:** *La moschea come significazione del divenire arabo-islamico*, in: *Architettura e spazio sacro nella modernità*, exhibition catalogue, Milan 1992, pp. 58-
- Pereira, José:** *Islamic Sacred Architecture. A Stylistic History*, New Delhi 1994
- Renz, Alfred:** *Geschichte und Stätten des Islam von Spanien bis Indien*, Munich 1977
- Seidl, Ernst (Ed.):** *Lexikon der Bautypen. Funktionen und Formen der Architektur*, Stuttgart 2006, articles on Madrasa pp. 334-, Minaret pp. 356-57, Mosque pp. 360-
- Serageldin, Ismail, Steele, James (Ed.):** *Architecture of the Contemporary Mosque*, London 1996
- Turner, Harold W.:** *From Temple to Meeting House. The Phenomenology and Theology of Places of Worship*, The Hague 1979, pp. 260-
- Vogt-Göknil, Ulya:** *Grands Courants de l'Architecture Islamique. Mosquées*, Paris 1975
- Vogt-Göknil, Ulya:** *Die Moschee. Grundformen sakraler Baukunst*, Zurich and Munich 1978

Acoustics in Sacred Buildings

The Sound of Space as a Symbol of the Sacred

The sound of a sacred space is a fundamental acoustic experience of people in a society. Accordingly, cultural conventions play a major role in how this is perceived. To the present day in the Christian Occident, churches are widely expected to exhibit a particularly good reverberating sound. Many sacred spaces are crowned by a dome, which symbolises the heavens and the house of God not just visually but also acoustically. In synagogues and in mosques, the need to hear the sermon or prayers clearly has always been and still is of greater importance. However, these spaces – with the holy shrine, the aron ha-kodesh, positioned against the wall that faces Jerusalem or the mihrab, the deep niche for the imam in the qibla wall that faces Mecca – also have a certain numinous quality. The general expectation is that a sacred space will conform to acoustic tradition. One reason for this may be that in the clamour and commotion of the world around us, aural perception has become ever more sidelined to the subconscious. Paradoxically, this makes the architectonic creation of acoustic environments more difficult. However, the greater freedom of formal expression and material design afforded by modern construction has also made new and impressive solutions possible in the field of acoustics.

Architectural Acoustics – The Conflict Between Resonance and Clarity

The history of sacred architecture describes a wide variety of functional requirements and how they have been adapted over time: the functions of prayer, readings from the Holy Scriptures, the sermon and the invocation and worship of the Holy have led to the formation of characteristic spatial shapes and design elements. It is, however, apparent that in certain circumstances the acoustic requirements can contradict one another. For prayer, protection from intrusive noise is required, for readings and the sermon, clarity of the spoken word. The invocation and worship of God are conducted through loud incantation or by a choir with many voices, supported in some religions by an organ or musical instruments.

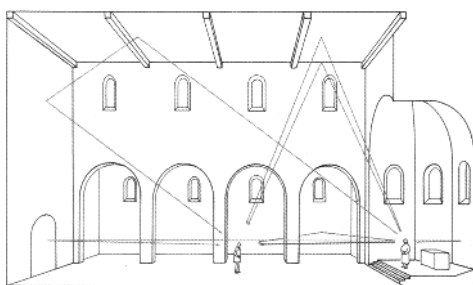
The acoustics of churches presents one of the most complex cases of architectural acoustics. Traditional churches often consist of one or more zones that are more or less connected with one another and that serve several liturgical functions with different acoustic requirements (nave, side aisles, transept, choir). The sound source (priest, organ, choir) reaches the congregation from changing positions. It can be confusing for readers, singers and audience alike when sound energy from other parts of the space reaches them with a delay. The position of the sound source and the form of the space are the key factors that determine the acoustic interaction of interconnected spaces.

Sound and Sound Propagation

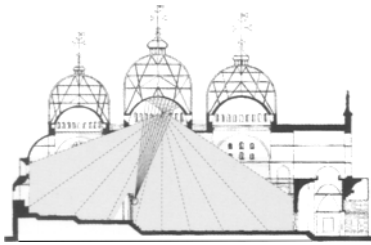
The intensity of a sound source attenuates rapidly with the distance travelled. The intensity of a sound that spreads evenly in all directions reduces by a factor of four as the distance doubles, by a factor of a hundred with a tenfold increase in distance. This makes it clear just how important it is to improve acoustic communication through the use of amplifying sound reflections.

In geometric acoustics, the propagation of sound waves is represented by rays that reflect off the enclosing surfaces of a space according to the same laws of reflection used in optics (Fig. 1). Each listener is located in a field of sound waves that arrives in staggered succession, radiating from a sound source at a speed of approximately 340 m/sec and reflecting off wall surfaces and sufficiently large obstacles: the direct sound *Dir* arrives first, then follows *A* (reflections from the rear wall of the apse), *W* (from the nearest side walls), *D* (reflections from the ceiling), *W'* (far side walls), *R* (rear wall) as well as further reflections from more than one surface such as *D'* (reflections from the ceiling and rear wall) and so on. The direct sound serves to locate the position of the sound source, and the interval between the direct sound and the first reflection gives an indication of the size of the room.

Our aural perception combines the direct sound and the successive sound reflections to an overall impression of the sound: we perceive the sound as more lucid and intense the closer the interval between the series of reflections within a time frame of 50 to about 150 milliseconds. Lateral reflections

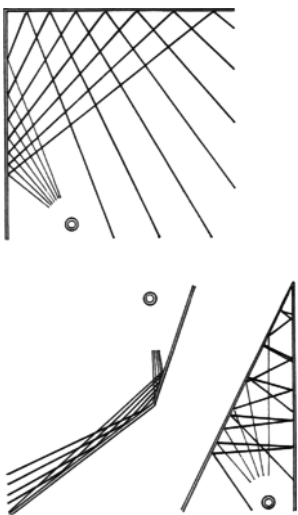


1 Direct sound from the interior surfaces of a traditional church



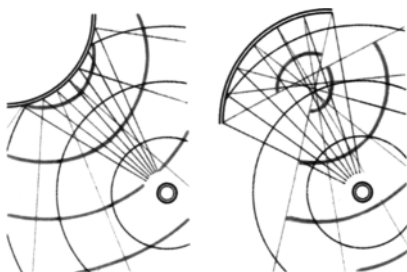
2 San Marco, Venice, 1063

A complex plan in the form of a Greek cross with five cupolas. Sound distribution: longitudinal section showing the transmittance of a sound source on the gallery at right, in front of the choir, to the nave via reflection from the main dome



3 Different angles

Right angle: reflections are transmitted evenly.
 Obtuse angle: reflections gather along the wall.
 Acute angle: reflections are trapped.



4 Convex and concave curves

Convex curves disperse sound waves; concave curves concentrate sound waves on a focal point after passing the focal point, the waves then disperse

strengthen the impression of spaciousness. They are particularly valuable as our ears are, between 6 to 10 decibels, more sensitive to lateral sound than from other directions. The early reflections strengthen the impression of the sound and improve its clarity. Later reflections are heard as reverberations. Very early reflections (less than 15 milliseconds) and hard and loud late reflections (later than 50 milliseconds) can be perceived as intrusive, overlapping or echoing reverberations. Any alteration in the shape of the space changes the paths of reflection and the sequence in which they arrive at the listener. Likewise, the pattern and sequence of reflections change as the position of the listener or the position of the sound source changes.

Geometric Analysis

Computer programmes use three-dimensional ray tracing to calculate the geometric propagation of sound. Such calculations are valid only for a particular combination of the position of the sound source and the listener. With an appropriately chosen cross section, two-dimensional geometric analyses can provide general information about the dissipation of sound taking into account higher order reflections from two, three or more surfaces. Although the attenuation of sound energy is not directly visible, such geometric analyses can provide useful information for the planning of the form of the space (see pp. 58-59). Acute angles and niches lead to localised sound accumulation, which can be intrusive if that is where listeners are located, or if they lead to the delayed relaying of sound to the listener. Right angles and rectangular spaces provide the most even distribution of sound (Fig. 3). As with mirrors, concave surfaces (such as the inward curve of a wall or a barrel vault), concentrate sound in a focal point, whereas sound reflecting off convex surfaces is dispersed. Depending on the distance between the sound source and the reflective surface, the effect of a surface can change entirely (Fig. 4).

Reflection and Diffraction

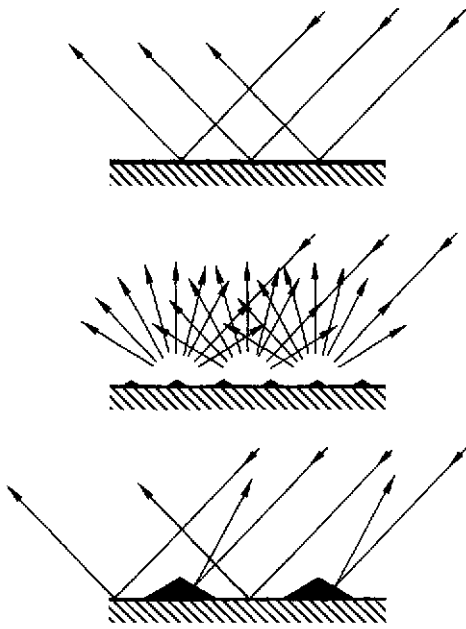
In order to be effective, a reflector must be significantly larger than the wavelength of the sound. For frequencies of between 20 and 20,000 hertz, this can range from 17 metres to 17 millimetres. If an obstruction is smaller than the wavelength, this portion of the frequency of the sound is ignored. For this reason, acoustic shadows can occur behind pillars and under galleries in sacred spaces as low frequencies pass by obstructions while high frequencies are reflected.

As with light, the edges of reflecting surfaces and surface structures in the average dimension wavelength can result in sound diffraction. A surface with a modulated structure with projections and recesses in the range of a centimetre to a decimetre can be used to reduce hard reverberations and reduce flutter echoes between parallel surfaces. It can also serve as a means of absorbing high frequencies (Fig. 5). This rule of reflector dimension and surface structure can have aesthetic implications for the design but can also be integrated into the architecture of the space. For example, this mixture of absorption and diffuse reflection explains the good acoustic properties of baroque stucco ornamentation or the ornamental surface reliefs in mosques.

Reverberation Time and Absorption

After the source of the sound falls silent, the sound persists for as long as it takes for all sound waves that have not been absorbed to reach the listener. The room volume, V , absorption surface area, A , and reverberation time, RT (time required for the sound pressure level to fall by 60 decibels), are connected by a simple formula: $RT \text{ (sec)} = 0.163 V/A$, whereby $A = \alpha_1 S_1 + \alpha_2 S_2 + \alpha_3 S_3 \dots$

However, this formula devised by Wallace C. Sabine is only valid for enclosed spaces in which sound can distribute rapidly and evenly. It can be used in the design phase to calculate the reverberation time when the absorption coefficient α_x and surface areas S_x of the respective materials used are known. The reverberation time RT has to be determined for every frequency, and is therefore represented in the form of a reverberation decay curve. An individual value without qualifying



5 Reflections of different frequencies on a scattering structure: for low frequencies the surface reflects as if it were smooth, for medium frequencies it scatters diffusely, for high frequencies it acts like many small reflectors oriented in different directions

frequency generally denotes the mean value of the reverberation time for frequencies between 500 and 1000 hertz. The size of the surface area of absorption required for a predetermined reverberation time can be derived for a given volume of the space with the help of a table (Fig. 6). If precise laboratory measurements are not available, α -values from technical datasheets can be used for the calculations (for example the α -value tables in Robert E. Mickadeit (et al): Building Construction. Materials and Types of Construction, 5th edition, New York, 1981). Sufficient reserves should be incorporated to ensure that fine adjustments to the room acoustics can still be made. Typically the reverberation time is measured on-site once the shell of the building has been completed to determine the actual acoustic properties of the construction. A final measurement after the principal elements of the interior fittings have been installed allows one to verify the acoustics and, if necessary, to make final corrections.

Because the sound signal of speech changes rapidly, clarity is particularly important. Relatively long reverberation times can nevertheless be tolerated when reverberations decay sufficiently rapidly and evenly and, as far as possible, consistently for all frequencies. This has been verified by measurements taken in sacred spaces with particularly good concert and vocal acoustic properties (Fig. 7). Further quality factors include the degree of syllable intelligibility, tonal colour of the initial reverberation, as well as values determined by the geometry of the space such as clarity, acoustic transparency, stereoscopic impression and laterality. For a mean reverberation time of 500 to 1000 hertz in historical and modern sacred spaces, recommended empirical values exist, which, depending on the architectural style, vary between 1.5 and 7.5 seconds for empty spaces with a volume of between 500 and 20,000 cubic metres. Even in large sacred spaces, the reverberation time rarely exceeds 15 seconds. In spaces with a lack of effective reflective surfaces, the reverberation time can also be surprisingly short, as is the case in St Peter's in Rome where the mean reverberation time is only 3.5 seconds. This is an indication that the unfavourable acoustic properties, which are well known, begin to approach those of being out in the open.

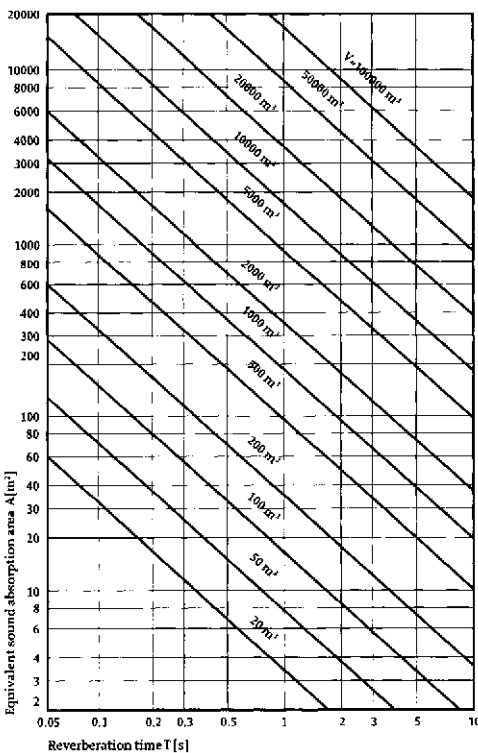
The Number of People

The people present in a sacred space together form a sound-absorbent area which, depending on the shape and arrangement of the space, can represent a large proportion of the interior surface area, particularly when the height of the space, is less than half the width. In high churches and halls, the effect of people present in a space is reduced due to the large area of the flanking walls but it nevertheless remains an important element. The amount of seating, the covering of the seats and their arrangement are therefore some of the most important determining factors for the acoustics of a space. In order to achieve really good acoustic conditions for speech and music for all listeners without the help of electronic amplification with today's density of seating, the maximum amount of seating should not exceed 1800 to 2000 seats.

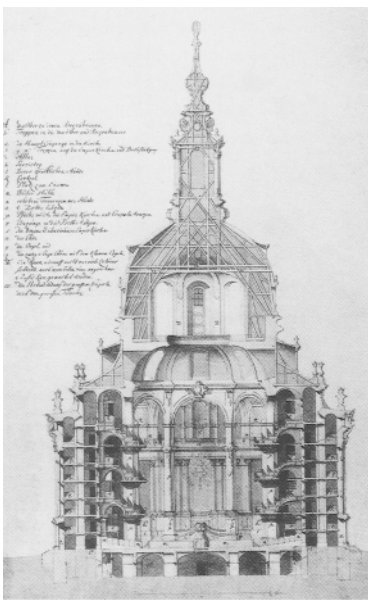
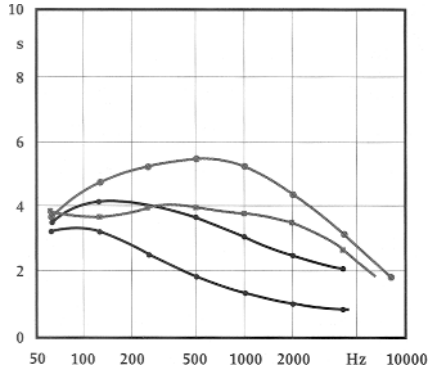
Materials

The application of absorbent materials not only reduces the intensity of sound reverberation but can also avoid the accumulation of sound energy that can lead to undesirable echoing effects. Generally speaking, secondary areas that adjoin the main space should have more sound absorption than the main space. For spaces that can be subdivided and used separately, the acoustics need to be optimised for each part of the space as well as for the space as a whole.

When hard and heavy materials are used which absorb very little sound energy in the frequency range of 100 to 200 hertz (for instance stone and concrete, but also laminated multiplex wood paneling that is firmly bonded to a substrate without a cavity or pronounced joints), the absorption of disruptive low frequency sound requires careful planning and complex corrective measures. Most effective in such cases are panel absorbers (soft panels with an enclosed cavity that are applied over hard materials with a heavy mass) and hollow chambers clad inside with absorbent material, which can be adjusted to match the frequencies that need absorbing. To achieve a well-balanced effect, it is impor-



6 The relationship between equivalent sound absorption area A [m²] and reverberation time T [s] for spaces of different volume



7 Church of Our Lady, Dresden, 1726-1743, reconstruction 2005

a) Reverberation decay curve derived from an analysis of old recordings (first and second curves from the top) and adjusted curves when occupied by 1000 and 4000 persons (third and fourth curves).

b) Cross section of the 1724-1725 project: the central space with a volume of 25,300 m³ and several tiers of galleries, a 35 metre high dome with a second dome inside encompassing a volume of 4900 m³, had excellent acoustic properties for speech and concerts (see p. 18 for plans)

SELECTED BIBLIOGRAPHY

Baumann, Dorothea: Musik und Raum. Eine Untersuchung zur Bedeutung des Raumes für die musikalische Aufführungspraxis. Habilitationsschrift Universität Zürich 2000. Publication in preparation
Baumann, Dorothea: Geometrical Analysis of Acoustical Conditions in San Marco and San Giorgio Maggiore in Venice, in: Howard, Deborah (Ed. et al.): Architecture and Music in Renaissance Venice. International Conference, Venice, Isola di San Giorgio, 8-9 September 2005. Milan 2006, pp. 117-146
Blauert, Jens (Ed.): Communication Acoustics, Berlin and Heidelberg 2005
Cirillo, Ettore, Martellotta, Francesco: Worship, Acoustics and Architecture, Brentwood 2006

tant to distribute the absorptive surfaces regularly in alternation with the reflective surface – for example stone paving for the open areas of the floor and hollow wooden floors laid beneath the seating.

The reduction of higher and medium frequencies is usually achieved by using porous materials such as mineral and organic fibres, by people in the space, and through the use of structured surfaces. Ornamental plasterwork, coarse plaster, clay plasters, exposed brickwork and rough-hewn wood or stone blocks all have favourable acoustic qualities as they reduce hard sound reflections. The absorptive range of curtains can be extended from high frequencies to medium frequencies, the heavier the curtain material and the greater the distance to the wall. Carpets, the most common floor material used in the prayer hall of mosques, are also used in synagogues and churches to improve the acoustics of empty spaces and to deaden the effect of footsteps.

Special Aspects of Acoustics in Sacred Spaces

The tradition of sacred spaces has produced pragmatic solutions to dealing with the problem of acoustics (for example the narrow choir space that is acoustically connected to the nave via sound reflections from the ceiling), which today can be realised in new forms thanks to modern construction methods and measuring techniques. The architectural acoustics should be considered throughout the entire design and building process – whether the spatial distribution of functions or the design of the interior fittings, the formal design of the space or the choice of materials, all aspects contribute to the design of the acoustics. As a result, acoustic conditions and qualities become a part of the overall concept. Through the appropriate choice of standard materials and elements for the interior furnishings and the careful planning of the shape of the space, it is almost always possible to achieve the desired acoustic conditions.

When a combination of spatial zones is discarded in favour of a simple rectangular space, then it is the task of the interior furnishings and fittings to create suitable conditions for the different functions in the space. The necessary stillness for prayer can be provided by an anteroom or by a zone that is more strongly sound insulated with appropriate materials. Traditionally a dome or cupola served as acoustic amplifiers for the invocation, singing of praises and instruments. In spaces without a dome, a sufficiently long reverberation time can serve the same basic purpose. Longer reverberation times do not compromise clarity of speech if they are linearised for all frequencies and when care is taken to avoid speech setting off reverberations. A reflector positioned above the speaker can be used to effectively exclude the acoustic volume of the space above. For the sermon and reading it is sufficient to raise the speaker to ensure the necessary direct sound radiation to the congregation: a step or raised pulpit, as is typical of the lecterns in mosques as well as synagogues, create the important direct visual and aural connection between speaker and listener. A niche or appropriately placed flanking wall surfaces can serve to create early reflections that strengthen the intensity of sound. By contrast, singers, organists and all other musicians are dependent on reverberation to transmit the sound and are therefore best placed on a raised gallery not too far from the ceiling. The now omnipresent use of electroacoustic amplification can help to amplify weaker voices, but their effect is that much better when the space is heavily sound insulated. However, the excessive use of sound insulation causes sacred spaces to lose one of their most essential qualities: the sense of otherworldliness, the atmosphere that creates the conditions for transcendent experience.

Cox, Trevor J., D'Antonio, Peter: Acoustic Absorbers and Diffusers. Theory, Design and Application, London 2004

Eggenschwiler, Kurt, Baschnagel, Karl: Aktuelle Aspekte der Kirchenakustik, in: Schweizer Ingenieur und Architekt, Vol. 25/1999, pp. 8-12

Fasold, Wolfgang, Veres, Eva: Schallschutz und Raumakustik in der Praxis, Berlin 2003

Fuchs, Helmut V.: Schallabsorber und Schalldämpfer. Innovative akustische Konzepte und Bauteile, Berlin 2007

Handel, Stephen: Listening. An Introduction to the Perception of Auditory Events, Cambridge, Massachusetts 1989

Horoshenkov, Kirill V.: Innovative Applications of Materials for Acoustic Purposes, in: Applied Acoustics, vol. 66/6, 2005

Meyer, Jürgen: Kirchenakustik, Frankfurt am Main 2003

Mickadeit, Robert E., Cavanaugh, William J., Whitney Clark Huntington: Building Construction. Materials and Types of Construction, 5th edition, New York, 1981.

Schricker, Rudolf: Kreative Raum-Akustik für Architekten und Designer, Stuttgart 2001

SN EN ISO 18233:2006: Acoustics. Application of New Measurement Methods in Building and Room Acoustics (ISO 18233:2006)

Acoustic Analysis

To illustrate the relevance of form, material and surface structure for architectural acoustics, a selection of interiors from the project examples have been analysed based on the plans and details given.

Plan Form

Eight of the project interiors have a simple rectangular plan form (see pp. 108-109, 156-157, 184-185, 186-187, 200-201, 228-229). All of the remaining plans are more complex. Many of them derive from a rectangular space – with one or more spatial projections or indentations – or are a rare combination of overlapping spatial elements with a rectangular plan (see pp. 116-17, 134-35, 136-37, 152-53, 158-59, 160-61, 162-63, 174-75, 176-77). Where wavelengths are the same length or larger than the depth of the projections, a smoothed out line along the wall (ignoring the projections) serves as the line of reflection. Only a few of the spaces exhibit a plan form that fans outwards from the altar (see pp. 170-73, 198-99, 224-25), which for large spaces (for example pp. 168-169) can result in insufficient lateral sound reflections from the side walls leading to poor acoustic reception in the central seating area of the space. To a certain degree, one can compensate for this disadvantage by choosing a slightly convex ceiling form with sufficiently high side walls.

In spaces with concave curving side walls (segments of a circle, other curves or angles with upright wall surfaces), sound can concentrate in the area of the congregation (see pp. 72-73, 142-43, 144-45, 174-75, 178-81: mirrored zigzag walls, 236-37 and 230-33: irregular octagon). Likewise, sharp pointed angles lead to an accumulation of the sound waves (see pp. 94-95). In such spaces, particularly those of large dimensions, it is best to avoid placing the listeners and the source of the sound (the musicians or speaker) at the focal point, as this can produce echoes if not counteracted by the use of structured wall surfaces or absorbent materials.

Cross Section and Longitudinal Section

Very little can be done to improve the acoustics of wide spaces with low ceilings in comparison to the width of the space. Insufficient lateral sound reflections that strengthen the impression of the sound mean that what the congregation hears lacks clarity and transparency. A well-established historical form of low hall that does, however, exhibit relatively good acoustics for speech is the hypostyle hall in mosques, which like the tree trunks in an open forest without undergrowth, distribute high frequencies diffusely. The numerous pillars, the strongly structured ceiling and array of small cupolas help to distribute sound in the medium and high frequency range (see pp. 218-19).

In very long spaces with parallel wall surfaces, the interval between the direct sound and the wall reflections can be more than 50 milliseconds (a difference in path length of more than 17 metres), resulting in echoing. One can counteract this by splaying one of the surfaces, by giving it a surface structure or by applying absorbent materials (see pp. 186-87: chapel with semi-circular apse). It is also necessary to treat one of the other parallel surfaces accordingly to avoid a strong imbalance in the tonal colour of the reflections.

Funnel-like battered walls (see pp. 194-97) direct reflections increasingly upward towards the ceiling, returning to ground level only after they have reflected off one or more further surfaces. The effect is similar to that of a semi-circular vault: the reverberation time is lengthened.

Ceiling Form

The effect of the plan and walls must always be considered in conjunction with the ceiling. When the height of a space is the same or less than the radius of the dome crowning it, the sound will be concentrated by the dome; in all other cases, the dome reflects sound out into the congregation below.

Tapering and rectangular rooflights can cause sound to accumulate before relaying it with a delay into the space below. Depending on the choice of material and the size of the area affected, this can be intrusive. Such areas should be made sound absorbent.

A 90-degree gable provides a favourable transmission of acoustic reflections between the side walls; a steeper gable (such as a pointed vault) leads to sound accumulation and an accompanying delay in the reflected sound; a more shallow gable (similar to a shallow vault) leads to reflections that travel along the gable before arriving with a delay on the opposite side. Bulging gables that are curved in a longitudinal direction (see pp. 98-99, 104-05, 108-09) produce a similar effect to shallow vaulting (see for example pp. 164-67). One-sided pitched roofs always lead to sound accumulation in the sharp corner at the upper edge (see pp. 90-93, 100-01, 136-37). Butterfly or M-shaped gables divide the space acoustically into two more or less separate halves resulting in an effect much like two parallel vaulted naves (see pp. 102-03, 138-41). For spaces defined by such concave surfaces, the resulting effect depends on the position of the sound source and of the listeners as well as the absolute volume of the space.

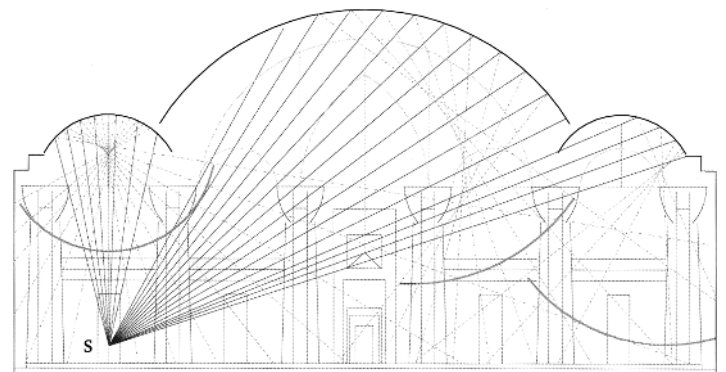
A General Rule

As the distances involved and the volume of a space increase, spaces that disperse sound unevenly become more problematic. Conversely, the smaller the dimensions of a space, the greater the risk of standing waves, which can also occur diagonally across several surfaces.

Mosque of Rome, Paolo Portoghesi, Vittorio Gigliotti, Sami Moussawi, 1995

In this prayer hall accommodating 2000 believers in an area of 40 by 40 metres, the large dome distributes the voice of the Imam back into the rear three-fifths of the square hall. The imam is located beneath a small cupola at the front centre, which functions as a reflector to distribute sound both lengthways as well as laterally across the entire space of the prayer hall. The small cupola on the opposite side next to the entrance wall gathers and reflects the direct sound, amplifying it for the rear of the space. The small cupolas along the side walls have a similar effect. These compensate for the decreasing intensity of the direct sound with distance, which is important for a room of this

size. The 32 pillars, each made of four intertwined shafts that open outwards at the top and the decorative ribbing of the dome, whose slender dimensions only affect high frequency sounds, distribute the sound reflections diffusely in all directions, improving the intelligibility of the prayer between the columns. The soft carpet counteracts hard reflections off the floor. Despite the hardness of the concrete, this combination produces a calm and lucid acoustic atmosphere.



Sogn Benedetg Chapel, Peter Zumthor, Somvix, 1988

Sound Distribution in the Plan of the Chapel

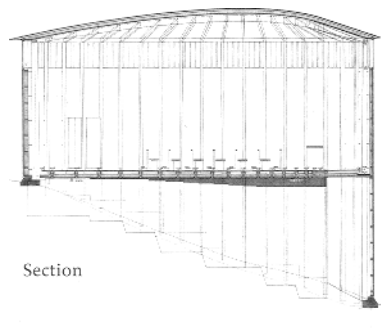
The altar is situated at the focal point of the oval, the priest stands behind the altar facing the congregation and therefore necessarily a little away from the focal point. This is ideal: the diagram shows a good distribution of the sound energy throughout the space with a concentration in the centre of the space and the rear entrance area of the church (the point of the droplet). Due to the small size of the 13.6 metre long church, the reflections follow rapidly, producing a good reinforcement of the sound. The pronounced structure of the surface

es, the choice of materials and the double-wall construction of the walls, ceiling and floor help to reduce the strength of the concentration of sound waves. Unpleasant low frequencies are absorbed, medium and high frequencies are scattered favourably. This results in a good clarity and transparency of speech.

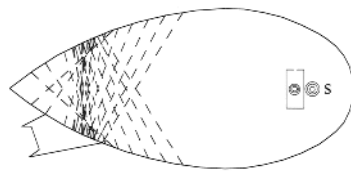
The tonal quality of the space is determined by the shape of the space and its dimensions, as well as by the strong resonance of its materials. Visitors recount that the resonance of the hollow floor is immediately apparent on entering the room. In theory, the shape of the oval

is problematic (acoustic focal point and a risk of echoing) as is the acute angle of the point (sound concentration). However, in combination with the shape of the shallow pitched roof and its slightly arching ridge, the choice of materials and the strongly structured interior within the small space, a room of particular acoustic intensity has been created.

Analysis of the Paths of Sound Transmission Via the Walls

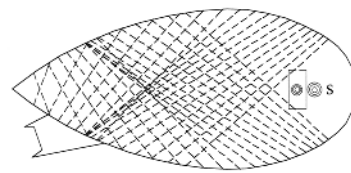


Section



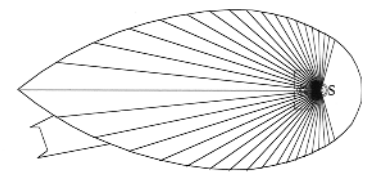
second order reflections

Direct sound is emitted forwards, reflected sound bounces off the side walls. Second order and third order reflected sound

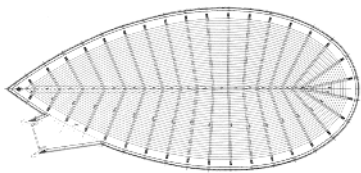


first order reflections

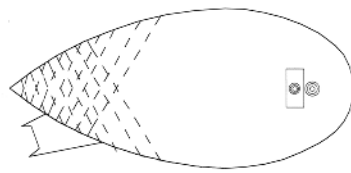
concentrate at the rear of the space. In the centre the direct sound is reinforced by the first order reflections.



direct sound

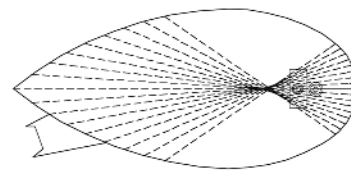


Plan



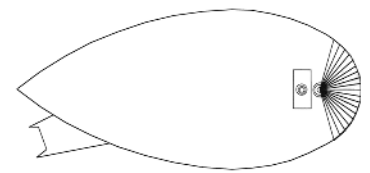
second order reflections

The darker sound proportion of speech radiates indirectly from the wall behind the priest and from there is reflected to the side



first order reflections

walls. At the rear of the space, one can see an additional concentration of first, second and third order reflections.



direct sound

Dresden Synagogue, Wandel Hofer Lorch Hirsch, 2001

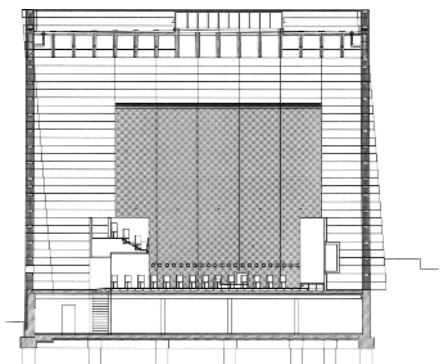
The inner sanctuary is a space within a space: a relatively narrow rectangular volume that stands at a slight angle to the outside walls and is enclosed on all sides by a curtain made of a diaphanous brass textile. The metal textile bands are in acoustic terms almost entirely transparent. The solid reflecting elements of the inner space consist of oiled oak panels and extend upwards about a quarter of the height of the space. The "inner" lateral reflections result only from these wooden surfaces, which enclose the torah wall and raised podium like a U-shaped bracket. At the opposite end, a similar

construction with the same reflective surfaces houses the women's gallery. The massive external walls of the "outer" envelope represent the limiting acoustic surfaces.

It is important that undesirable acoustic effects do not occur in the outer 26 by 24 metre cuboid form. The rotational torsion of the walls avoids such effects. Each course of blockwork is rotated slightly so that in all from top to bottom the walls are inclined by 5 degrees. The resulting twist and the surface structure of the opposite walls avoids the creation of flutter echo and standing waves, and dissipates

high frequency sound waves. Likewise, the coffered concrete ceiling eliminates reverberations that are too hard.

The raised position of the reading lectern, the bimah, directly in front of the centre of the space and the U-arrangement of the pews around it ensure a direct visual and acoustic intimacy between the reader and the listeners. The parallel side walls and their surface structure as well as the 1:1 height to width ratio of the outer space provide good acoustic conditions for the spoken word.



Light in Sacred Buildings

Natural light and the design of artificial lighting have a fundamental effect on the atmosphere of sacred spaces. Light and shadow determine the spatial qualities of a space; when used in the right amount at the right time and in the right place, light can accentuate, direct attention, create an atmosphere of contemplation and composure, foster togetherness in prayer, or underline the solemnity or festiveness of an occasion.

Light in Churches

Christian theology is a theology of light. God is regarded as the creator of light, and believers in God have been called “out of the darkness into His marvellous light”. In the revelation to John, the radiance of the holy city of Jerusalem is attributed to the glory of God who is portrayed as “illuminating” the city (Revelation, 21:11; 21:23; 22:5). This theology of light is the foundation of lighting design for churches.

Daylight has always been a key aspect in the design of sacred spaces. In Egyptian temples, the processional route led through a hypostyle hall growing ever darker before reaching the cult images, which were illuminated only on certain days by the rising sun, appearing magnificently out of the darkness. Similarly, only a few small windows puncture the mighty walls of Romanesque domes, sending rays of light through the darkness that were thought to come from God directly. In the 12th and 13th centuries, light was thought to be the source and actual essence of all that is beautiful. The walls of Gothic cathedrals made way for glorious coloured glass windows, a fusion of the immaterial – light – and the material, of the heavenly and the man-made. During the baroque period, the control of light in churches was taken to perfection, a high point in the orchestration of light in architecture. Transparent glass windows allowed light to flood into the interiors of churches, lighting up the frescos on the ceiling, modelling the plasterwork and illuminating the altar, behind which in some churches a yellow-coloured radiating gloriole shone from on high.

Natural Light

Daylight can be employed as a diffuse, soft light without shadows or as a strong directed light that casts sharp shadows. Daylight determines how a sacred space and the points of liturgical activities are perceived. The amount and direction of light can be used to focus orientation during the service or to create a place for silent prayer. Daylight can lend sacred spaces a spiritual atmosphere. Light can be used to give focus to a particular spot in an otherwise open space or to emphasise sacred meaning. Shadows can punctuate space. Complex interactions between light sources from several openings can create layered spaces, while soft diffuse light can lend spaces an appearance of weightlessness. Daylight can model spaces, changing how they appear with each hour of the day from morning to noon to evening. Every opening changes the character of a space, depending on whether it is placed in the centre of a wall, in the corner of a room or in the ceiling. And, unlike artificial light, sunlight is available every day, free and dependably, modulated only by the seasons, time of day and weather.

In the context of climate change, the use of daylight should also be considered in terms of energy efficiency. Sacred spaces in which services are celebrated in artificially lit surroundings fail to exploit not only the design possibilities but also the energy of sunlight. The degree to which daylight contributes to the illumination of interiors is expressed by the daylight factor. This is calculated as the proportion of brightness in an interior compared with the brightness outdoors on an overcast day. Comprising a sky component, an external reflected component and an internal reflected component, the daylight factor is a constant value for every point in a room. In temperate climates, the brightness of the sky varies considerably. Unlike in warmer climates, the size and arrangement of openings in churches must make the most of the lower light levels of overcast skies rather than direct sunlight. Effects resulting from direct sunlight – strong shadows, glare and heat gain – only happen on sunny

days. In countries that are regularly exposed to strong sunlight, the direct incidence of sunlight can be regulated through the use of smaller openings and suitable orientation, through external shading mechanisms or selective glazing that offer good light transmission but restrict energy transmission.

The daylight factor can be calculated during the design process and the daylight illumination simulated using a model. The daylight factor determines the lower limit of daylight illumination. Depending on the orientation, the position of the windows with respect to the points of the compass and the kind of glazing, areas can result that are either very light or in shadow. If the daylight factor is high, less artificial lighting is required: for a daylight factor of 1 per cent in a church with windows, supplementary artificial lighting will be required for church services; for a factor of between 2 and 4 per cent, church services can be held without the need for artificial lighting. To achieve a sufficient level of daylight illumination it is also necessary to ensure that light is consistent, that it is glare-free. The degree of shadow and the direction of the incident light must also be considered.

Natural Light From Windows

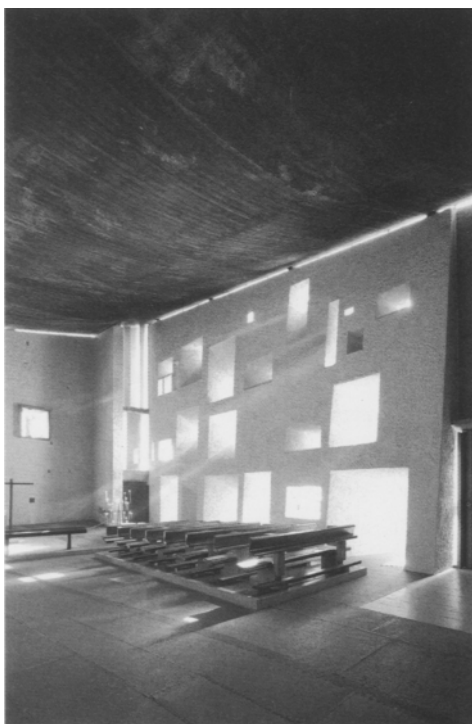
The amount of daylight and glazing in a church fundamentally determines the character of a space. The kind of glazing can be used as a design element that influences how open or closed a wall appears; it can also be a bearer of meaning. In deep spaces, light ceilings and flanking walls help to illuminate a space evenly. They contribute positively to the atmosphere of a space and increase the daylight factor. Sacred spaces that are lit from both sides ensure that the centre of the space, in most cases the focus of liturgical activities, is well lit and that the faces of the congregation are easily discernible. Windows in contemporary churches are rarely arranged in the traditional manner (for example, rows of rectangular or arched windows), but rather in unusual forms or arrangements so that particular lighting situations and effects result: in Álvaro Siza's Santa Maria Church in Marco de Canaveses (1996; see pp. 106-07), three windows are arranged high up beneath the ceiling, recessed in the inward curve of the northwest wall. The light is reflected off the white surface of the interior.

The perimeter walls of Heinz Tesar's Donau City Church in Vienna (2000; see pp. 156-57) are perforated with a regular pattern of smaller and larger round windows. They are supplemented by cubes of light of different sizes that are cut into the corners of the rectangular space and fill the space with light, emphasising the font and the tabernacle. Clad in light birch and sugar-maple, the space shines like a golden shrine encrusted in precious jewels. The altar is additionally emphasised by a rooflight cut into the ceiling in a shape that symbolises the wound inflicted on Christ on the cross.

In the pilgrimage church of Notre Dame du Haut in Ronchamp (1955; Fig. 1), Le Corbusier experimented with different-sized openings cut like deep incisions into the south wall. Sunlight streams into the space in white and coloured bands through the panes on which a prayer is written. The icon of the Virgin Mary is arranged in a glazed box in the east wall, so that in the morning the sun shines inwards from behind the figure of Mary. The curving roof is separated from the walls on the east and south side by a narrow 10 centimetre wide slot of light. Light entering through the slot grazes the underside of the concrete ceiling so that the heavy protective roof appears to float.

Natural Light From Glazed Walls

New means of construction using steel and reinforced concrete and the industrial production of large panes of glass have made it possible to open entire surfaces of spaces. Techniques such as the sand-blasting, etching, coating, melting, printing, spraying and painting of float glass offer new design possibilities. Heavily structured or tinted glass surfaces as well as translucent surfaces made of thin stone panels or matt glass provide a form of spatial enclosure, whereas transparent glazing provides a light and clear illuminated space and connects an interior with its surroundings. An example is St Canisius Church in Berlin by Büttner Neumann Braun (2002; Fig. 3), whose glazed frontage opens out onto an enclosed outdoor space to the south. Different forms of modulated daylight enter indirectly via a concealed translucent glass membrane behind the altar wall, through a slot that separates the north wall

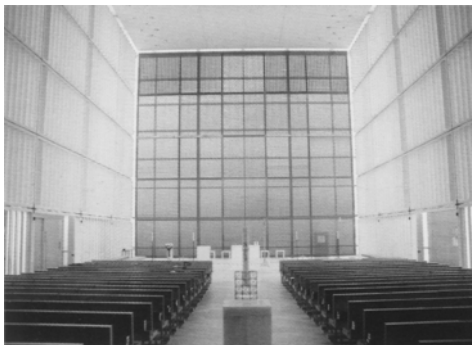


1 Le Corbusier, Pilgrimage Church Notre Dame du Haut, Ronchamp, 1955

Numerous different-sized deep recesses with coloured glazing pierce the south wall of the pilgrimage church. The roof appears to float above a 10 centimetre wide slot of light between the wall and ceiling



2 Büttner Neumann Braun, St Canisius Church, Berlin, 2003
A clear glass wall allows the church interior to open out onto an enclosed space outdoors. Additional direct daylight comes from a band of light and indirect light from a translucent glass membrane behind the altar. The mean daylight factor lies between 2.1 and 3.2 per cent.



3 Allmann Sattler Wappner, Sacred Heart of Jesus Church, Munich, 2000
The church space is enclosed by a wooden shrine placed within a translucent rectangular glass volume. The mean daylight factor around the altar is 6.2 per cent. Towards the back of the pews, this value drops to 2.5 per cent as the structure of the wooden slats becomes more closed.

from the ceiling and through an arc cut into the roof of the rectangular entrance canopy. The white rendered walls reflect the light from these various sources in different ways.

In Volker Giencke's St Florian's church in Aigen im Ennstal (1992; see pp. 98-99), sliding panes of coloured antique glass are arranged in front of a wall of transparent thermal glazing so that the play of colours, which produces a stimulating and contemplative atmosphere within, can be changed to reflect the church calendar.

Translucent facades close off the world and nature outside and concentrate attention on the activities within the church space. Unlike with transparent or tinted glazing, there is no danger of glare as a result of direct sunlight. The brightness of overcast skies is comparatively low, rising gradually as cloud cover clears to reveal a sunny sky; the space remains consistently illuminated. The cuboid form of the Christus Pavilion by gmp Architects and Joachim Zais (2000; see p. 110), a glass and steel construction, which was dismantled after the Expo 2000 and re-erected in Volkenroda, is enclosed by 12 millimetre thick glass panels bonded with 10 millimetre thick panels of crystalline marble. Light streams in through the capitals of the nine cross-shaped steel columns where they meet the roof. The diffuse and even light filtered by the white marble and the strong verticality produced by the lighting of the columns from above lend the space a contemplative and introverted character. The mean daylight factor for the entire interior of the church is 2.7 per cent.

The space of the Church of the Sacred Heart by Allmann Sattler Wappner in Munich (2002; Fig. 3) is enclosed by a wooden shrine placed within a translucent rectangular glass volume. Vertical slats of maple wood are arranged in a timber framework and adjusted so that the brightness of the space increases towards the altar. The degree of transparency of the outer facade follows exactly the inverse pattern: behind the altar it is opaque, preventing views inside or out, and at the entrance entirely transparent.

For fully-glazed surfaces, consistent and even illumination, glare-free light, the degree of shadow and the direction of incident light are even more fundamental for the resulting quality of natural light than with windows. The traditional though no longer obligatory orientation of churches, with the choir to the east and the long sides of the church on the north and south sides, is advantageous in terms of lighting. When the sun is lower in the sky, the west and east facing façades are exposed to greater direct solar irradiation and therefore more warmth than south-facing façades (or north-facing for churches in the southern hemisphere). The high position of the sun on the south side (or the north side for churches in the southern hemisphere) means that this façade can be shaded quite effectively by overhanging eaves, canopies, photovoltaic modules or louvres. This is more difficult on the west and east-facing facades where the angle of the sun approaches the horizontal. Large glazed openings on these surfaces can lead to a considerable build-up of heat. In churches with an eastward orientation, therefore, the natural regulation of indoor climate complements Christian symbolism: the Second Coming of Christ has always been prophesied to come with the rising of the sun in the east.

Natural Light from Skylights

Spaces that are particularly deep can be more evenly illuminated with light from above than from the side, the entire sky serving as a source of light rather than just a section, as is the case with windows and wall glazing. Skylights receive the brightest light from the zenith rather than the weaker light from above the horizon. When used in the same quantity, skylights are much less prone to obstructions to illumination than windows or glazed walls are. They cause less glare and are less susceptible to the kind of distracting silhouette-effects seen when looking at bright windows. Skylights are, however, not able to afford a view of the surroundings and can provide orientation through weather and time of day alone (Fig. 4).

Skylights provide sufficient illumination for all zones of a space within a cone with a 30-degree spread beneath the skylight. Sacred spaces can be lit solely from above, as can be seen, for example, in the Pantheon in Rome. Skylights can also be used to emphasise individual areas of a space, for example the crossing at the intersection of nave and transept. Light that shines from above onto the altar can



4 Florian Nagler, St Sophia, Munich, 2005
White timber slatted screens filter natural light that shines from above and through the rear wall. The mean daylight factor lies between 5.7 and 6.4 per cent



5 Königs Architects, Church of St Francis, Regensburg, 2004
Light falls through a translucent membrane hung beneath the sawtooth roof providing a diffuse light within the church. When the sun shines, the sawtooth roof casts shadows on the membrane; when the sky is overcast the membrane provides a bright even light. When it is dark, lights mounted between the roof and membrane throw cloud-like formations onto the membrane. The daylight factor near the altar is 1.5 per cent, around the pews a constant 1.2 per cent

lend the space a transcendent nature or similarly be used to symbolically mark the position of the font or tabernacle. Le Corbusier used daylight not so much to illuminate a space entirely but as a means of accentuation. In the monastery La Tourette near Lyon (1961), he uses cylindrical shafts, their inner surfaces painted, to shed coloured light onto the side altar of the crypt, accentuating its presence.

For spaces lit solely from above, a higher daylight factor is required to provide a pleasant level of brightness indoors than for spaces lit by windows (a daylight factor of at least 2 per cent which can normally be achieved with a 4 per cent window wall area proportion). A daylight factor of 4 per cent is necessary for complete natural illumination, which can be achieved with a window wall area proportion of 8 per cent. The Pantheon in Rome, a classic example, has a single opening at the top of the dome, which amounts to 4.06 per cent of the surface area. To ensure a consistent and even level of illumination, the distance between skylights should not be more than the height of the room. A space is regarded as evenly lit when the proportion of minimum daylight factor to maximum daylight factor is larger or equal to 1:2. For spaces lit by windows, this proportion must be larger or equal to 1:6.

Skylights are used in contemporary church architecture in different ways. In the double Church of St. Maria Magdalena by Kister Scheithauer Gross in Freiburg (2004; see p. 178), sunlight streams in between the ceiling joists through wide bands of rooflights, casting dynamic patterns of diagonal shadows across the concrete walls. The areas around the altars of both churches in the building are illuminated by indirect static light cast onto its wall surfaces: the altar and ambo in the Catholic space by a wall niche; the altar and pulpit of the Protestant space by a large wooden baffle with horizontal cut-outs that is suspended in front of a large window.

The church of St Francis in Regensburg (2004; Fig. 5) designed by Königs Architekten is entirely open to the sky, with the light from above filtered by a translucent membrane, creating an introverted atmosphere in the elliptical interior of the church. The mood and lighting of the space change with the position of the sun and clarity of the sky.

Artificial Light

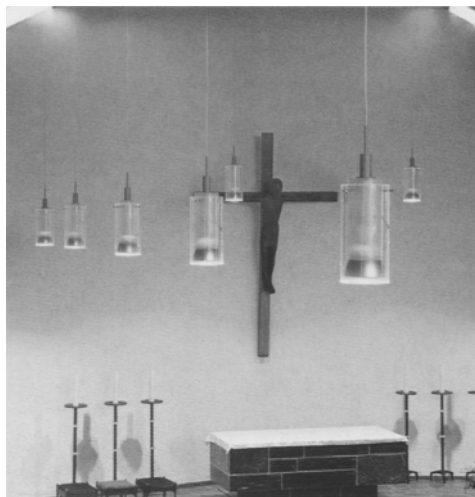
Artificial lighting can be integrated subtly into architecture and used for visual dominance. Like natural light, artificial light can, over and above its functional purpose, also acquire symbolic meaning. In darkness, artificial lighting can be used to create a spatial impression of its own or to emulate daylight as far as is possible.

Despite the abundance of light that surrounds us in everyday life, we still respond to the symbolism of light and darkness. For Catholic church services, for example, the right approach for the time of day is of critical importance and determines the need for supplementary artificial lighting:

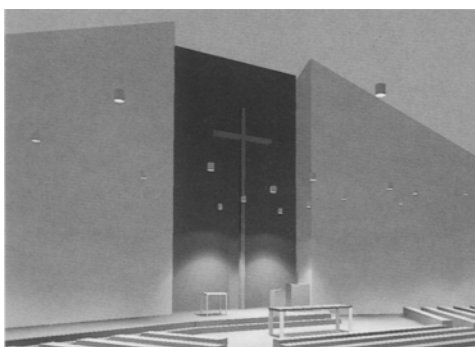
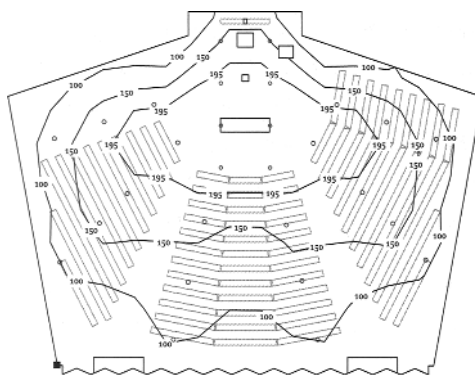
- Before sunrise for the Rorate Mass during advent, celebrated in candlelight.
- Before dawn for the Easter eve service, which begins in darkness and takes place as the sun begins to rise.
- On bright mornings for the Sunday High Mass, celebrated as the sun rises.
- At night for church services such as Midnight Mass, which takes place on Christmas Eve in the light of the Christmas tree, which should therefore not be outshone by artificial lighting.

Controlling Artificial Light

The number of candles lit for a church service used to denote the status of the mass. Today, the heightening or reduction of artificial lighting is likewise a means of orchestrating the celebration of the liturgy. Bus systems with integrated lighting control units (EIB/KNX) make it possible to provide the right kind of lighting in the right quantity at the right time during a church service. A Sunday morning church service needs artificial lighting only to supplement natural light if the daylight factor is not sufficient, or to create a particularly festive atmosphere on church holidays. For evening church services after sunset, subdued lighting with low light levels is most appropriate in which the pews are bathed in a dimmed light rather than illuminating the vault and ceiling as one would during the day. Lighting scenes can be programmed for church services that take place during the day or in the evening, for silent prayer,



6 Karl Hans Neumann, Church of St Joseph, Münchingen, 1962
Directional light: dual-state switchable glass cylinder light fittings provide directional light for the altar and pews. The lighting provides additional reading light by day and illuminates the church service in the evenings. The matt silver reflector is visible inside the transparent housing of the light fitting



7 Lighting calculation for an evening service: the broad illumination cone of the 30 pendant lights illuminate the church space with downlight.
above Light intensity: the isolux lines show that in the zone of the pews a luminosity of between 100 and 150 lux can be achieved. The altar, pulpit, font and lectern lie in the region of 195 to 250 lux
below Light distribution: the lower half of the room is bright; for the evening service, the upper half is illuminated only by reflected light

for celebrations such as baptisms or weddings and for concerts. They could be ready for recall through touch sensors, displays or panels. Lighting scenes can be adjusted as required at any time by dimming or brightening.

The Quality of Artificial Light

Natural light and artificial light have different qualities: in terms of colour, colour rendition, intensity and dynamics, natural light is far superior to artificial light. Neither the intensity and colour of daylight, nor its variety of modulation can be achieved artificially. Nevertheless, artificial lighting is required in churches as soon as it becomes dark. Research shows that people expect a certain quality of light indoors at different times of the day. For example, a bright white light of at least 3000 Kelvin comes close to how we experience light during the day outside. When using artificial light it is important to consider such biological expectations, and these are increasingly being reflected in professional dynamic lighting concepts. To create appropriate lighting conditions in churches that are used for all manner of activities, lights can be used which can be switched and dimmed in various combinations: concentrated downlight resembles the strength of direct sunlight, while diffuse atmospheric light resembles the ambient light of the sky. By dimming the light component, the colour of the light can be altered not unlike the colour of the sun as it sets (Fig. 6-8).

The Colour of Light

The colour of light is divided into three primary groups: daylight-white, neutral-white and warm-white. Lamps with good colour rendition properties such as incandescent and halogen lamps illuminate colours in church interiors naturally. More economical high pressure and low pressure discharge lamps have different chromatic properties and discontinuous spectral distributions. Colours of the spectrum that are not present in this light are not rendered naturally; the higher the colour rendering index, R (for example, greater than nine), the better the colour rendition and the better its suitability for sacred spaces.

Light Fittings

Visible light fittings are a distinct design element and should correspond to the nature of the sacred space. The form, suspension and arrangement of lights can lend spaces a rhythmic or concentrated character. Like other fittings in churches, they should ideally be designed for the space in question. Sacred spaces can be illuminated by a large number of small lamps, as can be seen in Henning Larsen's Enghøj Church (1994; see pp. 102-03) in which hundreds of transparent bulbs are suspended in clusters creating a starry sky, or in Fogh & Følner's Tornbjerg Church (1994; see pp. 100-01) in which transparent globe lamps, delicate like soap bubbles, are suspended in a tight grid; or they can be lit by a few large lamps that characterise the space such as can be seen in the Grace Church in Stuttgart by Maier Graf Speidel (1964; Fig. 9). The white wings of the light fittings pick up the folds in the concrete of the walls and ceiling, and through the play of light and shadow, they lend the austerity of the space lightness and buoyancy.

Lighting Considerations

A space appears light and pleasant when the luminance of its vertical surfaces is high. During the day, with the help of natural illumination, a value of 300, preferably 500 lux is desirable. In the evening, a mean intensity of illumination of 80 to 150 lux is necessary in the nave and the pews in particular so that the congregation can comfortably read their hymnbooks. Light attracts attention – the human eye is involuntarily drawn towards the lightest part of a room. The focus of activities should therefore be more brightly lit, with a light intensity of 150 to 250 lux. In the side aisles and secondary areas, the level of brightness should recede as bright areas in the periphery of view are distracting. The overall brightness should be sufficient so that accent light is not required. Very bright lamps or strongly contrasting light intensities of different items in view lead to glare. Very bright window surfaces in the



8 Karl Hans Neumann, Church of St Joseph, Müncheningen, 1962
Diffuse light: a translucent inner cylinder containing an economical compact fluorescent lamp produces diffuse ambient lighting for daytime church services



9 Maier Graf Speidel, Grace Church, Stuttgart, 1964
Soft light: the winged light fittings echo the folds in the concrete ceiling and walls. The matt glass and white perforated metal sheets reflect the light from the lamp producing a soft light within the church interior



10 Light to look at: burning prayer candles

choir can be just as glaring as visible points of light from spotlights beneath the ceiling or glass lamps mounted against a dark wall.

Light directs one's view and attention. The direction of artificial light can either follow that of daylight, supporting how it lights up a space through windows or skylights, or alternatively consciously illuminate other areas to create a different spatial impression. People need shadows in order to recognise the structure of spaces. Strong, directed light from a single source produces sharp shadows with a strong contrast. Consequently, it becomes more difficult to differentiate between object and shadow. Indirect lighting generally speaking produces very little shadow. It can be used to neutralise boundaries, to create spaces of lightness, but it can also impair our perception of space, making it appear monotonous and lifeless.

Liturgical Considerations

As the primary focus of church activities, the altar should be the lightest part of the space. The altar and ambo should be brightly lit, but not exaggeratedly so as if in the beam of a stage spotlight. The clergy and celebrants in the altar space must not be dazzled by bright lights at low-level that point at them. If floodlights are necessary to illuminate the altar, they should be mounted at an angle of 45 degrees above the angle of view of the clergy and should not shine directly on their heads. It is often advisable to illuminate the face of the priest at the altar and the sermon reader at the ambo or pulpit from two sides. By lighting the nave and altar in the same light, the communal celebration of the clergy and congregation can be given additional visual expression.

At dusk or at night, churches can appear inviting when the light within is visible from outside, beckoning one to enter to take part in prayers. A minimum level of brightness is necessary in order for people to get a sense of orientation in the space. The provision of sufficient light by which to see communicates a sense of security. Directed light can structure the visible environment and direct attention to the altar or to particular iconography within the church. Lit candles and the ever-changing play of light and shadow they create can be used to provide a visible point of brilliant light in an otherwise subdued space that is both attractive to look at and contemplative for prayer (Fig. 10).

Light in Synagogues

Light was God's first act of creation. God is the source of light and of life and is himself often called The Light. The significance of light in synagogues is similar to its role in Christian sacred spaces. The eternal light, a light that never dies out, represents the presence of God in the tabernacle as well as in the synagogue. The seven branches of the Jewish candelabrum, the menorah, is the oldest and most important religious symbol of Judaism. As a sign of religious enlightenment, the menorah is present in one form or another in every synagogue, as is the Kaddish lamp that commemorates the dead.

Natural Light

Synagogues are illuminated with skylights as well as windows and glazed walls. In "Synagoge '88," a treatise on the design of synagogues, Salomon Korn recommends illuminating synagogues exclusively with light from above. By refraining from using windows and openings in the walls, a place of concentration, prayer and contemplation can be created that is free of outside distractions. According to Korn, the bimah should be lit from above from a centrally arranged shaft of light making it the centre of attention. The outer walls should ideally be washed in light from above, and the torah shrine itself should appear as the source of light. The interior of the synagogue in Dresden by Wandel Hoefler Lorch Hirsch (2005; see pp. 200-01) follows Korn's recommendations and is lit by a rooflight. The central sanctuary is enclosed in a diaphanous metal curtain that hangs down from the ceiling and glitters in the light from above, a reference to Moses' tabernacle. The monolithic external walls that surround the sanctuary and curtain refer to the Temple of Jerusalem. In Alfred Jacoby's synagogue in Kassel

(2000; Fig. 11), filtered light shines from above through a band of skylights in the ceiling. The torah shrine is placed in front of a glass window that shines with a diffuse blue light.



11 Alfred Jacoby, *Synagogue, Kassel, 2000*
The open doors of the torah shrine are backlit, on the right the rectangular menorah made of blue glass, to the left and right the Kaddish lamps with the Star of David, also made of glass

Artificial Light

Artificial lighting in synagogues should be used in a similar fashion to natural light, in order to emphasise particular places in the sacred space. During the Jewish service, attention is focused on the torah shrine, the torah procession and the bimah. Readings are recited from the bimah and regardless of day or night this should be the brightest area of the synagogue. As the entire congregation actively takes part in the service, the seating must also be lit sufficiently. Zvi Hecker, for example, employs simple pendant lights that match the sparseness of the concrete enclosure to illuminate the synagogue in Duisburg (see pp. 198-99). By contrast, conspicuous lighting concepts are characteristic of Alfred Jacoby's synagogue designs: in Aachen (2000) and Chemnitz (2002), he uses chandeliers in the form of the Star of David. In his design for the synagogue in Kassel, the torah shrine itself is made a source of light by backlighting its glazed doors.

Light in Mosques

In the Koran, Sura 24 (Al-Nur - "Light") states that "God is the light of the heavens and the earth." Nevertheless light is not used to denote symbolic meaning in mosques since, with the exception of the Kaaba in Mecca, the use of symbolism is prohibited in Islam. Light should not be used to create mystical atmospheres but to clearly delineate the basic form of the prayer hall and its extents. Before God all men are equal. As a result, despite their orientation towards Mecca, mosques exhibit no particular directionality even though the opposite arrangement of entrance and mihrab creates an axis of sorts. The interiors of mosques should be evenly illuminated. The empty space of the floor, the ability to perceive the room as a whole and the even illumination produce a space of great unity and peace.

Natural Light

The handling of daylight in a mosque is very dependent on the climatic conditions of its location. In very hot climatic zones, daylight is only admitted through very small openings or filtered, for example by transenna as can be seen in the Umayyad Mosque in Damascus (see p. 47). In temperate climatic zones, more natural light is admitted into the interior of mosques through clear (rarely coloured) glass windows.

For the Ottoman type of central-dome mosque, which commonly serves as a model for new mosques built in a traditional style or reinterpretations thereof, the following apply:

- The entire room and the enclosing walls of the room should be brightly and evenly lit.
- Direct sunlight and strong shadows should be avoided.
- Central areas such as the mihrab or minbar should not be emphasised through the use of light.
- The room can be illuminated via clear glass windows above floor level, likewise the rim of the dome but not the vertex of the dome itself.

These principles have been realised in quite different ways. The Mosque of Rome by Portoghesi, Gigliotti and Moussawi (see pp. 218-19) is lit by numerous small windows in the tiers of the dome, by a large window in the qibla wall and indirect light from a strip window that runs around the room at half wall-height.

The revised design for the Central Mosque in Cologne by Paul Böhm from 2006 features several shell-like layers of walls that form a dome in the centre. Glazing arranged between the layers allows light to flood into the prayer hall (see p. 53).

SELECTED BIBLIOGRAPHY

- Baker, Nick, Steemers, Koen:** *Daylight Design of Buildings. A Handbook for Architects and Engineers*, London 2002
- Brandt, Ulrike:** *Lighting Design. Principles, Implementation, Case Studies*, Basel, Boston, Berlin 2006
- Buonocore, Pablo, Critchley, Michael A.:** *Tageslicht in der Architektur*, Zürich 2001
- Cakir, Ahmet (et al.):** *Tageslicht nutzen. Bedeutung von Dachlichtöffnungen für Ergonomie, Architektur und Technik*, Bochum 2001
- Casati, Roberto:** *The Shadow Club*, New York 2002
- Deutsches Architektur Museum DAM (Ed.):** *The Secret of the Shadow. Light and Shadow in Architecture*, Frankfurt am Main 2002
- Energieagentur NRW (Ed.):** *Tageslichttechnik in Gebäuden*, Heidelberg 2007, pp. 45-46
- Evans, Benjamin H.:** *Daylight in Architecture*, New York 1981
- Fischer, Udo:** *Oberlichter. Beleuchtung als Geschenk des Himmels*, Bochum 2003
- Ganslandt, Rüdiger, Hofmann, Harald:** *Handbuch der Lichtplanung*, Lüdenscheid 1992
- Gerhards, Albert:** *Liturgie und Licht. Eine Orientierungshilfe*, Trier 2006
- Kappel, Kai:** *Selbstleuchtende Wände. Betonglas im Sakralbau*, in: *Detail* 2001/2, pp. 198-202
- Köster, Helmut:** *Dynamic Daylighting Architecture. Basics, Systems, Projects*, Basel 2004
- Kreuz, Eva-Maria:** *Elektrisches Licht im Kirchenraum*, in: Gerhards, Albert (Ed.): *Liturgie und Licht. Eine Orientierungshilfe*, Trier 2006, pp. 75-97
- Kreuz, Eva-Maria:** *Kirchenbeleuchtung*, in: *Kirchliches Bauhandbuch. Energiesparendes und umweltschonendes Bauen in der evangelischen Kirche*, Bielefeld 2007
- Kreuz, Eva-Maria:** *Inszenierung des Lichts für die Feier der Liturgie*, in: *das münster* 1/2006, pp. 2-10
- Lechner, Norbert:** *Heating, Cooling, Lighting. Design Methods for Architects*, New York 2000
- Liturgiekommision der Deutschen Bischofskonferenz:** *Leitlinien für den Bau und die Ausgestaltung von gottesdienstlichen Räumen*, Bonn 1989
- Major, Mark, Speirs (et al.):** *Made of Light. The Art of Light and Architecture*, Basel 2007
- Muneer, T.:** *Solar Radiation and Daylight Models*, New York 2004
- Philips, Derek:** *Daylighting. Natural Light in Architecture*, Burlington 2004
- Vogt-Göckni, Ulya:** *Geometrie, Tektonik und Licht in der Islamischen Architektur*, Tübingen 2003

Artificial Light

The five daily prayers should, wherever possible, be conducted communally in the mosque. Two of the prayers take place during the day at midday and in the afternoon, the remaining prayers at dawn, after sunset and late in the evening. Additional prayers in the fasting month of Ramadan are conducted at night. For such ritual prayers, the use of artificial light in addition to natural light is absolutely essential. The orientation of the believers is fixed with all prayers conducted facing the qibla wall and the mihrab niche. The need to hear the prayer and recital takes priority over the ability to see the person leading prayers. As such, neither places nor people are especially illuminated; instead, the entire room is evenly lit. Large slender circular hoop chandeliers are commonly used to light historical Ottoman mosques, such as can be seen in the Sultan Suleiman Mosque in Istanbul (see p. 49). Occasionally, large chandeliers are used, although these contradict the principle of even illumination as they create a point of focus in a space that strictly speaking has no functional centre.

The tradition of illuminating spaces evenly using slender circular hoop chandeliers has been taken up and adapted in many modern mosques. In the Islamic Cultural Center in New York by Skidmore Owings Merrill (see pp. 216-17), a series of lamps suspended from the rim of the dome form a large circular ring reminiscent of its historical predecessor. In the Dar Al Islam Mosque by Hassan Fathy in Abiquiu (see pp. 210-11), a ring of traditional glass lanterns is suspended beneath the dome. In the Mosque of Rome by Portoghesi, Gigliotti and Moussawi (see pp. 218-19), a tiered series of hoops with small, suspended glass lamps emphasises the centre of the space, with further single hoops suspended from the 16 individual cupola around its perimeter.

Churches

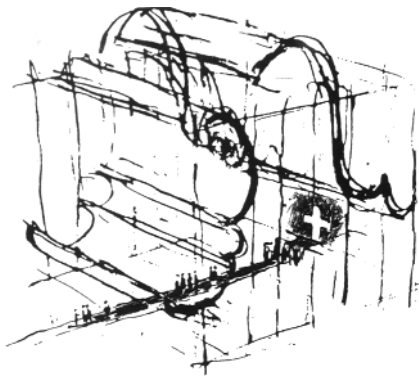
In comparison to residential, office or theatre architecture – with which it shares certain similarities with regard to the relationship between event and participation – modern church architecture is peculiarly complex. From a functional point of view, a church has “only” two spaces: a room for the church service and a room for preparing the church service. However, the symbolic qualities and continuity of the tradition of Christian sacred architecture stand in sharp contrast to the simplicity of the facts. In no other architectural task is the continuing validity of old or even ancient solutions – leaving aside large parts of the richness of its imagery – so apparent.

In terms of the arrangement of plan, buildings for church services can be divided into two basic types: the axial-processional arrangement and the centralised arrangement. Processional buildings do not have to be long; they need only exhibit a certain directionality, axiality and eccentricity. Centralised buildings need not be round; they need only exhibit a circular movement, be radial or concentric.

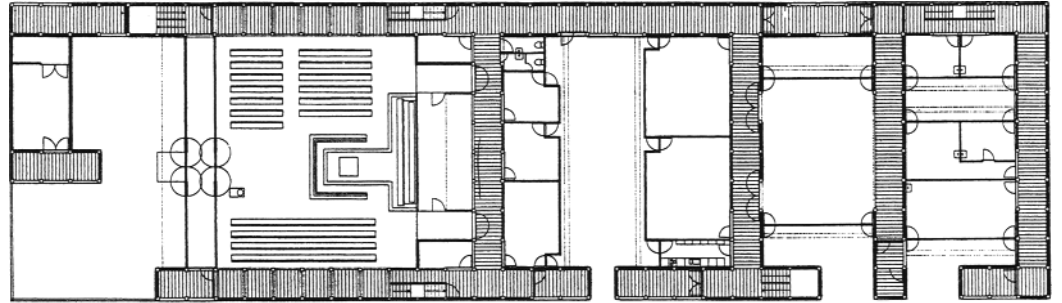
Since the days of Emperor Constantine’s “conversion” to Christianity, the processional arrangement has dominated Christian architecture in western Europe, and the centralised arrangement that of eastern Europe. That said, the two forms have never been clearly separated; the choice of plan for a church was never limited solely to the rectangular, on the one hand, or the cross-shaped, circular or square, on the other. The ever expanding possibilities offered by new materials and forms of construction since the Industrial Revolution has made almost anything possible. As such, the second half of the 20th century has seen the boundaries between the two become more fluid, though this does not mean that the often extravagant architecture is any less certain about its appropriateness for the liturgical ceremony.

The 51 case studies collected in the following chapter are divided primarily into churches that are either axial or centralised, with three further examples for each of the categories cathedrals/large churches, for double churches and for monasteries and convents, although these too could be classified as axial or centralised. Strong axiality can be seen in the projects by Alvar Aalto and Álvaro Siza, less pronounced axiality in the work of Juha Leiviskä and Steven Holl. Strongly centralised geometry can be seen in Trevor Dannatt’s and Anssi Lassila’s projects, subtler centralised arrangements in the work of Paulo Archias Mendes da Rocha and Raffaele Cavadini.

Of the cathedrals/large churches, José Rafael Moneo’s cathedral can be regarded as processional, Renzo Piano’s as centralised. There are three types of double churches. In Augusto Romano Burelli and Paola Gennaro’s church, the church hall can be divided, in Johannes Kister, Reinhard Scheithauer and Susanne Gross’ church, two halls are combined in a single building, in Manuel Pauli’s project two church halls are provided in a complex with two buildings.



Early sketches of the church space



Floor plan showing the five spatial subdivisions within the framework of the church; the main body of the church still shows the never realised central position of the altar



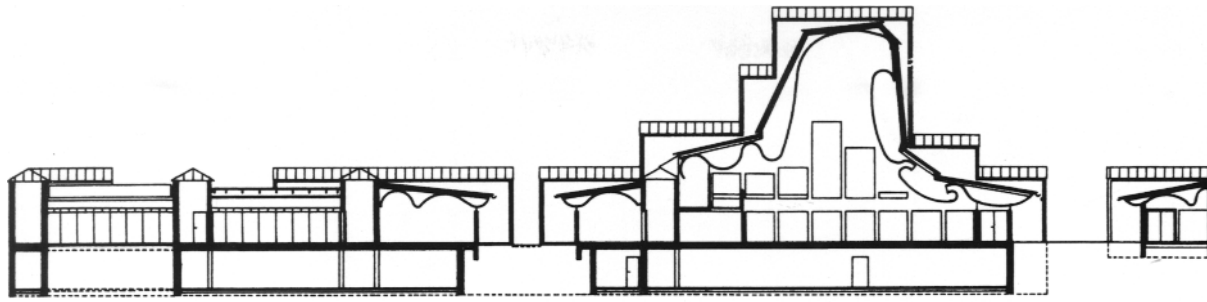
Bagsværd Church

Copenhagen, Denmark

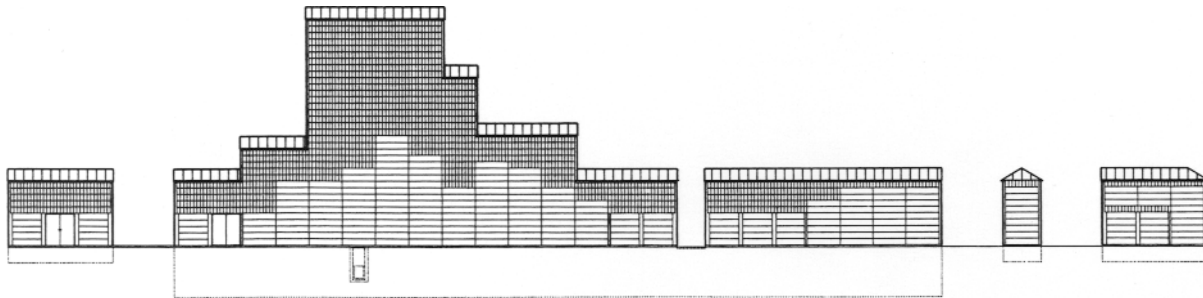
Architect	Jørn Utzon
Client	Bagsværd Parish Church Council
Completion	1976
Denomination	Lutheran-Protestant
Footprint	1742.5 m ²
Seating capacity	ca. 280

Dictated by its position on a main road on the periphery of Copenhagen, this elongated, stepped building seems at first glance ostentatiously introverted. One sees a concrete structure with wide, solid north-south gable walls and long east-west flanks. The roof of the centre structure and the roofs of the structures on either side contrast with one another: the former, oblique surfaces of vertically profiled aluminium and the latter, low pitched surfaces of glass and steel. Large format white tiles cover the upper sections of the external walls; the rising and falling of the exterior loosely corresponds to the line of the vaulted interior.

On a grid of 2.2 by 2.2 metres, there are 36 units along its length and ten across. The building covers an area



Longitudinal section



North elevation



View from the southwest, on the stepped facade the contrasting horizontal panels and vertical tiles | View from the west, the bells are high up in the right flank | View onto the south flank wall, left the ambo and altar made of concrete elements | View from the altar towards the entrance, above the springing point of the vault

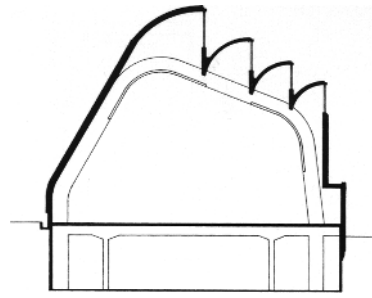
of 79.57 by 22.5 metres. The building is a large framework with five bays, arranged in a row from west to east: in the first of these are the forecourt, the chapel and the entrance to the church; in the second are the church and sacristy; in the third are the offices and the kitchen; in the fourth the parish hall; in the fifth seminar and group work spaces. The prefabricated structural frame with its longitudinal and lateral corridors serves to provide access to the ancillary rooms, and to enclose the four inner courtyards.

In contrast to the grey exterior, the white interior is defined by the balance between a weak longitudinal axis between the entrance and altar and the strong lateral axis created by the dominant vaults of half cylinders

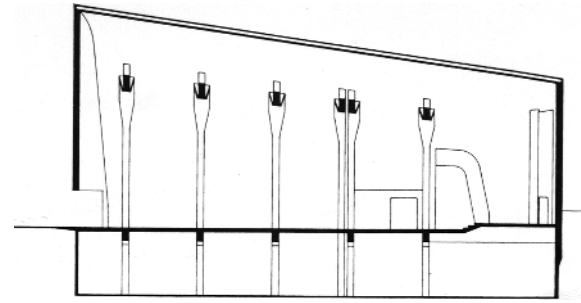
and half ellipses, which swing high and low. The thin 8 to 10 centimetre thick ceiling of wire mesh covered with air-sprayed concrete has a span of 17.35 metres; it rests on the wall slabs of the corridors on the north and south sides. The hidden rooflight on the west side and the light from the corridors make the space appear light; when the sun shines, one has the impression that the vault is opening up to the sky.

The altar occupies a large part of the east side of the church space. The concrete table is enclosed by a perforated screen of white bricks. Artificial light is provided by light bulbs attached to tubes. Like chains of lights and rows of candles, the small spheres give the dynamic interior a distinctly festive atmosphere.

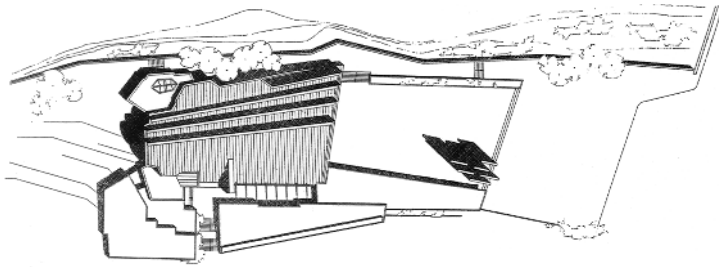
The Church of Bagsværd broke away from the rustic architecture of coarse red bricks and rough brown timber typical for almost every church in Denmark, and which still characterises Ravnshøj Church by C.F. Møller Tegnestue in Viby, Århus, dating from the same year (see pp. 74-75). Kenneth Frampton saw in Bagsværd the paradox of a simultaneously regional and universal architecture. The exterior can be likened to the form of warehouses and barns; the interior, in particular the vault, resembles the sort of spatial experience produced by the fluffy white clouds that lie in tall columns over the Pacific off Hawaii. In the architect's early sketches, one can already see an "imago mundi", the image of man between earth and heaven and on the way to God.



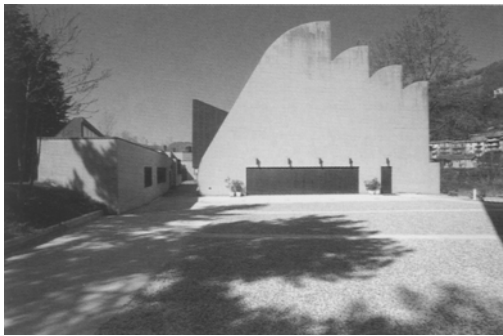
Cross section



Longitudinal section



Roof plan



View from the east, left the wing with offices and hall | View from the northwest, baptistry to the front | Nave with the rounded arches in reinforced concrete | View from the gallery onto the side entrance and the transition to the sacristy



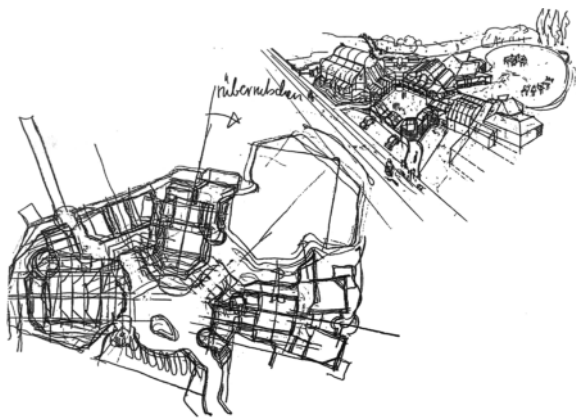
Church of the Resurrection of Mary

Riola di Vergato, Italy

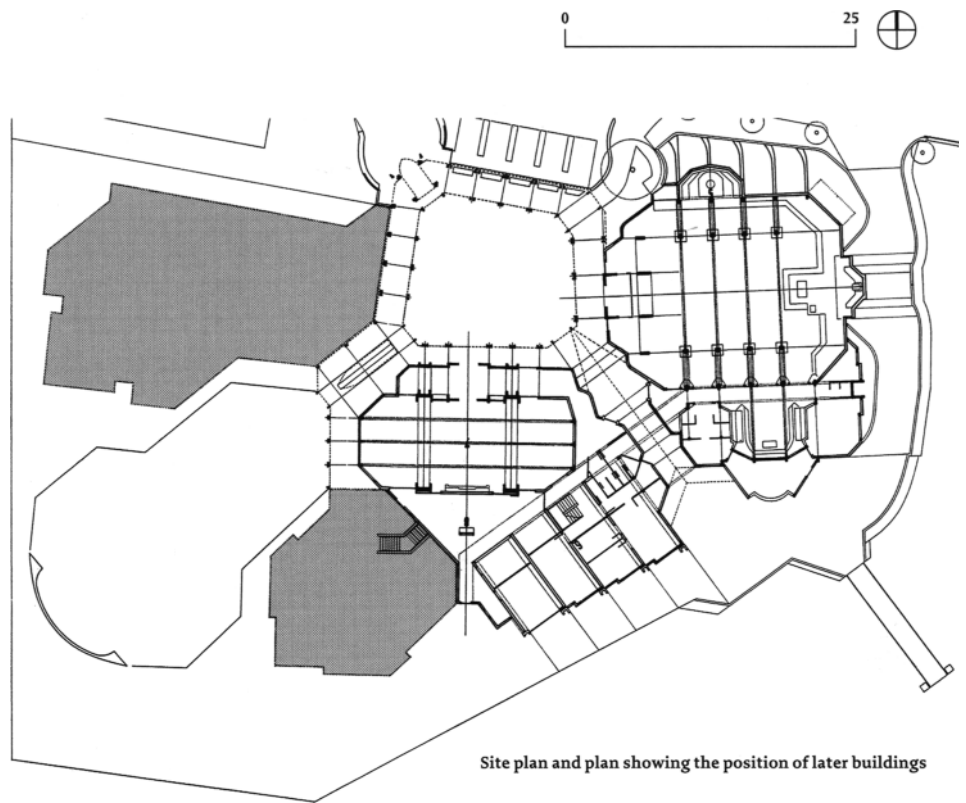
Architect	Alvar Aalto
Client	Cardinal Giacomo Lercaro
Completion	1978
Denomination	Roman Catholic
Seating capacity	ca. 240

Situated in the Bolognese Apennines and linked by a bridge, the villages Riola and Vergato are spread along the banks of the Reno. The church stands on a plateau between the river and the hillside. With its wedge-shaped form, the building is inserted between the flow of the currents and the slopes of the landscape.

Stepped to the north, curved to the south, sloping down to the west, the church was largely constructed out of industrially produced elements. Six rounded arches made of reinforced concrete serve as the supporting framework, on which four concrete shells rest, each a quarter cylinder in section. The external walls are clad with panels of local, light brown sandstone and the roof is clad in copper. On the north side, the



Design sketch



Site plan and plan showing the position of later buildings



The complex on a strip of land between a main road and housing estate | Church, meeting house and tower grouped around a courtyard and connected via arcades

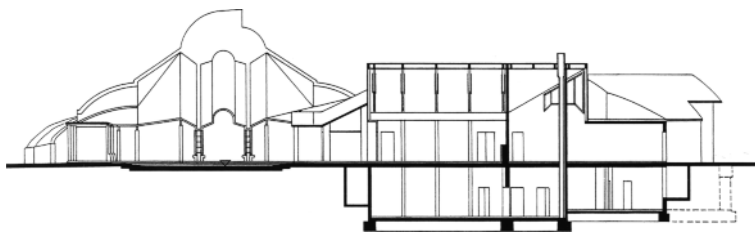


Brother Claus Church

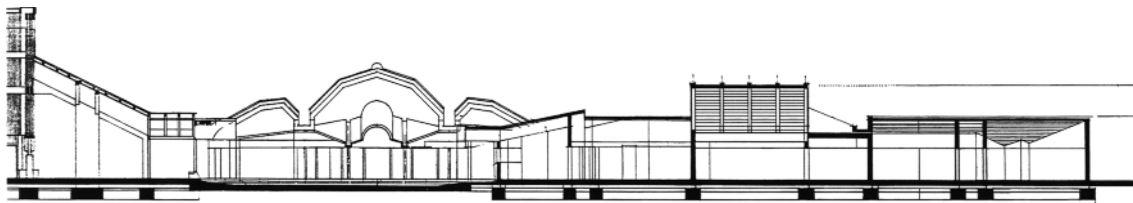
Graz, Austria

Architects	Michael Szyszkowitz, Karla Kowalski
Client	Diocese of Graz-Seckau
Completion	1987
Denomination	Roman-Catholic
Footprint	438.75 m ²
Seating capacity	ca. 200

In the submission details for the invited competition in 1982, the congregation requested a design for a “real church”. In other words, the new building in Graz-Ragnitz should be “immediately recognisable as a church”. This wish may have been in response to the difficulties that arose in connection with St Paul’s Church in Graz-Eisteichsiedlung (see p. 25) designed by Ferdinand Schuster in 1971. This predominantly steel-and-glass building with its red and brown main hall and square plan was devoid of all sacred typological and atmospheric characteristics. Through its sobriety and neutrality, the elongated building aspired to be a “church of the world”; St Paul’s Church was an expression of a consequent, even radical “aggiornamento” in the wake of the Second Vatican Council. Gradually, however, the



Section through church and meeting house



Section through meeting house and children's house



Courtyard with view of the barrel roof of the church and the meeting house | Undulations of ground and roof, beginning on the ground via the eaves to the ridge

congregation became increasingly disillusioned with their church and it was not long before the low unassuming building was regarded more as a multipurpose hall or cultural centre.

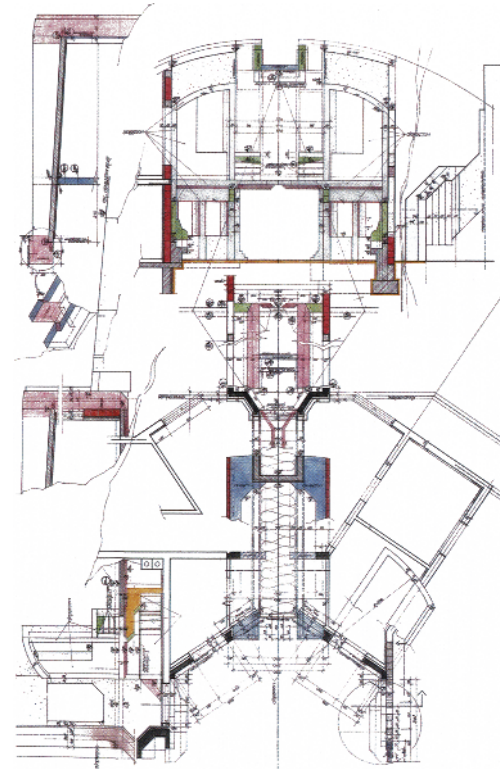
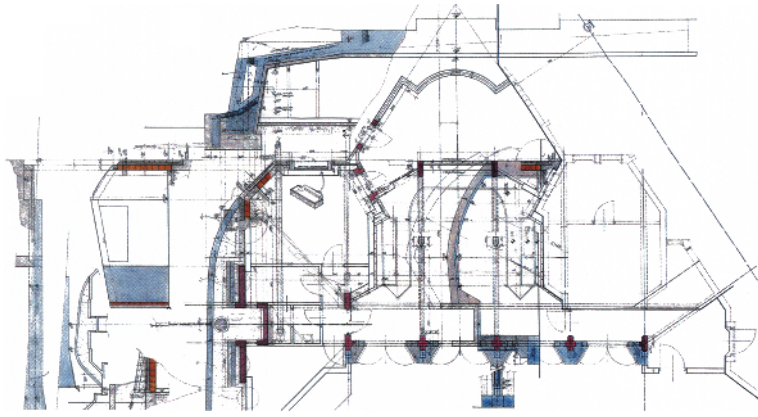
By contrast, the Brother Claus Church cannot by any means be described as unassuming or conventional. Situated at the edge of the town where urban switches to rural, the church sits on a broad strip of green between a six to eight storey housing estate to the south and a main road to the north. Although a somewhat tricky location, the heterogeneous nature of the situation does offer the potential to realise something individual, even playful, something that would rarely be tolerated in more structured urban textures and only

if a client were determined enough to create what one might call "signature architecture". An object of this kind which – however autonomous its conception may be – embodies the vitality of the "Graz School", as seen in the work of Günther Domenig and Eilfried Huth, and draws on the organic tradition of emulating the soft forms of nature, animals and plants, has perhaps the best possible conditions here on the periphery.

Drawing on their previous spatial investigations into congregation and enclosure in earlier projects, the two architects have arranged the building around a common centre. One enters via a courtyard, to be more precise, from the tower at the northwest corner of the complex – the slanted wooden block containing the

bells of the 17.5 metre high tower stands on six concrete columns – one is led through a portal into a cobbled courtyard surrounded on three sides by arcades. The west face of the courtyard is open. The fourth side of the 'cloister' is missing simply because the building planned for that area has not yet been realised. The 1300 square metre lawn on the southwest side, which opens out onto woodland and a stream, was originally planned to be used for a children's nursery and a youth club.

From the portal beneath the tower on the northwest corner of the complex, one's view wanders diagonally across the square courtyard before coming to rest on a covered passageway that leads in the direction of the



Detail sections and elevations



Entrance to the church | Central aisle towards the altar | View from the ambo and altar towards the entrance, on the left a footing of the laminated truss beams | Strips of boarding and glass between each pair of laminated truss beams, in the background the baptistry



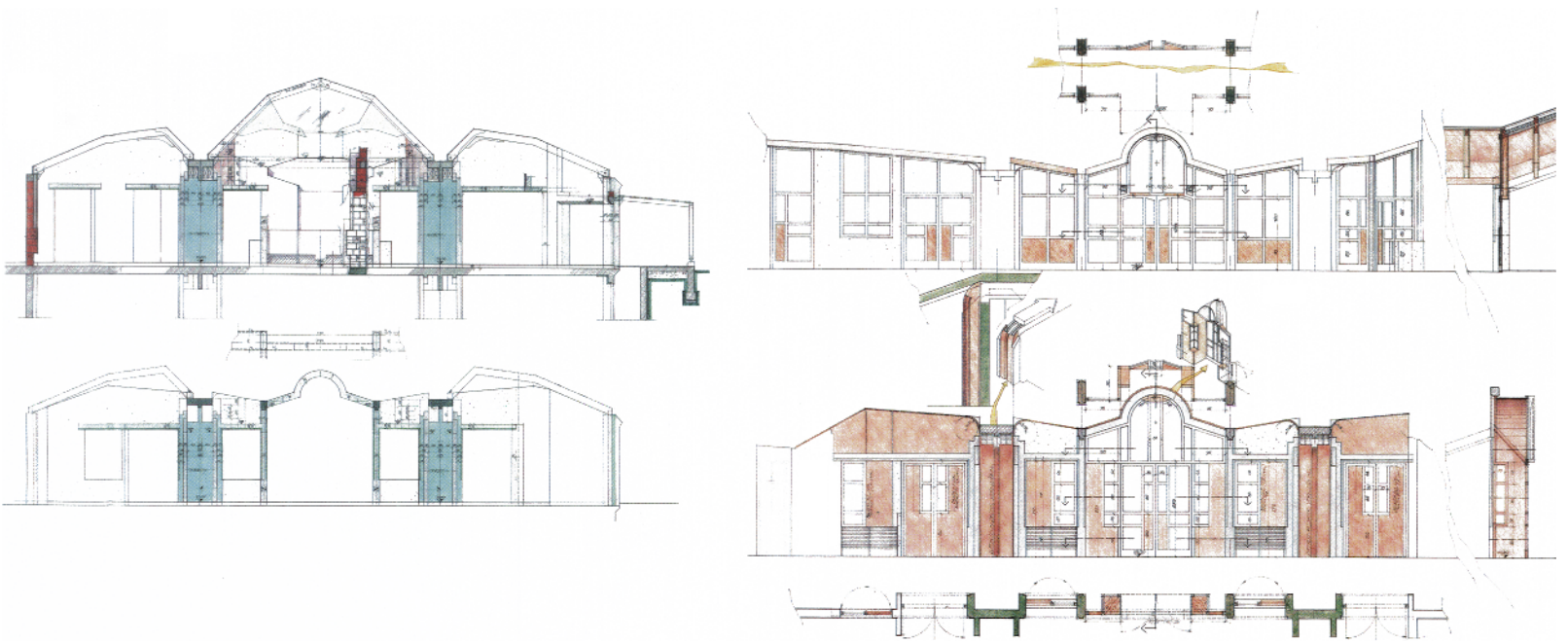
housing estate and separates the complex into a somewhat larger church on the left-hand side and the smaller meeting house to the right. In each of the buildings, the arrangement is axial and symmetrical. In each of the buildings, the cross section is more dominant than the floor plan. In each of the buildings, a barrel vault crowns its ridge, in the church broken into two parts, a larger and a smaller quarter-circle. In each of the buildings, the canopy extends deep into the entrance hall so that it becomes part of the "cloister" around the courtyard.

The zinc-clad roof landscape, whose plethora of curved and slanting surfaces undulate dynamically, is the dominant feature of the architecture. Broad troughs

separate the individual sections, the raining running along and down the columns. On one side of the plot, an embankment to the road rises up to the eaves, the zinc and glass continuing the undulation to the ridge of the roof. Depending on the weather, the matt shimmer of its surface merges with the white and grey of the sky above. Seen from the upper storeys of the neighbouring housing estate, the entire complex resembles the rise and fall of mountain ranges and valleys.

Inside the Brother Claus Church, the room is 22.5 metres long, 19.5 metres wide and 10.3 metres high to the underside of the curved laminated truss beams. Although the volume of the building is more or less

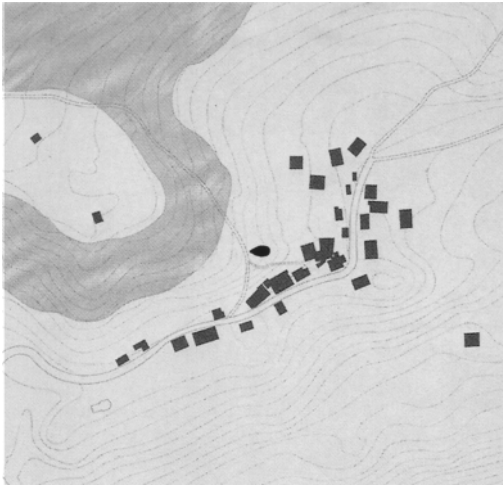
the same as half a cube, one is unaware of its Euclidian proportions. Here, it is not the pale whitish masonry walls that define the space, but rather the stained deep red, muscular timber trusswork of eight columns and four trusses. Each of the truss frames consists of two or three thick beams – their securing bolts and planks plainly visible – that rest on two inner and on two outer block-like footings, which can also serve as seats. The boarding and glass strips on the underside of the ceiling replicate the delineation of the columns and trusses, underlining the presence of these constructive elements. Without disrupting the overall unity of the space, the four large red truss frames subdivide the space much like a basilica. It has a narrow side aisle to the south, from which one reaches the chapel, with the



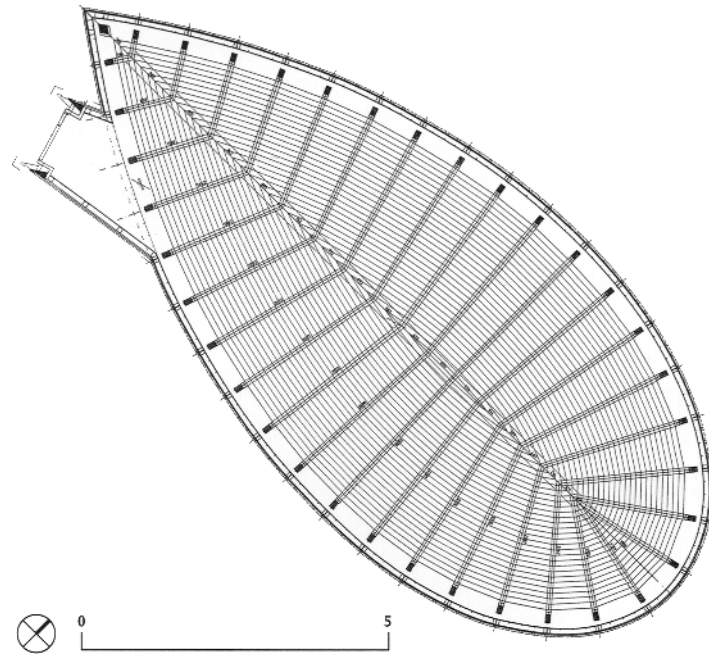
sacristy on its left and the confessional on its right. From the narrow side aisle to the north one reaches the small baptistry. It has a broad central nave with the altar, a choir and pews, which are arranged on three sides around the round altar table and can accommodate about 200 persons.

stands in the Catholic tradition of a wondrous, joyous, almost baroque exuberance, of which there are numerous examples in the Steiermark. It is not without reason that architectural critics have praised the building as being “refreshingly anarchic” and “orderly in its disarray”.

The Brother Claus Church in Graz is one of the few examples of more recent sacred architecture that does not adhere to the prevailing penchant for empty white walls or the customary mysticism of glass and light in all colours of the rainbow. Rather, the building – in which the unity of structure and decoration is so self-evident that no-one would think to question whether the structure is decorative or decoration structural –



Site plan, in the centre the half-figure of eight, also known in geometry as a lemniscate, to the west and north the Bann woods, to the south the village



Floor plan showing the position of the purlin, rafters and laths of the roof



North side | south side, with the "ladder" for the bell in front



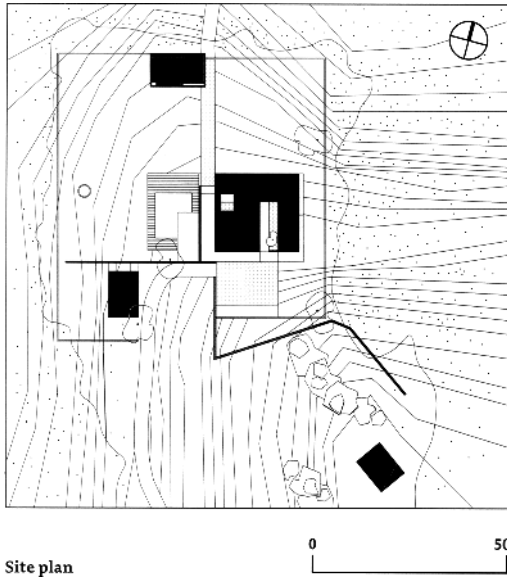
Sogn Benedetg Chapel

Somvix, Switzerland

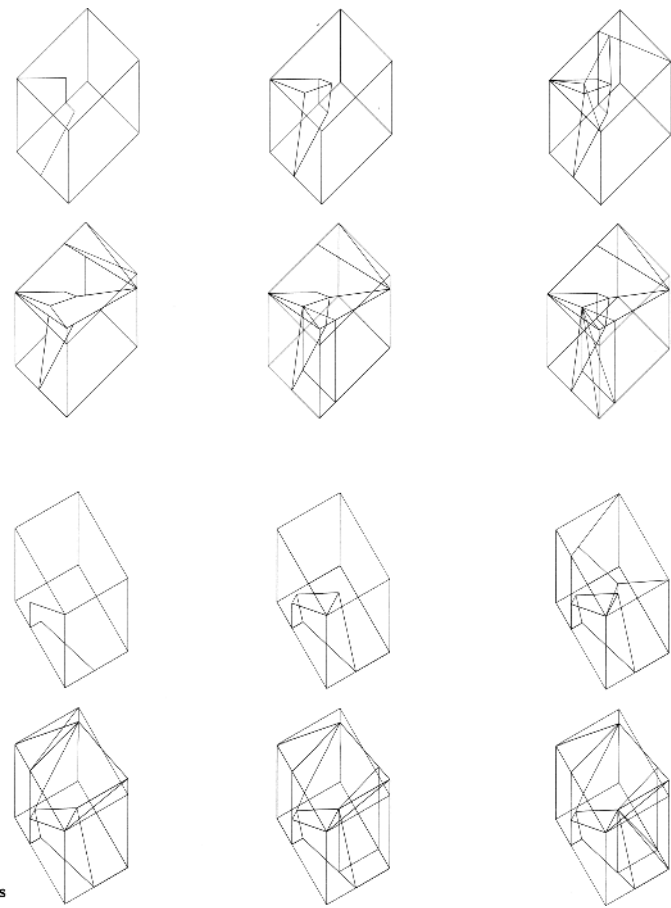
Architect	Peter Zumthor
Client	Disentis Benedictine Monastery
Completion	1988
Denomination	Roman-Catholic
Footprint	67.3 m ²
Seating capacity	ca. 40

More akin to a roadside or pilgrimage chapel than a village church, the height of the building at the entrance is only half of what it is at the bottom. Clad in larch shingles, the exterior is entirely closed except for a band of windows beneath the eaves of the shallow roof that caps the building. Its outward appearance reveals almost nothing of the interior. Not even the faintest undulation of the surface gives away any indication of the floor level within. All the visitor is immediately aware of is the shape of the floor plan, a half-figure of eight.

With a length of 13.6 metres, a width of 6.15 metres and a height of 6.2 metres, the interior of the chapel is quite minute, its cross section at its widest point forming a square. The construction is so slender that it is of al-



Site plan



Studies on folding wall variations



View from the west with the strip of window not visible from the entrance | View from the north showing the dynamic contraction and expansion of the entrance face | The interior illuminated by light from the west, steel cross on the rear wall | Interior view looking from the rear wall back towards the entrance



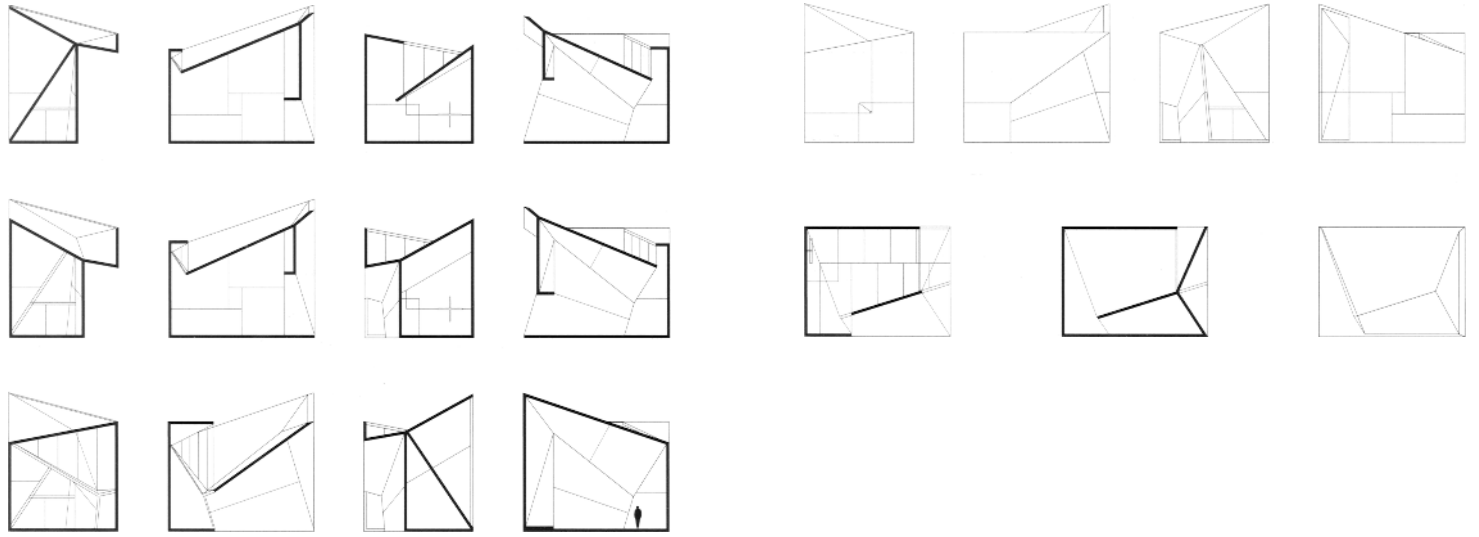
Chapel for a Country Estate and Hunting Lodge

Valleacerón, Almadén, Spain

Architects	Sol Madridejos Fernández Juan Carlos Sancho Osinaga
Client	private
Completion	2000
Denomination	Roman-Catholic
Footprint	94.08 m ²
Seating capacity	28

Situated in the province of Ciudad Real, on the crest of a hill surrounded by barren countryside, the chapel is part of a small country estate and hunting lodge, which encompasses a manor house, a warden's residence and trophy pavilion. The secular and the sacred architecture of the "feudal" estate are as extravagant as one another but stand apart, the profane buildings clustered together, the church higher up and to one side; the former rendered snow-white and entirely orthogonal, the latter a matt concrete structure and entirely diagonal.

As there is nothing far and wide to compare it with, the chapel initially appears quite large. In reality, however, it fits in a square of only 8.4 by 11.2 metres. The



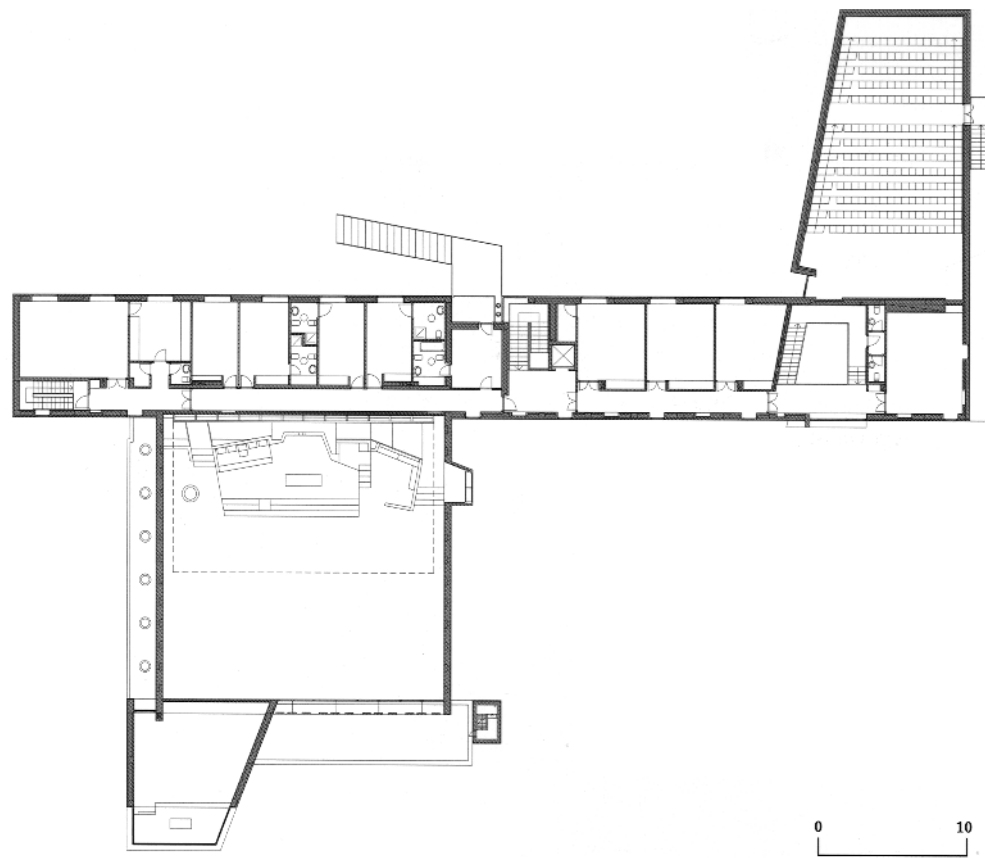
20 centimetre thick concrete walls were cast in situ and left fair faced. The marble additive in the mixture lends the crystalline form a varying sheen. Somewhat fragile and unstable looking at the front, at the back more robust and stable, the building reaches 10.6 metres at its highest point. In front of and to the left of the entrance, the folded composition changes most dramatically in rising and falling triangular and trapezoidal planes. The door is made of corten steel, as are the window frames and mullions.

Arriving from the northwest, one enters the chapel and faces the black steel cross on the rear wall. The construction artfully conceals the source of the light that illuminates the chapel. On the one hand, sun-

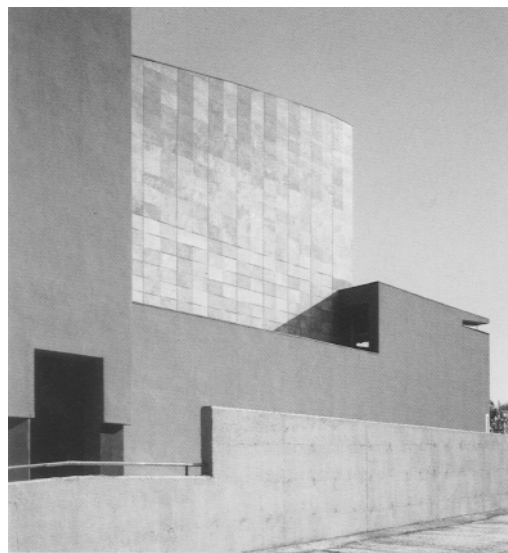
light enters through a full-height strip of glazing next to and above the door, although one is not aware of its full extent as one enters the chapel; on the other, sunlight enters from above and the side through a room-wide toplight and a sidelight at the rear of the building. One stands in a space that is anything but dark, although the only window one can actually see is a tiny square in the middle of the rear wall.

Architectural critics have likened the building to Japanese origami. Certainly, the folded plane and process of folding is a generative aspect of the design. Without the influence of the work of so-called deconstructivists such as Peter Eisenman or Rem Koolhaas, and without the help of computer-aided design, the build-

ing would not have had this form. In most cases, adjectives such as “sculptural” or “autonomous” are applied to describe spaces originally built to serve a particular function. In Valleacerón, however, the creation of a work of art has become reality. The “folie architecturale” can simply be itself for its own sake; it need not serve the needs of a congregation, only that of private contemplation in an increasingly pleasure-oriented society.



Ground floor plan



Northeast view | Southwest view of the main and secondary building, the chapel on the left, the entrance to the auditorium on the right | View of the church from the north, all sacred objects are made of white marble or brushed stainless steel | View of the church from the east, the altar in the foreground, in the background left the two confessional boxes, right the chapel | Chapel with daylight from the west

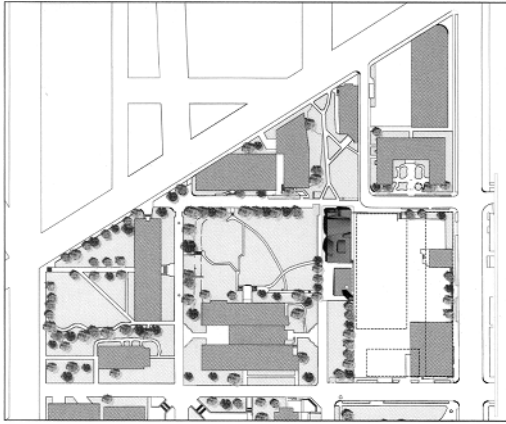


Santa Maria Josefa Church

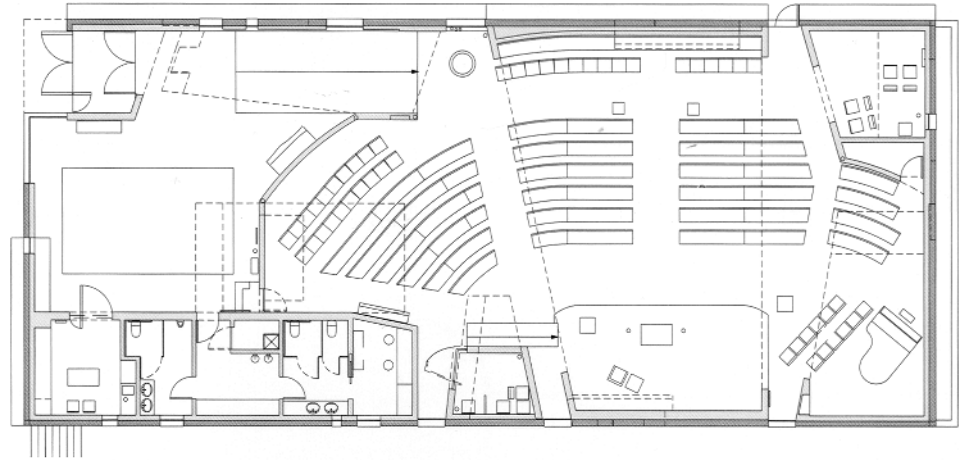
Rome, Italy

Architects	Francesco Garofalo, Sharon Yoshie Miura
Client	Vicar General of the Archdiocese of Rome
Completion	2001
Denomination	Roman-Catholic
Footprint	2100 m ²
Seating capacity	Church 350, chapel 50

The church stands in a new suburb a fair distance south of the centre of Rome, though not far from the Via Prenestina, one of the ancient Roman roads. It is bordered by a planned and approved suburb to the west and a spontaneous suburb to the east. On the slightly sloping site, about 80 by 80 metres overall, a complex of two interlocking buildings has been built. Form, size and colour have been used to clearly denote the function and hierarchy of each building. The auxiliary building has a double-hooked shape, with a long central section and two shorter elements at each end; the main building is box-shaped with a curving roof. The auxiliary building is low and is rendered a deep red colour; the main building – the church hall and bell tower – is high and clad with rough matt-shimmering panels of brownish



Site plan



Floor plan



View from the northeast with bell tower in the background | View from the south with reflecting pool in the foreground | Interior view of the church hall, at the back on the right the altar and ambo, on the left the Blessed Sacramental Chapel | View from the "route" to the entrance



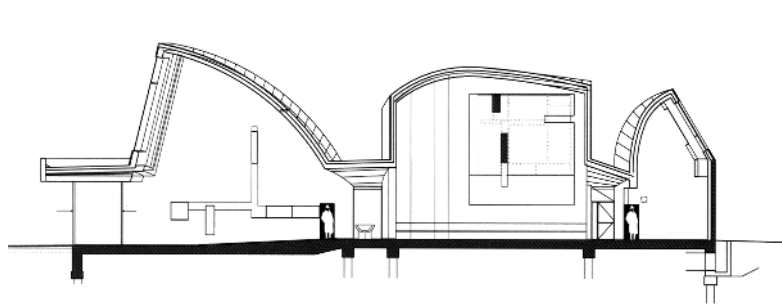
Chapel of St Ignatius

Seattle, Washington, USA

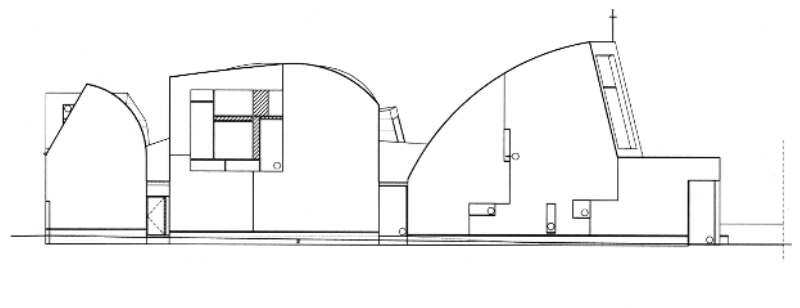
Architect	Steven Holl
Client	Seattle University
Completion	1997
Denomination	Roman-Catholic
Footprint	ca. 565 m ²
Seating capacity	230

The location of the buildings on the campus of the Catholic University of Seattle is determined by the rigid grid pattern of the roads. The chapel sits on a quadrangle in this grid. The orthogonal footprint of the building covers an area of 35.5 by 15.9 metres, its long side pointing exactly east-west, its short side north-south. In front of the building, which one approaches from the south, lie a shallow pool and the bell tower, a high concrete stele that holds aloft the sign of the cross.

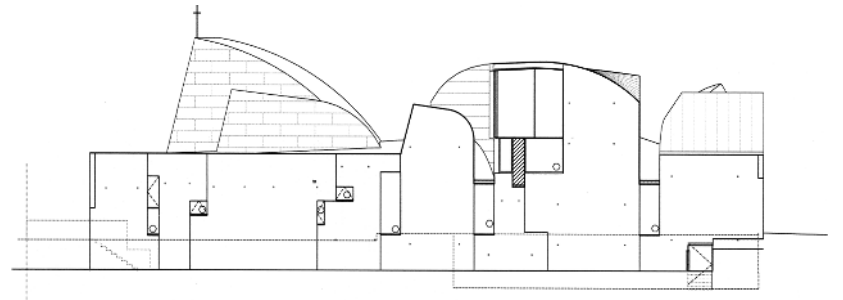
The architect has described the volume of the building as "bottles of light in a stone box". The chapel is enclosed by slabs of wall cast on-site. The exterior of the panels has been stained in light ochre and the holes used for craning the panels into place are capped with



Section from south to north looking towards the "processional route"



West elevation



East elevation



bronze stoppers. Steel beams, curved precisely using magnetic induction, form the arched roof forms of the six vaults; zinc panels cover the dynamic roofscape.

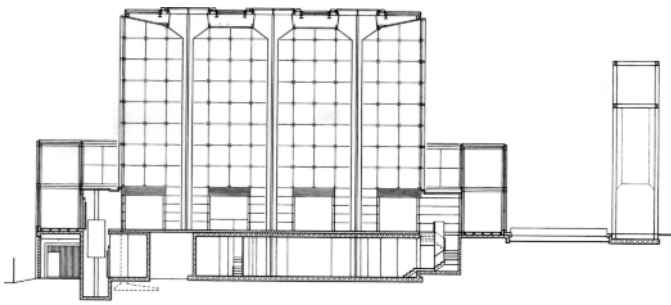
The programme of the church is complex. Each function and each ritual correspond to a vaulted-over space, one of the larger or smaller, shallow or steeply curving volumes that arc out of the roof. The ribbon containing the sacristy, the wedding chamber and a separate confessional box occupy almost half of the east side. A narrow "processional route" begins outside on the forecourt and runs along the wall of the west side to the font made of cedar wood. The axis ends at the sacrament chapel, whose walls are treated with beeswax. The onyx tabernacle stands in front of this. The main

central space opens out to the right of this processional axis and encompasses several areas, the entrance lobby, the congregation and areas for the priests and the musicians.

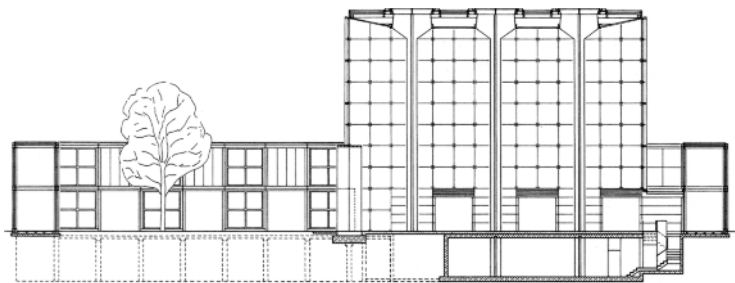
The chapel is illuminated almost exclusively from above. In the rough-plastered white interior, light streams out from behind baffles that are suspended slightly offset in front of the glass roof lights and blend into the walls. The sun shines onto coloured fields painted onto the reverse side of these baffles, which are concealed from view. From inside the chapel one can only see the slots at the edges of the baffles, which appear as strips and glances of light that scatter a halo of colour gently over the surrounding walls. Coloured

lenses operate as a counterpart to the larger strips and surfaces of colour; yellow and green serve as a counterpart to red and blue. In this way, each of the six "vessels" has its own play of colour.

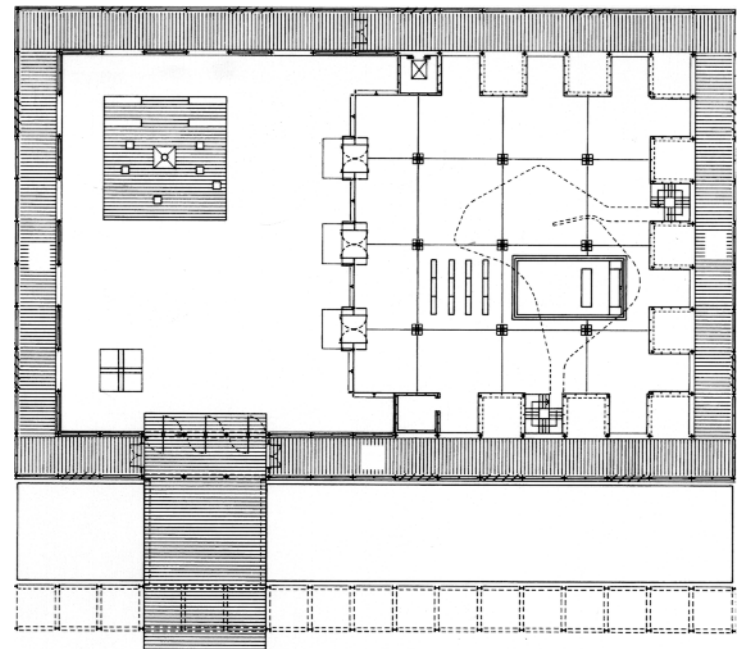
More so than its references to the oeuvre of Alvar Aalto, and even more than its exquisite materiality and advanced construction, it is the diffuse character of the space and light that makes the sometimes darker sometimes lighter interior a place of spiritual movement. The design is based on the ideas and concepts of Ignatius of Loyola, founder of the Society of Jesus. A preoccupation of the Spanish saint was apparently the ability to master spiritual life through the study of space and light.



Cross section



Longitudinal section



Ground floor plan



Night-time view of arcade, cloister, tower and pavilion | Front face of the pavilion with external structural framework and translucent panels of stone-glass | Interior view of the pavilion with altar and pews in the background, coffered ceiling above | Cloister, to the right some of the filled glass panels

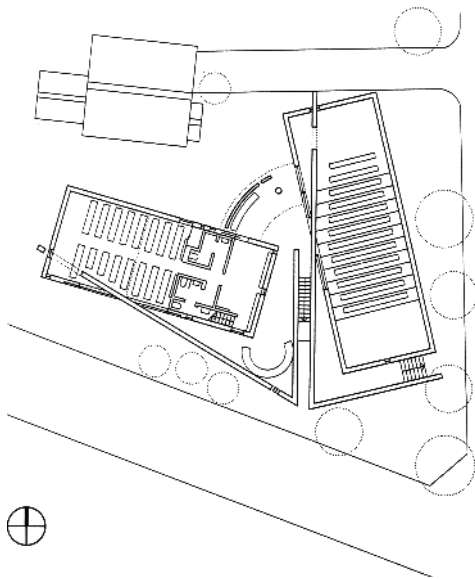


Christus Pavilion

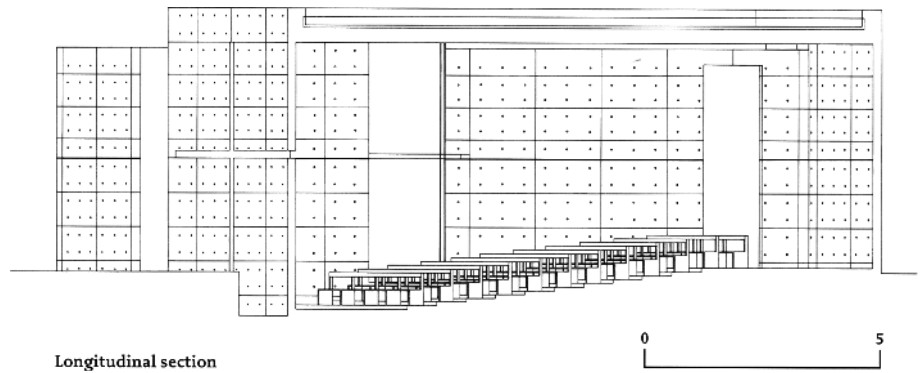
Hanover, Germany

Architects	Meinhard von Gerkan, Joachim Zais
Client	Protestant Lutheran State Church, Hanover, and the German Bishop's Conference, Fulda
Completion	2000
Denomination	Roman-Catholic, Lutheran-Protestant
Footprint	Pavilion ca. 466 m ²
Seating capacity	200

Erected for the World Expo, the Christus Pavilion is a rational and innovative building but nevertheless manages to create a monumental and majestic atmosphere, particularly inside. Its regular bay module of 3.4 metres, and restricted palette of steel, glass, marble and concrete underline this intention. The ensemble consists of an arcade, a cloister, courtyard, tower and pavilion. One enters via a gangway that passes through the 58 metre long and 14 metre high arcade, over a pool and through the cloister before arriving in the courtyard. In the left-hand corner, a steel and glass tower with the cross section of a cross reaches 27 metres into the sky. On the right-hand side, one sees the entrance to the Christus Pavilion with its three tall, symmetrically placed portals.



Site plan, right the chapel, left the Sunday school



Longitudinal section



View from the north | View of the rear wall with the sign of the cross | Full-height glazed section of the west wall with a reflection of the sign of the cross | West side with the long flank of the diagonal wall; just visible on the right, the "vestibule"

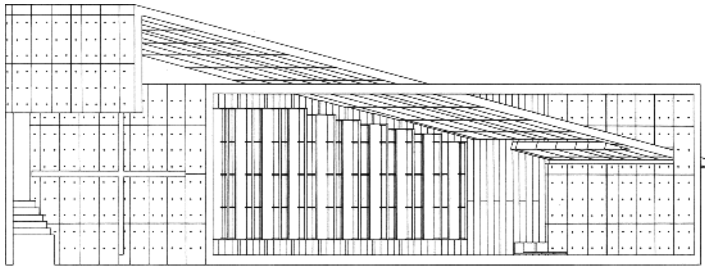
Chapel of the Light

Ibaraki, Japan

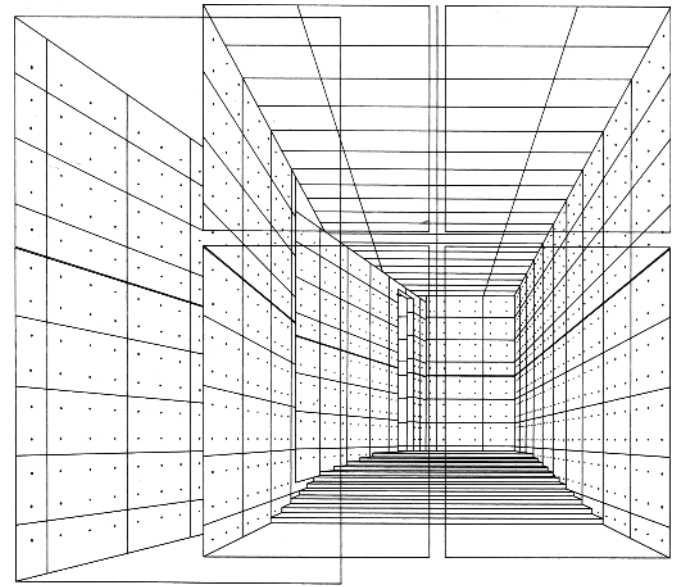
Architect	Tadao Ando
Client	United Church of Christ in Japan
Completion	1989
Denomination	Presbyterian
Footprint	ca. 113 m ²
Seating capacity	90

The building is situated in a quiet but built-up suburban neighbourhood. It consists of an angular wall and a rectangular box, both made of concrete constructed in situ. The angle is formed by two free standing planes placed at an angle of 75 degrees to one another. The longer of the two legs is aligned north-south, piercing the rectangular volume of the church on its westward side before exiting through the end wall to the north. Where the wall and box meet, open or glazed slots preserve the autonomy of both elements.

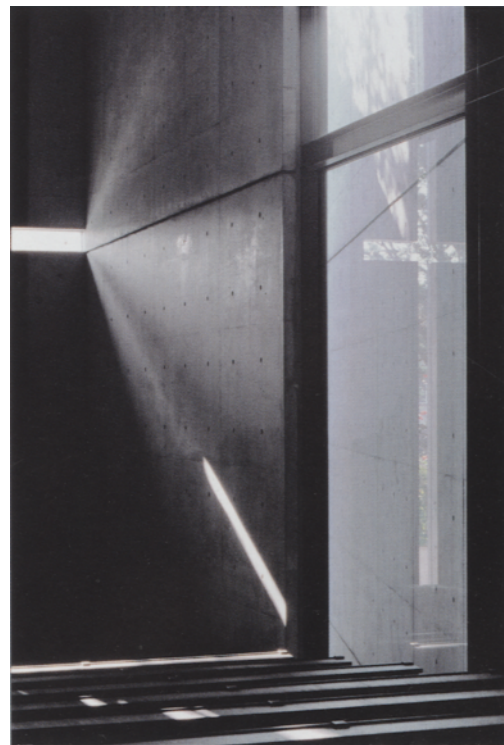
On arrival, one turns right and enters the "vestibule", already within the main volume of the building. Produced by the collision between the angular wall and the box, this forecourt tapers in a narrow wedge shape.



Axonometric projection



Perspective view of main "nave"



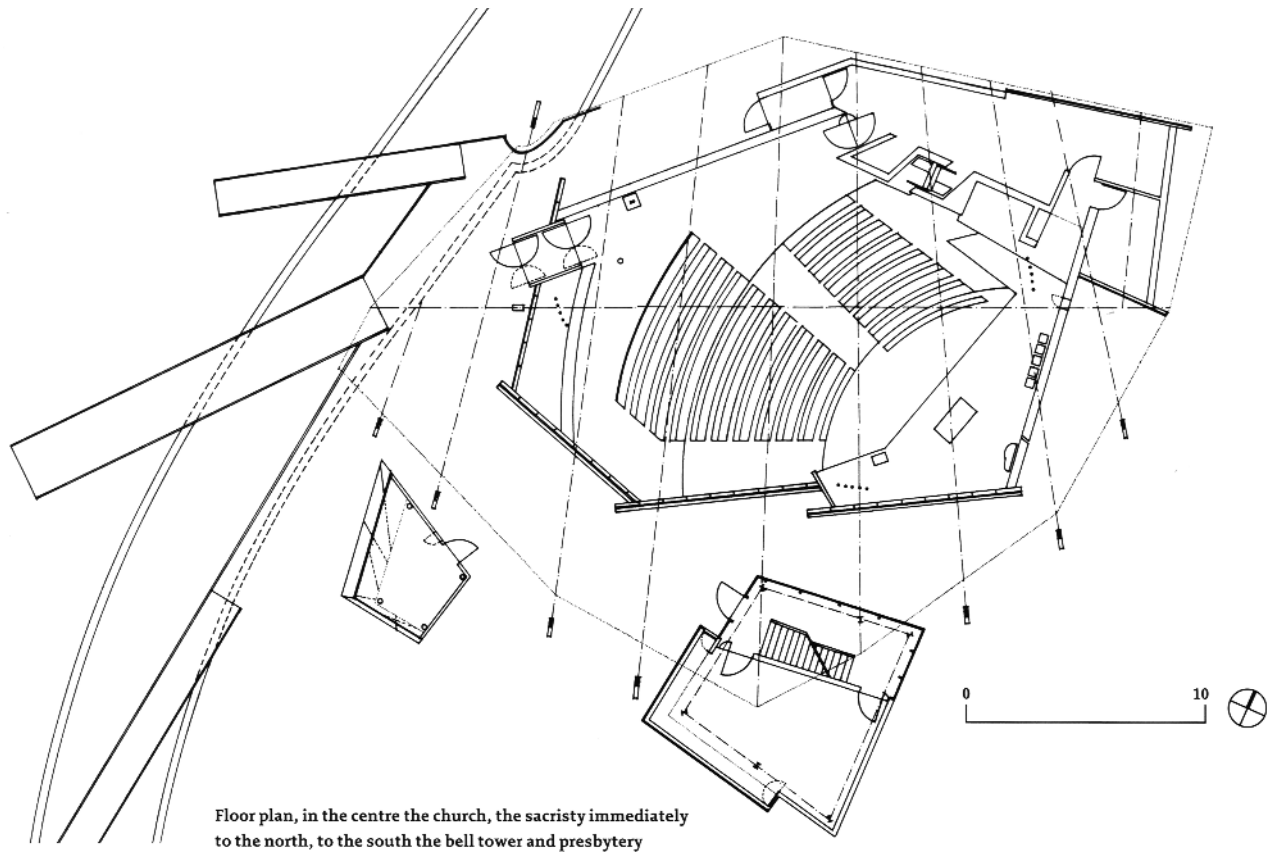
One continues on through a large 1.65 by 5.35 metre opening, a gap in the angular wall as it passes through the building and turns right again to look from the back towards the front of the main "nave".

The dimensions of the box, 18 by 6.28 by 6.28 metres, are the equivalent of three cubes arranged behind one another. The pitch-black cedar wood floor descends in shallow tiers towards the ambo. The pews, made of rough planking, divide down the middle to leave an aisle through the centre. The rear wall behind the ambo is divided once vertically and once horizontally, leaving two thin strips of light, which together form a slot in the sign of the cross. In the mornings until midday rays of sunlight stream through the opening, illuminating a

cross on the floor that shifts as the day progresses. The only other natural illumination is provided by the full-height glazed opening on the west wall.

The interior of the chapel is quite dark, acquiring a green or blue tinge from the daylight reflecting off the smooth concrete. According to the architect, this was the only way to transform light into a sign of belief. The building draws on the language of Le Corbusier and Louis Kahn on the one hand, and Richard Serra and Carl Andre on the other. Its sparse, reserved character has caused critics to celebrate it as an "architecture of silence." Together with Peter Zumthor's Sogn Benedetg Chapel in Somvix, Switzerland (see pp. 94-95), it has had a profound influence on sacred architecture since 1990.

Some ten years after its construction, the Chapel of the Light was extended to provide a Sunday school to the west of the chapel. Its form repeats the same basic formal principle with a similar angular wall and box. Today, the shape and spatial arrangement of both singularly ascetic buildings form a pair inseparable from one another.



Floor plan, in the centre the church, the sacristy immediately to the north, to the south the bell tower and presbytery



View from the west | Green roof from the southwest | Covered passage on the south side, the church to the right, the larch-clad presbytery to the left and base of the bell tower to the rear, which is used as a library | View towards the altar from the west, to the left of the altar the sedilia and the tabernacle, in the wall on the left space for the organ

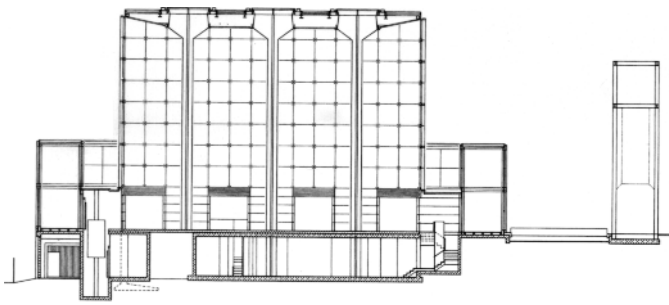


St Florian's Church

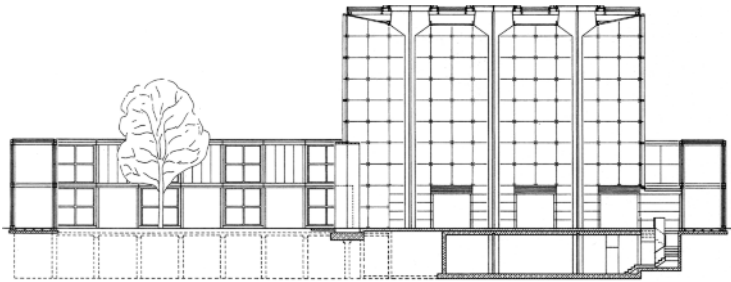
Aigen im Ennstal, Austria

Architect	Volker Gléncke
Client	Diocese of Graz-Seckau and the Municipality of Aigen im Ennstal
Completion	1992
Denomination	Roman-Catholic
Seating capacity	120

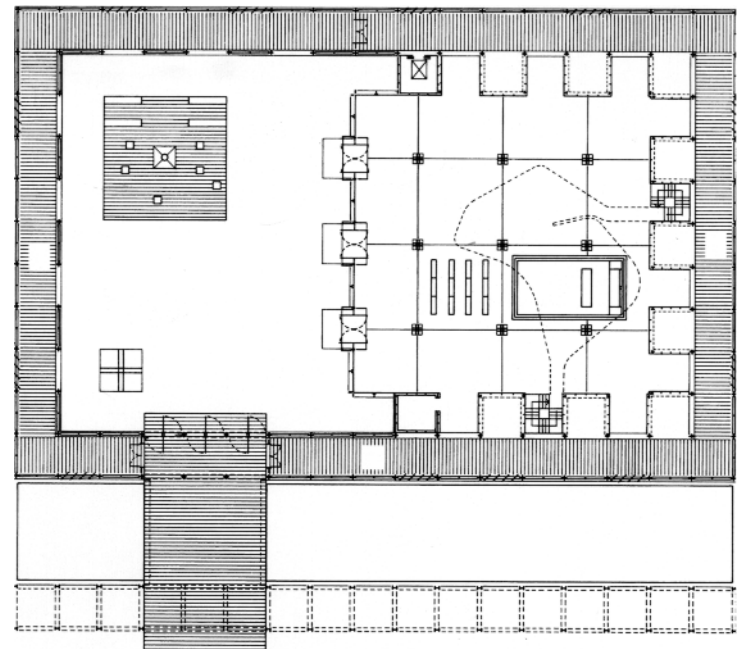
Bounded by a rocky ridge to the north and a country road to the south, the church stands in the middle of Aigen. The building is part of a constellation that includes the old village square and a new church square, with a stream separating the two. Three steel and timber gangways connect the two spaces. Built on a polygonal floor plan that deliberately avoids any obvious axuality or symmetry but nevertheless has a clear front and back, the building opens more towards the south and west and is more closed to the north and east. The earth and grass green roof lies like a tortoise shell over the building. Its supporting trusses and shell rest on walls on the north and east sides, on columns to the south and west. A projecting white steel plate rim runs around the perimeter roof like the edging of a plate.



Cross section



Longitudinal section



Ground floor plan



Night-time view of arcade, cloister, tower and pavilion | Front face of the pavilion with external structural framework and translucent panels of stone-glass | Interior view of the pavilion with altar and pews in the background, coffered ceiling above | Cloister, to the right some of the filled glass panels

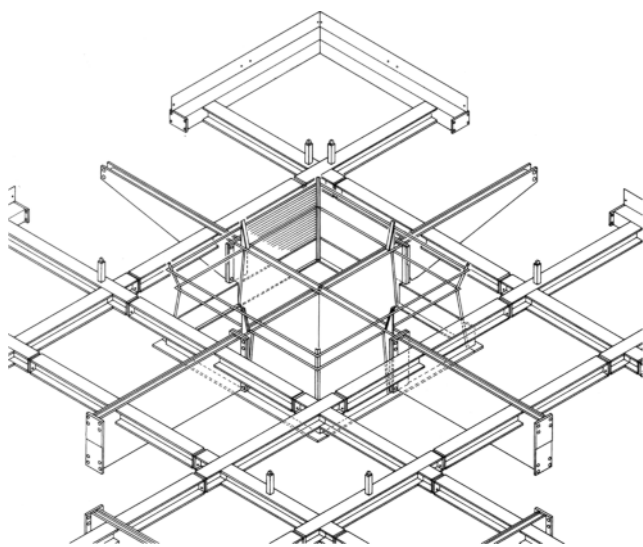


Christus Pavilion

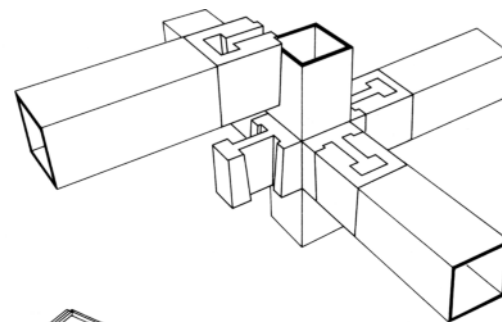
Hanover, Germany

Architects	Meinhard von Gerkan, Joachim Zais
Client	Protestant Lutheran State Church, Hanover, and the German Bishop's Conference, Fulda
Completion	2000
Denomination	Roman-Catholic, Lutheran-Protestant
Footprint	Pavilion ca. 466 m ²
Seating capacity	200

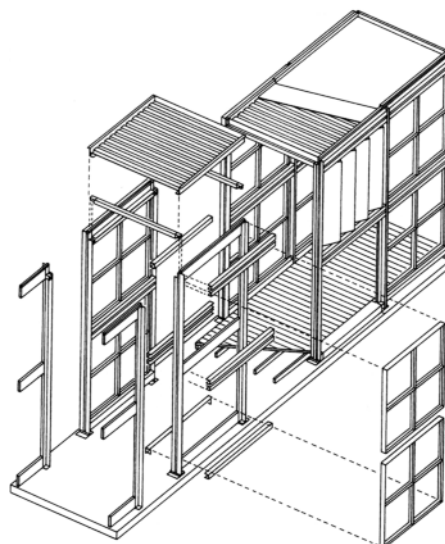
Erected for the World Expo, the Christus Pavilion is a rational and innovative building but nevertheless manages to create a monumental and majestic atmosphere, particularly inside. Its regular bay module of 3.4 metres, and restricted palette of steel, glass, marble and concrete underline this intention. The ensemble consists of an arcade, a cloister, courtyard, tower and pavilion. One enters via a gangway that passes through the 58 metre long and 14 metre high arcade, over a pool and through the cloister before arriving in the courtyard. In the left-hand corner, a steel and glass tower with the cross section of a cross reaches 27 metres into the sky. On the right-hand side, one sees the entrance to the Christus Pavilion with its three tall, symmetrically placed portals.



Isometric projection of roof structure



Schematic view of modular system



Exploded isometric projection of cloister



In terms of construction, the pavilion is a simple “table top” on “table legs”. The interior measures approximately 18 by 18 by 24 metres in which nine black columns stand. Each of these is made of four steel angle profiles which project at the top to form a capital; a rooflight is positioned directly over each of these. The paved concrete floor area is divided clearly into two halves. The left-hand zone is empty, the right-hand zone contains the pews and liturgical objects, all made of oak. The altar stands on a podium in front of a glass cabinet containing a steel cross. Beneath the altar area is the crypt, a rounded freeform shape made of concrete.

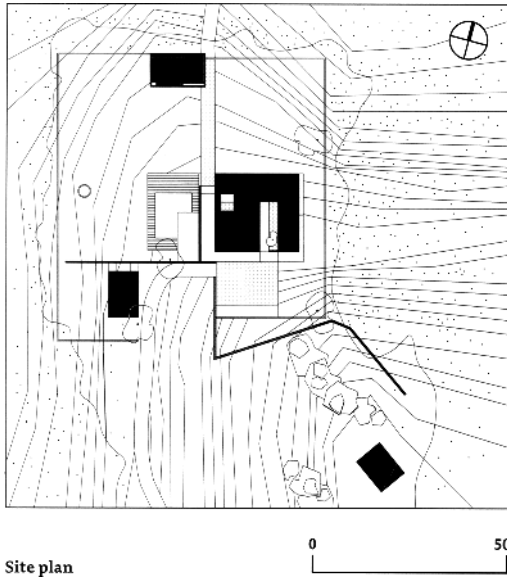
Inside the pavilion, the lower sections of the walls are clad with black steel panels, providing a visual plinth.

The upper sections are made of specially developed stone-glass panels. Each panel is 1.69 by 1.69 metres large and consists of a 10 millimetre thick marble panel bonded to a 12 millimetre thick glass panel with 1.5 millimetres of bonding resin. The panels are translucent and lend the walls of the pavilion an alabaster-like appearance. The stone-glass panels are supported externally in each corner by stainless steel fixtures attached to a lattice framework of vertical and horizontal steel members.

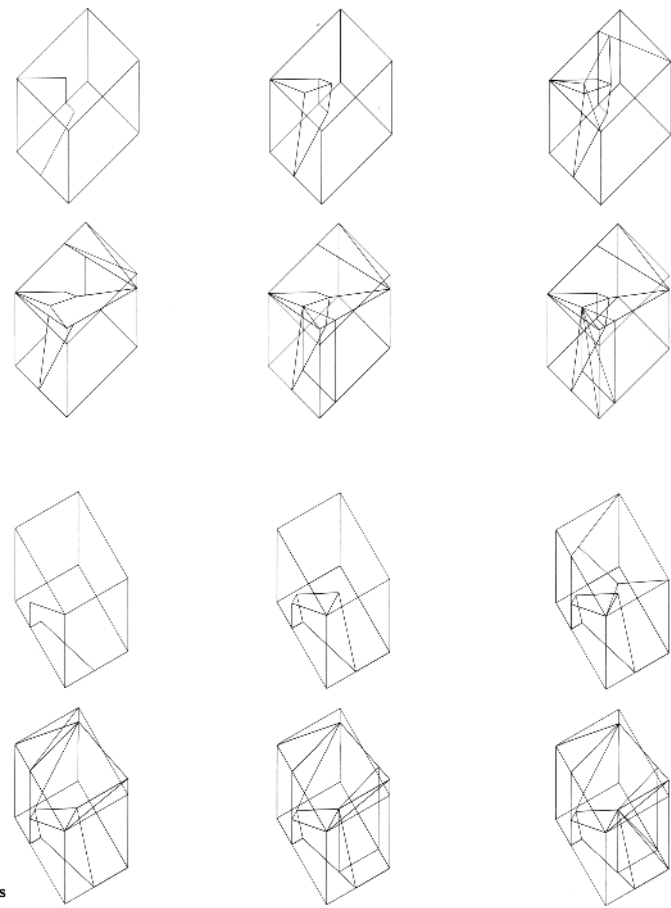
In contrast to the pavilion, the cloister appears lighter and more animated. With a width of 3.4 metres and a height of 6.8 metres, the cloister's dimensions are defined by the bay module. Inserted into the framework

of the cloister are dual-skin glass panels, each of which is filled with thousands of familiar objects, both natural and technical: one panel contains bamboo canes, the next plastic tubing, the next poppyseed heads, thereafter light bulbs, tea leaves, cogwheels, and so on. Despite their common geometry, the cloister and the pavilion alternate between the profane and the sacred.

In summer 2001, the Christus Pavilion was disassembled and re-erected in Volkenroda in Thuringia, Germany, though without the arcade, tower and crypt. The modular construction of the architecture was designed specifically with this eventuality in mind.



Site plan



Studies on folding wall variations



View from the west with the strip of window not visible from the entrance | View from the north showing the dynamic contraction and expansion of the entrance face | The interior illuminated by light from the west, steel cross on the rear wall | Interior view looking from the rear wall back towards the entrance



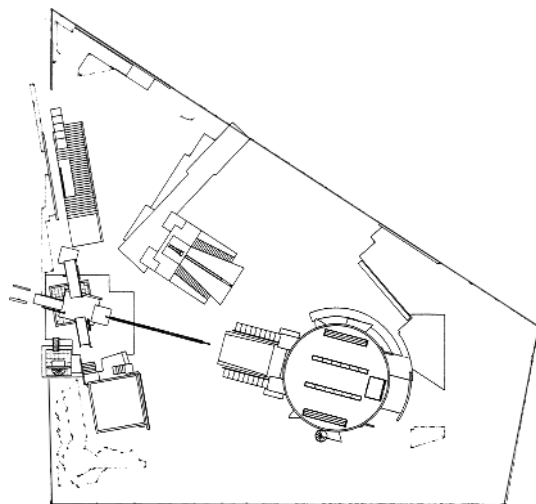
Chapel for a Country Estate and Hunting Lodge

Valleacerón, Almadén, Spain

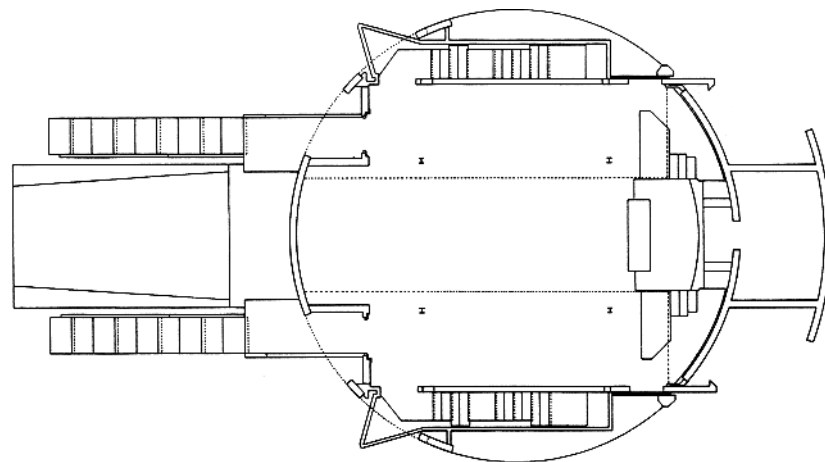
Architects	Sol Madridejos Fernández Juan Carlos Sancho Osinaga
Client	private
Completion	2000
Denomination	Roman-Catholic
Footprint	94.08 m ²
Seating capacity	28

Situated in the province of Ciudad Real, on the crest of a hill surrounded by barren countryside, the chapel is part of a small country estate and hunting lodge, which encompasses a manor house, a warden's residence and trophy pavilion. The secular and the sacred architecture of the "feudal" estate are as extravagant as one another but stand apart, the profane buildings clustered together, the church higher up and to one side; the former rendered snow-white and entirely orthogonal, the latter a matt concrete structure and entirely diagonal.

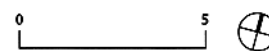
As there is nothing far and wide to compare it with, the chapel initially appears quite large. In reality, however, it fits in a square of only 8.4 by 11.2 metres. The



Site plan



Plan of church, lower level



View of the cylindrical church looking towards the front face | View of the four buildings from the west, in the background left the pyramid of the chapel | View of the church from the north, to the right two of the four entrances, left the external staircase from the upper gallery to the roof | View towards the altar zone of the church, to the left and right the four galleries

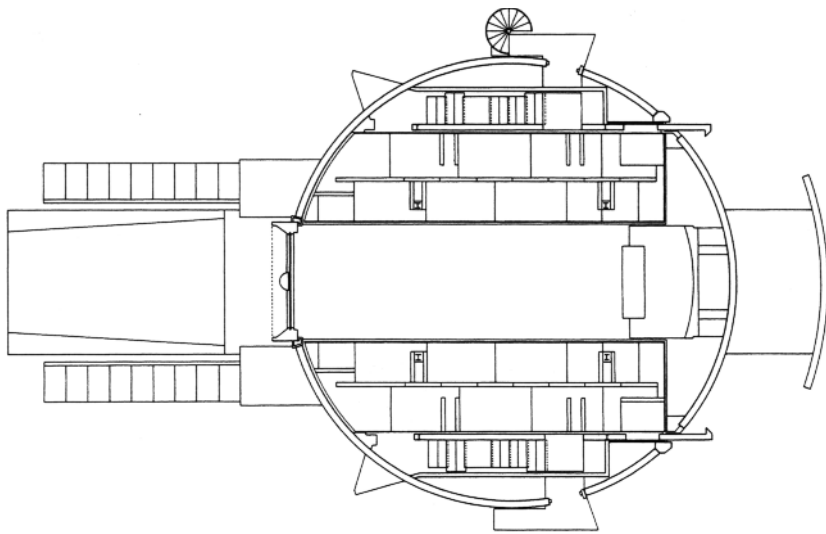


Church and Chapel in Parque de San Francisco

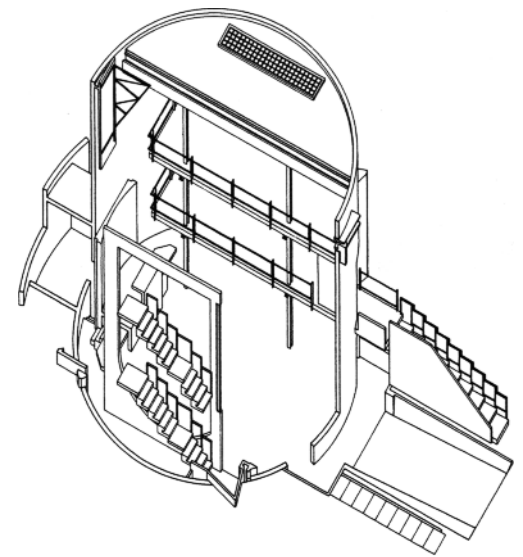
Almazán, Soria, Spain

Architect	Francisco Javier Bellosillo Amunátegui
Client	Diocese of Osma Soria
Completion	1987
Denomination	Roman-Catholic
Footprint	Church 113.04 m ² , chapel 70 m ²
Seating capacity	Church ca. 200, upper level ca. 100, chapel 70

Almazán is a small community of only 5800 inhabitants located in the Castilian highlands some 30 kilometres south of Soria. The Parque de San Francisco lies to the east of the centre of Almazán, next to a north-south road that separates the periphery from the centre. The level site has an elongated pentagonal form that grows progressively narrower towards the rear. Covered largely with lawn and a few spindly conifers, the Parque is bounded on the north by a row of newly-built white houses, to the south by a similar row of brown houses. In the midst of its urban surroundings, the Parque is so large that it appears like a desolate area. The bullring built nearby only strengthens the impression of a “barren” area left to progress at its own pace.



Plan of church, upper level



Axonometric of church

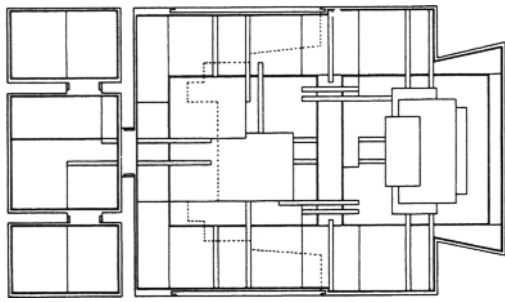


Four buildings made of rough in-situ concrete stand loosely arranged at the rear of the pentagon. The first of these has a wedge-shaped form and functions as a dwelling and office. The second has the form of a cube and is a house for children. The third is a pyramid and serves as a chapel. The fourth is cylindrical and is a church. Originally, the buildings were to be connected by two footpaths that were to cross precisely in the centre of the site. The wedge and cube housing the profane functions were to form the ends of one axis, the pyramid and cylinder housing the sacred functions the ends of the other axis. In this arrangement, the ensemble would have had an inward focus, turning its back on its surroundings.

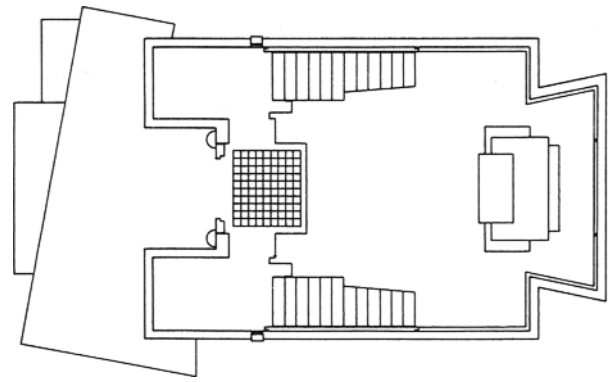
It seems that, for a while, the architect saw only the "vulgarity of the periphery" in the surrounding context of the park. That he eventually overturned his earlier inward arrangement is evident in the arrangement of the buildings. The constellation now establishes a connection, if somewhat distant, to the centre of Almazán. The intersecting axes have now been shifted from the centre to the western edge of the 1500 square metres large plot. Here, at the point where the Parque de San Francisco tapers markedly in an easterly direction, a stair and a bridge crossing as well as a "campanile" – without bells, but with elevated crow's nest at the top of a spiral stair – mark the entrance to the "sacred space". The wedge and cube stand at each end of the transverse axis, on the left and the right. The pyramid stands to

one side of the longitudinal axis with the cylinder at the rear. The hierarchy of the architecture is immediately apparent: the profane in the foreground, the sacred in the background. The church forms the focal point of the entire ensemble. It is the largest and tallest building and, as if to emphasise its stature still further, the shuttering marks on its concrete walls are entirely vertical.

Arriving from the west edge of the Parque, one passes the wedge with the dwelling and offices on the left and advances towards the pyramid of the chapel. Its upright long sides and inclined short sides are almost entirely plain surfaces, forming a square of 10 by 7 metres. On the shallower of the two inclines, two flights of steps lead onto the roof. The entrance is in the more



Plan of chapel, lower level



Plan of chapel, upper level



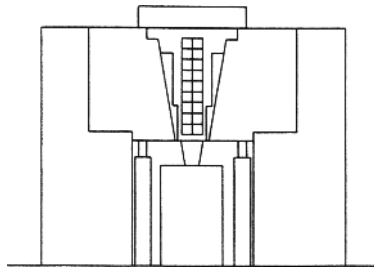
steeply inclined façade. Immediately behind the quadratic indentation which frames the double-doors, themselves flanked on either side by half-rounded pilasters, one emerges onto a gallery with a steel-and-glass balustrade. One's view continues forwards and downwards. Stairs on the left and the right descend a whole storey. At the bottom one stands immediately in front of the altar – a simple, broad-folded leaf of rough concrete – with the sloping wall of the wedge, a single strip of light running along its centre, leaning over it like a protective hand. A small crypt lies well hidden behind the last row of chairs directly beneath the entrance portal.

In paintings of urban scenes from the Quattrocento, the most important building is typically in the cen-

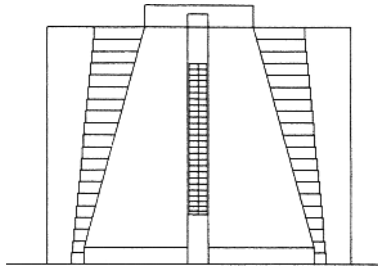
tre at the end of a vista. In the Parque de San Francisco, the church fulfils this role at the end of the axis that leads down a gentle descent across the lawn from the bridge crossing. The building has four entrances, none of them in the centre. Two are on the left and right at the end of the ramp, two at the end of two stairs that lead upwards either side of the ramp. The building has a diameter of 12 metres. Although its external appearance is cylindrical, it nevertheless attempts to mediate between the radial and the axial: the interior is a pure cube of 9 by 9 by 9 metres. All indications of the outer cylindrical form are concealed inside by four galleries, again with steel-and-glass balustrades, and their access stairs. The galleries divide the space into three storeys on the one hand, on the other into a central nave and

two side aisles to the left and right. This arrangement is reminiscent of a Protestant church; all it is lacking is a pulpit in the "apse" behind and above the altar.

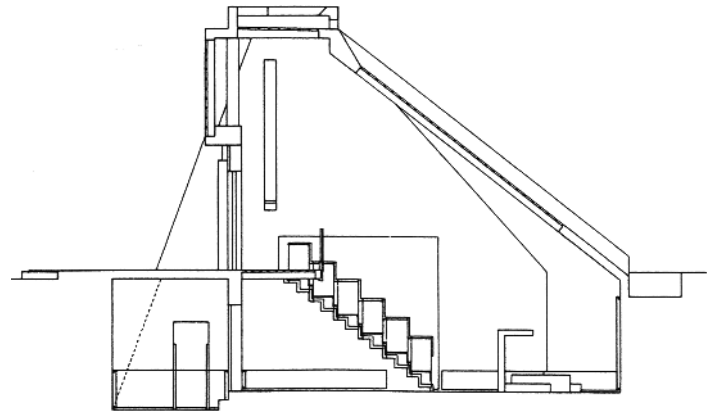
Each of the buildings – wedge, cube, pyramid and cylinder – has been designed as a solitary object. Nevertheless, together they form an ensemble: firstly, through their individual symmetries, evident inside as well as outside in the church and chapel; secondly, through the rough grey materiality of the concrete; thirdly, through the slots and strips of light in each building; fourthly, through the red, green and blue colours used for the steel doors and windows; and lastly, through the numerous stairs that make ascending and descending a characteristic part of each of the four buildings.



Front elevation of chapel



Rear elevation of chapel



Longitudinal section through chapel



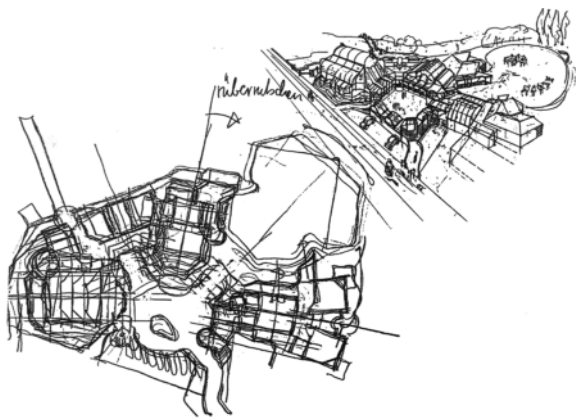
External wall and roofline behind the altar in the church | Entrance to the chapel | View from the lower level of the chapel looking back and upwards towards the high front wall of the chapel and the entrance | View from one of the two side stairs onto the altar zone in the chapel

The church and chapel in Parque de San Francisco have a specific affinity with Italian architecture. The “solitary pride” of the individual volumes on the lawn are reminiscent of the solitary character of the buildings around Pisa Cathedral. The ample use of profiles and pilasters that frame, step and shuffle the volumes and give special character to the details are clearly influenced by the work of Carlo Scarpa. A renewed emphasis on the value of history as an origin for design and the abandonment of the dogma of modernism derives from the ideas and concepts of the Gruppo Romano Architetti Urbanisti (GRAU), founded in the mid-sixties. In this respect, the church and the chapel refer to Castilian’s heritage as the land of a thousand castles. In this respect, too, their materiality – the concrete, steel

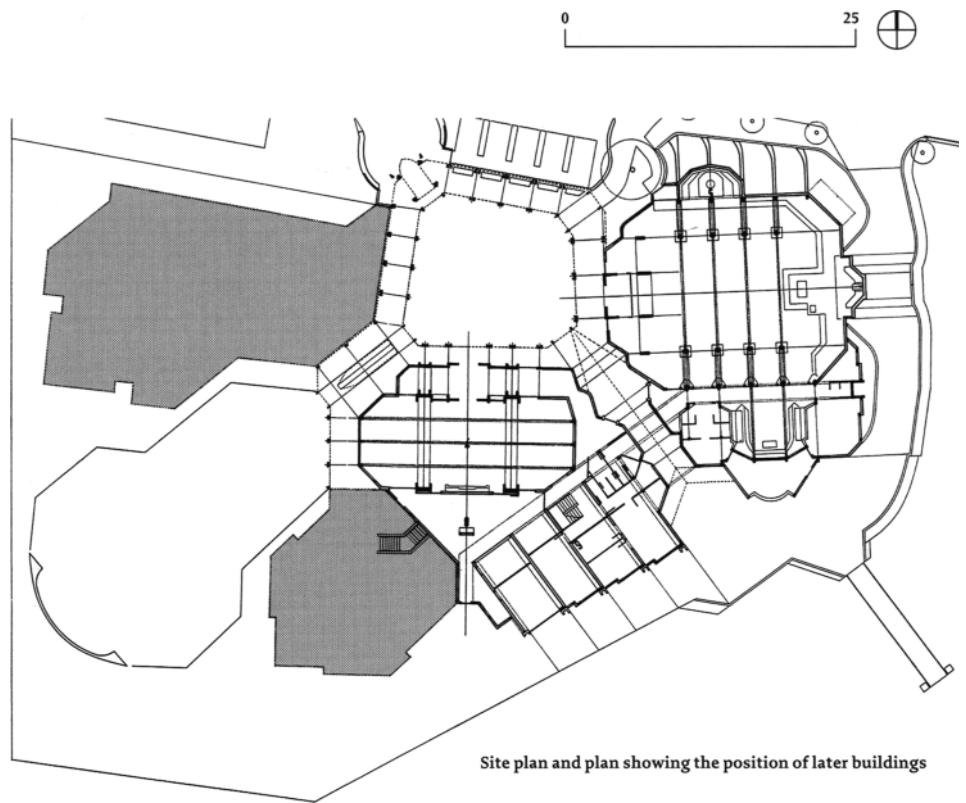
tubing, wired glass as well as the cabling and electrical fittings – refers to the architecture of workshops and factory buildings. The form of the chapel goes even further, making almost demonstrative reference to the culture of the Maya civilisation.

Indeed, the church and chapel adopt a precarious position which Spanish architectural critics soon coined as “eclectic rationalism”. The various references from near and far that inform the complex at Almazán are transformed through the design into an idealised constellation in which the divergent, even paradoxical elements are synthesised into an archaic, narrative and highly dramatised aesthetic. Even when the ensemble communicates little of the joy of “glad tidings”, its architec-

ture nevertheless gives us a sense of what Christian believers call the “mystery of faith.”



Design sketch



Site plan and plan showing the position of later buildings



The complex on a strip of land between a main road and housing estate | Church, meeting house and tower grouped around a courtyard and connected via arcades

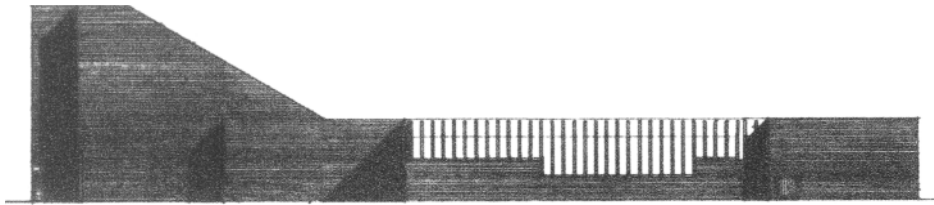


Brother Claus Church

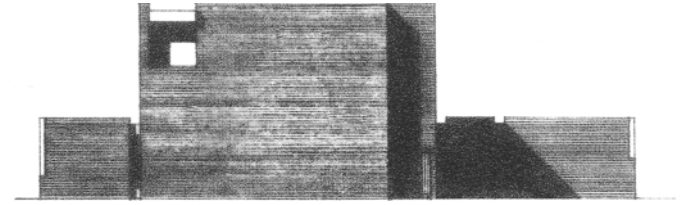
Graz, Austria

Architects	Michael Szyszkowitz, Karla Kowalski
Client	Diocese of Graz-Seckau
Completion	1987
Denomination	Roman-Catholic
Footprint	438.75 m ²
Seating capacity	ca. 200

In the submission details for the invited competition in 1982, the congregation requested a design for a “real church”. In other words, the new building in Graz-Ragnitz should be “immediately recognisable as a church”. This wish may have been in response to the difficulties that arose in connection with St Paul’s Church in Graz-Eisteichsiedlung (see p. 25) designed by Ferdinand Schuster in 1971. This predominantly steel-and-glass building with its red and brown main hall and square plan was devoid of all sacred typological and atmospheric characteristics. Through its sobriety and neutrality, the elongated building aspired to be a “church of the world”; St Paul’s Church was an expression of a consequent, even radical “aggiornamento” in the wake of the Second Vatican Council. Gradually, however, the



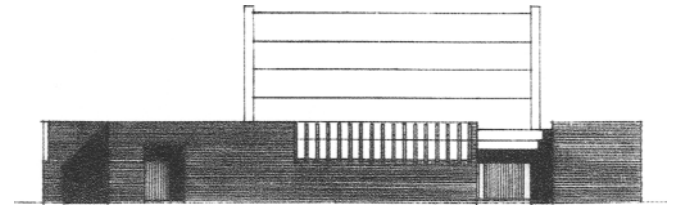
Northwest elevation



Northeast elevation



Southeast elevation



Southwest elevation



View from the southeast, entrance in the background | View from the northwest, in front the row of windows of the youth centre, behind the stepped roof of the nave | Parish hall, in the top centre the opening for the bells | Internal courtyard looking to the southwest, youth centre in the background | Nave of the main church with fourfold stepped skylight, right the transition to the parish hall, left the vertical shaft with the bells

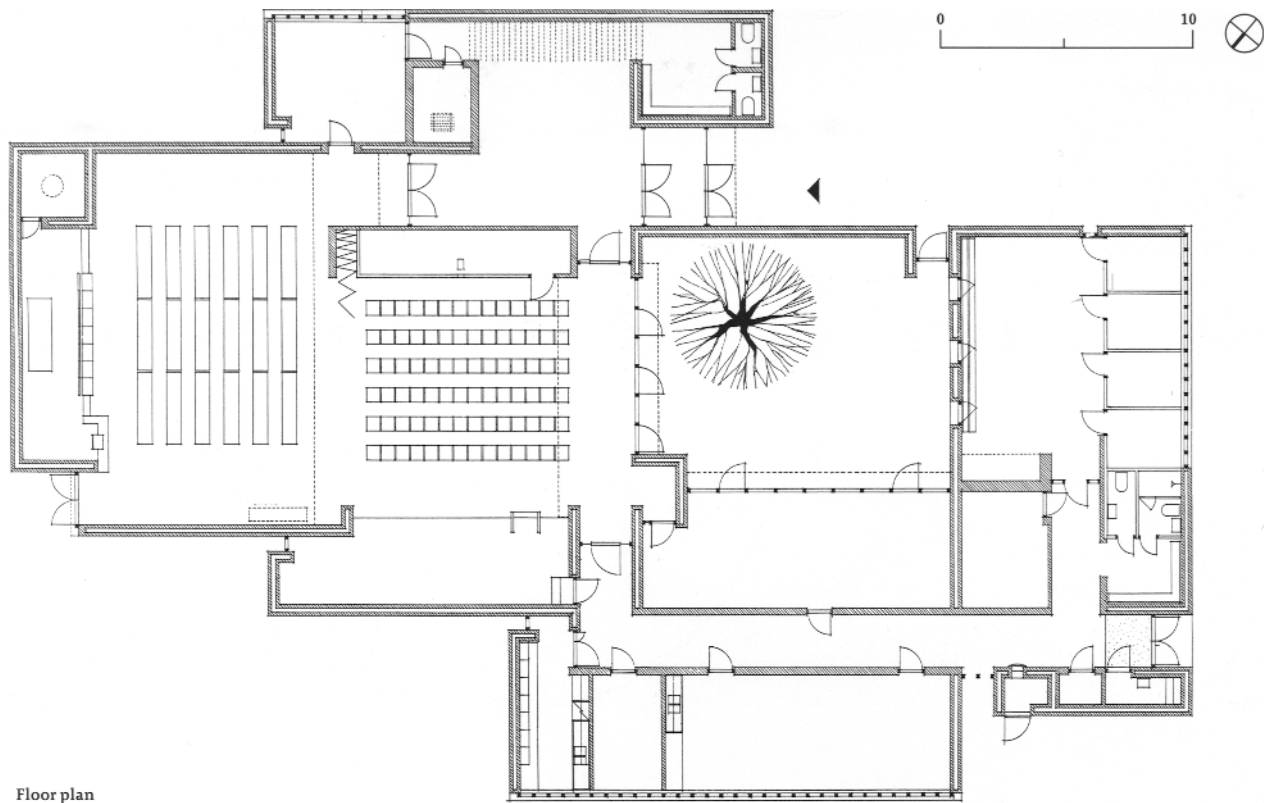


Church Centre

Bjuv, Sweden

Architects	Bengt Blasberg, Henrik Jais-Nielsen
Client	Association of Free Churches in Bjuv
Completion	1970
Denomination	Protestant free church
Footprint	Church ca. 140 m ²
Seating capacity	78

Bjuv is a community of 14,000 inhabitants formed from several parishes. It lies in Scania and for more than a century was shaped by the coal and steel industry. Built in the middle of a then new settlement and destined for the amalgamation of two free parishes of Methodists and Missionarists, the church centre presents the visitor with an elongated structure 40.76 metres in length, rising towards the back to a height of nine metres. The church itself occupies the depth of the site. Approaching from the road, a wall to the right defines the path to the entrance; but to the left, buildings and spaces are ranged piece by piece in increasing importance. There is a hierarchy of functions: the youth centre, a courtyard with trees and bushes, the parish hall and the main church.



Floor plan



Up to the point where one enters the church, the building material and the construction have already had their effect. The bricks came from a local brickworks. They are dark, with red and blue tones and are fire bricks, which are particularly durable. Each course follows a pattern of three stretchers followed by a header, an uncommon brick bond whose rhythm is created by the architects. They wanted raw walls and coarse joints; in some places, remains of mortar cling to the bricks. Thanks to its materials and construction, the building will certainly continue to age gracefully.

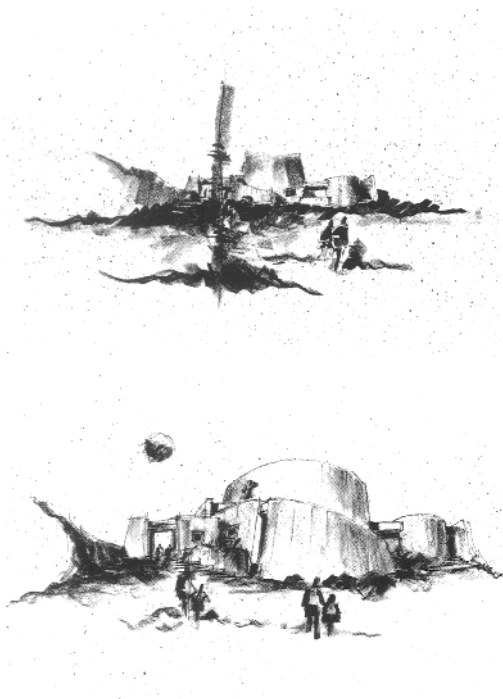
Around the entrance area of the church are, to the right, the cloakroom, a chapel and an office, and to the left an assembly hall with 90 seats in front of a "stage",

under which there is a pool that enables the rite of baptism to be performed, in which the candidate kneels in the water. The space opens up towards the southwest and northeast, on the one side out into the courtyard, on the other – when the folding partition is pushed to one side – into the 11.5 metre deep second hall with 80 seats where, on Sundays, church services are held. Here, too, the dark brickwork has been used, and on the floor there are brown tiles. Pitch pine has been used for the pews, with cushions made of sailcloth.

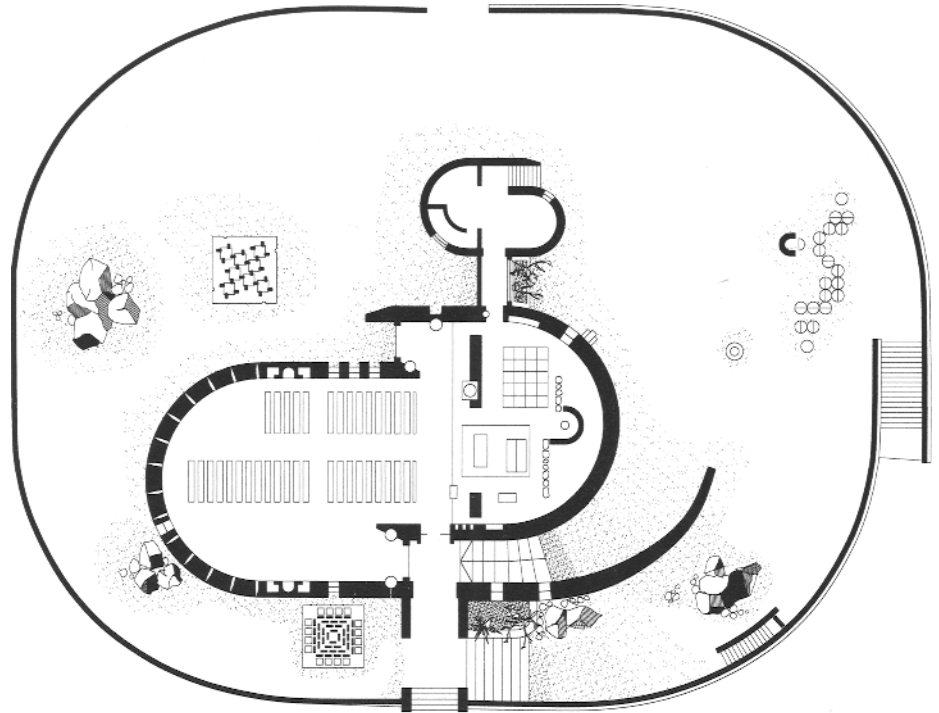
The beams, windows and ceilings give the roof a stepped form in concrete, glass and wood. This progression of steps follows a tradition of designs such as the House of Friendship by Hans Poelzig and of the

Maria-Regina-Martyrum Church by Rudolf Schwarz. The church does not have a tower. The bells hang in a vertical shaft to the side of the altar. Their sound radiates to the outside through an opening under a small canopy. Otherwise the rear wall is completely closed.

When they commissioned the building, the two parishes were not seeking anything monolithic or monumental. They wanted a centre not only for Sundays but also for use on weekdays. The huge cross made of iron sections next to the path to the entrance and the stepped roof in the background nevertheless make a strong gesture.



Design sketches



Plan of the plateau and church, on the east side the sacristy, to the west the sculpture "City of the Labyrinth", to the north the sculpture "City of Towers", both by Richard England



Site plan | View of the church from the west, with the portico in the centre | Seating and bell tower on the south side of the terrace | View of the altar area, to the left the font

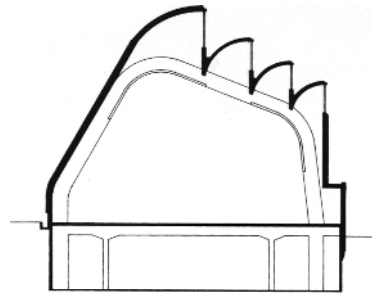


Saint Joseph's Church

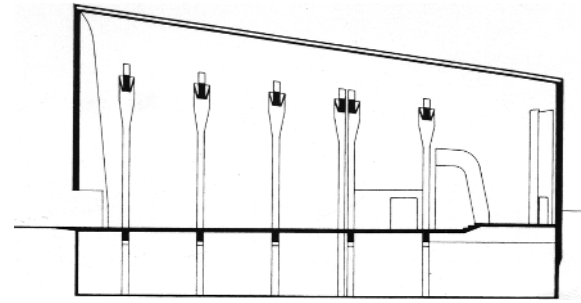
Manikata, Malta

Architect	Richard England
Client	Pastor Manwel Grima
Completion	1974
Denomination	Roman-Catholic
Footprint	ca. 458 m ²
Seating capacity	ca. 140

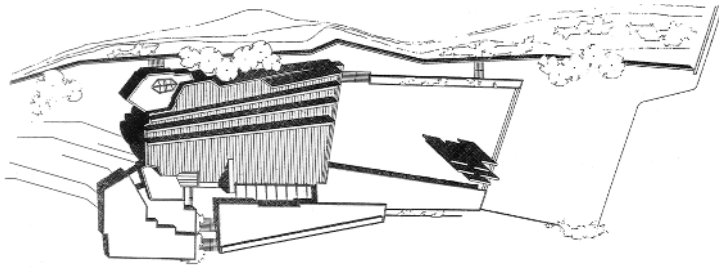
Even if they do not necessarily reach up high into the sky from the centre, Maltese churches always occupy a prominent position within the precincts of the villages. This is also the case in Manikata, a small village in the far north of the island. Strangely reminiscent of the appearance of a submarine, Saint Joseph's Church seems to float, with its low, rounded, never hard forms, on a hill on the outskirts of the settlement. The yellowish rendered building stands 76 metres above sea level. It is 7.6 metres high and occupies an artificial terrace, which is enclosed by a splayed encircling wall. One enters the 63 metre long plateau via three sets of steps from the south or the west. A few rocks lie on the pebbly ground; two sculptures, some seating and a bell tower invite one to stop and rest.



Cross section



Longitudinal section



Roof plan



View from the east, left the wing with offices and hall | View from the northwest, baptistry to the front | Nave with the rounded arches in reinforced concrete | View from the gallery onto the side entrance and the transition to the sacristy



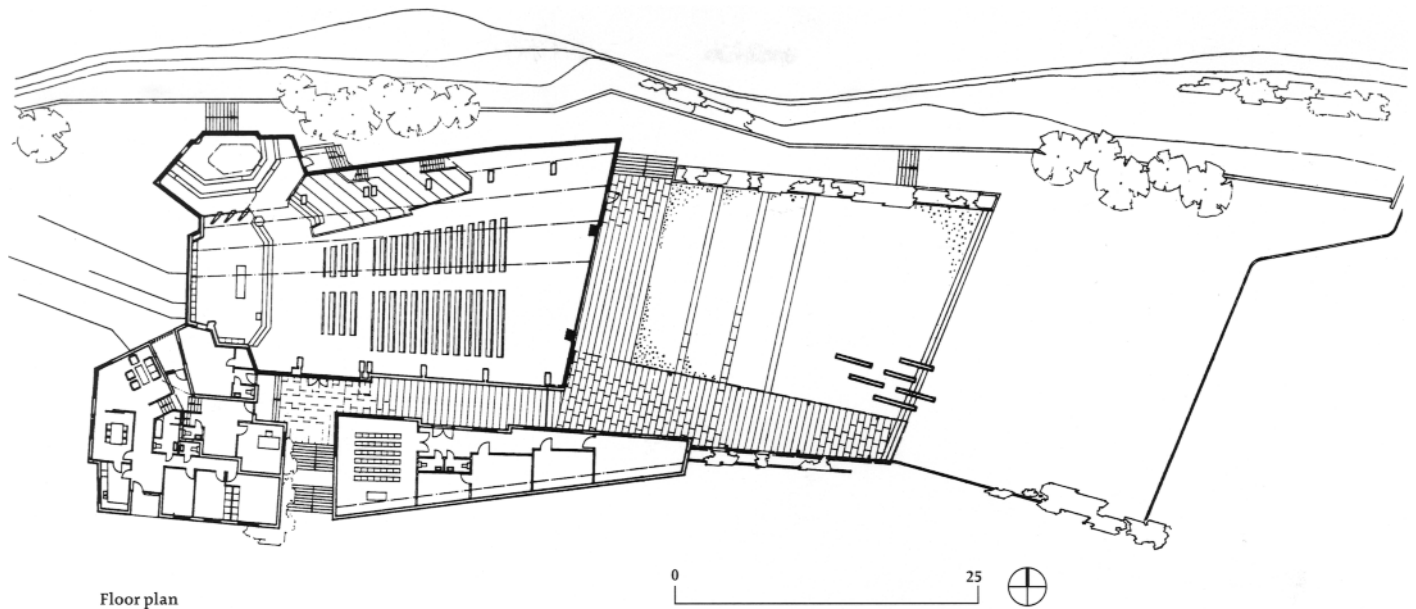
Church of the Resurrection of Mary

Riola di Vergato, Italy

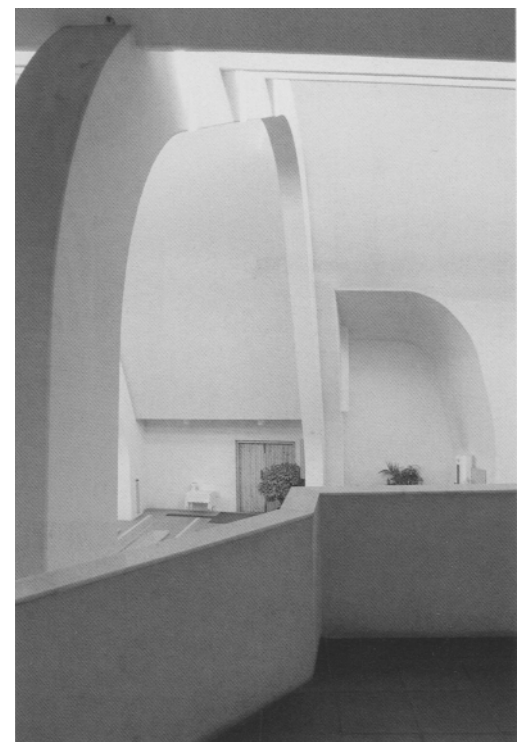
Architect	Alvar Aalto
Client	Cardinal Giacomo Lercaro
Completion	1978
Denomination	Roman Catholic
Seating capacity	ca. 240

Situated in the Bolognese Apennines and linked by a bridge, the villages Riola and Vergato are spread along the banks of the Reno. The church stands on a plateau between the river and the hillside. With its wedge-shaped form, the building is inserted between the flow of the currents and the slopes of the landscape.

Stepped to the north, curved to the south, sloping down to the west, the church was largely constructed out of industrially produced elements. Six rounded arches made of reinforced concrete serve as the supporting framework, on which four concrete shells rest, each a quarter cylinder in section. The external walls are clad with panels of local, light brown sandstone and the roof is clad in copper. On the north side, the



Floor plan



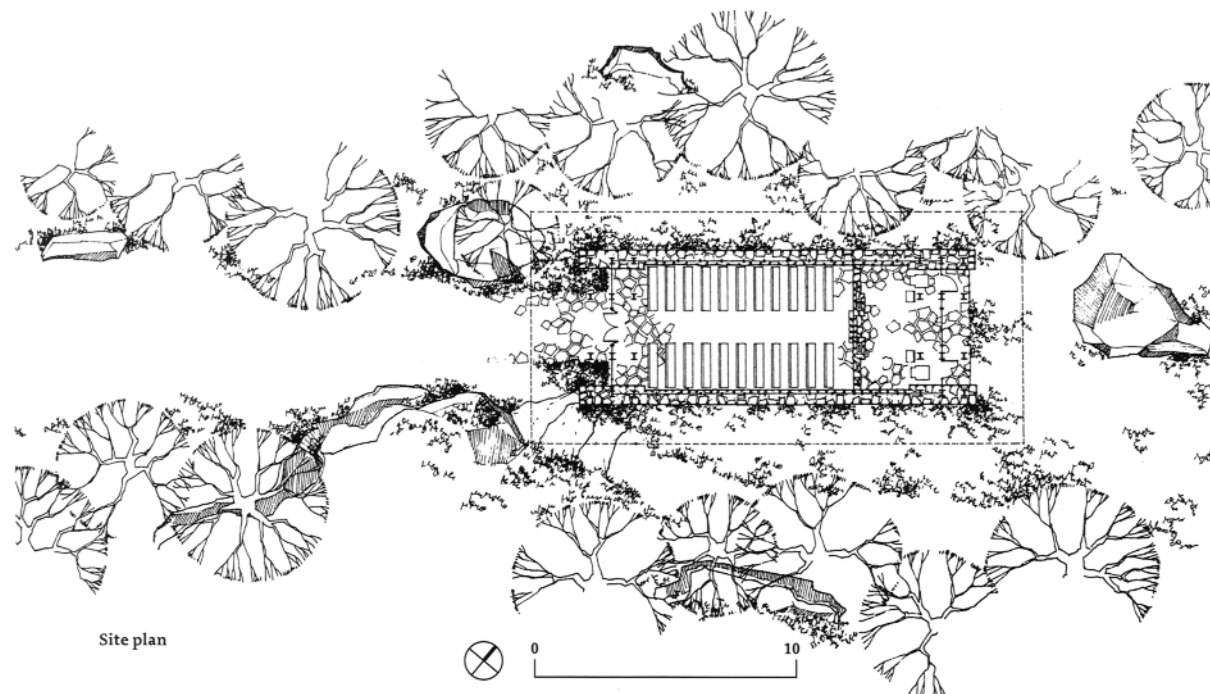
chapel containing the font projects from the wedge. The sacristy, the priest's residence as well as a wing containing offices and a hall are arranged to the south. At this point, a slab projects far and high out of the building. In terms of the balance of the building, this forms a vertical contrast to the horizontal vault of the roof. Originally, the slab was intended to conceal a sliding wall, which would have made it possible to divide the space into a smaller part with the altar and a larger part for assembly and festive occasions. However, this plan was never realised. Inside, the building is characterised principally by the arches. Although curved at three points, they run in one continuous thrust from floor to ceiling and back to the floor again. Since each arch is progressively smaller, not only from left to right

but also from front to back, they articulate the space more powerfully than any set of Romanesque pillars. The walls are finished in white lime. The pews, which stand on the reddish clay-tiled floor, can accommodate 240 people. The zone around the altar stands out due to the generous use of Carrara marble. Excepting the two vertical bands of light adjacent to the altar, the light comes solely from above and the north. The only light is reflected light that rebounds off the curved surface of the quarter cylinders down into the nave.

Presbytery, baptistery and music galleries are placed in a distinct relationship to one another. They form a whole, not least due to their many angles and the ups and downs of their steps. The console and prospect of

the organ are positioned above the opening to the baptism space. The chapel has an elongated skylight and – in a reference to the baptism of the prophet John – a window overlooking the river.

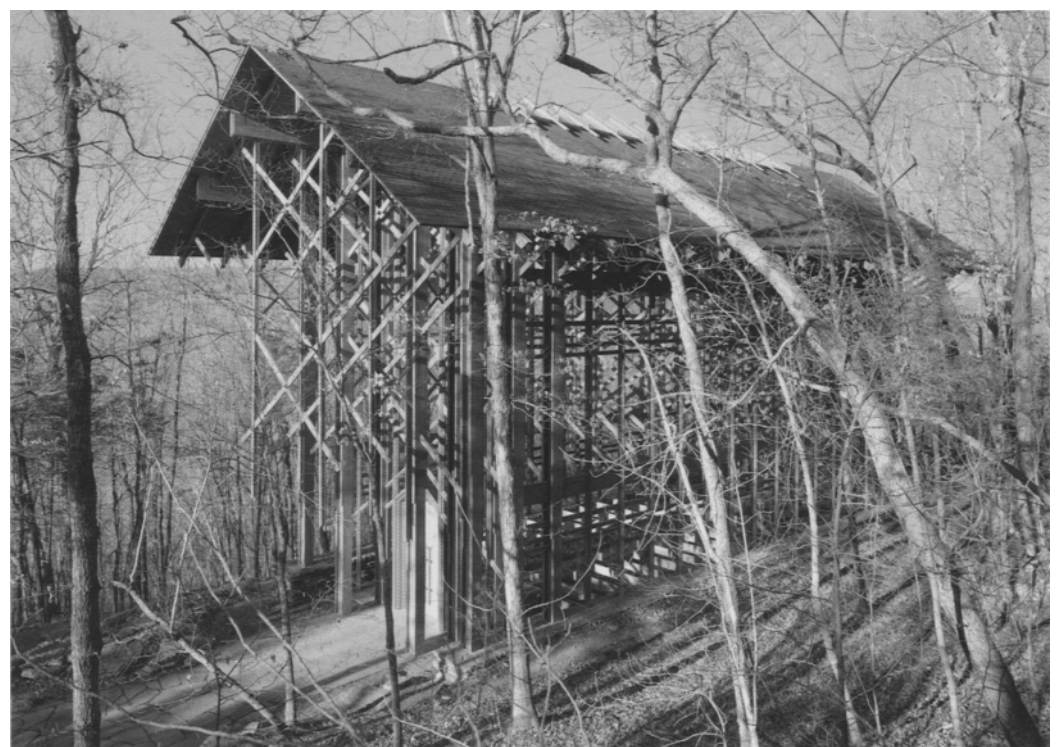
The 1966 design proposed further buildings on the south and west sides for parish use. The wedge of the church was a little longer and had seven rather than six arches. The immediate surroundings were more emphatically landscaped and the dialogue between inside and outside was stressed more strongly. Critics complained about the, in their opinion, mediocre detailing of the church. The architect died in 1976. According to sources, he would probably have clad part of the walls in wood for aesthetic and acoustic reasons.



Site plan



View from the northeast with view through from the altar to the portal | View from the north | Central aisle between the pews, cross beams above with diamond-shaped crossover | The side wall glazing, with attached lighting on the columns



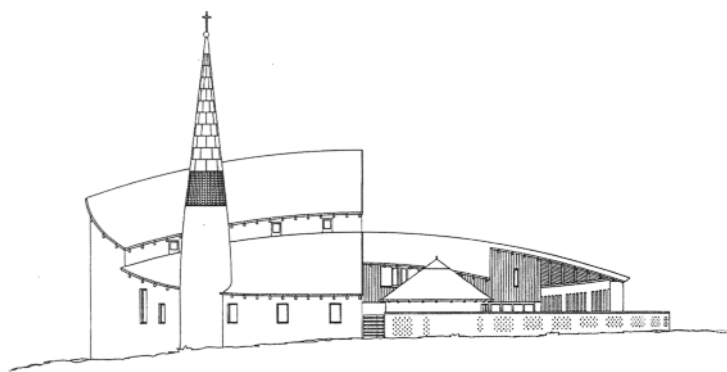
Thorncrown Chapel

Eureka Springs, Arkansas, USA

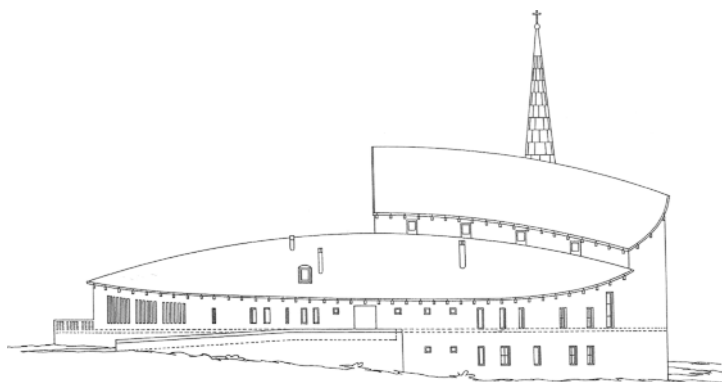
Architect	E. Fay Jones
Client	Jim Reed
Completion	1980
Denomination	None
Footprint	133.62 m ²
Seating capacity	ca. 100

Founded in the last quarter of the 19th century, Eureka Springs is a small health resort in northwest Arkansas. Thorncrown Chapel stands on a stony sloping site beneath the maple and oak trees of the Ozark Mountains, some 3 kilometres from the hotels and resort guests. The dimensions of the building – 18.28 metres long, 7.31 metres wide, 14.63 metres high – suggest a hall and processional church. And indeed, a central aisle runs the length of the building, with rows of pews to the left and right; at the end a low podium with two pulpits but no altar.

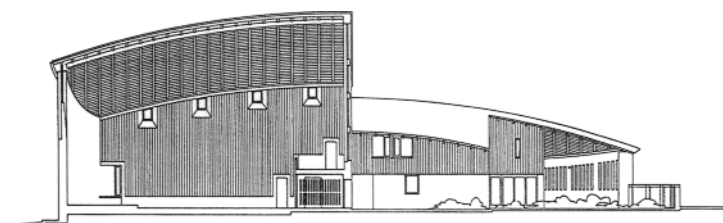
The distinctive spatial qualities of the chapel, which is particularly popular for Christian marriage ceremonies, are not so much determined by its straightfor-



Northwest elevation



Southeast elevation



Longitudinal section looking southeast



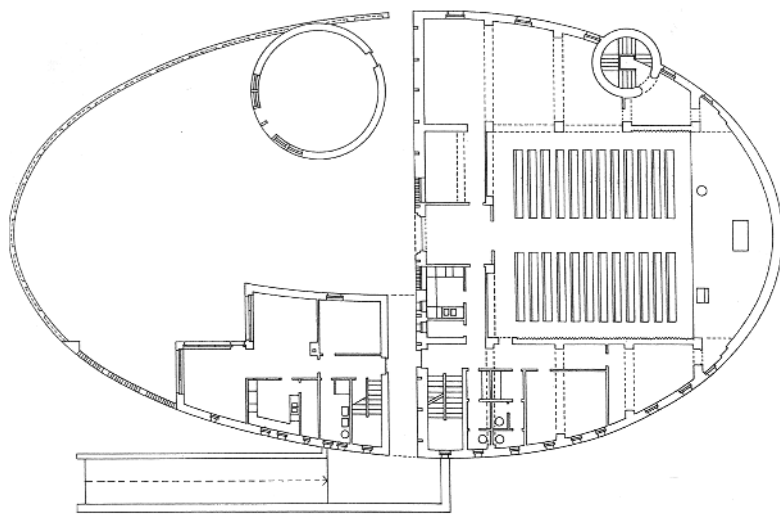
Dunaújváros Church

Dunaújváros, Hungary

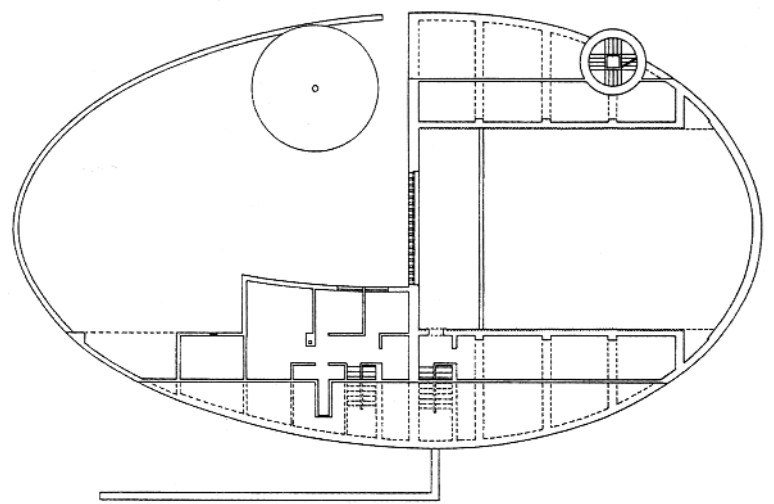
Architect	Tamás Nagy
Client	Dunaújváros Lutheran-Protestant Church Parish
Completion	1996
Denomination	Lutheran-Protestant
Floor area	Hall ca. 175 m ²
Seating capacity	ca. 300

Like an island or a fortress, the church stands in a green field, on the outskirts of an industrial city erected in the 1950s. Its neighbours include both small houses and the huge centre-less residential blocks and slab buildings that were typical in socialist states at that time.

The plan is a not quite perfect ellipse, a 50 metre long oval, divided in the middle. The slightly larger half to the southwest is only partly built over, the slightly smaller half in the northeast fully built on. In spite of its closed character, several buildings peel out of the complex. The church with its steep pitched roof has a collection of smaller extensions to the northwest and southeast, a parish hall with a 25 metre high pointed



Ground floor plan



Upper floor plan



View from the northeast | View from the southwest | Main church looking towards the north corner, daylight entering from the full-height window in the southwest | View of the pointed tower from below

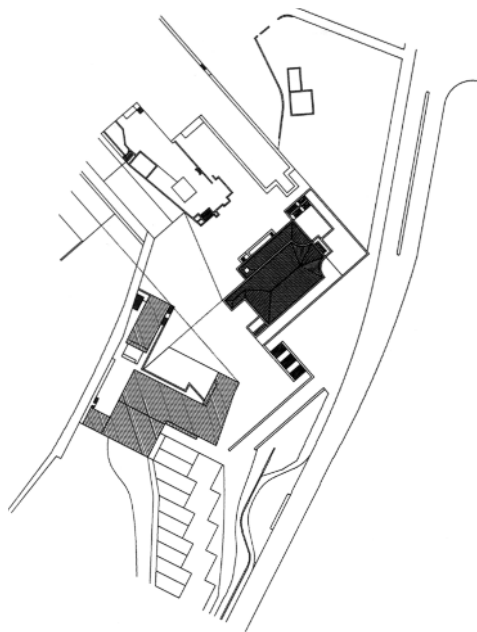
tower on one side and the sacristy on the other and the pastor's residence in front of the broad gable wall. In the half-oval of the courtyard, the roof curves and continues on to form a useful and shady canopy. On the opposite side, there is a round play-house for children.

The church, the front part of which is enclosed by a two metre high perforated masonry wall, follows the typical 18th-century tradition, when Hungarian Protestant churches were not permitted to have their entrances facing the street. Here, too, therefore, one enters, as it were furtively, from the side, whether from the northwest or the southeast. The two scarcely visible passages – the one between the offices and the pastor's residence is even covered – lead initially into the

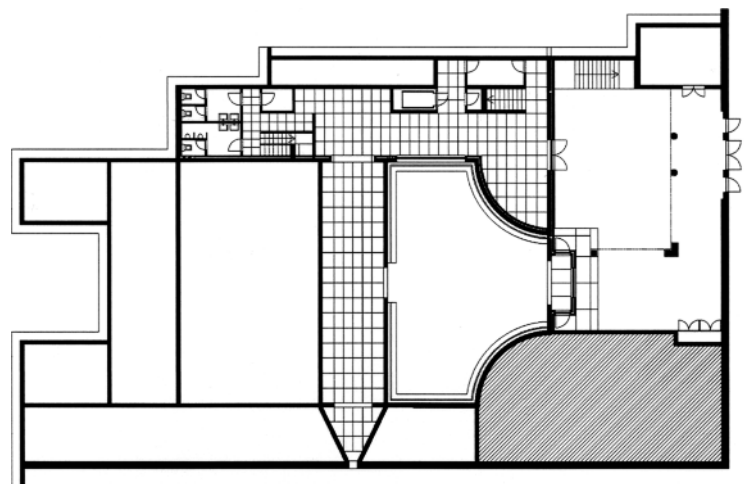
courtyard. Only from there does one reach the doors to the church.

In general, the building is axial and symmetrical in conception, constructed of brick laid to English bond. A broad strip reaching from ground to apex marks the middle of the wall next to and over the entrance. On account of its partly horizontal and partly vertical lines, this element is similar to a Gothic west window with its fine tracery, but in a typically 20th-century reduced and abstract version. The pews are arranged in a 12-by-12-metre square. The central aisle is emphasised by four chandeliers. The rear wall behind the altar and pulpit is rendered in white; all other surfaces are red like the stone or brown like the wood.

The whole complex is extremely homogenous. This impression is created by the enclosure of the ensemble, by the fusion of its elements, by the curved forms of the various buildings, by the vaulting of the individual roofs and, finally, by the almost exclusive use of red brick and pinewood. The Protestant Church in Dunaujváros is also an example of organic architecture in the Hungarian tradition. Nevertheless the building avoids – clearly to its advantage – expressive, not to say excessive symbolism and curvature.



Site plan



Lower floor plan with funeral chapel



View from the southwest, to the left the "tower" with the baptistry, to the right the "tower" with the weekday entrance and belfry | View from the east, plinth clad in granite, to the right the entrance to the lobby of the funeral chapel



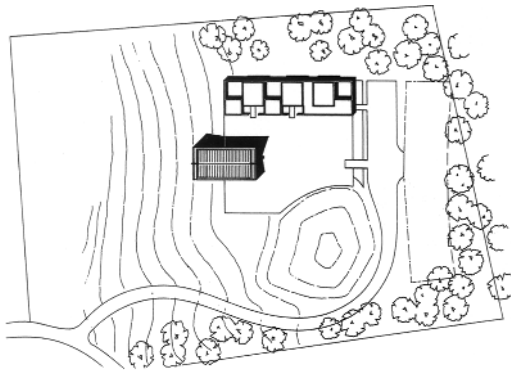
Santa Maria Church

Marco de Canaveses, Portugal

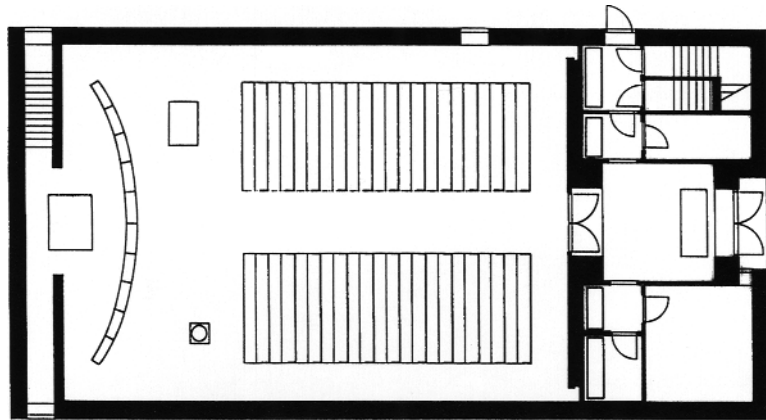
Architect	Alvaro Siza
Client	Fornos Catholic Church Parish
Completion	1996
Denomination	Roman-Catholic
Footprint	1184 m ²
Seating capacity	400

Many old churches in Portugal maintain their distance from their surroundings behind retaining walls, flights of steps and forecourts. This same strategy has been adopted for the Santa Maria Church in Marco de Canaveses. Making use of the sloping site, the building stands on a 4 metre high plateau. Together with rooms for the parish and the priest's residence, the church will form an "acropolis" that turns its back on the noisy road, presenting a closed façade to the northeast and southeast and opening out gradually towards the northwest and southwest.

Those approaching from below must first walk around the elevated forecourt behind the retaining wall and the entrance to the funeral chapel on the right and pro-



Site plan



Floor plan



View of the church and ancillary buildings from the southeast | View from the west | Kneeling rest and altar, behind them the backlit wall niche | The stringent processional arrangement of the church is even reflected in the material joins

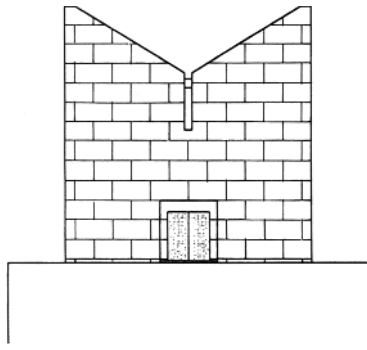


Enghøj Church

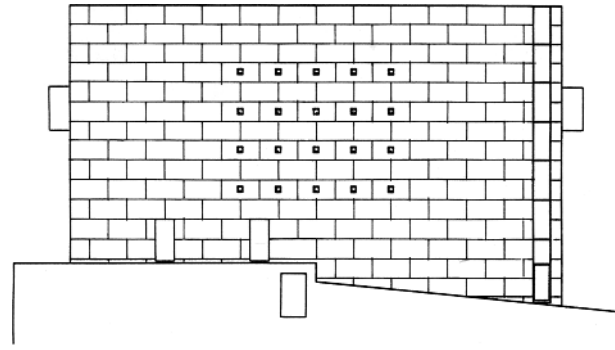
Randers, Denmark

Architects	Henning Larsen, Niels Fuglsang
Client	Building committee of the Parish Church Councils of Borup and Sankt
Completion	1994
Denomination	Lutheran-Protestant
Footprint	Church ca. 338 m ²
Seating capacity	170

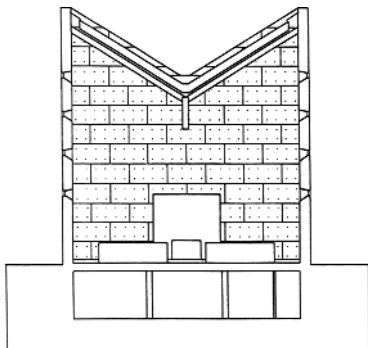
Although part of a new estate, the church appears to stand alone in the landscape. The building is concealed and enveloped by greenery, such as one only otherwise sees in castles set in open landscape. The complex stands on a hill. The plateau is square in form and enclosed by a wall. This enclosure is, however, both defined and compromised by three objects: on the north side a low elongated building; on the south side a hump presses into the square; on the west side the church projects from the square. Only the side to the east remains free for the entrance. The larger and taller building serves as the church, the smaller lower one for other functions. There is no tower. Instead a bell hangs at one end of the low building, which from the courtyard looks like a row of almost identical houses.



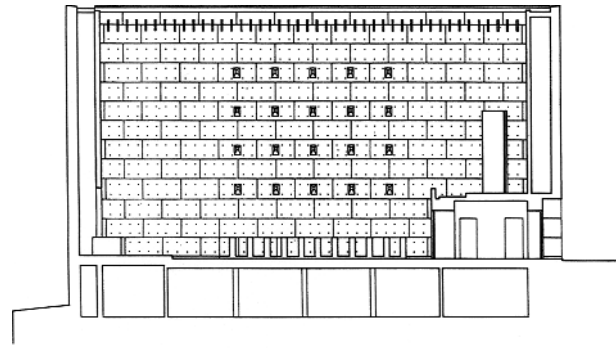
East elevation



North elevation



Cross section looking towards the altar and wall opening



Longitudinal section, on the right the vestibule and the gallery with organ



With a width of 13 metres, depth of 26 metres and height of 13.2 metres at the portal side in the east and 15.5 metres at the altar side in the west, the church has the dimensions of two cubes. When the weather is good, the block made of in situ concrete with white marble aggregate has an exceptionally radiant appearance. The roof is particularly impressive. As with the Viborgvej Crematorium in Århus, built in 1967, the architect has designed the roof as a deep V-shaped incision.

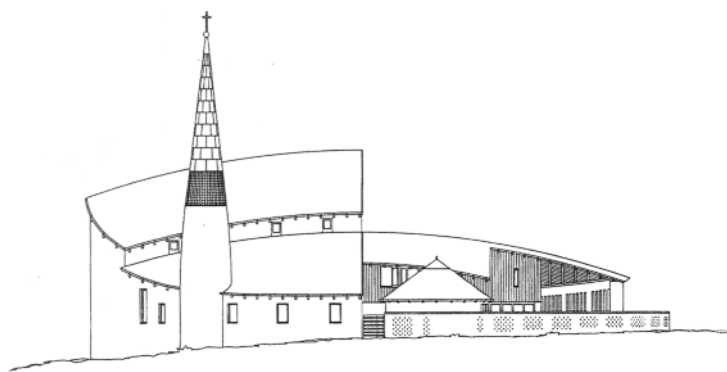
Though the building has a closed appearance from the outside, the inside is surprisingly light. Daylight streams into the space in from the side walls, on the one hand through each of the 20 regularly spaced "slits", on the other through slots left between the

walls and roof. The rear wall is articulated as two leaves. Without the visitor realising it, full-height bands of clear glass have been inserted between the inner and outer leaves. In this way, the opening behind the altar – which also provides access to the sacristy in the basement – forms an element of rare brightness.

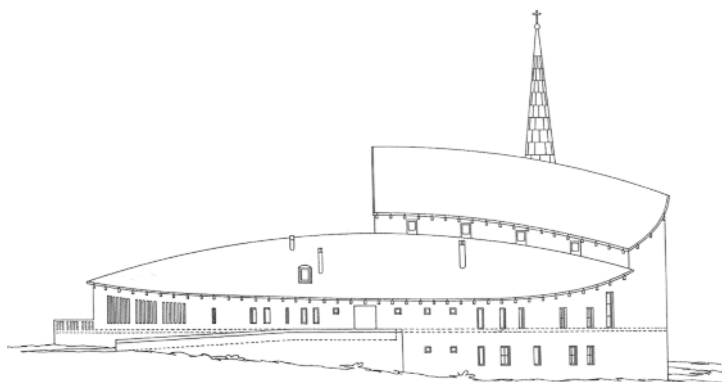
The church in Enghøj is of the processional type. Its axial symmetry, particularly the aisle leading from the portal to the altar, is emphasised by the details: for example by the roof, the rafters of which are like the hull of a ship and its beam like the keel. This 1.6 metre deep laminated beam runs down the centre of the space along its entire length, even projecting a little on the outside at both ends. Likewise, the joints in the concrete of the

floor align exactly with the cross behind the altar.

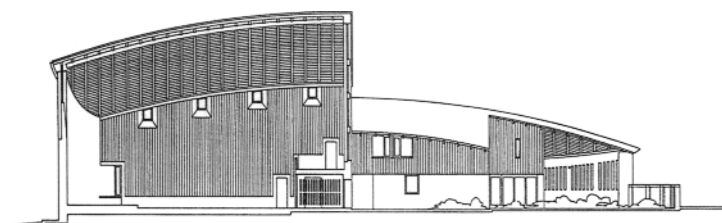
The architecture is entirely orthogonal except for the angle of the roof and the kneeling rest in front of the altar. Its gentle curvature in the direction of the altar table helps believers to visualise the Communion. The contrast between the black wooden pews and black granite altar and the white walls and white floor is also stark. In front of the pastor wearing his black cassock, the rear wall appears to open, becoming the brightest point in the entire building. One can be quite certain: the church at Enghøj wants to show the way to the light.



Northwest elevation



Southeast elevation



Longitudinal section looking southeast



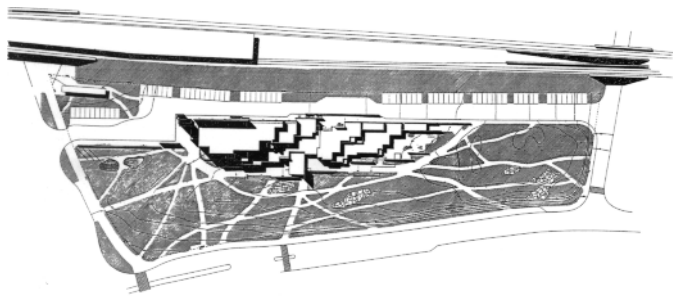
Dunaújváros Church

Dunaújváros, Hungary

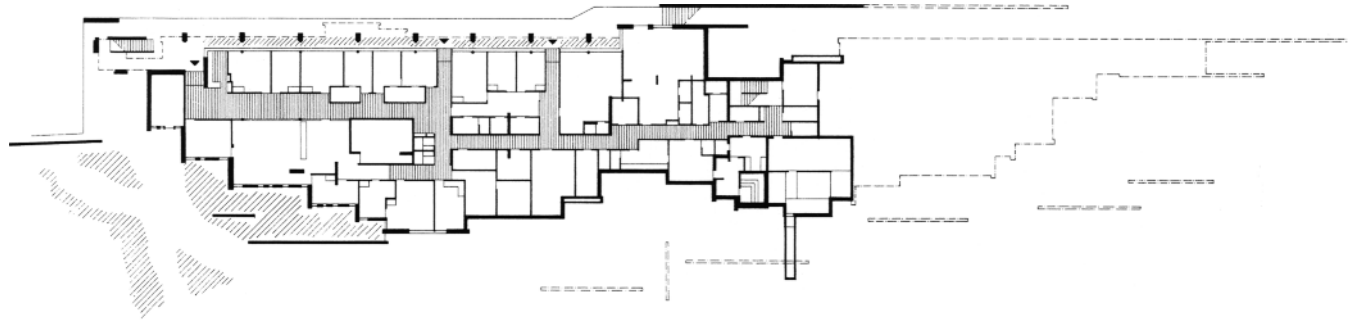
Architect	Tamás Nagy
Client	Dunaújváros Lutheran-Protestant Church Parish
Completion	1996
Denomination	Lutheran-Protestant
Floor area	Hall ca. 175 m ²
Seating capacity	ca. 300

Like an island or a fortress, the church stands in a green field, on the outskirts of an industrial city erected in the 1950s. Its neighbours include both small houses and the huge centre-less residential blocks and slab buildings that were typical in socialist states at that time.

The plan is a not quite perfect ellipse, a 50 metre long oval, divided in the middle. The slightly larger half to the southwest is only partly built over, the slightly smaller half in the northeast fully built on. In spite of its closed character, several buildings peel out of the complex. The church with its steep pitched roof has a collection of smaller extensions to the northwest and southeast, a parish hall with a 25 metre high pointed



Site plan



Lower floor plan



View of the church from the north showing the many projecting brickwork planes | View of the church from Louhela railway station | West wall stepping upwards from north to south culminating in the tower | The freestanding vertical slab of the tower, on the right the church with its south-facing sidelight and east-facing skylight



Myyrmäki Church

Vantaa, Finland

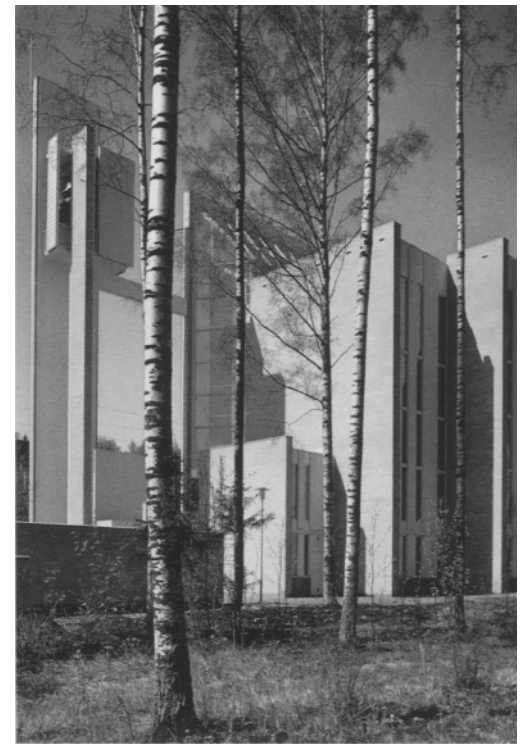
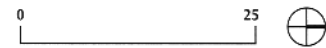
Architect	Juha Leiviskä
Client	Vantaa Church Parish Council
Completion	1984
Denomination	Lutheran-Protestant
Seating capacity	ca. 450

Commuters travelling to and from Helsinki pass by the church on not one but two sides of it, to the east by road, on the west by train. Twelve trains stop at Louhela station per hour every working day of the week. Traffic roars past from dawn until dusk. Certainly not an ideal location for a church. Nevertheless, the building rises to the challenge and acquits itself admirably. Its narrow, elongated shape turns its back on the railway embankment and shows its face to the park, adapting to fit the complex urban context and making a virtue out of a difficult situation.

The term elongated does not adequately describe the almost excessive extent of this building. The church has a total length of 116.6 metres and a maximum



Ground floor plan



breadth of only 28.8 metres, a ratio of approximately 4:1. The complex consists of four buildings, the three buildings to the north providing parish facilities for children, young people and the elderly, the southernmost building for the church itself. The four buildings are, however, almost inseparable in their structure. Whilst the yellowish brickwork, laid exclusively in stretcher-bond, underlines the static rootedness of the building, the stepped, staggered ascent of the building's form from north to south establishes a crescendo that reaches its climax with the 28.5 metre tall slab of the church tower.

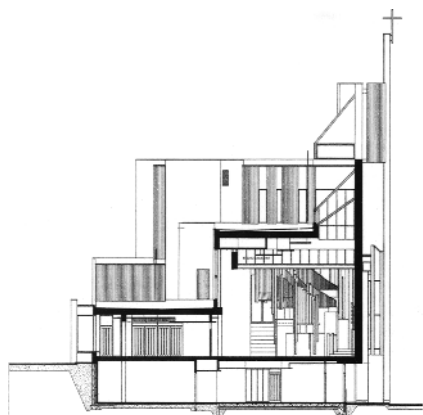
The church has a total of seven entrances. Those arriving from the north are led through a weave of small

passageways past the parish facilities to the entrance of the church. Arriving from the "foyer", the 12.5 metre high church hall appears light and airy. The white pews are arranged mostly on the east side, with a few further pews to the north. The free aisle to the altar is short and the space around the altar is like a stage without any depth. The high rear wall, the backbone of the entire building, is most apparent whilst the north and south sides – despite the free view to the organ and musician's platform – attract less attention. The acoustics of the church are reputedly so good that it is also often used for classical concerts.

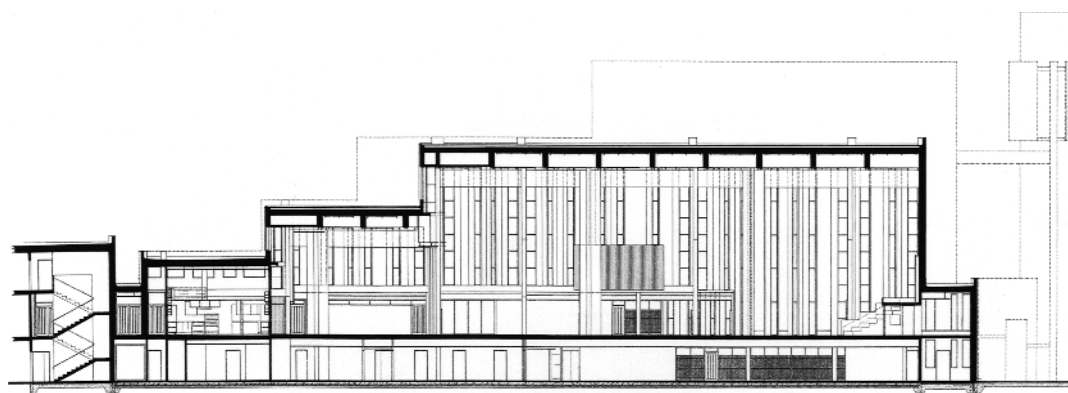
Several critics have pointed out a relationship between the church at Myyrmäki and the oeuvre of Theo van

Doesburg and Gerrit Rietveld. The neoplasticism of the two Dutchmen emphasises the planar qualities of wall and surface rather than the volume as a whole. In this respect, the church in Vantaa does follow in the footsteps of De Stijl. The extent to which the theme of the wall slab dominates the building can be seen by the frequency with which walls project beyond or above the extents of spaces, and the degree to which free-standing planes extend northwards or southwards into the site. If one calculates all these additional projections and adds them to the length of the building, the length of the complex totals 180.6 metres.

In the interior too, walls stand next to and behind other walls, all smoothly plastered and painted white.



Cross section through the ancillary spaces



Longitudinal section looking east



The main and east façade of the building showing the similar linearity of the strips of wall and the tree trunks | View westwards towards the altar and ambo | View northwards with the corridor to the rest of the church | View south towards the organ and platform for the musicians, on the left the main entrance

some vertically ridged, separated into tall strips, layered or staggered. The striped, translucent and coloured textiles by Kristiina Nyrhinen, which hang like banners or flags from the flat ceiling, are not simply decoration but constitute an integral interpretative element of the architecture, placed with a rhythmic musicality not unlike that of canon and fugue.

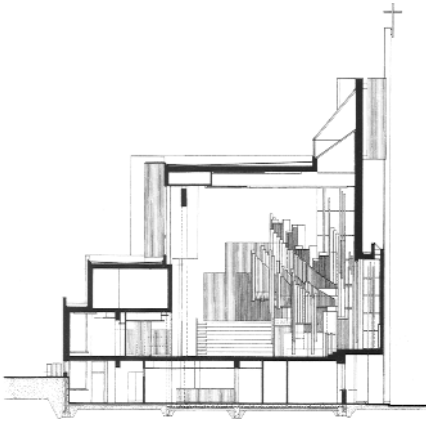
Particular attention should be given to the use of light in the building. Firstly, since the early Gothic period, the representation of godliness in Christianity has been connected with the relationship of light and space; secondly, in northern climes – where in summer night never falls and in winter day never breaks – light is a phenomenon with extremes. For 20th-century

Finnish architects, the maximisation of daylight is one of the most important design criteria.

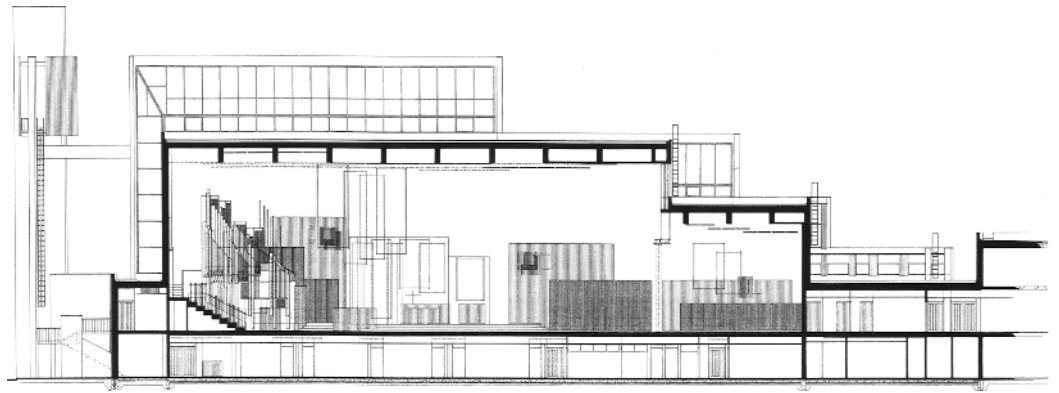
The church at Vantaa owes its radiant, almost baroque luminosity to light from the east and south and to a lesser degree from the west and north: from the east via full-height strips of glass, and from the south and east via wide, diagonally projecting roof and side lights that join at the corners. The building itself is a scaffold for light to pervade. Light never stays, it comes and goes. Early in the morning, light illuminates the altar, the ambo and rear wall directly; in the afternoon it skirts the same surface but from the other side. The light transforms the edges and corners of the numerous staggered vertical segments of wall into thin

lines that subtly change in tone, blend and disappear as if painted sfumato.

In Finland, the essence of space is not the urban space of the city; it is landscape. It is a cutting through a forest or the banks of a lake that marks spatial experience. The creation of genuinely modern architecture that draws on the landscape is perhaps Alvar Aalto's greatest achievement. The creation of form from nature remains a Finnish trait to this day. The Myyrmäki Church, despite its urban context, picks up this theme too, alongside that of the wall and of light. Its relationship to nature is, however, not one of form, which has nothing remotely in common with mountains, valleys or tree stumps. Instead it is one of the play of light and



Cross section through the altar zone



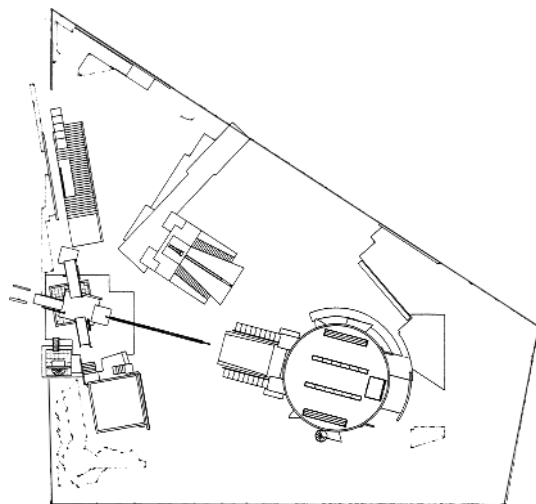
Longitudinal section looking west



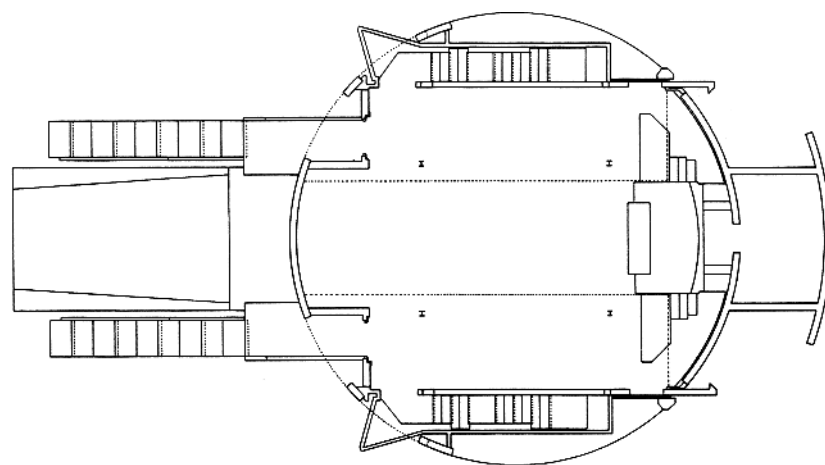
colour, the continual change between matt white and grey, mixed and laced with the blue and green of the strips of fabric to the left and right of the altar. Strong colours are nowhere to be seen, only the freshness of a winter morning.

The church next to the rail embankment of Louhela station is not the only sacred building the architects have created. Similarly illustrious are St Thomas' Church in Oulu from 1975 and St John's Church in Kuopio from 1992. All three buildings employ the same restricted, or rather concentrated, vocabulary. All three buildings are characterised by staggered or stepped walls, the use of red or yellow brickwork outside, white plaster inside, the inrush of bright light

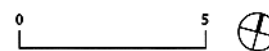
through the use of sharply sloping or diagonal skylights and sidelights, and the gentle play of light on soft colours. Those fortunate enough to have experienced all three buildings will be aware of how the architectural language has matured from one church to the next. Of these, the complexity of built form and intensity of the feeling of space is most pronounced in the Myymäki Church. It is not without reason that the British architect Colin St John Wilson remarked on the "trance-like experience of spiritual exultation" felt in the church.



Site plan



Plan of church, lower level



View of the cylindrical church looking towards the front face | View of the four buildings from the west, in the background left the pyramid of the chapel | View of the church from the north, to the right two of the four entrances, left the external staircase from the upper gallery to the roof | View towards the altar zone of the church, to the left and right the four galleries

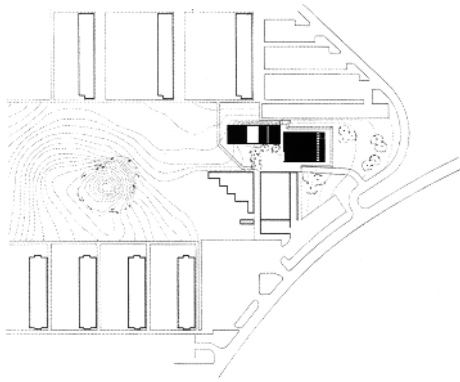


Church and Chapel in Parque de San Francisco

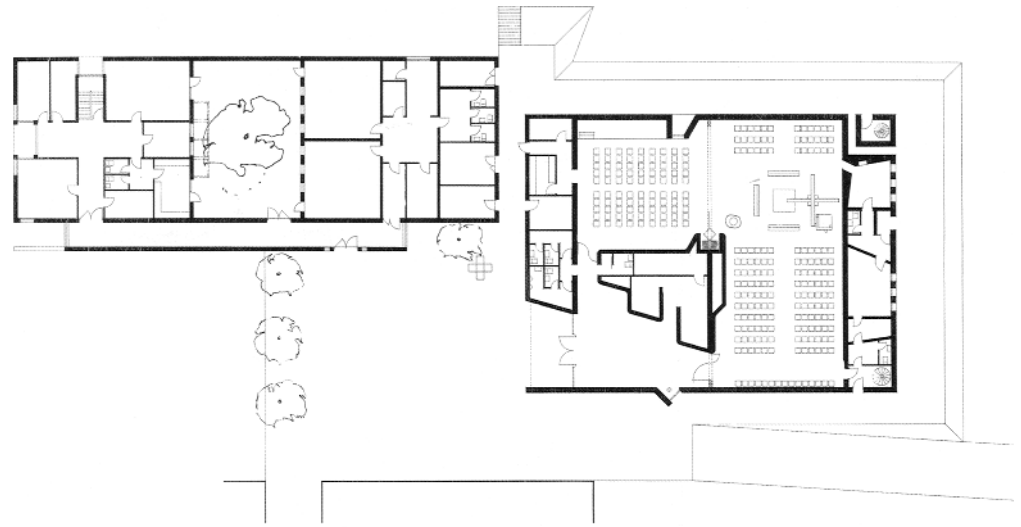
Almazán, Soria, Spain

Architect	Francisco Javier Bellosillo Amunátegui
Client	Diocese of Osma Soria
Completion	1987
Denomination	Roman-Catholic
Footprint	Church 113.04 m ² , chapel 70 m ²
Seating capacity	Church ca. 200, upper level ca. 100, chapel 70

Almazán is a small community of only 5800 inhabitants located in the Castilian highlands some 30 kilometres south of Soria. The Parque de San Francisco lies to the east of the centre of Almazán, next to a north-south road that separates the periphery from the centre. The level site has an elongated pentagonal form that grows progressively narrower towards the rear. Covered largely with lawn and a few spindly conifers, the Parque is bounded on the north by a row of newly-built white houses, to the south by a similar row of brown houses. In the midst of its urban surroundings, the Parque is so large that it appears like a desolate area. The bullring built nearby only strengthens the impression of a “barren” area left to progress at its own pace.



Site plan



Plan of the church and ancillary spaces



Forecourt with the metal sculpture of a raven by Erik Heide | View from the southeast

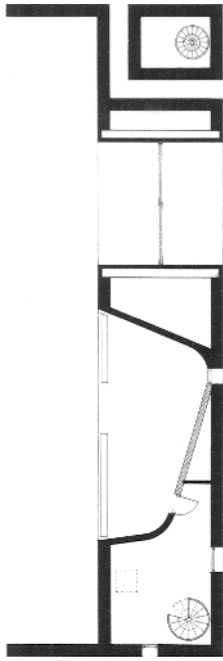


Ravnsbjerg Church

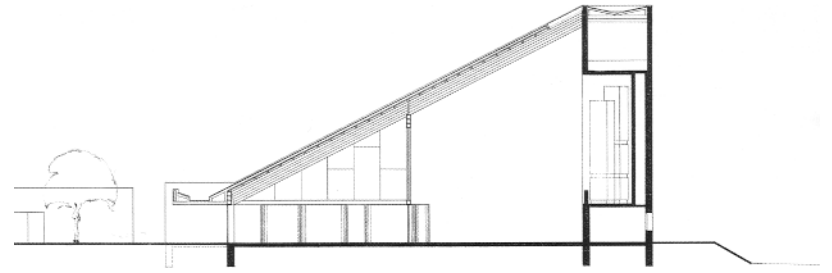
Viby, Denmark

Architects	C. F. Møllers Tegnestue
Client	Viby Parish Church Council
Completion	1976
Denomination	Lutheran-Protestant
Footprint	ca. 1075 m ²
Seating capacity	ca. 170

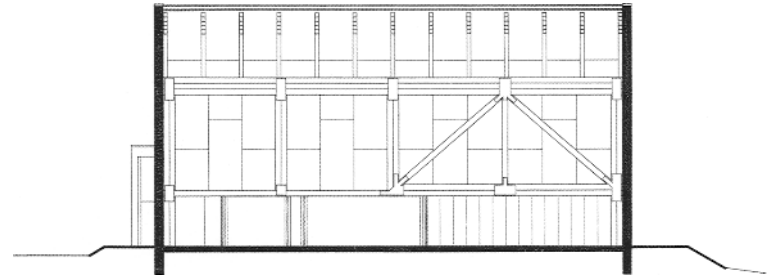
Shopping centre, kindergarten and church are grouped around a rectangular square. The church has a wedge-shaped profile, which rises at an angle of 27 degrees to a height of 16 metres. Not only on this face does the building appear exceptionally closed. What contributes to its solid, heavy character are that the church sits on a plateau with sloping sides and ends; that the tower, though an independent freestanding structure, is only separated from the wedge by two, full height "hollow joints" the width of a door; that the reveal of the circular window creates the impression of very thick walls; that the sometimes reddish, sometimes brownish bricks are generally laid in English bond except for the sills, copings, lintels and around the circular window where they are aligned as soldier courses.



Plan of the series of rooms at the east end at organ gallery level



Longitudinal section



Cross section



Main church space looking north, right the circular window and the organ loft, left the timber framing of the partition | Main church space looking south, left the wooden "Tree of Life" sculpture, right the threshold to the parish hall

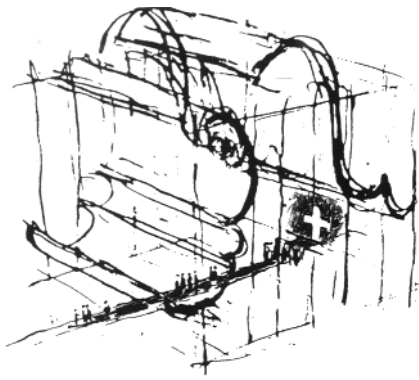
The outward appearance of the building does not disclose that, in principle, this is an example of the rare "corner church" type. The plan shows a clear square form, extended on the west and east sides across the entire width of the church by an area of about a sixth of the square in each case. The length and breadth of the structure are 33 and 25 metres, respectively, a proportion of 4:3. With regard to use, the square is divided into quarters. While the vestibule is arranged in the southwest section and the hall with 90 chairs in the northwest section, the main church occupies the southeast and northeast parts. The narrow series of rooms on the west and east sides accommodate, on the one hand, the kitchen and technical installations, on the other the vestry and the organ loft.

The slope of the roof, covered externally with lead panels, is also a strong element in the interior. All parts of the space are so conceived that, wherever one stands, the greatest possible area of the underside of the monopitch roof with its beams and laths remains visible. Hence the low brickwork of the entrance hall and the framed timber and glass structure, not only over the folding partition between the parish hall and the main church, but also over the stone vestibule's "paravents". Nothing should interrupt the view upwards.

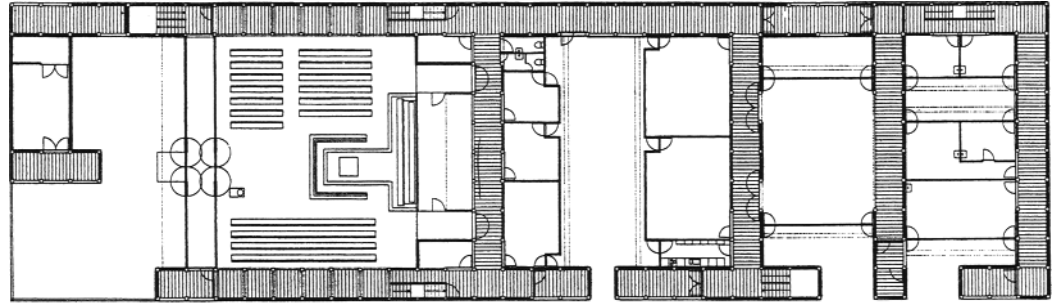
The furnishings of the church by the artist Erik Heide have a powerful presence. All the objects were made from the same Pomeranian pinewood that has been used for the roof and the partition. The altar is a two

by two metre square table. Kneeling rests for Communion surround it on three sides. The posts of the pulpit are decorated with branded symbols of the Evangelists. A dove glides above the 7.2 metre high "Tree of Life". In the morning light the round window glows brightly as if it were the sun. The sunlight shines to the west through the framework, and on into the remaining, less important parts of the building.

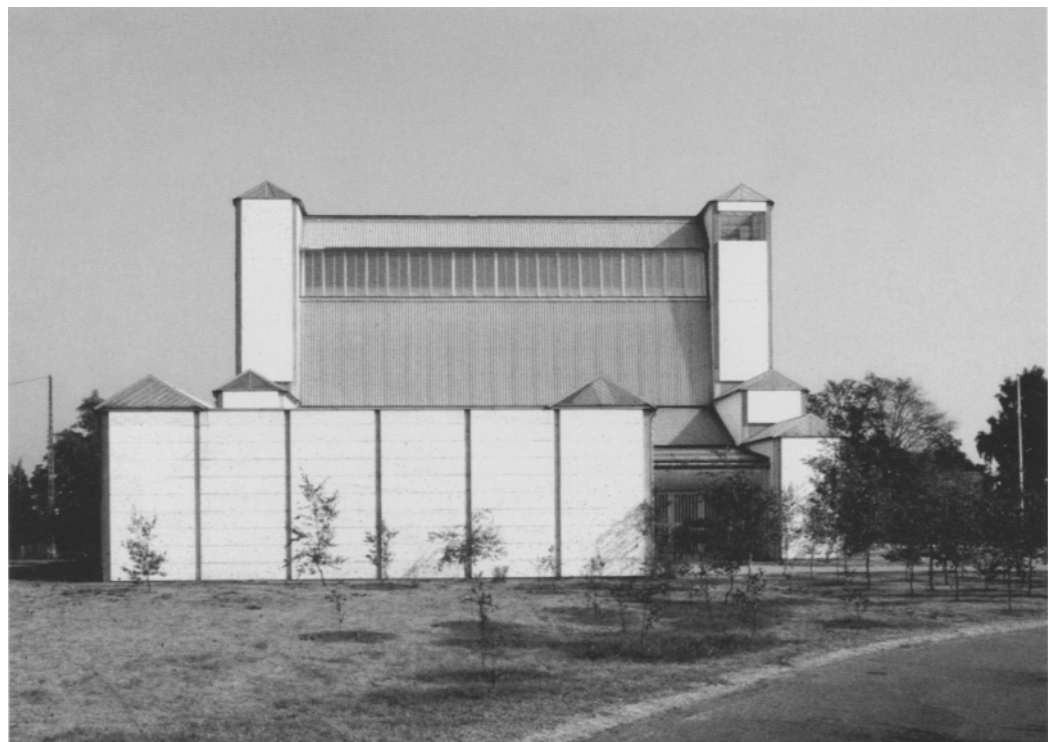
The architects define their buildings as "Romanesque" and "pragmatic". The church is reminiscent, also with regard to its furnishings, of the solidity and massiveness of Romanesque architecture, as well as some of the work of Dominikus Böhm. But above all it calls to mind the Chorale: "A Mighty Fortress Is Our God".



Early sketches of the church space



Floor plan showing the five spatial subdivisions within the framework of the church; the main body of the church still shows the never realised central position of the altar



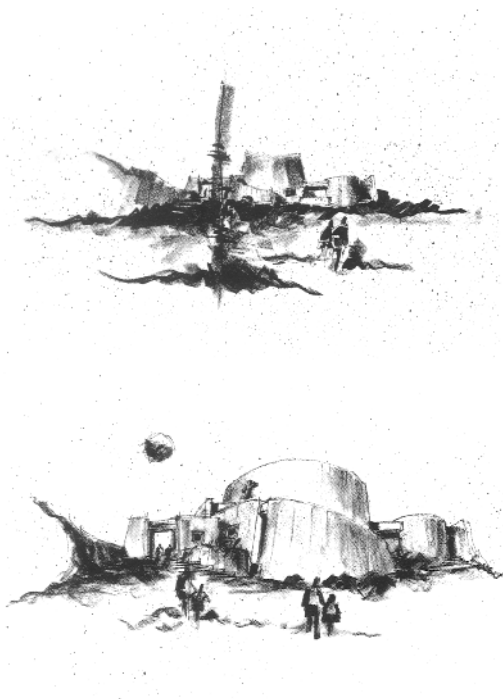
Bagsværd Church

Copenhagen, Denmark

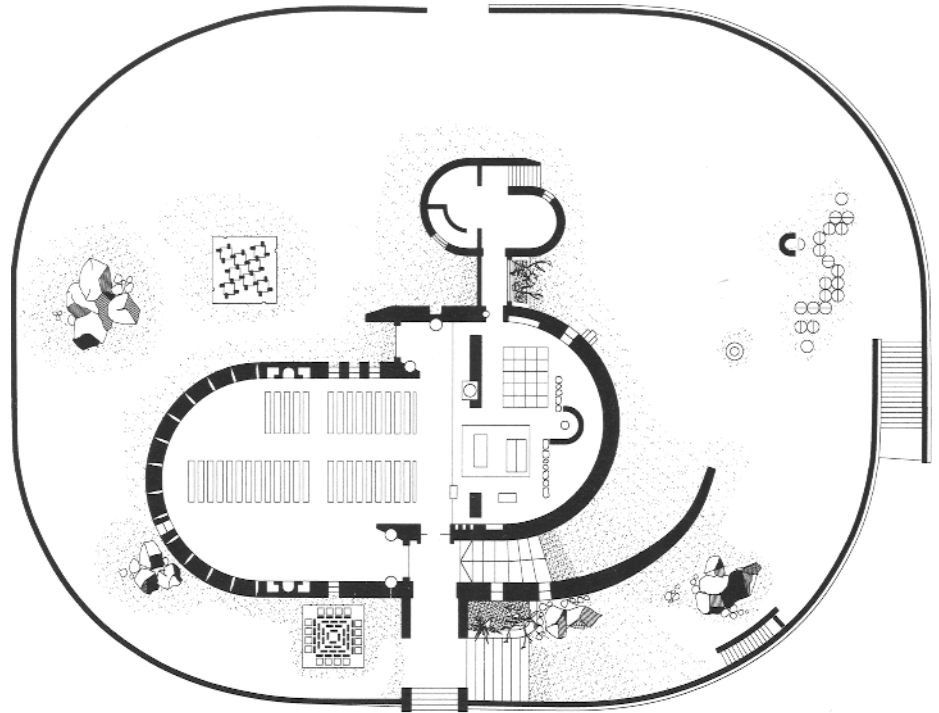
Architect	Jørn Utzon
Client	Bagsværd Parish Church Council
Completion	1976
Denomination	Lutheran-Protestant
Footprint	1742.5 m ²
Seating capacity	ca. 280

Dictated by its position on a main road on the periphery of Copenhagen, this elongated, stepped building seems at first glance ostentatiously introverted. One sees a concrete structure with wide, solid north-south gable walls and long east-west flanks. The roof of the centre structure and the roofs of the structures on either side contrast with one another: the former, oblique surfaces of vertically profiled aluminium and the latter, low pitched surfaces of glass and steel. Large format white tiles cover the upper sections of the external walls; the rising and falling of the exterior loosely corresponds to the line of the vaulted interior.

On a grid of 2.2 by 2.2 metres, there are 36 units along its length and ten across. The building covers an area



Design sketches



Plan of the plateau and church, on the east side the sacristy, to the west the sculpture "City of the Labyrinth", to the north the sculpture "City of Towers", both by Richard England



Site plan | View of the church from the west, with the portico in the centre | Seating and bell tower on the south side of the terrace | View of the altar area, to the left the font

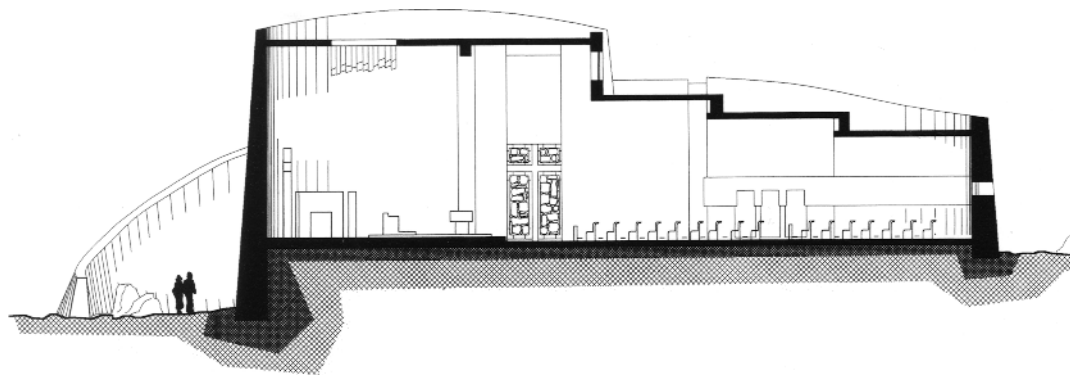


Saint Joseph's Church

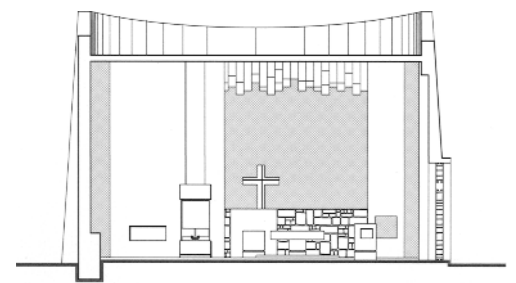
Manikata, Malta

Architect	Richard England
Client	Pastor Manwel Grima
Completion	1974
Denomination	Roman-Catholic
Footprint	ca. 458 m ²
Seating capacity	ca. 140

Even if they do not necessarily reach up high into the sky from the centre, Maltese churches always occupy a prominent position within the precincts of the villages. This is also the case in Manikata, a small village in the far north of the island. Strangely reminiscent of the appearance of a submarine, Saint Joseph's Church seems to float, with its low, rounded, never hard forms, on a hill on the outskirts of the settlement. The yellowish rendered building stands 76 metres above sea level. It is 7.6 metres high and occupies an artificial terrace, which is enclosed by a splayed encircling wall. One enters the 63 metre long plateau via three sets of steps from the south or the west. A few rocks lie on the pebbly ground; two sculptures, some seating and a bell tower invite one to stop and rest.



Longitudinal section looking west



Cross section looking south

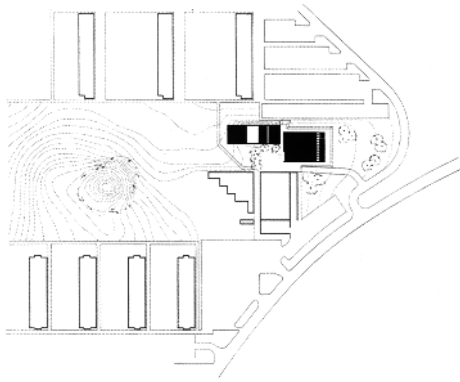


Passing a wall slab and through a portico, visitors are drawn into a passageway that turns to the right, continuing on beyond the wooden door. In the interior of the church the eye is led along the wall and further to the right. The entire progression, a half-circle from inside to outside, leads to its objective, a full view of the altar at the end of the north-south axis between the pews. Not until this moment can one perceive the plan of the building, which is in the form of two figures, each a "U" with extended legs, each like a conch and each 13.5 metres across.

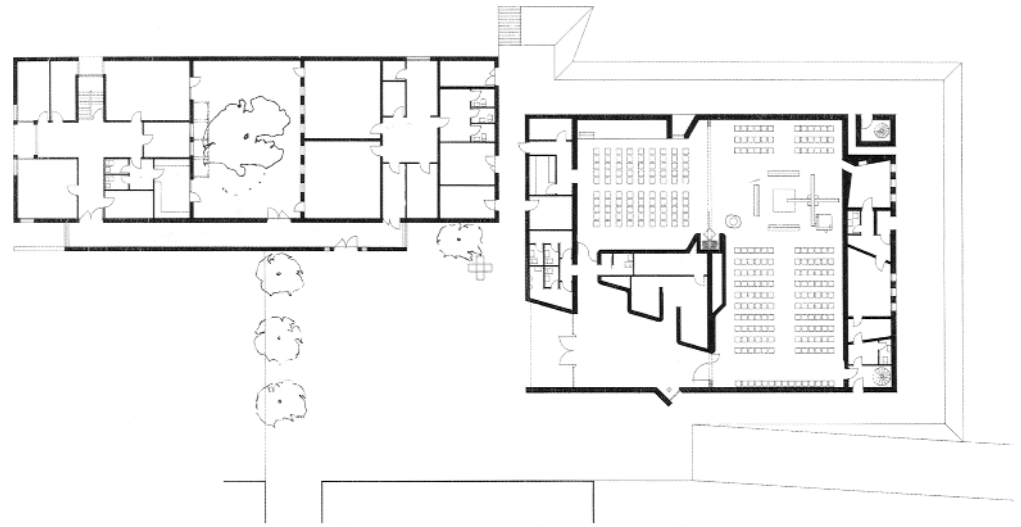
Standing opposite instead of next to one another and moreover arranged slightly offset, the two spaces serve the lay person and the priest, respectively. The wall

behind the hardwood pews, which accommodate 140 people, contains a confessional on its west and east sides. Fourteen abstract sculptures hang within the north curve, signifying Jesus Christ's Way of the Cross. Altar and ambo are made of limestone; fresh water runs into the font. Though only one step up, the presbytery is somewhat theatrical: between the altar table and the rear wall stands the "stage set", a man-high wall of brown rough stone blocks with a white niche for the tabernacle, and stones hang from the concrete ceiling like the fringe of a curtain that is just opening. To provide daylight there are skylights and windows; strips of glass at the junction between the two conches.

Malta's indigenous architecture, displaced for centuries by the numerous foreign rulers of the island, was first rediscovered in the 20th century. For example the ca. 5000 year old temple that was probably dedicated to a mother earth goddess, since its design – a "U" with two opposing chambers – resemble the form of an enormous uterus. Or the "Gima", a low, curved dry-stone structure, which farmers still use today as a shed. Designed at the beginning of the sixties, Saint Joseph's Church makes reference above all to this specifically Maltese cultural identity: an example of "critical regionalism" before the expression was coined.



Site plan



Plan of the church and ancillary spaces



Forecourt with the metal sculpture of a raven by Erik Heide | View from the southeast

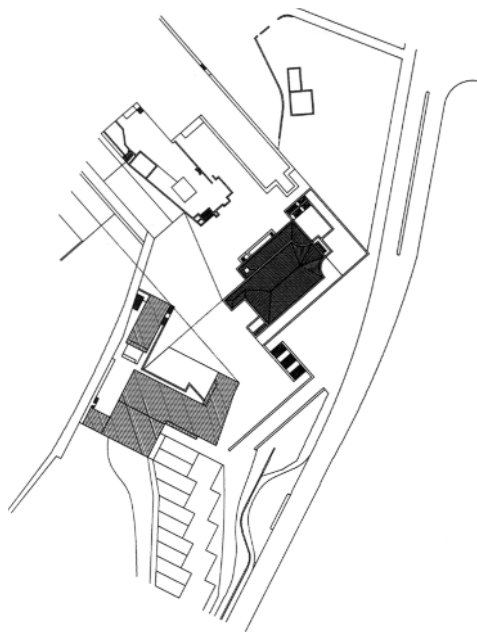


Ravnsbjerg Church

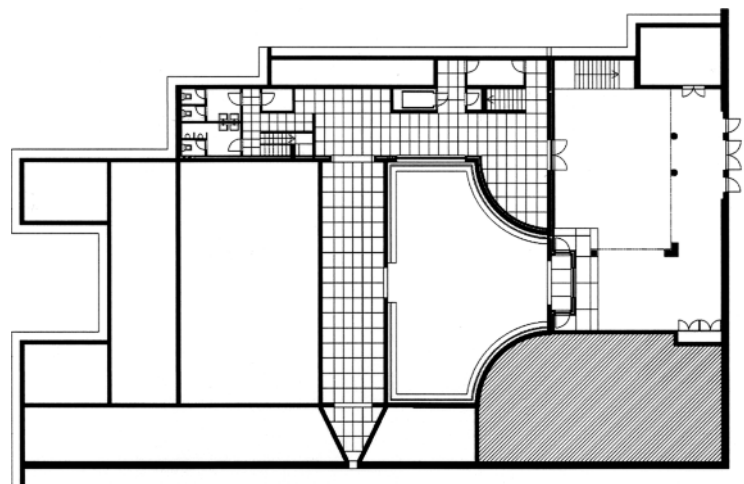
Viby, Denmark

Architects	C. F. Møllers Tegnestue
Client	Viby Parish Church Council
Completion	1976
Denomination	Lutheran-Protestant
Footprint	ca. 1075 m ²
Seating capacity	ca. 170

Shopping centre, kindergarten and church are grouped around a rectangular square. The church has a wedge-shaped profile, which rises at an angle of 27 degrees to a height of 16 metres. Not only on this face does the building appear exceptionally closed. What contributes to its solid, heavy character are that the church sits on a plateau with sloping sides and ends; that the tower, though an independent freestanding structure, is only separated from the wedge by two, full height "hollow joints" the width of a door; that the reveal of the circular window creates the impression of very thick walls; that the sometimes reddish, sometimes brownish bricks are generally laid in English bond except for the sills, copings, lintels and around the circular window where they are aligned as soldier courses.



Site plan



Lower floor plan with funeral chapel



View from the southwest, to the left the "tower" with the baptistry, to the right the "tower" with the weekday entrance and belfry | View from the east, plinth clad in granite, to the right the entrance to the lobby of the funeral chapel



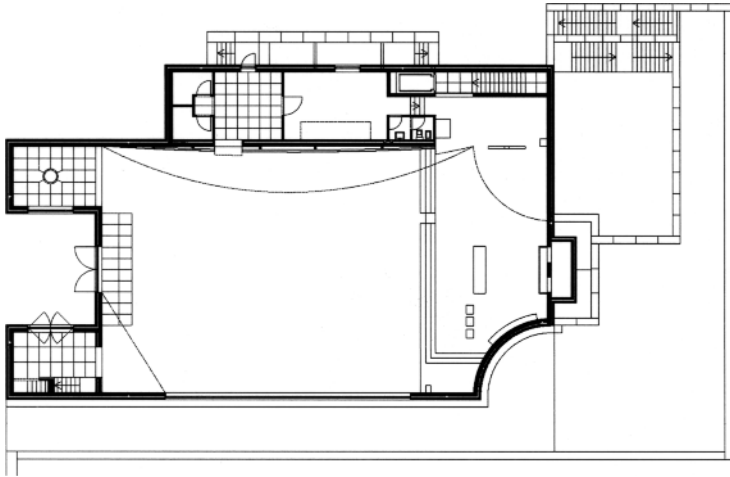
Santa Maria Church

Marco de Canaveses, Portugal

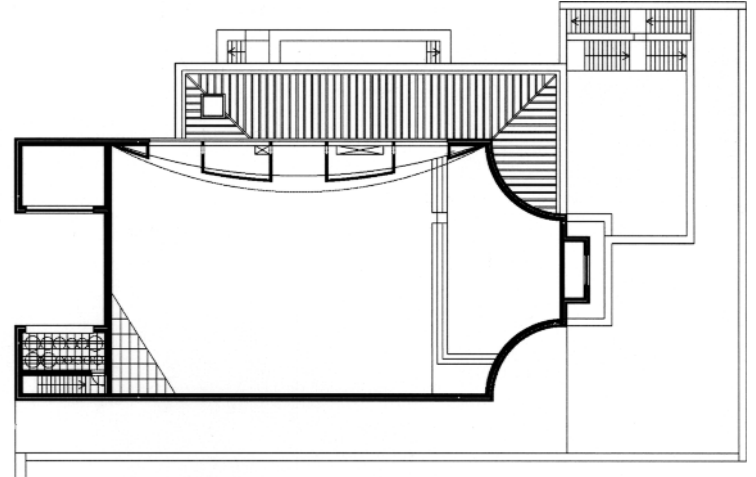
Architect	Alvaro Siza
Client	Fornos Catholic Church Parish
Completion	1996
Denomination	Roman-Catholic
Footprint	1184 m ²
Seating capacity	400

Many old churches in Portugal maintain their distance from their surroundings behind retaining walls, flights of steps and forecourts. This same strategy has been adopted for the Santa Maria Church in Marco de Canaveses. Making use of the sloping site, the building stands on a 4 metre high plateau. Together with rooms for the parish and the priest's residence, the church will form an "acropolis" that turns its back on the noisy road, presenting a closed façade to the northeast and southeast and opening out gradually towards the northwest and southwest.

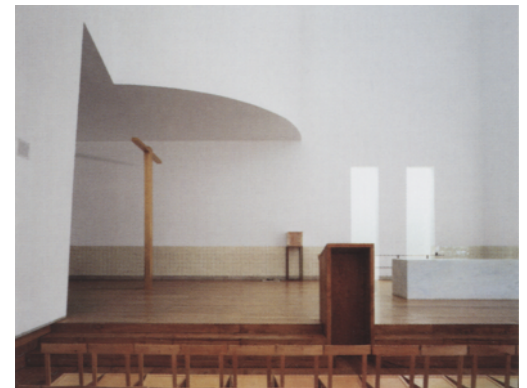
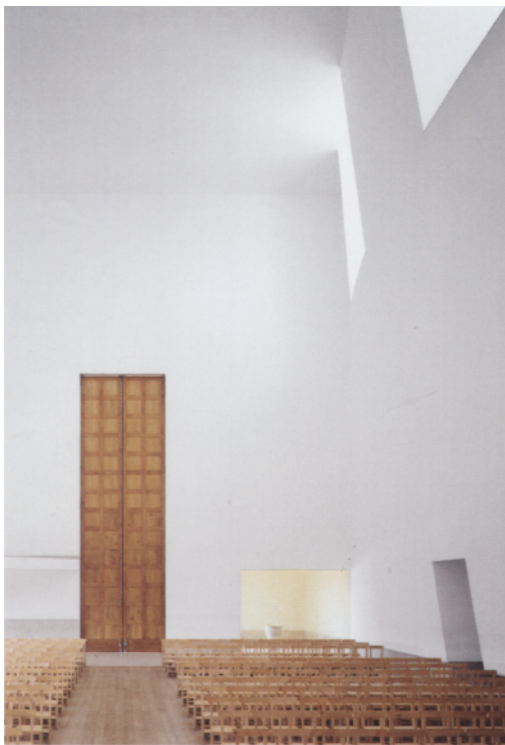
Those approaching from below must first walk around the elevated forecourt behind the retaining wall and the entrance to the funeral chapel on the right and pro-



Middle floor plan with space for the laity, priests and adjacent extension for the sacristy



Upper floor plan with the organ and stair to the belfry



View of the portal, the organ on the left, on the right the font and access to the sacristy | View of the altar | Presbytery with altar, ambo and tabernacle

ceed on across the car park before ascending a flight of stairs that lead one away from the church. Only after turning back on oneself does one reach the front of the building, a perfect square of 17.5 by 17.5 metres. The centre portion is indented, producing the impression of two tall "towers" to the left and right of the entrance portal, which at 3 metres wide and 10 metres high is of truly impressive stature.

In the interior, the lower portion of the walls are covered with Azulejos, the colour of the tiles varying between white and yellow. As one walks up the aisle, the naturally lit interior changes progressively from a static to an animated space. This is to a large extent due to the northwest wall, which bulges inwards increasingly

towards the top. Although its weighty appearance is an illusion evoked by curved plasterboarding within the interior of the church, its curve draws one further into the room towards the marble altar, the brass tabernacle and oak sedilia. Behind the low podium, the rear wall is indented on each side with quarter-cylindrical indentations in the corners which, like convex "apses", provide a hint of three naves.

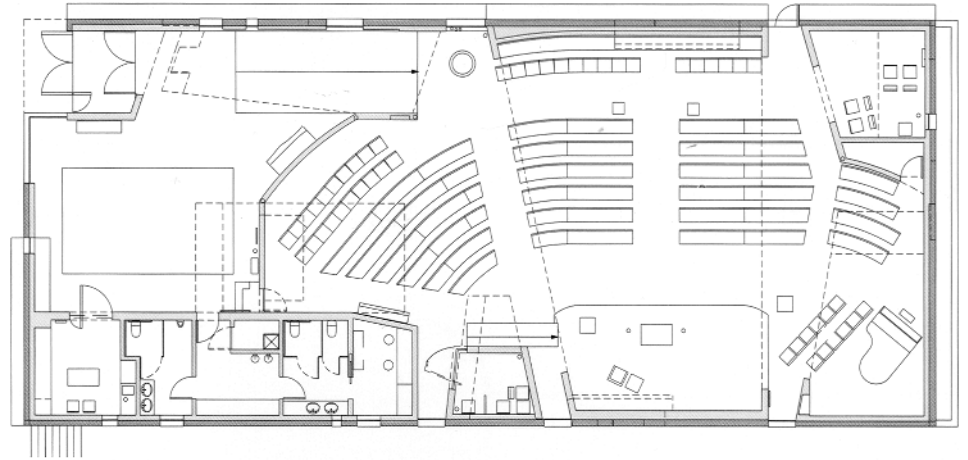
Aside from the few light sources on the southwest side – the huge oak double doors, open only on Sundays, or the font in the left-hand "tower", or the lobby behind the weekday entrance in the right "tower" – there are three points from which light illuminates the interior: firstly, three windows high up in the northwest

wall, secondly a 16 metre long and 50 centimetre wide strip low down in the southeast wall, and, thirdly, two bright upright openings directly behind the altar. The latter are lit by a walled chamber that projects on the outside of the building and also allows lights into the funeral chapel in the floor below beneath the altar.

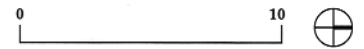
The building's outward appearance is reminiscent of twenties or thirties modernism: clean, smooth, white and light. But unlike so many modernist buildings, it is firmly rooted, standing squarely on its plinth, like a bastion defiant in the face of its surroundings. The architecture of the Santa Maria Church is paradoxical in other respects, too: in one and the same form it is both classical and baroque, stoic but also vigorous.



Site plan



Floor plan



View from the northeast with bell tower in the background | View from the south with reflecting pool in the foreground | Interior view of the church hall, at the back on the right the altar and ambo, on the left the Blessed Sacramental Chapel | View from the "route" to the entrance



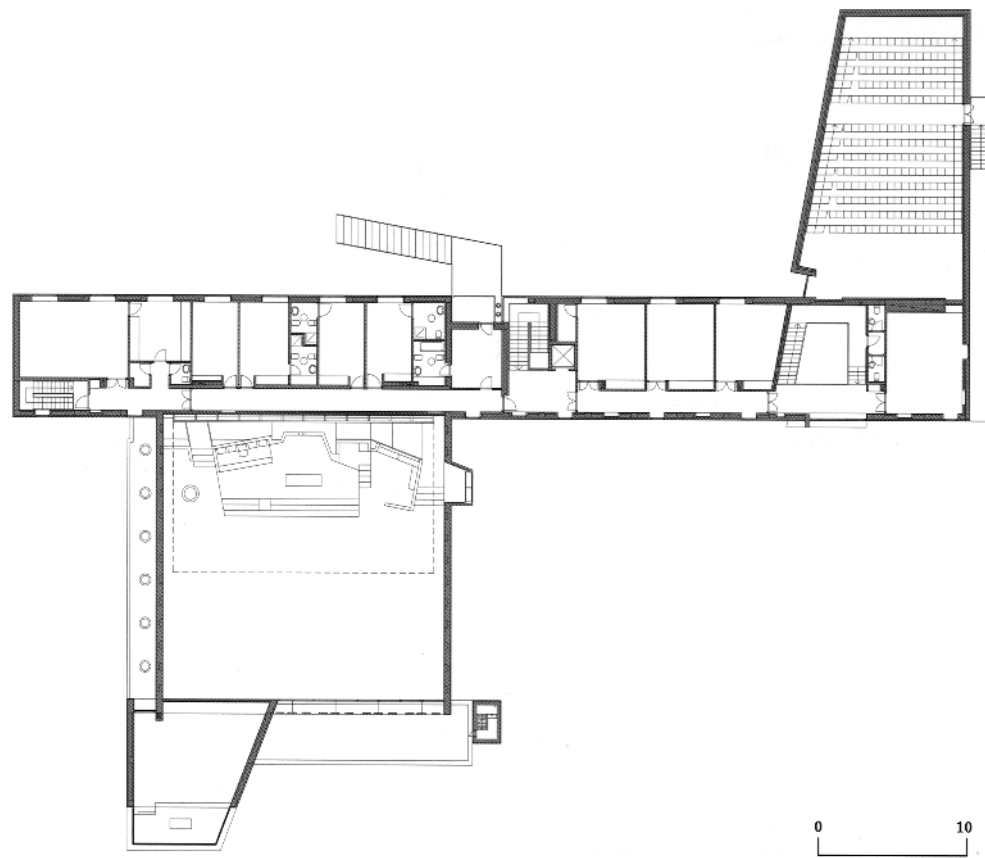
Chapel of St Ignatius

Seattle, Washington, USA

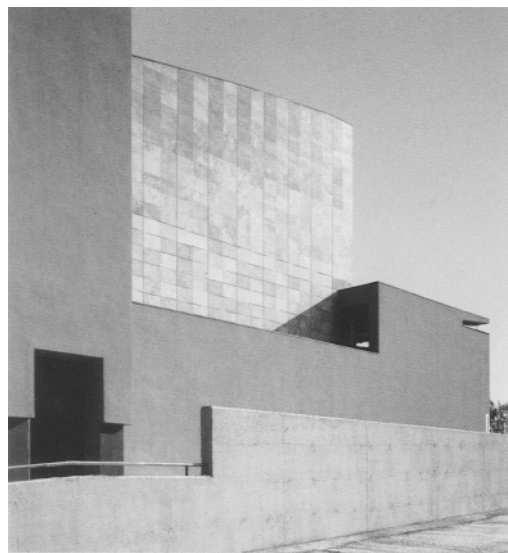
Architect	Steven Holl
Client	Seattle University
Completion	1997
Denomination	Roman-Catholic
Footprint	ca. 565 m ²
Seating capacity	230

The location of the buildings on the campus of the Catholic University of Seattle is determined by the rigid grid pattern of the roads. The chapel sits on a quadrangle in this grid. The orthogonal footprint of the building covers an area of 35.5 by 15.9 metres, its long side pointing exactly east-west, its short side north-south. In front of the building, which one approaches from the south, lie a shallow pool and the bell tower, a high concrete stele that holds aloft the sign of the cross.

The architect has described the volume of the building as "bottles of light in a stone box". The chapel is enclosed by slabs of wall cast on-site. The exterior of the panels has been stained in light ochre and the holes used for craning the panels into place are capped with



Ground floor plan



Northeast view | Southwest view of the main and secondary building, the chapel on the left, the entrance to the auditorium on the right | View of the church from the north, all sacred objects are made of white marble or brushed stainless steel | View of the church from the east, the altar in the foreground, in the background left the two confessional boxes, right the chapel | Chapel with daylight from the west

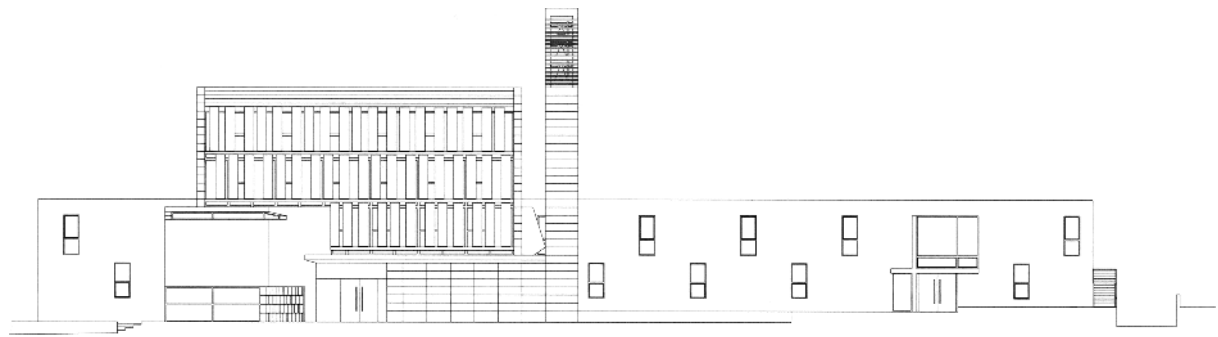


Santa Maria Josefa Church

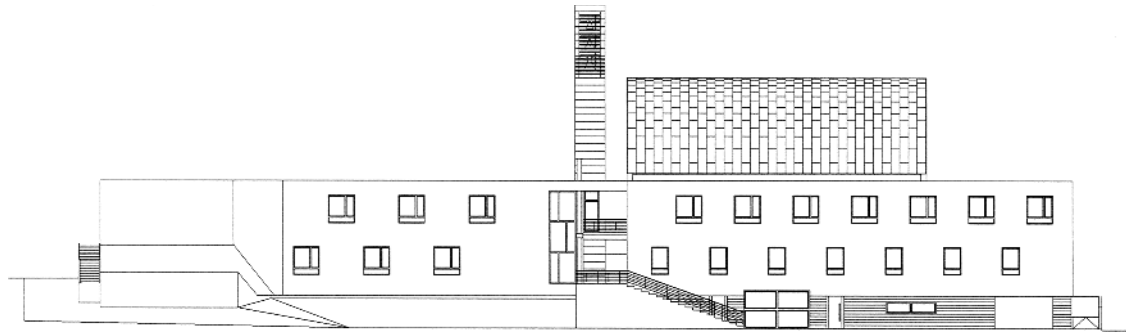
Rome, Italy

Architects	Francesco Garofalo, Sharon Yoshie Miura
Client	Vicar General of the Archdiocese of Rome
Completion	2001
Denomination	Roman-Catholic
Footprint	2100 m ²
Seating capacity	Church 350, chapel 50

The church stands in a new suburb a fair distance south of the centre of Rome, though not far from the Via Prenestina, one of the ancient Roman roads. It is bordered by a planned and approved suburb to the west and a spontaneous suburb to the east. On the slightly sloping site, about 80 by 80 metres overall, a complex of two interlocking buildings has been built. Form, size and colour have been used to clearly denote the function and hierarchy of each building. The auxiliary building has a double-hooked shape, with a long central section and two shorter elements at each end; the main building is box-shaped with a curving roof. The auxiliary building is low and is rendered a deep red colour; the main building – the church hall and bell tower – is high and clad with rough matt-shimmering panels of brownish



Elevation of the front west face, below left the flattened cross in the chapel window



Elevation of rear east face, below right the flattened window cross of the crypt



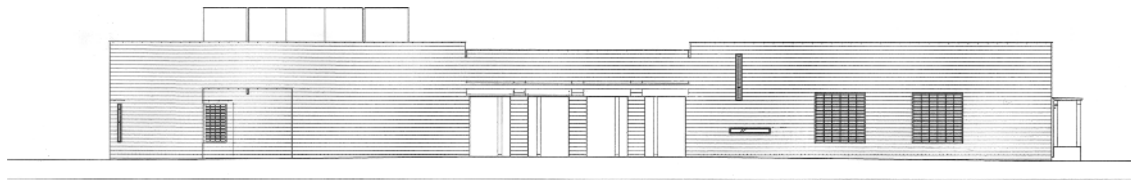
travertine that are reminiscent of dark onyx. The ensemble of volumes is carefully composed and balanced throughout. Strong gestures greet visitors coming from either direction: with a projecting chapel on the north-west side and a cantilevered auditorium to the south-east.

One enters through the door in the centre of the west wall of the main building – a three-storey high, double-skin wall with a plane of rhythmically spaced, tall, thin, and white concrete brise-soleil elements in front of transparent glass – and enters a room of about 20 metres square. The bottom half of the walls to the left and right are clad in cherry wood and plastered pure white above. Rows of lapped timber slats rise from the rear to-

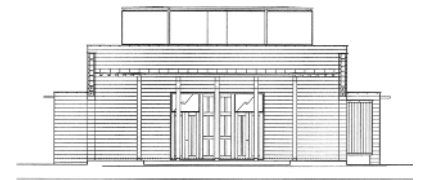
wards the front following the curve of the ceiling, stopping as they reach the middle. The presbytery is placed in front of this arching form. From a liturgical point of view, the arrangement follows the spirit of Catholic tradition. Against the background of the brown-coloured rear wall, the green marble “podium” and green marble “paravent” give the appearance of scenery and horizon on a stage set. Directly behind the zone, a narrow stair leads to the crypt, located in the lower storey of the auxiliary building. The northern section contains the sacristy and the priest’s residence; the southern section contains seminar and work rooms, as well as an auditorium. Its entrance is signified clearly from outside, not just by the double doors and large glass pane facing the staircase, but also by a concrete cross that in-

tersects both the entrance and the glass pane, framing two sides of each and giving them a strong white border. A covered passage passes through the red building on axis with the bell tower and connects the open recreation areas on each side of the building.

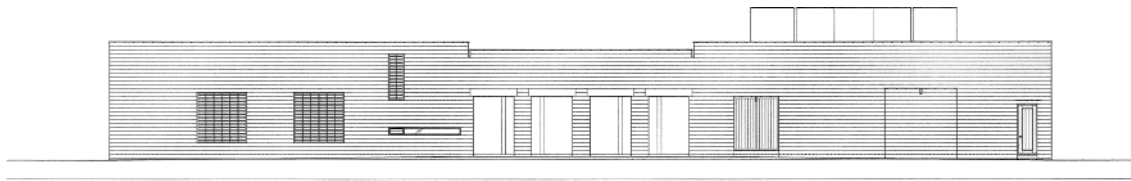
With regard to certain aspects of its design and the use of fine wood and natural stone in its interior, the Santa Maria Josefa Church is similar to some of Alvar Aalto’s churches, but without their dynamic forms. It is probably most comparable with Aalto’s Church of the Holy Ghost in Wolfsburg, Germany, from 1962. Both churches exhibit an arching roof where wall and roof form a single element, and not least a certain resonance, underlined here through the luxurious use of marble.



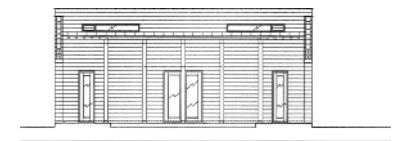
West elevation



Section through courtyard
looking towards church hall



East elevation



Section through courtyard
looking towards parish hall



Four portals open onto the courtyard, on the left the church hall, on the right the parish hall | Entrance to the church from the courtyard, with doors made of pinewood | Central aisle and roof light, behind the altar on the right, the entrance to the sacristy, left the tabernacle | Side aisle on the west side with vertical lighting embedded in the wall, on the right the niche for the font

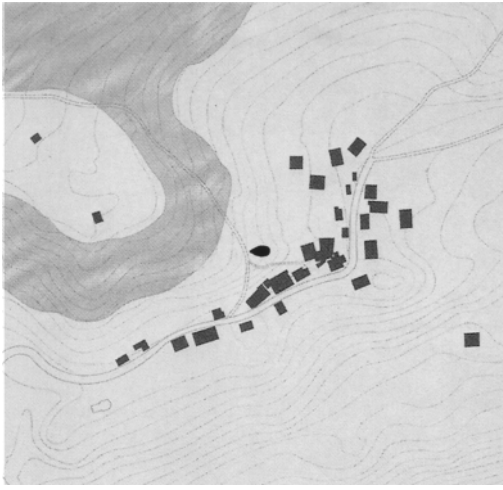


St Clara Church

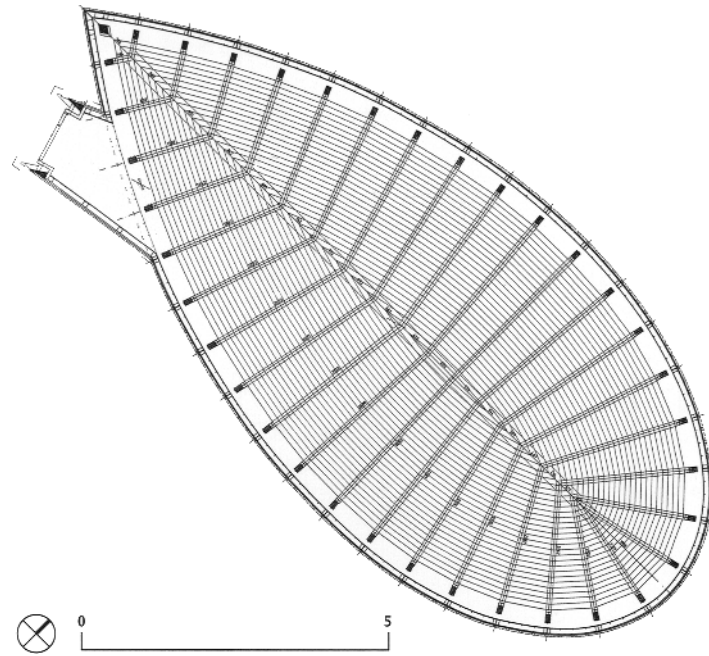
Kongsvinger, Norway

Architects	Henrik Hille, Ervin Strandskogen
Client	Diocese of Oslo
Completion	2001
Denomination	Roman-Catholic
Footprint	Church ca. 195 m ²
Seating capacity	ca. 112

The former fortress town of Kongsvinger lies in south-eastern Norway, close to the border with Sweden. The municipality numbers nearly 18,000 inhabitants and – because the country is largely Protestant – only a very small Catholic following of around 200 persons, mostly immigrants from the Philippines, Vietnam or Poland. Accordingly, the church on the outskirts of Kongsvinger had to be built to a modest budget. However, the building makes a virtue out of its limited resources. Only on two occasions does the church employ what one could loosely term precious materials: thin external light brown sandstone panels for the external cladding and white marble panels for the altar. Arranged with its long sides in an east-west orientation and its narrow sides running north-south, the low,



Site plan, in the centre the half-figure of eight, also known in geometry as a lemniscate, to the west and north the Bann woods, to the south the village



Floor plan showing the position of the purlin, rafters and laths of the roof



North side | south side, with the "ladder" for the bell in front



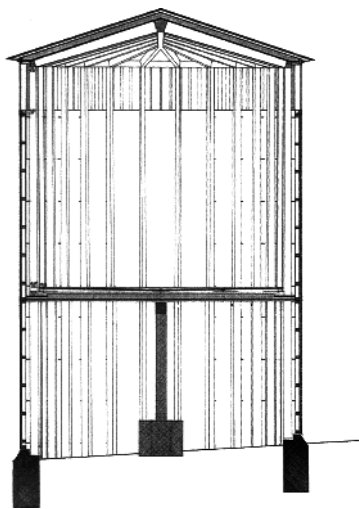
Sogn Benedetg Chapel

Somvix, Switzerland

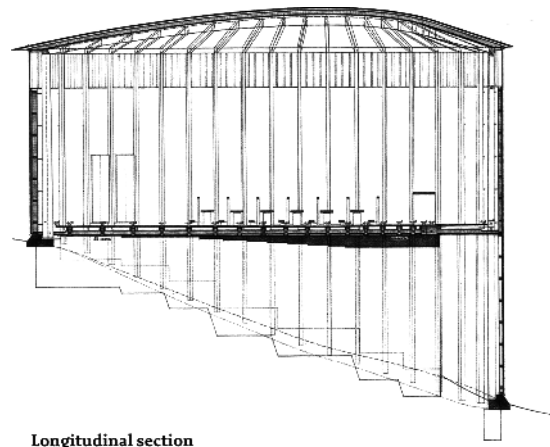
Architect	Peter Zumthor
Client	Disentis Benedictine Monastery
Completion	1988
Denomination	Roman-Catholic
Footprint	67.3 m ²
Seating capacity	ca. 40

More akin to a roadside or pilgrimage chapel than a village church, the height of the building at the entrance is only half of what it is at the bottom. Clad in larch shingles, the exterior is entirely closed except for a band of windows beneath the eaves of the shallow roof that caps the building. Its outward appearance reveals almost nothing of the interior. Not even the faintest undulation of the surface gives away any indication of the floor level within. All the visitor is immediately aware of is the shape of the floor plan, a half-figure of eight.

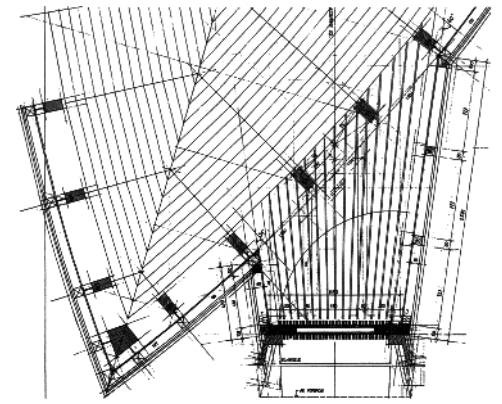
With a length of 13.6 metres, a width of 6.15 metres and a height of 6.2 metres, the interior of the chapel is quite minute, its cross section at its widest point forming a square. The construction is so slender that it is of al-



Cross section



Longitudinal section



Plan of entrance area



Interior looking east, in the centre at the rear the altar | interior looking west, two wall cupboards at the rear

most featherweight lightness yet without the slightest hint of frivolity. Thirty-seven slender columns made of laminated pine together with the arched purlin and the rafters form a skeleton that resembles a fragile baldachin, reaching down to the ground without touching walls or floor.

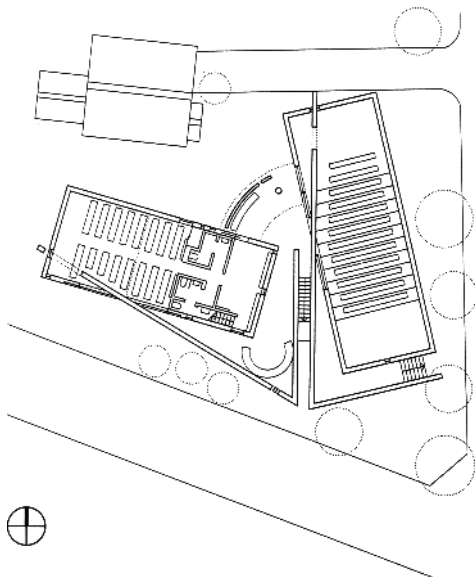
The entrance and main space are separated by a threshold. One steps into a “boat” and takes a seat on one of the benches made of lime wood. One is eye to eye with the altar. The supporting construction for the floor is concealed beneath the floorboards, which all point towards the centroid of the half-figure of eight. The wall, which encloses the room in a single sweep, is primed with chalk and painted in a silver-bronze colour accord-

ing to a design by Jean Pfaff. The result is an abstract panorama, a foggy grey beneath and a foggy white above where the sun shines between the mullions of the windows.

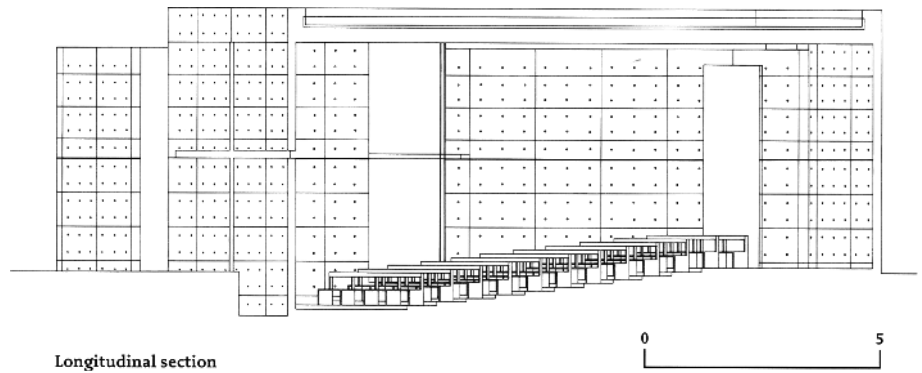
However unique, or even authoritative, the Sogn Benedetg Chapel may seem, it treads in the footsteps of Rudolf Schwarz. The underside of the shallow pitched roof, the fenestration of the window strip, in fact the entire framework exhibits similarities to the St Michael Church in Frankfurt am Main, Germany, and the St Theresia Church in Linz, Austria, where Schwarz attempted to realise his ideal of “building imagery” in stone. That from below the Sogn Benedetg Chapel appears like a tower and from above like a boat; that we

compare it with a droplet, a leaf or a fish; that we step onto its floor as if into the hull of a boat – all these testify to its openness to pictorial interpretation. According to Schwarz, building in images is never mimetic but always analogue. This “memory of the indefinite” should be equally valid for architecture as well as theology.

This chapel is one of the most important examples of late-20th-century sacred architecture in Europe. Along with Tadao Ando’s Chapel of the Light in Ibaraki, Japan (see pp. 96-97), it changed the face of much sacred architecture that followed after 1990.



Site plan, right the chapel, left the Sunday school



Longitudinal section



View from the north | View of the rear wall with the sign of the cross | Full-height glazed section of the west wall with a reflection of the sign of the cross | West side with the long flank of the diagonal wall; just visible on the right, the "vestibule"

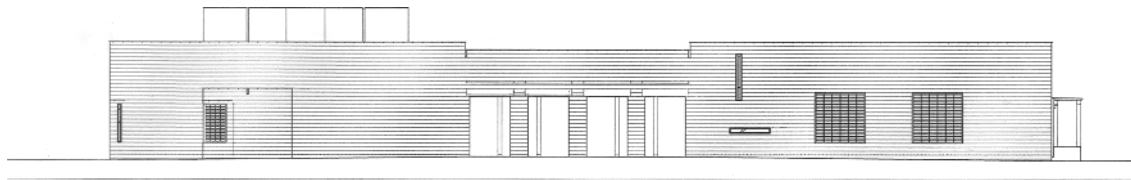
Chapel of the Light

Ibaraki, Japan

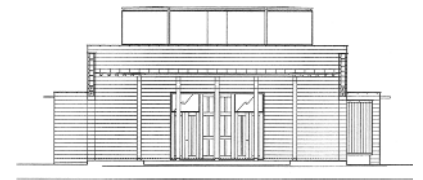
Architect	Tadao Ando
Client	United Church of Christ in Japan
Completion	1989
Denomination	Presbyterian
Footprint	ca. 113 m ²
Seating capacity	90

The building is situated in a quiet but built-up suburban neighbourhood. It consists of an angular wall and a rectangular box, both made of concrete constructed in situ. The angle is formed by two free standing planes placed at an angle of 75 degrees to one another. The longer of the two legs is aligned north-south, piercing the rectangular volume of the church on its westward side before exiting through the end wall to the north. Where the wall and box meet, open or glazed slots preserve the autonomy of both elements.

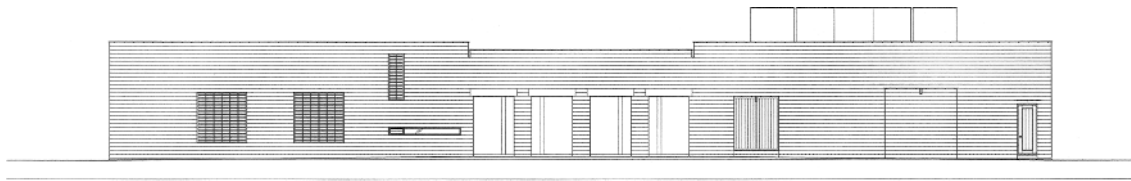
On arrival, one turns right and enters the "vestibule", already within the main volume of the building. Produced by the collision between the angular wall and the box, this forecourt tapers in a narrow wedge shape.



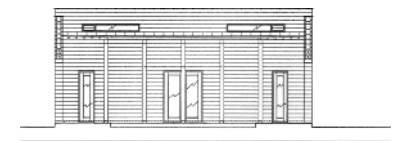
West elevation



Section through courtyard
looking towards church hall



East elevation



Section through courtyard
looking towards parish hall



Four portals open onto the courtyard, on the left the church hall, on the right the parish hall | Entrance to the church from the courtyard, with doors made of pinewood | Central aisle and roof light, behind the altar on the right, the entrance to the sacristy, left the tabernacle | Side aisle on the west side with vertical lighting embedded in the wall, on the right the niche for the font

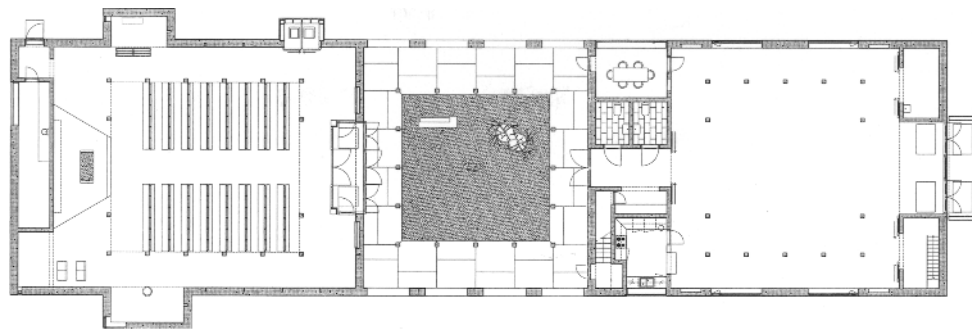


St Clara Church

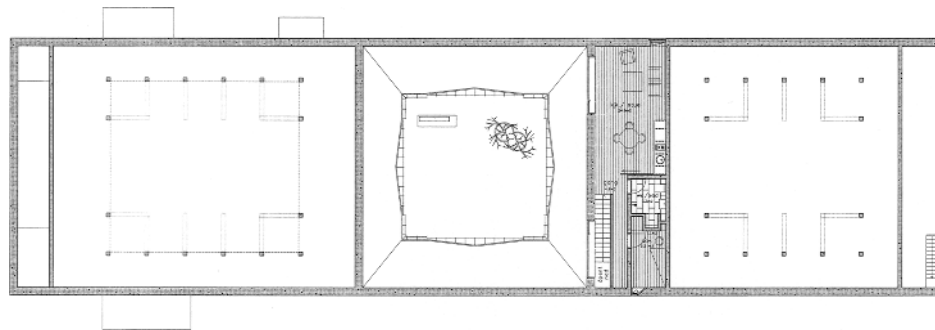
Kongsvinger, Norway

Architects	Henrik Hille, Ervin Strandskogen
Client	Diocese of Oslo
Completion	2001
Denomination	Roman-Catholic
Footprint	Church ca. 195 m ²
Seating capacity	ca. 112

The former fortress town of Kongsvinger lies in south-eastern Norway, close to the border with Sweden. The municipality numbers nearly 18,000 inhabitants and – because the country is largely Protestant – only a very small Catholic following of around 200 persons, mostly immigrants from the Philippines, Vietnam or Poland. Accordingly, the church on the outskirts of Kongsvinger had to be built to a modest budget. However, the building makes a virtue out of its limited resources. Only on two occasions does the church employ what one could loosely term precious materials: thin external light brown sandstone panels for the external cladding and white marble panels for the altar. Arranged with its long sides in an east-west orientation and its narrow sides running north-south, the low,



Plan of lower level, at the rear the altar wall of the sacristy



Plan of upper level, the priest's residence opening onto the courtyard



elongated building exhibits refined 4:1 proportions. Through the way the church sits in its urban surroundings and announces its presence through the sign of the cross, one enters the building from the centre of the west side through four open portals with sturdy columns. The building is divided into three parts. One hall for the church service and one hall for the parish, both approximately equal in size, stand either side of an open colonnaded courtyard in the form of a square.

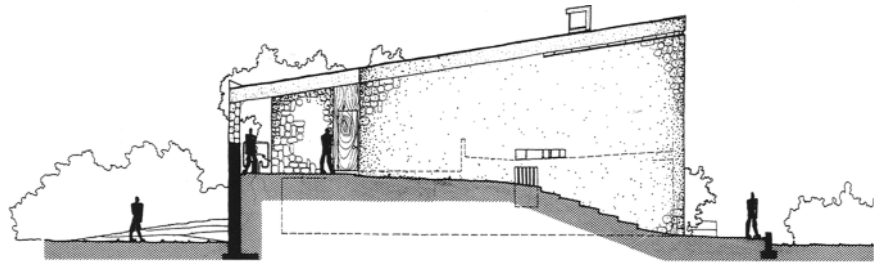
This very simple and clear typology, with regard to its volume, function and the relationship of its parts, is not uncommon in northern Europe. The effect is heightened in Kongsvinger by axial symmetry, but one can find this kind of basic structure – here two

examples, which in all other respects are quite different – in the Centrumkyrka in Bjuv from 1970, designed by Bengt Blasberg and Henrik Jais-Nielsen (see pp. 70-71) or the Mortensrud Church in Oslo, completed in 2002 and designed by Jan Olav Jensen and Børre Skodvin.

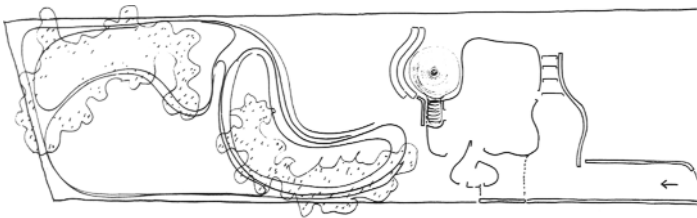
The St Clara Church has a large central nave with narrow side aisles on either side, to the west a niche for the baptistry and font, to the east a niche for the confessional box and a statue of the Virgin Mary. The processional route from the entrance wall to the altar wall measures 15.7 metres, from side wall to side wall 12.45 metres. Compared with the space for the priests, the congregation is given a stronger emphasis. Sixteen columns, each made of 20 centimetre thick laminated

pine, surround the oak pews for the congregation. The roof over the 112 seats is raised to form a lantern-like skylight with clear perimeter clerestory glazing.

The building has a solid character with a concrete floor and light brown plastered walls. The rural character of the interior gives the impression that the building has been there for a long time. It is not without reason that some have termed St Clara Church a “miniature basilica”.



East elevation, front side



Site plan



Ramp from the road towards the entrance on the upper level | Entrance to the lower level from the rounded courtyard, the concrete floor of the altar within can be seen as a diagonal line on the facade | From left to right the volumes for altar area, for quiet prayer, confessional and sacristy zones, and portico | View from the main space on the upper level into the anteroom below, with three layers of walling visible, rough-hewn quarried stone, brick and sprayed concrete

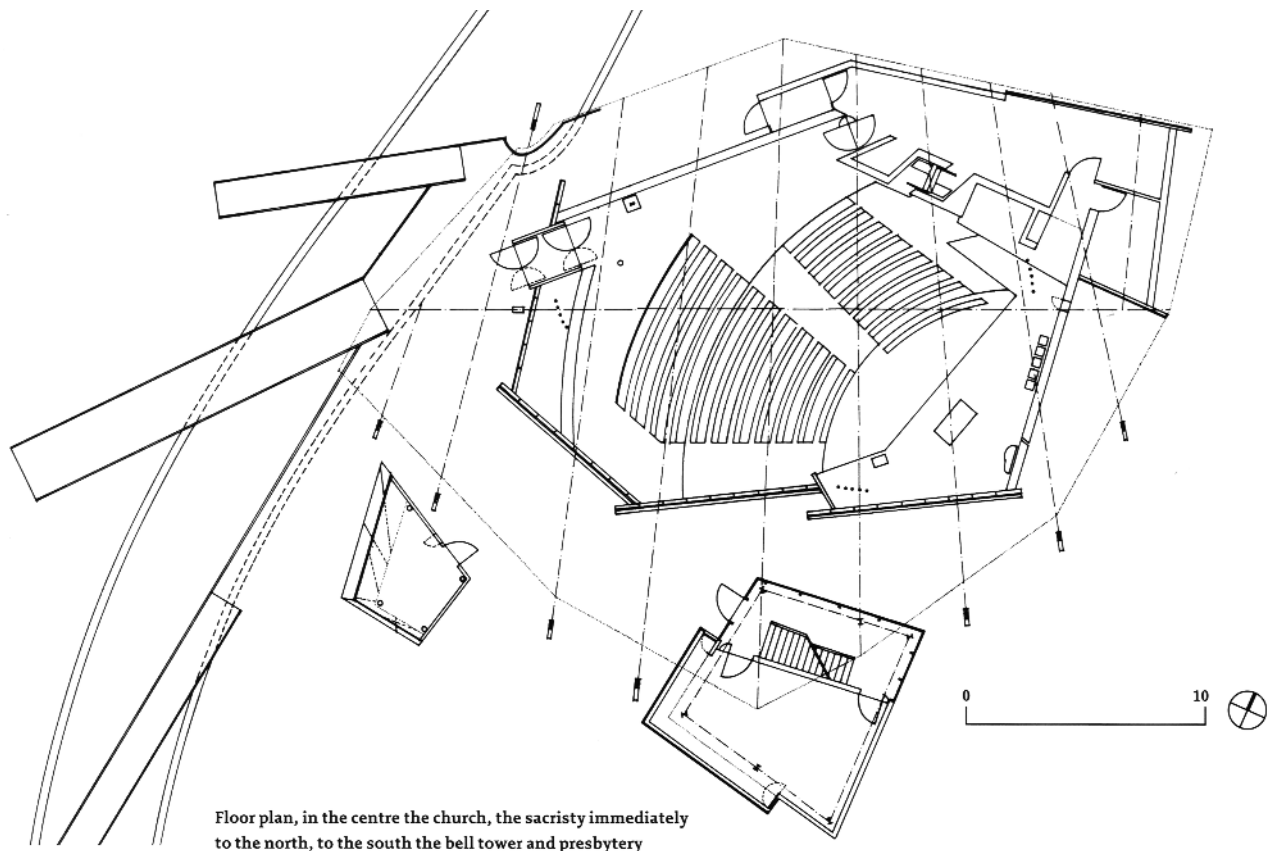


Church of Our Lady of Lourdes

Navarons di Spilimbergo, Italy

Architects	Glauco Gresleri, Silvano Varnier
Client	Monsignore Lorenzo Tesolin
Completion	1970
Denomination	Roman-Catholic
Footprint	130 m ²
Seating capacity	65

From the mid-fifties to the end of the sixties, due largely to the "Centro di Studio e Informazione per l'Architettura Sacra" and the journal "Chiesa e Quartiere," Bologna became a meeting place for Catholic architects and theologians looking for answers and assistance in adapting or even reforming their churches, both as parishes in an urban society, as well as buildings in urban contexts. In the late Middle Ages, the choir and high altar of the priests had led to a separation of the clergy and the laity, shifting emphasis away from the people. In later years, the ritual and ornament of the Baroque had further intimidated believers. The essence of Catholicism, so the reformers asserted, was to be found in early Christianity: the first churches were homes converted into meeting places, as can be



Floor plan, in the centre the church, the sacristy immediately to the north, to the south the bell tower and presbytery



View from the west | Green roof from the southwest | Covered passage on the south side, the church to the right, the larch-clad presbytery to the left and base of the bell tower to the rear, which is used as a library | View towards the altar from the west, to the left of the altar the sedilia and the tabernacle, in the wall on the left space for the organ

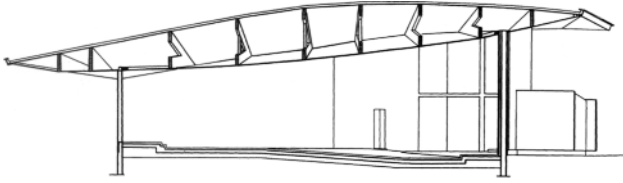


St Florian's Church

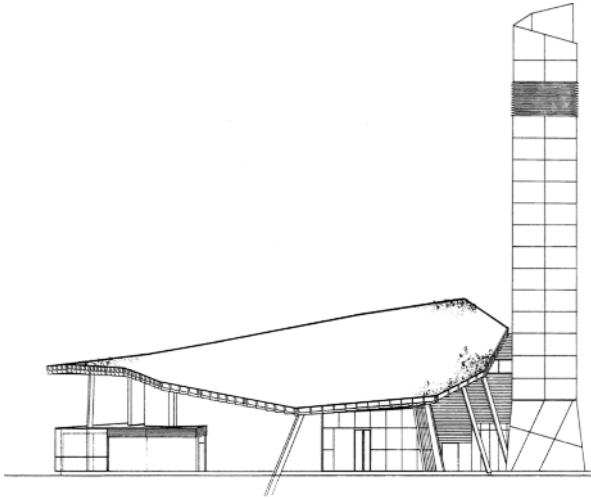
Aigen im Ennstal, Austria

Architect	Volker Giencke
Client	Diocese of Graz-Seckau and the Municipality of Aigen im Ennstal
Completion	1992
Denomination	Roman-Catholic
Seating capacity	120

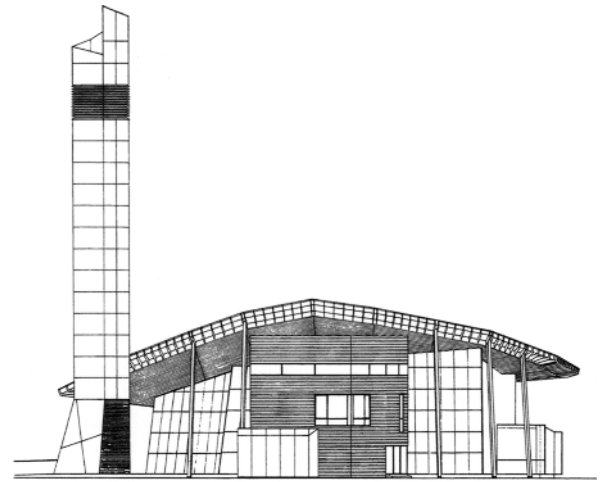
Bounded by a rocky ridge to the north and a country road to the south, the church stands in the middle of Aigen. The building is part of a constellation that includes the old village square and a new church square, with a stream separating the two. Three steel and timber gangways connect the two spaces. Built on a polygonal floor plan that deliberately avoids any obvious axially or symmetry but nevertheless has a clear front and back, the building opens more towards the south and west and is more closed to the north and east. The earth and grass green roof lies like a tortoise shell over the building. Its supporting trusses and shell rest on walls on the north and east sides, on columns to the south and west. A projecting white steel plate rim runs around the perimeter roof like the edging of a plate.



Longitudinal section



West elevation



South elevation



Arriving from the west side, one enters a structure that appears to glow with a brownish, sometimes reddish colour. The architectural space is that of a compressed and distorted hexagon and it is enclosed by seven walls: three walls to the south, one glazed wall on the west side, two to the north and a concrete wall on the east side. A framework of thin steel members supports the full-height glazing: each of the cells in the grid contains a transparent reflective pane and a transparent insulating pane on the inside, then, slightly offset and mounted on a system of rails, coloured plates of antique glass that can be shifted or replaced, resulting in a wall whose colour and pattern can be changed at will.

One of the concrete walls has been given a distinctive red "al fresco" rendering; this dual-layer "thick wall" contains a recess for the organ, space for the confessional box and the staircase for roof access. Light wood surfaces – birch above, maple below – give the room warmth. The roof-height from the entrance to the altar rises from 4.2 to 7.1 metres; the floor level ramps downwards by a full half metre. The pews are arranged on this slope in two compact groups. A broad flat podium emphasises the glass shrine of the altar.

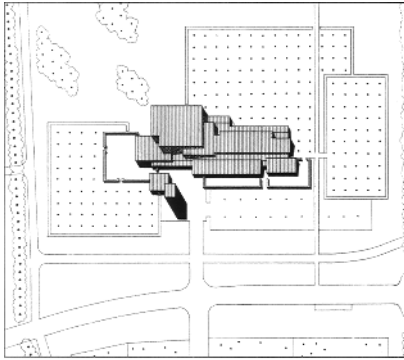
The spatial experience of St Florian's church is characterised not just by two competing axes – the line of the fold in the ceiling and the line of the aisle in the direction of the altar – but by a subtle sense of circular

gyration to the right. This rotational movement begins outside with the stream that flows from the south northwards and eastwards, continues with the diagonal orientation of the entrance lobby and the gentle curve of the pews and is most powerful when the seated congregation watch the celebrants and servers walk over from the sacristy towards the podium and the altar.

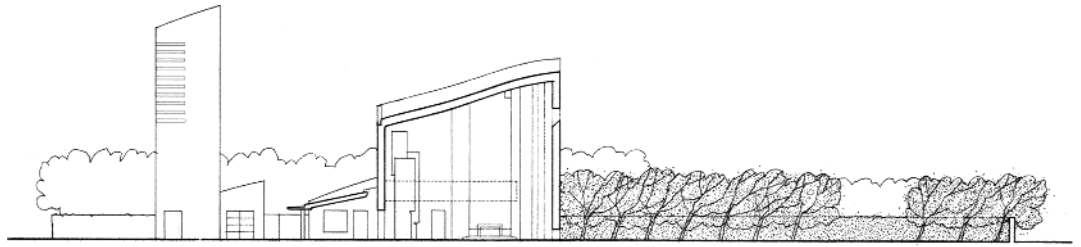
The presbytery is located in front of the church on the right, the 32.2 metre high bell tower on the left. Panes of roughcast glass encase the skeletal form of the bell tower. A covered passage leads between the three volumes under the green roof and, not least due to the sloping walls and different materials and colours, exhibits a dynamism of its own.



Design sketch



Site plan



Cross section through the church hall

View from the northeast, on the left the undulating form of the church roof | View of the altar with the pulpit on the right, font on the left, the altar and 'apse' slightly out of axis with the aisle between the pews | View from the gallery towards the altar, on the left the organ | View from the altar space towards the gallery, the tight arrangement of light bulbs forming a suspended plane in the air



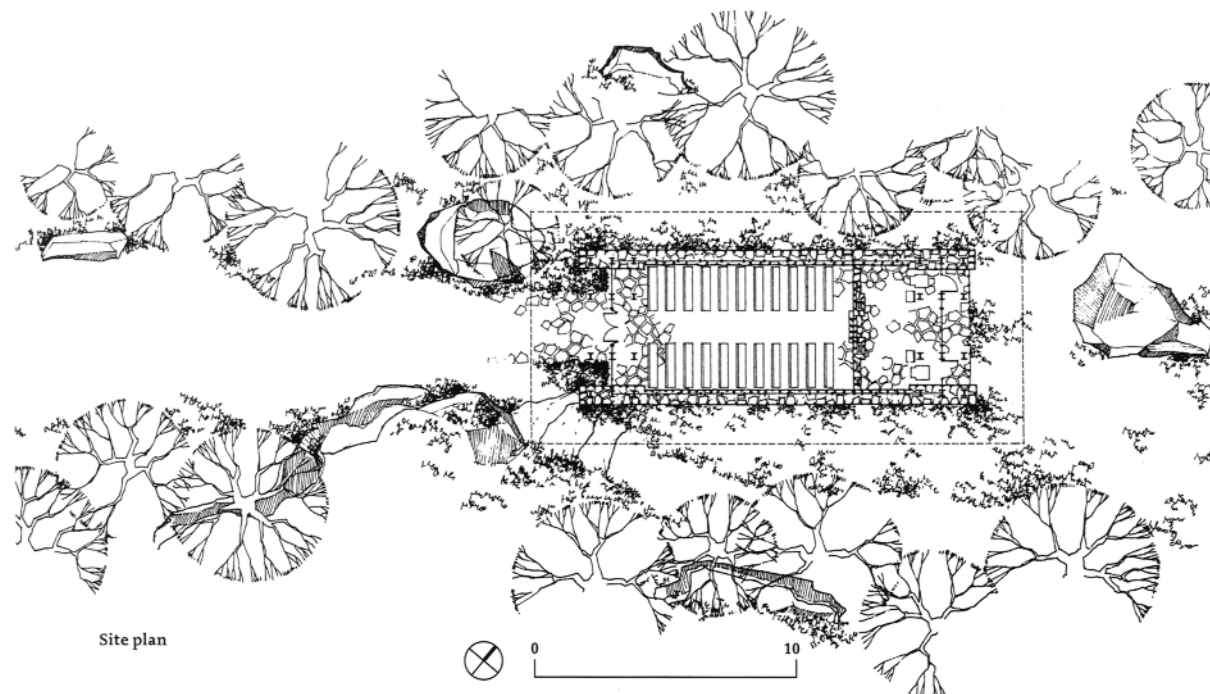
Tornbjerg Church

Odense, Denmark

Architects	Johan Fogh, Per Følner
Client	Tornbjerg Parish Church Council
Completion	1994
Denomination	Lutheran-Protestant
Footprint	Hall 157.45 m ²
Seating capacity	Floor ca. 128, gallery ca. 50

Spread from northwest to southeast, the complex stands on a patchwork of lawns in the centre of a new suburb inspired by the garden city ideal. With a total length of almost 52 metres, the complex consists of a low elongated section to the rear for the hall, a pair of offices, the sacristy and the waiting room for the baptismal congregation. Shed roofs made of zinc crown the whitewashed masonry walls. Bowing slightly, they slope towards the front; only one of them has a double undulation that sets it apart as the church and centre of the building.

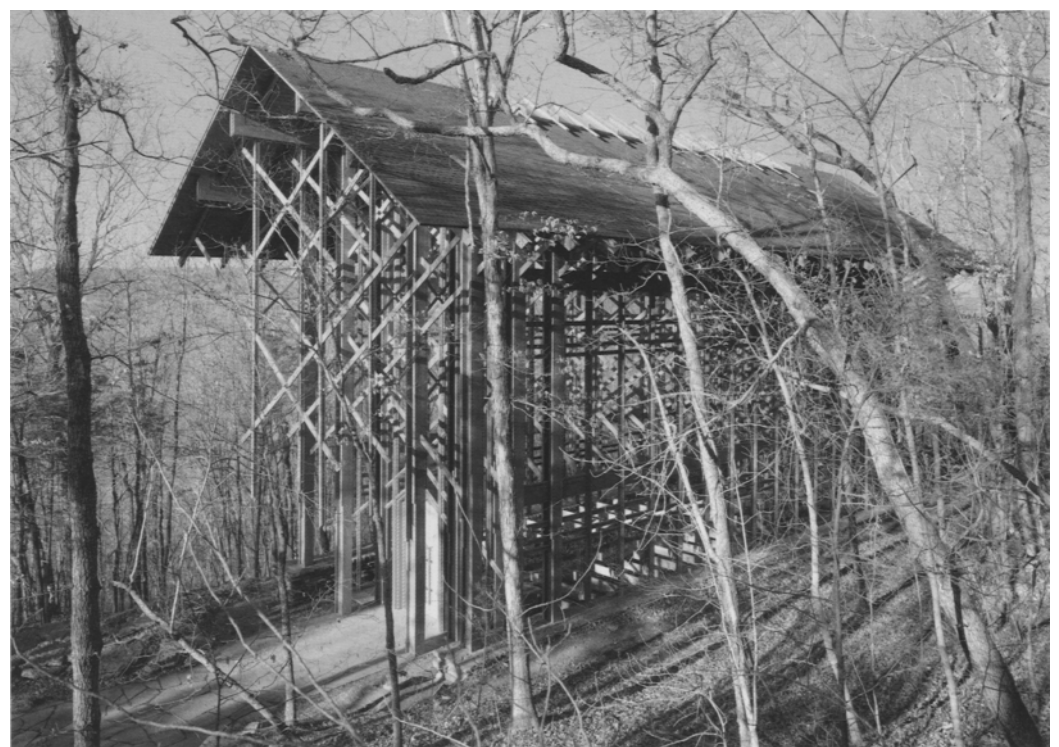
The almost 16 metre high bell tower stands offset from the building to the left and slightly in front of the partially glazed entrance. Twelve strips of glazed bricks



Site plan



View from the northeast with view through from the altar to the portal | View from the north | Central aisle between the pews, cross beams above with diamond-shaped crossover | The side wall glazing, with attached lighting on the columns



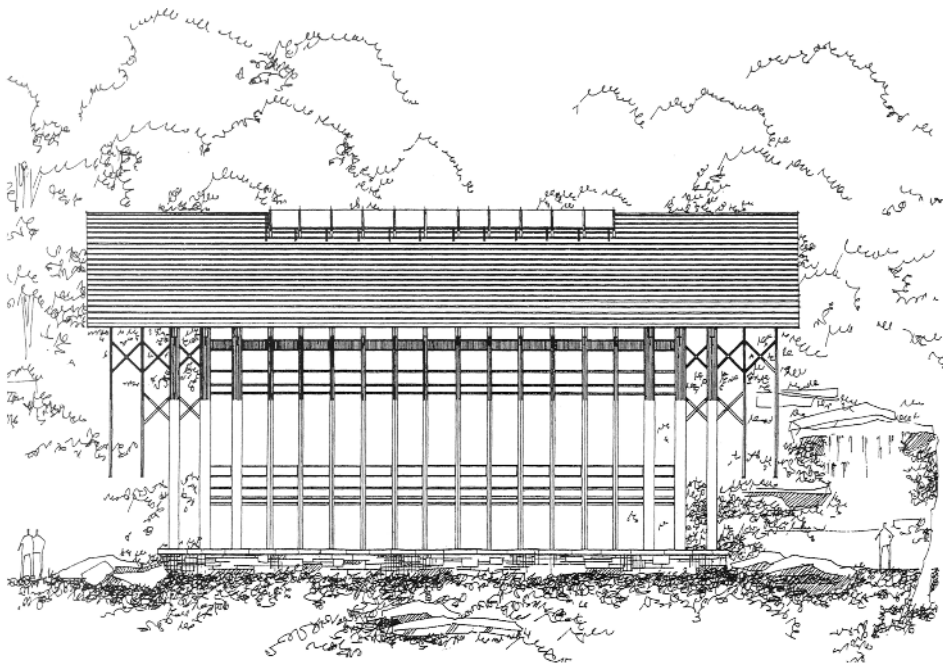
Thorncrown Chapel

Eureka Springs, Arkansas, USA

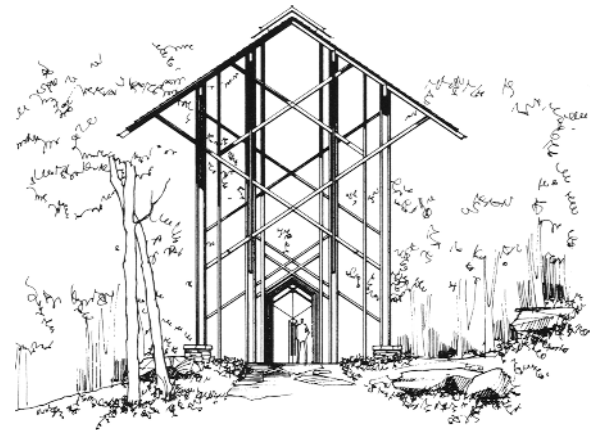
Architect	E. Fay Jones
Client	Jim Reed
Completion	1980
Denomination	None
Footprint	133.62 m ²
Seating capacity	ca. 100

Founded in the last quarter of the 19th century, Eureka Springs is a small health resort in northwest Arkansas. Thorncrown Chapel stands on a stony sloping site beneath the maple and oak trees of the Ozark Mountains, some 3 kilometres from the hotels and resort guests. The dimensions of the building – 18.28 metres long, 7.31 metres wide, 14.63 metres high – suggest a hall and processional church. And indeed, a central aisle runs the length of the building, with rows of pews to the left and right; at the end a low podium with two pulpits but no altar.

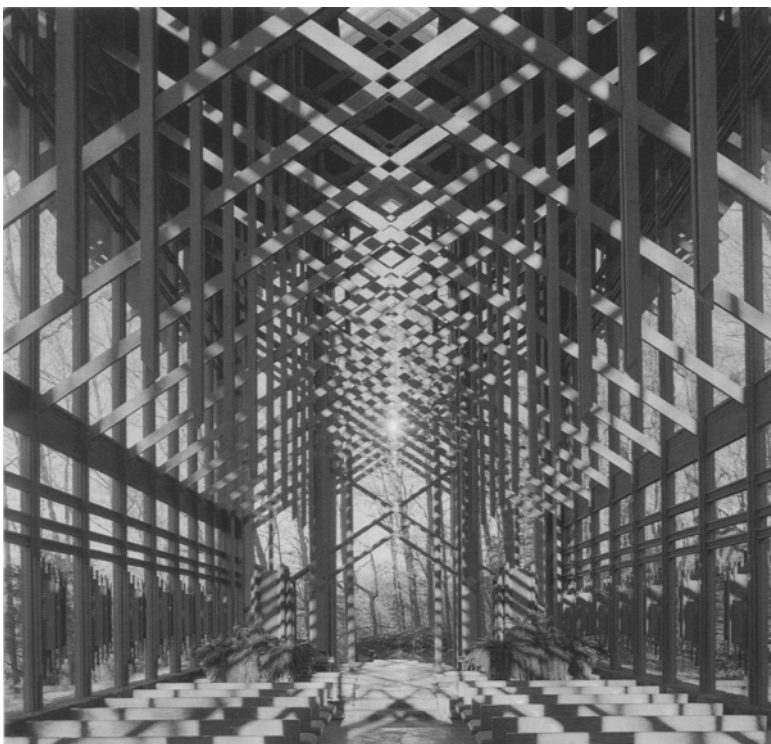
The distinctive spatial qualities of the chapel, which is particularly popular for Christian marriage ceremonies, are not so much determined by its straightfor-



Northwest elevation



Southwest elevation



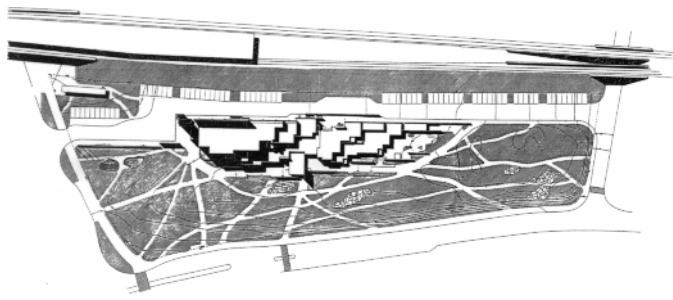
ward plan and section. Rather, the impression of a large but light roofed-over shelter – more precisely, an impression of transparency and perfect camouflage – derives from the omnipresence of its material and construction. In all directions, they allow one's view to pass from forest to building and out again to the forest. In all directions, they blur the boundary between inside and outside. In all directions, nature and culture blend into a single intertwined scaffold of trunks, beams, twigs and bars that appear as if they could continue growing indefinitely, getting ever longer, wider, higher.

Almost all the materials used for the chapel come from the immediate surroundings of the Ozark Mountains.

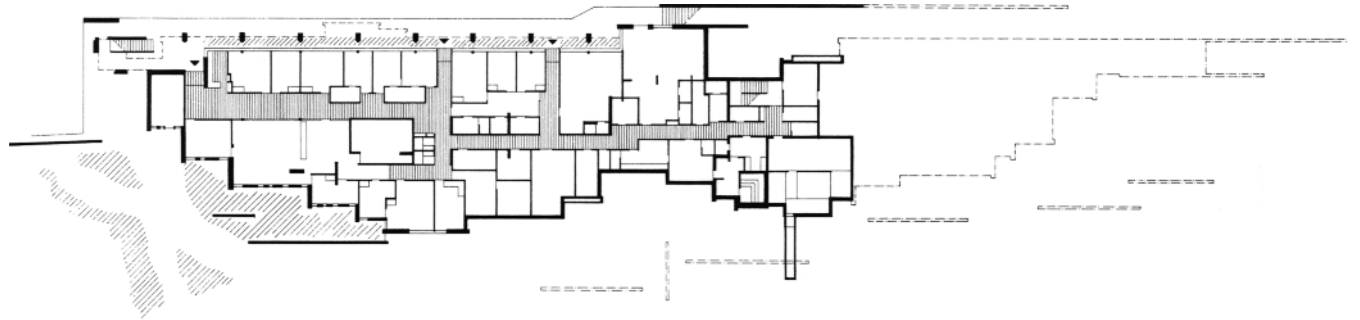
The painted grey pinewood of the walls and ceiling, the rough-hewn natural stone of the floor and parapet walls, the clear plates of glass between the columns: all were brought piece by piece on foot to the site, in order to impact as little as possible on the site. A lower row of larger and an upper row of smaller crosses, formed from the left and the right by rows of crossing bars, are attached to the columns of the side walls and support each side of the roof. Each cross consists of five parts: four beams which meet at a diamond-shaped steel crosspiece. This hollow element forms the crossing of each of cross.

Thorncrown Chapel, like the rest of the architect's oeuvre, is influenced by the organic architecture of Frank

Lloyd Wright. It shares a transparency reminiscent of Frank Lloyd Wright Junior's Wayfarer's Chapel in Palos Verde, California, built in 1951. Although farther removed, it also relates to the vertical linearity of the high space of Saint Chapelle in Paris, but without relegating the construction to the outside, as is typically the case for the High Gothic period. Finally, the Thorncrown Chapel refers to an American tradition of romantic transcendentalism, inspired by the likes of 19th century authors such as Ralph Waldo Emerson and Henry David Thoreau who sought to find a new harmony between nature and culture.



Site plan



Lower floor plan



View of the church from the north showing the many projecting brickwork planes | View of the church from Louhela railway station | West wall stepping upwards from north to south culminating in the tower | The freestanding vertical slab of the tower, on the right the church with its south-facing sidelight and east-facing skylight



Myyrmäki Church

Vantaa, Finland

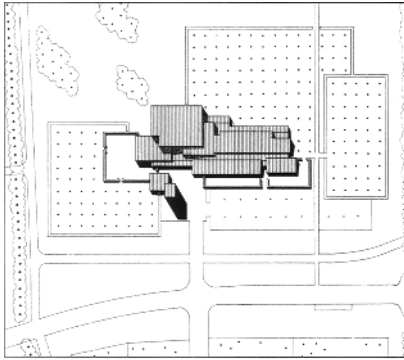
Architect	Juha Leiviskä
Client	Vantaa Church Parish Council
Completion	1984
Denomination	Lutheran-Protestant
Seating capacity	ca. 450

Commuters travelling to and from Helsinki pass by the church on not one but two sides of it, to the east by road, on the west by train. Twelve trains stop at Louhela station per hour every working day of the week. Traffic roars past from dawn until dusk. Certainly not an ideal location for a church. Nevertheless, the building rises to the challenge and acquits itself admirably. Its narrow, elongated shape turns its back on the railway embankment and shows its face to the park, adapting to fit the complex urban context and making a virtue out of a difficult situation.

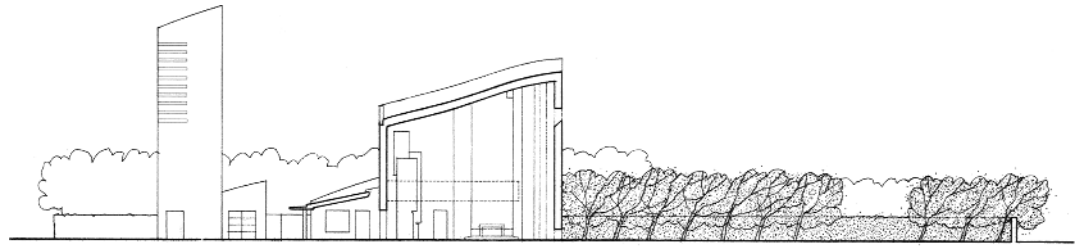
The term elongated does not adequately describe the almost excessive extent of this building. The church has a total length of 116.6 metres and a maximum



Design sketch



Site plan



Cross section through the church hall

View from the northeast, on the left the undulating form of the church roof | View of the altar with the pulpit on the right, font on the left, the altar and 'apse' slightly out of axis with the aisle between the pews | View from the gallery towards the altar, on the left the organ | View from the altar space towards the gallery, the tight arrangement of light bulbs forming a suspended plane in the air



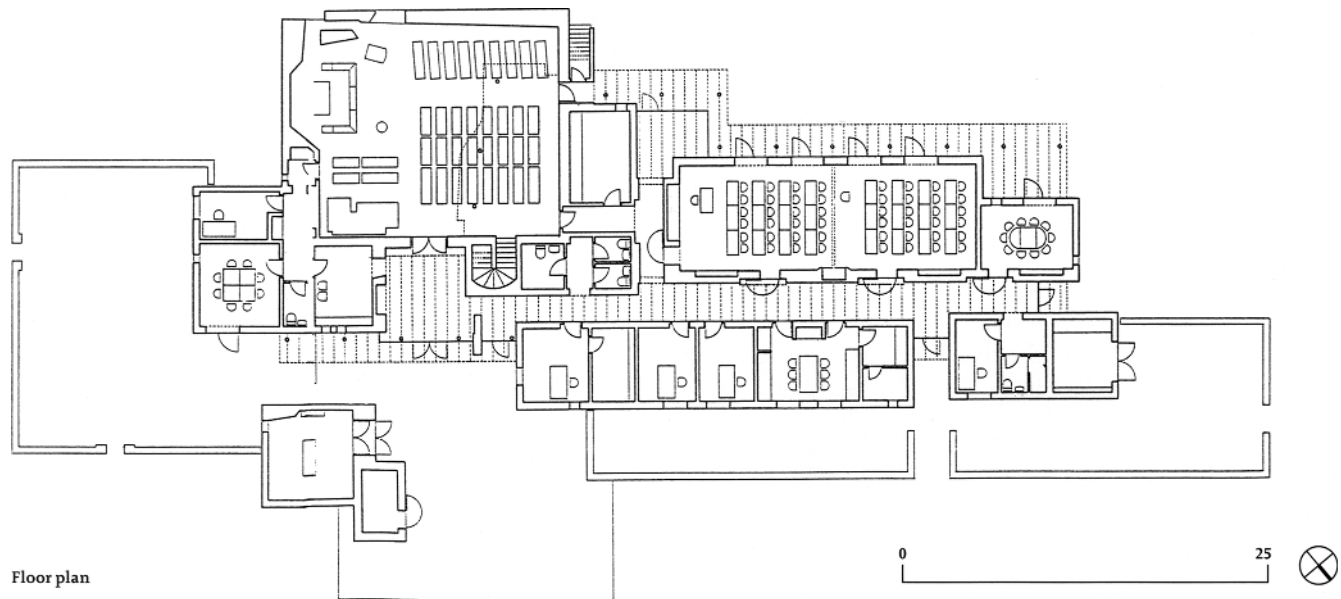
Tornbjerg Church

Odense, Denmark

Architects	Johan Fogh, Per Følner
Client	Tornbjerg Parish Church Council
Completion	1994
Denomination	Lutheran-Protestant
Footprint	Hall 157.45 m ²
Seating capacity	Floor ca. 128, gallery ca. 50

Spread from northwest to southeast, the complex stands on a patchwork of lawns in the centre of a new suburb inspired by the garden city ideal. With a total length of almost 52 metres, the complex consists of a low elongated section to the rear for the hall, a pair of offices, the sacristy and the waiting room for the baptismal congregation. Shed roofs made of zinc crown the whitewashed masonry walls. Bowing slightly, they slope towards the front; only one of them has a double undulation that sets it apart as the church and centre of the building.

The almost 16 metre high bell tower stands offset from the building to the left and slightly in front of the partially glazed entrance. Twelve strips of glazed bricks



Floor plan



mark the openings out of which the bells toll. A similar decoration marks the position of the altar zone on the outside wall to the southeast. A small chapel of rest nestles up against the tower; the small church courtyard is enclosed by a white wall.

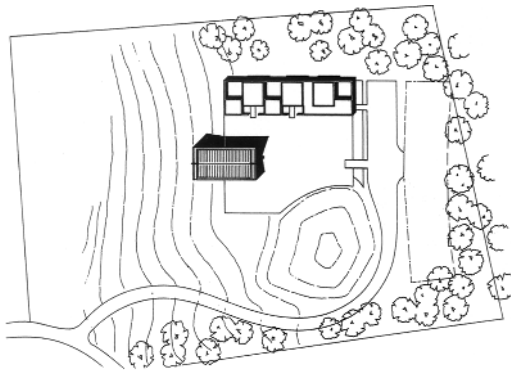
One enters the church through a vestibule on one side and sees the pine enclosure for the organ on the left, on the right the gallery supported by circular columns. The plan of the church is almost quadratic. With a length of 13.4 metres, 11.5 metres wide at the back and 12 metres at the front, the room widens towards the black granite altar. A larger and a smaller block of pews made of birch offer seating for 128 persons, with space for a further 50 on the gallery. The aisle between the rows leads to-

wards a point slightly to one side of the centre of the altar and the "apse" as if deliberately liberating the interior from the inevitability of the processional route.

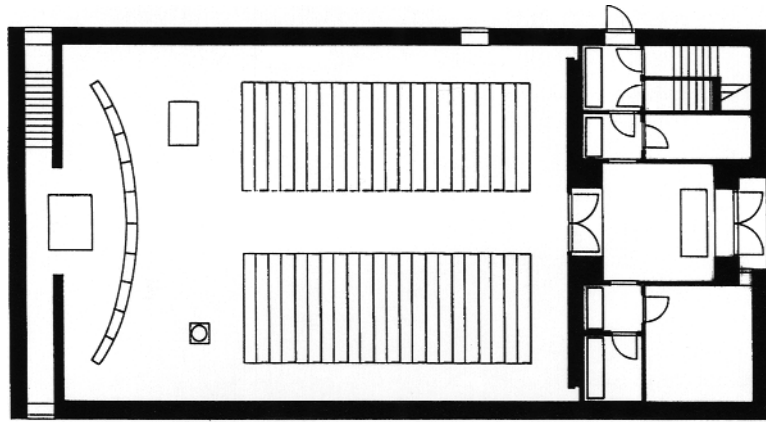
The whitewash on the walls and the brown brickwork of the floor are reminiscent of the medieval churches of cities in northern Europe. Several openings in three of the four walls, some low down, some high up, provide illumination. In the corner of the south wall a window spans from floor to ceiling. A "pillar" arranged in front of it serves as a form of "baffle" against bright sunlight. Naked light bulbs dangle from the narrow pine boarding on the ceiling of the 9.5 metre high space (measured at its midpoint). Closely spaced in tight rows and dangling on long threads, they form an intermediary plane

not unlike a starry sky. As such, the colourless glass spheres contribute considerably to the spatial definition of the interior.

The influence of Alvar Aalto is clearly evident in its reference to forms from the landscape – the up and down-swing of the roofs, its interlocking volumes, which from the side resemble shoved together ice floes – in its use of timber planking, of white and brown and in its play of light over soft forms. However, it is the incorporation of qualities from the architects' own previous design for the interior of the Egedal Church in Kokkedal, Denmark, that helped the architects achieve such a harmonious design for the interior of the church in Tornbjerg.



Site plan



Floor plan



View of the church and ancillary buildings from the southeast | View from the west | Kneeling rest and altar, behind them the backlit wall niche | The stringent processional arrangement of the church is even reflected in the material joins

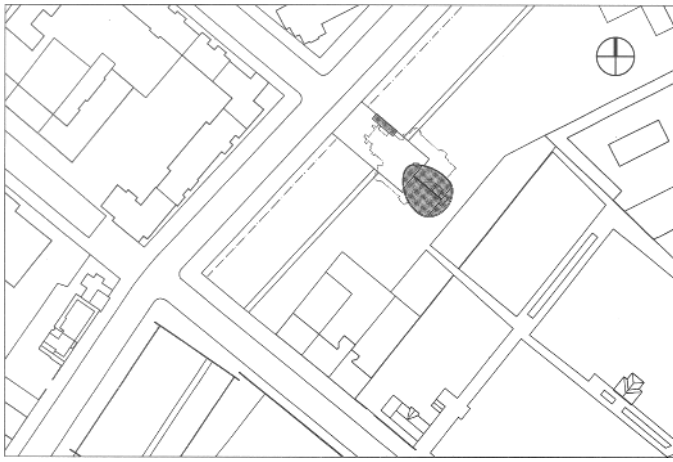


Enghøj Church

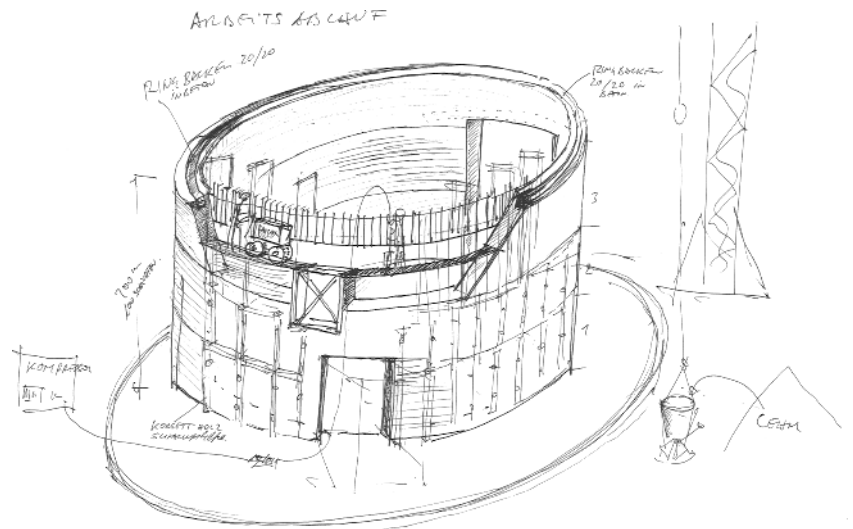
Randers, Denmark

Architects	Henning Larsen, Niels Fuglsang
Client	Building committee of the Parish Church Councils of Borup and Sankt
Completion	1994
Denomination	Lutheran-Protestant
Footprint	Church ca. 338 m ²
Seating capacity	170

Although part of a new estate, the church appears to stand alone in the landscape. The building is concealed and enveloped by greenery, such as one only otherwise sees in castles set in open landscape. The complex stands on a hill. The plateau is square in form and enclosed by a wall. This enclosure is, however, both defined and compromised by three objects: on the north side a low elongated building; on the south side a hump presses into the square; on the west side the church projects from the square. Only the side to the east remains free for the entrance. The larger and taller building serves as the church, the smaller lower one for other functions. There is no tower. Instead a bell hangs at one end of the low building, which from the courtyard looks like a row of almost identical houses.



Site plan showing the strip of the former Berlin Wall running from northeast to southwest



Sketch of the construction of rammed earth walls using timber shuttering



Entrance from outside | Chapel on the strip of the former Berlin Wall, with the path formerly used by the soldier patrols running through the centre, view northeast | Interior with the altar on the left and retable saved from the demolished Church of Reconciliation in the niche on the right | Ambulatory between the outer and inner skin, on the left the door to the chapel



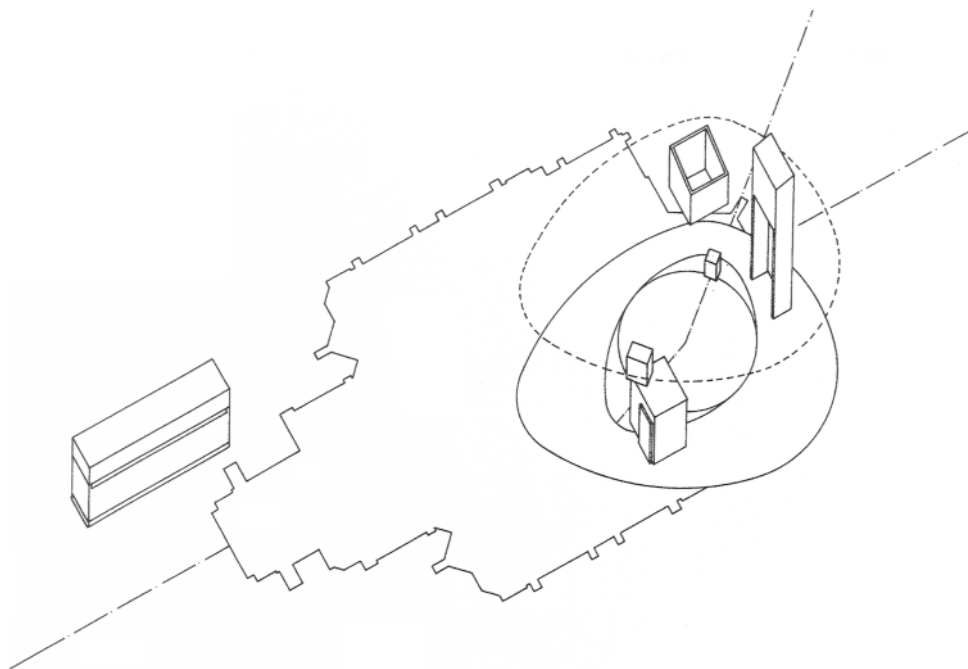
Chapel of Reconciliation

Berlin, Germany

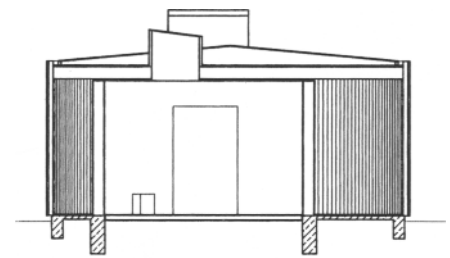
Architects	Rudolf Reitermann, Peter Sassenroth
Client	Protestant Reconciliation Church Parish, Berlin
Completion	2000
Denomination	Lutheran-Protestant
Footprint	ca. 398 m ²
Seating capacity	100

The chapel stands where from 1961 until 1989 the wall between East and West Berlin once ran, exactly on the spot where Gotthilf Ludwig Möckel's neo-Gothic Church of Reconciliation once stood before it was demolished in 1985. The central theme of this partly solid, partly fragile architecture, which consists of a high oval volume for the church service and a low rectangular bell frame, is the history of the political and religious transformation of this place.

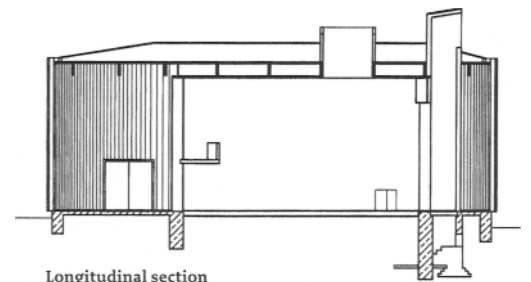
The design of the inner container began with a circle as the most compact form of gathering. By stretching and bulging this form, a hint of vestibule and choir is created. The specific dynamism of this almost 9 metre high and 18.5 metre wide chapel derives from the inter-



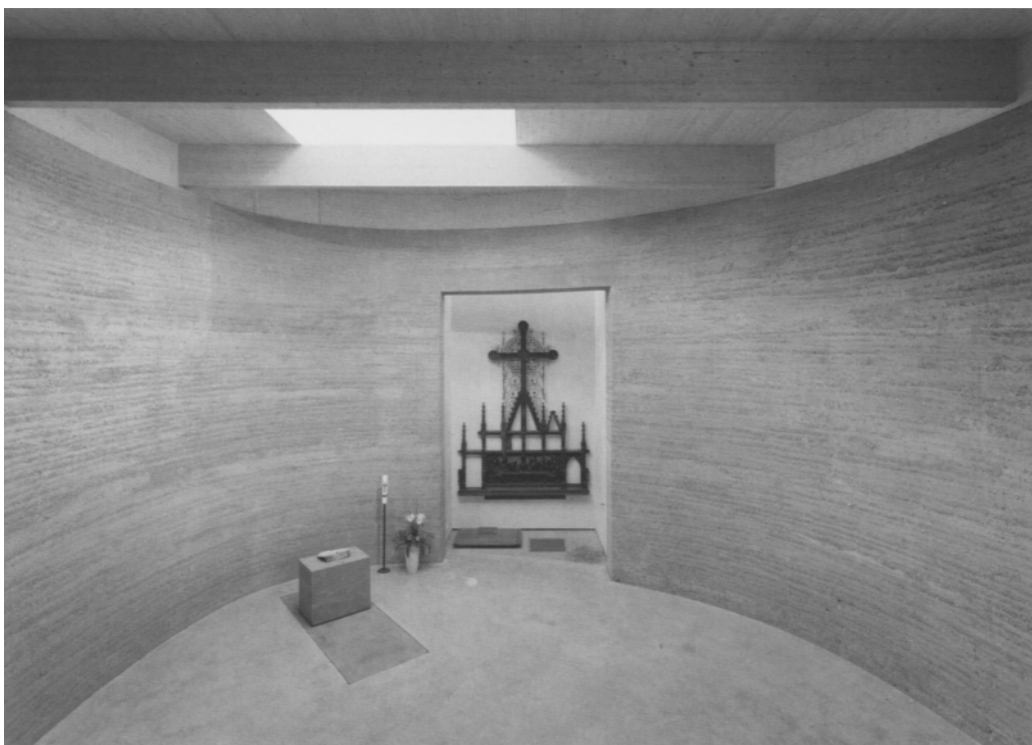
Axonometric projection showing relationship of the new chapel to the old church



Cross section



Longitudinal section



section of two axes: the west-east axis that characterises church architecture since its beginnings, northeast to southwest axis that runs parallel to the central axis of the earlier church.

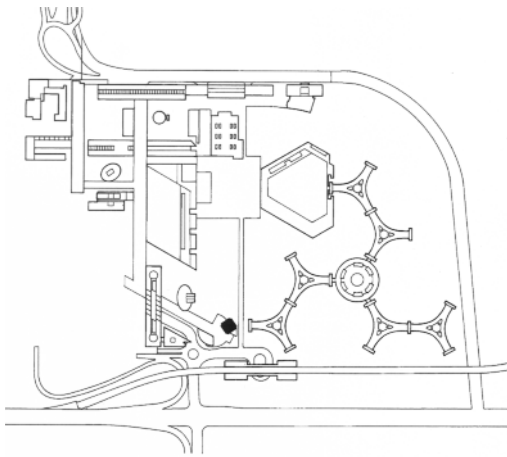
The first of these two axes is marked by a square "rose" visible high up on the west wall and the rammed earth block of the altar in front of the east wall. At the end of the second of these two axes, one sees an illuminated niche with a dark wooden artefact from the original church that depicts the Last Supper of Christ and the Disciples. The eye wanders between the vanishing points of both these axes as it attempts to shift the altar table rightwards beneath the retable and the retable leftwards over the altar table. This separation of the

two ritual objects is particularly apparent from the entrance at the rear of the space and from the wooden organ loft.

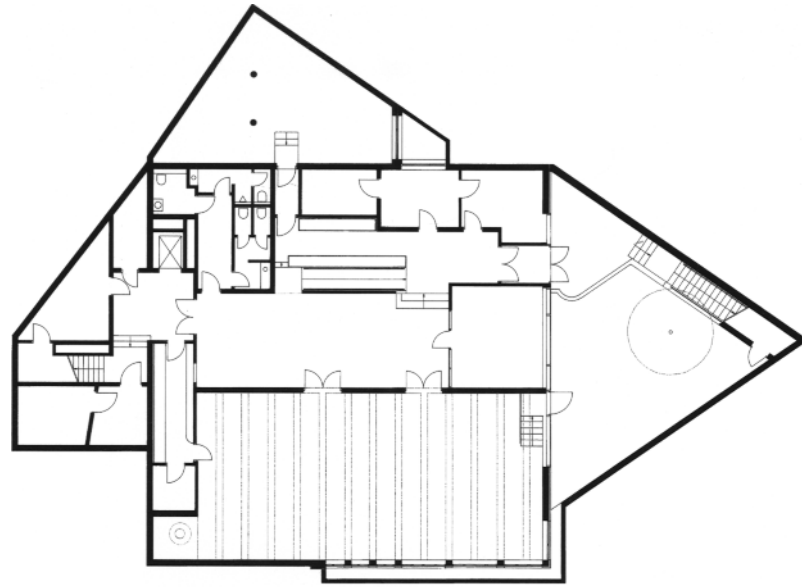
The preparation of the material and construction was overseen by Martin Rauch. Rammed earth, a mixture of earth, brick grit and straw fibres, is used for the floor and the half metre thick enveloping walls of the inner skin. The rough surface of the enclosing walls shows the process of layer after layer of the compression of earth and stone. In the diffuse light, the granular structure and crushed brick additive from the demolished church appear sometimes grey and green, sometimes red and brown. In a well in the floor beneath the old retable, one can see part of the cellar of the old church.

The access stair to the cellar was filled in by border soldiers after the building of the wall.

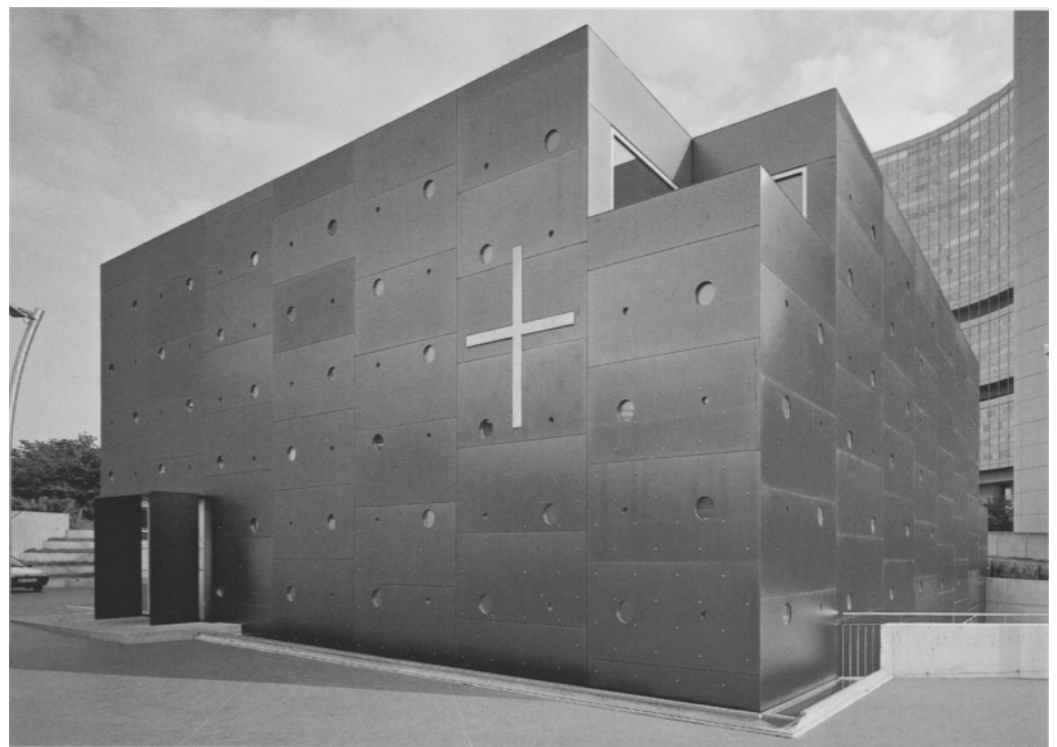
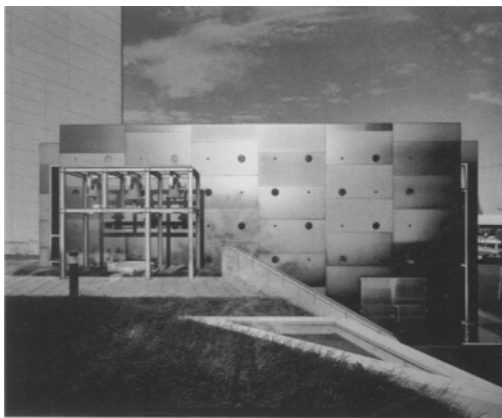
The nucleus of the chapel with its two projecting boxes, a black entrance and white niche, is surrounded by a second skin at an irregular distance from the core. Nine frames made of laminated timber columns and beams support the outer skin, a curtain of vertical timber slats made of Canadian Douglas fir that over time have gradually acquired a silvery patina through sun and rain. The surrounding timber screen swings freely around the firm core like 'egg white' around a 'yolk.' Between the two an asphalted ambulatory, that grows alternately wider alternately thinner, allows visitors to wander around the chapel.



Site plan



Lower level plan



View from the west, on the left the steel belfry | View from the southeast, on the far left the corner with the entrance

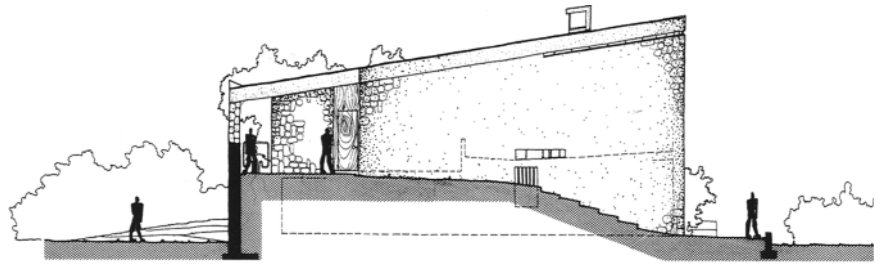
Donau City Church

Vienna, Austria

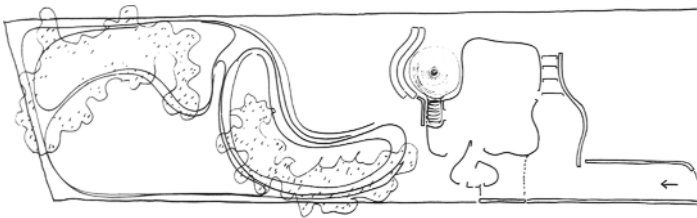
Architect	Heinz Tesar
Client	Archdiocese of Vienna
Completion	2000
Denomination	Roman-Catholic
Footprint	ca. 485 m ²
Seating capacity	150

In close proximity to an underground station, concave and convex high-rise buildings from the seventies and a series of office and commercial buildings built in the nineties, the church in "Donau City" is placed diagonally on the three-quarter roundel of a plaza produced by the forking of two roads. The rectangular volume consciously avoids any competition with the vertical architecture of its immediate surroundings.

As a result, at first glance, the angular building is almost inconspicuous. It is a volume made of concrete, a half cube with dimensions 21.5 by 21.5 by 10.75 metres. Its four external walls are clad in chromium steel panels that reflect a black, blue or brown colour, and are arranged horizontally, underlining the form of the



East elevation, front side



Site plan



Ramp from the road towards the entrance on the upper level | Entrance to the lower level from the rounded courtyard, the concrete floor of the altar within can be seen as a diagonal line on the facade | From left to right the volumes for altar area, for quiet prayer, confessional and sacristy zones, and portico | View from the main space on the upper level into the anteroom below, with three layers of walling visible, rough-hewn quarried stone, brick and sprayed concrete

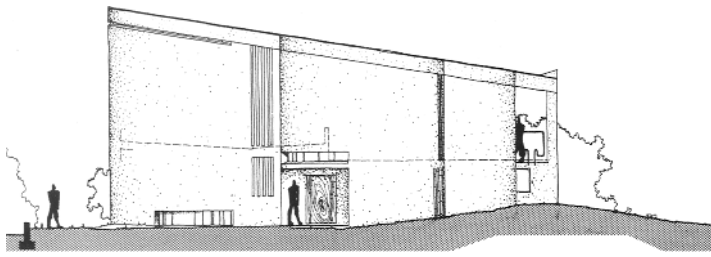


Church of Our Lady of Lourdes

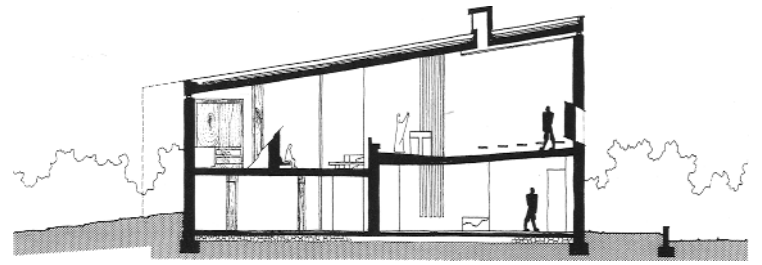
Navarons di Spilimbergo, Italy

Architects	Glauco Gresleri, Silvano Varnier
Client	Monsignore Lorenzo Tesolin
Completion	1970
Denomination	Roman-Catholic
Footprint	130 m ²
Seating capacity	65

From the mid-fifties to the end of the sixties, due largely to the "Centro di Studio e Informazione per l'Architettura Sacra" and the journal "Chiesa e Quartiere," Bologna became a meeting place for Catholic architects and theologians looking for answers and assistance in adapting or even reforming their churches, both as parishes in an urban society, as well as buildings in urban contexts. In the late Middle Ages, the choir and high altar of the priests had led to a separation of the clergy and the laity, shifting emphasis away from the people. In later years, the ritual and ornament of the Baroque had further intimidated believers. The essence of Catholicism, so the reformers asserted, was to be found in early Christianity: the first churches were homes converted into meeting places, as can be



West elevation, rearward side



Longitudinal section

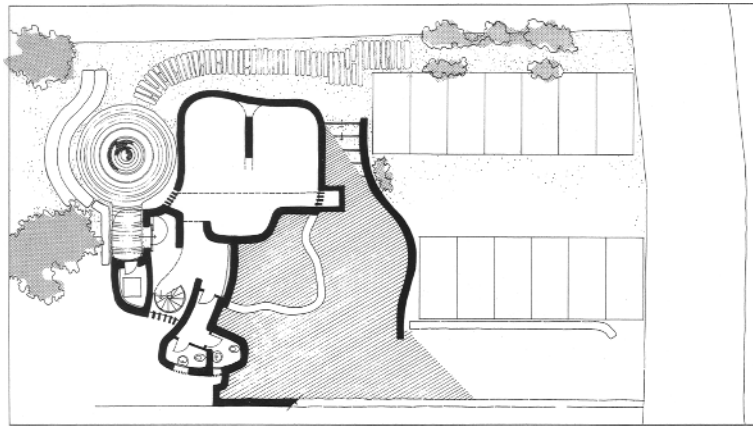


seen in Dura Europos on the River Euphrates (see p. 13). The Christians, at that time still persecuted by the Romans, congregated in their home environments to hear the gospel and celebrate Communion.

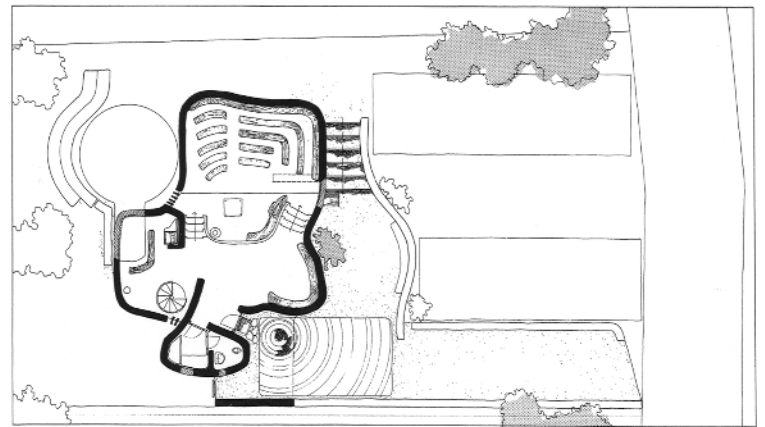
Inspired by the ideal of the agape, the meal or feast eaten by the early Christians, the Church of Our Lady of Lourdes is more than faithful to the liturgical reforms of the Second Vatican Council. The building is situated some two kilometres from Spilimbergo in the Italian region of Friuli-Venezia Giulia. In 1970 Navarons numbered exactly 253 inhabitants and more than half of the male population were farmers. In a village of this size, a church serves also as a place where one meets one another. There was and still is no other meeting place.

Beginning from the edge of the road and flanked on each side by a wall, a path leads up to an open portico in which a bell hangs. The church stands on the right with walls of fairly small lumps of ash-grey lime-rich stone, mined from the nearby Tagliamento valley, then hewn and laid in courses of uniform thickness. Only a couple of steps beyond the narrow entrance door, a short section of wall blocks the visitor's path forward. The sacristy and the space for silent prayer and repentance are on the left, on the right the ceiling rises and the sprayed concrete render of the brick wall is rough and white. Only the reddish terracotta tiles on the floor lend the organic form of the interior some colour.

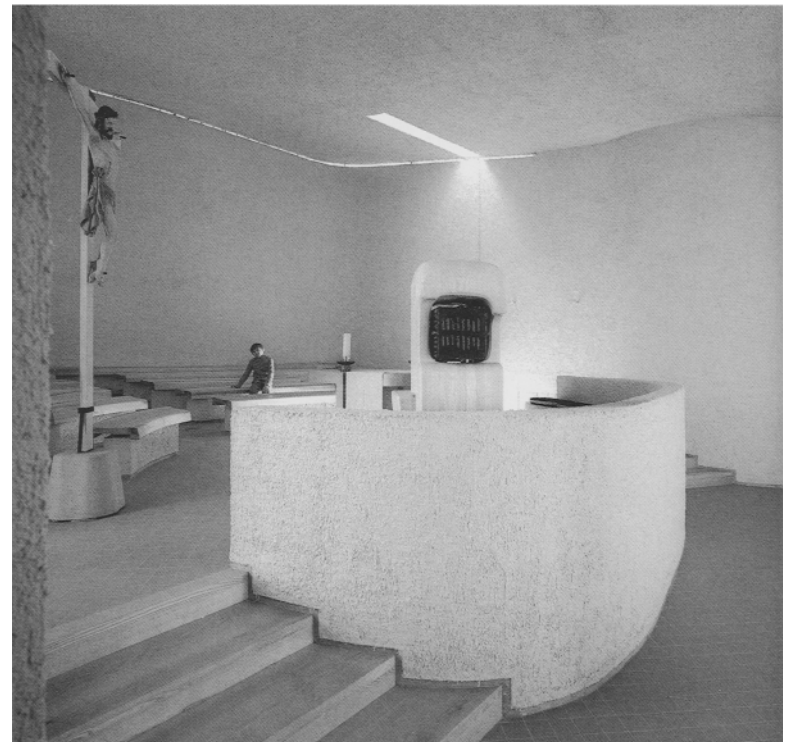
Although the anteroom and the main space of the church form a single space – the ratio of depth to breadth is 5:3 – the place for the Eucharist could hardly have been accorded greater emphasis. Through the placement of a freestanding section of wall across the centre of the space that curves back on each side leading to four steps on both the left and the right, the choir screen and high altar of old is interpreted anew. Here, all those participating in the church service congregate on one and the same "stage", a space where previously only the ordained were allowed. Despite the 8.5 metre long axis that leads aisle-like through the centre from the rear wall behind the pews to the freestanding wall in the centre with the 1.1 metre wide altar in front of it, the pews for the laity and the bench for



Upper floor plan



Lower floor plan



the priests and servers are not arranged in opposition but in coalition. This impression is underlined by the casual centripetal character of the space: produced on the one hand by the curved arrangement of the pews, and on the other by a slight ascent in the floor level towards the rear of the congregation and towards the rear of the priests, so that each can look each other in the eye more easily.

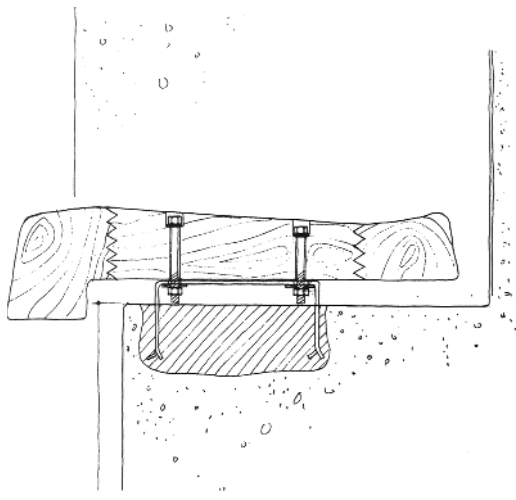
In the zone around the altar, the tabernacle and the pews for the laity and the priests, daylight comes from the west and the east, as well as from the north. In line with the top of the left-hand stair a high vertical window with slender concrete "tracery" reaches from the floor to the ceiling; in line with the right hand stair, a

narrow slot opens in the ceiling as well as in the wall. At the top, a narrow, 6 centimetre wide gap runs along the junction between the wall and ceiling like a long white band of light that encircles the congregation from the left, from the right and from behind. All the liturgical objects and furniture are crafted out of the soft wood of the Swiss pine and in soft curving forms.

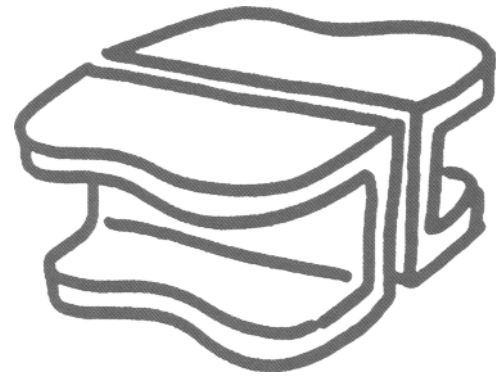
For the design of the interior of the church, the architects were able to draw on previous experience made in earlier projects. Prior to the church at Navarons, they had already tackled the problem of designing an appropriate space for a small but close-knit congregation in the funeral chapel at Vajont and the chapel in the student building at Pordenone. In both cases they chose a

slightly centripetal architectural arrangement, always encouraging informal congregation rather than enforcing it through formal constraint.

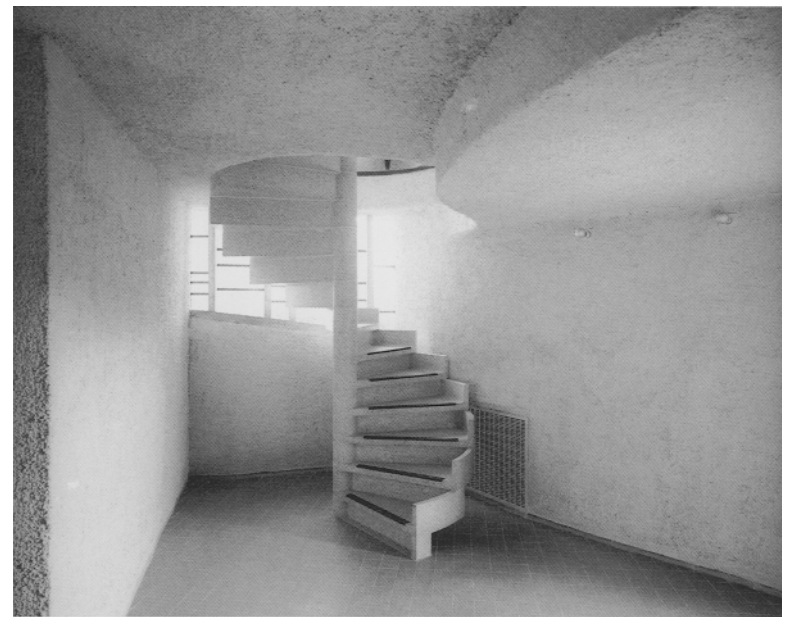
The Church of Our Lady of Lourdes was soon heralded as the "Italian Ronchamp" by architectural critics. Without doubt, Le Corbusier's Chapel of Notre Dame du Haut heavily influenced church architecture throughout western Europe well into the 1970s, its influence still plainly evident in Wojciech Pietrzyk and Jan Grabacki's Church of the Ark of the Lord built in 1977 in Nowa Huta, Poland. However, in Navarons, the relationship to Ronchamp is not one of externalities (it has no sculptural ambitions and is not a "trou de mystère") but one of assimilation and adaptation.



Section through the bench in the outside wall



Sketch of the altar



Altar with fittings and furniture made of Swiss pine | Enclosure around the altar space, light slot along the junction between the walls and the roof | View from the space for silent prayer back towards the altar, at the bottom right the head of the stair | Spiral stair to the lower level

More precisely, adaptation here means imitation: for instance, the light slot between the walls and the ceiling, or the rough, white materiality of the render or the small rounded hollow at the lower end on the west side, which serves a function similar to that of the rounded space on the east side of Ronchamp. Likewise, the choice of rough-hewn stone for the walls and concrete for the roofs is inspired by Le Corbusier, whose innovative combination of the archaic and the modern was a key characteristic of the Villa Maillot in Le Pradet, the Pavillon Suisse in Paris and the Duval factory in Saint Dié.

Le Corbusier's notion that every building can only be fully described by the movement of visitors and us-

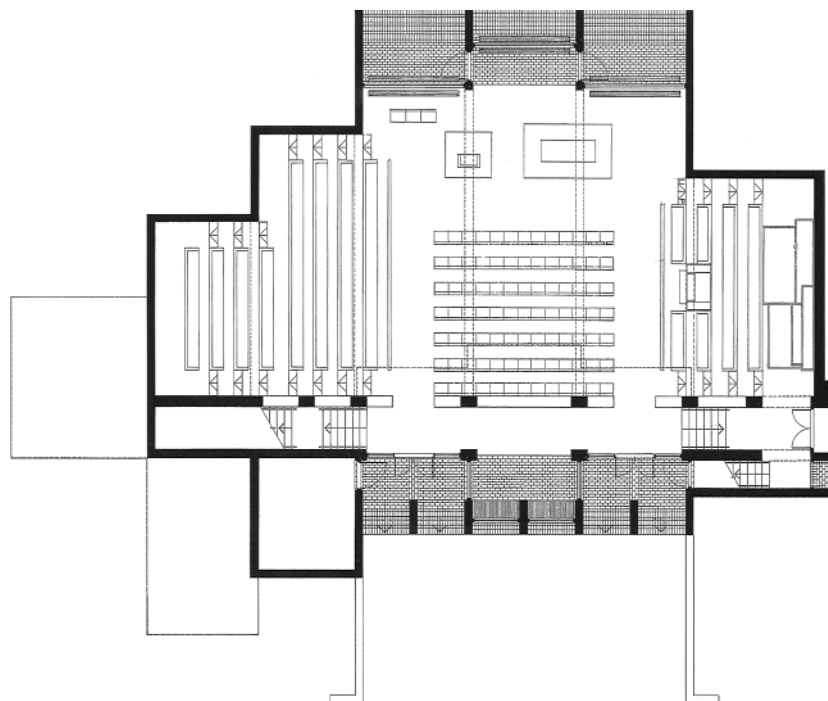
ers passing through it is even more evident in the Church of Our Lady of Lourdes. On their very first visit to the site, the architects interpreted the steep slope of the ground as an invitation to orchestrate a veritable "promenade architecturale". It is therefore no wonder that the designers – who were among the principal drivers of the debates in Bologna – focused not only on the central theme of the Eucharist as *Communio* in their architecture, but also on the spatial interpenetration of inside and outside, of above and below.

In this sense, the promenade begins at the road and ascends towards the entrance, looking across at three rising and bowing forms in stone, behind which one later finds the sacristy, the anteroom and main space. One

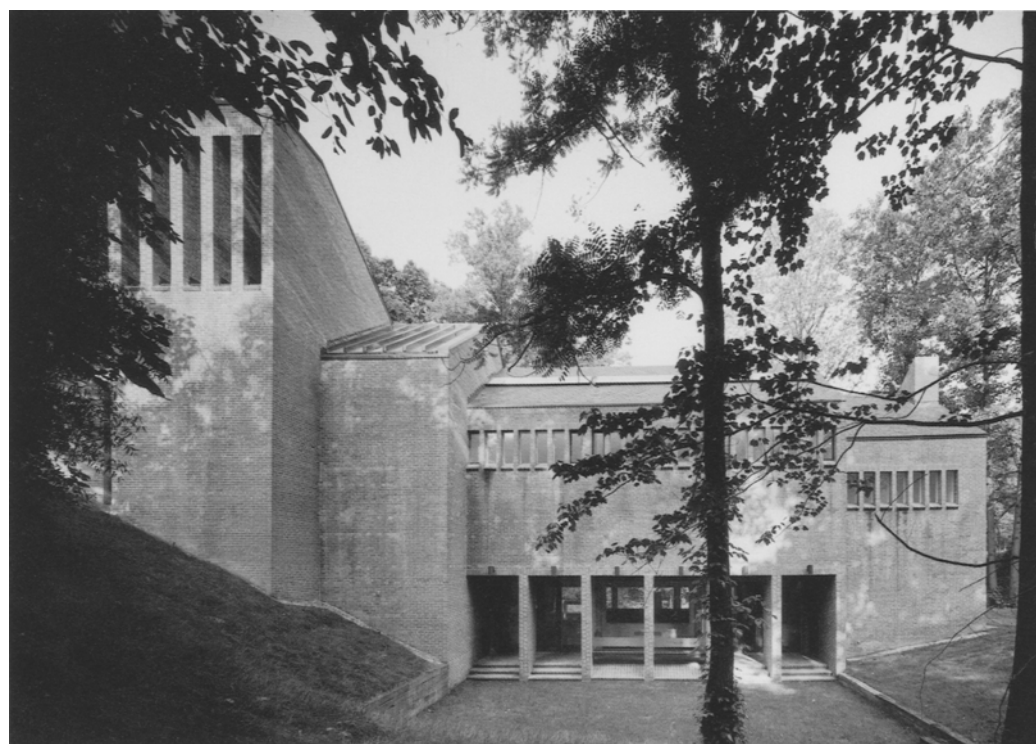
enters through the door into the anteroom, from there turns and ascends the steps on the right into the main space of the church, passing onwards between the altar and the pews, to descend again via the steps on the left into the room with the confessional and the spiral stair. In the level below, one proceeds once around the room, steps into the tiny vestibule and through the door next to the heating room back outside. One follows the curve of three long steps at the end of the rounded courtyard, turns to the right and ascends the lower part of the path next to the church wall before arriving back at the road. One stands only a stone's throw away from where the promenade began.



Site plan



Plan of the lower level

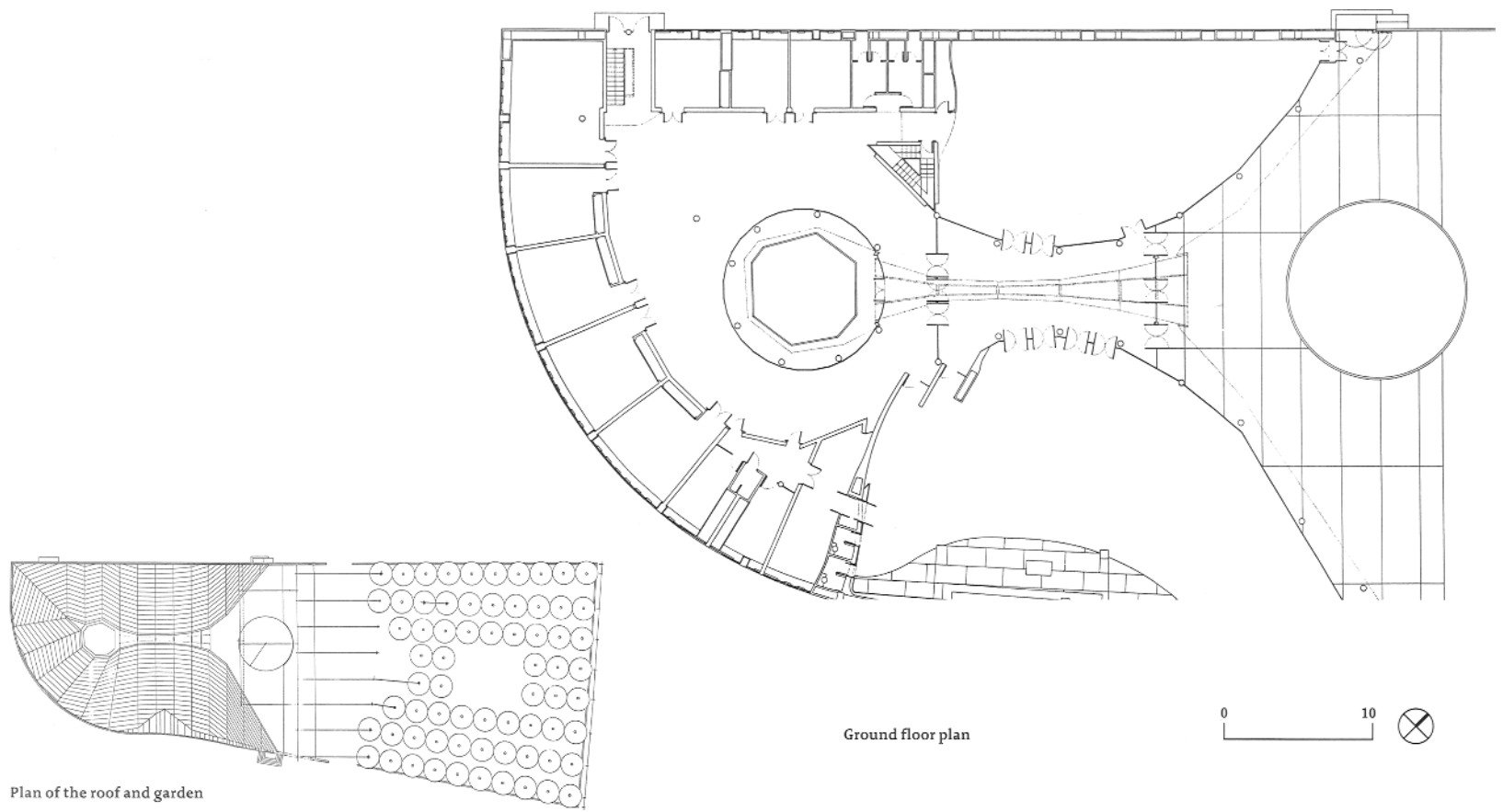


Florence Hollis Hand Chapel, Mount Vernon College

Washington D.C., USA

Architects	George E. Hartman, Warren J. Cox
Client	Callaway Foundation, La Grange
Completion	1970
Denomination	None
Footprint	ca. 697 m ²
Seating capacity	Lower level ca. 100, upper level ca. 200

Like a town within a town, spread around the campus of a typical college in the U.S., there are houses, lecture theatres, sports fields, library, laboratory, refectory, café and the chapel. Mount Vernon College, George Washington University also has such a place. The complex stands on a hillside, measuring 34.4 metres from north to south, but does not, however, resist the slope but instead follows the incline, establishing a relationship with its green surroundings rather than resisting them. From above, the building seems at most one and a half storeys high. It has projections and recesses, is clad in red bricks and grey slate and fits in with the neo-colonial style dominated architecture along Campus Drive. Only lower down does the building risk a big gesture. Here, the chapel appears like a huge slop-



Plan of the roof and garden

Ground floor plan



View from the east, left the church, right the parish hall | View from the south, behind the windows ancillary rooms below, dwellings above | View from the north, behind the stone wall the garden | The church, to the right as if floating, the sculpture above the altar, on the left the pews made of toble.



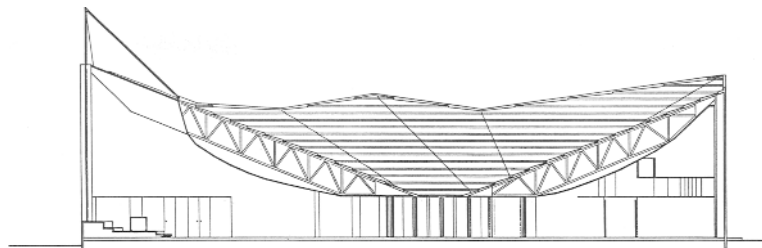
Church of Santa Teresa de Jesús

Tres Cantos, Spain

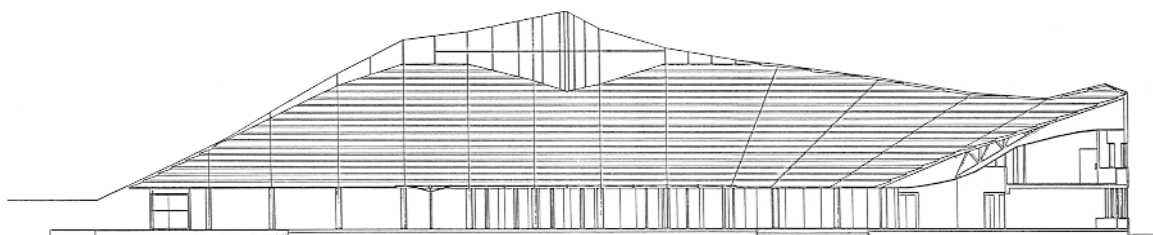
Architects	Andrés Perea Ortega, Julián Franco López, José Manuel Palao Nuñez
Client	Archdiocese of Madrid
Completion	1991
Denomination	Roman-Catholic
Footprint	Church 437.91 m ²
Seating capacity	ca. 300

Founded in the seventies as a suburb on the northern periphery of Madrid, Tres Cantos today has almost 40,000 inhabitants. Like many modern satellite towns, this estate also suffers from problems of a lack of density and functional mix. The church stands on level ground on a tapering curving site. Half of the site serves as a garden and half is occupied by the church. The building makes no attempt to pay heed to its urban surroundings and gives no indication of its typology. It is therefore not exactly broken down into smaller distinguishable parts, nor is it particularly recognisable by symbols such as a tower or a nave.

From low down one sees a large concrete shape that, with its ups and downs, corners and edges, is like an



Cross section



Longitudinal section



abrupt range of white hills, dissociating itself from the long, red blocks of flats in the neighbourhood. From above, however, seen from the flats in the upper storeys of the residential blocks to the northwest and northeast, the object has the form of a hollow. The terraced formation falls from all sides in the direction of a walkway and a polygon with a tiny formal garden. An elongated rooflight denotes the part of the building intended for church services. Its apex runs along the eaves line of the gently curving external wall and rises to a high point like the peak of an iceberg 13.8 metres above the ground.

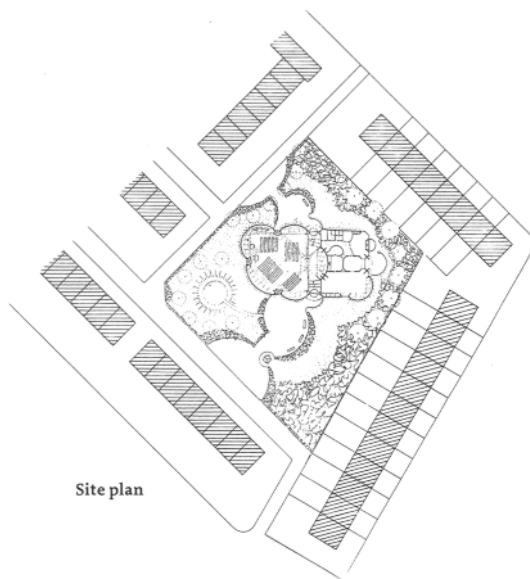
Coming from the garden, one is led into a forecourt from where, passing between the religious hall on the

left hand side and the secular hall on the right, one reaches a glazed promenade leading from the northeast to the southwest deep within the building into a 'rotunda' and facing a 'cloister'. The centre of this space, the aforementioned formal garden, is open to the sky. In the 'cloister', at the lower level, there is a series of ancillary rooms, notably the sacristy and offices, and above, three dwellings with a gallery overlooking the 'rotunda'.

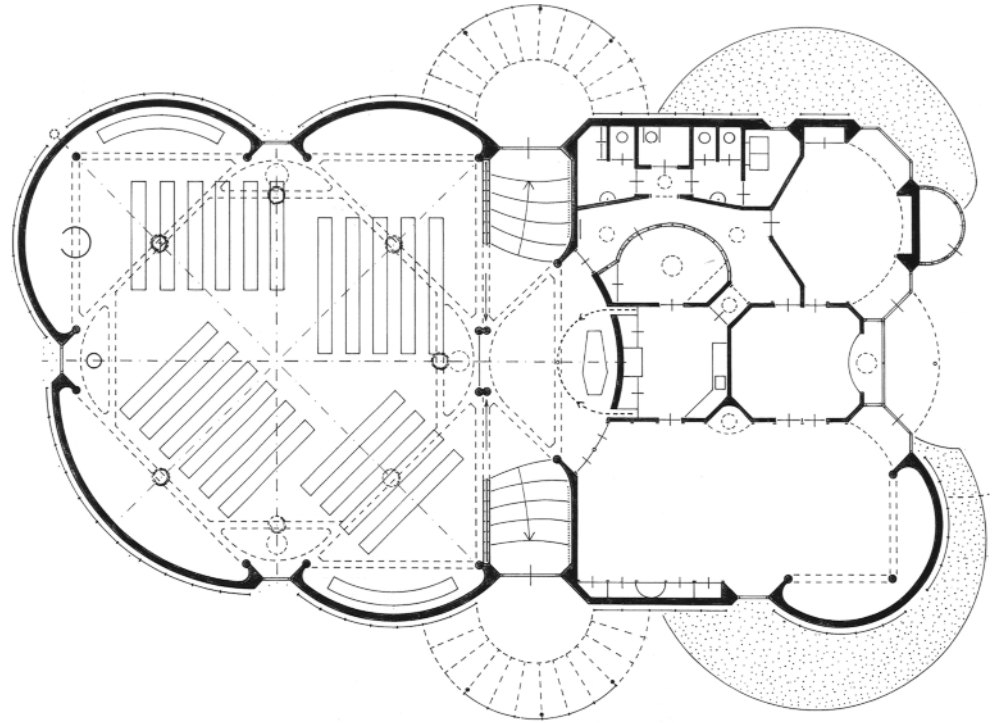
The plan of the hall, in which the churchgoers meet for services, is in the form of a segment. From the glass wall containing four double doors, the white ceiling sweeps upwards in a single, mighty gesture. The aforementioned rooflight widens out over the presbytery and, together with the full-height band of glass, produces on

the smooth wall behind the altar, depending on the strength of the sun, an almost blazing background for the sculpture with the figures of Teresa of Avila and of Jesus of Nazareth. Following the curvature of the glass wall, the pews are arranged in an arc around the altar.

When the building was designed in the early eighties, the architect considered the revered "architettura della città" of the likes of Aldo Rossi to be a "mistake," indeed an absolute "escapade", particularly in a suburban context. Strangely, yet recognisably so, the Church of Santa Teresa de Jesús introduces a Finnish flavour into a Spanish context. The building is landscape, and in this respect it is reminiscent of some of the work of the Finnish architect Reima Pietilä.



Site plan



Floor plan



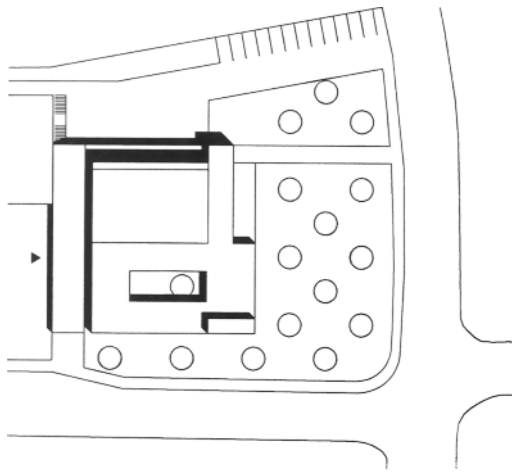
Entrance from the south, under the zinc roof on the right the ancillary rooms | View from the north, on the left the profane functions, on the right the sacred functions, on the far right the bell frame

Maranatha Moluccan Church

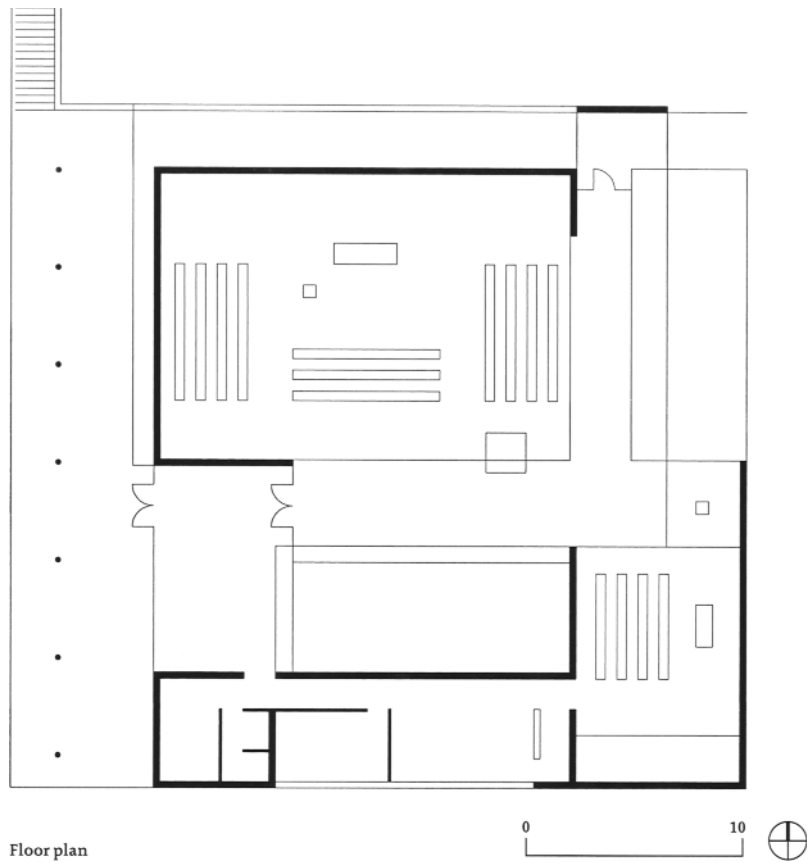
Deventer, Netherlands

Architects	Aldo van Eyck, Hannie van Eyck
Client	Moluccan Community Deventer
Completion	1992
Denomination	Protestant Free Church
Footprint	ca. 550 m ²
Seating capacity	250

The trapezium shaped site has two almost 60 metre long sides and its position is totally imprisoned by surrounding blocks of flats. The situation and house of the Moluccan parish community avoids being typically religious and resembles a children's day centre or a youth club. As such, the grounds and church are like an oasis, a paradise in alien surroundings. This impression stems from the transformation of the grounds into a garden. The elongated building stands diagonally on the site. The upper curved parts of the façade are clad in vertical wooden slats, the lower parts, not only the curved but also the upright elements are enclosed by a metal trellis, on which white roses climb up a matt blue background.



Site plan



Floor plan



View of the entrance area from the north, left the ground-level glazing strips on the west side | View from the southeast with illuminated beacon by Keith Sonnier

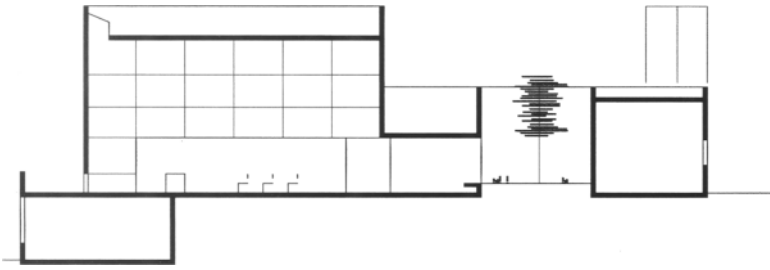


Church of St Francis

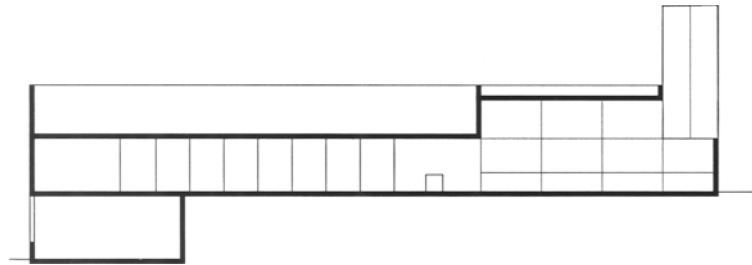
Steyr, Austria

Architects	Peter Riepl, Gabriele Riepl
Client	St Francis Roman-Catholic Parish office, Steyr, and Bishopric of Linz
Completion	2001
Denomination	Roman-Catholic
Footprint	ca. 840 m ²
Seating capacity	ca. 150

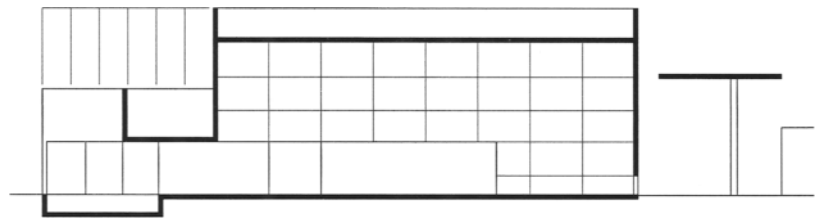
Surrounded to the north and west by a large residential estate totalling some 6000 flats, bounded to the south and east by intersecting roads, the church in Resthof/Steyr stands on a plot of land measuring 28.2 by 29.8 metres. The concrete monolithic construction of almost chthonic solidity has a light colour that shimmers grey/green/brown. The corner that faces the road junction is marked by a rectangular tower-like glass protrusion. Instead of bells it contains a coloured, illuminated sculptural installation by Keith Sonnier. Twelve loops of intertwined neon tubing suggest the contours of a fish. This early sign, originally a secret means of recognition among Christians, is so powerful at night that it has almost become a sign for the entire neighbourhood.



North-south section through the altar zone



North-south section through the front and chapel



East-west section through the central axis that divides the building



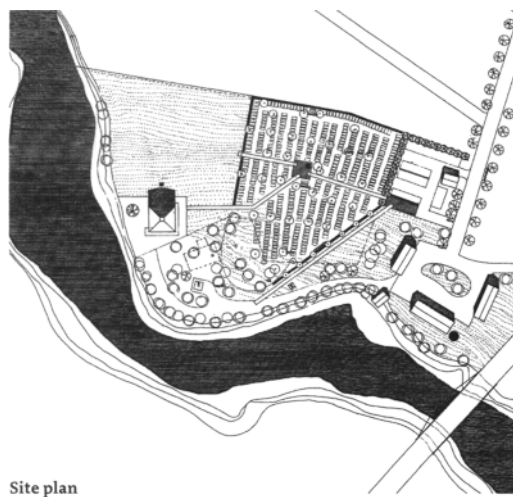
Church space with view of the red-coloured altar block | Central west-east axis, with font in the background

On its west side, the front of the building is covered by a concrete canopy supported by seven cylindrical columns. Due to its size and the repetitive rhythm of its parts, the 6.8 metre deep loggia or stoa has a certain dignity, even solemnity. Entering through the glazed entrance and lobby, one continues along a central west-east axis, which extends through the building like a backbone towards the black stone font at the rear. The axis divides the building into two halves, the space of the church on the left and, on the right, all other auxiliary rooms including a 9 by 4 metre inner courtyard which is partially enclosed by concrete walls, partially glazed, and designed like a Japanese garden.

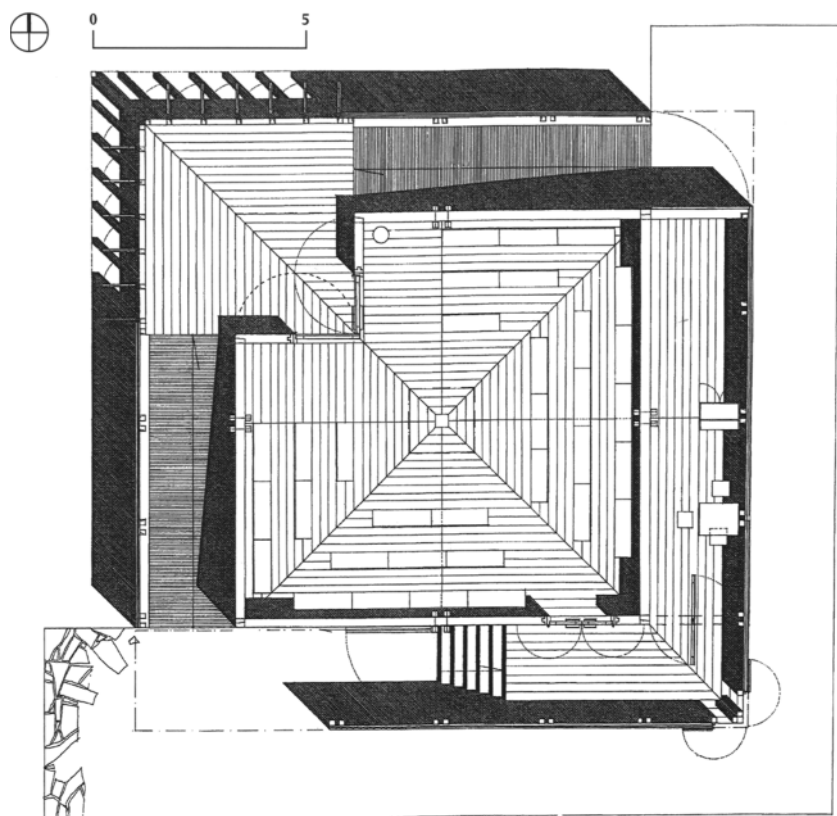
The building does not awaken associations; it does not recall a fortress, a tent or boat. Architects may see a relation to the free plan in the work of Mies van der Rohe as exemplified by his Barcelona Pavilion. The five spaces of the complex – church, chapel, sacristy, lobby and “cloister” – are open to one another, creating a flowing space yet without compromising the underlying grid of the floor plan. This hierarchy of functions, in other buildings denoted by a front-back or centre-edge relationship, is never unclear. This is because the main church space and sacristy are higher than the lobby and “cloister”. And, as if to emphasise this still further, the processional route begins outside from the road and leads right around the church space used for the Sunday Mass, the first half outside – east-north –

the second half inside the building – west-south – effectively walking around a volume within the volume of the building.

The church floor is slate; the walls and ceiling are clad with birch panels. The pews are arranged in three groups around the low podium, and the altar and can seat 150 people. The deep red of the altar is the strongest colour in the entire building. The 7.2 metre high space of the church is naturally illuminated by strips of glazing at roof and ground level, and to the south and east by the long frameless windows onto the inner courtyard and pond next to the font. When, at dusk, the downlighters illuminate the walls, the wood glows almost like gold.



Site plan



Floor plan



View from the northwest with the shutters | View from the southwest, the entrance to the sacristy on the right of the near corner, to the left the ramp leading to the vestibule | Entrance with ramp in east-west direction, a section of the room-high shutters is visible in the background | Vestibule with the banks of the river in the background | The church looking towards the door to the sacristy with the altar beside it



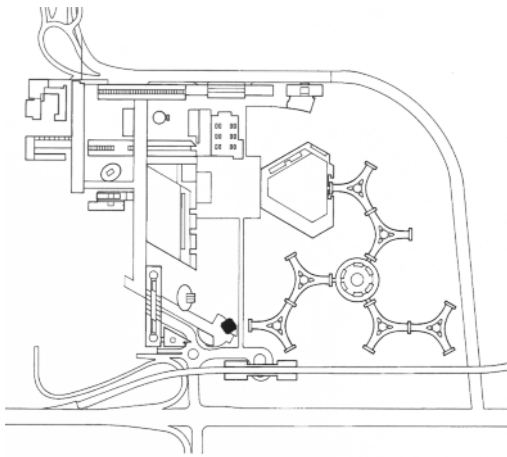
Kärsämäki Church

Kärsämäki, Finland

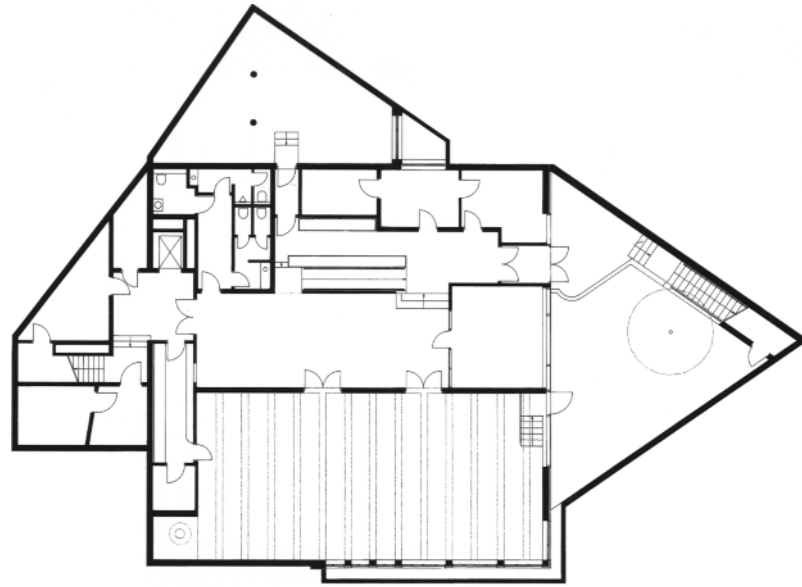
Architect	Anssi Lassila
Client	Kärsämäki Protestant Church Parish and University of Oulu
Completion	2004
Denomination	Lutheran-Protestant
Footprint	ca. 144 m ²
Seating capacity	ca. 100

The building stands in the midst of fields and meadows on the banks of the Pyhäjoki river. The site lies in the direct vicinity of a former mid-18th-century church that was destroyed in the mid-19th-century. At the end of the 20th century, the idea arose to rebuild the church in its original form but was discarded when it became impossible to find reliable historical documentation. As a result, the parish initiated a competition for a church of the 21st century built with the materials and techniques of the 18th century.

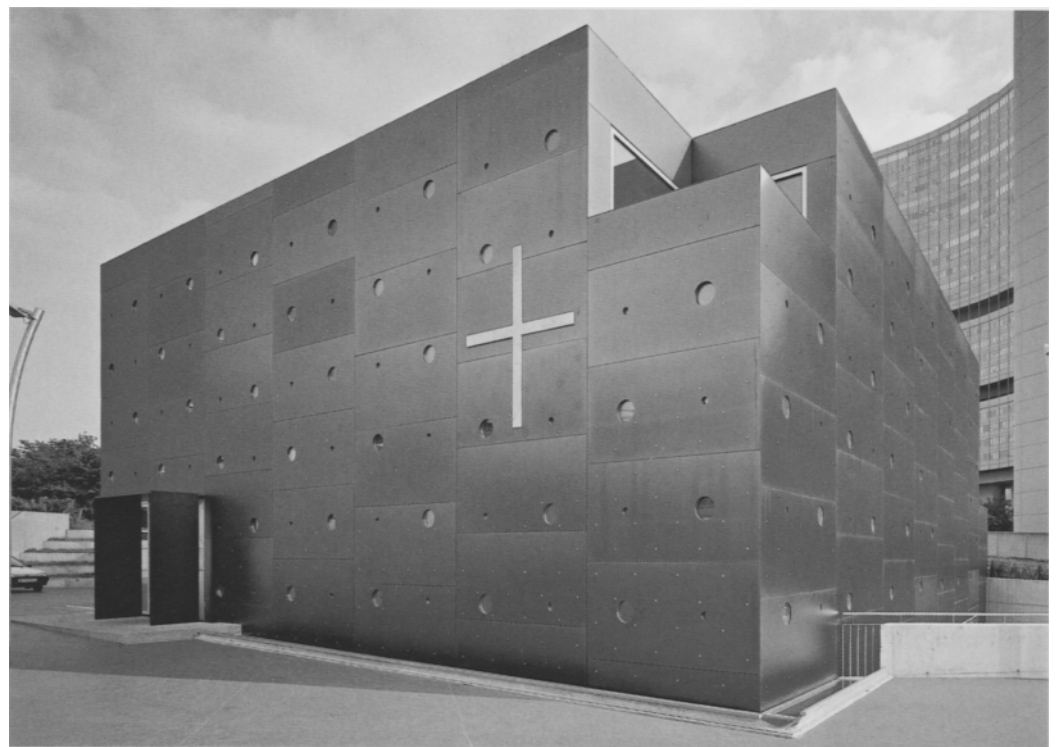
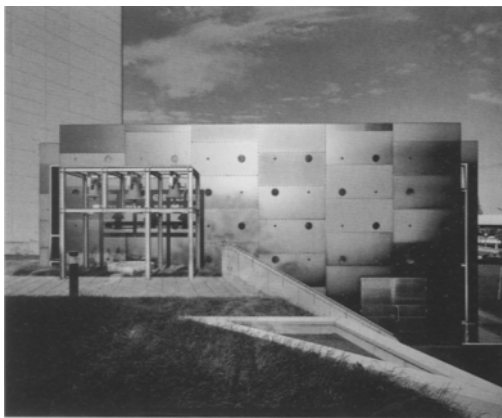
In the new church, the archaic enters into a close relationship with the modern. Four walls and four roof surfaces form a cube and a pyramid, entirely covered in a blackened exterior skin. The building is almost entirely



Site plan



Lower level plan



View from the west, on the left the steel belfry | View from the southeast, on the far left the corner with the entrance

Donau City Church

Vienna, Austria

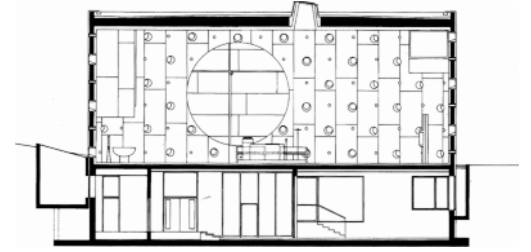
Architect	Heinz Tesar
Client	Archdiocese of Vienna
Completion	2000
Denomination	Roman-Catholic
Footprint	ca. 485 m ²
Seating capacity	150

In close proximity to an underground station, concave and convex high-rise buildings from the seventies and a series of office and commercial buildings built in the nineties, the church in "Donau City" is placed diagonally on the three-quarter roundel of a plaza produced by the forking of two roads. The rectangular volume consciously avoids any competition with the vertical architecture of its immediate surroundings.

As a result, at first glance, the angular building is almost inconspicuous. It is a volume made of concrete, a half cube with dimensions 21.5 by 21.5 by 10.75 metres. Its four external walls are clad in chromium steel panels that reflect a black, blue or brown colour, and are arranged horizontally, underlining the form of the



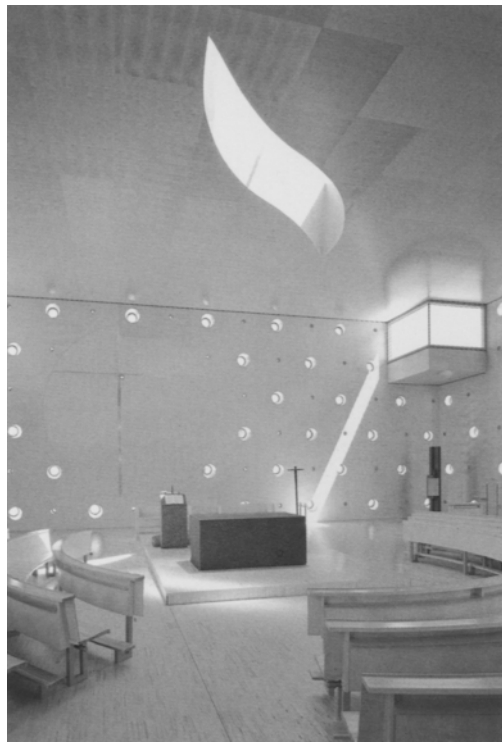
Upper level plan



Section with view of the wall behind the altar



Section with view of the wall behind the belfry



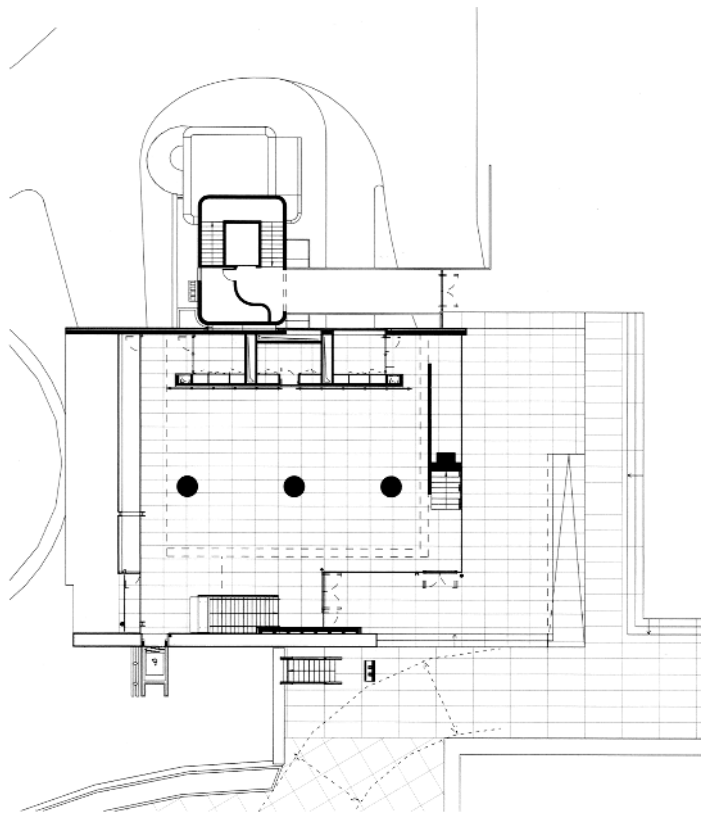
Entrance area on the southwest side | Altar area showing stele with tabernacle and eternal light beneath the quadratic skylight

building. Almost all of the 100 panels, each 2.7 by 1.35 metres in size, are punctured by a grid of fine holes as well as smaller and larger round windows. These flush "portholes", as well as glazed cutouts in the corners of the building, allow light into the interior. The entrance to the church is placed on the corner. Silvery double doors open to the left and right of one of these cutouts, which is signified from outside by a portal and pool.

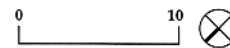
Hard and cold on the outside, warm and gentle in the interior, dark coloured on the outside, light on the inside: this opposition breathes life into the church. The maple floor, birch walls and, in particular, the numerous round windows create a space of almost ba-

roque quality. The pews, grouped in three sharply defined sections, are arranged around a raised dais with the altar slightly off-centre, the ambo and the sedilia, whose forms are pared back to the minimum. Made of syenite, the colour of the altar varies between grey and black. An elongated slot of skylight opens above the block of the altar; a stretched S-shaped gash, whose form is intended to denote the wound inflicted on Christ's heart. To the left and to the right behind the altar table, two partly glazed, partly wood-covered cutouts define two further spaces in the corners, the first for the font, the second for the stele with the tabernacle and eternal light. In front of the altar and the pews, hidden in the wall, is a small room for the confessional as well as an entry and exit for the priests.

The sacristy and the rooms for the parish are located on the lower floor. The sloping nature of the site, barely perceptible from outside, makes it possible to locate the secular functions where one cannot see them from the plaza. In addition, the sloping ground has been exploited to raise the belfry to the left of the entrance, reached by a flight of grassed stairs, and a triangular cutout courtyard to the right to allow light into the lower floor.



Middle level plan at the height of the esplanade



Our Lady of the Pentecost Church

Paris, France

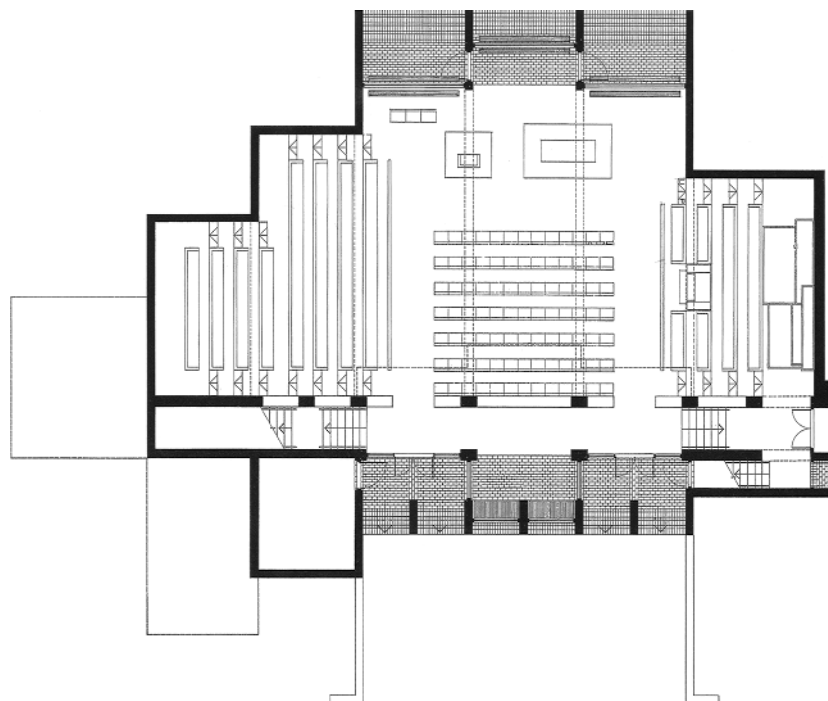
Architect	Franck Hammoutène
Client	Diocese of Nanterre
Completion	2001
Denomination	Roman Catholic
Footprint	Hall 213.3 m ²
Seating capacity	ca. 300

In La Défense, where millions of square metres of office space have been pressed into a variety of forms since the fifties, the church is the smallest building. It stands at the edge of the gigantic esplanade of the Grande Arche and is enclosed on three sides by the arching form of the Centre National des Industries et Techniques (CNIT) to the northwest, a wing of an office building to the southwest and the entrance and exit of a road tunnel to the northeast.

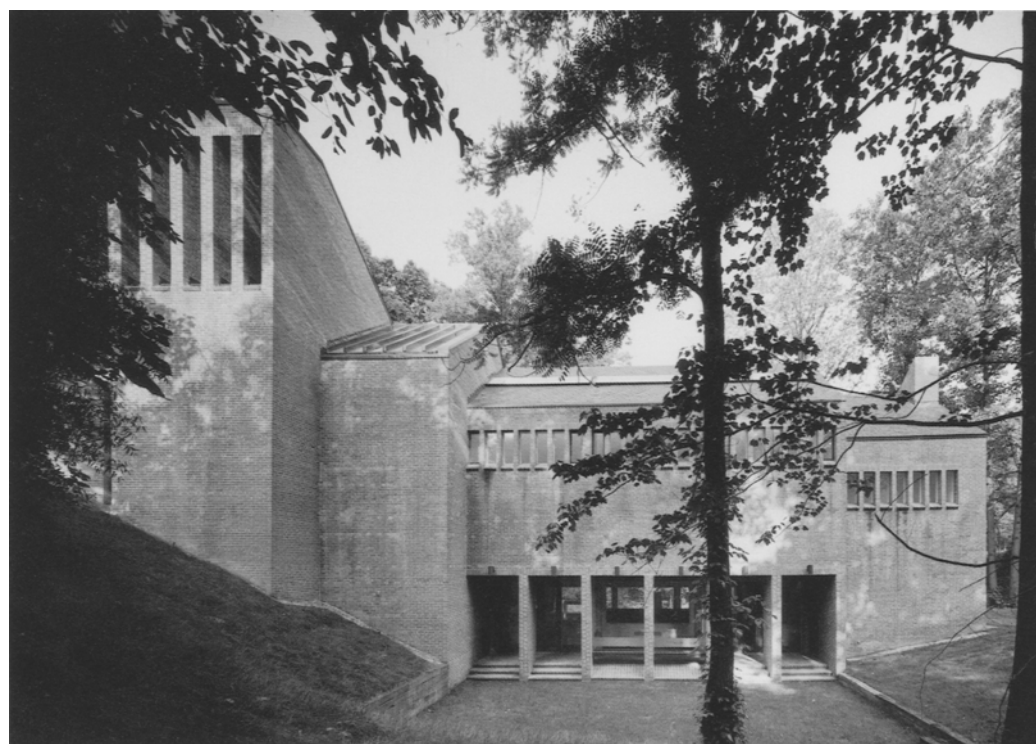
The church rests on 63 slender pile foundations and six 1.2 metre thick concrete columns. For the most part, the building takes the form of a cube made of concrete, steel and glass. Its lower and middle floors are used for gatherings and administration, the upper floor for the



Site plan



Plan of the lower level

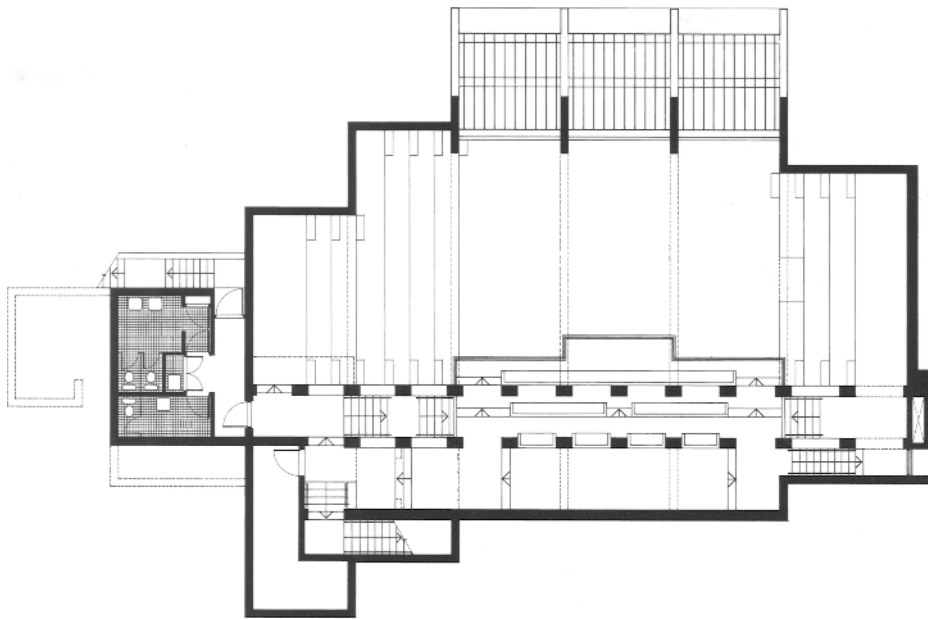


Florence Hollis Hand Chapel, Mount Vernon College

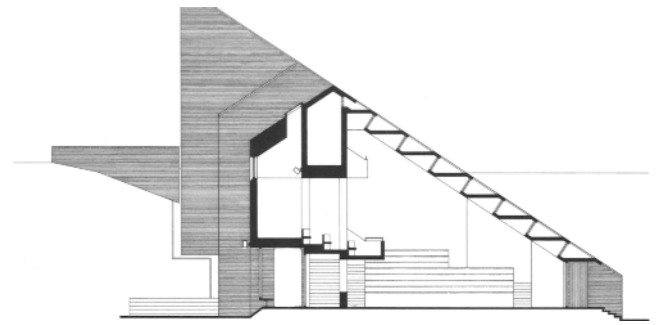
Washington D.C., USA

Architects	George E. Hartman, Warren J. Cox
Client	Callaway Foundation, La Grange
Completion	1970
Denomination	None
Footprint	ca. 697 m ²
Seating capacity	Lower level ca. 100, upper level ca. 200

Like a town within a town, spread around the campus of a typical college in the U.S., there are houses, lecture theatres, sports fields, library, laboratory, refectory, café and the chapel. Mount Vernon College, George Washington University also has such a place. The complex stands on a hillside, measuring 34.4 metres from north to south, but does not, however, resist the slope but instead follows the incline, establishing a relationship with its green surroundings rather than resisting them. From above, the building seems at most one and a half storeys high. It has projections and recesses, is clad in red bricks and grey slate and fits in with the neo-colonial style dominated architecture along Campus Drive. Only lower down does the building risk a big gesture. Here, the chapel appears like a huge slop-



Plan of the upper level



Cross section



View from the south, on the right, partially obscured, the entrance | View from the west, the altar zone is behind the front part of the roof | View from the east, tower with the bells on the left | View of the hall with the classically conceived gallery | View into the chapel from the south, left the altar and ambo, in the background the organ

ing and low-slung roof with a strong frame and a regular grid.

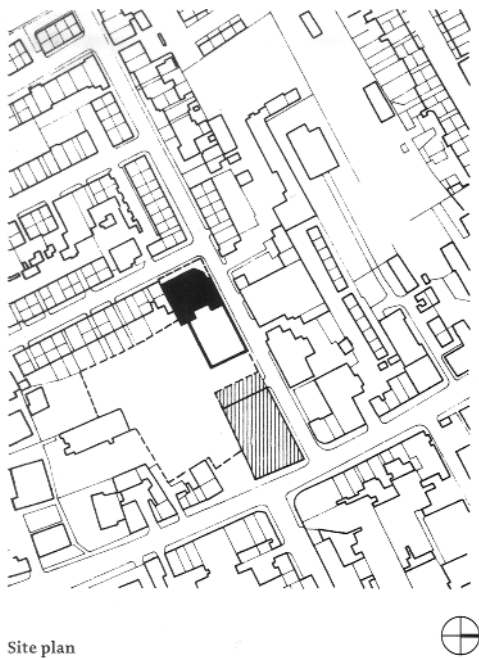
The interior of the chapel has an upper, middle and lower level. The entrance is on the upper level, on the southeast side of the complex. Under the tower block with the bells there is space for cloakroom, choir room, office and a foyer with a small balcony, which affords a view into the hall. Next to this is a bridge, which carries the technical services across to the north side of the building. Apart from the sacristy and the toilets, the middle level is all part of the main hall. This includes the stepped gallery and the side staircases to the galleries on the south and north sides of the chapel, which are separated by wooden parapets from the central sec-

tion of the lower space. The framing of the gallery – its format, symmetry and relationship of wall to opening – follows a classical pattern, though this can be appreciated properly only from the lower level.

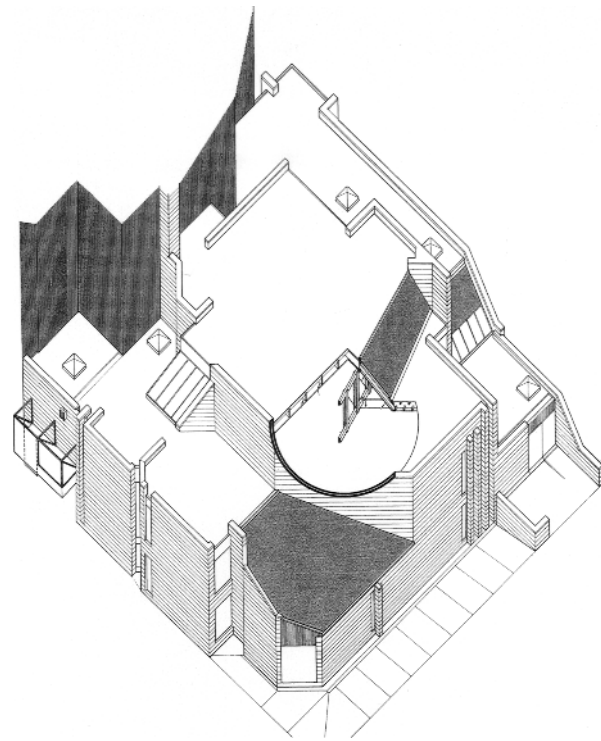
At this point, the orientation of the space changes. Three wide window niches afford a view out over the dogwood in the park outside, directing one's attention to the east and west, rather than south and north, despite the organ on the raised gallery. White walls, brown parquet and red carpet are reminiscent of the colourful interiors of 18th-century English churches. There are around 100 oak chairs below; in the side and rear galleries there is space for a further 200 people. The altar stands on a podium to the west. Above it, rows of

skewed, elongated "coffers" rise up with the roof, which has a 45 degree pitch. Light falls through the canopies of the trees onto the grey zinc strips and from there it is reflected through oblique glass strips first onto the underside of the roof sections and then into the hall. The light that illuminates the space is always indirect and always reflected.

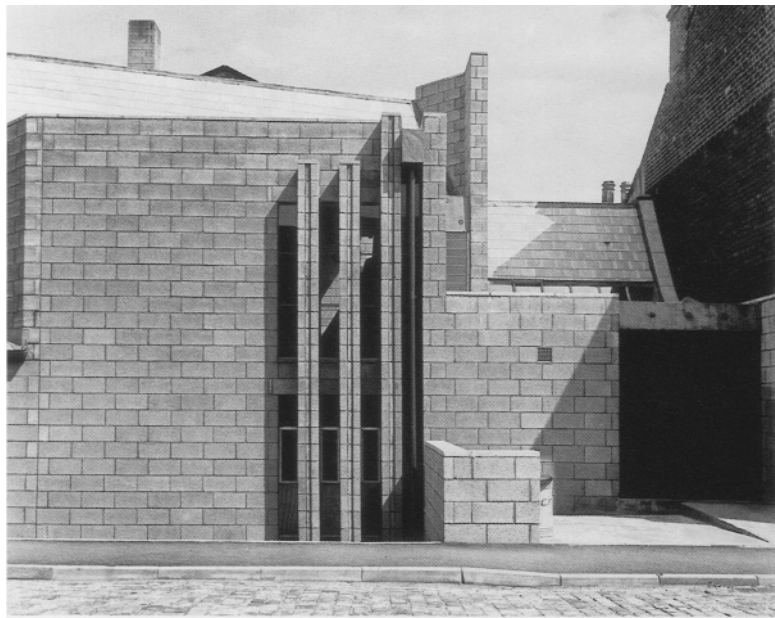
The Florence Hollis Hand Chapel at Mount Vernon College is non-denominational, although its programme employs altar, ambo and ritual objects. Its atmosphere is redolent of the type of assembly hall found in older high schools as well as the type of main auditorium in traditional universities, which is why a periodical gave the chapel the name "Worship Music Drama Building".



Site plan



Axonometric with cutout showing roof truss



View from the southwest, on the right the side entrance to the stage and youth club | View from the west, on the left the entrance, in the centre one of the classrooms, above it a window above the stage | Junction between the old and new buildings on the northwest side | Main entrance with canopy and sign on which the spotlights that illuminate the façade are fixed

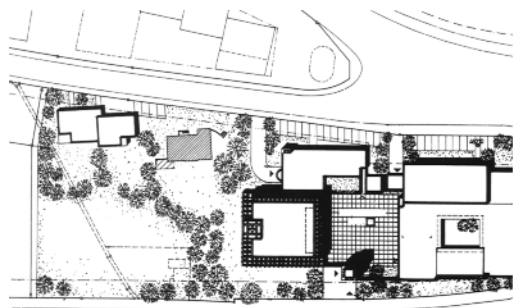


Morley Central Methodist Church Annexe

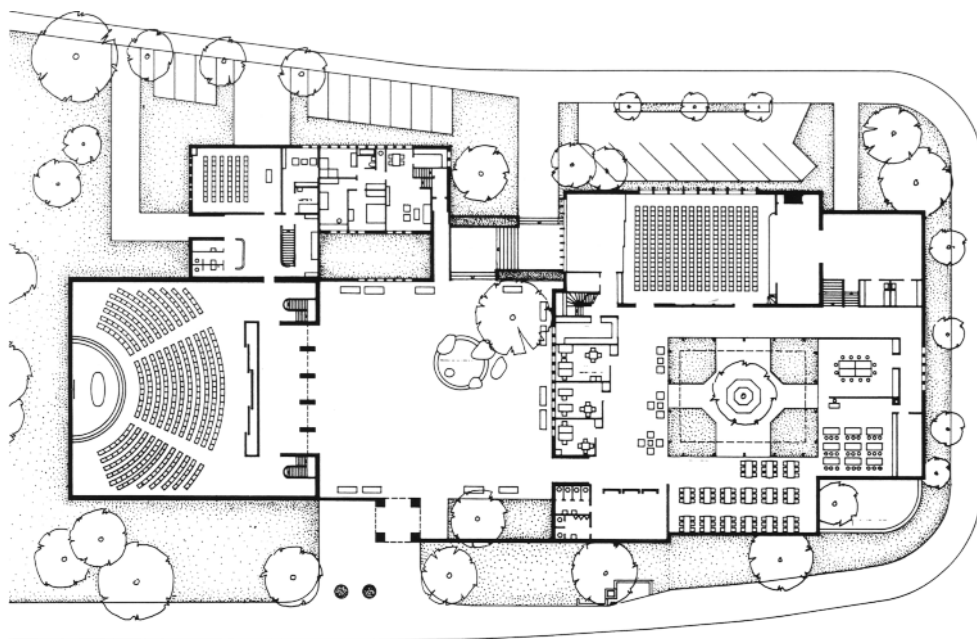
Leeds, Great Britain

Architect	James N. Thorp
Client	Morley Central Methodist Church
Completion	1970
Denomination	Methodist
Footprint	ca. 408 m ²
Seating capacity	Hall 250

In the period between the late sixties and the late seventies almost every church was planned as a community centre. The church is not solely a building for the church service or a vessel for the holy; it is simply the place where believers congregate in the name of Jesus Christ. "A church should be functional" was the motto of the day. Accordingly, the functional programme of church buildings provided spaces for younger and older people to come together not only on Sundays but also on weekdays for all manner of social and cultural activities. No naves, no towers, no processional arrangement, no congregational arrangement: the specifically sacred elements were abandoned in favour of multifunctional or polyfunctional spaces. Many such new spaces – which were also used for Catholics to cel-



Site plan



Ground floor plan



Churchyard with the base of the tower on the left, in the background the entrance to the church with the cast aluminium panels of the relief "Water and Fire" by Bernard Schorderet | View from the west with the 35 metre high "campanile" | Main church showing the combined altar, pulpit and font, hung below the rooflight the wall tapestry by Moik Schiele | Back of the church hall with the musicians' gallery

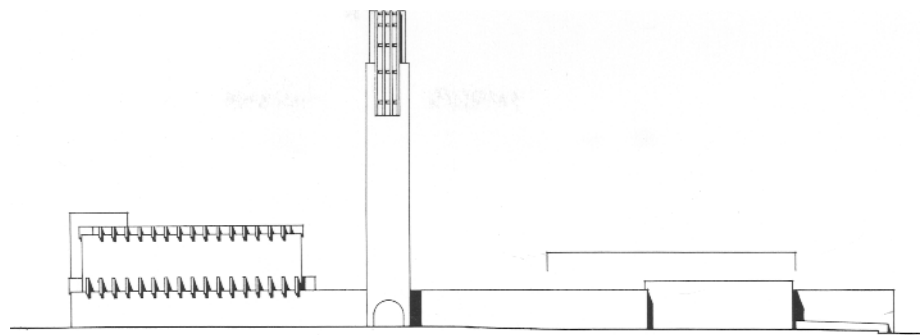


Glaubten Reformed Church

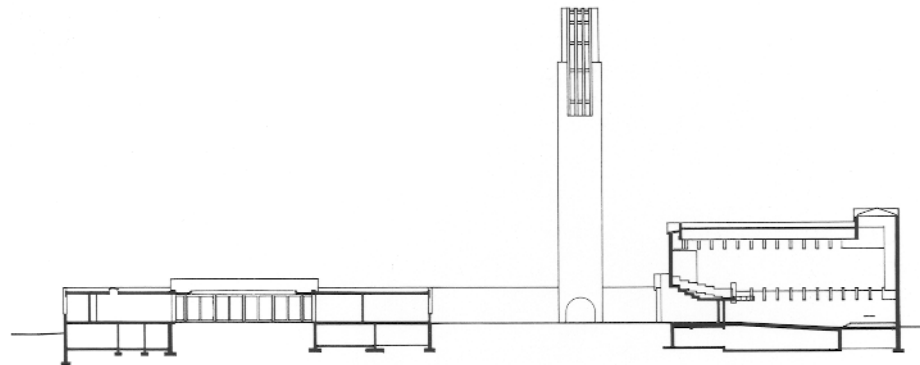
Zurich, Switzerland

Architects	Rudolf Guyer, Esther Guyer
Client	Zurich-Affoltern Reform Church Council
Completion	1972
Denomination	Protestant Reformed
Footprint	Church ca. 609 m ²
Seating capacity	Lower level ca. 450, upper level ca. 80

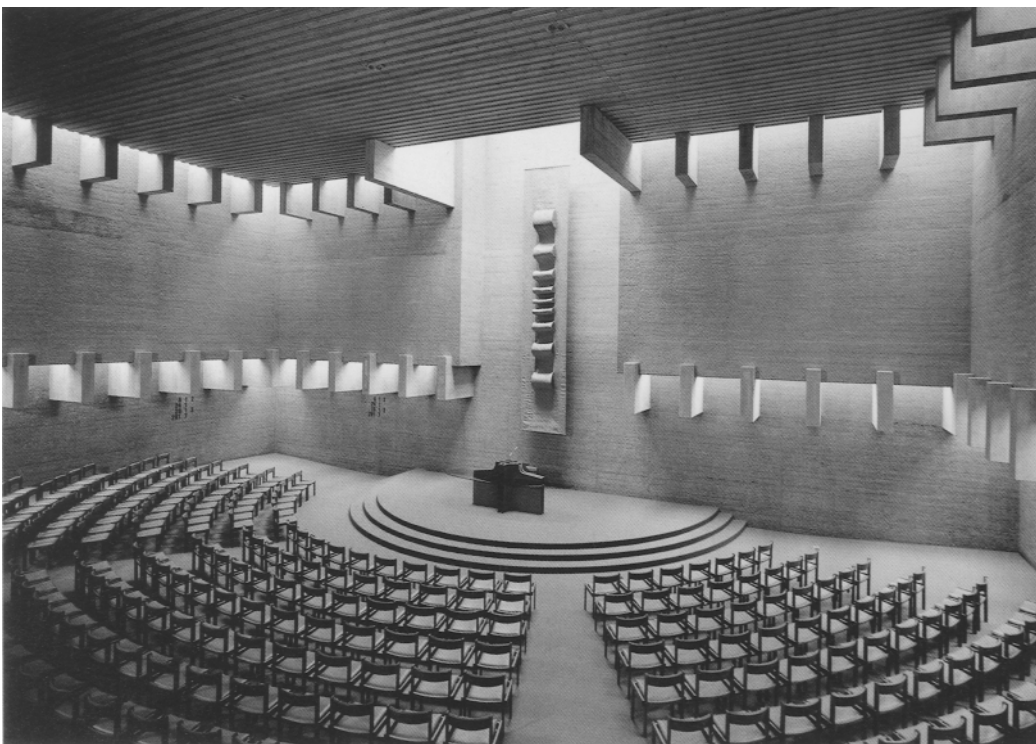
Surrounded on three sides by traffic noise, the church adopts a withdrawn position from the street. The complex is enclosed by a ring-wall that is only open in two places: a flight of steps to the north, and four rounded arches at the base of the tower to the south. The parts of the building to the east provide facilities for social and cultural activities; here an older parish hall has been extended with three new wings around a new green courtyard in the middle. The parts of the building to the west encompass the main church, the wing containing a room for devotions, the parish rooms, the verger's residence and the 35 metre high tower with its six bells. The ensemble surrounds a paved court. This, together with the church, forms a rectangle of 51.5 by 23 metres.



South elevation



Longitudinal section



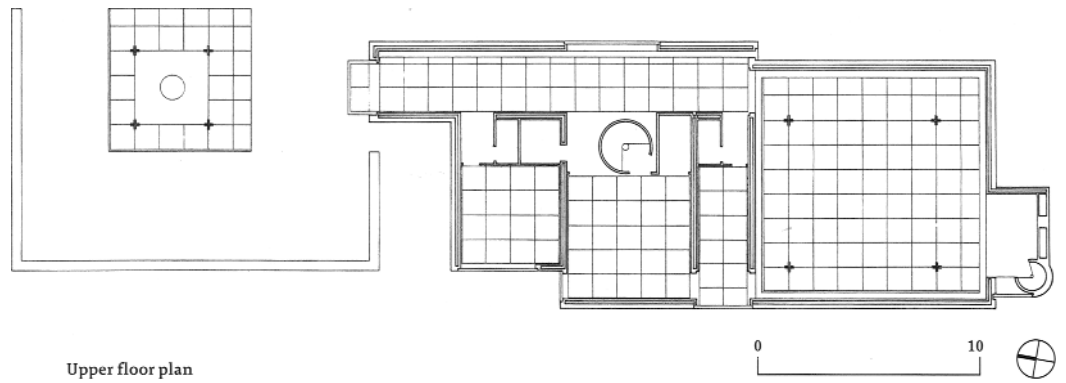
The architects gave the church project the name “cella”. It has resulted in a piece of extremely concentrated architecture. Due to its surroundings, the building presents a windowless exterior. The “bunker” is constructed almost entirely of concrete, with a brownish hue, roughened and textured with a hammer so that, at first sight, it looks like stone. The pre-fabricated, projecting concrete beams between the lower and upper levels and between walls and roof are smooth and grey. Slab columns and the stepped portal give the open entrance a somewhat sober feel. One enters the building through “Water and Fire”, to the left or right of a 14.5 metre wide and 2.3 metre high relief made of cast aluminium panels with a gold leaf depiction by Bernard Schorderet.

The volume of the church gives the impression of a half cube. It is, however, not without direction. On the contrary, the gently sloping floor towards the 9.8 metre high front wall, the placing of the 450 chairs in three sections, the semicircular stage of the altar and the rooflight above it establish a clear orientation.

To emphasise the liturgical focus of the space, a single, partly copper and partly glass element serves simultaneously as altar, pulpit and font. This is also emphasised by the wavy copper-thread tapestry by Moik Schiele. The brown of the wall hanging, the green of the floor, the wooden ceiling and the grey of the projecting beams: the calm, earthy colouring is bathed in a constant matt sheen by the soft streaks of reflected

light coming from all sides. Windows with a view to the outside would destroy this effect.

The design of Glaubten Church dates from the year 1965. It is able to combine modernity and classicism in a memorable way. The *béton brut* and the relationship between wall elements and projecting beams can be seen to relate to individual works by Kenzo Tange or Paul Rudolph. The dominant campanile however boasts other influences. This sort of *italianità* with veiled references to the Romanesque period, the Renaissance and the rationalism of the twenties and thirties is a precious rarity in the middle of the sixties north of the Alps.



Upper floor plan



Site plan, chapel in the southwest of the site



The church hall from the east, clear glass mounted in black steel frames | View from the west, right the high space of the church, left the low canopy



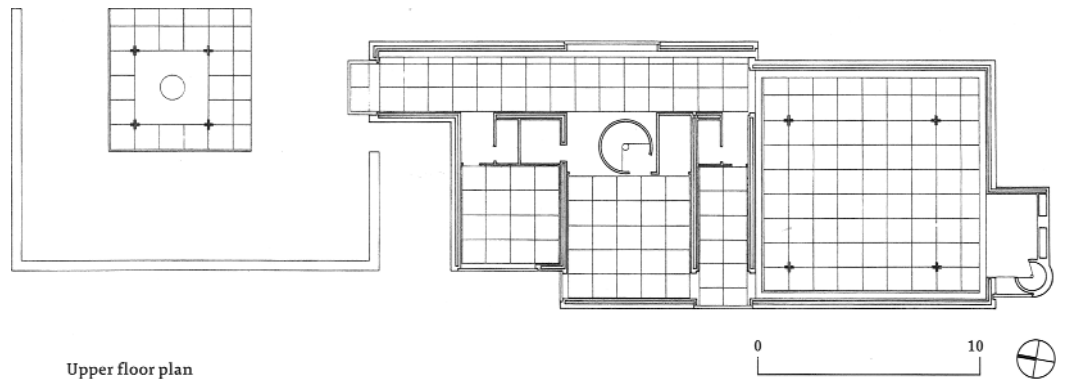
Höör Chapel

Höör, Sweden

Architect	Bernt Nyberg
Client	Parish Council of Höör
Completion	1972
Denomination	Lutheran-Protestant
Footprint	Chapel ca. 112 m ²
Seating capacity	75

Höör lies almost in the middle of Scania, a province at the south tip of Sweden. Its nearly 15,000 inhabitants live in a couple of villages which, since the end of the sixties, form a community completely shaped by rural tourism. When the churchyard was extended at the beginning of the seventies, a chapel was also added. As the site slopes distinctly to the south, it was not difficult to separate the lower level, which was reserved for the preparation of funerals, functionally and visually from the upper floor. This meant that the chapel could also be used for services on Sundays.

The plan of the building is in the form of a square. On arriving at the cemetery, visitors soon encounter a square with equal sides when they follow its central



Upper floor plan



Site plan, chapel in the southwest of the site



The church hall from the east, clear glass mounted in black steel frames | View from the west, right the high space of the church, left the low canopy



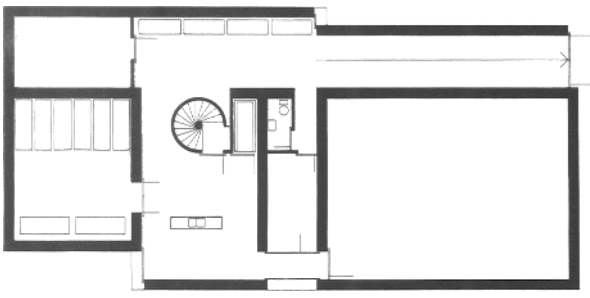
Höör Chapel

Höör, Sweden

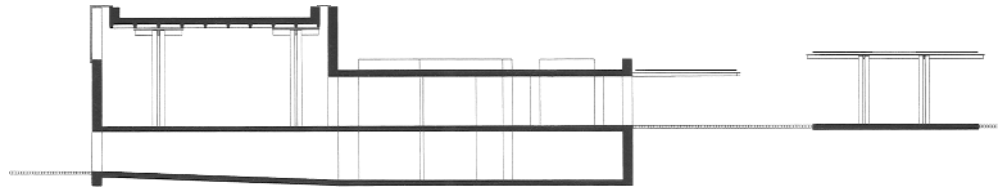
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Lower floor plan



Longitudinal section from the east



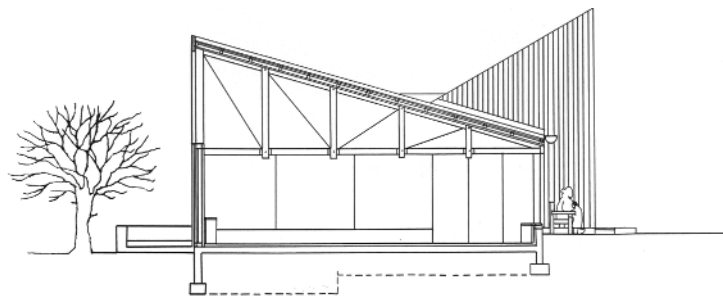
Chapel with view towards the west wall | Corridor with the same concrete coffered ceiling as used in the chapel

axis in a westerly direction. At the far end of the axis – at the crest of the hill where the path appears to vanish – there is a canopy, the posts of which define the corners a square of three by three units. Behind the entrance on the left hand side the square shape reoccurs. In the elongated building, an L-shaped access route links three squares of four by four, five by five and six by six units respectively. In the progression from the smallest square in the north to the largest in the south – at the same time a progression from open canopy to closed assembly space – the area for the mourners doubles from each to the next.

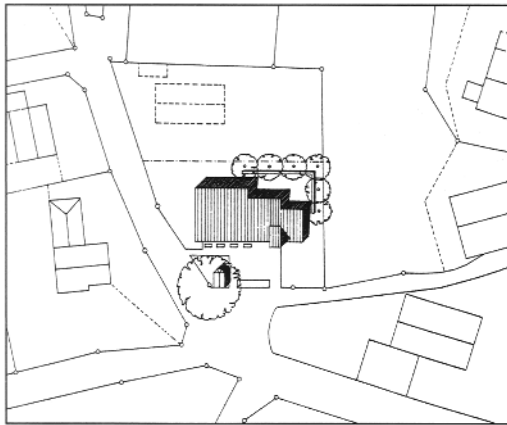
The chapel measures about 10.6 by 10.6 metres. Coarse bricks, wide mortar joints, narrow ventilation slits:

rough textured walls surround a freestanding baldachin. Its steel supports comprise twin T-beams, with a broad cross-shaped steel capital; its concrete coffered roof numbers eight by eight coffers, each square in shape. There are two windows, too high to permit a view outside, but which admit sunlight from the east and south. Light from above enters on all sides through a gap between the concrete roof and the brickwork walls. Glass panes with heating elements cover these gaps. Metal strips, which look like silver paper, reflect light from the edges of the walls into the room. Artificial light is provided by simple light bulbs in the centre of each coffer. The altar stands immediately in front of the west wall.

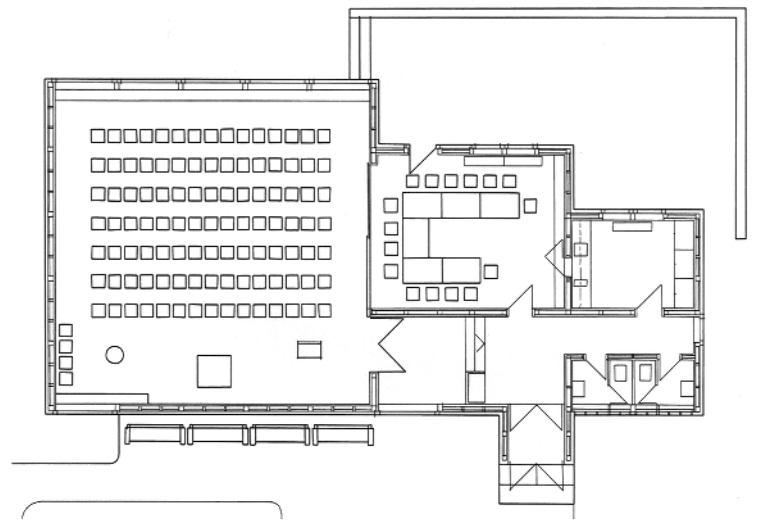
The way in which the bricks and supports are used in Höör is reminiscent of St Peter's Church in Klippan, Sweden built by Sigurd Lewerentz in 1966. However the use of building materials that evoke the conflict between the archaic and the industrial is stronger in Höör than in Klippan. Nevertheless, in the cemetery at Höör a coherent, harmonious architecture has been achieved: on the one hand through the interplay of volume and module, on the other through the colour harmonies of brown and grey for everything material and yellow and white for everything that is light.



Cross section



Site plan



Floor plan



View from the south | View from the north, left the seating wall | Part of the "entrance hall" with way through to the church space | View from the hall looking west, above right the mullioned windows

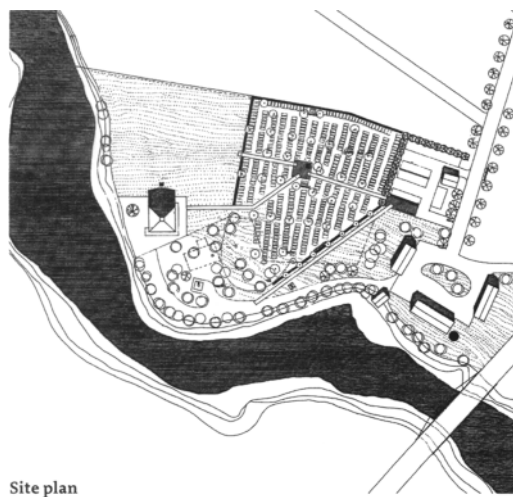


Rudolf-Alexander-Schröder House

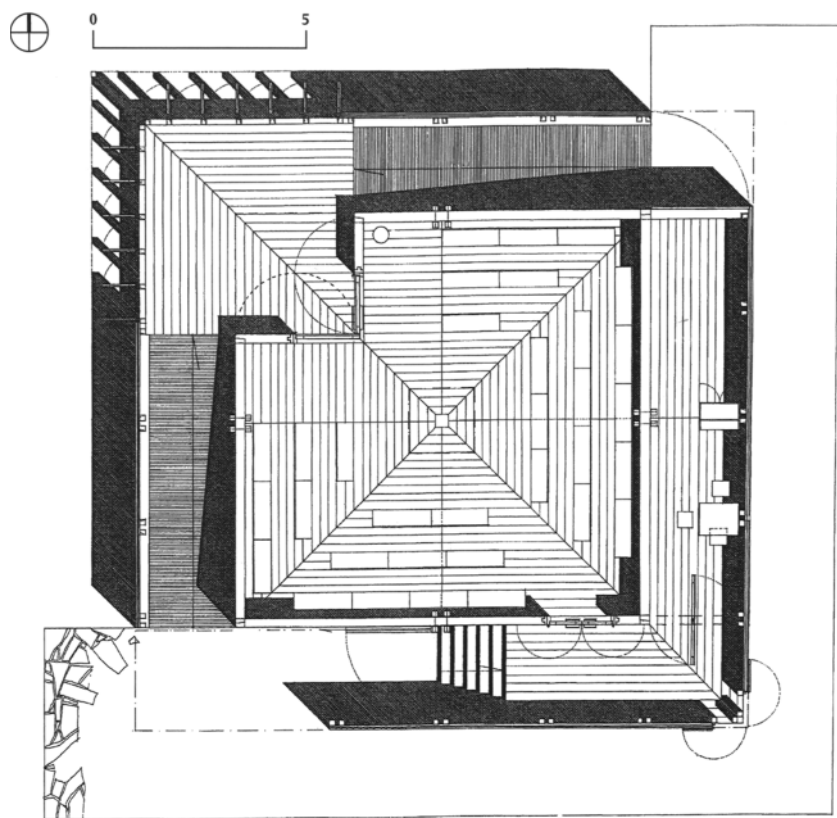
Bergen am Chiemsee, Germany

Architect	Theodor Hugues
Client	Übersee Protestant Church Parish
Completion	1974
Denomination	Lutheran-Protestant
Footprint	Church 107.12 m ²
Seating capacity	ca. 114

The elongated building stands on the north side of a small square, where several roads and paths meet. In the immediate surroundings, there are many houses from the sixties and seventies, built at a low density typical for a location of this kind and period. Existing elements that determined the design were a magnificent lime tree with a lush crown and a tiny chapel. The Rudolf-Alexander-Schröder House lends both of these their due prominence while giving them a recumbent background, in which only the projecting bell frame offers a clear pendant. All in all, one sees an ensemble, the parts of which – the green tree, the red roof, the light render of the old building, the dark cladding of the new building – complement one another through contrast and balance.



Site plan



Floor plan



View from the northwest with the shutters | View from the southwest, the entrance to the sacristy on the right of the near corner, to the left the ramp leading to the vestibule | Entrance with ramp in east-west direction, a section of the room-high shutters is visible in the background | Vestibule with the banks of the river in the background | The church looking towards the door to the sacristy with the altar beside it



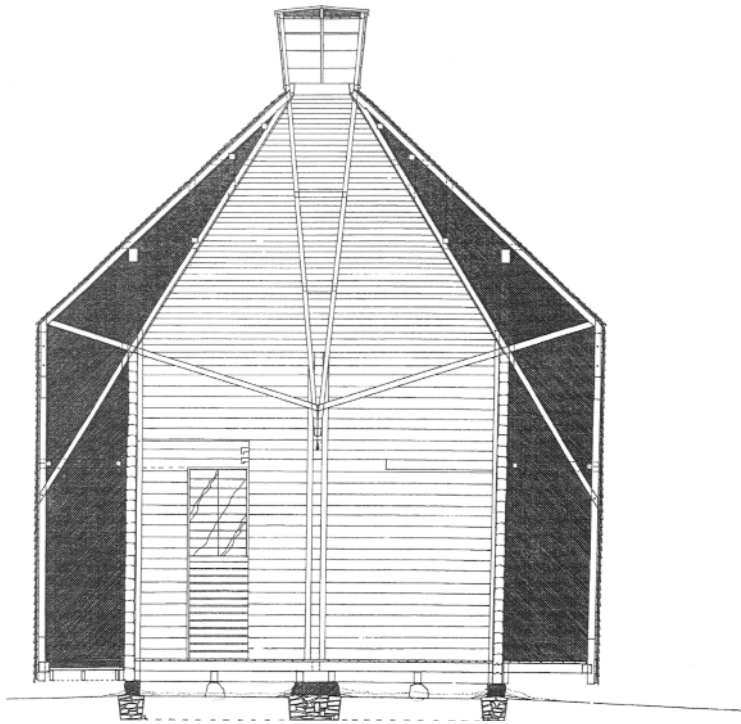
Kärsämäki Church

Kärsämäki, Finland

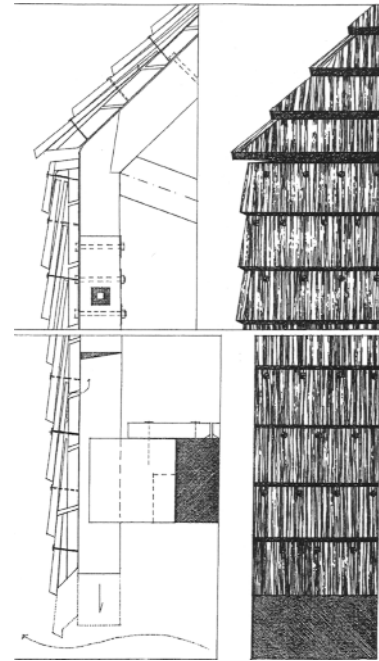
Architect	Anssi Lassila
Client	Kärsämäki Protestant Church Parish and University of Oulu
Completion	2004
Denomination	Lutheran-Protestant
Footprint	ca. 144 m ²
Seating capacity	ca. 100

The building stands in the midst of fields and meadows on the banks of the Pyhäjoki river. The site lies in the direct vicinity of a former mid-18th-century church that was destroyed in the mid-19th-century. At the end of the 20th century, the idea arose to rebuild the church in its original form but was discarded when it became impossible to find reliable historical documentation. As a result, the parish initiated a competition for a church of the 21st century built with the materials and techniques of the 18th century.

In the new church, the archaic enters into a close relationship with the modern. Four walls and four roof surfaces form a cube and a pyramid, entirely covered in a blackened exterior skin. The building is almost entirely



Section



Detail of the shingling at the eaves



made of wood. The structural construction is made of pine, the covering of aspen. Around 50,000 wood shingles were dipped in tar and individually nail-hung. The locks, bolts, hooks and nails have all been made of second-hand iron. The logs and slats inside and the wood shingles outside are all visible. From an ecological point of view, the building is flawless.

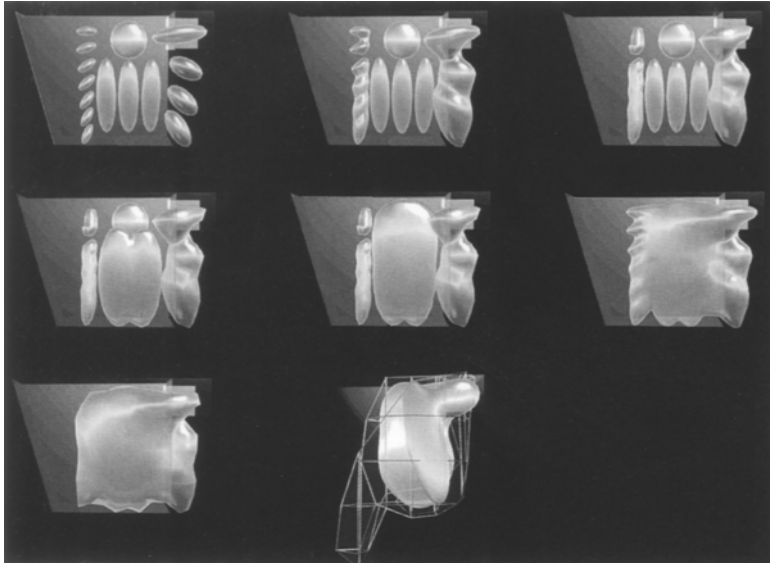
The plan of the building is a square 10 metres wide and 10 metres long surrounded by a 2 metre wide 12 metre long strip on all four sides. This simple device enables clergy and congregation to be separated: the sacristy lies in the south and east wing; the entrance and vestibule in the north and west wing. One enters the vestibule from one of the two ramps. In the corner of the

north and west walls, ten narrow openings afford a view outwards across the fields. These openings span from floor to ceiling and allow light into the room.

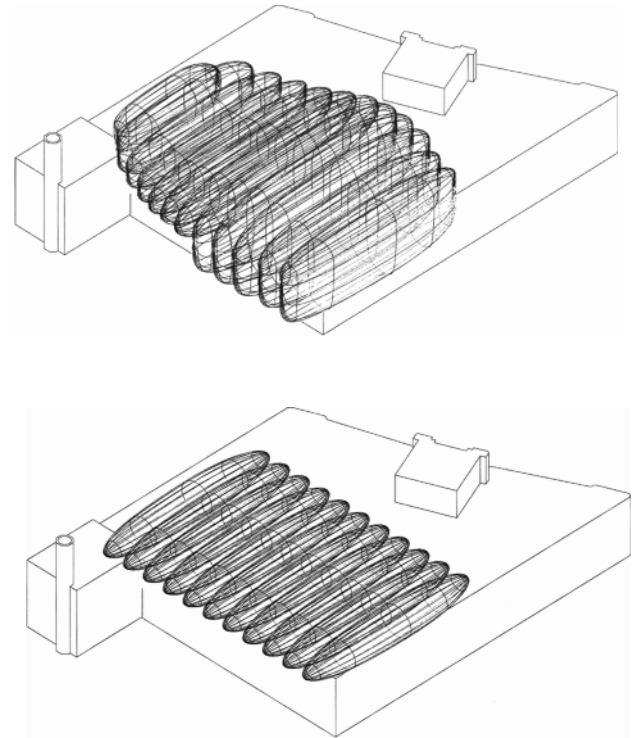
From the opposite corner of the building, the route leads via the vestibule to the main space of the church. The church space itself has the dimensions of a cube. Although a cube has no particular directionality, the room exhibits an extreme centrality, due not only to the steep pyramidal roof but also to the lantern that crowns the building. The lantern's supporting structure points downwards in a wedge shape to a spot on the centre of the floor. It would appear that this place is predestined for the altar. In actual fact, the table of the altar and the pews, their wood whitened with leach,

have no permanent position and can be arranged differently as desired to seat the 100-person-strong congregation. During Finland's long dark days, the room is lit by candlelight.

The four windows of the lantern are subdivided by mullions in the shape of a cross. Slightly to one side of the building, a series of bells hang in a supporting framework. The building is not otherwise marked or signified. Simple and angular with its fusion of wall and roof, the building is all the more compelling for its unrevealing nature: the church in Käräsämäki is enigmatic and monumental. It shares this quality with a number of other important buildings from the last one and a half centuries.



First "metablobs" with the programme for the church



Development of the spatial structure of the church hall within the Knickerbocker Laundry building



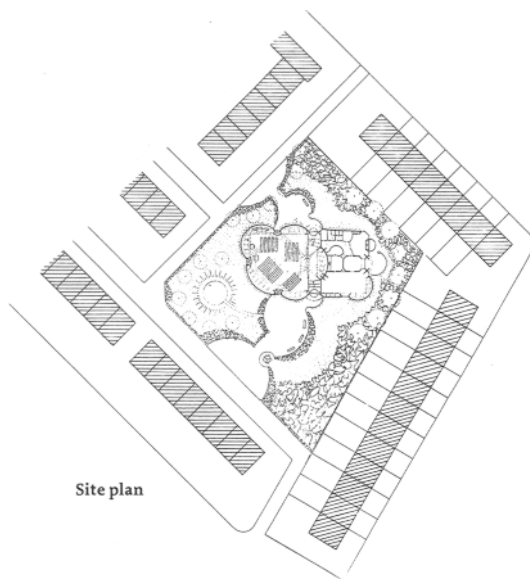
View from the west with main entrance | View from the north with main exit | View from the south with the Knickerbocker Laundry | View from the east | Outdoor stair and fire escape with view over Manhattan, the steel framework is clad inside with redwood

Korean Presbyterian Church

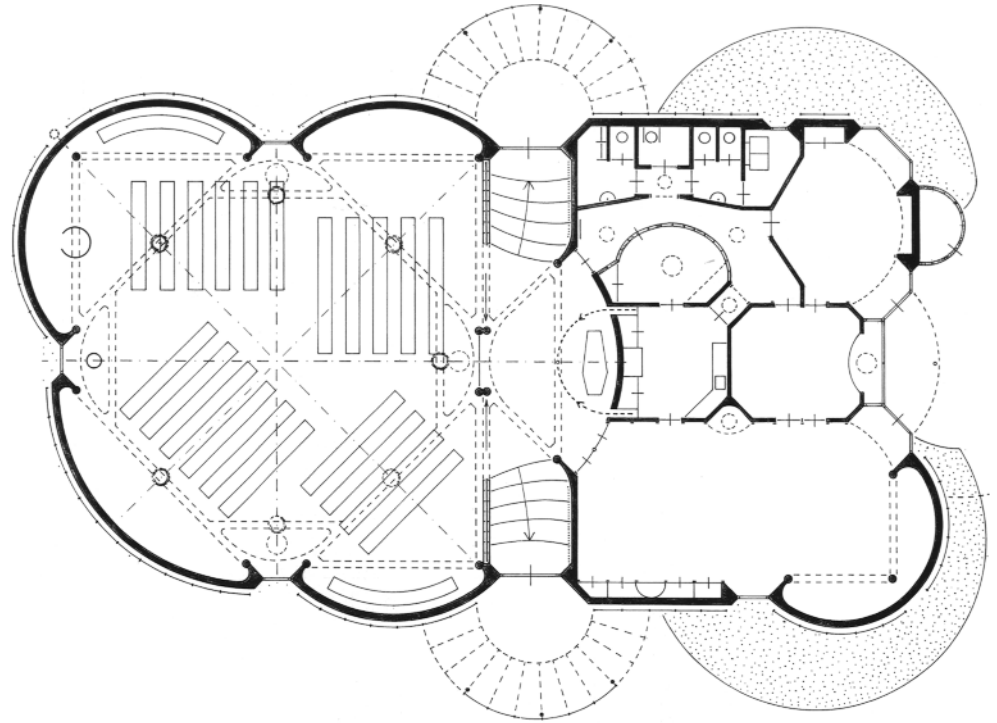
New York City, New York, USA

Architects	Douglas Garofalo, Greg Lynn, Michael McInturf
Client	Korean Presbyterian Church of New York
Completion	1999
Denomination	Presbyterian
Footprint	17,999 m ²
Seating capacity	Sunday church 2500, wedding church 600

Due to the varied origins of its inhabitants, the United States is home to many other Christian groups in addition to the two large churches. Consequently, sacred architecture in the U.S. is extremely varied. In one and the same metropolis, in Los Angeles for example, one can find a small storefront church alongside a huge cathedral. In the case of the Korean Presbyterian Church in New York City, however, it seems that a rare synthesis of both types, the small conversion and the large new building, has been achieved. Moreover, here it is the product of an architectural design process that, because of its radically digital production and topological rather than geometric approach, pushes forward the boundaries of spatial exploration in architecture.



Site plan



Floor plan



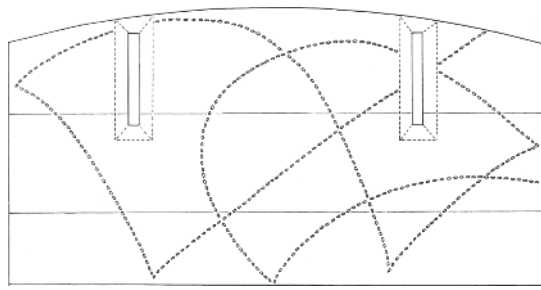
Entrance from the south, under the zinc roof on the right the ancillary rooms | View from the north, on the left the profane functions, on the right the sacred functions, on the far right the bell frame

Maranatha Moluccan Church

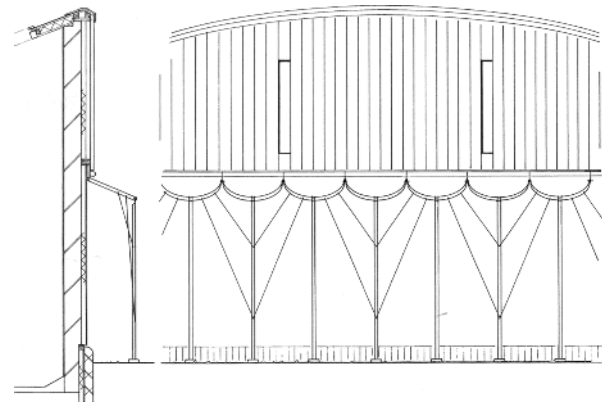
Deventer, Netherlands

Architects	Aldo van Eyck, Hannie van Eyck
Client	Moluccan Community Deventer
Completion	1992
Denomination	Protestant Free Church
Footprint	ca. 550 m ²
Seating capacity	750

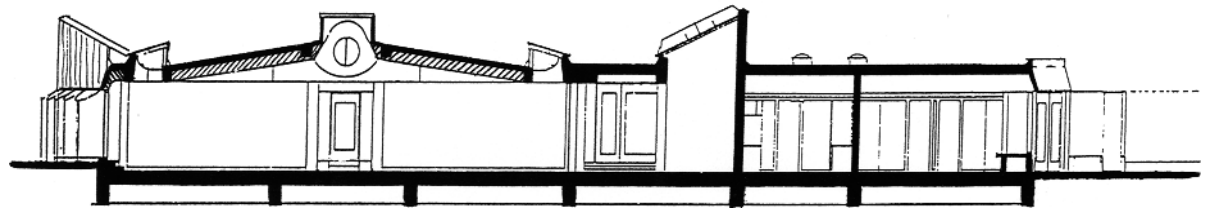
The trapezium shaped site has two almost 60 metre long sides and its position is totally imprisoned by surrounding blocks of flats. The situation and house of the Moluccan parish community avoids being typically religious and resembles a children's day centre or a youth club. As such, the grounds and church are like an oasis, a paradise in alien surroundings. This impression stems from the transformation of the grounds into a garden. The elongated building stands diagonally on the site. The upper curved parts of the façade are clad in vertical wooden slats, the lower parts, not only the curved but also the upright elements are enclosed by a metal trellis, on which white roses climb up a matt blue background.



Elevation of a wall element from inside



Elevation of a wall element from outside



Longitudinal section looking to the north



View into the 2.9 metre high church, the floor of Alta-Quartz slabs, the seats arranged in two directions | View along the south side towards the west, left one of the niches with changing shades of colour and shimmering mother-of-pearl, the floor rising slightly to meet the concrete wall

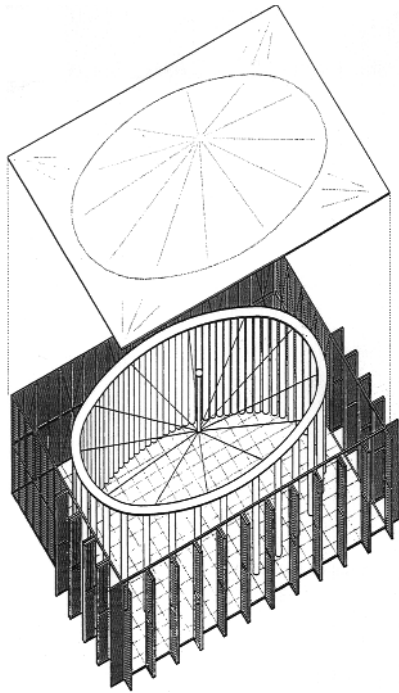
On each side, the garden leads up to the canopies and entrances to the north and south, descending thereafter after three steps down into a roughly 15.5 metre long entrance lobby. The plan of the low building is, at its centre, the shape of a not quite perfect square, which nonetheless permits a clear separation between the parts designated for secular and religious uses. The ancillary spaces lie to the east, including an assembly hall, a kitchen and two offices; the space on the west side is for church services.

Opening a sliding door presents one with a view of the concrete structure with eight cylindrical supports and numerous longitudinal and lateral beams that describe the figures, under the roof, of a square, a rotat-

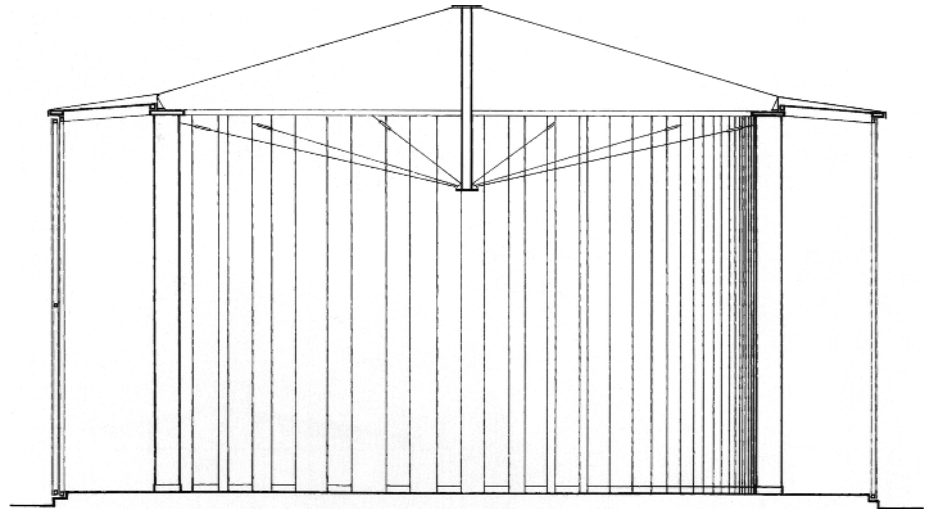
ed square and an octagon. Although the spatial impression created by the structure seems at first to be symmetrical, closer inspection reveals that the architecture is not quite perfect, and is missing the corners to the west and south. This "flaw", together with the tension of the offset altar and pulpit, produce a "multiple symmetry", in which half of the chairs relate to the altar, and half to the pulpit, by which centrifugal and centripetal energies struggle to achieve the correct balance. The wall elements stand outside the structure; their concave forms are covered with a colour that changes intensity in three layers from deep to light blue. Concealed rooflights illuminate the niches. With the steadfastness of the structure and the ephemeral and marginal quality of the bright wall-sections, one

imagines to be in a tent, on an island, the blue of the sea and the sky in the distance. The lines of mother-of-pearl pressed into the plaster make one think of the flight of birds and the passage of fish; the work of Iene Ambar underlines the boundless feel of the building.

The Maranatha Moluccan Church is an expression of the equal importance of the rationalist and the expressionist architecture of the 20th century so typical of structuralism. Furthermore, it expresses a reverence of the Moluccans, the group of islands between the Philippines and Australia that was once a Dutch colony. The shells came from there. The structure resembles that of a "baileo", the open-sided assembly buildings of the village communities on the Moluccans.



Axonometric



Section



The figure of Christ in front of the Paper Church | Front façade at night-time, all double doors opened

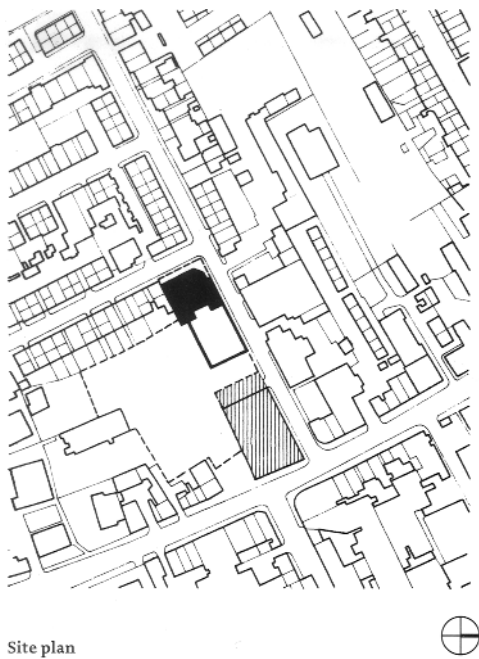


Paper Church

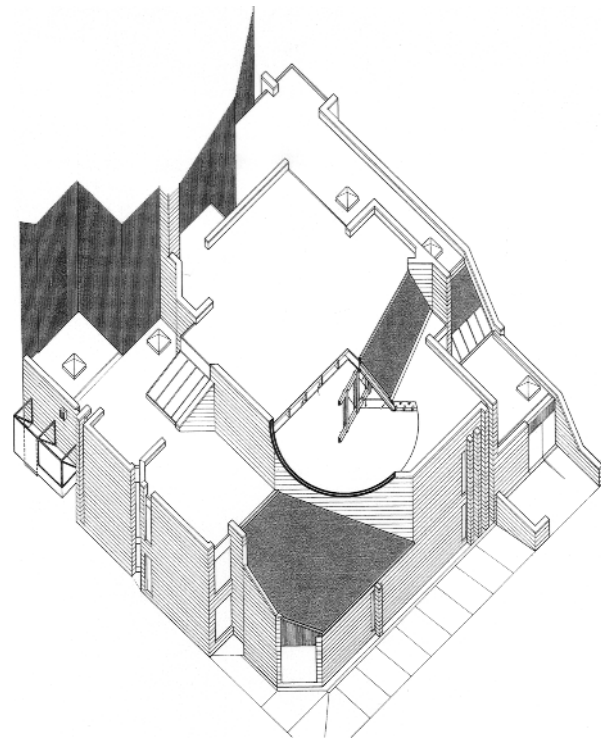
Kobe, Japan

Architect	Shigemi Ban
Client	Private
Completion	1995
Denomination	Roman-Catholic
Footprint	ca. 150 m ²
Seating capacity	ca. 90

The earthquake in Kobe in early 1995 destroyed large parts of Nagata, one of the poorer quarters of the city. Among the buildings that burned down was a timber Catholic church used primarily by Vietnamese immigrants. Within six months the Paper Church had been erected in its place. As the architect – who has since gone on to push forward the boundaries of lightweight construction – embarked on the design, he was aware that the church needed to be built at low cost and as quickly as possible. In addition, it needed to be easy to transport, to dismantle and assemble. The materials and construction would therefore need to be such that the building could be erected by volunteers without professional skills.



Site plan



Axonometric with cutout showing roof truss



View from the southwest, on the right the side entrance to the stage and youth club | View from the west, on the left the entrance, in the centre one of the classrooms, above it a window above the stage | Junction between the old and new buildings on the northwest side | Main entrance with canopy and sign on which the spotlights that illuminate the façade are fixed

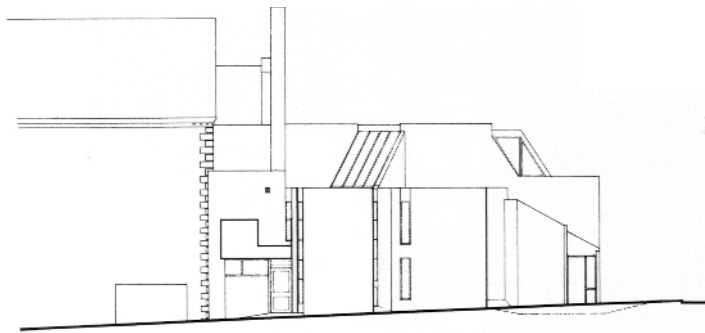


Morley Central Methodist Church Annexe

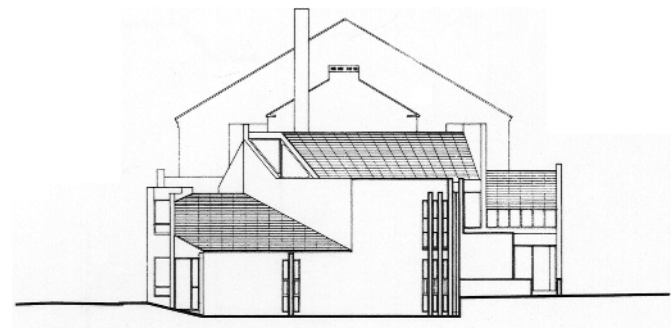
Leeds, Great Britain

Architect	James N. Thorp
Client	Morley Central Methodist Church
Completion	1970
Denomination	Methodist
Footprint	ca. 408 m ²
Seating capacity	Hall 250

In the period between the late sixties and the late seventies almost every church was planned as a community centre. The church is not solely a building for the church service or a vessel for the holy; it is simply the place where believers congregate in the name of Jesus Christ. "A church should be functional" was the motto of the day. Accordingly, the functional programme of church buildings provided spaces for younger and older people to come together not only on Sundays but also on weekdays for all manner of social and cultural activities. No naves, no towers, no processional arrangement, no congregational arrangement: the specifically sacred elements were abandoned in favour of multifunctional or polyfunctional spaces. Many such new spaces – which were also used for Catholics to cel-



Northwest elevation



Southwest elevation



celebrate the Sacrament or Protestants the Communion – were more akin to a utilitarian lecture room or stage hall, in which a flexible podium and variable seating were the most prominent elements.

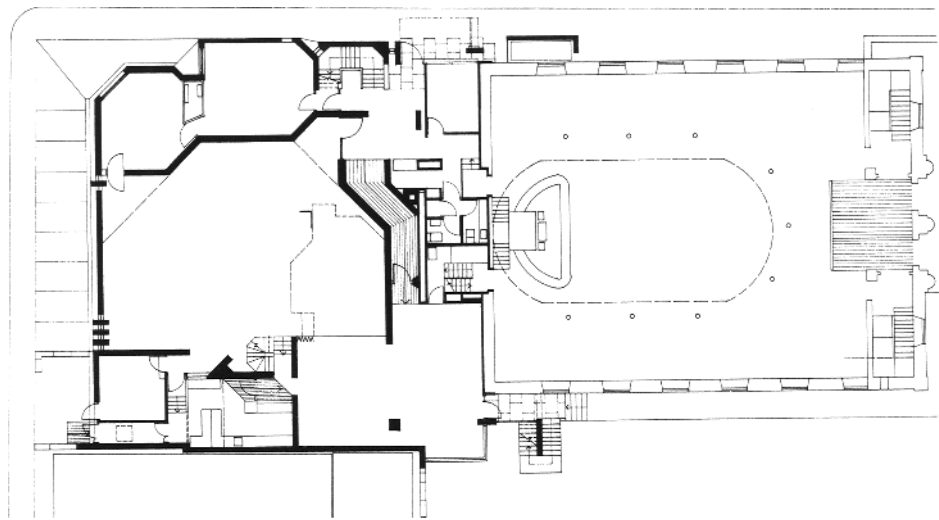
Although the community centre approach found favour among both Catholics and Protestants, it was most enthusiastically embraced by Lutheran and Reform church congregations. Avowed Methodists may even have gone a step further, rejecting churches that did not offer spaces for social or communal activities. The Methodist Church arose in the first half of the 18th century as a response to the perceived self-importance of the clergy of the Anglican Church. In principle, Methodism is a denomination of devout preachers,

who set up “classes” and “Sunday Schools” in order to spread the word among the burgeoning lower classes. Martin Luther’s belief in “sola fide” (justification by faith alone) and a tremendous commitment to the needs of the working classes went hand in hand. Accordingly, Methodism is most strongly rooted in the cities of the Industrial Revolution in England.

This was the case in Morley, a municipality in west Yorkshire with a population that today numbers some 42,000 inhabitants and is now part of Leeds. Built in 1861, the Central Methodist Church lies in the centre of Morley near to the Main Road and City Hall. The area around the church is dominated by rows of two-storey terraced houses, typical workers’ housing. The church

itself is rectangular with a low pitched roof and, on account of its dimensions and pediment gables, bears resemblance to a temple. Quoins, stone window mouldings and cornices on the first and second storeys lend the stonework masonry a certain decorum, which the Methodists tolerated to a degree. The interior can accommodate up to 1000 people.

The annexe adjoins the hall on a free plot to the west and south of the old soot-stained building. The old building and new annexe maintain a critical balance: the annexe occupies some four-tenths of the entire church property; it dominates the corner of two streets on a slight incline; it presents itself as a complex polygon containing different functions, so that the temple



Lower floor plan



Junction between the old and new buildings on the southeast side, the canteen below and the youth club above in the projecting volume that overlooks the cemetery, to the right the fire escape | Winding stair in the stage hall, on the left the folding partition which can be opened to join the canteen and stage hall | Balcony in front of the youth club kitchenette, on the right the posts of the winding stair. Choral concert on the stage, above them one of the roof joists that structure the space



behind it – a straightforward pattern-book building of the time – pales somewhat in comparison.

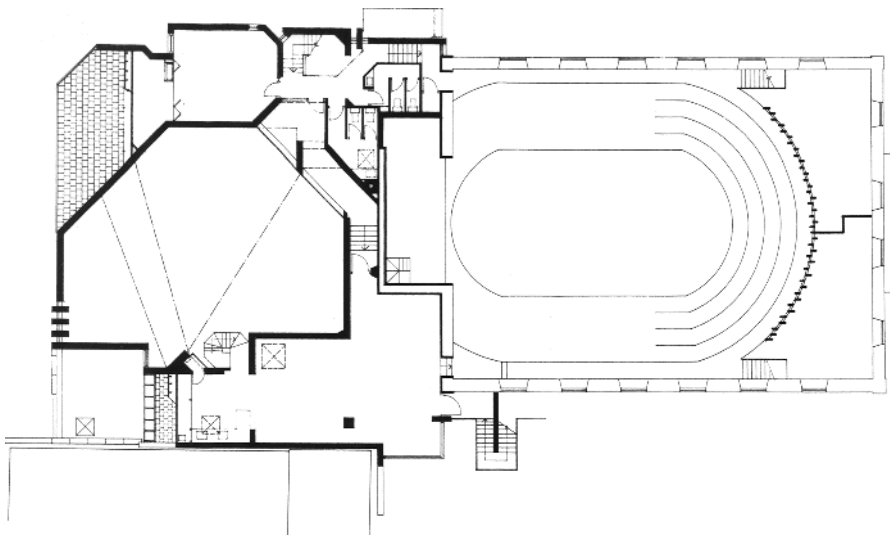
Measuring 19.5 by 20.9 metres, the annexe has a roughly rectangular plan. For the narrow street to the south and west, however, local regulations stipulated that the building should step back three metres and that the corner be cut at 45 degrees. This statutory constraint was undoubtedly generative for the design of the building, in particular the folds of the walls and the creation of a half-octagon in the centre of the plan. Both elevations conform to the modernist ideal of a clear relationship between inside and outside. Accordingly, the entrances are arranged on the very left and right, with the classrooms distributed around the cor-

ner, the hall behind it and above. The building is constructed of two leaves of concrete breeze blocks; the exterior-facing blockwork with an additional granite component. The door and window frames are metal and small grey cement roof tiles cover the sloping surfaces of the roof.

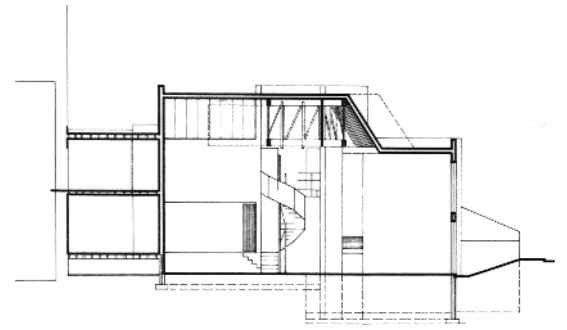
The entrance to the annexe is at the end of the long side of the old church. A concrete canopy-like construction – on which a “logo” could be placed – announces the entrance. To the left are an office, wardrobe and toilets, on the right two classrooms, the second of which can only be reached through the first. Straight ahead a ramp leads into the canteen and kitchen, which can serve up to 60 people. All spaces are arranged around

the half-octagon of the stage space. The youth club, kitchenette and classrooms on the upper floor follow the same arrangement.

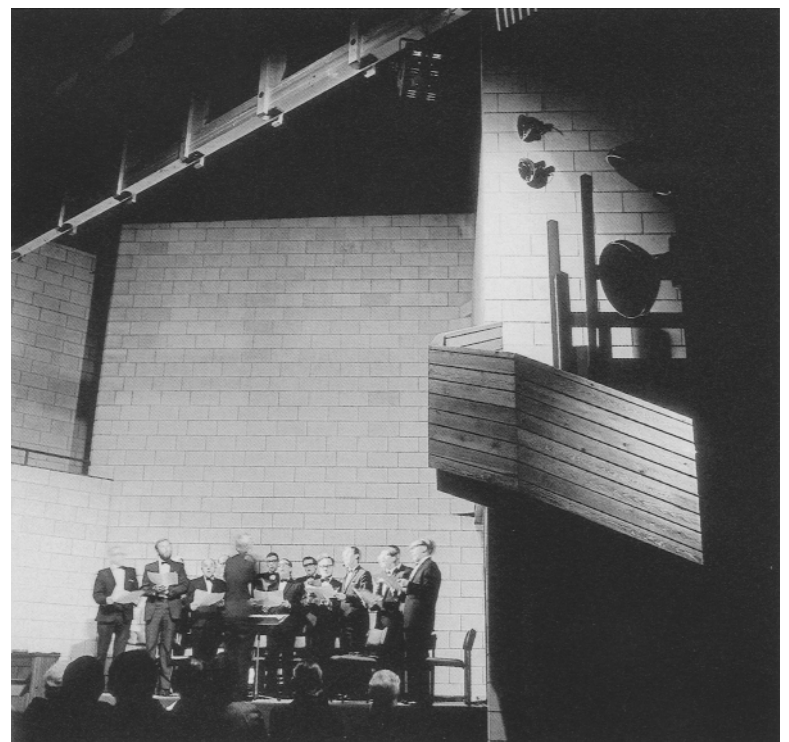
The hall with the stage can seat 250 persons on movable chairs. The angle of two sturdy roof joists made of pine determine one’s perception of the 8.2 metre high space. The stage is at one end, the rest of the floor at the other. The platform of the podium is the same height as the floor level of the canteen behind it. By opening a folding partition, it is possible to combine both spaces. A green-coloured wooden stair stands slightly offset and winds up in an octagonal spiral, leading to the kitchen on the first landing and the youth club canteen on the second landing. Coloured surfaces on the ceiling,



Upper floor plan



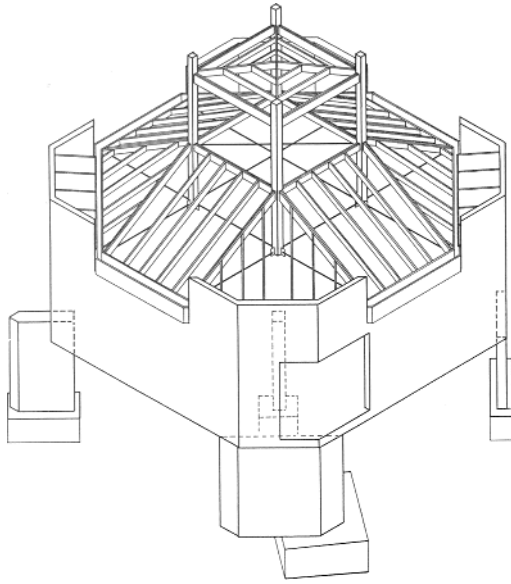
Section through the centre of the hall



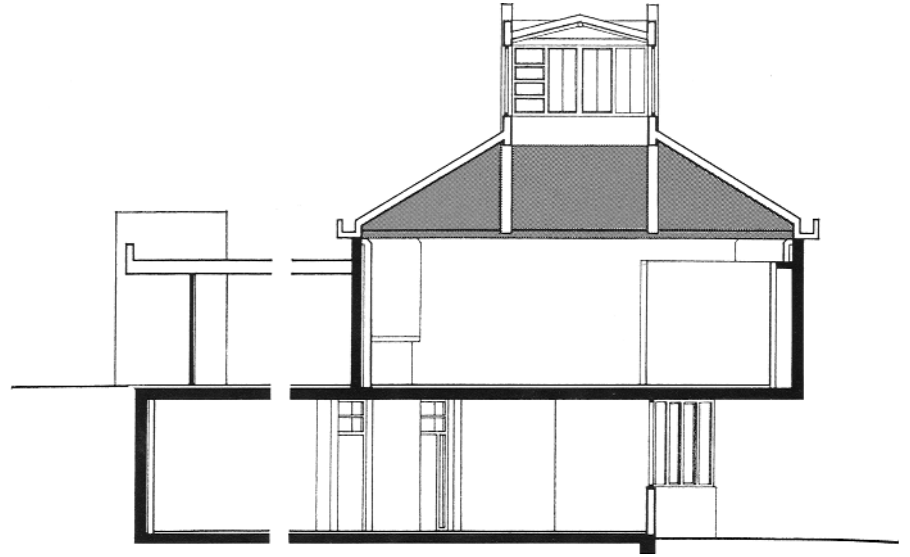
sometimes red, sometimes blue, contrast with the pale colour of the breeze blocks. Natural light enters from the side through a series of narrow slots in the wall that reach from floor-to-ceiling and from a larger skew window high up beneath the roof. Artificial lighting is provided by spotlights attached to the roof trusses.

In the early seventies the "Central Methodist Hall" was also used for new forms of church services in which amateur dramatics and concerts played a central role. Nevertheless, buildings like the annexe to the Central Methodist Church have long been the subject of criticism from architects and theologians alike: in ideal conditions, so their argumentation, a community centre can be a "cultural centre with a place of worship", in

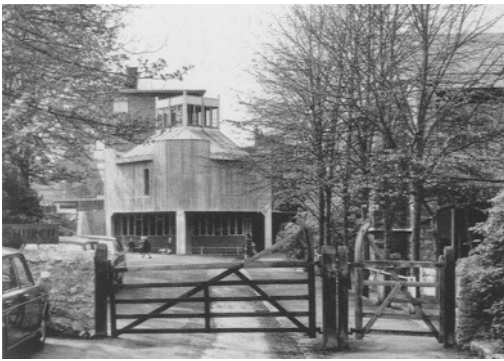
worse cases it is simply a "social help centre". Criticism of this kind disregards the tradition of Methodism and fails to appreciate the breadth of tasks and activities a church congregation undertakes. In cities where fewer and fewer persons attend traditional church services with the Eucharist or Communion, churches can end up facing an unpleasant choice: sell or demolish. When converted appropriately, for whatever kind of religious purpose, such buildings can acquire a character as robust as that of the church in Morley.



Axonometric of the constructional elements



Section

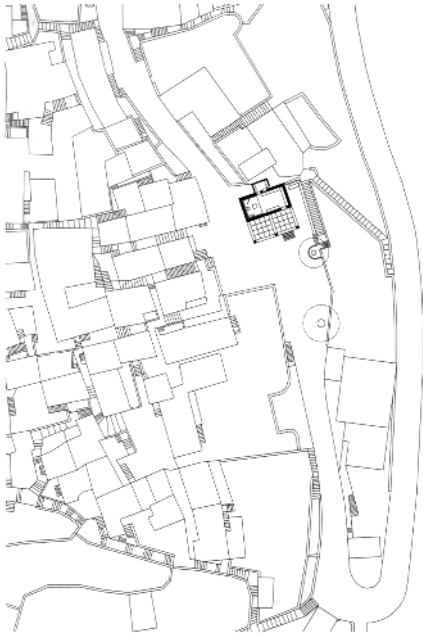


Quaker Meeting House, Blackheath

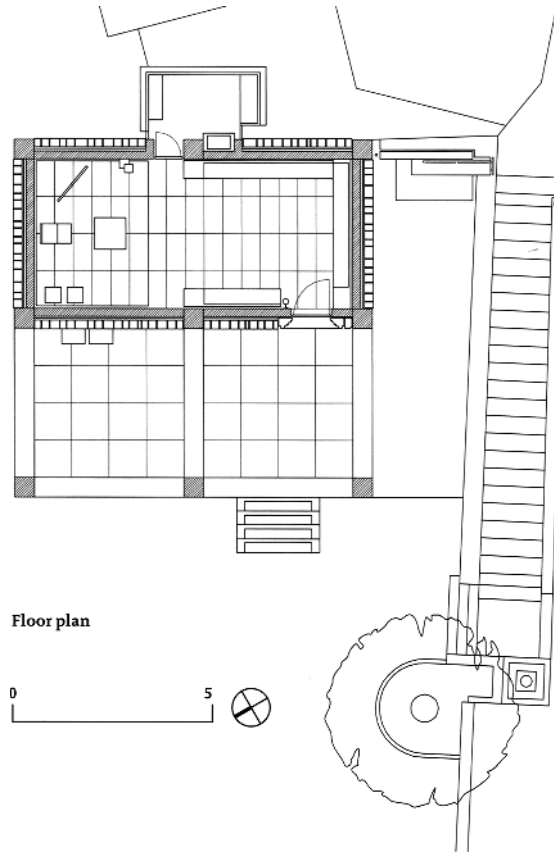
London, Great Britain

Architect	Trevor Dannatt
Client	Blackheath Meeting of the Religious Society of Friends, London
Completion	1972
Denomination	Quaker
Footprint	Hall 100 m ²
Seating capacity	ca. 100

The House of the Religious Society of Friends stands in a complex in-between situation, bounded to the north by a railway cutting and to the south by raised-level road traffic. Any building on this terrain has to compete with an embankment and with a 19th-century church. Given these difficulties, the building was not built parallel to the road and the church, but was rotated by 45 degrees in order to achieve a prominent position for the house. The changing levels of the site provided an opportunity for two storeys each with their own separate entrances. What is below is of secondary importance: a multi-purpose, sub-divisible space of just under 58 square metres behind a triangular canopy. What is above is of primary importance: the Quakers' meeting hall.



Site plan



Floor plan



View from the southwest | View from the west towards the "forecourt" | Stepped portal of the oratory, to the right the fresco with the depiction of the Annunciation | View of the altar zone with two of the three light slots in the background

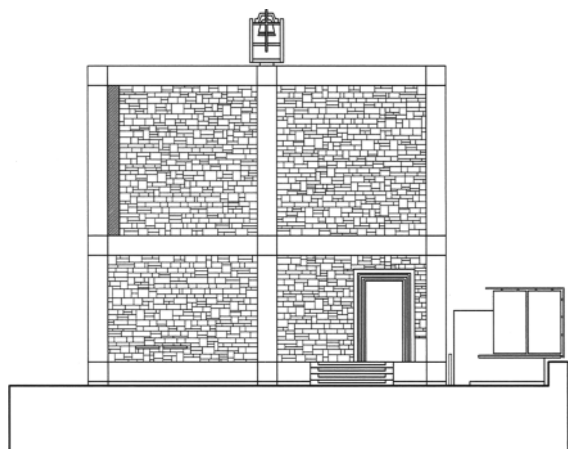
Oratory of San Bartolomeo

Brissago, Switzerland

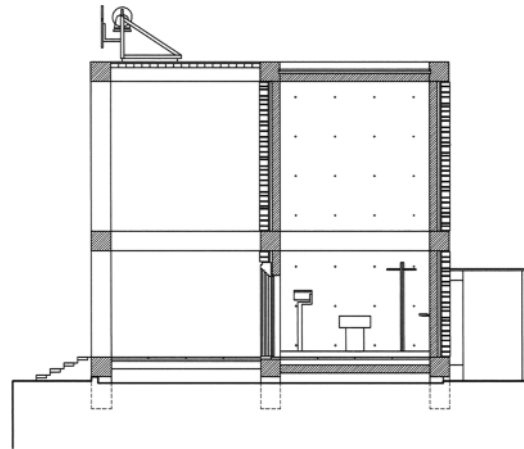
Architect	Raffaele Cavadini
Client	Don Annibale Berla
Completion	1997
Denomination	Roman-Catholic
Footprint	82.81 m ²
Seating capacity	ca. 20

Situated on a plateau high above Lago Maggiore and the town of Brissago, the village of Porta has had an oratory since the Middle Ages. It enjoys a position at the edge of a slope overlooking the lake, forcing the road to bend around the building. Despite its inescapable presence in the village, the chapel fell into an increasingly derelict state until, in the mid-nineties, the parish decided to demolish it and replace it with a new building. As with its predecessor, the new oratory is very prominent. Nevertheless, the relationship of the object to the texture of its environment attempts to strengthen the spatial coherence of its surroundings.

The chapel has a rigorously geometric form. It is a cube of 9.1 by 9.1 by 8.1 metres. The columns and beams,



Southwest elevation



Section through the altar zone

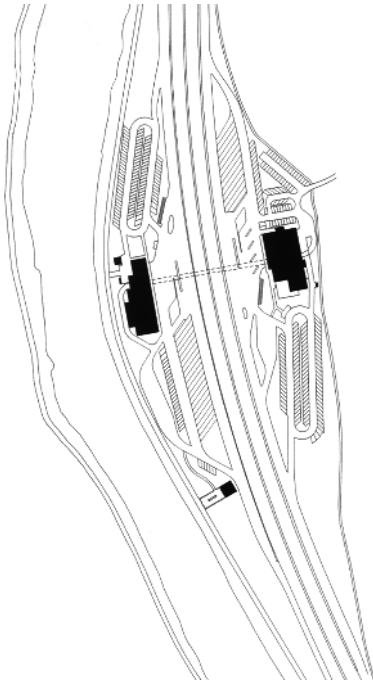


uniformly made of 50 centimetre thick concrete, define not only the edges of the box but also its interior. The framework divides the box into eight volumes, four below and four above. From the bend in the road, the chapel is visible as a hollow frame. Steps lead up to a covered "forecourt" occupying half of the cube, with a glass-block roof. The space for prayer lies to the rear. Here, the exterior of the panels of the concrete framework are stacked with flat slabs of rough-hewn grey granite. One enters through a stepped portal into the oratory itself, which is divided into two halves, one for the laity and one for the priests.

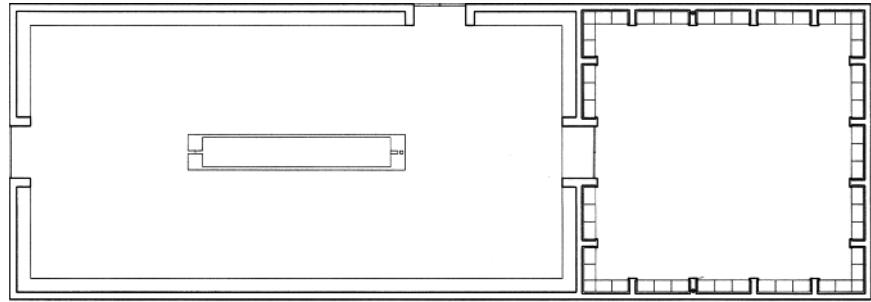
Three slots allow light into the interior. These slice through the concrete and granite envelope of the oth-

er half of the cube – two in the walls, one in the ceiling, two vertical, one horizontal, arranged tightly against the east, south and west faces – are made in such a way that the light glances across the surface of the smooth concrete of the structural framework and the rough concrete infill, an effect that is particularly pronounced in the mornings and the evenings. A slight threshold on the floor made of black slate marks the edge of the zone with the altar, ambo and three concrete seats. The pews arranged around the walls can seat some 20 people and are faced with cherry wood seating surfaces. A small sacristy is tucked away at the rear of the chapel, and a section of wall from the previous oratory with a fresco depicting the Annunciation is mounted on the outside wall facing the slope.

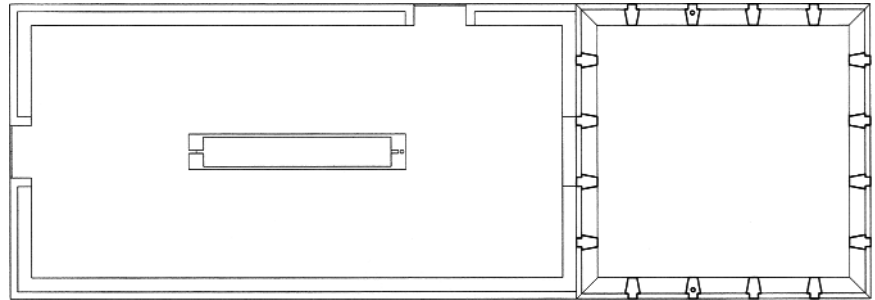
The geometry of the oratory in Porta is not arbitrary. Rather, the relationship between the closed and open sections reflects the duality of the public and the sacred. This half-half division between internal and external space is a common trait of sacred architecture in the Ticino region. The chapel establishes a dialogue with the churches Santi Pietro e Paolo and Madonna di Ponte in Brissago. The pilasters that delineate the space of these churches, designed in the 16th century by Giovanni and Pietro Beretta, are echoed by the gridded framework of the oratory in Porta. Also evident in the chapel is the influence of the reduced forms of minimal art, in particular the structural sculptures by Sol LeWitt.



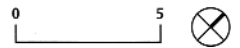
Site plan showing the "chapel" at the edge of the motorway service station



Plan at the level of the plinth



Plan at the level of the windows



View from the west over the courtyard and building, aluminium-framed windows extend around all four sides of the frameless box | The cuboid of the chapel seen at dusk illuminated from within



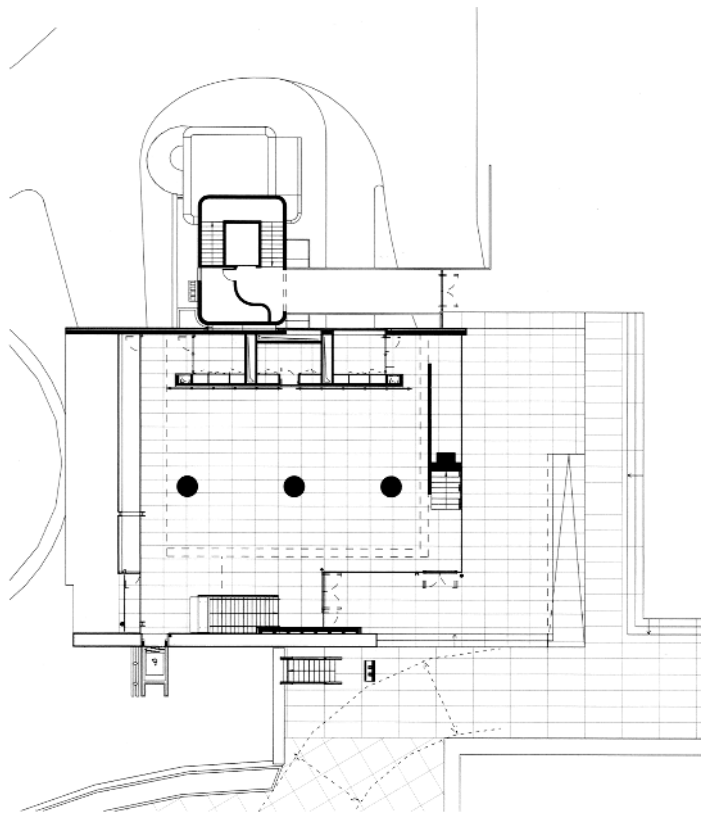
Place of Contemplation

between Altdorf and Erstfeld, Switzerland

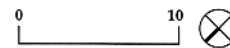
Architects	Pascale Guignard, Stefan Sauer
Client	Foundation for the Place of Contemplation on the Motorway at Uri
Completion	1998
Denomination	None
Footprint	Cuboid 100 m ²
Seating capacity	ca. 50

In the fifties, sixties and seventies, roadside chapels were built along almost every major motorway in Germany. In Switzerland, however, despite the heavy through-traffic and high level of tourism in the country, there is only one single building of this kind. Its position could hardly have been better chosen. Those travelling southwards will find this "place of contemplation" between the exits Altdorf and Erstfeld, on the southern perimeter of a motorway service station with two huge restaurants, some 20 kilometres before the entrance to the busy St Gotthard tunnel.

The building is situated like a clasp between technology and nature: on one side the cars rush past, on the other the waters of the river Reuss stream by, framed



Middle level plan at the height of the esplanade



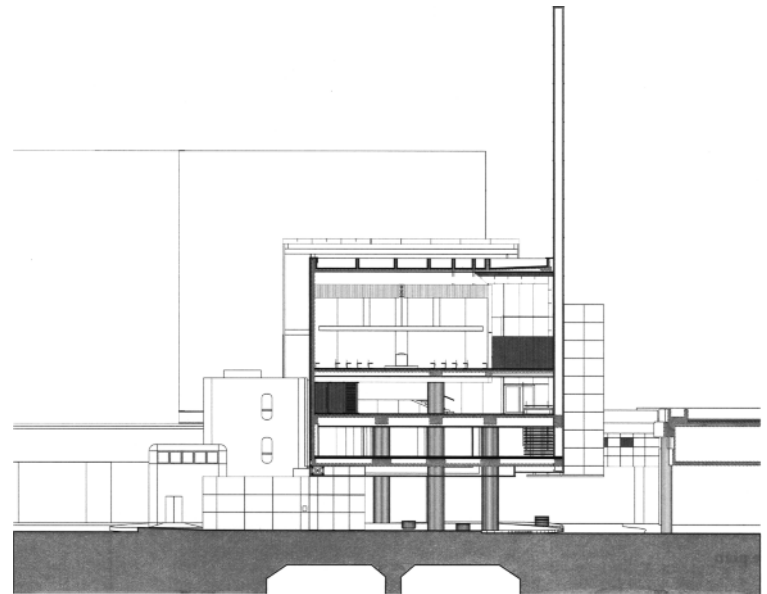
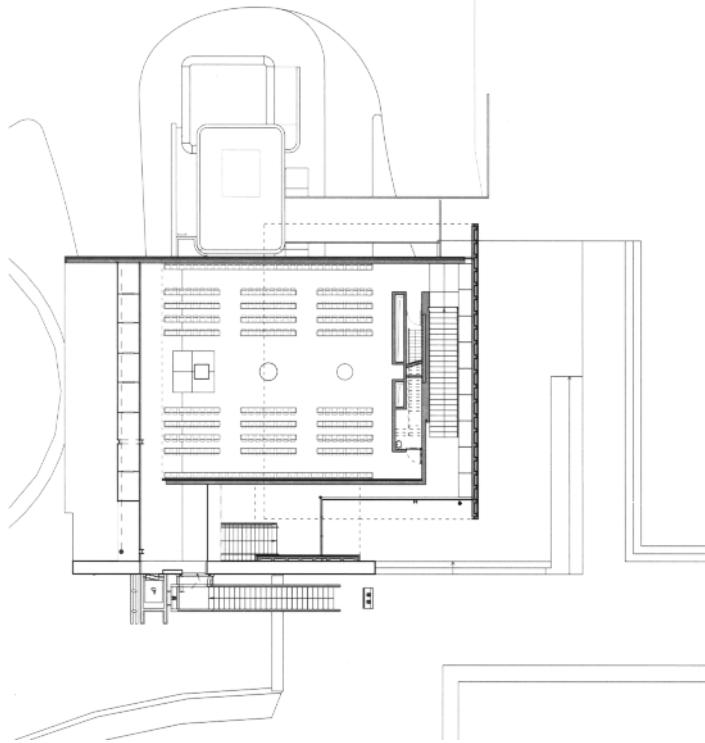
Our Lady of the Pentecost Church

Paris, France

Architect	Franck Hammoutène
Client	Diocese of Nanterre
Completion	2001
Denomination	Roman Catholic
Footprint	Hall 213.3 m ²
Seating capacity	ca. 300

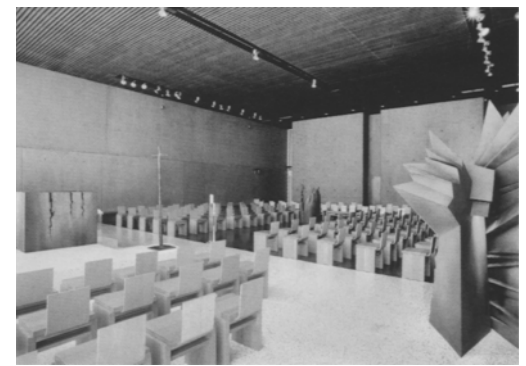
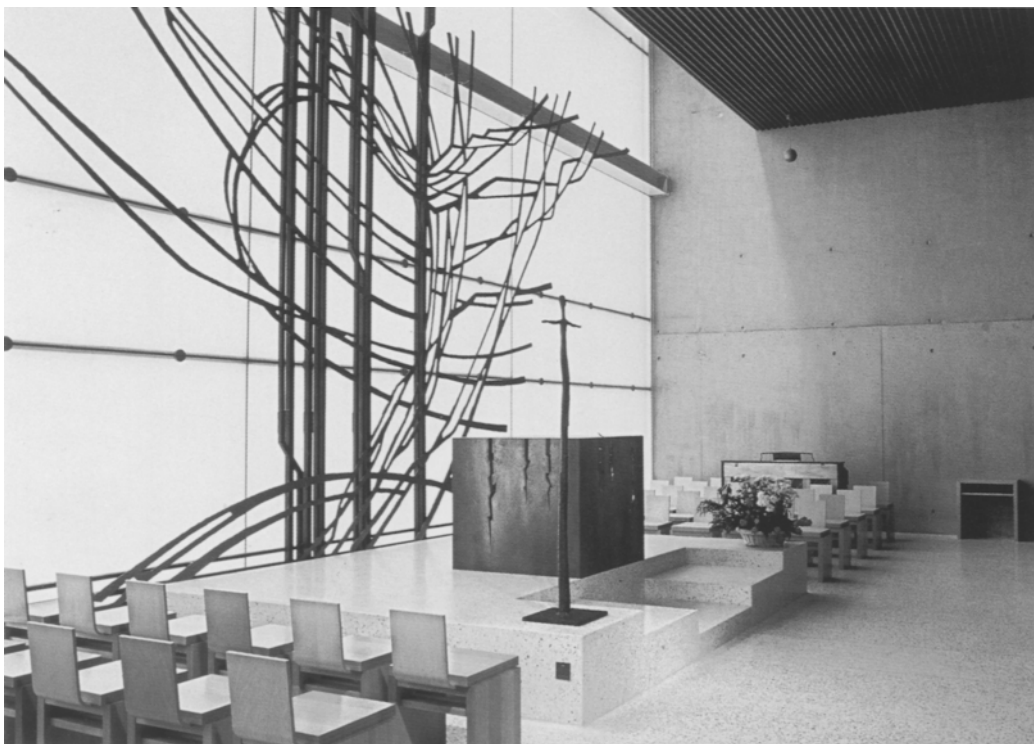
In La Défense, where millions of square metres of office space have been pressed into a variety of forms since the fifties, the church is the smallest building. It stands at the edge of the gigantic esplanade of the Grande Arche and is enclosed on three sides by the arching form of the Centre National des Industries et Techniques (CNIT) to the northwest, a wing of an office building to the southwest and the entrance and exit of a road tunnel to the northeast.

The church rests on 63 slender pile foundations and six 1.2 metre thick concrete columns. For the most part, the building takes the form of a cube made of concrete, steel and glass. Its lower and middle floors are used for gatherings and administration, the upper floor for the



Cross section at the height of the church hall

Upper level plan with the church hall as box within a box



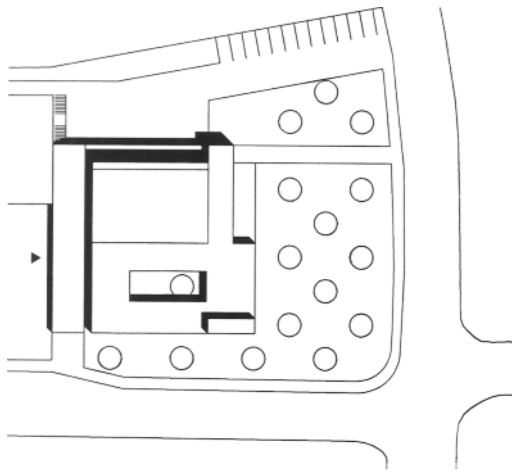
View from the north with road tunnel in the foreground | View from the south with the CNIT to the left | Presbytery with the altar made of corten steel and stone and terrazzo floor, left the northeast wall with the metal sculpture by Jacques Loire : Church hall with altar and ambo arranged along the longitudinal axis

church service. Entrances to the building are located at the middle level from the esplanade and at the upper level via an external stair on the northwest side of the building. On the landing of this stair, visitors turning to the right pass through a matt shimmering construction some 36.4 metres high and 19 metres wide, but only 80 centimetres deep. Constructed as a steel framework clad in laminated glass, it is articulated as a plane that appears to float freely in front of the cube of the building. For several reasons, it lends the architecture a singular quality: the same form appears at once like a door leaf, a screen and a tower; it picks up and transforms the monotone and monochrome, the transparent and translucent of the surroundings; and lastly it marks the church with the sign of the cross.

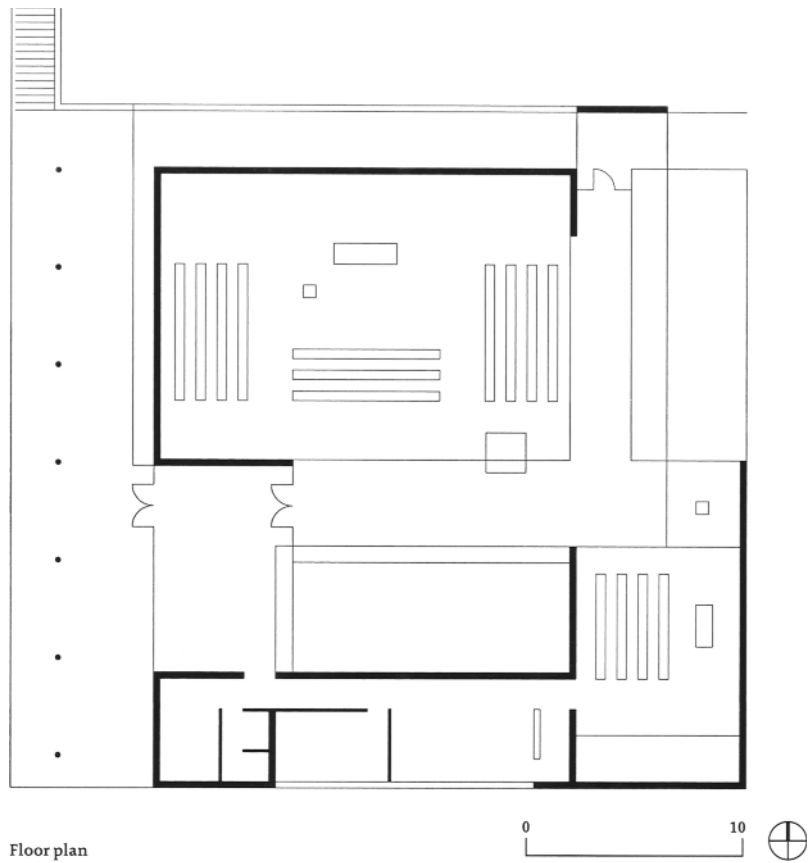
The hall for church services is buried deep within the building. The feeling of an enclave results not just because it is located on the uppermost of three storeys, but also because it affords no views from outside inwards or from inside outwards. The room measures 15.8 by 13.5 metres. The double layer of the whitish, glazed northeast wall protects the room in such a way that one hears and sees nothing of the hectic whirr of urban life outside. A black metal sculpture by Jacques Loire appears to grow out of the wall like a tree of life. The central objects of the liturgy are arranged along a single axis, the altar on the northeast wall, the ambo on the southwest wall and the baptistry as a basin in the floor, directly in the centre of the room. Approximately 300 chairs made of oak are arranged to the left

and the right of the axis. The seat of each of the chairs can be flipped over to one side to meet the neighbouring chair, effectively doubling the capacity when required.

The Church of Our Lady of the Pentecost deliberately avoids competing with the “ever larger” buildings of the surroundings. Nevertheless, its architecture – through its signalling presence and its cross – still makes a strong gesture within its context. The space of the church itself is a room for peace and congregation. In addition, the positioning of the liturgical elements and seating subscribes to the newer ideal of the Communion, which as yet has been realised in only a few churches.



Site plan



Floor plan



View of the entrance area from the north, left the ground-level glazing strips on the west side | View from the southeast with illuminated beacon by Keith Sonnier

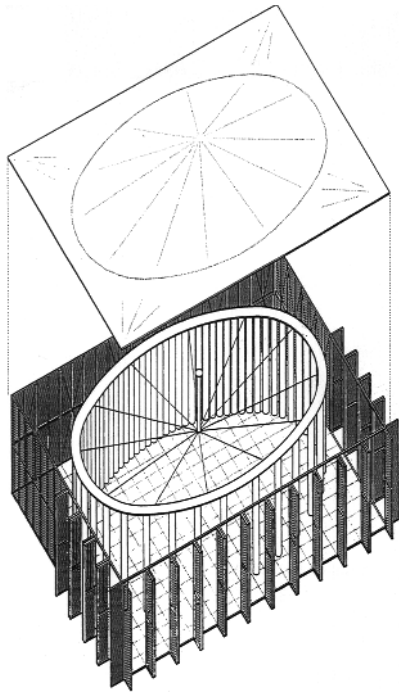


Church of St Francis

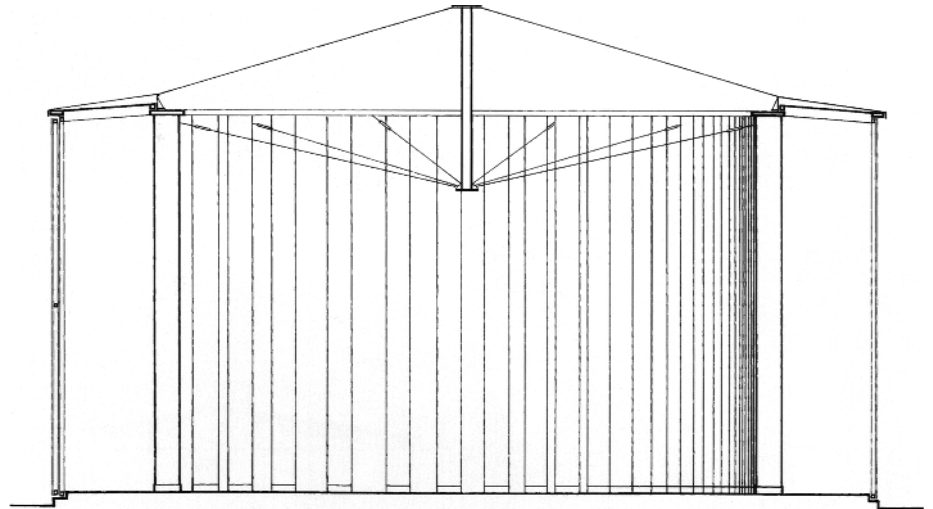
Steyr, Austria

Architects	Peter Riepl, Gabriele Riepl
Client	St Francis Roman-Catholic Parish office, Steyr, and Bishopric of Linz
Completion	2001
Denomination	Roman-Catholic
Footprint	ca. 840 m ²
Seating capacity	ca. 150

Surrounded to the north and west by a large residential estate totalling some 6000 flats, bounded to the south and east by intersecting roads, the church in Resthof/Steyr stands on a plot of land measuring 28.2 by 29.8 metres. The concrete monolithic construction of almost chthonic solidity has a light colour that shimmers grey/green/brown. The corner that faces the road junction is marked by a rectangular tower-like glass protrusion. Instead of bells it contains a coloured, illuminated sculptural installation by Keith Sonnier. Twelve loops of intertwined neon tubing suggest the contours of a fish. This early sign, originally a secret means of recognition among Christians, is so powerful at night that it has almost become a sign for the entire neighbourhood.



Axonometric



Section



The figure of Christ in front of the Paper Church | Front façade at night-time, all double doors opened

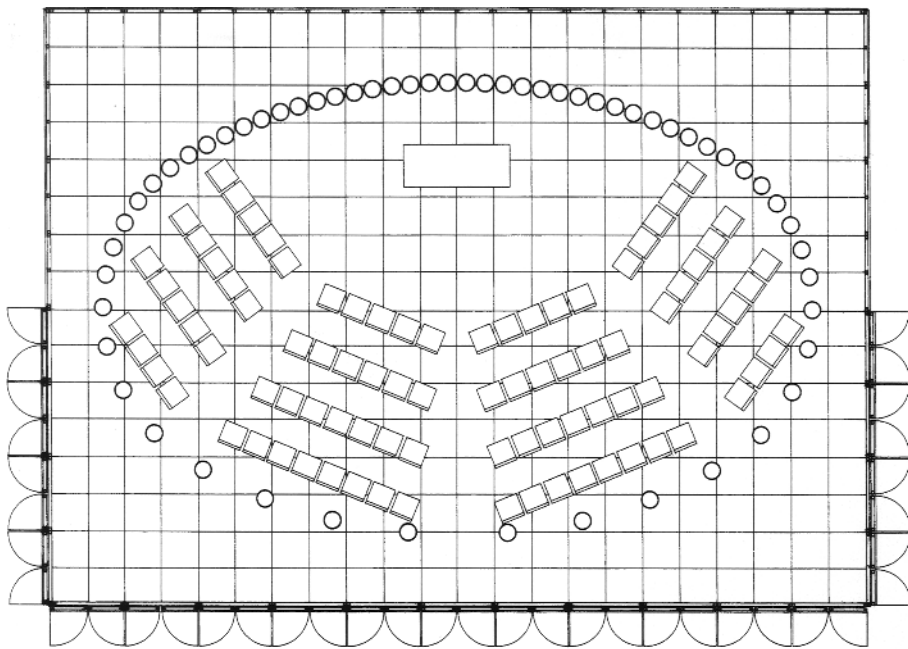


Paper Church

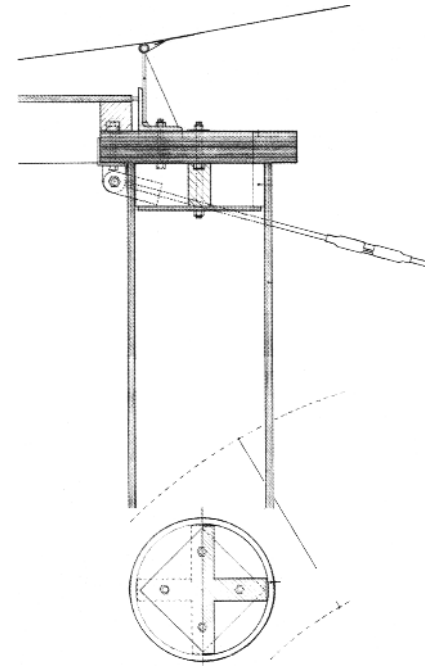
Kobe, Japan

Architect	Shigemi Ban
Client	Private
Completion	1995
Denomination	Roman-Catholic
Footprint	ca. 150 m ²
Seating capacity	ca. 90

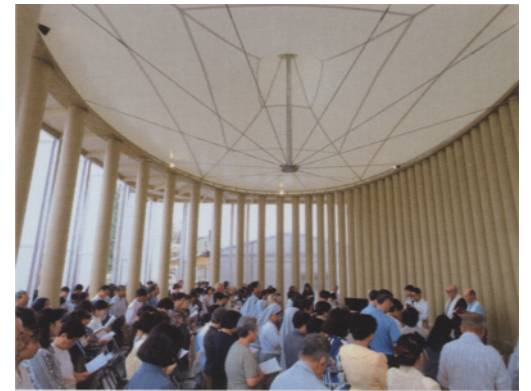
The earthquake in Kobe in early 1995 destroyed large parts of Nagata, one of the poorer quarters of the city. Among the buildings that burned down was a timber Catholic church used primarily by Vietnamese immigrants. Within six months the Paper Church had been erected in its place. As the architect – who has since gone on to push forward the boundaries of lightweight construction – embarked on the design, he was aware that the church needed to be built at low cost and as quickly as possible. In addition, it needed to be easy to transport, to dismantle and assemble. The materials and construction would therefore need to be such that the building could be erected by volunteers without professional skills.



Plan



Detail of column and roof junction



Southeast view of the interior | Church service in the Paper Church

Despite its apparent simplicity, it is an architecture of exquisite proportions. Measuring 15.3 by 11.1 by 5 metres, the proportions of its length, breadth and height are exactly 3:2:1. The building consists of a box that encloses an elliptical cylinder. The tension between the rectangular and the curvilinear give the building a form that is at once classical and baroque.

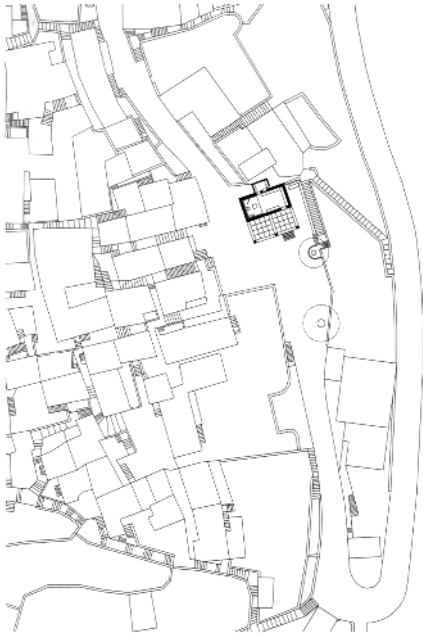
A standardised industrial product is used for the main construction: 58 tubes of 15 millimetre thick brown laminated cardboard, each with a height of 5 metres and a diameter of 33 centimetres. The columns are simply slotted over a footing, a base made of a wooden disc and cross. Each column is topped with a second disc as stopper. To protect against water, the tubes are

painted with a polyurethane coating. The paper columns offer half the load-bearing capacity of timber columns, easily sufficient to support the membrane roof. The white textile roof has a teflon coating to protect it against fire. A system of rods and cables give the tensile roof rigidity and form, lending it the qualities of an umbrella or parasol.

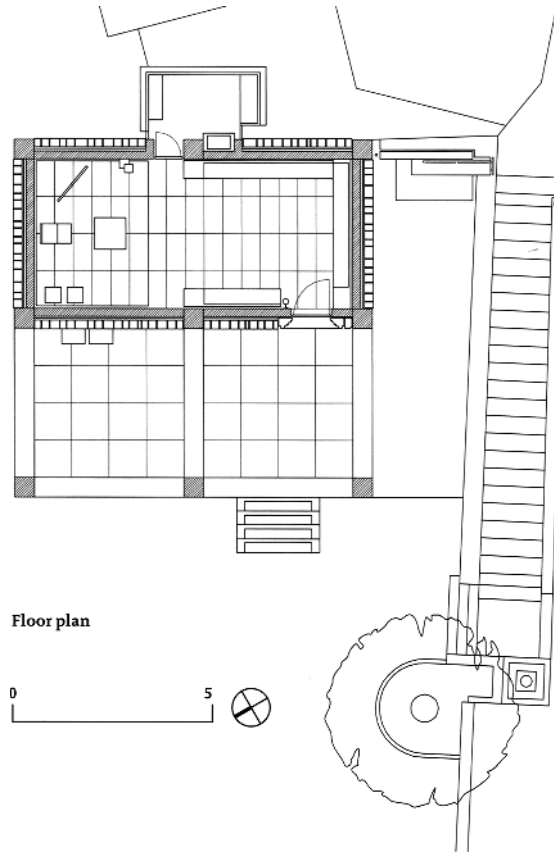
On the south face and half of each of the narrow side faces, the outer wall gives way to a series of finely ridged double doors. Made of polycarbonate sheeting and aluminium, the doors span the full-height from floor to ceiling. They serve not only as ventilation but can also be opened fully so that a church service can be followed by those standing outside. The closed and

open sides of the building are reflected in the spacing of the columns, which stand further apart to the south and closer together behind the altar. Leaving aside the ambulatory between the structural columns and outer skin, the church offers sufficient space for 90 persons. The translucent materials used for the roof and outer skin ensure the building is always light during the day.

To the right of the church stands a statue of the figure of Christ, the only remaining artefact from the previous church. The Paper Church was always envisaged as a temporary solution and stood on this spot for ten years. In 2005 it was dismantled and re-erected on a site in Taiwan.



Site plan



Floor plan



View from the southwest | View from the west towards the "forecourt" | Stepped portal of the oratory, to the right the fresco with the depiction of the Annunciation | View of the altar zone with two of the three light slots in the background

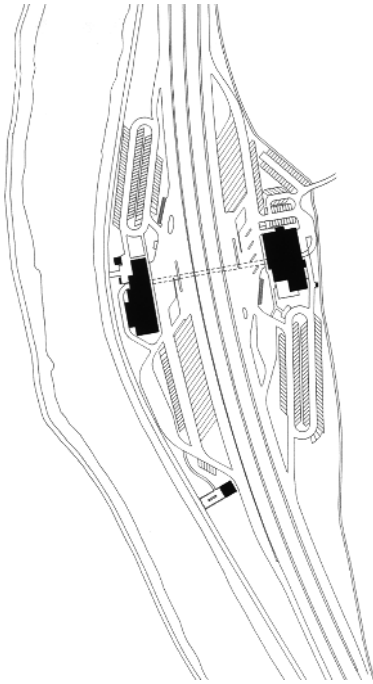
Oratory of San Bartolomeo

Brissago, Switzerland

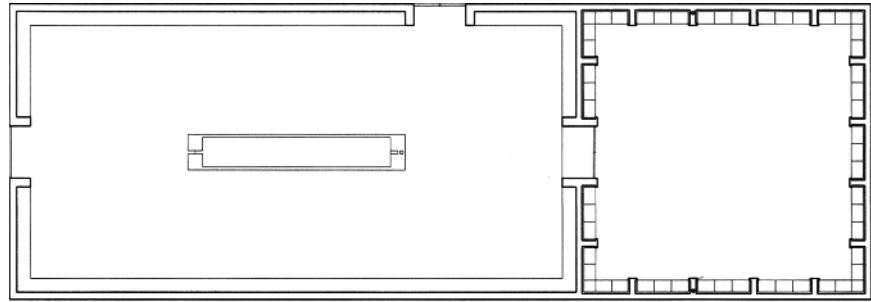
Architect	Raffaele Cavadini
Client	Don Annibale Berla
Completion	1997
Denomination	Roman-Catholic
Footprint	82.81 m ²
Seating capacity	ca. 20

Situated on a plateau high above Lago Maggiore and the town of Brissago, the village of Porta has had an oratory since the Middle Ages. It enjoys a position at the edge of a slope overlooking the lake, forcing the road to bend around the building. Despite its inescapable presence in the village, the chapel fell into an increasingly derelict state until, in the mid-nineties, the parish decided to demolish it and replace it with a new building. As with its predecessor, the new oratory is very prominent. Nevertheless, the relationship of the object to the texture of its environment attempts to strengthen the spatial coherence of its surroundings.

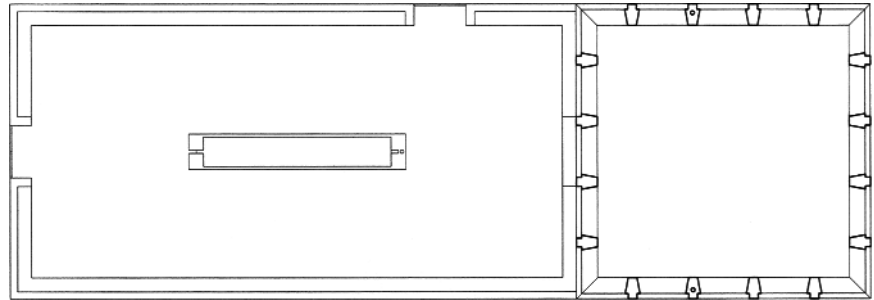
The chapel has a rigorously geometric form. It is a cube of 9.1 by 9.1 by 8.1 metres. The columns and beams,



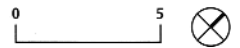
Site plan showing the "chapel" at the edge of the motorway service station



Plan at the level of the plinth



Plan at the level of the windows



View from the west over the courtyard and building, aluminium-framed windows extend around all four sides of the frameless box | The cuboid of the chapel seen at dusk illuminated from within



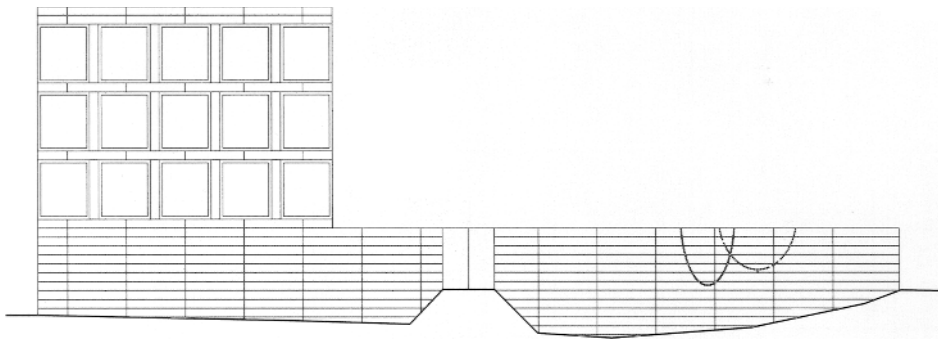
Place of Contemplation

between Altdorf and Erstfeld, Switzerland

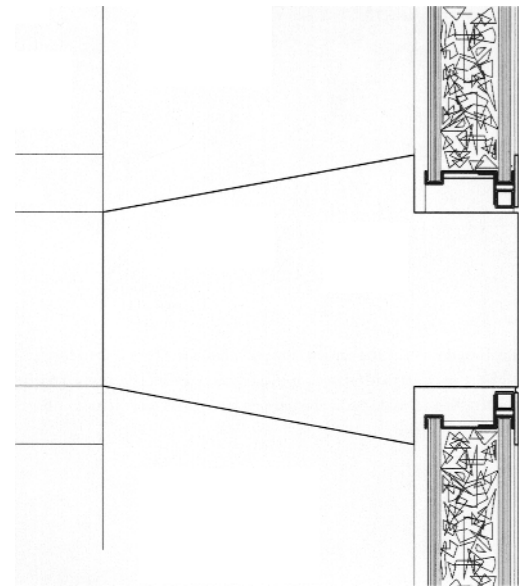
Architects	Pascale Guignard, Stefan Sauer
Client	Foundation for the Place of Contemplation on the Motorway at Uri
Completion	1998
Denomination	None
Footprint	Cuboid 100 m ²
Seating capacity	ca. 50

In the fifties, sixties and seventies, roadside chapels were built along almost every major motorway in Germany. In Switzerland, however, despite the heavy through-traffic and high level of tourism in the country, there is only one single building of this kind. Its position could hardly have been better chosen. Those travelling southwards will find this "place of contemplation" between the exits Altdorf and Erstfeld, on the southern perimeter of a motorway service station with two huge restaurants, some 20 kilometres before the entrance to the busy St Gotthard tunnel.

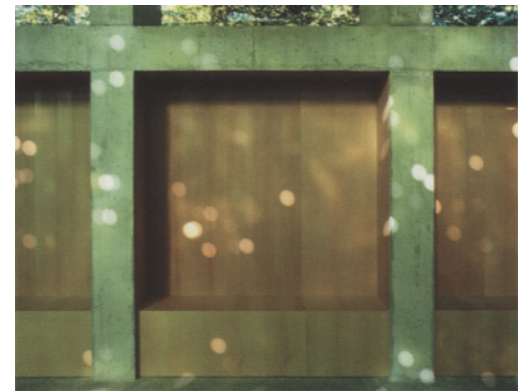
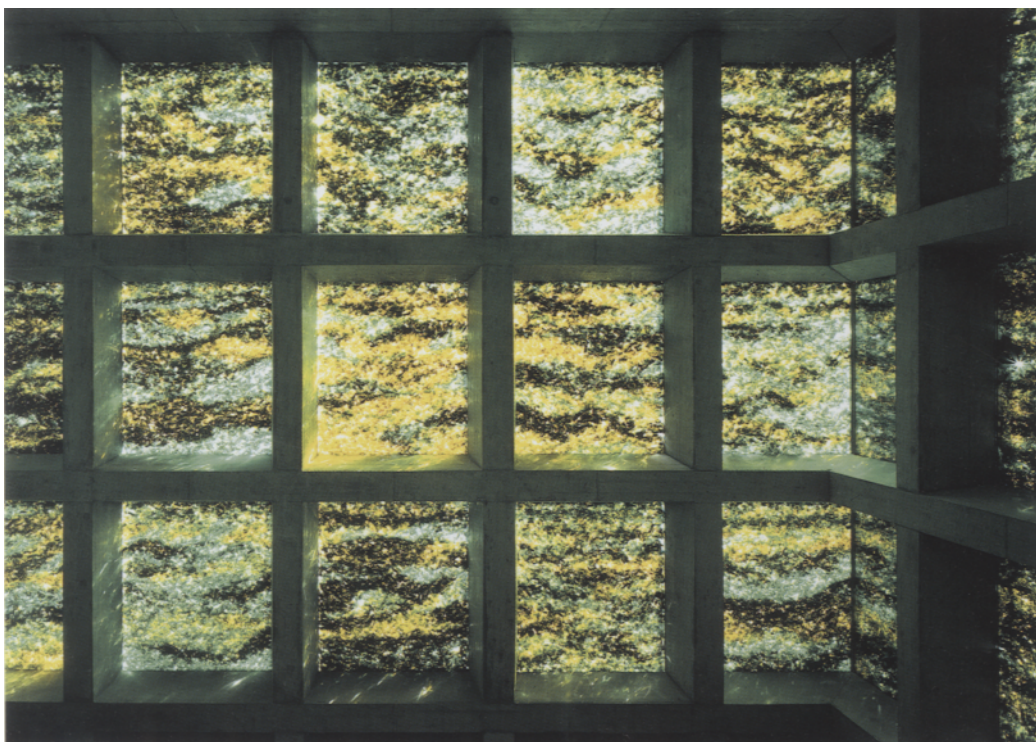
The building is situated like a clasp between technology and nature: on one side the cars rush past, on the other the waters of the river Reuss stream by, framed



North elevation, to the right a relief of prayer-heads



Section through a concrete pier and box window, the frame is inserted into a rebate with laminated safety glass on the outside, float glass on the inside

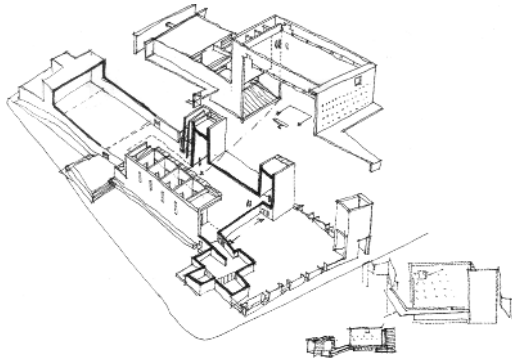


Detail of the concrete skeleton and the box windows filled with broken shards of green glass : Detail of base showing integral benches clad in beechwood

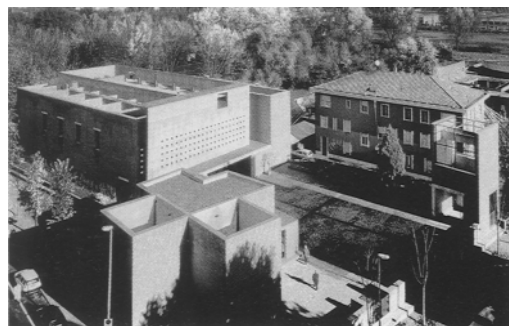
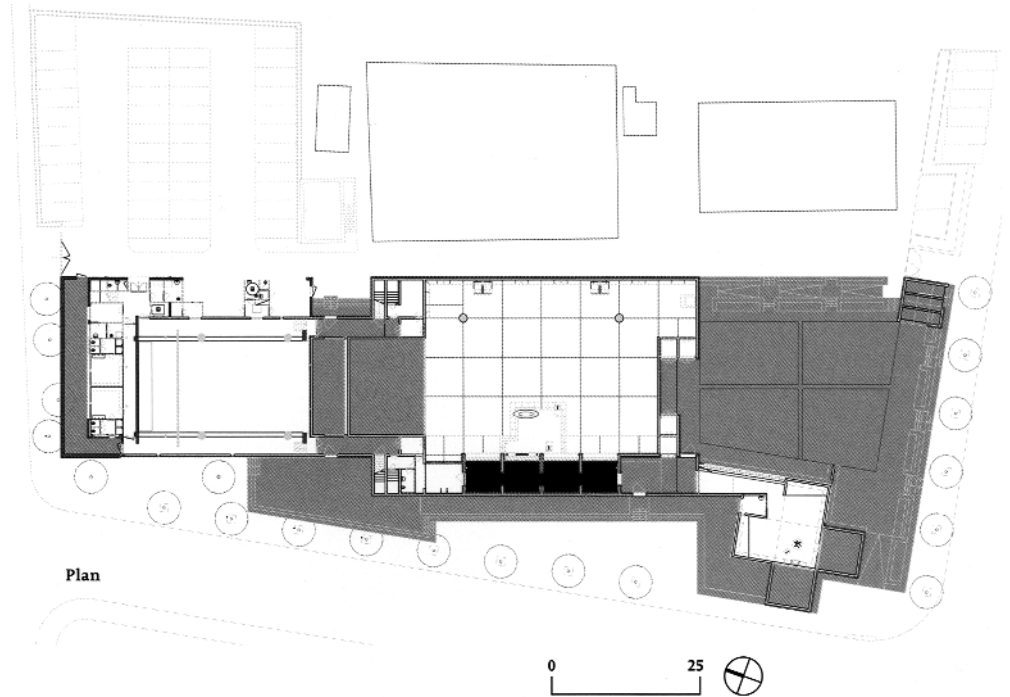
behind by the massif of the Alps. The dimensions of the building – 29.26 metres long by 10 metres wide – betray its calculated proportions. The path from the car park leads into a courtyard enclosed by walls with benches all around and a raised elongated water basin in the centre. A relief cast into the in situ concrete walls displays symbols of Jewish, Christian, Moslem as well as Hindu and Buddhistic faiths, including prayer rolls, prayer beads and a tablet with engraved texts from the scriptures of the different faiths. The “chapel” itself is located at the eastern narrow end of the courtyard. Its dimensions give it the appearance of a pure cube. Its gridded subdivision atop a solid, closed base gives the chapel the impression of being firmly seated, impervious to the rush of activity around it.

Whereas outside the flush arrangement of the walls and windows form a geometric whole that reflects with different qualities during the day, the impression from inside is very different. Here the concrete skeleton, with a 72-centimetre cross section, is very apparent creating a strongly modulated appearance. In the depths of the window recesses, box windows filled with broken shards of green glass are positioned such that their frames are concealed behind rebates in the concrete framework. It is as if one can reach out and grasp the greenness of sunlit leaves in a deciduous forest. The space can accommodate about 50 persons. Benches are integrated into the solid recesses at the base, their seats and backrests clad with beechwood. A glass cabinet stands in the centre of the room; it contains a crystal.

The chapel is a place of contemplation, a place of silence, for retreat, for rest and reflection. It offers drivers passing through one of Switzerland’s busiest motorway routes a counterpoint to the hectic mobility of the world outside, answering its disintegration of space and time with an invitation to contemplate the here and now. The “chapel of world religions”, as it is termed by the architects, has a sacred quality without religious specificity. Its hermetic architecture corresponds to the spread of non-denominational, almost roving spirituality that has arisen since the nineties.



Exploded view of the entire complex, from bottom left to top right, the courtyard with chapel and campanile, the church with vestibule and main hall, the garden court, the parish hall and administration



View from the southwest, at the back on the right between the towers of the baptistry and campanile, the priest's residence | Courtyard with chapel and corridor on the left, the concrete facing of the main building | View southwest with the island of the altar on the left, the gridded wooden panels in the concrete ceiling contain lighting and heating elements | The Chapel of Our Lady on the northeast side of the building | North face of the main hall with view into the garden court



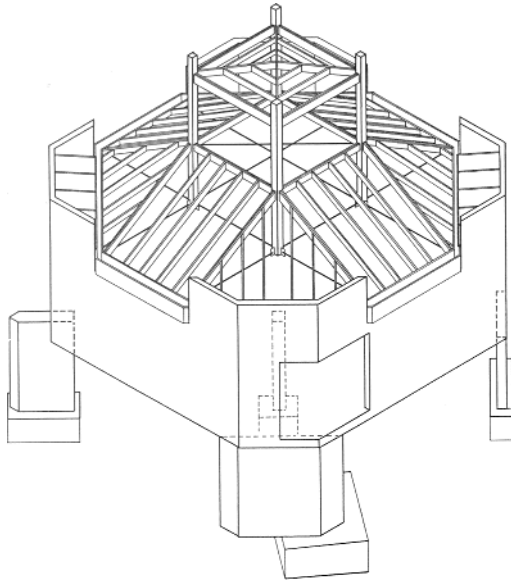
St Ireneo Church

Cesano Boscone, Italy

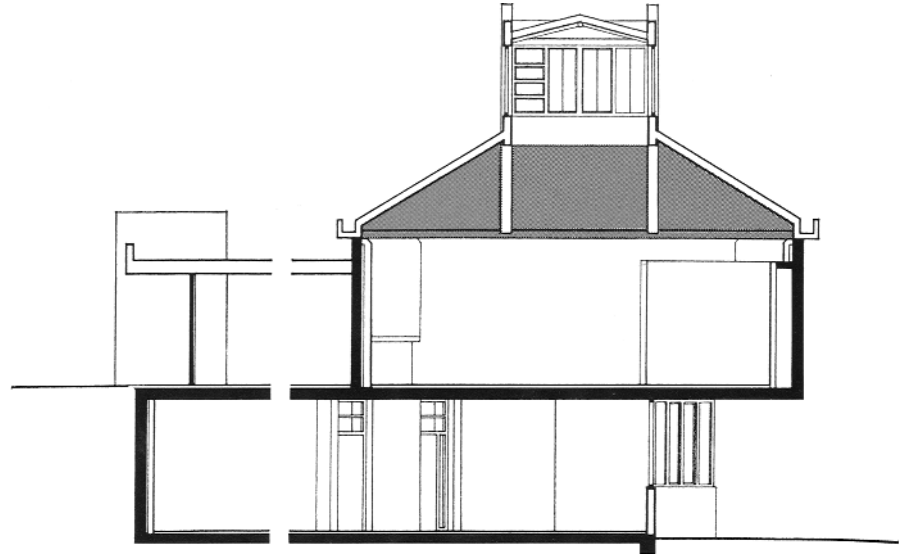
Architect	Mauro Galantino
Client	Diocese of Milan
Completion	2000
Denomination	Roman-Catholic
Footprint	1550 m ²
Seating capacity	Pews 249, chairs 144

The church is situated in a "dormitory satellite" on the "periphery of the periphery" of Milan; according to the architect, situations like these demand strong signals. In Cesano Boscone, however, a different solution was chosen. The building complex attempts to extend and interlock with the existing disparate context, picking up the lines of buildings and areas to the east, and setting the entire complex on an elevated platform that clearly separates it from the main roads and side roads to the west and south.

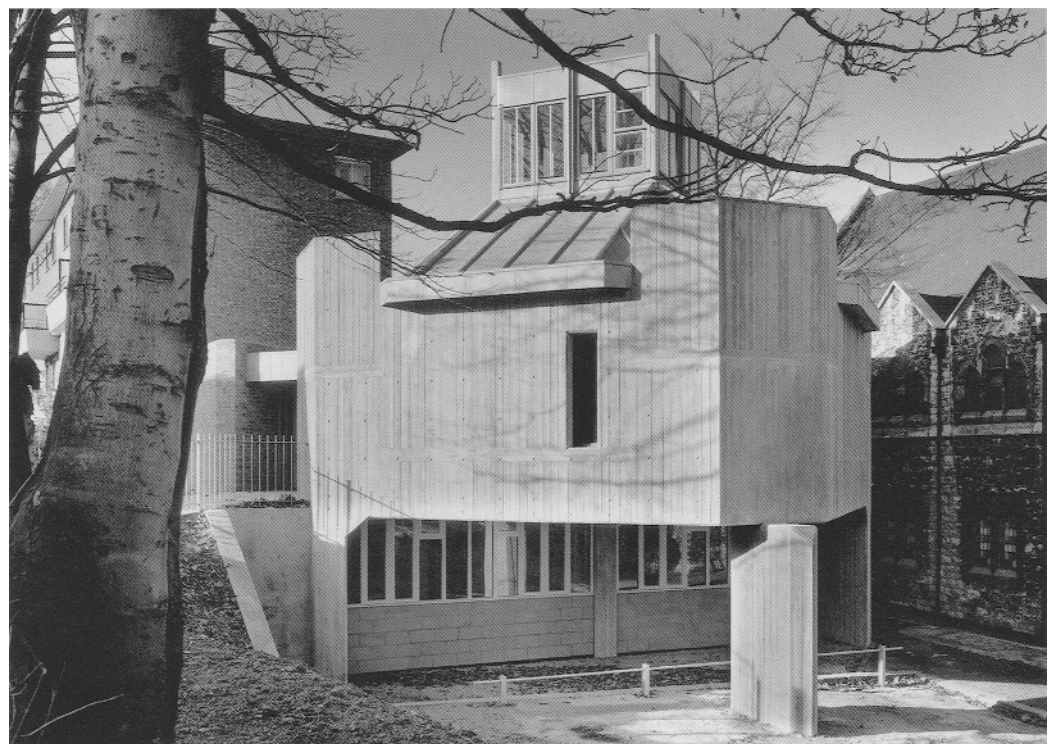
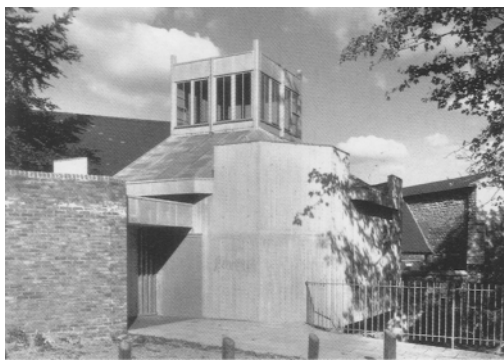
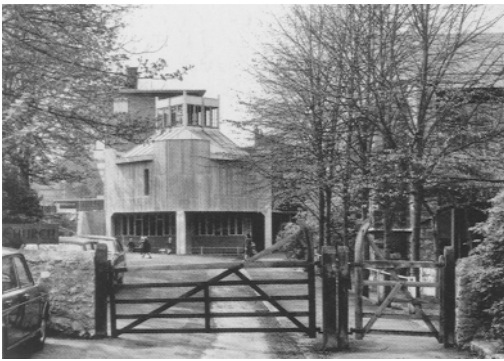
Including the spaces for the church and the parish centre, the entire building has a length of 108 metres and a breadth of 42 metres at the front and 22 metres at the rear. The overall height of the building is 14 metres,



Axonometric of the constructional elements



Section

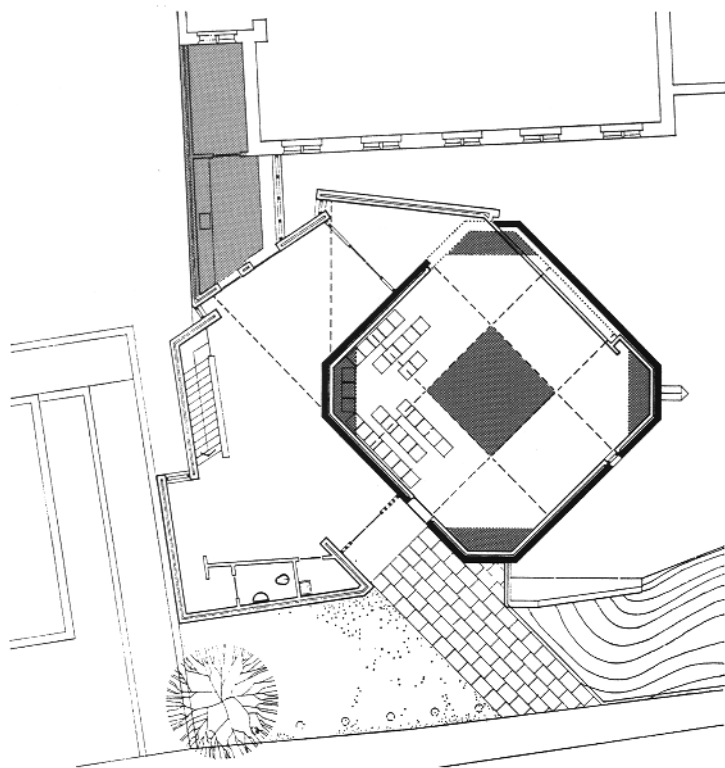


Quaker Meeting House, Blackheath

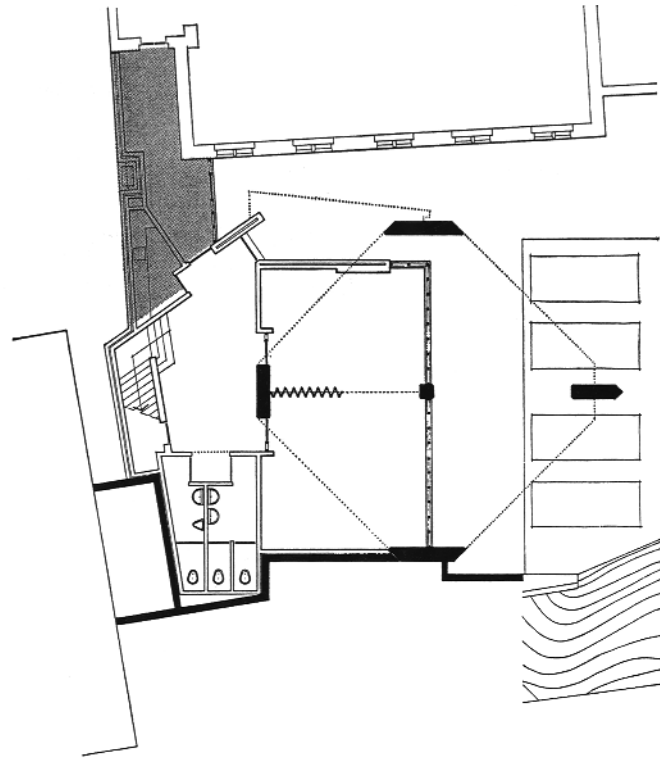
London, Great Britain

Architect	Trevor Dannatt
Client	Blackheath Meeting of the Religious Society of Friends, London
Completion	1972
Denomination	Quaker
Footprint	Hall 100 m ²
Seating capacity	ca. 100

The House of the Religious Society of Friends stands in a complex in-between situation, bounded to the north by a railway cutting and to the south by raised-level road traffic. Any building on this terrain has to compete with an embankment and with a 19th-century church. Given these difficulties, the building was not built parallel to the road and the church, but was rotated by 45 degrees in order to achieve a prominent position for the house. The changing levels of the site provided an opportunity for two storeys each with their own separate entrances. What is below is of secondary importance: a multi-purpose, sub-divisible space of just under 58 square metres behind a triangular canopy. What is above is of primary importance: the Quakers' meeting hall.



Plan of the upper level



Plan of the lower level



View from the east, at the rear the canopy of the multi-purpose space | Main building from the upper level with corner tower and central tower, entrance to the vestibule on the left | View from the southeast, on the left the house, on the right the church, in the centre the narrow window level with the hall | Way through from the vestibule to the hall, in the corner, rear right, one of the four small obscured rooflights | Visible transparent construction of the roof, which additionally subdivides the plain space of the hall

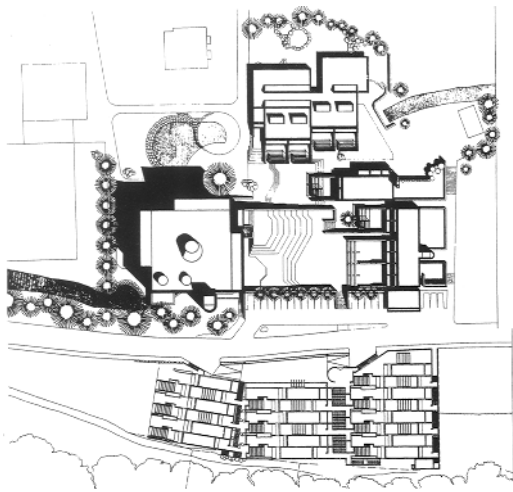
At its various levels, the architecture changes from square to octagonal to square. The fair-faced concrete façades rise in the four corners a little above eaves level. From outside, one has the impression of a compacted building, of a compressed "cathedral" with a "central tower" and "corner towers". Despite its historical references, the building remains without pretension – a concrete box with a lid of wood and zinc. Floor and walls of the upper storey rest on four slab-shaped pillars at the sides and a support in the middle. The walls carry the weight of the roof; the roof carries the weight of the "lantern". The vestibule is evidently not intended to be visible from the road. A windowless brick wall functions as a mediator to the residence on the left hand side. A low polygon opens up behind the entrance.

Its five wall sections, rotated to the right, maintain distance from one another through the use of room-high glass and light strips. In this way, and through the gentle stepping of the ceiling, a spiral is suggested. The vestibule leads all eyes and feet into the hall, where the services take place.

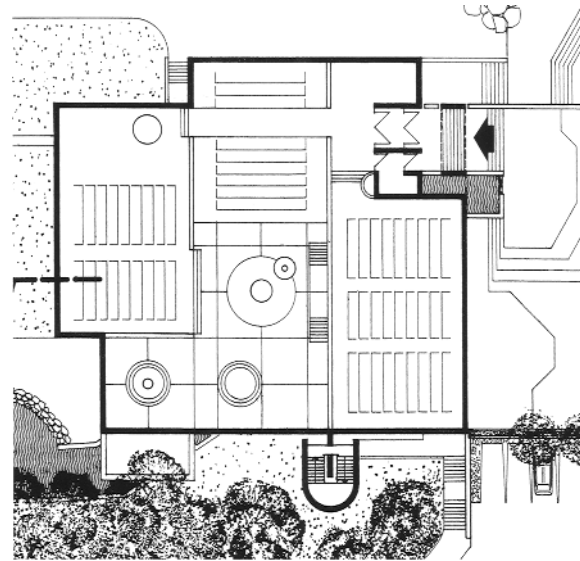
Since the Quakers do not have clergy or rite, altar or ambo, this space remains empty but can be filled with up to a hundred chairs. The length and breadth of the hall measures 10 metres and the height from the cork-tiled floor to the underside of the tension rods of the roof structure is 3 metres. The four longer and four shorter walls of the octagons – plain concrete outside and blockwork inside – are finished in a smooth

white plaster. Above the shorter walls are small rooflights concealed from view. In the space itself there is only one tall, narrow window. When one enters the hall and looks to the front, one looks onto the street from where one has just come.

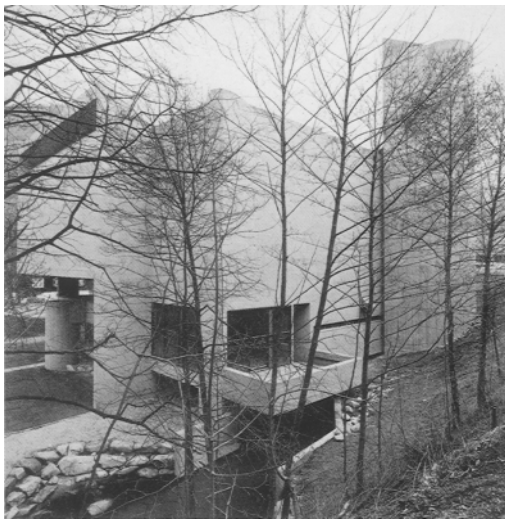
The roof construction consists of four trusses that cross each other and narrow laths of redwood from the region of Lake Kara in Russia. The steel tension rods form nine subdivisions and allow the spatial arrangement of the room to be more clearly experienced. A huge "lantern" sits directly above the central area, a cube with edges of about 3 metres in length. The light fittings that hang from the four corners of the "lantern" are made of zinc.



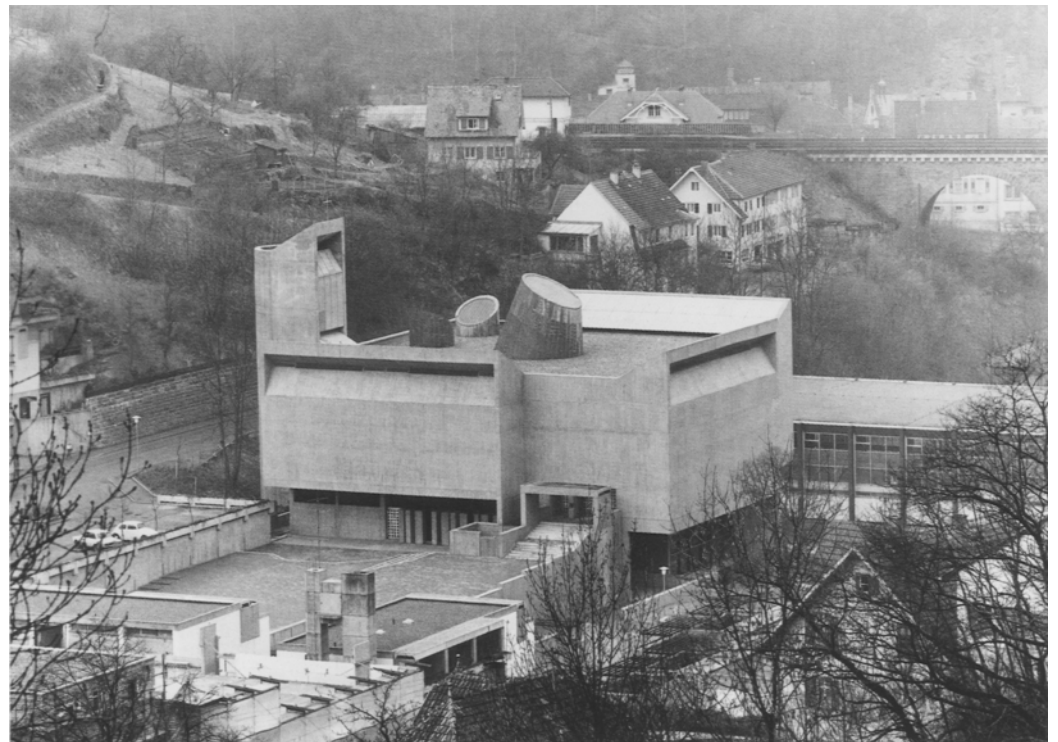
Site plan, in the centre the stepped ensemble of the church area, far left and far right the Reichenbach, which flows under the building



Upper floor plan



View from the southwest, behind the balcony lies the practice room for the church choir, below the balcony the Reichenbach | View from the northeast, clearly showing the striped texture and cone of the skylight, in the background the viaduct | Entrance, to the left the way up to the gallery, on the right the way down to the weekday church | View from the southeast

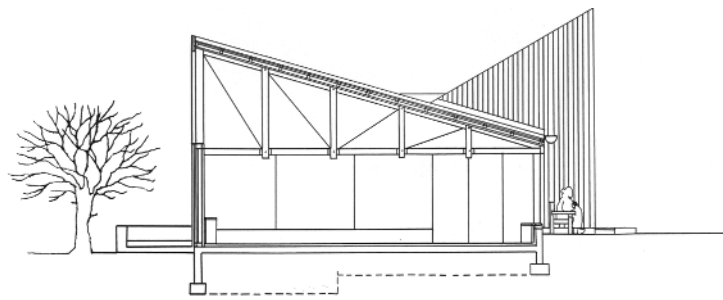


St John the Baptist Church

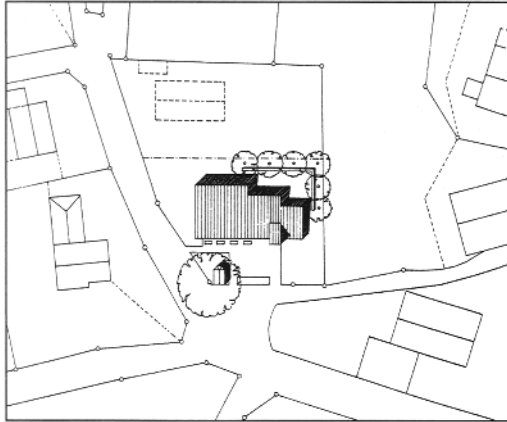
Hornberg, Germany

Architect	Rainer Disse
Client	Catholic Parish of Hornberg
Completion	1972
Denomination	Roman-Catholic
Footprint	ca. 1000 m ²
Seating capacity	Sunday church 600, weekday church 40

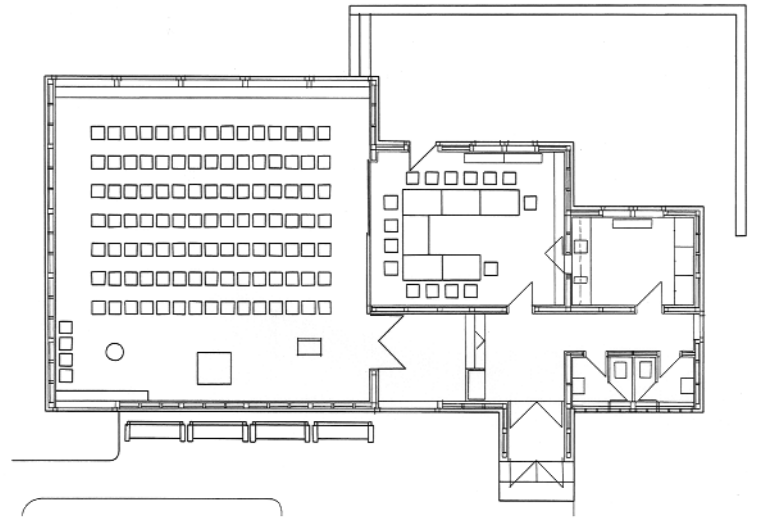
Situated on the site of an earlier sawmill, resting on twelve wall slabs on rocky terrain on both sides of the River Reichenbach and built of in situ, lightweight and fair-faced concrete, the church stands in a Black Forest valley running west to east. The flat roof, with the truncated cone of the lead-clad skylight in the middle, stands out from the steep slopes. The block-like structure, more or less square in plan, appears closed towards the top and more open at the bottom. The bell tower projects on the south side, its plan section in the form of a "U". The concrete of its exterior, which bears traces of the vertical saw-cut formwork, contrasts with the smooth surface of the four large walls of the church.



Cross section



Site plan



Floor plan



View from the south | View from the north, left the seating wall | Part of the "entrance hall" with way through to the church space | View from the hall looking west, above right the mullioned windows

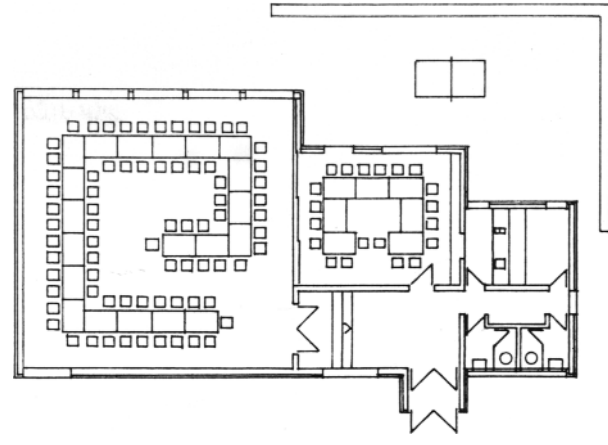
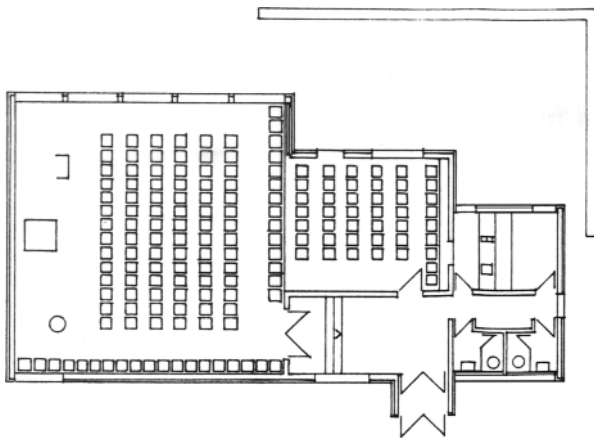


Rudolf-Alexander-Schröder House

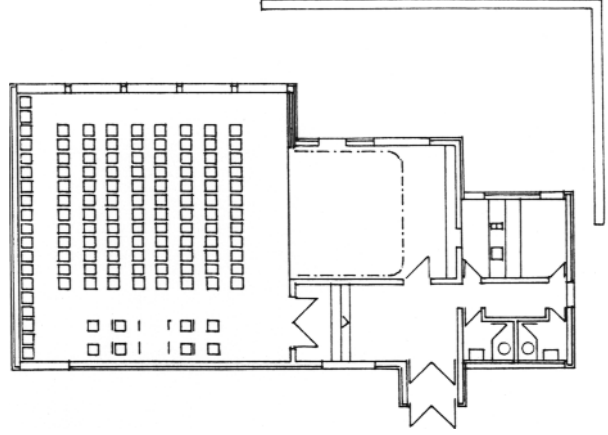
Bergen am Chiemsee, Germany

Architect	Theodor Hugues
Client	Übersee Protestant Church Parish
Completion	1974
Denomination	Lutheran-Protestant
Footprint	Church 107.12 m ²
Seating capacity	ca. 114

The elongated building stands on the north side of a small square, where several roads and paths meet. In the immediate surroundings, there are many houses from the sixties and seventies, built at a low density typical for a location of this kind and period. Existing elements that determined the design were a magnificent lime tree with a lush crown and a tiny chapel. The Rudolf-Alexander-Schröder House lends both of these their due prominence while giving them a recumbent background, in which only the projecting bell frame offers a clear pendant. All in all, one sees an ensemble, the parts of which – the green tree, the red roof, the light render of the old building, the dark cladding of the new building – complement one another through contrast and balance.



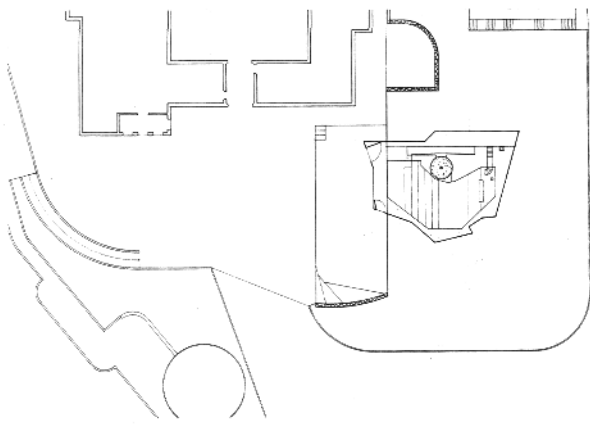
Plans with alternative seating patterns for both spaces: church services, meetings and theatre



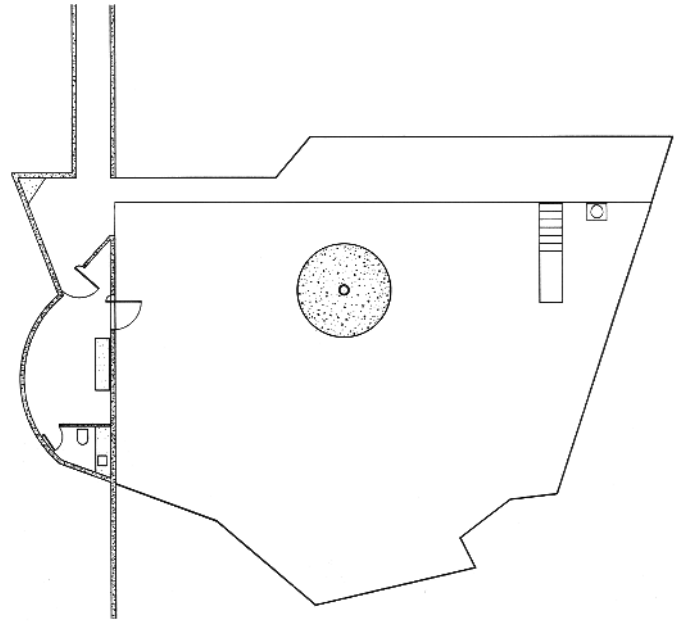
The timber frame rests on foundations of compacted concrete. The posts measure 14 by 14 centimetres and stand at two metre centres. The building occupies a double square of 20.45 by 10.3 metres. The south side continues in a straight line; on the north side, however, the building steps back twice. Here, a concrete right angle serves as a wall to sit on and as the boundary of a terrace. Externally, the building is characterised, above all, by its two monopitch roofs, from south to north the broader roof rising at a pitch of 16 degrees, the narrower roof falling at 30 degrees. The tension caused is not just sculptural; it is also functionally legitimised. The large roof surface covers the church space and the parish hall, the sacristy and the cloakroom, the small roof surface the bell cage and the entrance lobby.

To celebrate mass, the congregation assembles in the main church space. Quarry tiles on the floor and spruce planks on the walls characterise the space, the height of which is about a quarter of its length and breadth. Since the space is square in plan, the 114 chairs are best arranged in a wide circle; in this arrangement the altar and ambo can be placed in the centre. The roof structure is of lighter appearance, with trusses and chords in timber and diagonal, round steel tie-rods. On the south side, the light enters through a section of full-height glazing; on the north side, a full-width row of five mullioned windows the height of the trusses provides additional light. Artificial light is cast upwards and downwards by small lamps on the tops and sides of the bottom chords of the trusses.

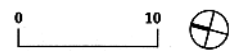
With reference to the exterior-interior relationship, the concordance of volume and function, this church proves itself to be genuinely modern architecture. Clearly discernible are the influences of American timber construction, the chapel by Heikki Sirén and Kaija Sirén in Espoo, Finland, from 1957, and the Church of the Holy Spirit by Hans Busso von Busse in Schaftlach, Germany, from 1967. The Rudolf-Alexander-Schröder House does not make a lot of fuss about its form; it is understandable at first glance, indeed almost ordinary. This is an example, in the best sense, of "architecture without architects".



Site plan



Plan of lower level



View from southwest with retaining wall on the left | View from the courtyard of the Palácio Boa Vista | Lower level with pool of water below and interaction of concrete shell and glass skin | View from the northeast

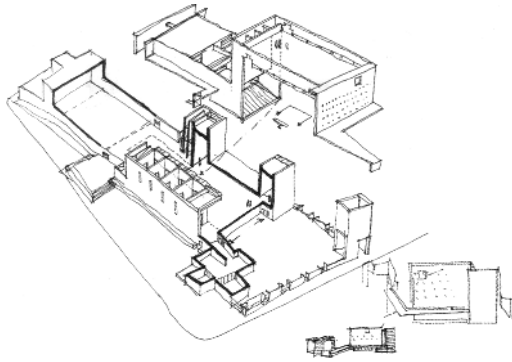
St Peter's Chapel

Campos do Jordão, São Paulo, Brazil

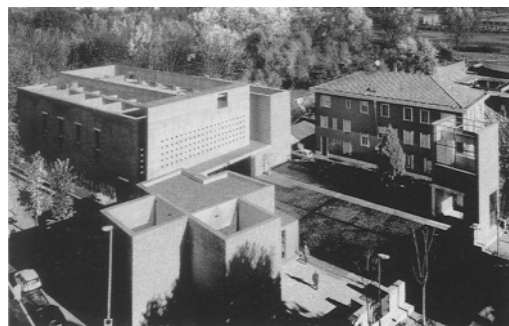
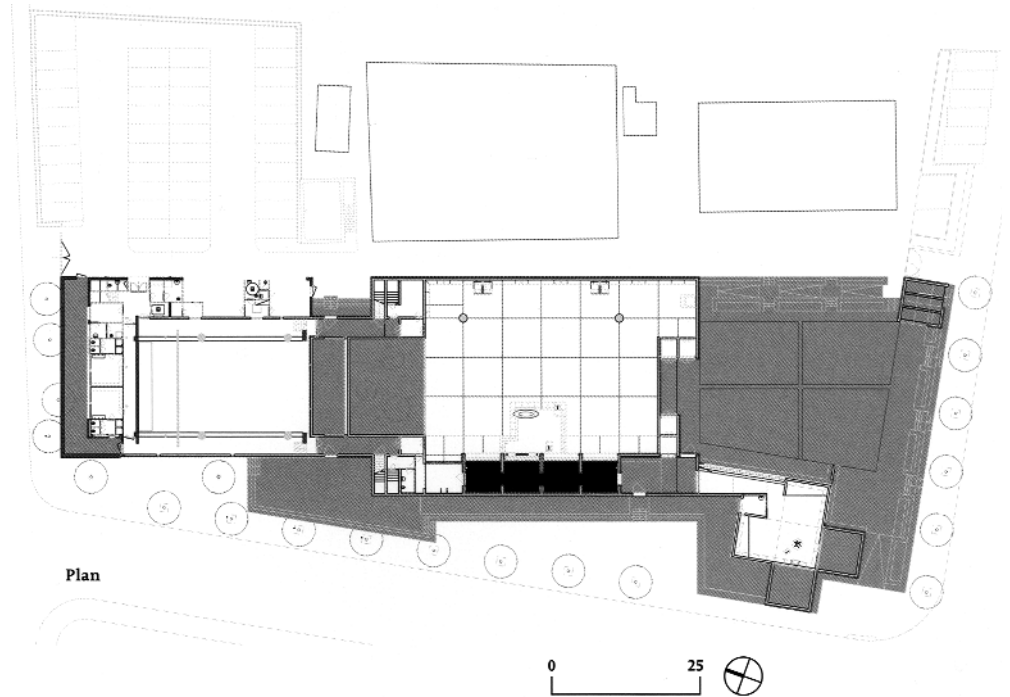
Architect	Paulo Archias Mendes da Rocha
Client	Ministry of Public Buildings and Works of the State of São Paulo
Completion	1989
Denomination	Roman-Catholic
Footprint	310 m ²

Located in the highlands of the Serra da Mantiqueira northeast of São Paulo, the town of Campos do Jordão originated from a settlement of villas and has been a health resort since the twenties with numerous sanatoria for sufferers of pulmonary ailments. Later the town became an exclusive holiday destination, due to its architecture, which visitors once regarded as a piece of "Switzerland in Brazil".

The town's expansion, which caused the population to swell to 50,000 inhabitants, was in part due to the decision to build the Palácio Boa Vista there in 1938. Originally built as the residence for the Governor of São Paulo, it has been used as a museum since the early seventies.



Exploded view of the entire complex, from bottom left to top right, the courtyard with chapel and campanile, the church with vestibule and main hall, the garden court, the parish hall and administration



View from the southwest, at the back on the right between the towers of the baptistry and campanile, the priest's residence | Courtyard with chapel and corridor on the left, the concrete facing of the main building | View southwest with the island of the altar on the left, the gridded wooden panels in the concrete ceiling contain lighting and heating elements | The Chapel of Our Lady on the northeast side of the building | North face of the main hall with view into the garden court



St Ireneo Church

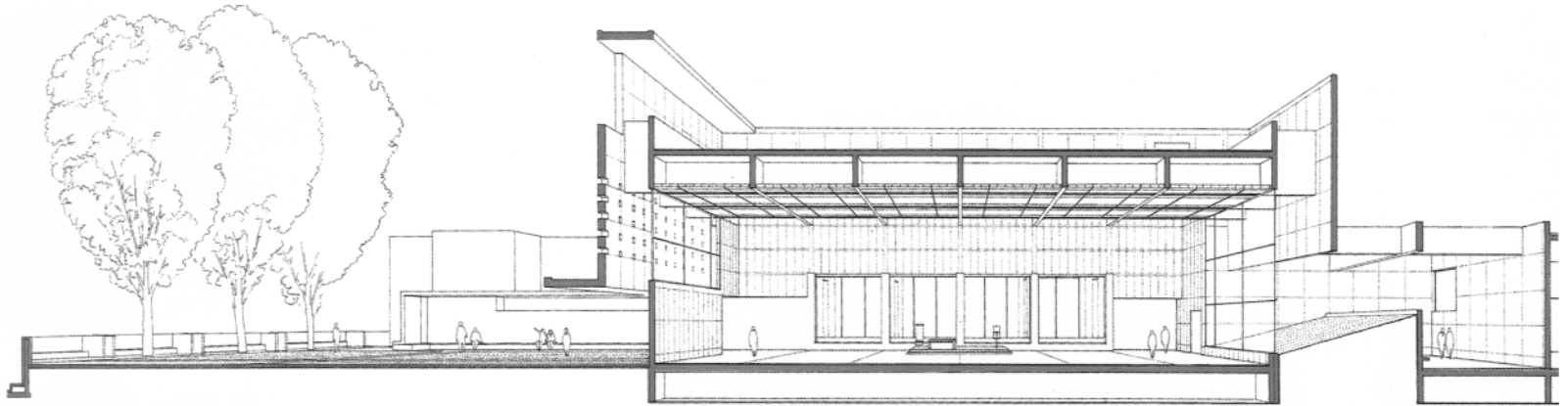
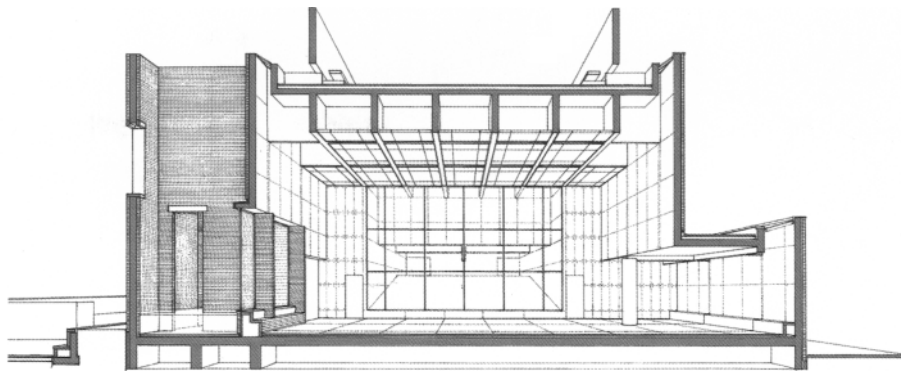
Cesano Boscone, Italy

Architect	Mauro Galantino
Client	Diocese of Milan
Completion	2000
Denomination	Roman-Catholic
Footprint	1550 m ²
Seating capacity	Pews 249, chairs 144

The church is situated in a "dormitory satellite" on the "periphery of the periphery" of Milan; according to the architect, situations like these demand strong signals. In Cesano Boscone, however, a different solution was chosen. The building complex attempts to extend and interlock with the existing disparate context, picking up the lines of buildings and areas to the east, and setting the entire complex on an elevated platform that clearly separates it from the main roads and side roads to the west and south.

Including the spaces for the church and the parish centre, the entire building has a length of 108 metres and a breadth of 42 metres at the front and 22 metres at the rear. The overall height of the building is 14 metres,

Cross section looking north



Longitudinal section looking west

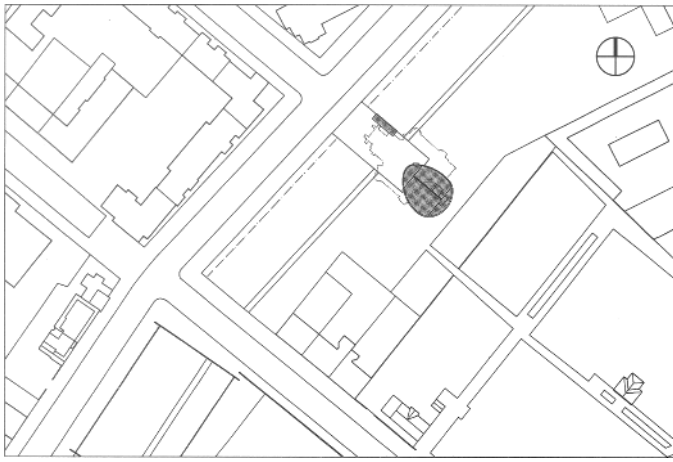


measured from street level. The entrance courtyard lies at the corner of the complex. Its trapezoid form is defined by the chapel to the left, the campanile to the right, the concrete frontage of the church up ahead as well as two rows of benches and the priest's residence. The orientation of the chapel and campanile follows that of the road, the paving of the courtyard by contrast the axis of the church, resulting in a Piazzetta reminiscent of Camillo Sitte's ideals.

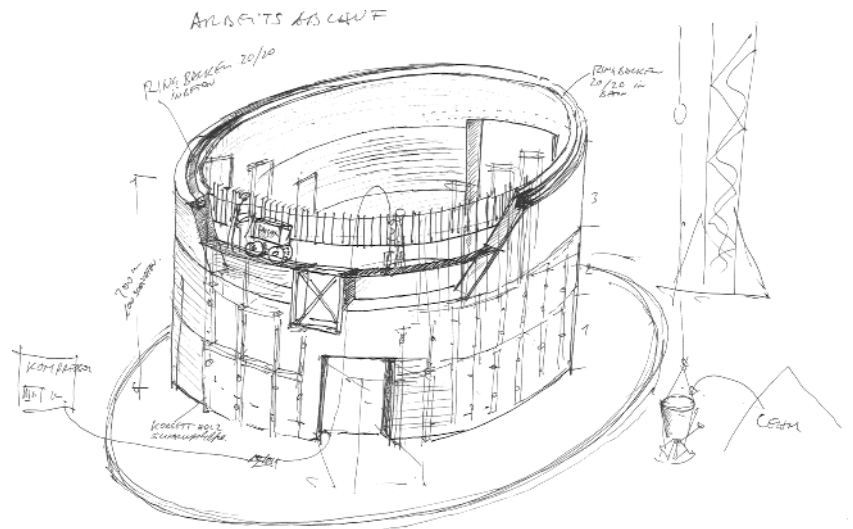
A corridor, open to the courtyard, leads from the chapel and underneath the projecting roof of the church. The schematic arrangement of the church is that of a hall church turned crossways: to the east a 3.4 metre high vestibule with spaces for the font and confession,

in the centre a 7.9 metre high main hall with pews arranged in three blocks around the island with the altar and ambo. The altar table is a replica of an elliptical table designed in the thirties by Piero Bottoni for the Villa Muggia. To the west four shaft-like cavities behind glass panes appear like a row of apses. With the exception of these light-filled boxes, north light falls from the side from the garden court, then through a full-height glass panel, and on the other side from the south through 105 small holes in the concrete facing of the church frontage and through a broad window high up in the wall. In addition, light streams in from above onto the east wall of the vestibule and the east and west walls of the main church hall.

Whilst light streams in from all around, the surroundings remain concealed from view: the periphery would distract from the Eucharistic mass. The castello-like external appearance of the complex is largely due to the defensive concrete frontage and the three squat towers to the east. Of these, the tower in the south is the campanile, the tower in the centre is the baptistry and the tower to the north facilitates access to the building. The use of materials reflects the contextualism outside and functionalism inside: red brick outside, predominantly grey concrete inside. However, one's awareness of contextualism and functionalism vanishes upon entering the strongly introverted space of the church, expressed through the building's numerous sizeable cavities and recesses.



Site plan showing the strip of the former Berlin Wall running from northeast to southwest



Sketch of the construction of rammed earth walls using timber shuttering



Entrance from outside | Chapel on the strip of the former Berlin Wall, with the path formerly used by the soldier patrols running through the centre, view northeast | Interior with the altar on the left and retable saved from the demolished Church of Reconciliation in the niche on the right | Ambulatory between the outer and inner skin, on the left the door to the chapel



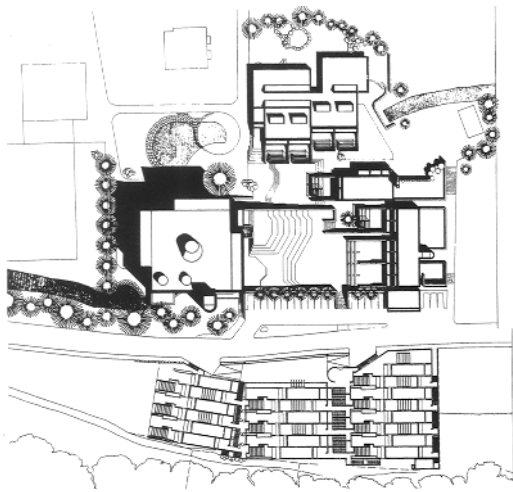
Chapel of Reconciliation

Berlin, Germany

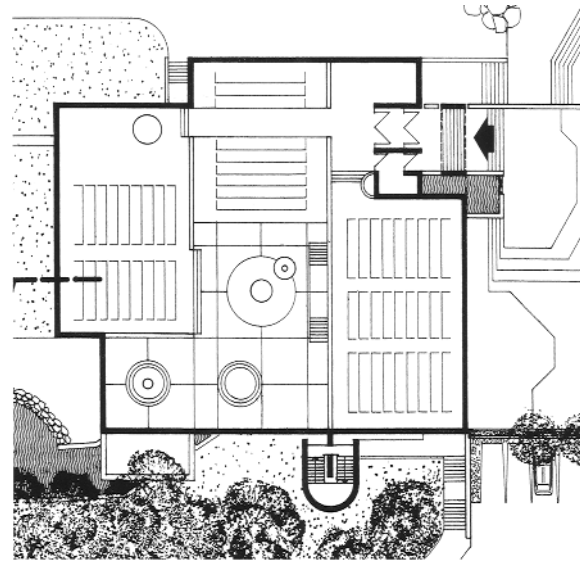
Architects	Rudolf Reitermann, Peter Sassenroth
Client	Protestant Reconciliation Church Parish, Berlin
Completion	2000
Denomination	Lutheran-Protestant
Footprint	ca. 398 m ²
Seating capacity	100

The chapel stands where from 1961 until 1989 the wall between East and West Berlin once ran, exactly on the spot where Gotthilf Ludwig Möckel's neo-Gothic Church of Reconciliation once stood before it was demolished in 1985. The central theme of this partly solid, partly fragile architecture, which consists of a high oval volume for the church service and a low rectangular bell frame, is the history of the political and religious transformation of this place.

The design of the inner container began with a circle as the most compact form of gathering. By stretching and bulging this form, a hint of vestibule and choir is created. The specific dynamism of this almost 9 metre high and 18.5 metre wide chapel derives from the inter-



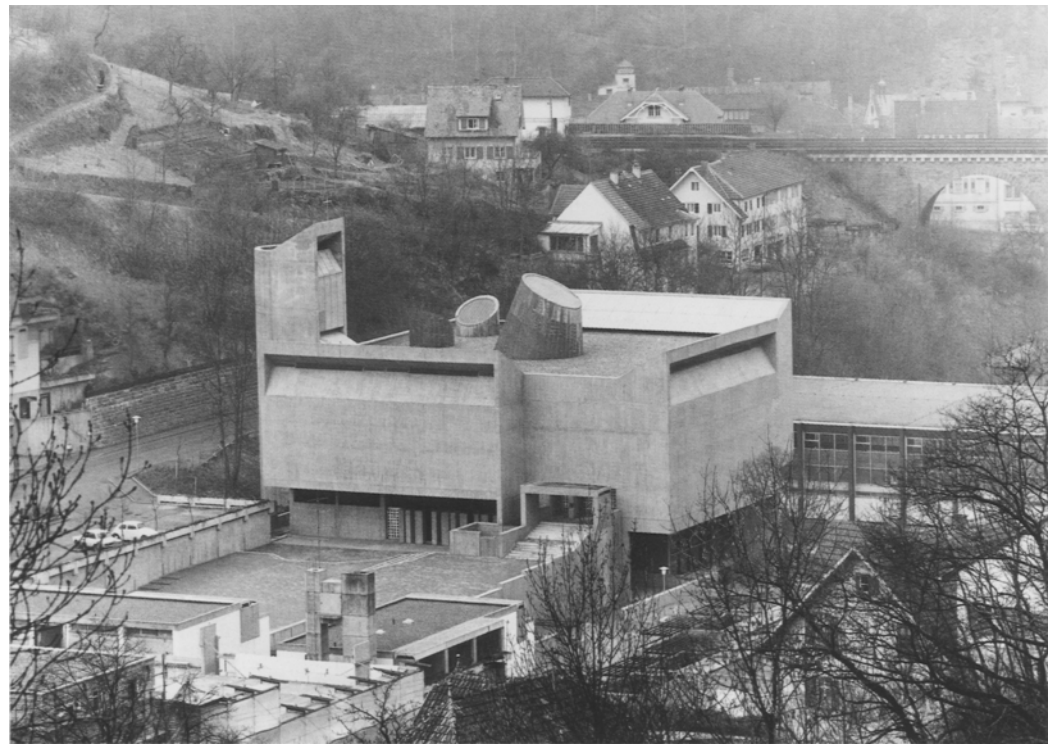
Site plan, in the centre the stepped ensemble of the church area, far left and far right the Reichenbach, which flows under the building



Upper floor plan



View from the southwest, behind the balcony lies the practice room for the church choir, below the balcony the Reichenbach | View from the northeast, clearly showing the striped texture and cone of the skylight, in the background the viaduct | Entrance, to the left the way up to the gallery, on the right the way down to the weekday church | View from the southeast

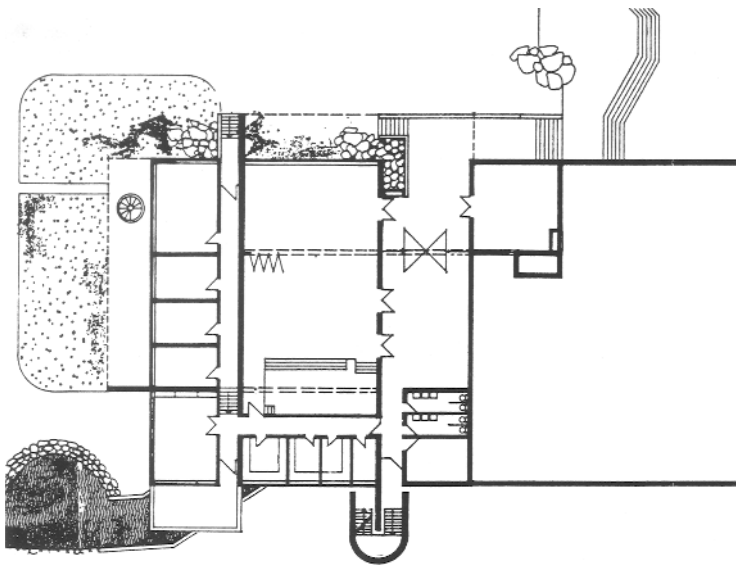


St John the Baptist Church

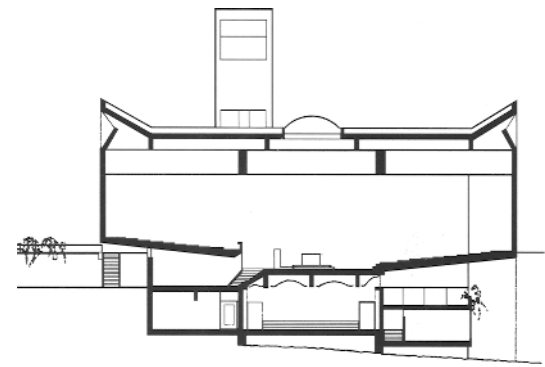
Hornberg, Germany

Architect	Rainer Disse
Client	Catholic Parish of Hornberg
Completion	1972
Denomination	Roman-Catholic
Footprint	ca. 1000 m ²
Seating capacity	Sunday church 600, weekday church 40

Situated on the site of an earlier sawmill, resting on twelve wall slabs on rocky terrain on both sides of the River Reichenbach and built of in situ, lightweight and fair-faced concrete, the church stands in a Black Forest valley running west to east. The flat roof, with the truncated cone of the lead-clad skylight in the middle, stands out from the steep slopes. The block-like structure, more or less square in plan, appears closed towards the top and more open at the bottom. The bell tower projects on the south side, its plan section in the form of a "U". The concrete of its exterior, which bears traces of the vertical saw-cut formwork, contrasts with the smooth surface of the four large walls of the church.



Lower floor plan, in the middle the hall with stage and folding partition



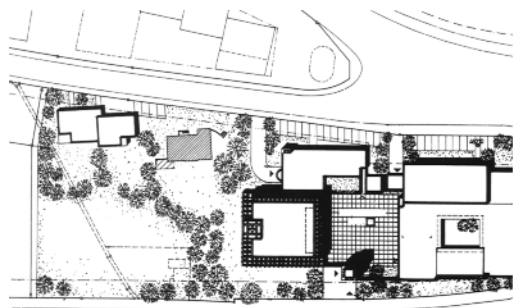
Longitudinal section with view to the south



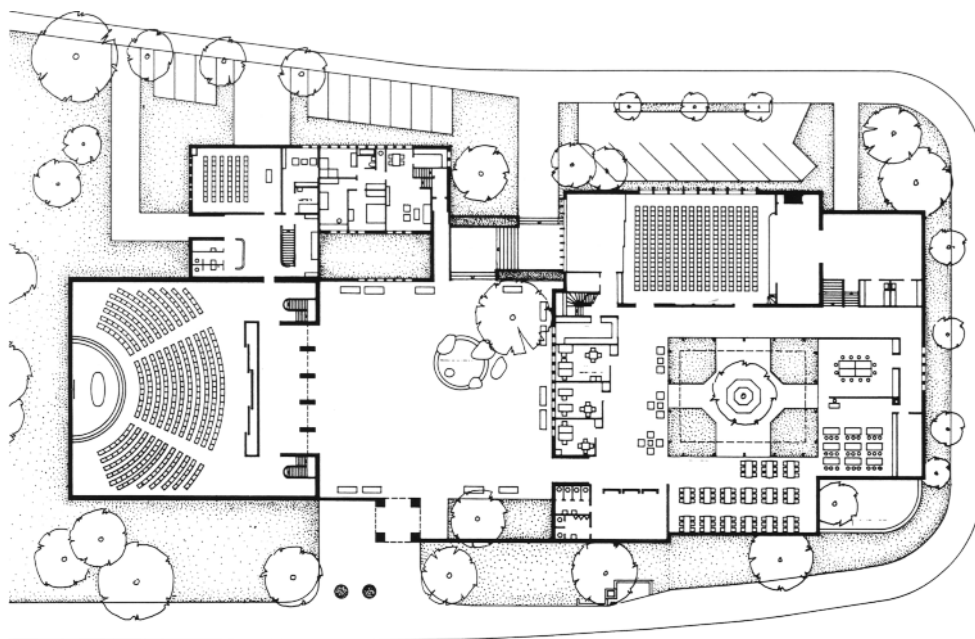
The forecourt slopes down in the direction of the entrance to the weekday church and rises towards the entrance to the Sunday church. Passing to one side of a fountain, one enters the building through a wide portal. The space measures a good 31 metres from north to south and more than 34 metres from west to east. The altar, the ambo and the font stand on circular islands, all three highlighted by light from above. The massive truncated cone above the circular altar, clad in yellow-stained timber slats and surrounded by four roof beams, accentuates the most important item among the objects of the liturgy. The 3.65 metre high molten glass and chromium steel column with the tabernacle – a work by the artist Florian Lechner – is also in a prominent position.

The zone with the liturgical elements is clearly marked by its grainy brushed concrete floor. Around this central point are the pews, arranged in three blocks, all made of ash and slightly inclined to the front, so that the congregation can better follow the proceedings. The organist and the choristers, due to their position between the rows of pews to the west and the north, become part of the celebrating congregation. In front of the seldom-used gallery on the east side, a hollow opens up with two staircases leading down into the weekday church and the sacristy. The lowest level of the building – reached mainly from the north, behind a small park with a pond and a tree – is used for social and cultural activities.

With regard to its architecture, St John the Baptist Church is heavily influenced by *Le Corbusier's* monastery *Sainte Marie de La Tourette* in *Eveux-sur-Arbresle*. The church in *Hornberg*, however, forms the nucleus of a larger complex near the viaduct of the *Black Forest Railway*, as further buildings adjoin the central area: to the north a children's centre and a sisters' hospice, in the east the priest's residence with the library and dwellings for the clergy, in the south – beyond a narrow road – ten markedly staggered dwelling houses. Since it was designed by one and the same hand, the ensemble is exceptionally coherent and carefully structured. It testifies to the ideal of a Catholic community that, not long after, would no longer have been realisable in the same manner.



Site plan



Ground floor plan



Churchyard with the base of the tower on the left, in the background the entrance to the church with the cast aluminium panels of the relief "Water and Fire" by Bernard Schorderet | View from the west with the 35 metre high "campanile" | Main church showing the combined altar, pulpit and font, hung below the rooflight the wall tapestry by Moik Schiele | Back of the church hall with the musicians' gallery

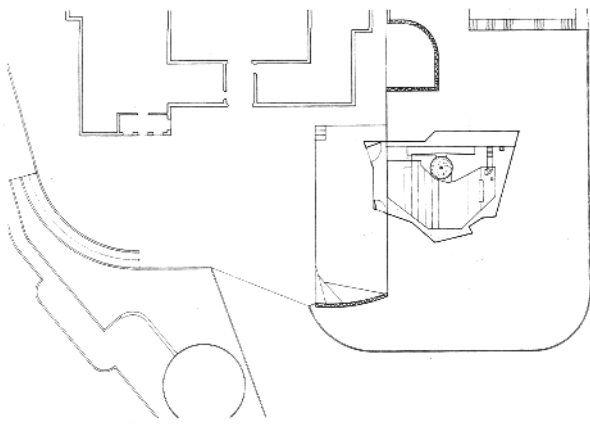


Glaubten Reformed Church

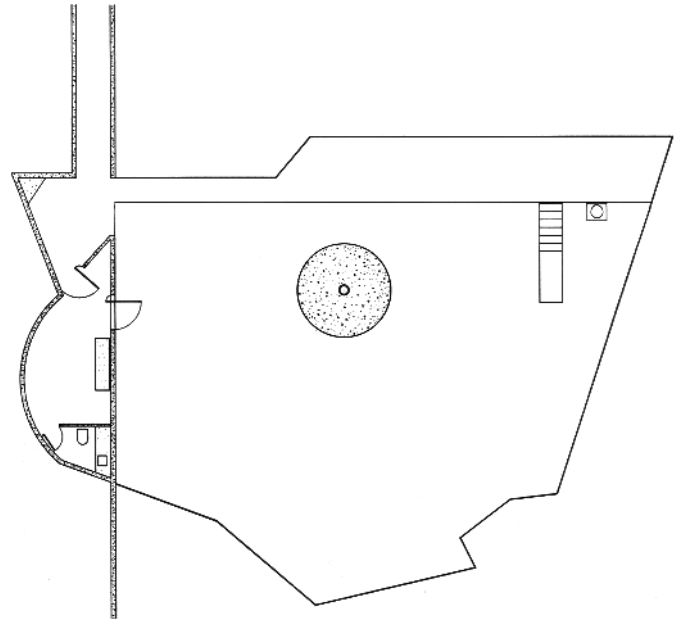
Zurich, Switzerland

Architects	Rudolf Guyer, Esther Guyer
Client	Zurich-Affoltern Reform Church Council
Completion	1972
Denomination	Protestant Reformed
Footprint	Church ca. 609 m ²
Seating capacity	Lower level ca. 450, upper level ca. 80

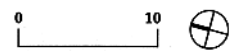
Surrounded on three sides by traffic noise, the church adopts a withdrawn position from the street. The complex is enclosed by a ring-wall that is only open in two places: a flight of steps to the north, and four rounded arches at the base of the tower to the south. The parts of the building to the east provide facilities for social and cultural activities; here an older parish hall has been extended with three new wings around a new green courtyard in the middle. The parts of the building to the west encompass the main church, the wing containing a room for devotions, the parish rooms, the verger's residence and the 35 metre high tower with its six bells. The ensemble surrounds a paved court. This, together with the church, forms a rectangle of 51.5 by 23 metres.



Site plan



Plan of lower level



View from southwest with retaining wall on the left | View from the courtyard of the Palácio Boa Vista | Lower level with pool of water below and interaction of concrete shell and glass skin | View from the northeast



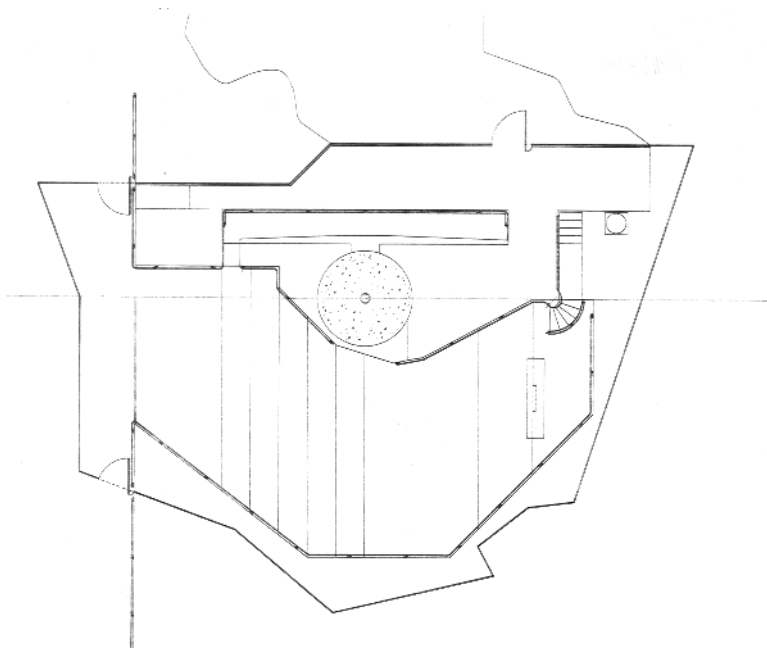
St Peter's Chapel

Campos do Jordão, São Paulo, Brazil

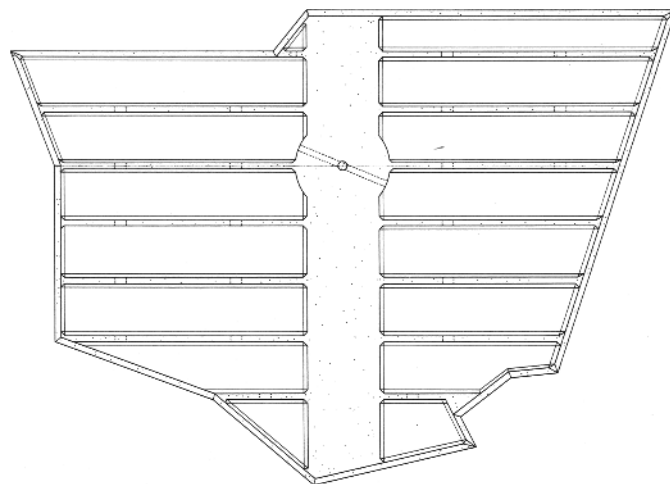
Architect	Paulo Archias Mendes da Rocha
Client	Ministry of Public Buildings and Works of the State of São Paulo
Completion	1989
Denomination	Roman-Catholic
Footprint	310 m ²

Located in the highlands of the Serra da Mantiqueira northeast of São Paulo, the town of Campos do Jordão originated from a settlement of villas and has been a health resort since the twenties with numerous sanatoria for sufferers of pulmonary ailments. Later the town became an exclusive holiday destination, due to its architecture, which visitors once regarded as a piece of "Switzerland in Brazil".

The town's expansion, which caused the population to swell to 50,000 inhabitants, was in part due to the decision to build the Palácio Boa Vista there in 1938. Originally built as the residence for the Governor of São Paulo, it has been used as a museum since the early seventies.



Plan of upper level



Underside of the roof

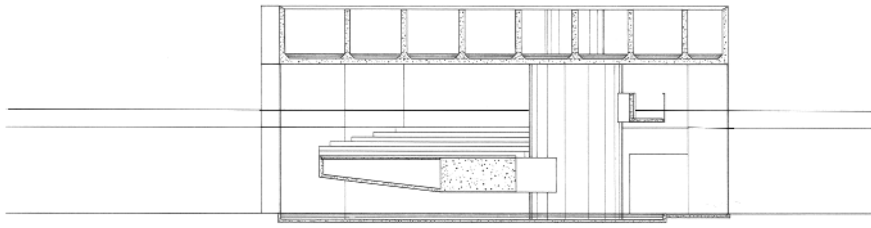


St Peter's Chapel stands on a south-facing slope in the direct vicinity of the Palácio. To give it adequate space, the landscaping of the highest point of the slope, where it meets the forecourt of the Palácio, had to be changed. Three metres of earth were excavated and the level terrain in front of the Palácio secured with a retaining wall. The low volume of the building is inserted into the arrangement of the whole yet still enjoys a prominent position: its lower level is inserted slightly into the wall, its upper level sits atop the edge of the wall. The north face of the chapel points westwards parallel to the south face of the museum, the east face of the chapel points southwards parallel to the west face of the museum.

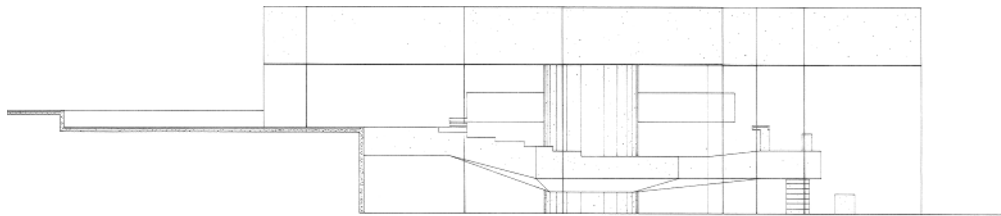
Made of steel and exposed cast concrete and surrounded by a glazed curtain wall, the building appears from the forecourt like a horizontal band of concrete floating over a horizontal strip of glass, the latter slightly broader measuring 2.25 metres compared to the 2.05 metres of the concrete. To the casual observer, its sparse architecture, which avoids the decorative historicism of its larger neighbour but obligingly incorporates it, inverts the normal relationship of wall and roof. It appears as if the fragile skin is about to buckle under the mass of the roof. The construction responsible for this illusion only becomes apparent after entering one of the two narrow doors on the corners of the building, themselves not immediately discernible in the flush curtain of glass walling. From the elongat-

ed vestibule within, one looks not only down into the depths of the space, which slopes away gently both inside and outside, but also across at the massive circular pillar in the centre of the building.

Except for the sacristy, which is tucked away under the forecourt and behind the retaining wall and connects to the south wing of the Palácio via a passageway, and except for a ramp leading to the front, the entire lower level is a flat surface of water. The edges of this dark pool extend right up to the glass skin of the building, marking its perimeter on the ground. The still surface of the water creates dramatic reflections of the world outside. The chapel literally extends an invitation to the lush surrounding landscape of the highlands to



Cross section



Longitudinal section



View of the ramp, in the background the entrance to the sacristy, at the front the steps to the altar, two depictions of Simon Peter by Glauco Pinto de Moraes on the underside of the gallery | The altar space with view south across the highlands | The water surface and concrete skin looking westwards | Ramp, reflection of the depictions in the pool when artificially lit



the south and the majestic Palácio to the north to display their attractions throughout both storeys of the interior.

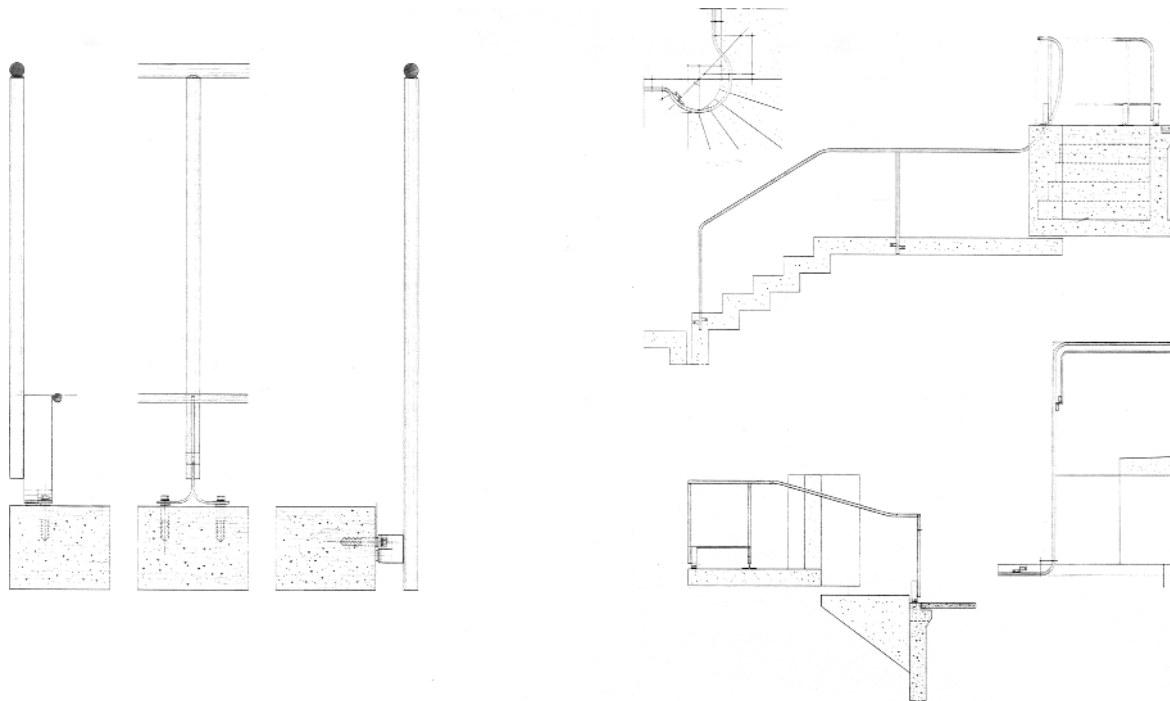
Due to the almost immaterially thin glass panes of the façade with its matt metal framing, the upper level of the building appears almost like an extension of the palace forecourt. The aforementioned massive circular pillar is 5.2 metres high with a diameter of 3.3 metres. It supports a gallery to the left, which extends almost 10 metres into the depth of the room, and a concrete cantilevered shell-like balcony that extends out sideways and forwards. The projecting shell and the glass skin avoid all contact, the outline of their figures not matching and their lines not parallel. As a re-

sult, the shell acquires a kind of sculptural autonomy. That it also serves a practical function is immediately visible: it carries the congregation, bearing them like a ship that floats over the water. At the same time the "deck" with its perimeter railing resembles a spectator's stand or a theatre, sloping down towards the altar so that the entire congregation can follow the service more easily.

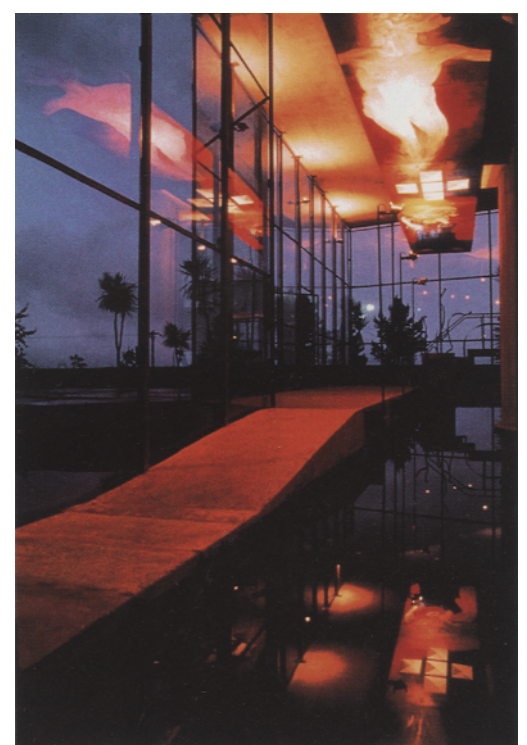
Although the building has a quadratic plan, it comfortably surrounds half an octagon. The plan attempts to unite the benefits of the longitudinal with the circular. The vestibule and altar space set up an axial arrangement, while the round pillar creates a rotational movement on both the upper and lower level. In a long gy-

ratory clockwise path, the space leads the priest and servers from the sacristy first along the ramp next to the gallery, then up the five steps over the water to the altar and in front of the congregation, which, after the service is over, leave the circle exiting onto the palace forecourt.

The longitudinal and cross sections reveal the character of the chapel most clearly. They show how the architect – who evidently has more than a passing familiarity with the oeuvre of Le Corbusier and Oscar Niemeyer – masterfully and courageously reveals the structural potential of concrete. They also demonstrate his appreciation of transparency and horizon. Driven by a desire for the unity of building and land-



Details of banisters

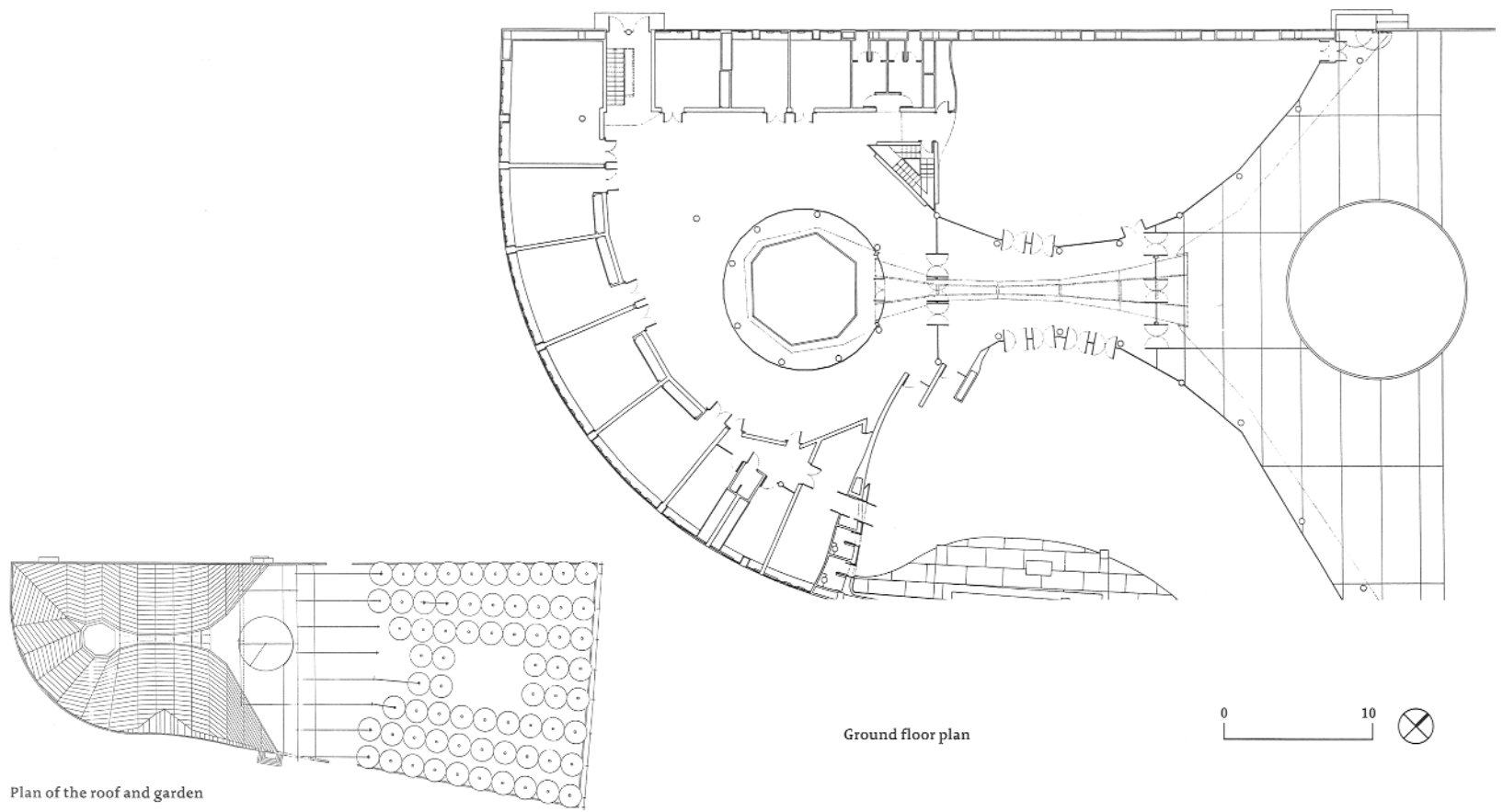


scape and for a thoroughly open relationship between outside and inside, the architect has reduced the structural components to a single pillar, a cantilevered shell and a roof. According to the architect, Brazilian architecture lacks all "notion of shelter". He adds, "one enters through a door and leaves through a door." Nothing more. His notion of shelter was already a central theme of his design for the Brazilian Pavilion for the 1970 Expo in Osaka, which is in principle just a large sheltering roof.

When a church refers to its patron, then mostly through painted wall or glass murals that commemorate the saint to which the church is dedicated. St Peter's Chapel in Campos do Jordão is no exception,

with a picture (by Glauco Pinto de Moraes) depicting Simon Peter. A two-part depiction of the Apostle, as the man with the keys to the Kingdom of Heaven on the one hand and a man facing death through crucifixion on the other, is placed where one would not immediately expect to find it: on the ten metre long underside of the gallery. When artificially lit, both figures are reflected in glowing yellow and red in the water below. Using this device, the architect integrates the need for iconography without compromising the architectural form of the building. In fact, precisely because the two pictures do not otherwise impact on the spatial form of the church, the building itself can be seen as having iconographic connotations. In the context of the 20th-century experience whereby kitsch appears through

figurative representation and disappears through abstraction, the architecture of this building offers a both Catholic and avant-garde means of interpretation. One can see the shell as the fisherman's boat, and the pillar as the rock. For those who subscribe to this interpretation, both commemorate the life of St Peter. As is written in the Gospel according to Luke, Jesus calls Peter to be his follower with the words: "Follow me, and I will make you fishers of men." And in the Gospel according to Matthew: "Thou art Peter. And upon this rock I will build my church."



Plan of the roof and garden

Ground floor plan



View from the east, left the church, right the parish hall | View from the south, behind the windows ancillary rooms below, dwellings above | View from the north, behind the stone wall the garden | The church, to the right as if floating, the sculpture above the altar, on the left the pews made of toble.



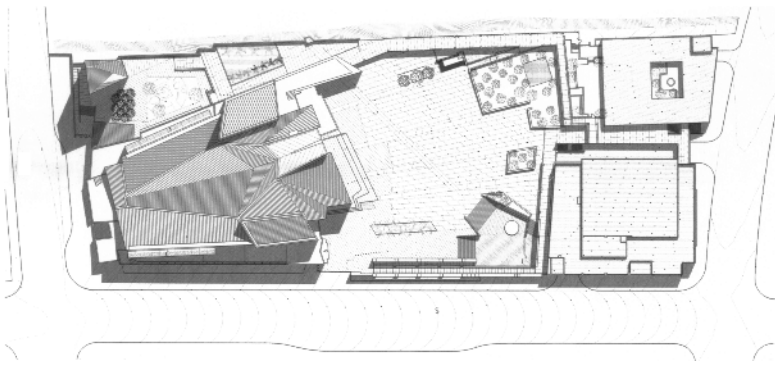
Church of Santa Teresa de Jesús

Tres Cantos, Spain

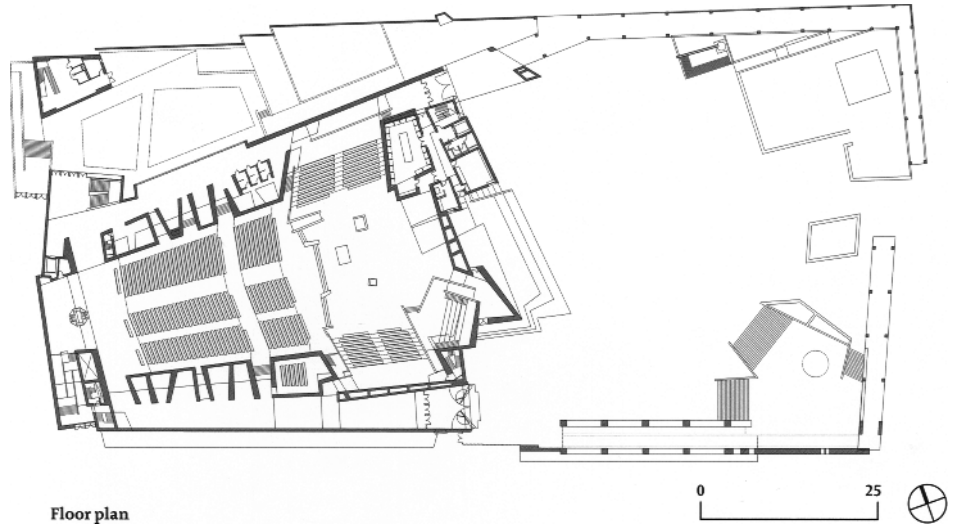
Architects	Andrés Perea Ortega, Julián Franco López, José Manuel Palao Nuñez
Client	Archdiocese of Madrid
Completion	1991
Denomination	Roman-Catholic
Footprint	Church 437.91 m ²
Seating capacity	ca. 300

Founded in the seventies as a suburb on the northern periphery of Madrid, Tres Cantos today has almost 40,000 inhabitants. Like many modern satellite towns, this estate also suffers from problems of a lack of density and functional mix. The church stands on level ground on a tapering curving site. Half of the site serves as a garden and half is occupied by the church. The building makes no attempt to pay heed to its urban surroundings and gives no indication of its typology. It is therefore not exactly broken down into smaller distinguishable parts, nor is it particularly recognisable by symbols such as a tower or a nave.

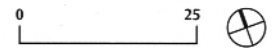
From low down one sees a large concrete shape that, with its ups and downs, corners and edges, is like an



Roof plan of the buildings



Floor plan



Presbytery, with the "jewel box" with cross high up on the rear wall | View of the plaza and the cathedral from the southeast, to the left the main portal | Central nave with view towards the north flank | The side chapels in the ambulatory on the southeast side



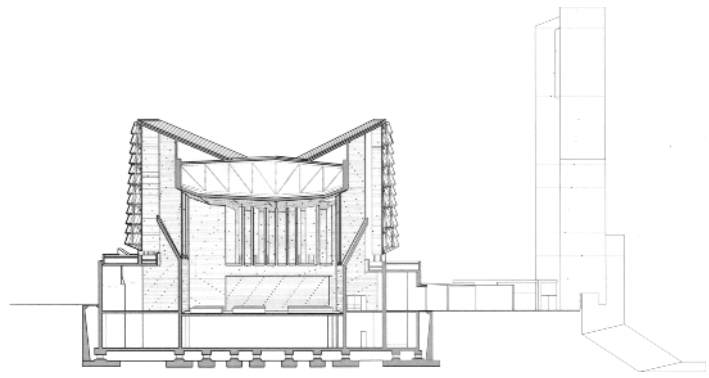
Cathedral of Our Lady of the Angels

Los Angeles, California, USA

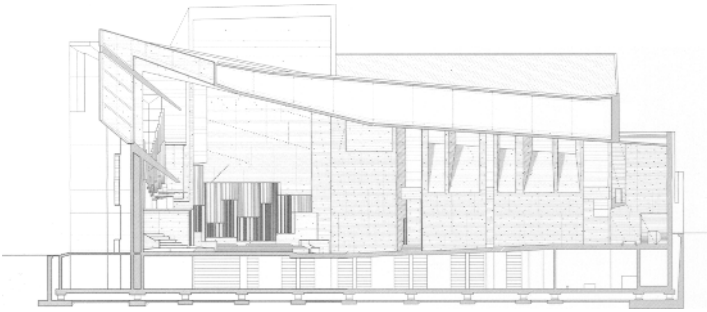
Architect	José Rafael Monco
Client	Archdiocese of Los Angeles
Completion	2002
Denomination	Roman Catholic
Footprint	Entire site 21,150 m ² , church 4000 m ²
Seating capacity	Pews 1900, chairs 1100

Despite its extensive sprawl, Los Angeles has over the last few decades undertaken initiatives to strengthen its inner-city areas. The new cathedral just south of Hollywood Freeway is a further initiative in this direction. Surrounded by wide roads – subjecting it to a constant 75 decibels day and night – the church stands at the upper end of a site that slopes gently from west to east, with the cardinal's residence and diocese curacy located at the lower end. A large plaza, 8100 square metres in size, enclosed by retaining walls and raised planting mediates between the buildings.

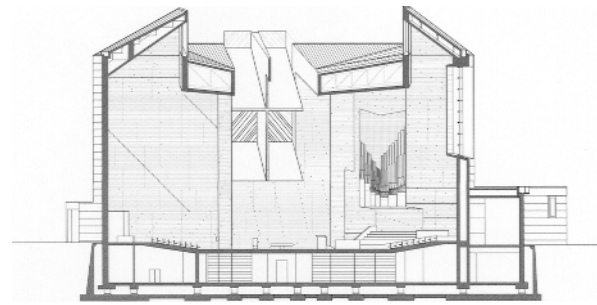
The decision to divide the site into three parts with the cathedral positioned at the west end makes it difficult to place the altar in front of the east wall. To make this



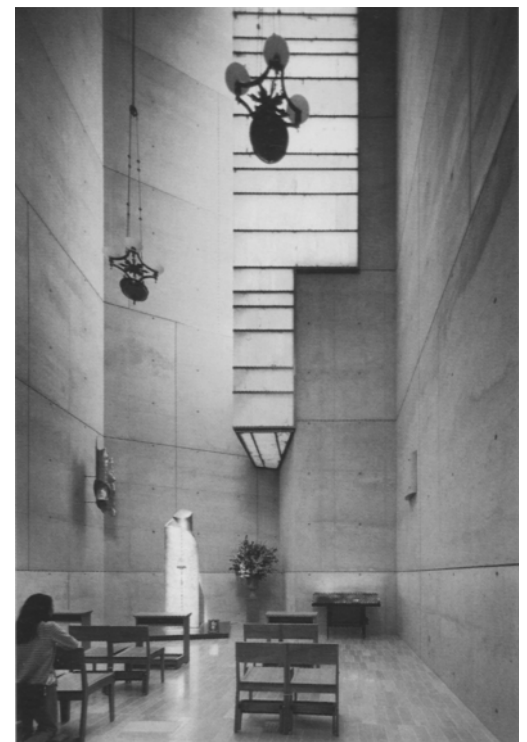
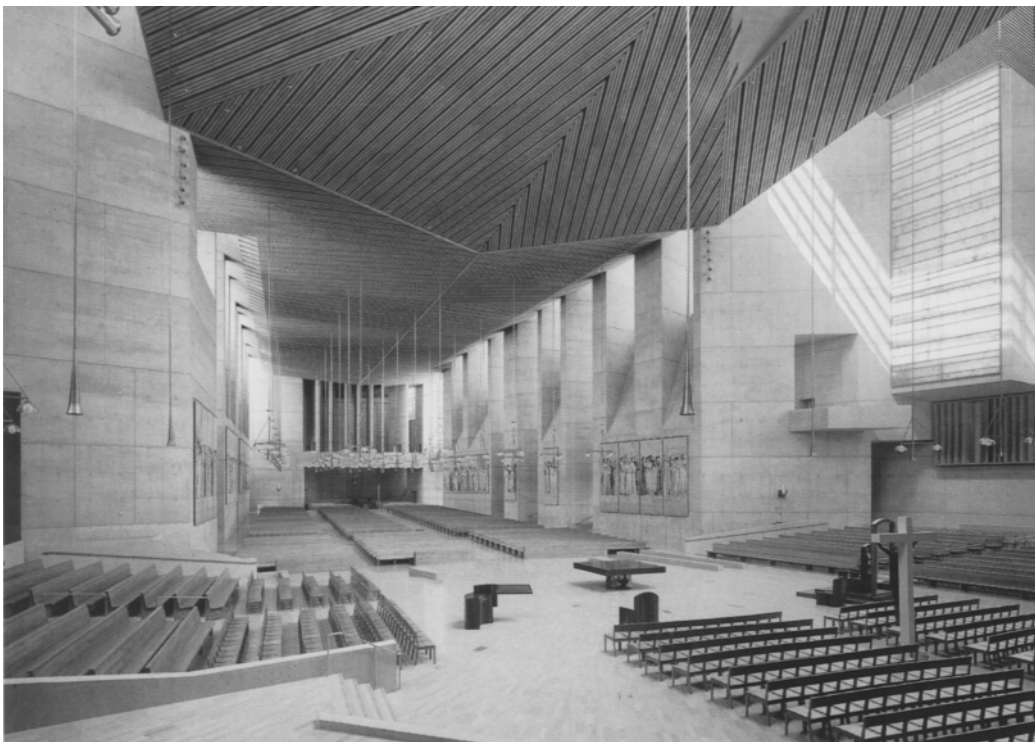
Cross section looking west



Longitudinal section looking south



Cross section looking east



possible, a new typology of processional architecture has been devised in which the visitors make their way first along and up the sides of the building before returning back down the centre of the cathedral.

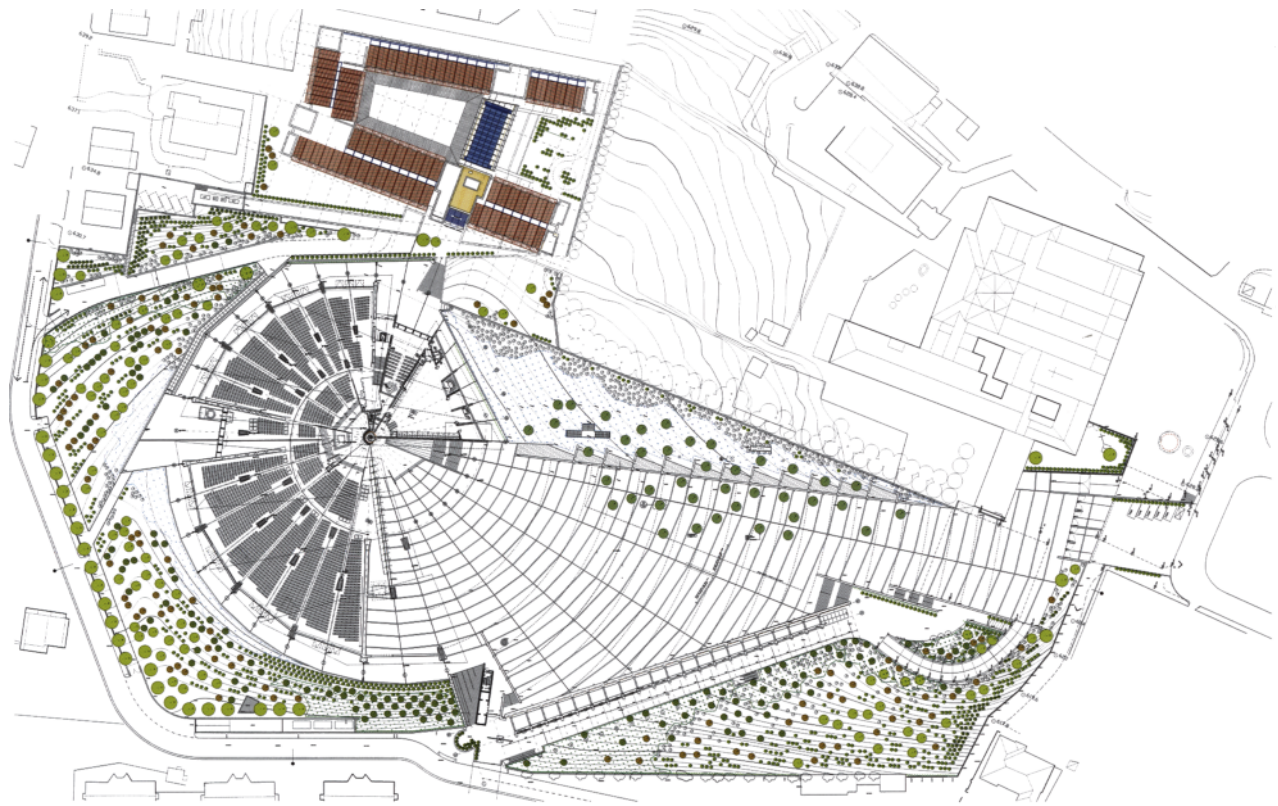
One ascends to the plaza and stands in front of a monumental structure cast in concrete pigmented the distinctive yellowish colour of adobe. The horizontal sections of wall look like shingles laid one over the other. The entrance to the church is marked by a sculpture. The central nave measures 101.65 metres in length. To the north and south it is flanked by a series of full-height side chapels, each side with an ambulatory that runs behind them. Unlike most church plans, the niches are turned outwards, allowing the main nave to re-

main the centre of attention between the baptistry and presbytery, between the pool for baptismal submersion and the space around the red marble altar. The floor is paved with sandstone, the ceiling made of cedar and douglas fir, and the pews and the organ of cherry.

The load-bearing rear and side walls of the side chapels allow huge curtain-like surfaces of precious alabaster to be suspended on the outside walls. Light shines through these translucent surfaces, illuminating the ambulatories and the tall narrow spaces between the side chapels as well as deep into the main nave. Slightly offset from the central axis and arranged high up in the rear wall is a glazed "jewel box" that projects both

inwards and outwards and features a giant mullion and transom, which cuts the figure of the cross into the morning light.

Los Angeles was founded by Iberian Franciscans and their mission stations influence the form of the church on the freeway. Although the Cathedral is demonstratively processional in its architecture, it does attempt to achieve a balance between the paradoxical principles of axial and centralised arrangements. Its basic figure is cruciform with a nave and transept; the pews and chairs surround the altar on three sides. In its capacity for creating community, the architecture is both monumental and functional.



Site plan with ground floor plan, to the west the semicircular form of the church hall and the quarter circle of the chapel and sacristy



View of the context from the northeast, centre-left the Basilica Santa Maria delle Grazie, on the right the Padre Pio Pilgrimage Church | View of the complex from the east, left the retaining wall with colonnade and entrance beneath the cross | View of the church from the north, in the background the half-round form of the "aula liturgica", between the roof sections the cone over the altar, at the front the quarter-circle with the sacristy and chapel behind the screen | Colonnade looking east, the arches growing smaller towards the top

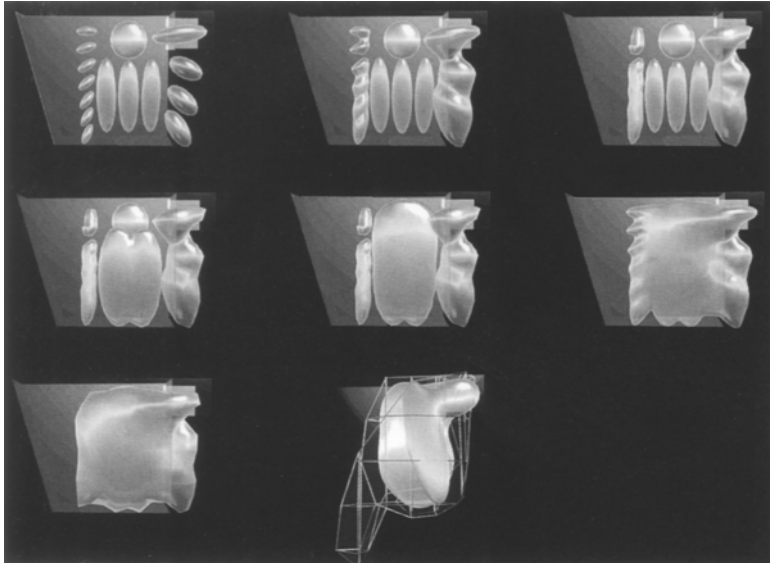


Padre Pio Pilgrimage Church

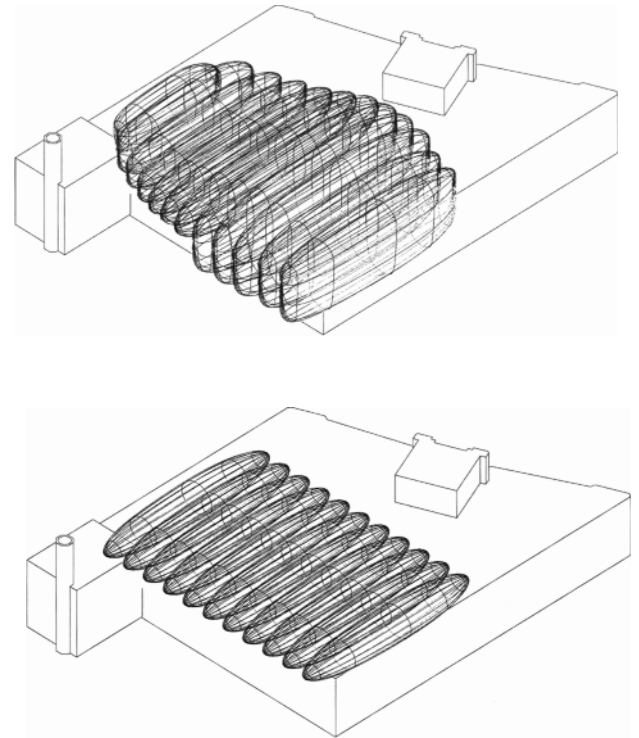
San Giovanni Rotondo, Italy

Architect	Renzo Piano
Client	Order of the Minor Capuchin Friars, Foggia
Completion	2004
Denomination	Roman-Catholic
Footprint	Church ca. 6000 m ²
Seating capacity	ca. 6500

Catholic Europe is dotted with a series of pilgrimage destinations visited each year by vast numbers of pilgrims. They visit the place where a famous saint has lived or worked to pray and implore him for help and guidance. In contrast to popular opinion, Lourdes in France and Fátima in Portugal are not the most visited pilgrimage destinations in Europe but San Giovanni Rotondo in Apulia, one of the poorer regions in south-east Italy. Padre Pio, a Capuchin friar, was already venerated during his lifetime, and in the years since his death in 1968 and his canonisation in 2002, the number of pilgrims has risen steadily with each year. In 2004 it is estimated that some seven million guests visited San Giovanni Rotondo.



First "metablobs" with the programme for the church



Development of the spatial structure of the church hall within the Knickerbocker Laundry building



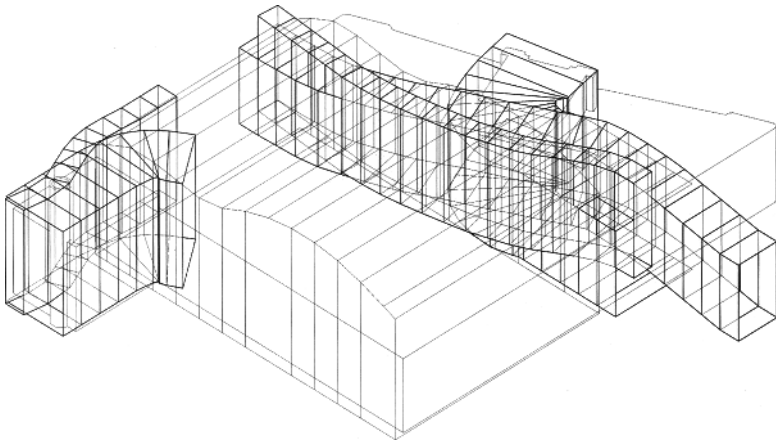
View from the west with main entrance | View from the north with main exit | View from the south with the Knickerbocker Laundry | View from the east | Outdoor stair and fire escape with view over Manhattan, the steel framework is clad inside with redwood

Korean Presbyterian Church

New York City, New York, USA

Architects	Douglas Garofalo, Greg Lynn, Michael McInturf
Client	Korean Presbyterian Church of New York
Completion	1999
Denomination	Presbyterian
Footprint	17,999 m ²
Seating capacity	Sunday church 2500, wedding church 600

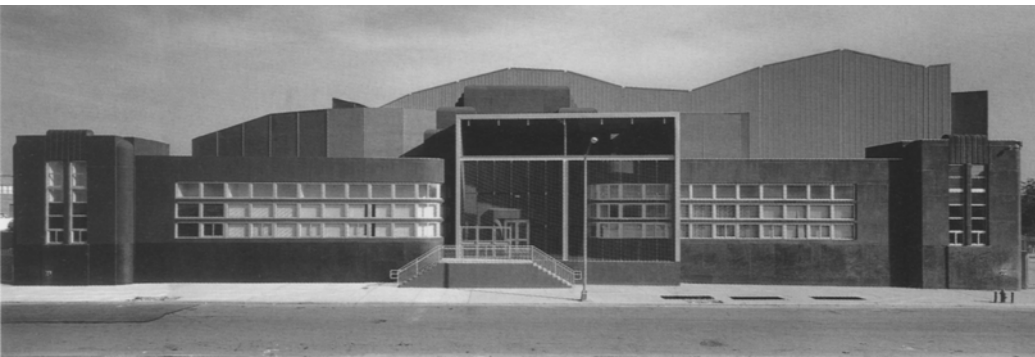
Due to the varied origins of its inhabitants, the United States is home to many other Christian groups in addition to the two large churches. Consequently, sacred architecture in the U.S. is extremely varied. In one and the same metropolis, in Los Angeles for example, one can find a small storefront church alongside a huge cathedral. In the case of the Korean Presbyterian Church in New York City, however, it seems that a rare synthesis of both types, the small conversion and the large new building, has been achieved. Moreover, here it is the product of an architectural design process that, because of its radically digital production and topological rather than geometric approach, pushes forward the boundaries of spatial exploration in architecture.



The system of "pipes" and "hoses" for the access routes



Longitudinal section through the church hall

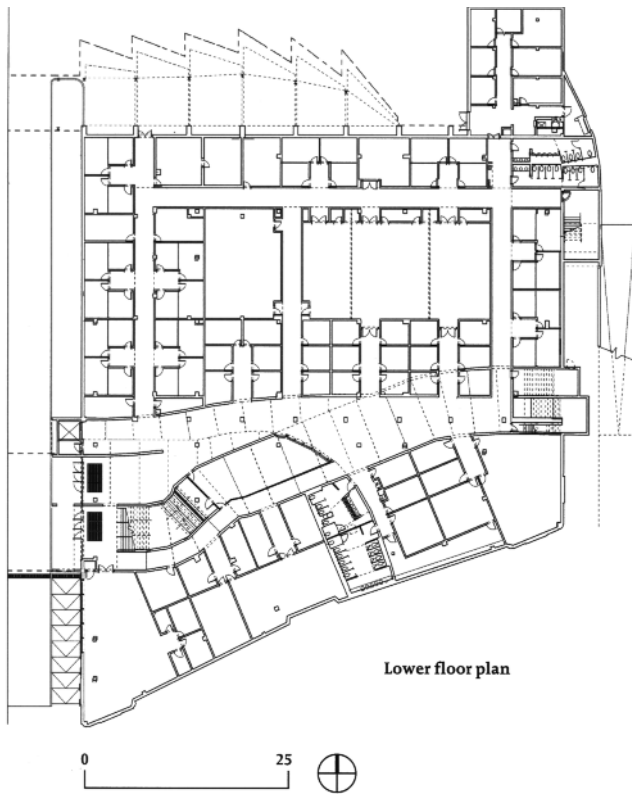


The building is situated in Sunnyside, a residential neighbourhood in Queens on Long Island, in the south-east of the city of New York. A broad band, which previously served predominantly industrial functions in the eighties, runs through the grid of streets from west to east. The block to the north of 37th Avenue was occupied by Knickerbocker Laundry, its offices at the front and factory to the rear. Designed by Irving M. Fenichel and built in 1932, the laundry was an example of art deco architecture. In particular, the 61 metre long white concrete building on the south side with the main entrance and its symmetrical arrangement of three stumpy towers in the centre and corners has a monumentalism of the kind Lewis Mumford would have criticised as instilling "a false sense of continuity".

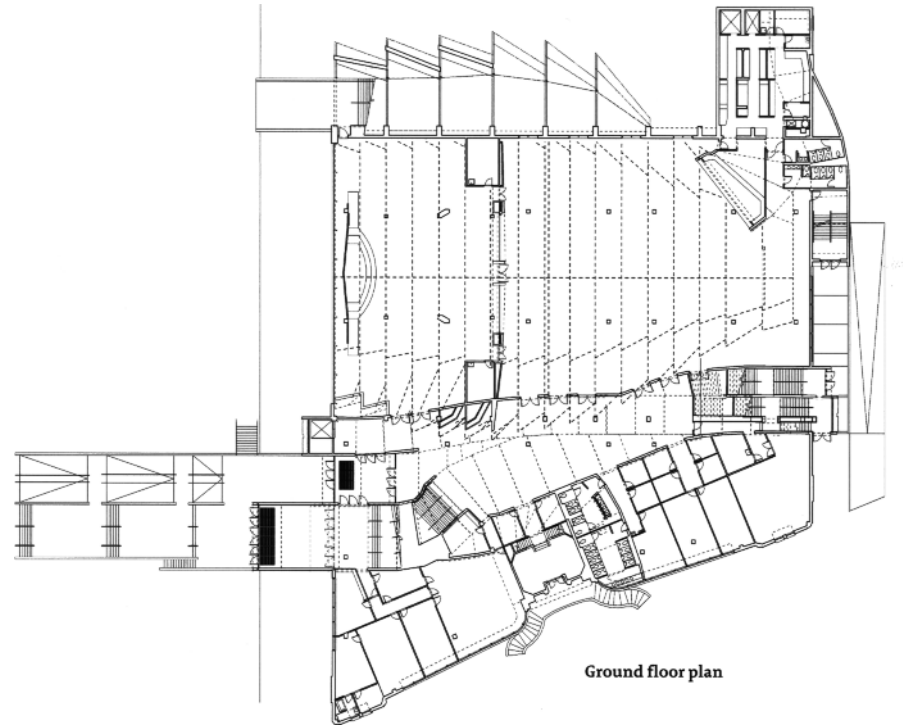
In this case, however, conservation was not a central concern of the conversion from Knickerbocker Laundry to Presbyterian Church. The existing architecture was neither treated as a solitary icon nor as a palimpsest to inscribe. Such strategies for mediating between old and new do not feature in the architects' approach. Their interest is not historical, but rather one of utility. The building is quite simply a suitable container, whose entrance can be relocated from the south to the west side and whose concrete exterior, covered in multi-coloured graffiti, can be given a new covering.

Surrounded by the asphalt of hundreds of parking spaces and equipped with an almost ceremonial stair, the three distinct parts of the complex are immediately

visible, even before one enters through the glazed façade: the first part, the old office wing along a rail track; the second part, the new church hall over the old factory; the third part, a connecting piece with the stairs, ramps and corridors for accessing the other parts. Although the former laundry building is a concrete panel construction, the new spaces have a steel structural framework. For the walls and ceilings, low-cost building materials have been used such as sheet iron, cedar wood, plasterboard and plexiglass. The Knickerbocker Laundry building and the access buildings are painted black or clad in dark metal. The volume of the church, encased in vertical white metal profiles, arches upwards behind them, its roofscape reminiscent of the work of Alvar Aalto.



Lower floor plan



Ground floor plan



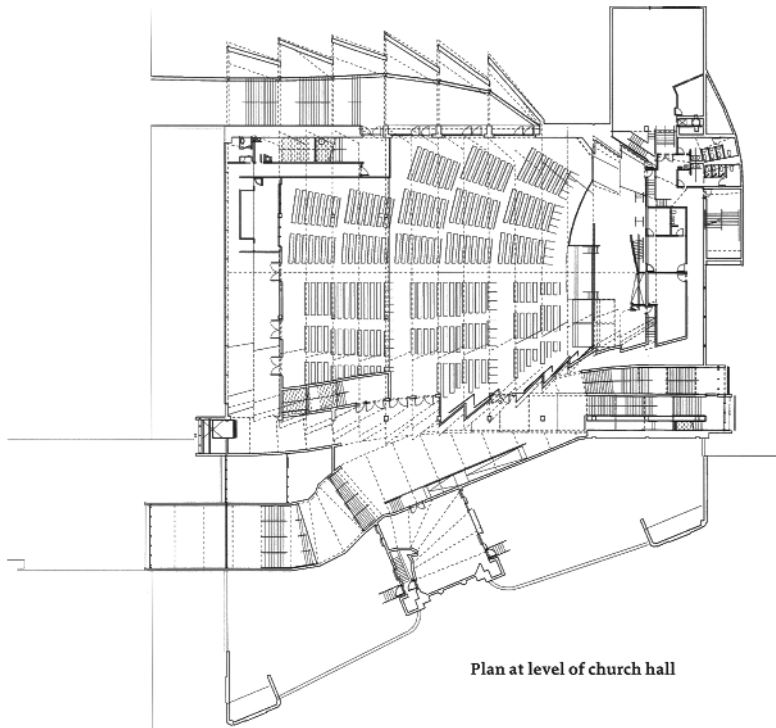
The space for the church itself rests on the two rear floors of the former laundry, the lower floor of which is used for workshops and classrooms, the upper floor at the west end as a wedding church seating up to 600 persons, and at the east end as a cafeteria catering for up to 800 persons. The Sunday church has a stage, main congregation space and galleries and can seat 2500 persons on grey wooden pews upholstered in red velour. The stage, which has been carpeted grey, is further emphasised by the musicians' galleries that flank either side and the central arrangement of the organ. The arrangement of preacher and congregation facing one another is fixed. The slight angling of the side pews focuses attention on the pulpit and altar, as does the trail of small lights that run along the centre of the

ceiling. The ceiling is broken into white ribs that grow lower towards the altar, although the ribs themselves run crosswise, penetrating the wall on the north side above the windows and continuing on beyond. Outside, the white ribs form six shell or shovel-like shades covering the external fire escape, from where one can see the skyscrapers of Manhattan. Their steel gridded structure is clad inside with redwood, externally with lead-coated sheet metal panels. From outside, the building suddenly appears like a scaly armadillo on spindly legs.

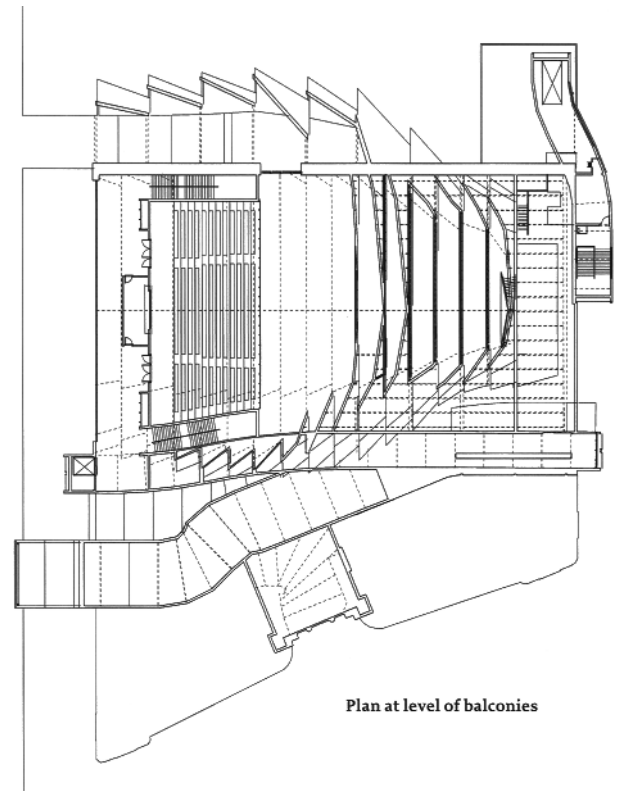
Squeezed between the former office wing and the church hall, a series of corridors, ramps and stairs have been inserted, divided into sections by changes in lev-

el. They form a system of tubes or hoses. At their ends these arteries project outwards to form a glass surface inscribed in white with the sign of the cross. This underlines their character still further: they serve not only as access routes, but also as a spatial system with a meaning of their own. The pattern of thin joins on the partly black, partly white epoxy terrazzo floor and the rows of plain neon lights on the otherwise bare ceiling highlight the turning and winding of the passageways.

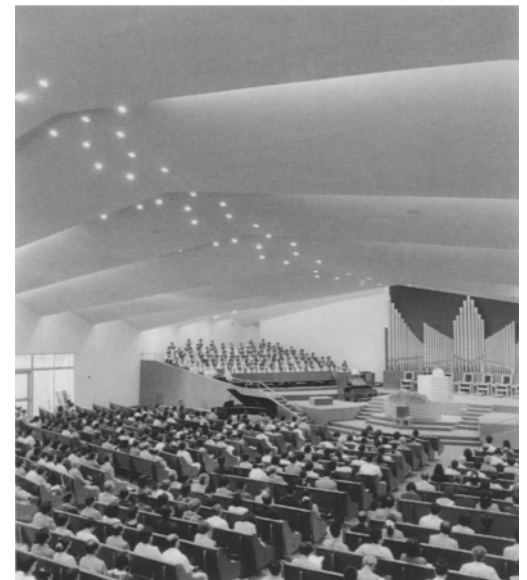
The form of the Presbyterian Church is unimaginable without the mathematical method and digitalisation of the design process. With the triumph of topology over geometry in the late 20th century, it has become



Plan at level of church hall



Plan at level of balconies



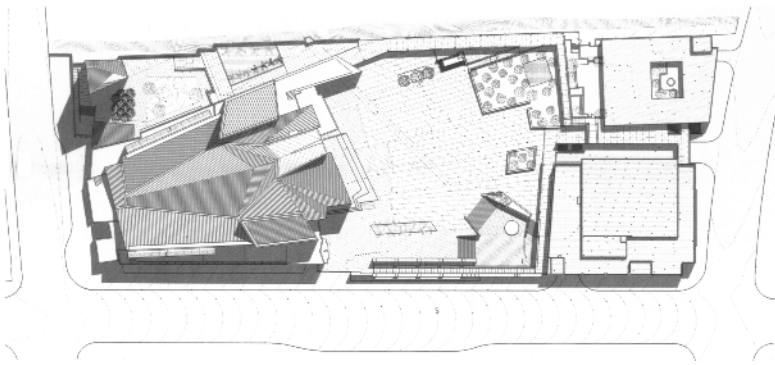
View from the east along the corridor, stair and ramps of the access route, entrance to the church on the right | Church hall with view over the pews and the folded “ribs” of the ceiling | Church hall with view of the altar

possible to create volumes whose forms, whether hard or soft, compressed or stretched, broken or distorted, defy conventional definitions, rules, ordering principles or geometrical description. These are volumes that one can only describe as “amorphous” or “fluid”, forms which can only be calculated using software from the automotive or film industries. The architects have used these to create “metablobs” for parts of the programme of the church. These bubbles have been grown on-screen, morphed and shaped to form a constellation of forms with a single exterior skin. In a later stage, the Knickerbocker Laundry building was then integrated, the whole then subsequently aligned with the constraints of reality, with the restrictions of material, construction and budget. In the process, the

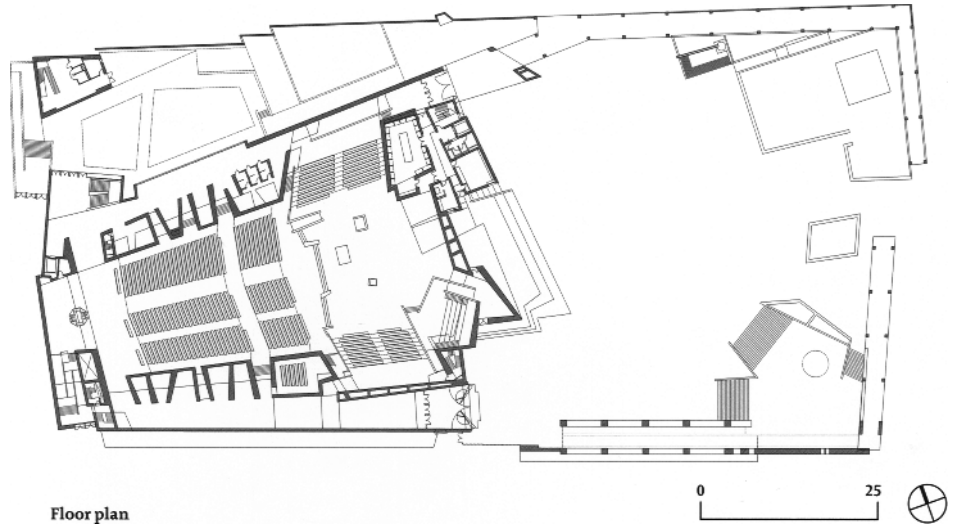
“blob” has had to relinquish much of the original fluid appearance it had on screen.

The building in Sunnyside can be seen as a hybrid composite, an experimental “animate form” that mixes the monumental with the industrial, the dynamic with the fragmented – described by one journalist as an “alien novelty”. However, as a building for church services of a size comparable to that of the Catholic St Patrick’s Cathedral in Manhattan, the Presbyterian Church in Queens is not unusual for the USA. Gunnar Birkert’s Calvary Baptist Church in Detroit, Michigan from 1977, and Philip Johnson’s Crystal Cathedral in Garden Grove, California from 1980 are just two noteworthy examples of numerous precursors. Common

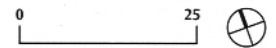
to all of these is a certain theatrical drama. On experiencing the interior of the Korean Presbyterian Church, one commentator remarked on its resemblance to the glamour of the New York Radio City Music Hall. In this respect, it is no wonder that the architectural journal “Casabella” called the church an “architettura come spettacolo”.



Roof plan of the buildings



Floor plan



Presbytery, with the "jewel box" with cross high up on the rear wall | View of the plaza and the cathedral from the southeast, to the left the main portal | Central nave with view towards the north flank | The side chapels in the ambulatory on the southeast side



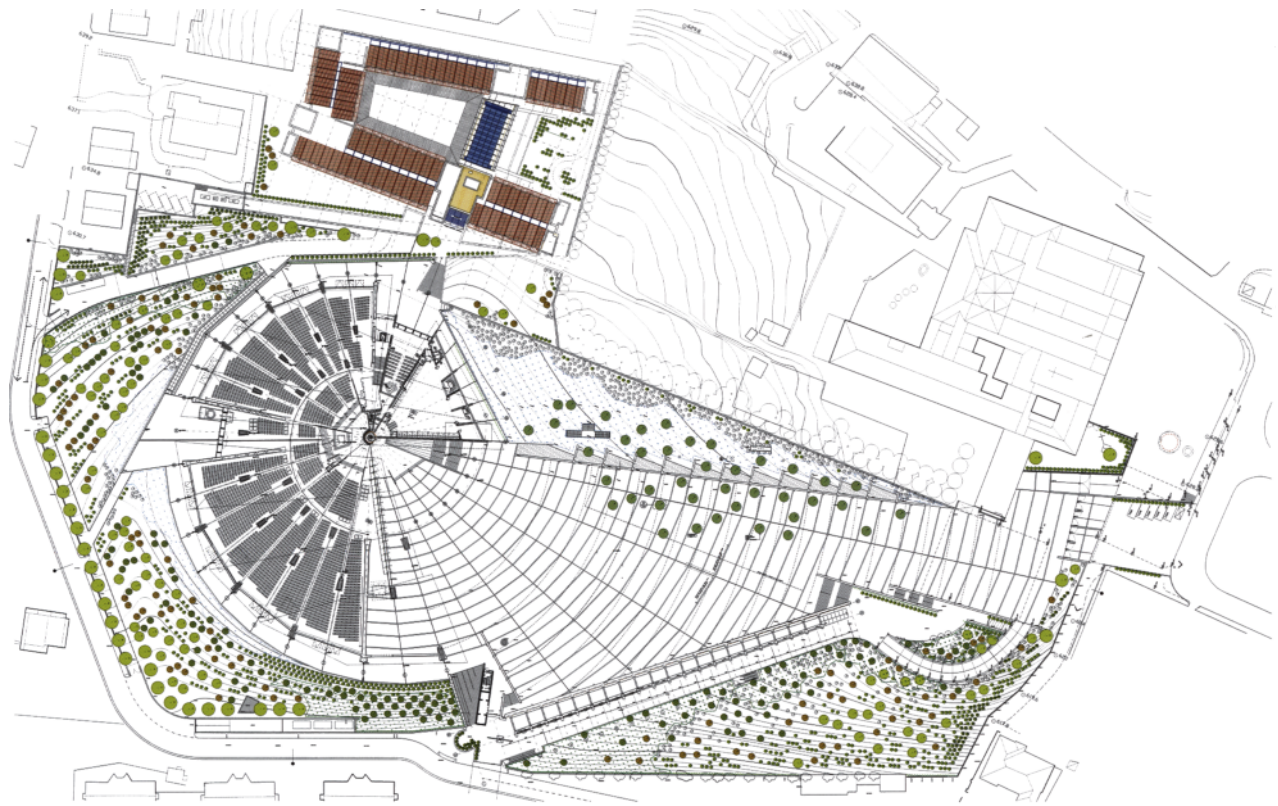
Cathedral of Our Lady of the Angels

Los Angeles, California, USA

Architect	José Rafael Monco
Client	Archdiocese of Los Angeles
Completion	2002
Denomination	Roman Catholic
Footprint	Entire site 21,150 m ² , church 4000 m ²
Seating capacity	Pews 1900, chairs 1100

Despite its extensive sprawl, Los Angeles has over the last few decades undertaken initiatives to strengthen its inner-city areas. The new cathedral just south of Hollywood Freeway is a further initiative in this direction. Surrounded by wide roads – subjecting it to a constant 75 decibels day and night – the church stands at the upper end of a site that slopes gently from west to east, with the cardinal's residence and diocese curacy located at the lower end. A large plaza, 8100 square metres in size, enclosed by retaining walls and raised planting mediates between the buildings.

The decision to divide the site into three parts with the cathedral positioned at the west end makes it difficult to place the altar in front of the east wall. To make this



Site plan with ground floor plan, to the west the semicircular form of the church hall and the quarter circle of the chapel and sacristy



View of the context from the northeast, centre-left the Basilica Santa Maria delle Grazie, on the right the Padre Pio Pilgrimage Church | View of the complex from the east, left the retaining wall with colonnade and entrance beneath the cross | View of the church from the north, in the background the half-round form of the "aula liturgica", between the roof sections the cone over the altar, at the front the quarter-circle with the sacristy and chapel behind the screen | Colonnade looking east, the arches growing smaller towards the top

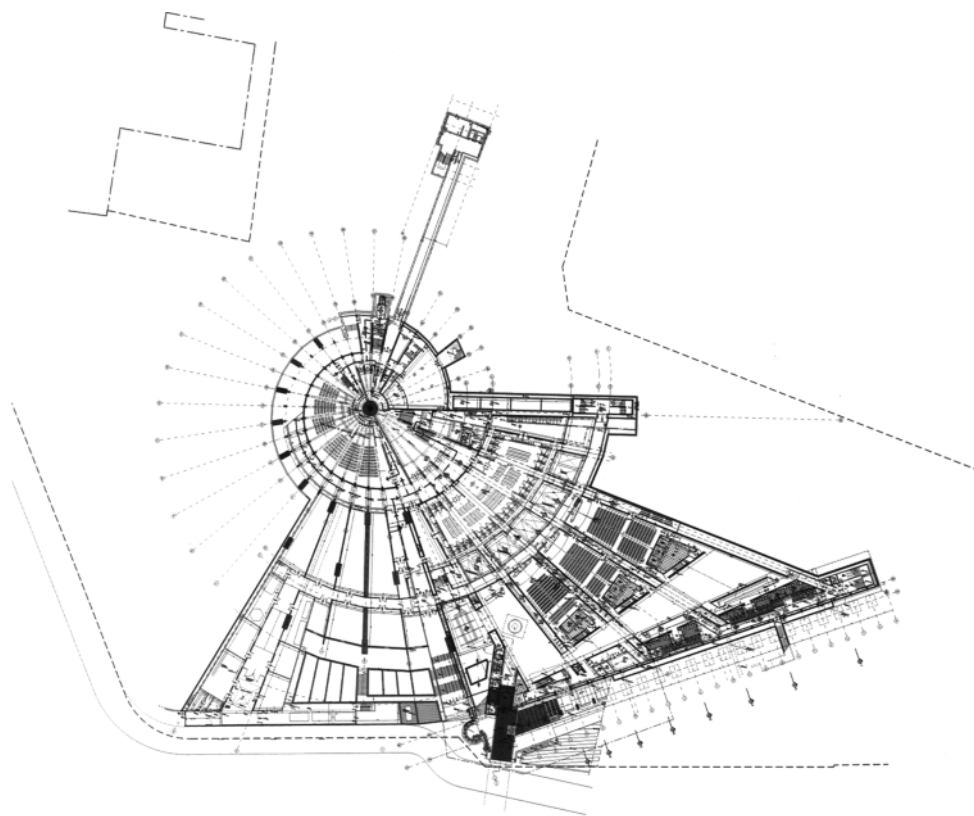


Padre Pio Pilgrimage Church

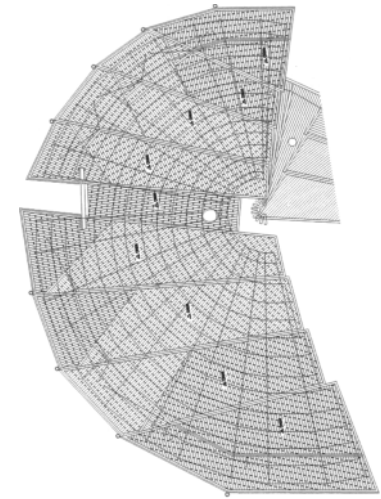
San Giovanni Rotondo, Italy

Architect	Renzo Piano
Client	Order of the Minor Capuchin Friars, Foggia
Completion	2004
Denomination	Roman-Catholic
Footprint	Church ca. 6000 m ²
Seating capacity	ca. 6500

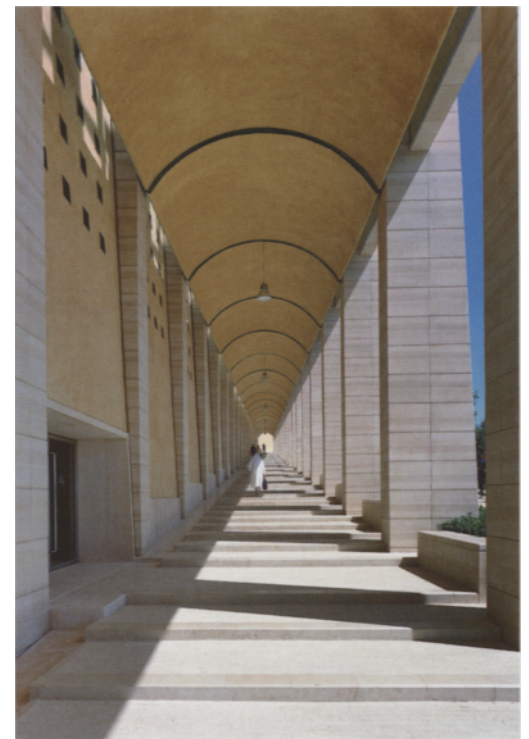
Catholic Europe is dotted with a series of pilgrimage destinations visited each year by vast numbers of pilgrims. They visit the place where a famous saint has lived or worked to pray and implore him for help and guidance. In contrast to popular opinion, Lourdes in France and Fátima in Portugal are not the most visited pilgrimage destinations in Europe but San Giovanni Rotondo in Apulia, one of the poorer regions in south-east Italy. Padre Pio, a Capuchin friar, was already venerated during his lifetime, and in the years since his death in 1968 and his canonisation in 2002, the number of pilgrims has risen steadily with each year. In 2004 it is estimated that some seven million guests visited San Giovanni Rotondo.



Lower floor plan, the crypt in the centre, the lecture halls, administration and storage for the most part under the square



Roof plan



Like an acropolis, the new complex, built in commemoration of the friar, commands a prominent position on a hill over its strangely disparate surroundings. The commercial exploitation of pilgrimage – hotels and restaurants jostle to make the most out of the pilgrims' devotion – has devastated the urban and rural structure of the immediate vicinity. As such, the new complex only makes reference to the 17th-century basilica Santa Maria delle Grazie at the east end of the site and clearly delineates the boundary to the south. Classical colonnades form a giant retaining wall screening off the "junk space" to the south, to borrow a phrase from Rem Koolhaas. From below, one sees little of the complex and from above little of what lies below. Once on the plateau above, one leaves the city behind, the view

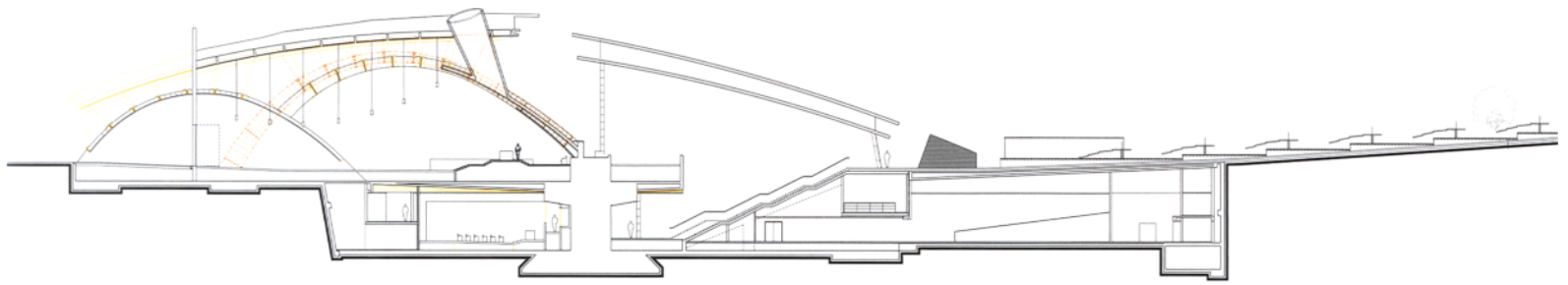
straying across the distant landscape of the Adriatic coastline and towards the heavens.

Every pilgrimage is a procession from station to station. In San Giovanni Rotondo, too, there is a fixed route. It leads from the road at the foot of the hill, through a colonnade up to a square, from there into the lower storey of the church for confession and to learn about the saint and his activities, then into the church for Mass and finally into the crypt for prayer – Padre Pio's tomb is the culmination of the pilgrimage – before finally exiting to the rear of the church.

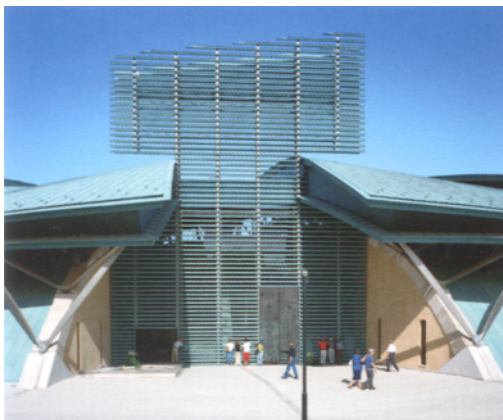
The entrance to the colonnade is also the entrance to the pilgrimage site. It is marked by a 40 metre high

cross and an open horizontal carillon of eight bells that sound an entire octave from C to C at the top of the retaining wall. The first arcade of the 100 metre long passageway, closed to the left, open to the right, has a height of 25 metres. As the path slowly rises – the steps are widely spaced and the incline gentle – the pillars become smaller and smaller. The perspective of the colonnade ends at two stairs to the left that lead to the highest point at the edge of an expansive plateau. A 9000 square metres elongated triangle, it is large enough to accommodate up to 30,000 people. At the bottom of the slightly inclined square stands the church.

The most characteristic element of the building – its sweeping arches and oversailing roof – is immediately



South-north section through the altar



West entrance in front of the axis from the baptistry to presbytery, to the right the bronze doors by Mimmo Paladino | View of the altar and organ, lighting from the large window on the right and from rooflights between the roof sections | The arcs of the arches with segments of five or six blocks each, top left a V-shaped steel supporting strut for the roof rests at the intersection between two segments of the arch



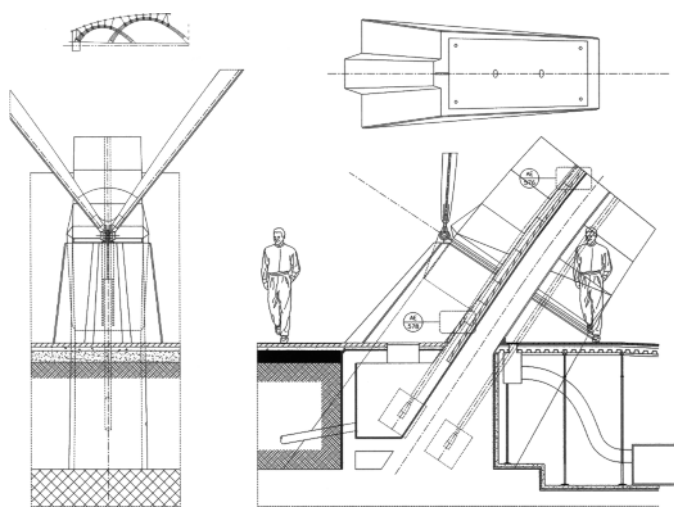
apparent. Its amphitheatre-like interior is, however, only visible after passing through the row of doors in the high entrance screen. The semicircular form of the room is structured by two sets of shallow stone arches that fan out radially; the inner arches are larger, the outer arches smaller. The inner and outer rows of arches overlap partially, gradually becoming lower with each rotation, giving the impression of a descending spiral, not unlike that of a flat sea or snail shell. The structural elements of the architecture concentrate the space inwards toward the primary liturgical focus. The sweeps of the arches direct one's eye to the altar, behind which the cluster of arches appear to spring out of the ground, dividing the half-circle into nine sections. The result is a church with multiple naves providing sufficient space

for 6500 believers in two sets of four blocks of pews and with an aisle that leads from the rear to the front of the church, from the baptistry to the presbytery.

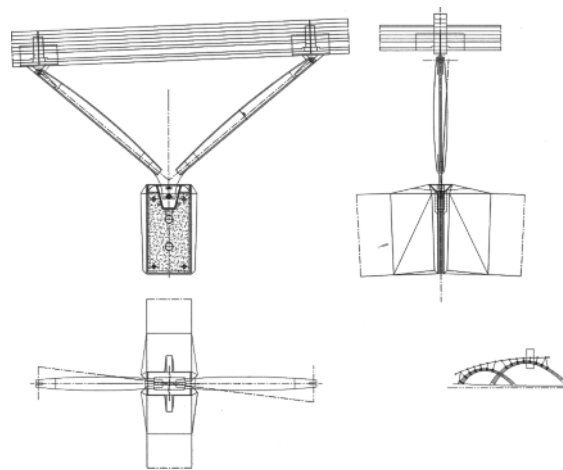
The architect was initially sceptical about accepting the commission for the Padre Pio Pilgrimage Church. The entire programme, its consequences for the urban environment and the building seemed too immense and problematic. From the beginning it was clear the church was to be built in stone but that it was not to appear solid and heavy. Instead, the desire was to achieve a lightweight, almost effortless structure. With the help of the engineer Peter Rice, a structure inspired by the Gothic master builders of old was created, a tour de force of stone segments whose

dynamic forms are reminiscent of the large winding stone staircases of castles and forts built between the Gothic and the Renaissance.

The precise forms of the rough blocks of the light brown, lime-rich Bronzetto d'Apricena, mined from the vicinity of San Giovanni Rotondo, were first computer calculated and then cut to size in Carrara. The permissible tolerance lay by half a millimetre. Five or six such blocks were then bonded together, bored lengthways to receive several steel cables before being brought into place. The stones withstand the compression, the cables tension: like a taut necklace, each arch retains its shape. The internal tensioning of each of the 21 arches – with spans of between 38 and 50 metres and heights



Longitudinal and cross section through the left-hand base of an arch next to the entrance



Longitudinal and cross section through top section of an arch

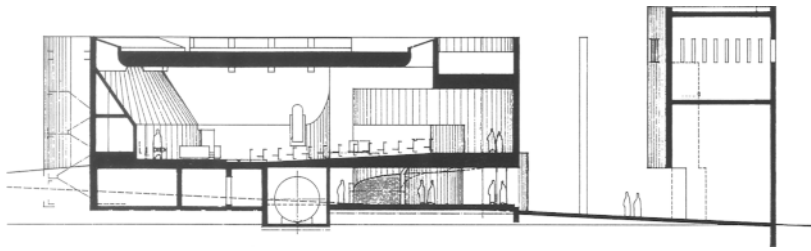


of between 11 and 16 metres – is not just an example of technical finesse but an important stabilisation measure for a building visited by masses of people in an earthquake-prone region such as Apulia.

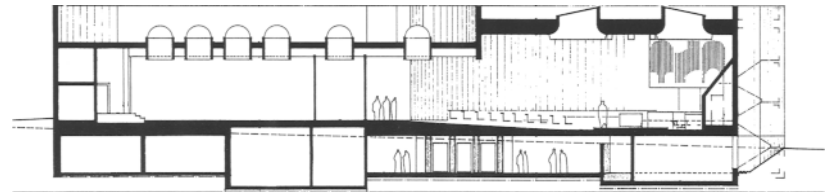
The “aula liturgica”, as the architect calls his building, has a varied roofscape that in some respects resembles the shell of a turtle. It consists of a series of scales covering a total surface area of 19,500 square metres, each clad in patinated green copper. From the square one sees four large scales falling away to the left, on the right three in the foreground and four further behind falling away to the right. The scales rest on timber purlins borne by V-shaped steel struts, which in turn rest on the stone arches.

As with the St Pius X Basilica in Lourdes, a subterranean concrete building constructed in the fifties by Pierre Vago, the Padre Pio Pilgrimage Church has the character of a stadium and a theatre, although every attempt has been made to reduce the size and mass of the necessarily large building. Architectural critics have noted similarities with the work of Bruce Goff and Pier Luigi Nervi, but only after first drawing parallels between Piano’s technologically advanced architecture and ancient heathen burial mounds. After all, the Tumba Padre Pio in the crypt beneath the altar is the focus of the entire complex and also the source of the arches arcing over the congregation – not just structurally but also spiritually. A conical funnel over the altar punctures the copper roof to the left and the right,

shedding light onto the altar. One is reminded of expressive baroque reliefs in which the graves burst open to show the awakening of the corpses on the day of the Last Judgement. This perhaps also explains the reason why the glass surface over the main entrance to the church, a 50 square metres large upright panel, is due to be replaced by an artwork by Robert Rauschenberg depicting the Apocalypse.



Section Catholic Church and tower block



Section parish hall and Protestant Reformed Church



Square and passageway between the churches | View from the west, the tower in the foreground, the Reformed church to the left, the Catholic church to the right | Catholic church with ritual objects made by Gianfredo Camesi | Reformed church, with ritual objects made by Rolf Iseli



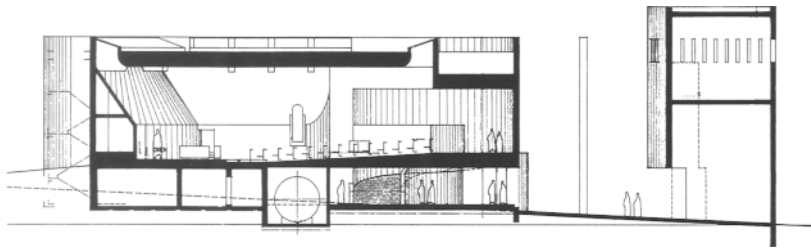
Christ Church

Langendorf, Switzerland

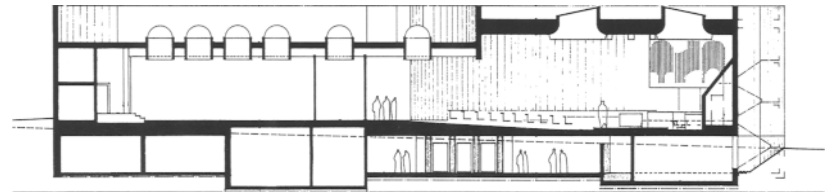
Architect	Manuel Pauli
Client	Langendorf Catholic Church Parish and Reformed Church Parish
Completion	1971
Denominations	Roman-Catholic; Protestant Reformed
Footprint	Catholic hall ca. 415 m ² , protestant hall ca. 415 m ²
Seating capacity	ca. 420 and ca. 380

Constructing two new churches as a single building was something of a rarity at the beginning of the seventies, especially in a village numbering no more than 3200 inhabitants. The ensemble stands on a slight incline in the centre of the village. Seen from above, the building consists of three elements, whose outer edges form a square measuring 46 by 46 metres. The square is rotated so that its corners point due north, south, west and east.

Arriving from the west, one approaches the corner of the tower-like block, which is located at the lowest point on the plot and with a height of 12.5 metres reaches the eaves line of the other buildings. From below, the complex presents a closed face. However,



Section Catholic Church and tower block



Section parish hall and Protestant Reformed Church



Square and passageway between the churches | View from the west, the tower in the foreground, the Reformed church to the left, the Catholic church to the right | Catholic church with ritual objects made by Gianfredo Camesi | Reformed church, with ritual objects made by Rolf Iseli



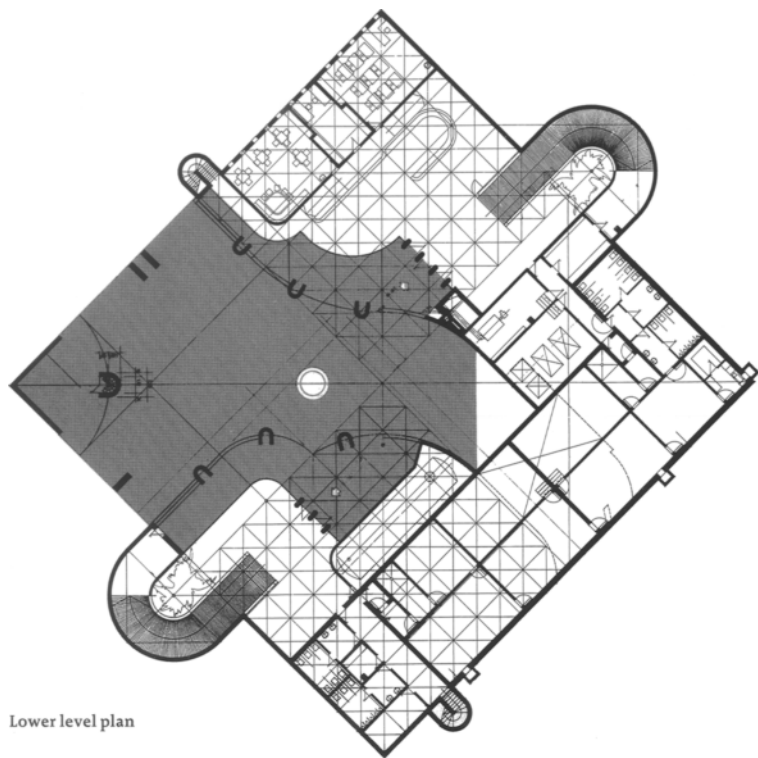
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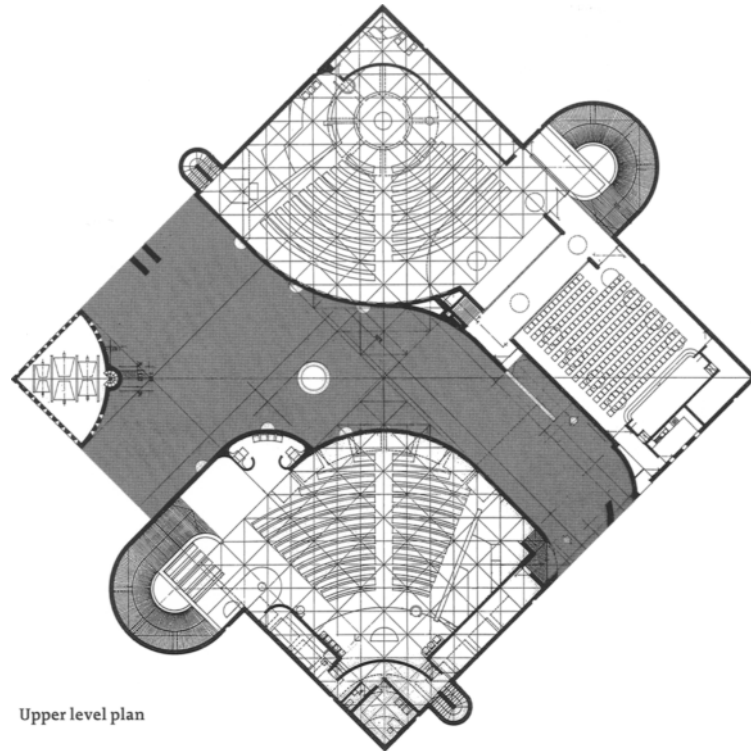
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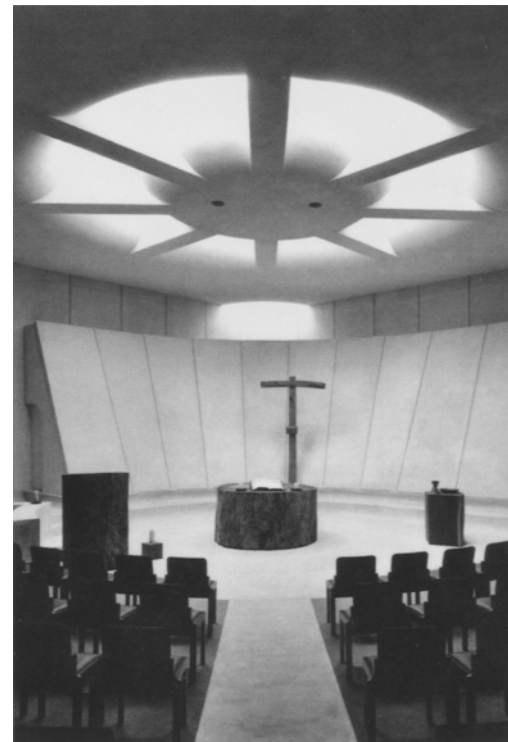
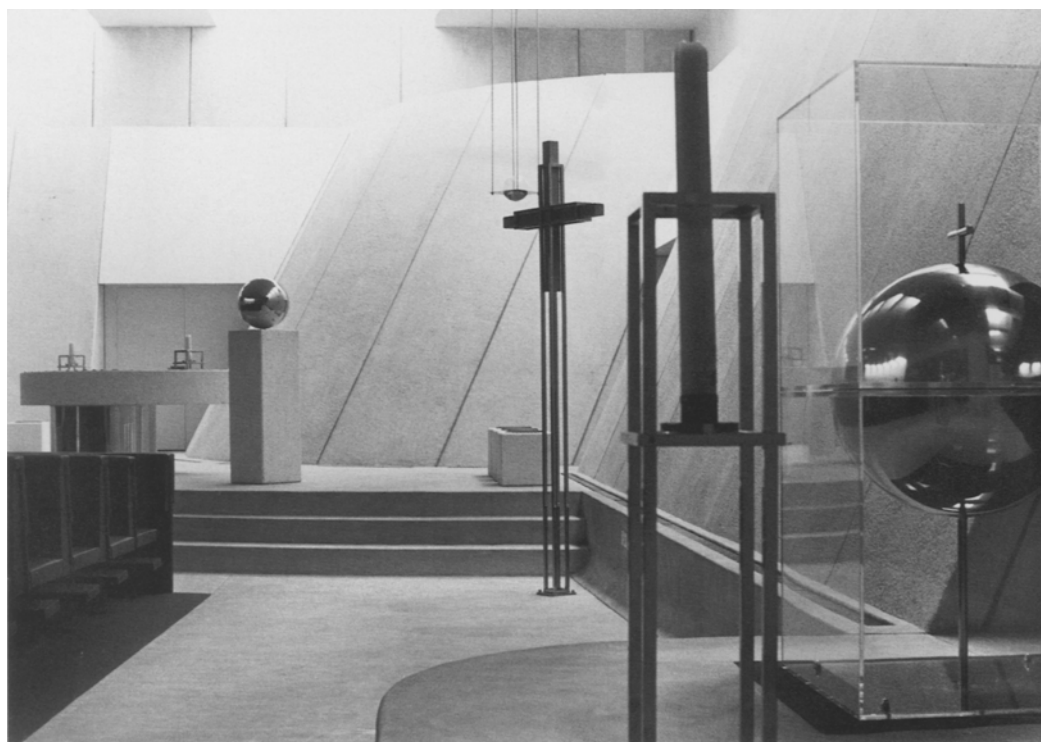
Arriving from the west, one approaches the corner of the tower-like block, which is located at the lowest point on the plot and with a height of 12.5 metres reaches the eaves line of the other buildings. From below, the complex presents a closed face. However,



Lower level plan



Upper level plan



directly behind the stele to the left and right of the tower, a square and passageway open out, which then curves to the right and rises with the incline, lending the space a stage-like feeling. The switch from positive to negative, from mass to emptiness, gives the complex an urban quality.

Due to the clay-rich consistency of the soil, the church and tower rest on 156 driven piles. The building itself is constructed out of industrially produced materials. Standardised prefabricated concrete panels, each 35 centimetres thick and 1.5 metres wide, were placed on the ground and then welded and grouted at the seams. The maximum height of the elements is 9 metres; each panel reaches from the floor to the ceiling,

The concrete is lined with a compound of white marble grit and white powdered cement, and the surface emulates the limestone typical for the region of Solothurn.

Both churches have much in common: the division into a lower zone for the social and cultural parish activities and an upper level for church services; the semicircular, full-height projection for the access ramp, a plan in the form of a quarter circle; the positioning of the sacristy behind the rear wall of the altar; the placing of the organ against the wall next to the ambo or pulpit; and the orientation of the altar at 90 degrees to the sector of the circle. Nevertheless, despite their mirror-image symmetry, both churches have their own character. In the Catholic church, which seats 420, the shape of the

rooflight is such that it also illuminates the baptistry and confessional chapels. In the Reformed church, seating 380 people, the circular rooflight serves solely to emphasise the altar and pulpit. The materiality of the sacred objects of the liturgy is also different: steel, chrome and glass in the Catholic church; oak stumps and blocks in the Reformed church.

The decision to build one church rather than two, is usually an attempt to maximise potential, one of rationality and efficiency. In Langendorf, however, the combination of Catholic and Reformed Christ Church is a child of the ecumenical movement which in the mid-sixties, when the building was being designed, was experiencing an upsurge of popularity.



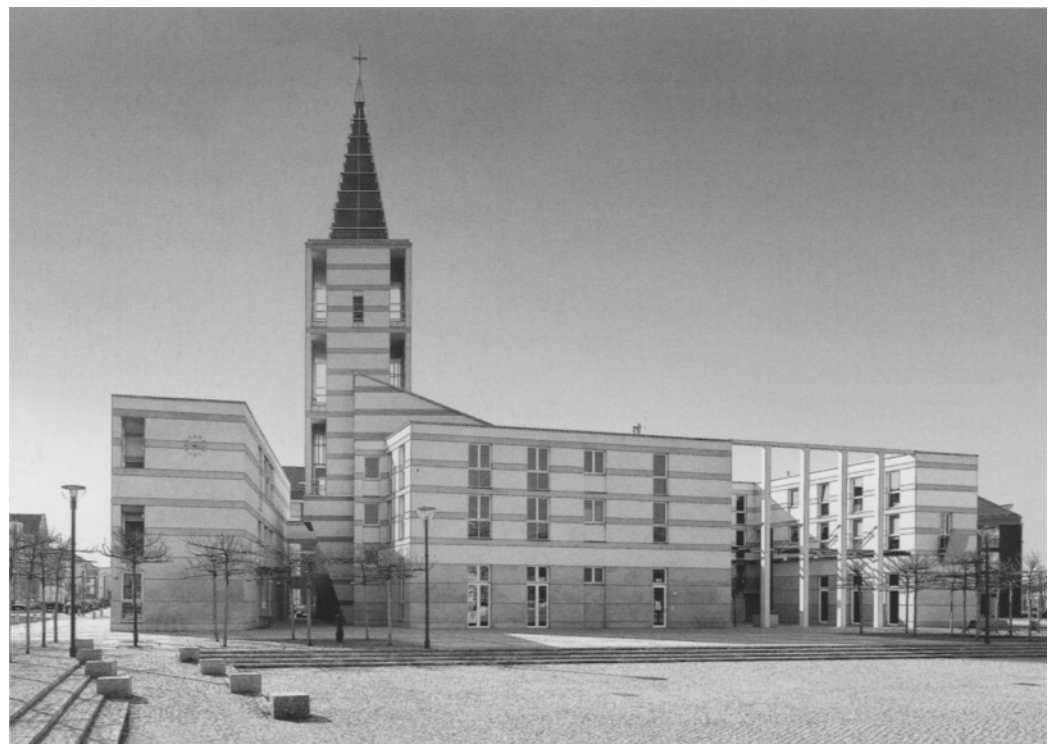
Ground floor plan



First floor plan



A model showing the centre of the Kirchsteigfeld quarter | View from the north, the passageway on the left, courtyard on the right, market square in the foreground | View from the northwest | View towards the altar at the base of the church tower, terracotta floor, liturgical objects made of walnut



Church of Reconciliation

Potsdam, Germany

Architects	Augusto Romano Burrelli, Paola Gennaro
Client	Industrie- und Wohnbau Groth und Graalls GmbH
Completion	1997
Denominations	Lutheran-Protestant and Methodist
Footprint	Hall 196.84 m ²
Seating capacity	Lower level 350, upper level 120

The Kirchsteigfeld is a new quarter in southeast Potsdam. Built in the late nineties to a plan by Rob Krier and Christoph Kohl, it is designed according to Camillo Sitte's "artistic principles." The homogeneity of the urban environment and architecture has a most artificial appearance. The church stands on the south side of the market square, with the intention of forming the spatial as well as spiritual focus of the neighbourhood.

The double-church gives the impression that it has developed out of a four-wing complex. Whilst some of its symmetry has become fragmented in the process of the dissection, apportioning, rotation and re-arrangement of its parts, the building's form as a whole was never compromised. A rectangular box with a length of



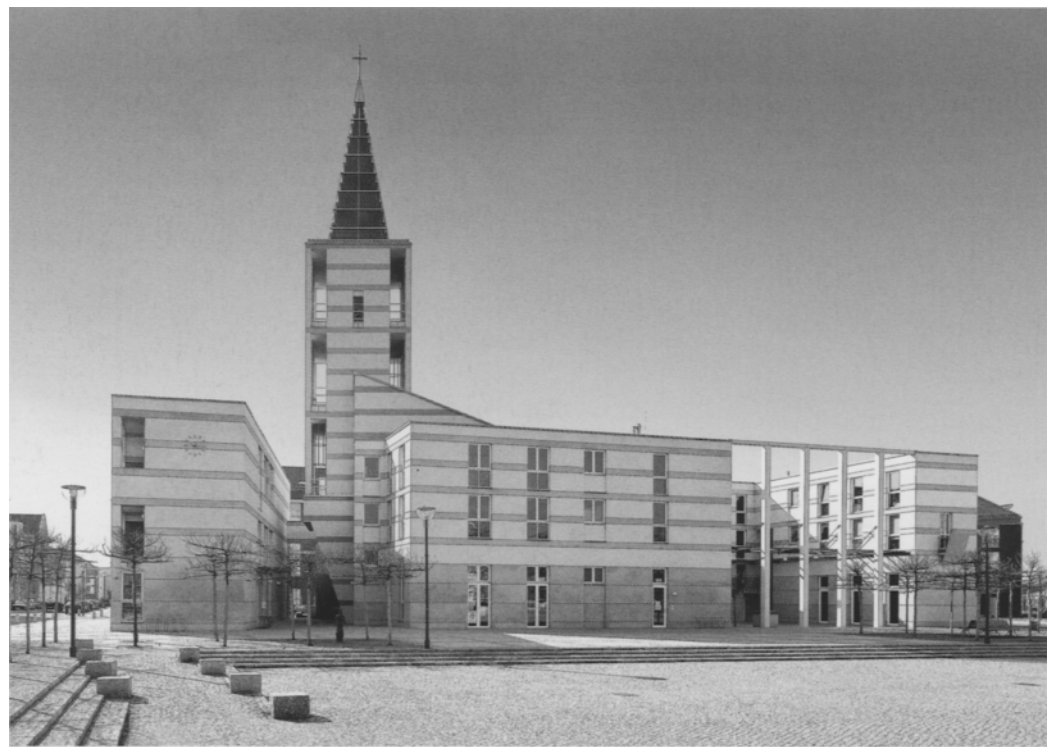
Ground floor plan



First floor plan



A model showing the centre of the Kirchsteigfeld quarter | View from the north, the passageway on the left, courtyard on the right, market square in the foreground | View from the northwest | View towards the altar at the base of the church tower, terracotta floor, liturgical objects made of walnut



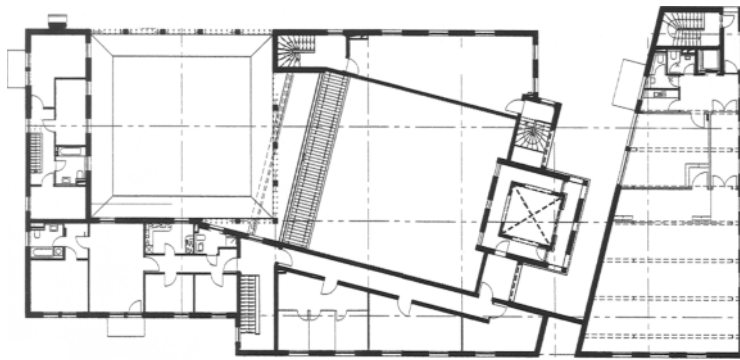
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Potsdam, Germany

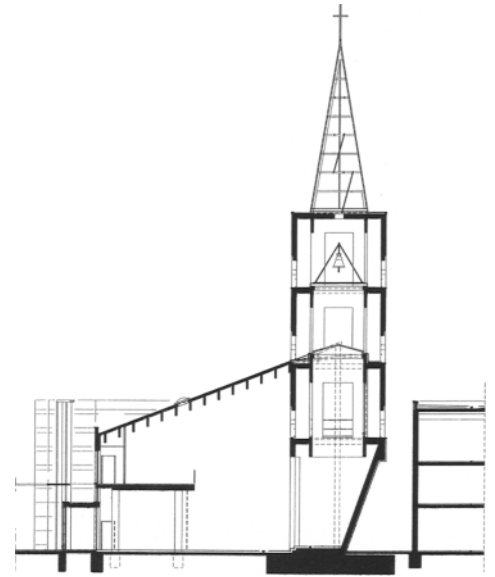
Architects	Augusto Romano Burrelli, Paola Gennaro
Client	Industrie- und Wohnbau Groth und Graalls GmbH
Completion	1997
Denominations	Lutheran-Protestant and Methodist
Footprint	Hall 196.84 m ²
Seating capacity	Lower level 350, upper level 120

The Kirchsteigfeld is a new quarter in southeast Potsdam. Built in the late nineties to a plan by Rob Krier and Christoph Kohl, it is designed according to Camillo Sitte's "artistic principles." The homogeneity of the urban environment and architecture has a most artificial appearance. The church stands on the south side of the market square, with the intention of forming the spatial as well as spiritual focus of the neighbourhood.

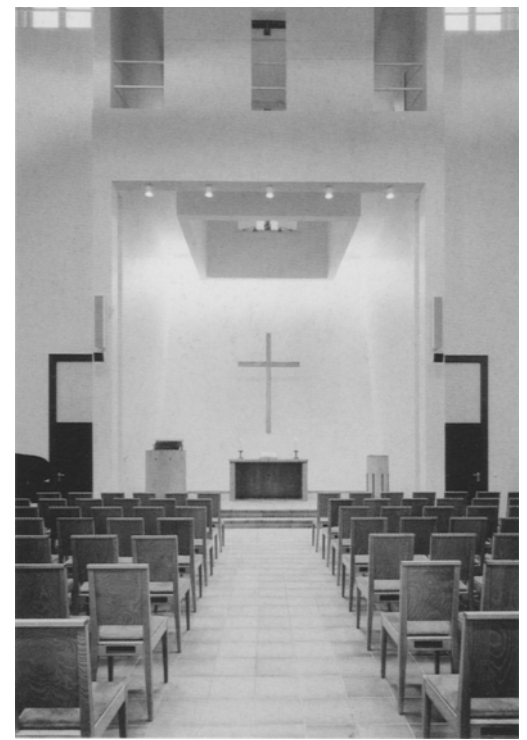
The double-church gives the impression that it has developed out of a four-wing complex. Whilst some of its symmetry has become fragmented in the process of the dissection, apportioning, rotation and re-arrangement of its parts, the building's form as a whole was never compromised. A rectangular box with a length of



Second floor plan



Section through the church tower and church looking north



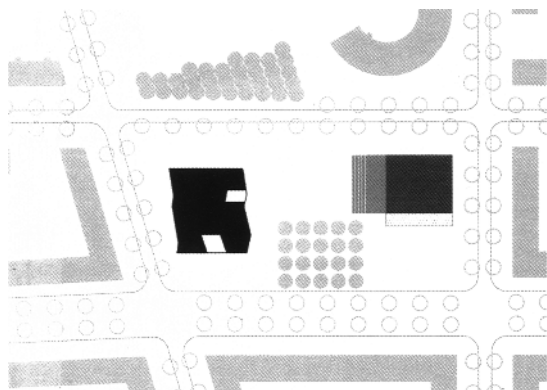
53.9 metres and a proportion of length to breadth of approximately 2:1, its edges and corners are clearly delineated throughout. This is underlined by the consistent treatment of the pale rendered façades: the plinth in dark brown, the two upper storeys with light and dark brown horizontal striping.

The east wing contains a library and music school complete with a small stage; the west wing provides three dwellings; the north and south wings contain further ancillary spaces. These two wedge shapes enclose the church and church tower. On each side of this central building there is a small space open to the sky, one to the east, one to the west. The space next to the tower appears like a tapering passageway, the space next to

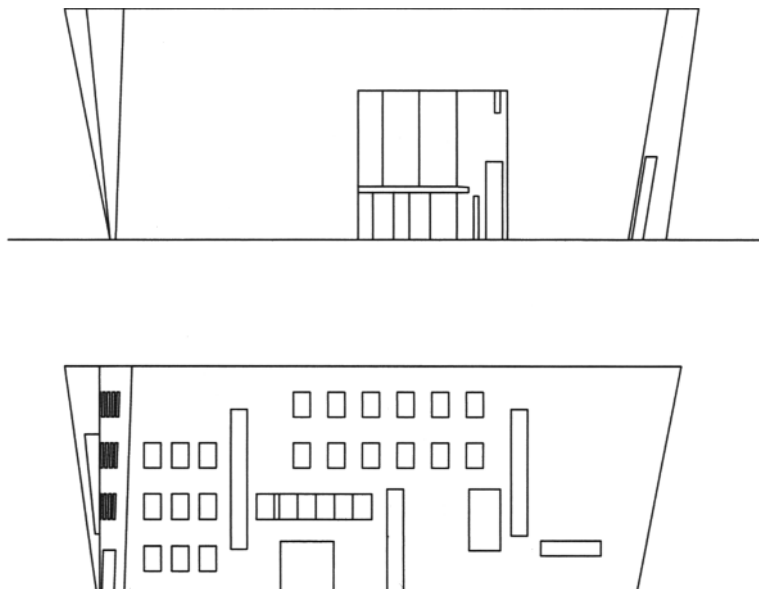
the church like a small courtyard. A strip of glazed roofing runs around each edge of the 14 metre long sides of this courtyard, emphasising its cloister-like association.

One enters the courtyard through a framework of four tall columns and a crossbar. The entrance to the church is slightly concealed, lying not in the axis but to one side. The church hall is plastered white, its dimensions 13.3 metres wide and 14.8 metres deep – approximately equal to those of the courtyard outside. A white folding partition allows the room to be divided in two for the Protestant and Methodist congregations. The altar, the pulpit, the support for the font and the blue-upholstered seats – all designs by the architect –

are made of walnut. The positioning of the altar is unusual: the wall behind the altar table slopes outwards, the room extending upwards, and the tower rises directly out of this square plan. The shaft of the tower is 25 metres, and the spire, which is clad with solar panels, a further 16 metres. Church steeples and pitched roofs are of great significance typologically, making it easier for passers-by to identify a church as a church, without having to guess its functions. The architects' design follows the tradition of Prussian architecture. The relationship between the whole and the parts of the Church of Reconciliation picks up the legacy of Ludwig Persius, the 19th-century master builder of Potsdam who had a pronounced predilection for the Italianate.



Site plan



Elevation of the narrow sides to the southwest and northeast



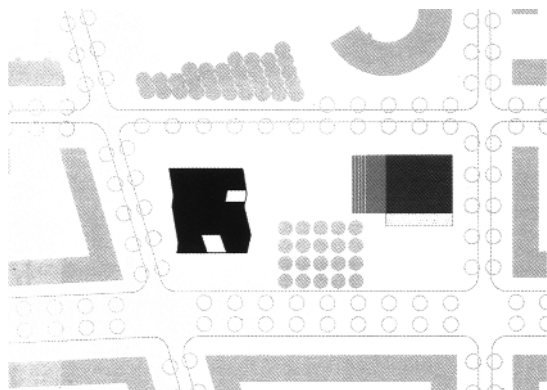
Church of St Maria Magdalena

Freiburg im Breisgau, Germany

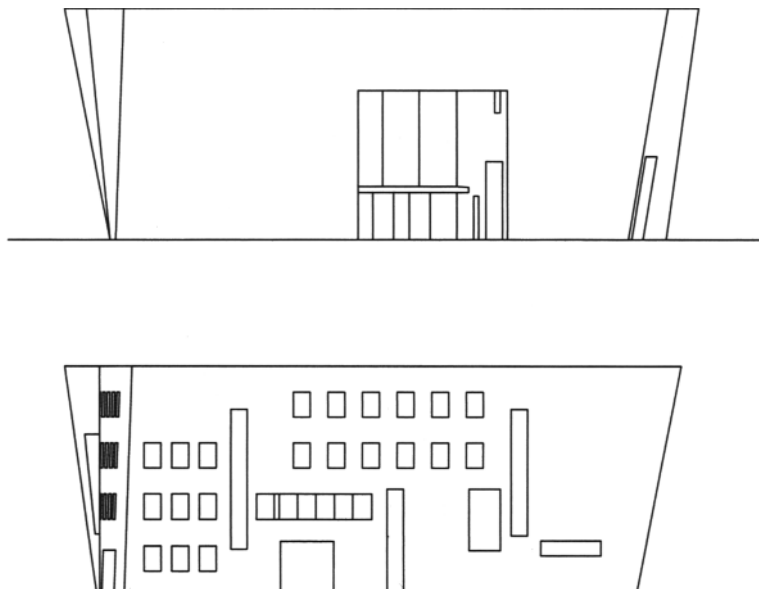
Architects	Johannes Kister, Reinhard Scheithauer, Susanne Gross
Client	St Maria Magdalena Catholic Parish and Maria Magdalena Protestant Parish, Freiburg im Breisgau
Completion	2004
Denomination	Roman-Catholic and Lutheran-Protestant
Footprint	10875 m ²
Seating capacity	Catholic hall 220, protestant hall 650, combined 650

In Germany since the nineties, it has become taboo to use words such as "estate" in conjunction with urban expansion plans for cities. The reutilisation plans for the former Rieselfeld to the west of Freiburg are a case in point: mindful of simply filling the area with houses for ten to twelve thousand inhabitants, the plan was to produce an "urban quarter" with blocks instead of rows and a density similar to that of other late-19th-century quarters but with as much greenery as some of the smaller quarters built in western and southern Germany in the fifties.

Together with the Rieselfeld Community Centre, the Church of St Maria Magdalena stands on a rectangular square that forms the centre of the new urban quar-



Site plan



Elevation of the narrow sides to the southwest and northeast



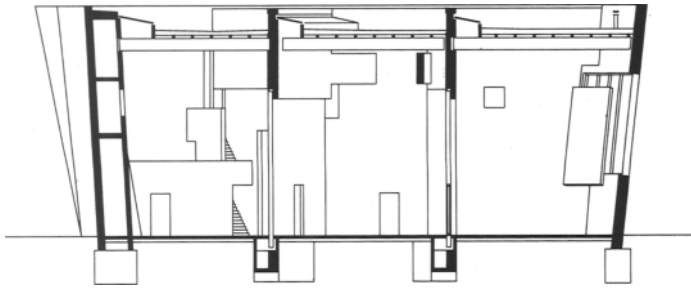
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Cross section through the central lobby



Longitudinal section through the Protestant church



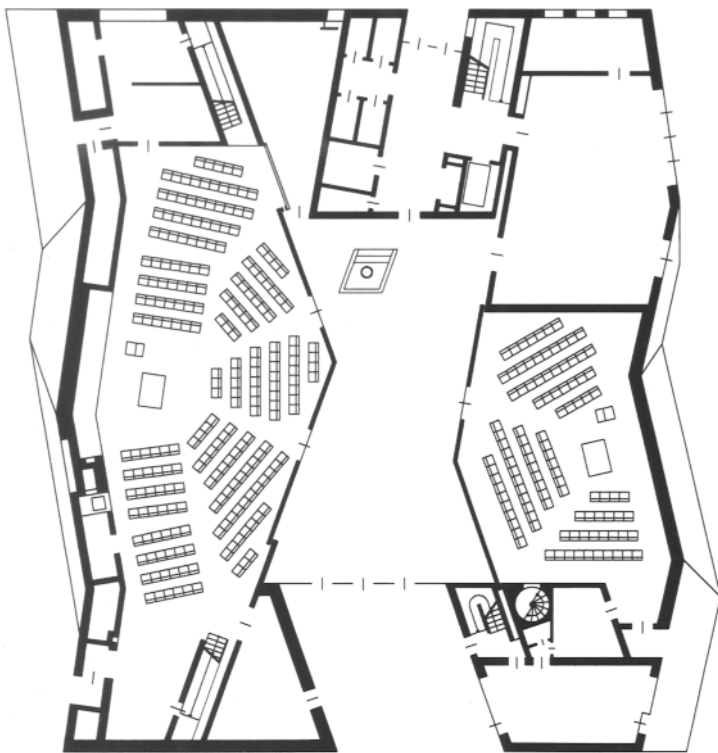
View of the northern tip, to the right the horizontal stripe that lights the altar space in the Catholic church | View of the southern tip, the portal to the left, to the right the large window of the Protestant church | View from southwest, behind the portal on the right, the entrance to the business space, used as a shop | A unity of three: the Protestant church, the foyer with main entrance in the background, and the Catholic church

ter. Unlike its neighbour, the architecture of the church is both homogenous and erratic. Its outward appearance, akin to a giant outlandish boulder, gives no indication of its purpose. There is no bell tower – instead the bells ring from behind an opening behind the portal – nor even a cross on one of its four bare walls that might at least hint at its use. The 13.48 metre high walls of its sharply delineated edges point exactly to the north and south, and west and east. The northeast and southwest walls each measure 30 metres, the northwest and southeast walls each 38.2 metres. Although the building stands squarely on the ground, the folds and kinks in both of the long sides, some of which lean out slightly forwards, give the building a distinct and dynamic form. One is not yet aware of it, but the modu-

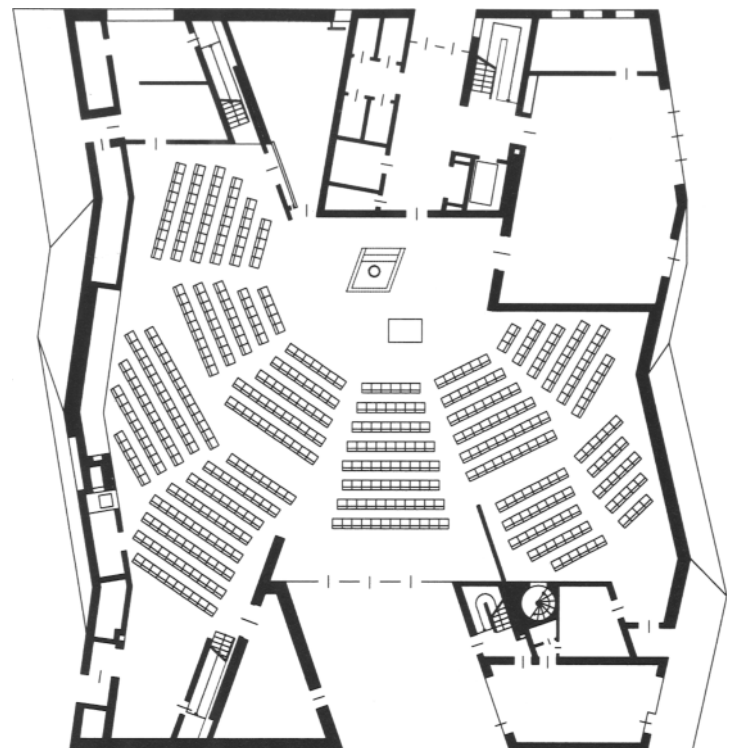
lation of its surfaces reflects the space around not just one but two altar spaces in this double-church. The largest opening on the northwest wall marks the location of the Catholic presbytery, the largest opening on the southeast wall that of the Protestant presbytery.

The “ecumenical” programme for two Catholic and Protestant congregations was already outlined in the original competition brief. They detailed the poles of God’s House and the People’s House, of this world and thereafter, and suggested that the building be formed as a whole with three parts. To give the church a sufficiently prominent presence on the not exactly small square, the architects decided to unite all parts of the programme into a single volume.

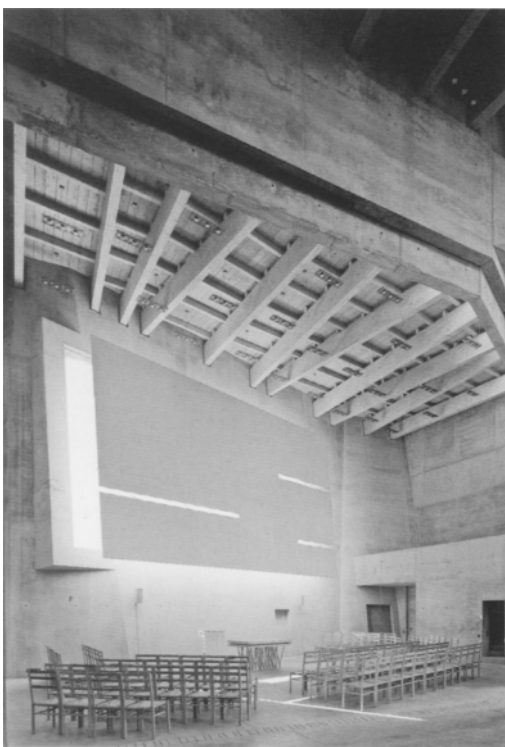
The building has a smaller and a larger, a more secret and a more public entrance. Through a portal on the southwest wall one enters a courtyard whose form, not quite perfectly rhomboid in shape, gives a first indication of the sometimes obtuse, sometimes acute angularity of the inner container. To the left is a small vestry, to the right a business space, ahead three oak doors: behind these one enters a large foyer that extends the depth of the building. It serves not only for baptisms – the font stands in a square recess two steps deep – but also as a passage between the two entrances and exits to the southwest and northeast. The foyer is like a courtyard within the building, providing access to the Catholic church on the left and the Protestant church on the right. Both churches can be opened up



Plan when used as two churches



Plan when used as a single church



to this central “street” by retracting their walls, four in total each weighing 22 tonnes, with the help of electrically driven motors.

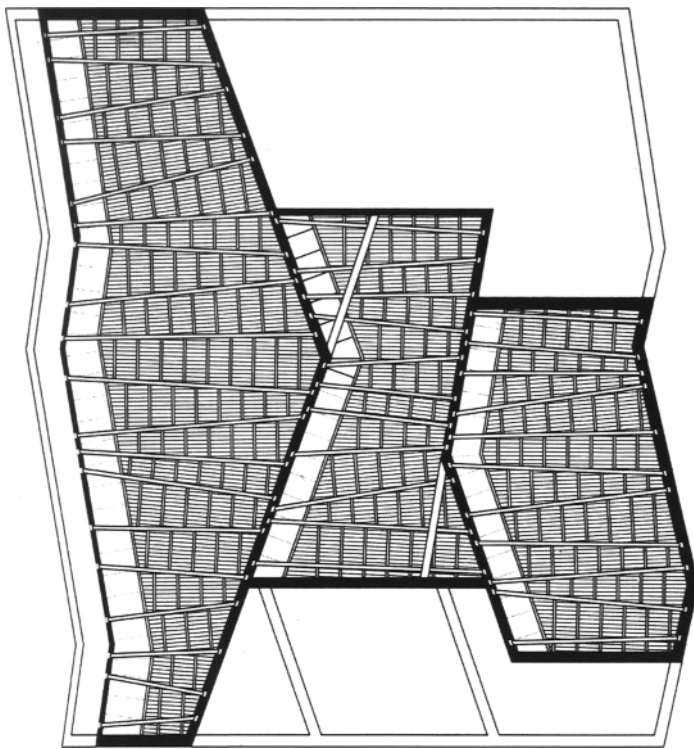
When both churches are combined the space of the church is vast, its expanse on par with medieval churches. The ceiling unites the parts into a whole. The beams and boarding of the ceiling run crosswise, the rafters lengthways, with lighting cradles each with three spots, also suspended lengthways. Strips of glass supported by steel profiles allow light to stream in from above.

When, however, the church is divided into a central foyer and two church halls, the differences become

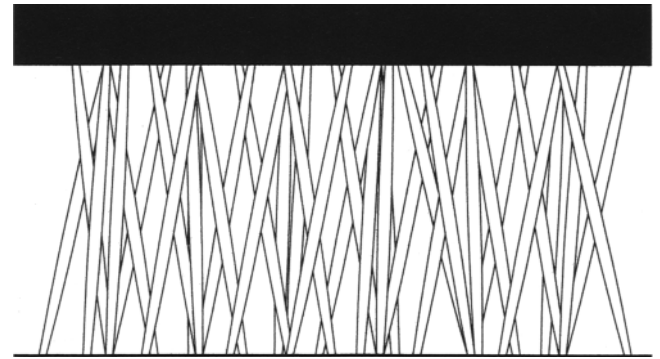
apparent. The Catholic church fills the entire length of the northwest side and has two galleries and a twin-walled rear surface, which accommodates a small chamber and provides a safe home for the tabernacle. The Protestant church occupies half the length of the southeast side and has one gallery. On this side next to this church, the ancillary spaces serve most of the other purposes. The altar and chairs are identical throughout. Designed by Susanne Gross, the fragile character of the furnishings – the chairs in oak with reed seats – contrasts markedly with the robust character of the walls.

As the Catholic church is illuminated more strongly in the evening, the Protestant church in the morning, the

former appears darker, more expressive and the latter lighter and more minimal. The impression is also reinforced by the treatment of the surface behind the altar. In the Catholic church there is a wide niche with its own concealed rear window, that can glow reddish in the evening sun. Above and to each side, the sunlight shining through the roof lights and between the beams throws a dynamic play of diagonal stripes across the wall. Behind the altar in the Protestant church is a 10 by 6 metre large window, and, in front of it, a little offset from the window, a wooden baffle with horizontal slots cut out of it. Light is reflected into the room – to the left, the right and below, as well as through the three slots – but unlike in the Catholic church, the light remains static and unchanging.



Soffit plan



Altar space in the Catholic church | View from the Protestant to the Catholic church with separating walls retracted | View from the Protestant to the Catholic church, the entire wall including door is mobile, the runners covered with a wooden threshold cover strip | Altar space in the Protestant church | Sketch of the altar

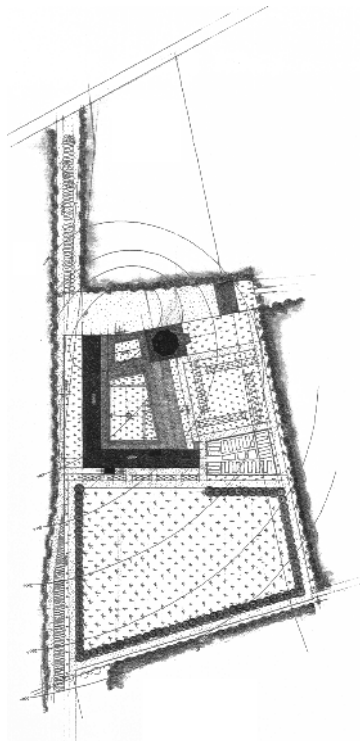
The exceptionally compact and monolithic building is constructed of lightweight concrete cast in situ and left fair faced. The colour of the 40 centimetre thick walls is achieved through its mixture of lava, cement, ash and sand rather than pigments. The three levels of construction are visible as joints on the surface of the concrete. The demonstrative materiality – the sheer presence of the concrete – obviates all need for further decoration. The delicate play of light across its surfaces is ornament enough.

During the sixties and seventies, some concrete churches sought to counter the monotony of mediocre modernism through sculptural architecture. Some of these buildings were indeed the work of sculptors,

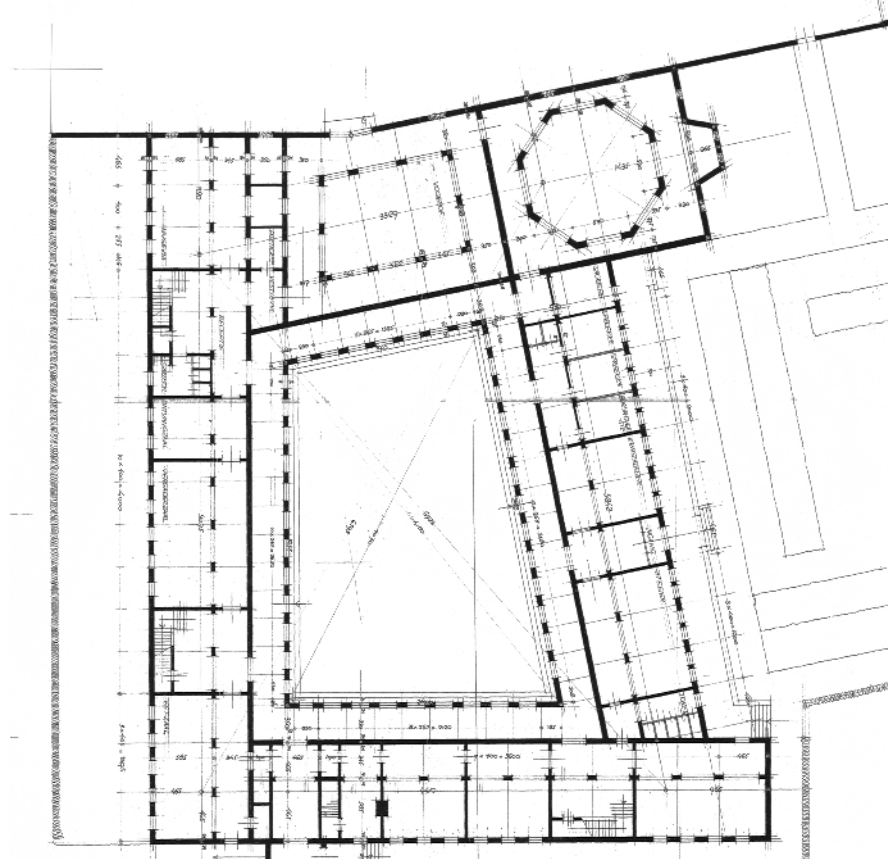
among them Walter Maria Förderer's Church of St Nicholas in Hérémence, Switzerland from 1971 or Fritz Wotruba's Church of the Holy Trinity in Vienna, Austria from 1976. Other churches built around the same time by southern German architects such as Rainer Disse, Hans Kammerer/Walter Belz and Helmut Striffler have a similar, though less sculptural and therefore less dramatic character, as they do not employ the jagged interlocking forms that make Förderer's and Wotruba's work so eccentric.

St Maria Magdalena Church draws inspiration from these 40 year old predecessors. Its qualities lie in the homogeneity of its materials and construction, as well as in its function and symbolism. It also offers a

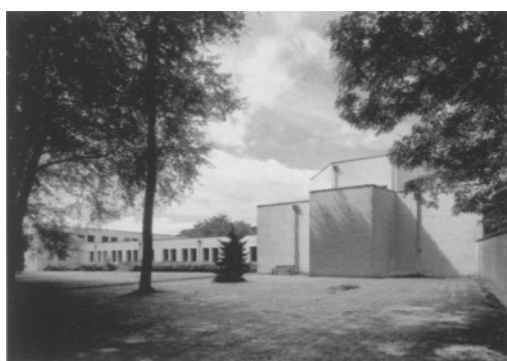
solution to the task of uniting "two churches as one church". Lastly, even the most casual of observers will notice that through the planar quality of its walls, the visibility of the timber roof, and details such as the spiral staircase in one of the two church halls, it also relates to a Romanesque tradition.



Site plan



Ground floor plan



View from the northeast, chapel on the right | View from the south, the separate bell tower on the left

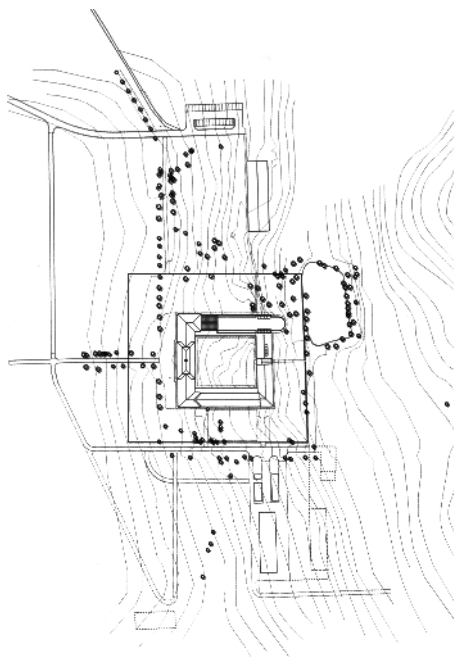
Franciscan Convent Roosenberg

Waasmunster, Belgium

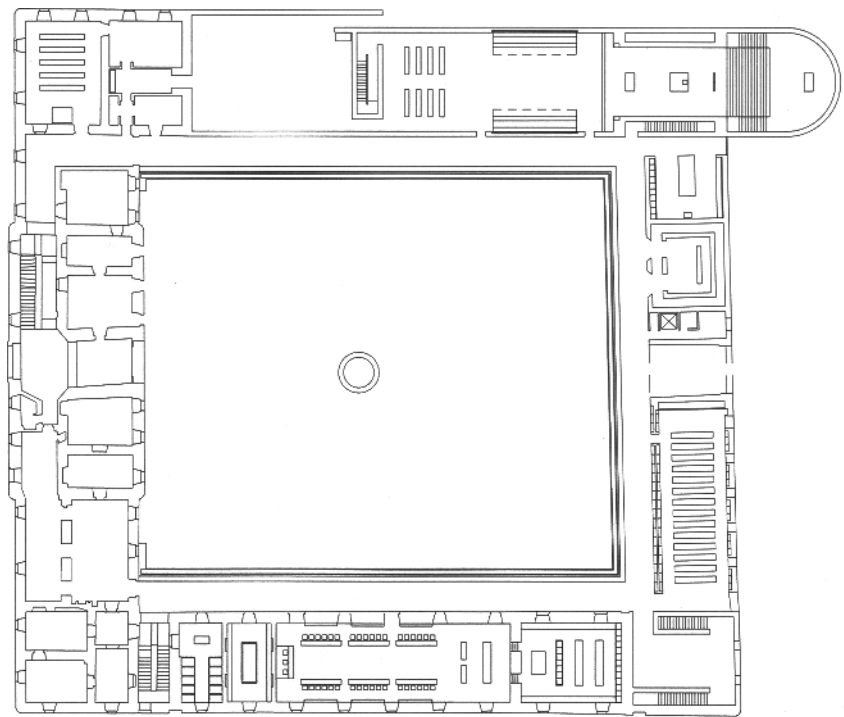
Architect	Hans van der Laan
Client	Franciscan Sisters of Mary, Waasmunster
Completion	1975
Denomination	Roman-Catholic
Footprint	Chapel 312 m ²
Seating capacity	Chapel 97

Surrounded on three sides by woodland, the convent stands on a south-facing and slightly inclined open space. The 66.6 metre long west wing and the 58.4 metre long south wing form a pair joined perpendicularly at the corner; likewise the east and north wings. Together each pair of buildings encloses a trapezoidal courtyard garden. The whitewashed brickwork surfaces of the 50 centimetre thick walls are identical throughout the complex. All the iron-framed windows on the ground floor have the same 3:4 proportions, all the windows on the upper floor 1:1 proportions. Black glazed cap-and-pan roof tiles crown all copings and upper surfaces.

Access to all the rooms is arranged in such a way that the nuns and visitors can go about their day in com-



Site plan



Ground floor plan



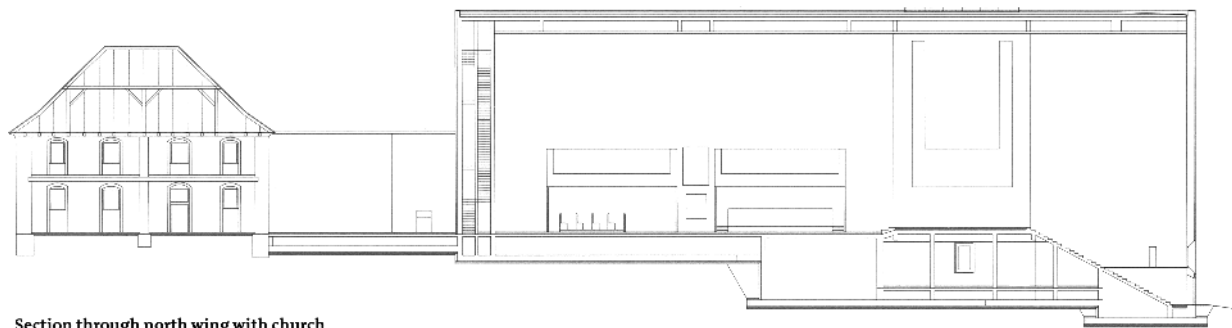
Cistercian Monastery Our Lady of Nový Dvůr

Teplá, Czech Republic

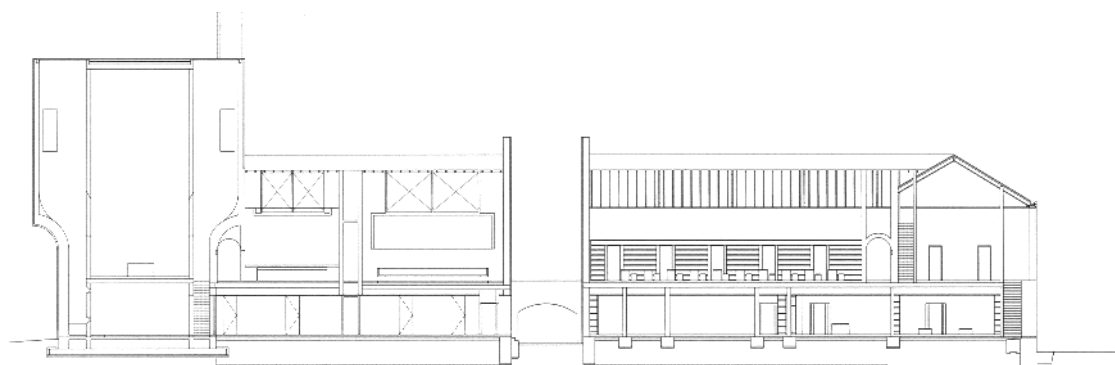
Architect	John Pawson
Client	Cistercian Abbey of Our Lady of Sept-Fons, Dompierre-sur-Besbre
Completion	2004
Denomination	Roman-Catholic
Footprint	3075 m ²
Seating capacity	Monks' choir 42, lay choir 50

Of all the branches of the Cistercian order, the Trappists observe the rules of the order most strictly. Their monasteries are never built in or near to settlements, but are always in remote countryside or woodland areas. The Cistercian Monastery Our Lady of Nový Dvůr in Western Bohemia is no exception and is built on the site of a long dilapidated farm estate. The 70.25 metre square four-wing monastery encompasses both the existing restrained baroque building and a new extension.

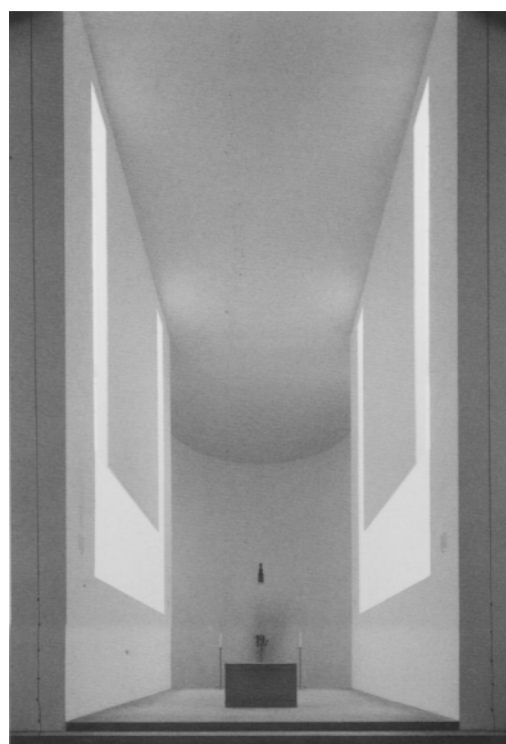
The west wing is located at the highest point of the sloping site. The former manor house contains the entrance as well as a series of offices, with classrooms for the novices and the monks' washroom above. The south wing contains the lavatorium, the refectory,



Section through north wing with church



Section through east wing with sacristy, chapter house and scriptorium



External view of the church apse, a light chamber projecting from the north wall | View from the northwest | View from the manor house into the north wing of the cloister | Choir with altar, light chambers to the left and right backlit with neon lights | Stained oak choir pews with view into the lay choir, the floor covered with granite from China

the kitchen and clothing store on the ground floor, above the dormitory with 34 beds. Whilst the east wing contains the laundry facilities and infirmary with eight beds, on the upper floor the scriptorium, chapter house and sacristy, the north wing is entirely devoted to the church.

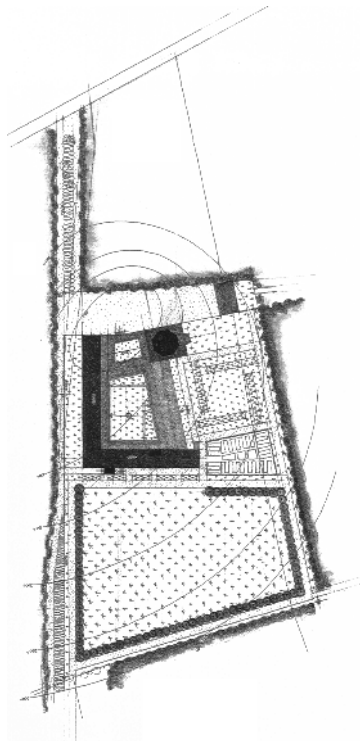
The cloister serves as the backbone for the entire complex. In Nový Dvůr this is in some respects a construction without precedent. Disappearing into the manor house – where it is subsumed into the hallway and corridor – it is entirely different on the other three sides along the new wings. Divorced from the ground level outside, and therefore unaffected by the sloping site, the cloister is not structured by pillars or ribwork. In-

stead, one side wall and barrel roof form a single element that appears to hang silently. On the other side, full-height glazing draws the eye into the courtyard.

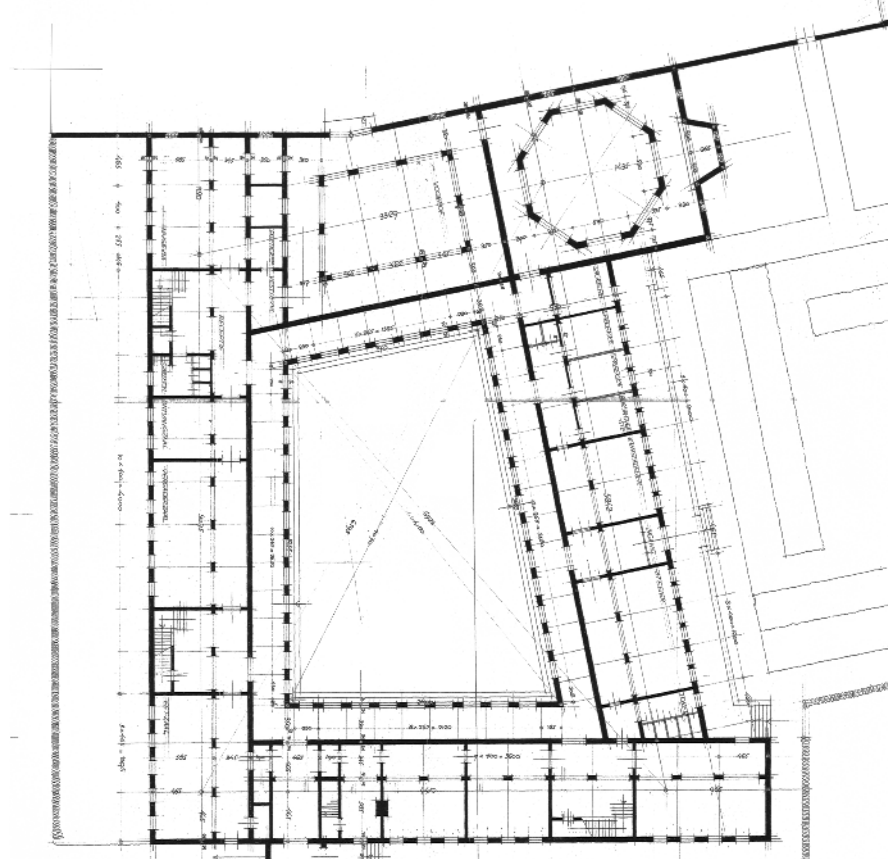
Measuring 47.1 by 10.5 by 13.6 metres, the church has almost extreme proportions. As with the rest of the building, the concrete shell of the church is painted pure white. The light comes from the left and right from two sets of three U-shaped frames. Six of the eighteen strips indicate an equivalent of a crossing. Above all, however, they emphasise the radical hierarchy of the processional arrangement – the path from the lay choir to the monks' choir to the presbytery – additionally underlined by the barriers and steps. Behind the altar there is a wide stair from where the monks ar-

rive from their seclusion and take up position in their choir.

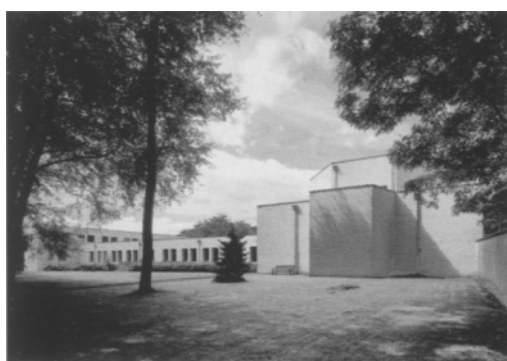
The British architect collected numerous examples of simple buildings for his book "minimum". On several occasions the book – a canonical reference for the design of pure objects – refers to Cistercian architecture. The barrel vaulting of the cloister in Le Thoronet can be seen to recur here in Nový Dvůr. For Bernhard of Clairvaux, abstraction and restraint were an expression of the Cistercian life of solitude. However, today modernist architecture values its aesthetic qualities. In this desire for beauty lies a problem of luxurious minimalism. Only with time will the monastery escape this as the building begins to show its age.



Site plan



Ground floor plan



View from the northeast, chapel on the right | View from the south, the separate bell tower on the left



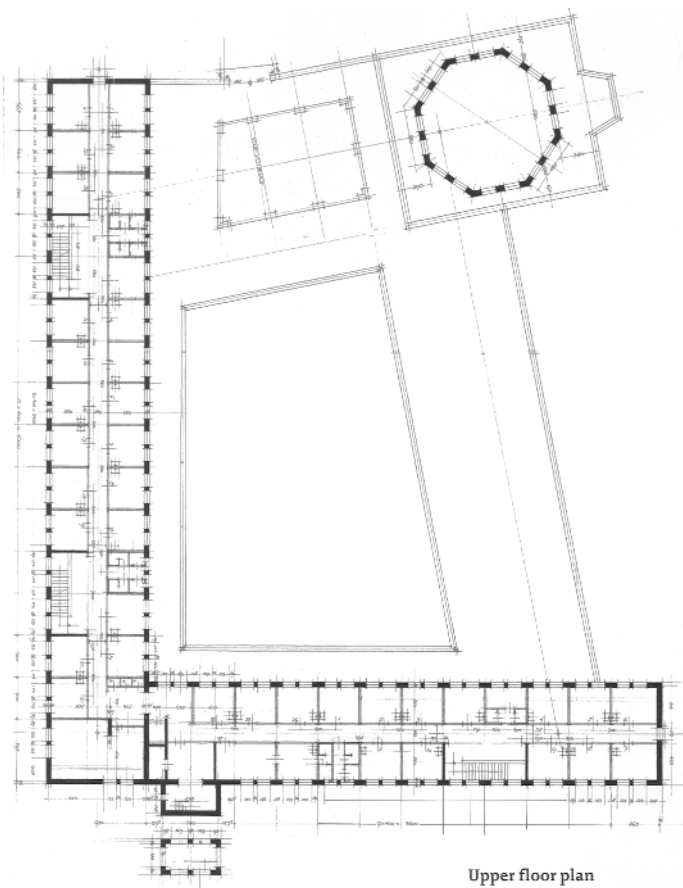
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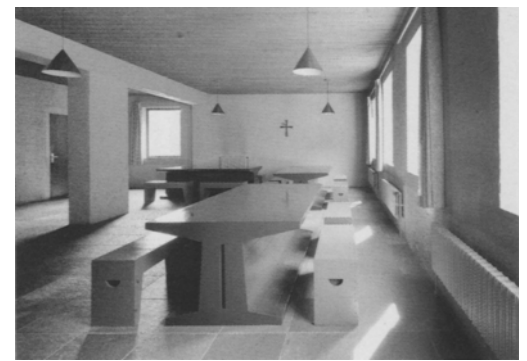
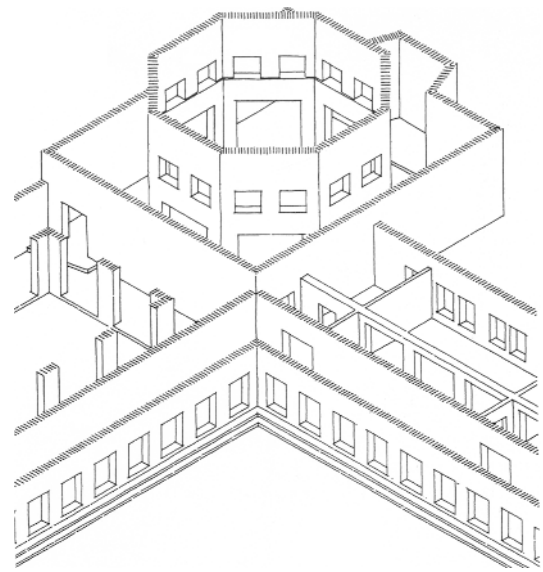
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Upper floor plan



Chapel with the axis between altar and tabernacle, between them the priest's seat | Refectory, all furniture designed by the architect

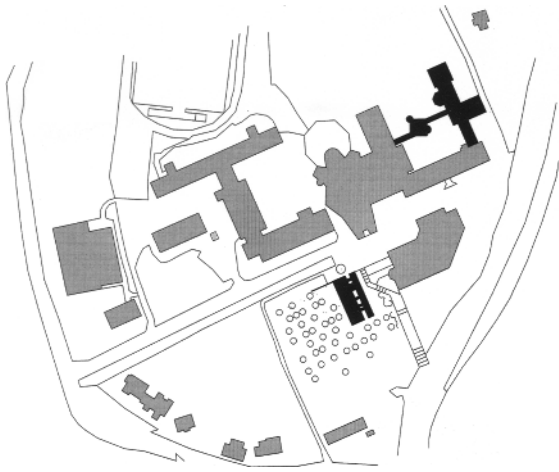
pletely separate environments: the north wing accommodates entrance courtyard and chapel; the east wing sacristy, office, library and workshop; the south wing kitchen and refectory; the west wing guest rooms, lecture hall and museum; the upper storeys of the west and south wings, the nuns' rooms and guest rooms.

One enters the convent from the north. Except for a door – at a bend in the wall that marks the spot where north and west wings meet – this side of the building is entirely closed. The entrance courtyard directly behind the entrance provides access to the garden courtyard as well as the chapel. However, as if to slow the pace of arriving visitors, the doors are not on axis, but located out of view in the corners.

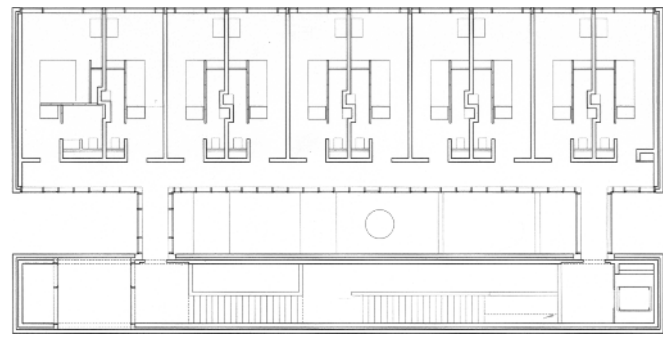
The position of the altar and tabernacle in the chapel mediates between the longitudinal and circular arrangements. The plan is an octagon – with an edge-length of 5.3 metres – inside a square, only slightly longer than it is wide. The altar is positioned a little east of the centre of the room and arranged in an axis with the tabernacle in a niche in the east wall. The grey pews and knee-rests for the nuns are arranged around three sides, and together with the stations of the liturgy form a circle. The floor is covered with a yellow-brown flagstone. The central octagon projects out of the roof of the square, allowing light in through eight pairs of windows all of the same format. The timber panelling on the ceiling and the pendant lamp shades both recall traditional kitchens or workshops – give

the chapel, despite its brightness, a decidedly domestic atmosphere.

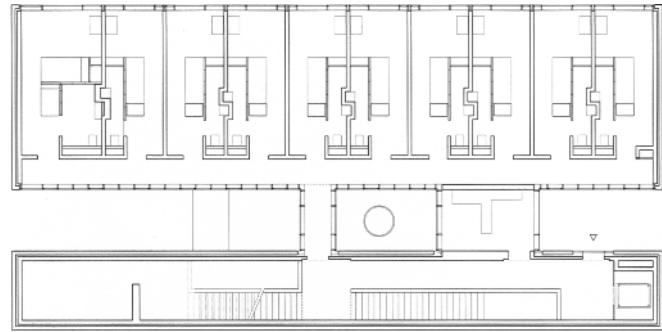
The exceedingly limited palette employed by the architect and Benedictine has one single aim: the unity of architecture and the Eucharist as an ensemble of symbols. Church architecture is the continuation of the primitive hut. However, this most supreme and pure form of church architecture, one entirely liberated from function, cannot be achieved through the use of particular building materials, but only through the connection between space and number: through proportion.



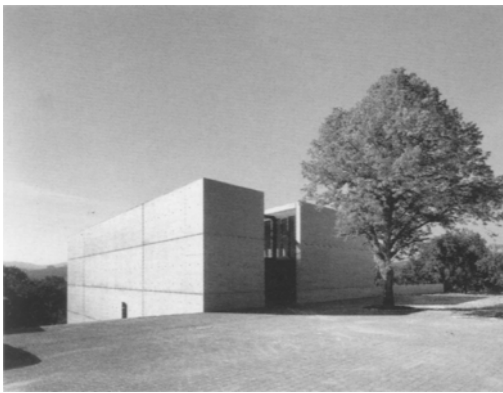
Site plan, the House of Silence to the south, to the north the chapel, refectory and dormitory built in the eighties



Upper floor plan



Ground floor plan



Entrance face opposite the abbey church | Rear of the building, the hall in the broader of the two blocks, to the left the guest room windows | Steel-and-glass bridges between both wings, in the background the abbey church | Room for prayer and contemplation with hidden rooflight | Cell with view westwards

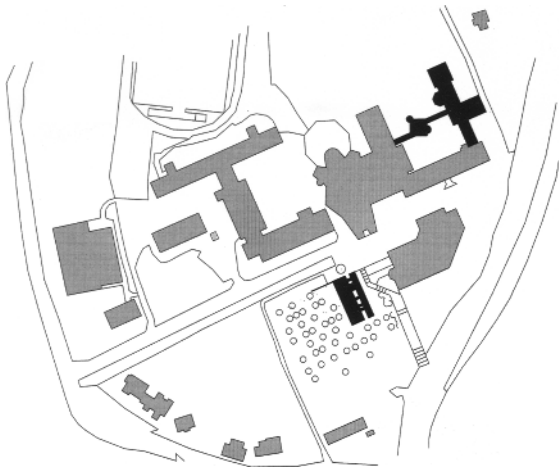


House of Silence at Königsmünster Benedictine Abbey

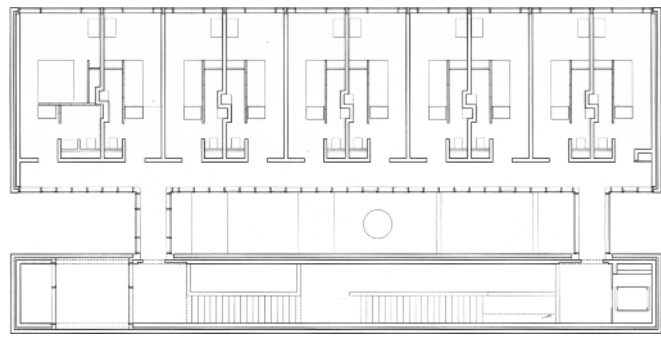
Meschede, Germany

Architects	Peter Kulka, Konstantin Pichler
Client	Königsmünster Benedictine Abbey, Meschede
Completion	2001
Denomination	Roman-Catholic
Footprint	ca. 480 m ²
Seating capacity	None in the chapel

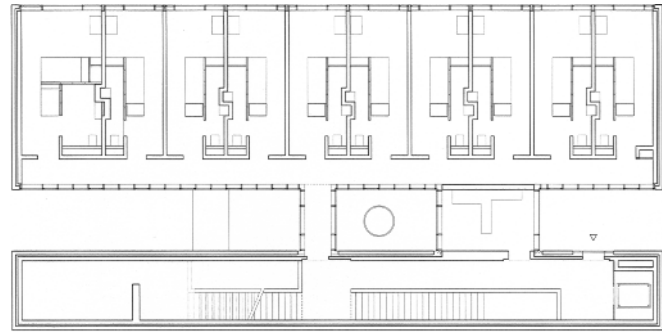
Together with the abbey church, built in the sixties, the House of Silence frames the entrance to the complex of the Benedictine Königsmünster Abbey. Built over a period of 80 years, the ensemble lies on a high sloping site and is reached from the town via a series of steps. The most recent addition, pushed into the slope of the site, has the appearance of a square-cut monolith, 15 metres wide, 32 metres deep and 13.5 metres high at its upper end. The block consists of a narrow and a wider concrete box, between them a slot approximately 3 metres wide. Five glass passageways bridge the gap over this gorge between the eastward and westward wings of the building. The sharp formal division of the two parts reflects a functional separation between served and serving zones.



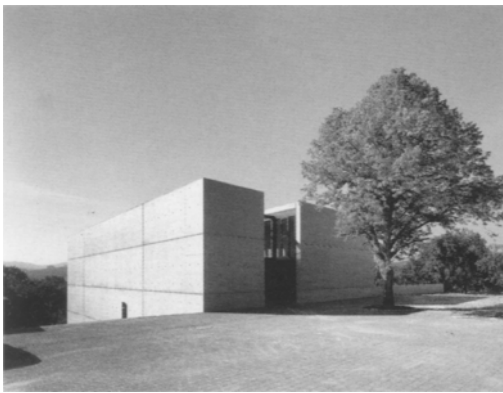
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Ground floor plan



Entrance face opposite the abbey church | Rear of the building, the hall in the broader of the two blocks, to the left the guest room windows | Steel-and-glass bridges between both wings, in the background the abbey church | Room for prayer and contemplation with hidden rooflight | Cell with view westwards

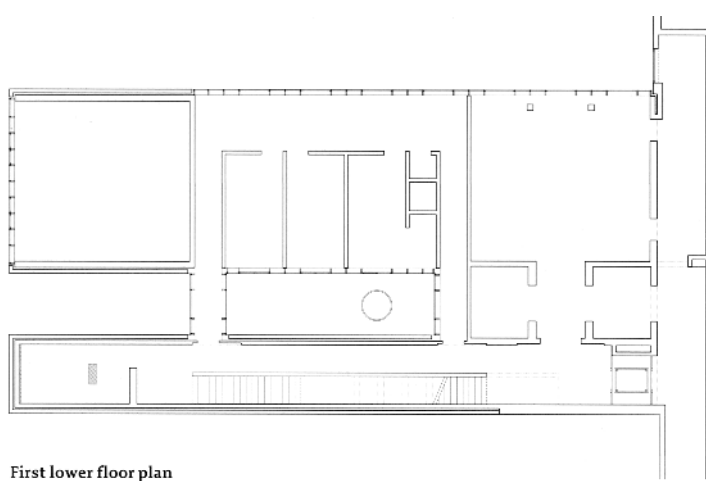


House of Silence at Königsmünster Benedictine Abbey

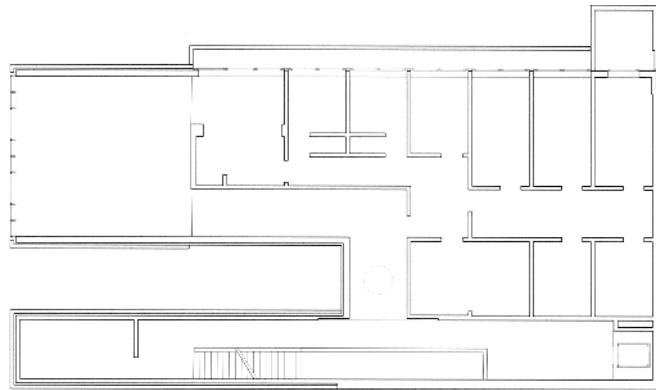
Meschede, Germany

Architects	Peter Kulka, Konstantin Pichler
Client	Königsmünster Benedictine Abbey, Meschede
Completion	2001
Denomination	Roman-Catholic
Footprint	ca. 480 m ²
Seating capacity	None in the chapel

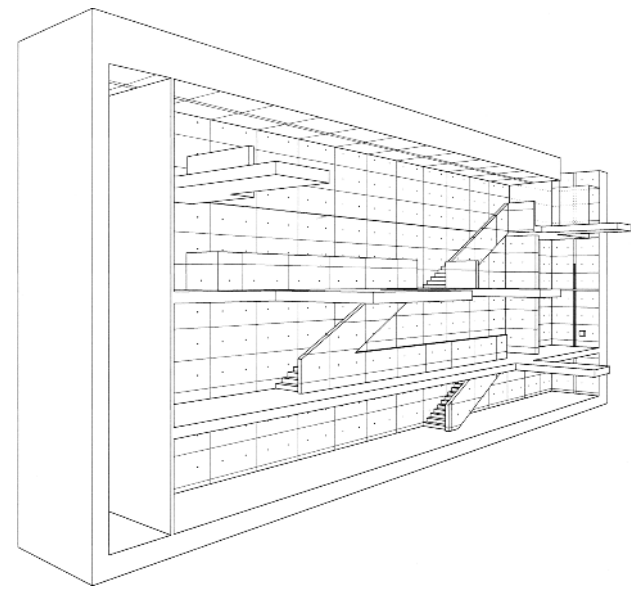
Together with the abbey church, built in the sixties, the House of Silence frames the entrance to the complex of the Benedictine Königsmünster Abbey. Built over a period of 80 years, the ensemble lies on a high sloping site and is reached from the town via a series of steps. The most recent addition, pushed into the slope of the site, has the appearance of a square-cut monolith, 15 metres wide, 32 metres deep and 13.5 metres high at its upper end. The block consists of a narrow and a wider concrete box, between them a slot approximately 3 metres wide. Five glass passageways bridge the gap over this gorge between the eastward and westward wings of the building. The sharp formal division of the two parts reflects a functional separation between served and serving zones.



First lower floor plan



Second lower floor plan



Longitudinal section through the narrow block



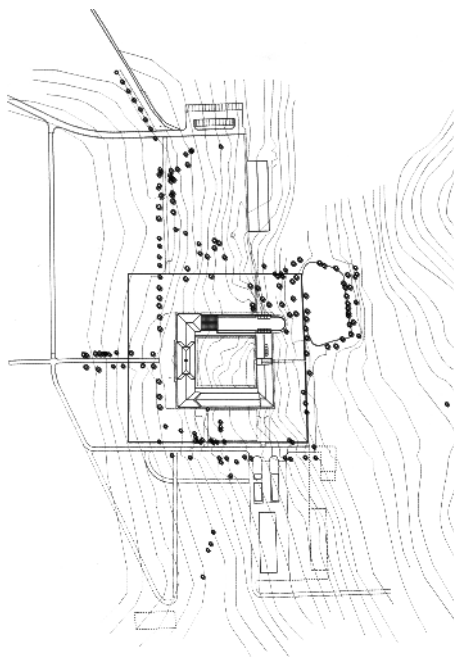
The entrance to the House of Silence is at its upper end, diagonally opposite the abbey church. Inside the narrower of the two blocks, a Jacob's ladder – two flights of stairs arranged one behind the other along the windowless outside wall – descends from the rear of the building. Behind it, occupying part of the ground and lower ground floors, is a small chapel. A simple unadorned room for prayer and contemplation, it is faced entirely in concrete. A steel cross stands against the light grey of the rear wall, aligned with the grid of anchor holes in the concrete and lit from above by a hidden rooflight.

The broader of the two blocks houses the guest rooms. The ground and upper floors each contain ten cells

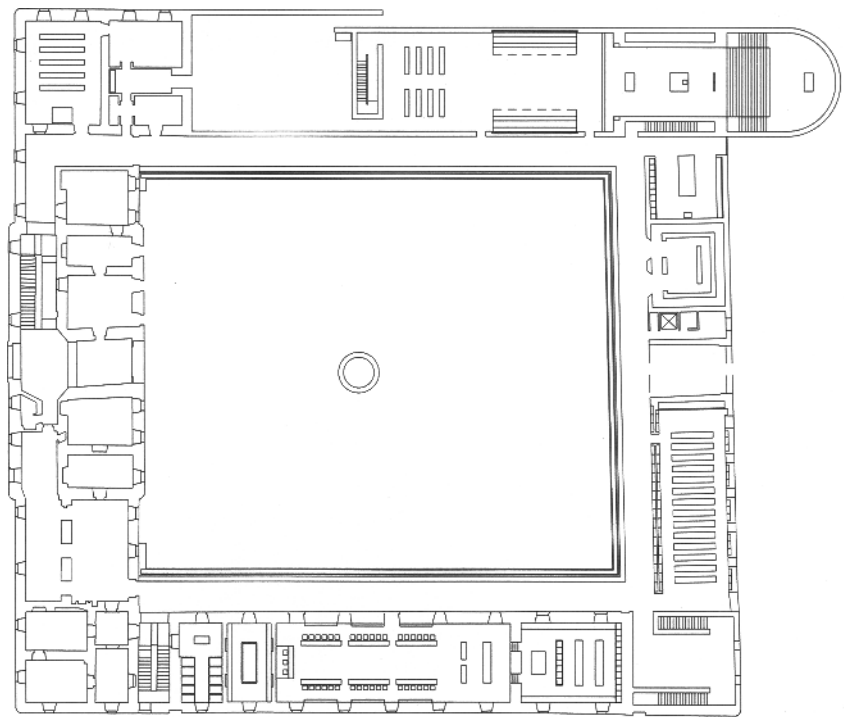
sparingly furnished with bed, table and chairs made of oak, although each has a bathroom. The full-height windows – walls, floor and ceiling are all smooth concrete – look west. Narrow vertical hinged metal flaps to the sides of the windows provide ventilation. The rooms for the monks' and guests' day-to-day activities are arranged at the lower end of the slope on the two lower floors. These include a few offices, a refectory, a "cloister" and a two-storey high hall with a square plan and view south into an orchard.

Of all the buildings in Königsmünster Abbey – including the chapel, refectory and dormitory previously designed by the architect in the eighties – the new House of Silence is perhaps the most monastic. Everything

about it promotes contemplation and reflection. Not only the narrow "pathway tract" but also the broader "existential tract" are characterised by radical reduction. The simplicity of the forms, material and construction emphasise the necessary and the essential. The architecture has an archaic and an ascetic character. Utterly self-immersed, the building is intended not as "a place of this world" but "a place in the world."



Site plan



Ground floor plan



Cistercian Monastery Our Lady of Nový Dvůr

Teplá, Czech Republic

Architect	John Pawson
Client	Cistercian Abbey of Our Lady of Sept-Fons, Dompierre-sur-Besbre
Completion	2004
Denomination	Roman-Catholic
Footprint	3075 m ²
Seating capacity	Monks' choir 42, lay choir 50

Of all the branches of the Cistercian order, the Trappists observe the rules of the order most strictly. Their monasteries are never built in or near to settlements, but are always in remote countryside or woodland areas. The Cistercian Monastery Our Lady of Nový Dvůr in Western Bohemia is no exception and is built on the site of a long dilapidated farm estate. The 70.25 metre square four-wing monastery encompasses both the existing restrained baroque building and a new extension.

The west wing is located at the highest point of the sloping site. The former manor house contains the entrance as well as a series of offices, with classrooms for the novices and the monks' washroom above. The south wing contains the lavatorium, the refectory,

Synagogues

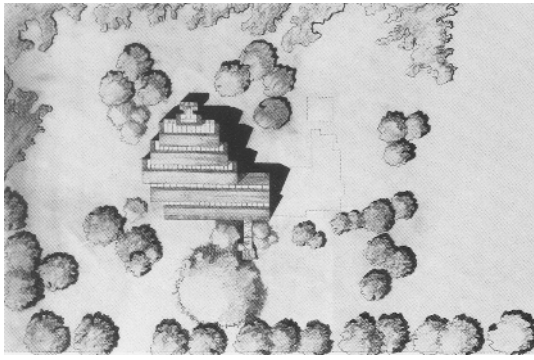
Up until its destruction by the Romans in the year 70 according to the Christian calendar, the temple on Mount Moria in Jerusalem was the actual centre of Jewish religious activities. Although synagogues had been built in the same location after the destruction of the First Temple in the year 586 before the Christian Era, they only began to be built in increasing numbers after the destruction of the Second Temple by the Romans, of which only one wall survived that is today known as the “Wailing Wall”.

For the Jews, only the site of the Temple in Jerusalem and the Torah, the five Books of Moses, are considered holy. With the exception of the First and the Second Temple, a synagogue is not a consecrated building. It is merely a substitute for the Temple, which – according to the Orthodox Jews – will at some point in the distant future be rebuilt on its original site after the return of the Messiah. The synagogue has three functions: as a “bet ha kneset”, a house of assembly, as a “bet ha tefillah”, a house of prayer and as a “bet ha midrash”, a house of study for the Torah and Talmud.

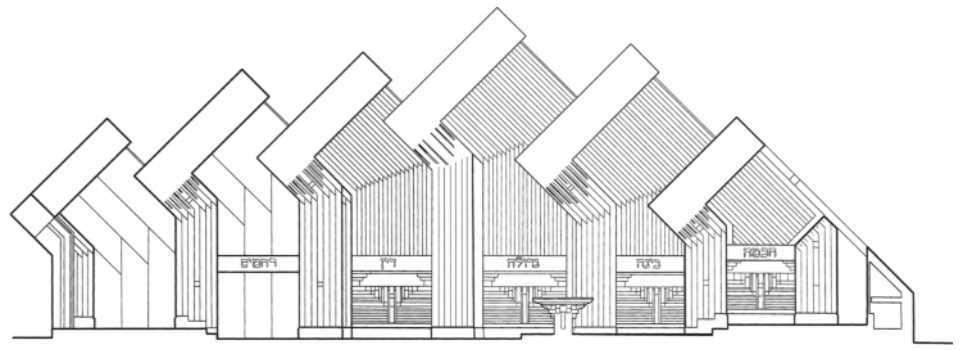
Ever since the loss of the temple, the Jewish service excludes any kind of symbolic offering. The ritual is dedicated purely to the word, whether written, spoken or sung. To adapt a thought by the religious philosopher Schalom Ben-Chorin, one could call the sermon the “words of God speaking”. The climax and heart of the ritual is the reading from the Torah. For this purpose the Torah is first removed from the “aron ha-kodesh”, the holy shrine, and laid on the “bimah”, a lectern.

In all synagogues, the aron ha-kodesh stands against the mizrah wall – which faces Jerusalem – while the bimah is placed differently according to regional tradition. In the orthodox Ashkenazi synagogues in central and eastern Europe, it stands in the centre of the space, the seating arranged on three sides around it. In the orthodox Sephardi synagogues in western and southern Europe, the bimah stands in front of the west wall with the seating arranged along both sides leaving an axis open between the shrine on the east wall and bimah on the west wall. In the later synagogues of reformed or liberal Jewish congregations – for example in the new synagogues by Zvi Hecker in Duisburg and by Wandel Hoefler Lorch Hirsch in Dresden – the aron ha-kodesh and bimah stand on a small podium in front of the mizrah wall.

Except for in the United States, new synagogues are built only very rarely. This restraint can be attributed to the fact that Jews do not view a building solely for the purpose of conducting a service – replete with sacred character and large organ – as being essential for religious life. In Germany, however, the building of new synagogues has more recently been undertaken with renewed vigour. Synagogue architecture in Germany also serves a memorial function, as for political and moral reasons the memory of the Shoah is always present.



Site plan, on the right the outline of the earlier building



Longitudinal section through the central axis with the bimah in the centre



Anteroom with view westwards | View from the west showing the series of pointed gables



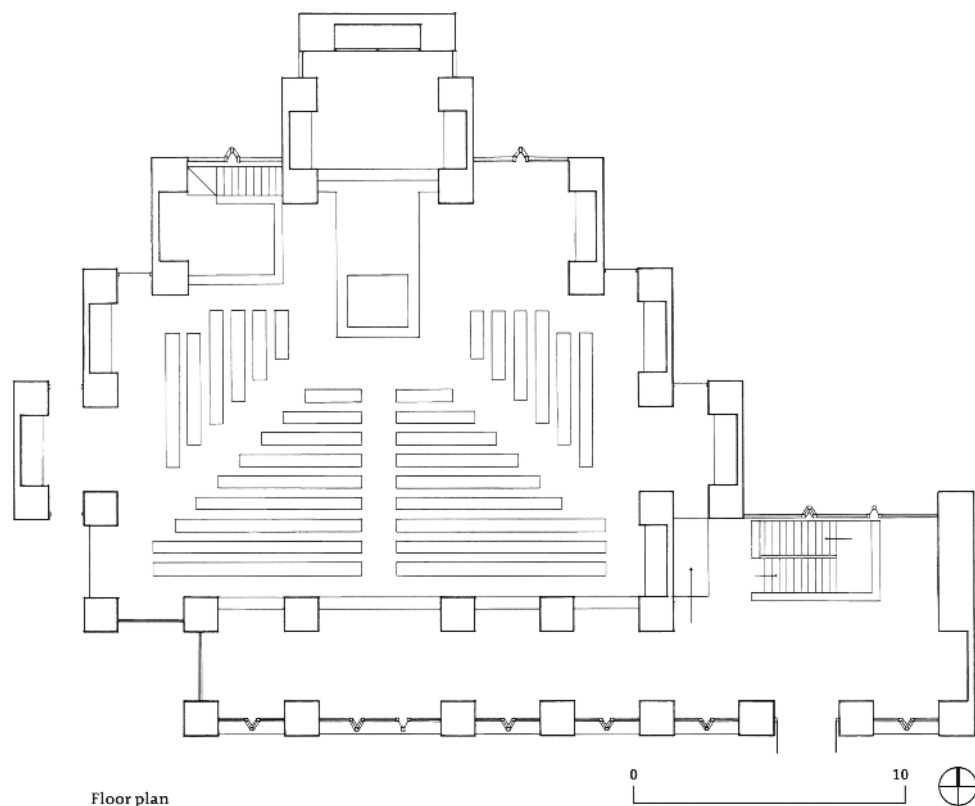
Gates of the Groves Synagogue

East Hampton, New York, USA

Architect	Norman C. Jaffe
Client	The Jewish Center of the Hamptons, East Hampton
Completion	1989
Denomination	Reform Judaism
Footprint	ca. 465 m ²
Seating capacity	250

The name "Gates of the Grove" refers to a pastoral scene. And indeed, the synagogue stands in a small park at the far east end of Long Island. The building is a timber construction clad in wood shingles and appears as a stepped series of elongated, angular and opaque structures, capped at their east and west ends by a series of pointed gables. Seen from the south and north, however, the building is more like a summer house with a sturdy pitched roof. These walls are glazed from floor to ceiling, and are modulated at eaves height by a lattice of slender timber slats.

The interior is divided into three parts: a corridor-like anteroom, the main space in the form of a hall and lastly at the rear – in the centre behind a square



Floor plan



Main space, at the rear, the smaller portal with the space for the Holy of Holies, the Torah shrine, illuminated from above and the east and west | Detail of the shingles on the walls to the left and right of the entrance

room – the Holy of Holies. The structure of the hall is defined by five broad portals, each with two pillars with a 45-degree bend that support a long cross-beam. Between each of the beams, which rise to a height of 10.65 metres, there is space for a north-facing roof-light. The floor and plinth are paved with limestone panels from Wisconsin, the walls and ceilings clad with Alaskan cedar wood. The joins in the timber boarding are clearly visible, their parallel lines underlining the verticality of the pillars and the horizontality of the beams.

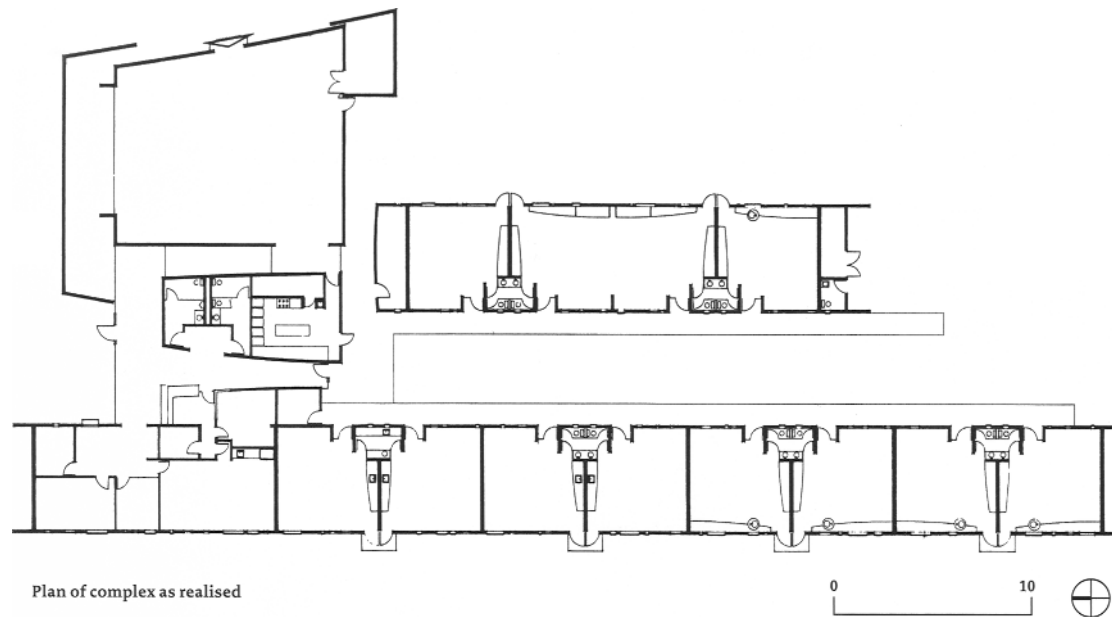
As with orthodox Ashkenazi synagogues, the Torah rolls reside in a Torah shrine in the rear wall – although here, unlike traditional synagogues, this does

not face eastwards – while the bimah is located in the centre of the room. The pulpit is surrounded on three sides by pews made of ash. Niches in the east and west end walls provide further seating.

Due to its specific relationship to the surrounding landscape on the one hand, and its decorative use of wood and stone on the other, the “Gates of the Grove” Synagogue can be considered as standing in a tradition of “romantic modernism” as seen in the work of Frank Lloyd Wright or E. Fay Jones. The form and materiality of the building also makes reference to the old, entirely wooden synagogues constructed in eastern Europe. And, although one sees it only once one is aware of it, many details relate to the number ten.

The ten bent pillars refer to the yod, the tenth letter in the Hebrew alphabet. The slender slats in the windows to the north and south, the ten niches, and not least the ten words inscribed on the beam above these remind the congregation of the Sephirot, the ten attributes of eternal holiness as represented in the Tree of Life in the Jewish Kabbalah.

During the eighties, many Jewish congregations in the U.S. began to focus more strongly on the roots of their religion. In the “Gates of the Grove” Synagogue, divergent elements are united. In East Hampton at least, reformed ritual and orthodox reference do not contradict one another.



View of the synagogue from the northeast showing concrete masonry | Main entrance, on the right the passage through to the courtyard, on the left the art garden, walled on three sides, with the synagogue behind it

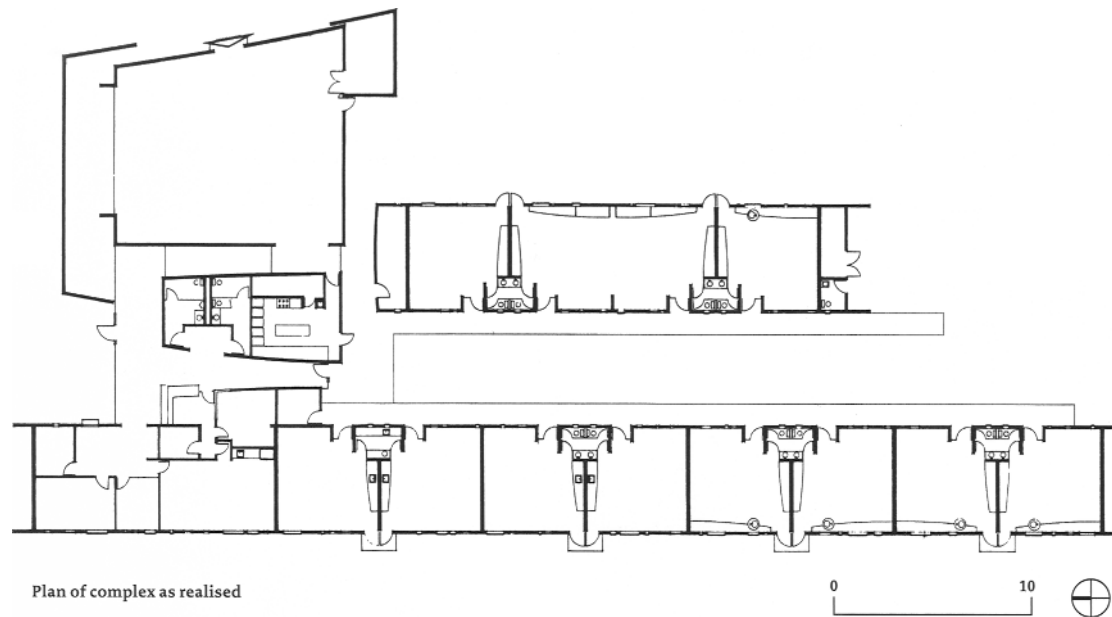


Temple Kol Ami

Scottsdale, Arizona, USA

Architect	William P. Bruder
Client	Temple Kol Ami Congregation, Scottsdale
Completion	1994
Denomination	Reform Judaism
Footprint	Synagogue 723 m ²
Seating capacity	ca. 120

Although the site lies in one of the largest cities in Arizona – Scottsdale numbers 220,000 inhabitants – one's first impression is of desert. The complex with its tight arrangement of small streets and courtyards is modelled on ancient Middle East Jewish settlements. The design of the complex encompasses a lecture and assembly hall, the Temple Kol Ami, a wedding chapel, a children's nursery, religious school, library and offices. Presenting a closed and straight face to the west, and an open and undulating face to the east, the complex has a total length of 177 metres. These ambitious plans were later revised by the client and as yet only a part of the building to the south has been realised: the lecture and assembly hall – which now serves as the synagogue – as well as two low parallel wings with class-



View of the synagogue from the northeast showing concrete masonry | Main entrance, on the right the passage through to the courtyard, on the left the art garden, walled on three sides, with the synagogue behind it

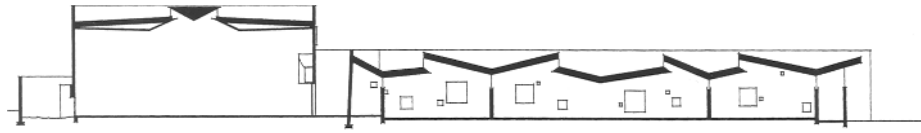


Temple Kol Ami

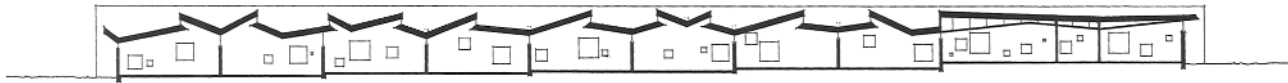
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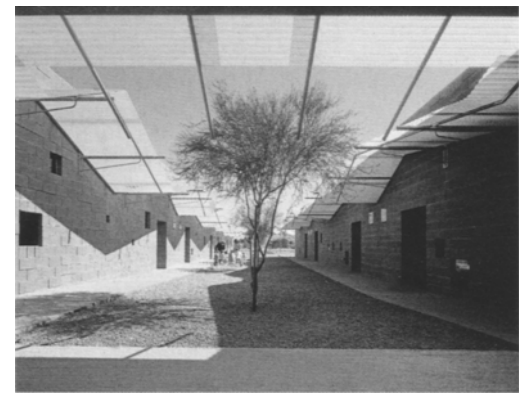
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Cross section



Longitudinal section



Interior of the synagogue, at the rear the recess with cherry-wood Torah shrine | Courtyard with sun canopies and entrances to the classrooms

rooms. Resembling small dwellings but without being kitschy, each of these is accessed via an interior courtyard and protected against the heat of the sun by undulating canopies made of corrugated plexiglass.

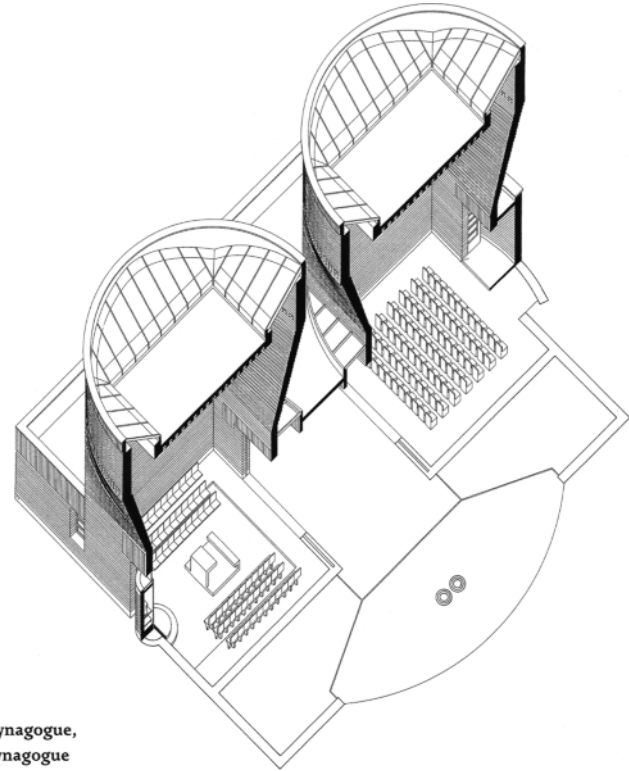
Tilted at an angle of 7 degrees and with a Richard Serra-inspired shallow curve, the east side of the complex presents a fortress-like wall. The 6.7 metre high wall is interrupted only once by a projecting metal plane that marks the point where the shrine containing the Torah rolls stands. The entrance to the synagogue is positioned on one side to the north. The sparse interior is not unlike that of a university lecture hall and is illuminated by a broad strip along the central west-east axis between the two butterfly roofs as well as a band

of windows on the north side. Here one can look out onto an art garden featuring a plethora of desert flora. All buildings are predominantly constructed out of economic building materials, which are cleverly used to great effect. Inside and out, the walls are made of standardised rough concrete blockwork with dimensions of 40.5 by 20.25 by 20.25 centimetres. Laid entirely in stretcher bond, the wall exhibits a subtle relief-like texture: the blockwork has a haphazard appearance, projecting irregularly as if carelessly laid. The granular texture and colour of the masonry – which changes from grey to yellow and from red to brown with the incident light – looks like it were the work of lay-people rather than that of a master's hand.

Although reminiscent of the work of Bruce Goff and Paolo Soleri, the building in Scottsdale is characterised less by its eccentric forms or its aesthetic references to synagogue architecture of the U.S. and Europe, and more by pragmatic and practical considerations. The Temple Kol Ami serves as a “bet ha kneset”, a house of assembly, as a “bet ha tefillah”, a house of prayer and as a “bet ha midrash”, a house of study. In short, despite the lack of sacred aura in its interior, it is a synagogue through and through.



Site plan



Axonometric, below left the orthodox synagogue, top right the conservative and reform synagogue



View from the north | View from the southeast | View of the orthodox synagogue from north | Masonry skin made of Pietra di Prun stone showing the transition from stepped to vertical brickwork



Cymbalista Synagogue

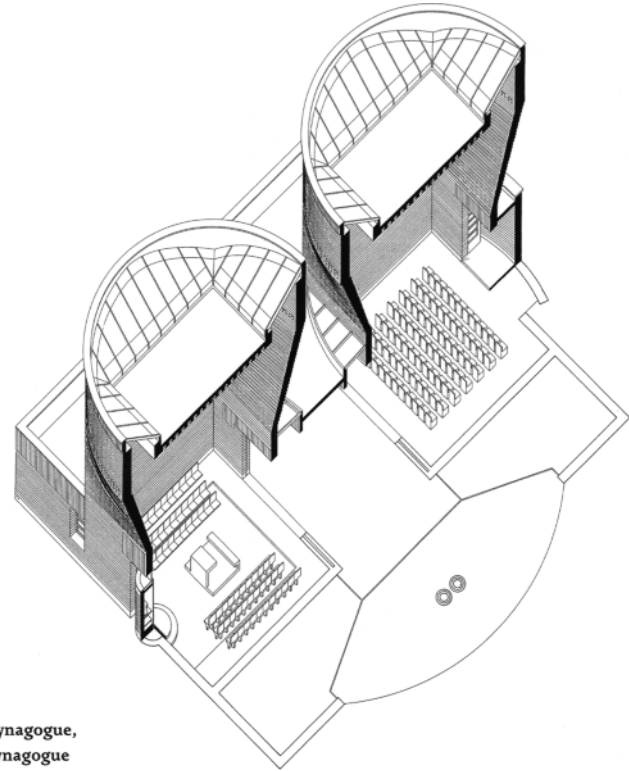
Tel Aviv, Israel

Architect	Mario Botta
Clients	Norbert Cymbalista, Paulette Cymbalista
Completion	1998
Denomination	Orthodox, Conservative, Reform-Judaism
Footprint	800 m ²
Seating capacity	Orthodox synagogue 84, conservative and reform synagogue 120

With nearly 30,000 students, the University of Tel Aviv is probably the largest academic institution in Israel. Surrounded by traffic arteries and featuring a number of buildings of architectural note, the campus is like a city within the city, indeed in parts like a palm-tree island. Towards the end of the nineties, the centre of the complex was developed and expanded, enriching it both aesthetically and symbolically. This improvement is due largely to the contribution of the Swiss benefactors Norbert and Paulette Cymbalista, who were responsible for commissioning the architect to build a synagogue on the university campus. They are likewise responsible for the building becoming built reality and their contribution is recognised in the name of this house of prayer and learning.



Site plan



Axonometric, below left the orthodox synagogue, top right the conservative and reform synagogue



View from the north | View from the southeast | View of the orthodox synagogue from north | Masonry skin made of Pietra di Prun stone showing the transition from stepped to vertical brickwork

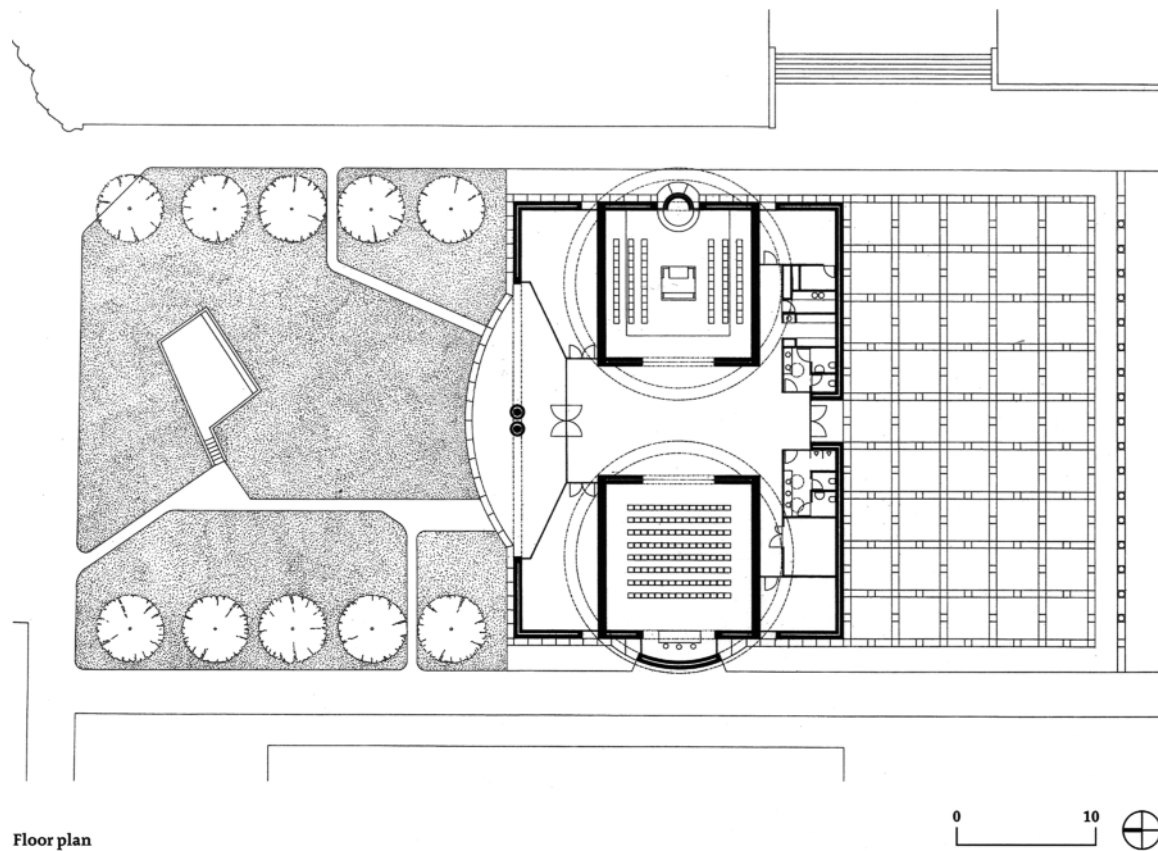


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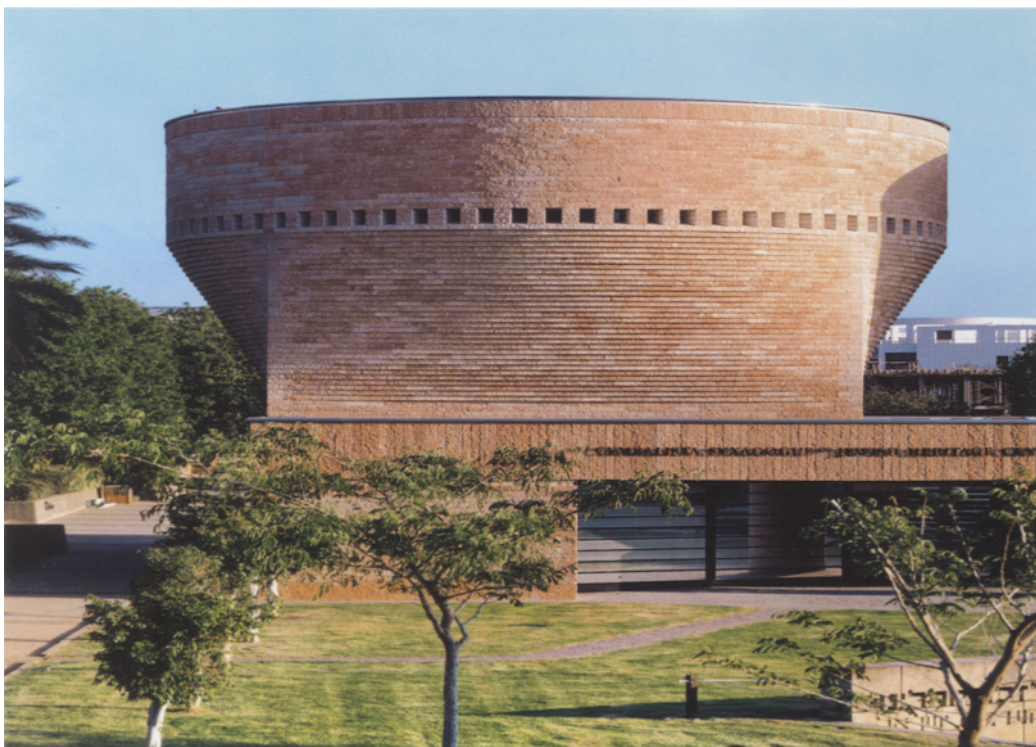
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Floor plan



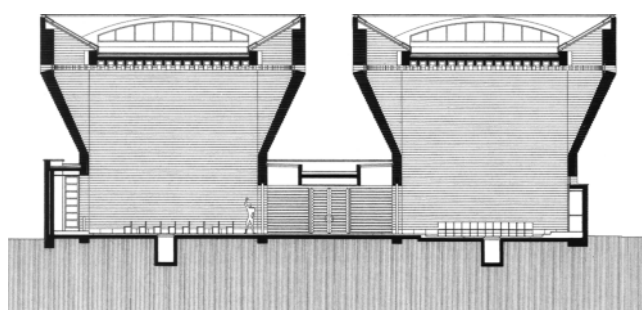
The Cymbalista Synagogue with its 4.6 metre high plinth occupies a rectangular footprint of 31.25 by 23.9 metres. Two large, identical volumes rise out of the low rectangular box of the plinth. Like stumps or towers, they extend outwards and upwards, changing shape in the process. The structure and the skin of the stumps were constructed in one and the same process. The inner skin made of reinforced concrete had to be crafted finely – reflecting the slow and continual transition of the towers from a cube to a cylinder – so that it fits the outer skin, made of Pietra di Prun, as precisely as possible. This fossil-rich limestone from Veneto alternates in colour between white-red and white-brown and its unusual strength was valued in ancient times for the construction of Romanesque

basilica such as the Basilica San Zeno Maggiore in Verona. In Tel Aviv, each course of the long stone blockwork cantilevers outwards, softening the transition between the rigorous geometric forms of the volumes.

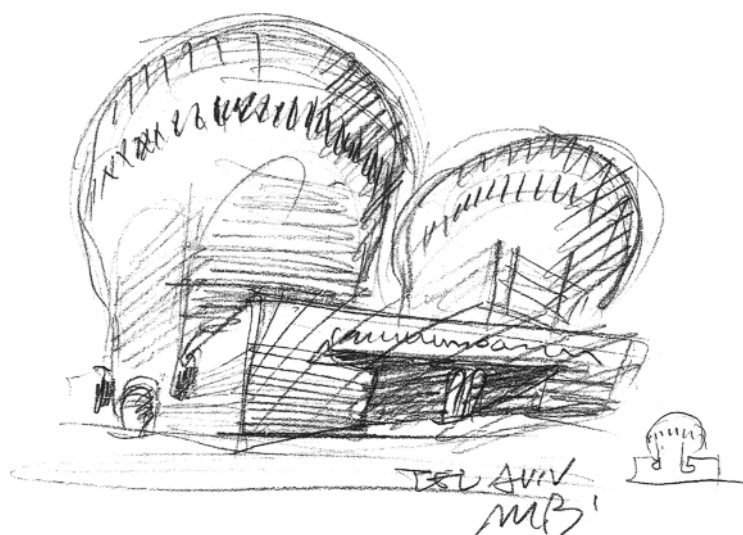
The entrances are located directly in the centre of the long sides of the synagogue's plinth. The entrance to the north is marked by two white round pillars, which commemorate Jachin and Boaz and refer to the bronze pillars in front of the Temple of Solomon. They identify the north façade as the main face of the building. One enters into a narrow but deep entrance hall which opens onto a hall on the left and one on the right, each 48 square metres in size. The hall on the east is a museum with a collection of Judaica, the hall to the west a

library with writings relating to the Torah and Talmud. Following the curve beyond the two small halls, one reaches two larger halls. The correspondence between the former and the latter is functional; the orthodox synagogue lies behind the museum, the synagogue for conservative and reformed Jewish ceremonies lies behind the library.

The interiors of the concrete structure in the two large rooms are clad with Pietra Dorata sandstone from Tuscany. The matt beige and distinct vein of the soft stone contrasts markedly with the black granite of the floor. At floor level, each of the rooms is 10.5 metres long and wide. Together with the ceiling – its timber coffered structure is suspended at a height of 10.5 metres –



Longitudinal section with view from the south



Design sketch



Entrance hall seen from the south, to the right the orthodox synagogue | The orthodox synagogue, in the foreground the bimah, in the background the Torah shrine with Alabaster surround, all furniture designed by the architect



these dimensions would describe the outline of a pure cube were it not for the fact that the walls widen outwards as they rise, changing shape so that above the height of the ceiling and a row of small windows the square has transformed into a cylinder. In the resulting space between the edges of the square ceiling and the circular perimeter of the external walls, daylight falls through four inclined glazed segments shedding sharp strips and sweeping curves of light across the Pietra Dorata walls.

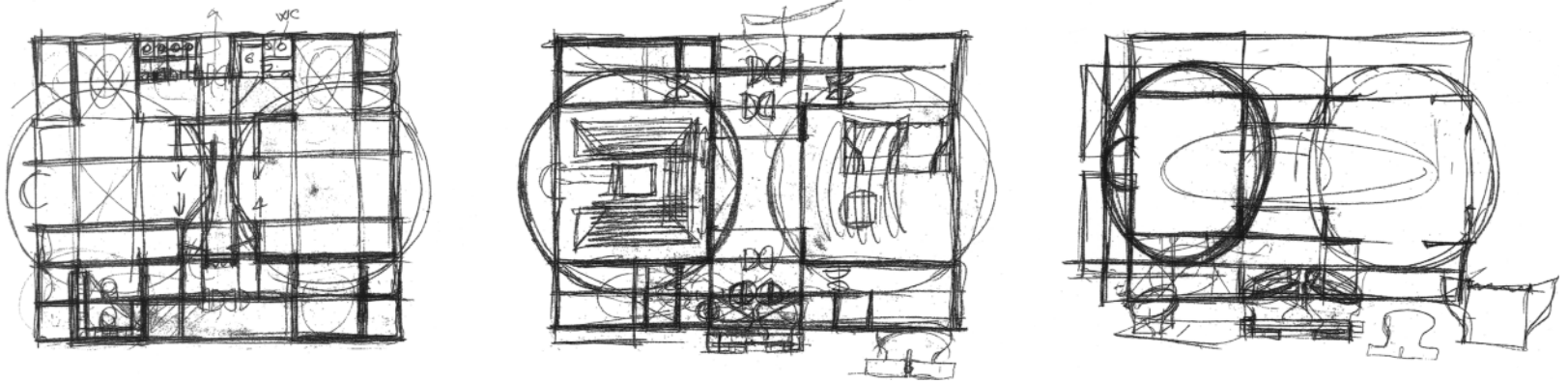
The orthodox synagogue follows the spatial arrangement of the Sephardi tradition. The shrine for the Torah lies in the centre of the east wall, framed by a surround of translucent alabaster from Pakistan. The

bimah is positioned in front, a little way into the room. Benches are arranged to the left and right of the pulpit and the congregation sees the Torah rolls from the side. To avoid disrupting the unity of the space and its birch furnishings, there is no gallery. The separation of men's and women's seating area is nevertheless fulfilled – the women sit slightly raised at the rear, the men lower down at the front. The areas are separated from one another by a metal balustrade.

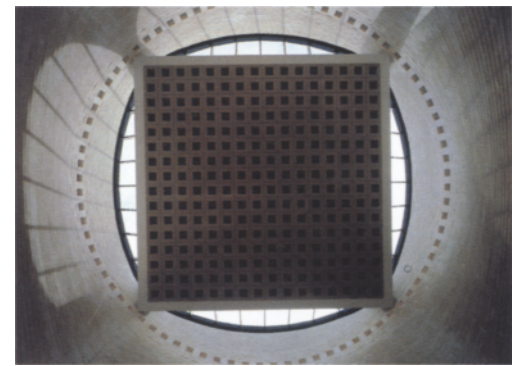
The synagogue for conservative and reformed Jewish ceremonies is an auditorium that the University of Tel Aviv also uses for conferences and lectures. A podium and apse are located in the centre of the west wall and naturally illuminated from the left and right. The mo-

bile seating, with the name "Laleggera" has been designed by Ricardo Blumer. For Jewish services a Torah shrine is wheeled into the room on rollers.

Given the fact that the Jewish culture is primarily one of the word, many synagogue designs in the nineties have attempted to derive their form from language and the book. The synagogue in Tel Aviv eschews such references. The architect chose instead to pursue his ongoing interest in a reduced and expressive geometry. His preoccupation with the relationship between square and circle, cube and cylinder is evident in much of his work – for example his early villas in Ticino. Notable earlier sacred works include the Parish church of the Blessed Odorico of Pordenone completed in 1992



Design sketches

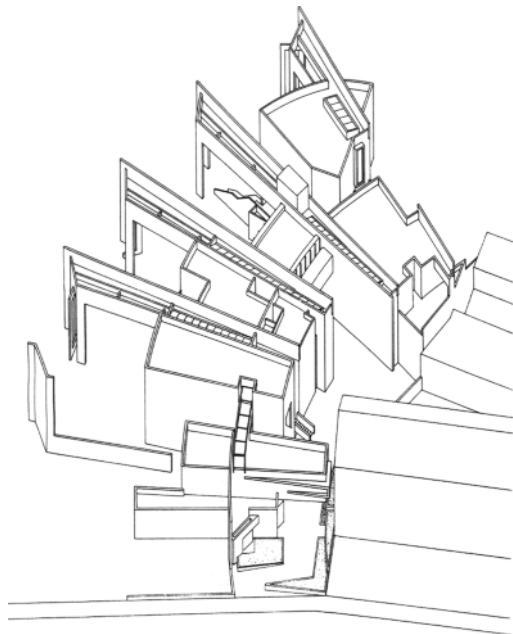


The conservative and reform synagogue with seating designed by Ricardo Blumer | Underside of the suspended ceiling with acoustic coffered recesses filled with wood wool

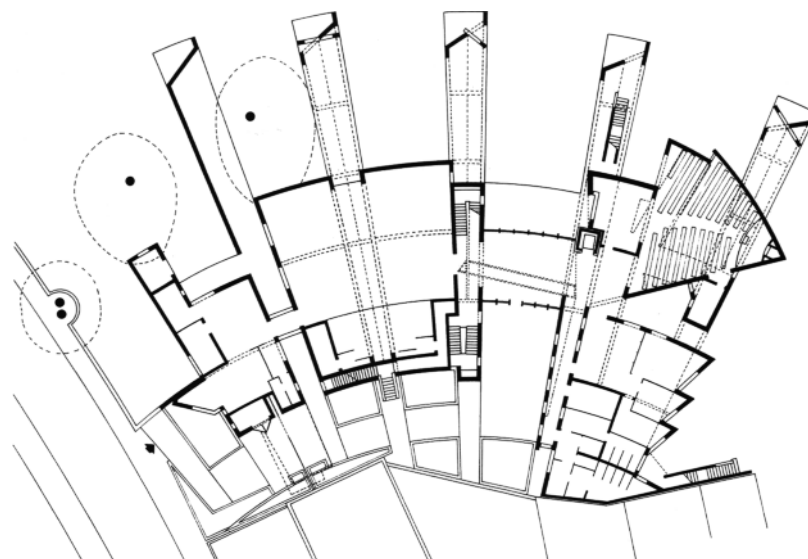
and Parish of San Pietro Apostolo in Sartirana from 1995. In both of these churches, the main space has a circular plan enclosed within a surrounding square of more or less equal dimensions. In the Cymbalista Synagogue, however, the transition between the two figures is more harmonious and rigorous than ever before. In addition, the Cymbalista Synagogue bears a similarity to Louis I. Kahn's project for the Hurva Synagogue in Jerusalem. In both projects, wall, opening and light serve the same single purpose: the spatial experience of the spiritual and the monumental.

Although the architect values the "intrinsic qualities" of his architecture on the green campus more than its symbolism, he has nevertheless created a kind of me-

morial for the Swiss benefactors' political and cultural programme. With the synagogue, Norbert and Paulette Cymbalista wanted to contribute towards reconciling divisions in Israel's society, on the one hand into religious and laicist sections and on the other between different movements within Judaism. In this respect the building is a signal. The synagogue can be read as both one or two buildings. Does it, or do they, not reflect the unity and the dualism of prayer and learning, of faith and knowledge, of religion and laicism? One way or the other, after nearly four decades of mediocrity, the Cymbalista Synagogue at the University of Tel Aviv represents the first Jewish house of prayer and learning on Israeli territory, whose architecture has achieved international recognition.



Axonometric projection, at the bottom the entrance from the "Springwall"



Ground floor plan



Site plan | View from the northeast with offices and classrooms on the left, in the middle the synagogue, on the right the series of portals | Entrance from the courtyard, in front of the glazed entrance a bridge connects the rabbi's flat with the classrooms | Entrance hall | Synagogue with the women's gallery on the right

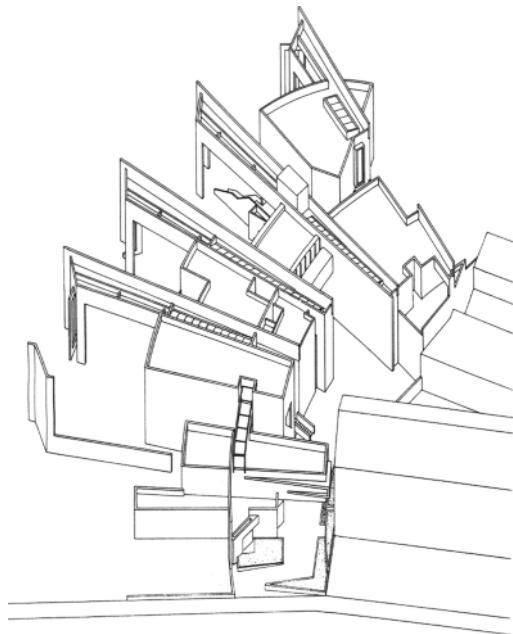


Duisburg Jewish Community Centre

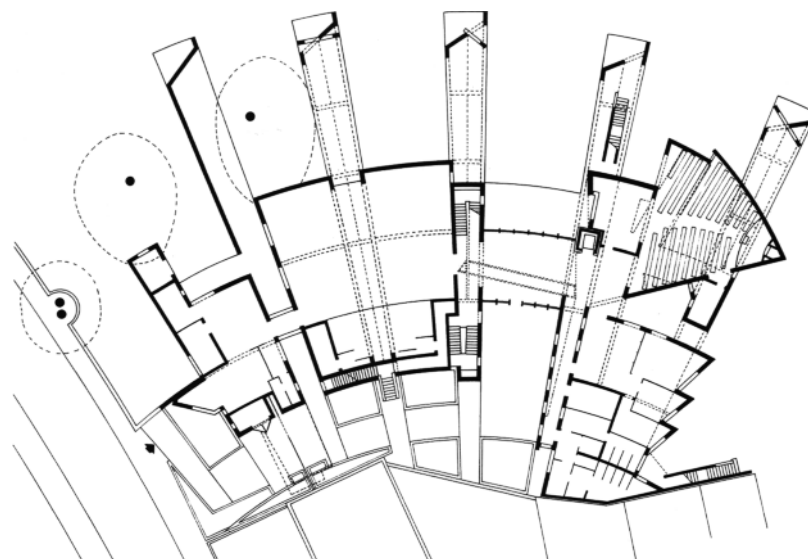
Duisburg, Germany

Architect	Zvi Hecker
Client	Duisburg Jewish Congregation, Mülheim an der Ruhr and Oberhausen
Completion	1999
Denomination	Unified Judaism
Footprint	Total 2650 m ² , synagogue 132 m ²
Seating capacity	Main 150, gallery 100

For those acquainted with the history of urban development, the name "Springwall" – the address of the Jewish Congregation – already provides a clue to the location of the community centre. The building is situated on the northeastern edge of the old town of Duisburg. Along a road once occupied by the city wall, the building extends a row of plain houses before fanning out in a broad arc from west to east. Its plan is the shape of a segment of a circle – between an eighth and a quarter of a circle – and points towards an artificially created park from which the view extends northwards out over a canal and the inner harbour. One can imagine the development of the design: the first step involved a series of semicircular arcs and radii with a common centre point. In the second step, contours were added to



Axonometric projection, at the bottom the entrance from the "Springwall"



Ground floor plan



Site plan | View from the northeast with offices and classrooms on the left, in the middle the synagogue, on the right the series of portals | Entrance from the courtyard, in front of the glazed entrance a bridge connects the rabbi's flat with the classrooms | Entrance hall | Synagogue with the women's gallery on the right

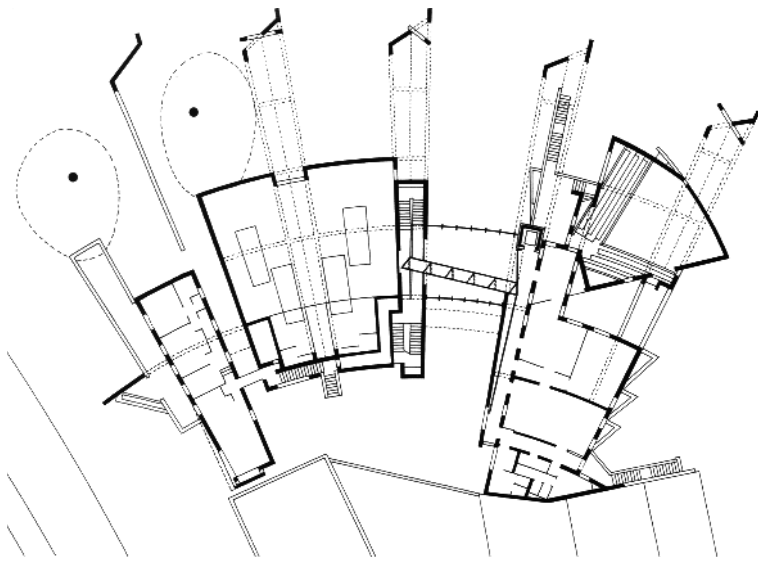


Duisburg Jewish Community Centre

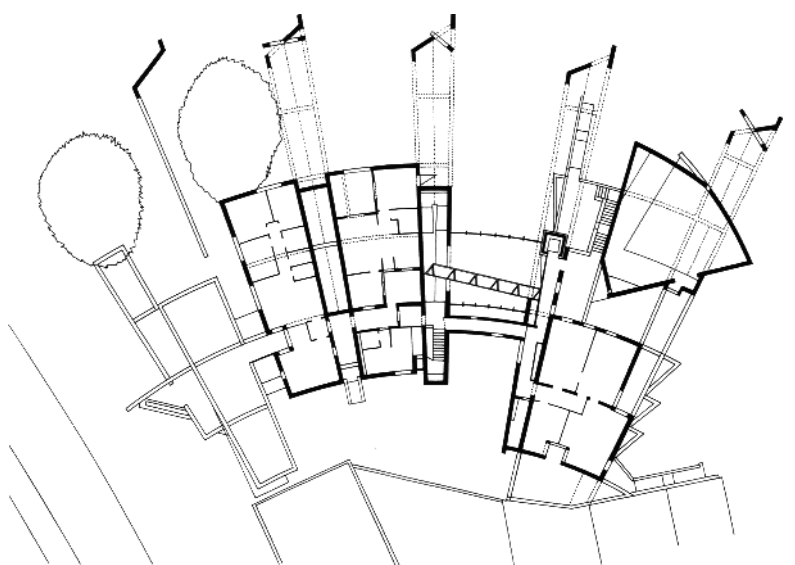
Duisburg, Germany

Architect	Zvi Hecker
Client	Duisburg Jewish Congregation, Mülheim an der Ruhr and Oberhausen
Completion	1999
Denomination	Unified Judaism
Footprint	Total 2650 m ² , synagogue 132 m ²
Seating capacity	Main 150, gallery 100

For those acquainted with the history of urban development, the name "Springwall" – the address of the Jewish Congregation – already provides a clue to the location of the community centre. The building is situated on the northeastern edge of the old town of Duisburg. Along a road once occupied by the city wall, the building extends a row of plain houses before fanning out in a broad arc from west to east. Its plan is the shape of a segment of a circle – between an eighth and a quarter of a circle – and points towards an artificially created park from which the view extends northwards out over a canal and the inner harbour. One can imagine the development of the design: the first step involved a series of semicircular arcs and radii with a common centre point. In the second step, contours were added to



First floor plan



Second floor plan



the radii and sectors. In the third, a structure of five portals radiating outwards were drawn, four of which took the form of double-walled concrete slabs or frames, with rendered buildings spanning between them. These buildings, together with the ends of two of the portals, define small courtyards. The synagogue faces due east, the pointed end of its wedge shape extending into the park. The synagogue as the centre of the centre is emphasised by black slate cladding, a stark contrast to the concrete and plaster employed elsewhere.

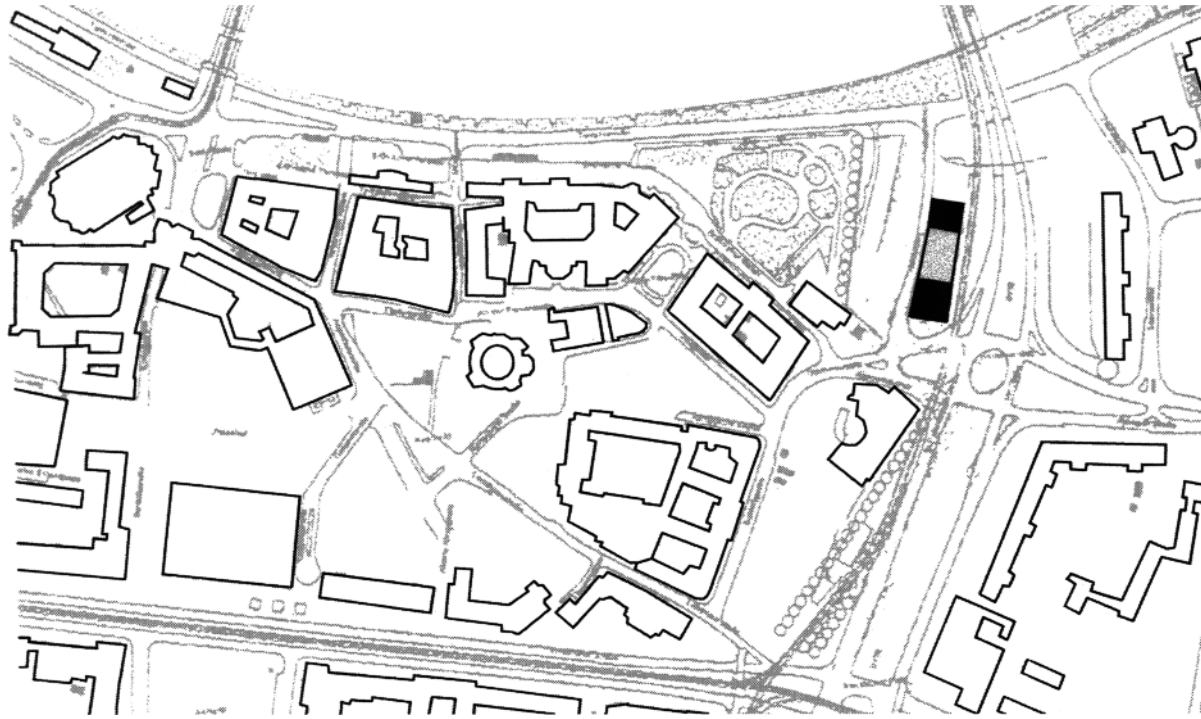
The building's chaotic appearance is only momentary. In reality it is transparent, permeable and continuous. The radiating portals serve as circulation. The spaces between the fanning walls accommodate a series

of functions: a multi-purpose hall and kitchen on the ground level between the first and third portals, with two flats above; between the third and fourth portals, the entrance hall with glazed façades to the north and south; between the fourth and fifth portal, the synagogue and the offices and classrooms.

Arriving from the "Springwall", the entrance leads beneath a cantilevered building, the caretaker's dwelling, into a courtyard and the entrance hall. The doors of the synagogue open to the right. The bright white space, illuminated from above and from the side, has seats made of maple and tapers towards the rear. The platform and its sacred objects are clad in a stone imported from Jerusalem. Sometimes red, sometimes brown, the

slabs have a haphazard irregular and rough-hewn form. The two towers to the left and right of the Torah look as if they had been made by Cyclops from the Levant. The archaic or even primitive appearance is intentional.

As with the architect's other buildings, the Jewish Community Centre unites the often paradoxical qualities of the rational with the contextual and the metaphorical to form a beautiful whole. The plan of the building resembles an open book or an open hand. The Hebrew word for "hand" is also the Hebrew word for "memory". While the park with its ruins and relicts calls to mind the age of industrialisation, the Jewish Community Centre in Duisburg is more than just a memorial. It provides a place for Judaism to thrive.



Site plan, far left the Hofkirche, left of centre the Frauenkirche



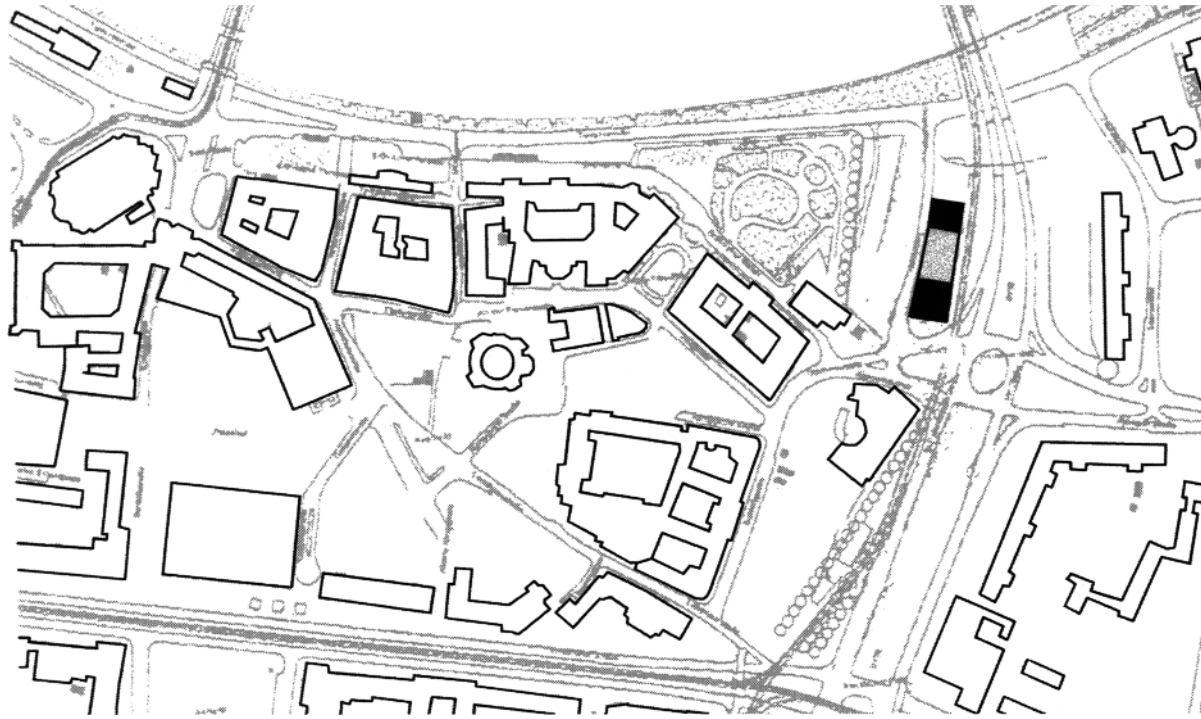
Dresden Synagogue

Dresden, Germany

Architects	Hubertus Wandel, Andrea Wandel, Rena Wandel-Hoefler, Andreas Hoefler, Wolfgang Lorch, Nikolaus Hirsch
Client	Dresden Jewish Congregation
Completion	2001
Denomination	Liberal Judaism
Footprint	Total 1286 m ² , synagogue 624 m ²
Seating capacity	Main 736, gallery 60

To fulfil its role as a mediator between the baroque Brühl Terrace to the west and the slab blocks from GDR times to the east, the site had to establish a clear division between the “good” urban grain of the older buildings and the “poor” urban grain of the more modern buildings whilst simultaneously respecting the lie of the existing structures. The long narrow site – 110 metres long in a north-south direction and 26 metres wide – nevertheless opens more to the west than the east, a traffic artery cutting through the urban structure on the east towards the river Elbe.

Between the volumes of the synagogue and the community centre, which are located at either end of the site, lies a courtyard. On this raised plateau, 16 plane



Site plan, far left the Hofkirche, left of centre the Frauenkirche



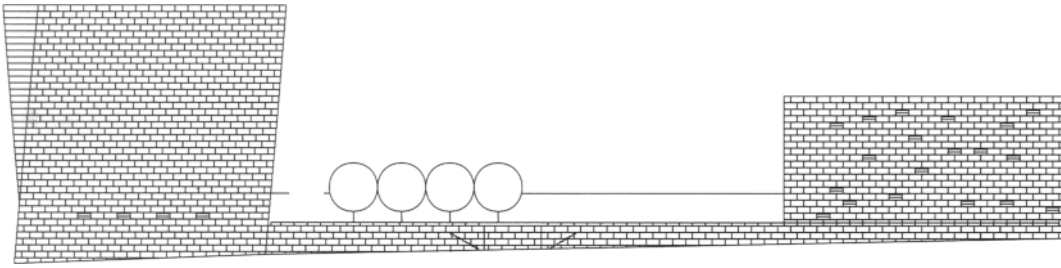
Dresden Synagogue

Dresden, Germany

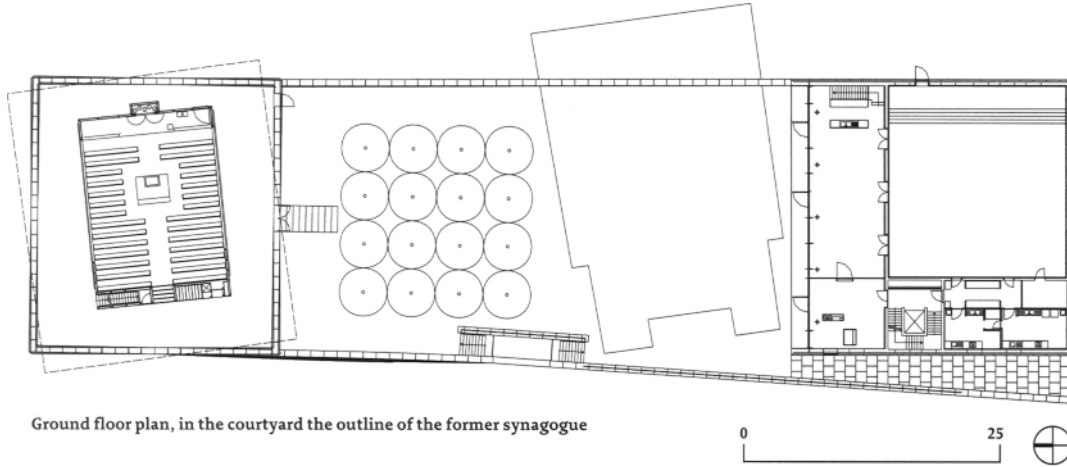
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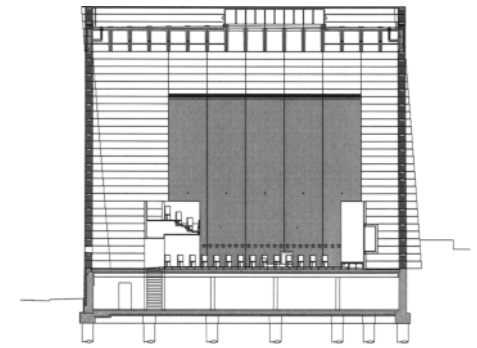
Between the volumes of the synagogue and the community centre, which are located at either end of the site, lies a courtyard. On this raised plateau, 16 plane



West elevation



Ground floor plan, in the courtyard the outline of the former synagogue



West-east section through the synagogue, in the centre the inner sanctuary within the synagogue walls



View from the southwest, synagogue on the left, community centre on the right | View from the north, in the foreground the 40 layers of twisting blockwork, at the rear the courtyard façade of the administrative, community and school building | View of the inner sanctuary within the synagogue walls with the bimah in the centre in front of the wooden Torah shrine and organ | Space between the external walls and the internal brass curtain with the horizontal oak panelling visible on the right

trees are arranged in a square – at once an extension of the Brühl Terrace and a place for celebrating Sukkot, the feast of Tabernacles, which takes place in autumn. Here, an area of coarsely crushed glass marks the footprint of the old synagogue built by Gottfried Semper in the sand. Both the larger more introverted synagogue and the smaller more extroverted community centre are clad in the same material: 120 by 60 by 60 centimetre blocks made of a composite of cement, limestone, sand, quartz and yellow pigment. This artificial stone resembles the traditional Elbe sandstone but does not darken as markedly. The dimensions of the new synagogue – 26 by 24 by 24 metres – give it the appearance of a cube. In actual fact, the walls twist outwards and inwards. Each course of blockwork – each rectangular in

shape – is rotated slightly layer for layer until the uppermost layer faces due east. This torsion is also evident from inside as the walls are not covered and the services are concealed in channels within the blockwork.

In the centre of the austere space stands a large rectangular insertion clad in horizontal panels of oiled oak. At its shorter west face, this house-inside-a-house serves as a gallery, at the east end it contains the Torah shrine and an organ. The pews are arranged around the bimah, which is illuminated from above by a coffered roof-light in the concrete ceiling. Suspended from the roof from cables are steel rods which bear a veil-like curtain that reaches the floor on the north and south sides.

These partially plain, partially decorated strips – a textile made of brass – have a most ceremonious character, defining a space within the space of the synagogue as if enclosed by a heavenly baldachin.

The interpretation of the spatial qualities of the Jewish ritual from before the Diaspora, and its location at the edge of the old city before and after the Shoah, are its greatest qualities. The external walls of the synagogue refer to the biblical Temple of Solomon, the internal baldachin to the biblical tabernacle. The skewed form of the building, so “perfectly succinct”, strives and falls, leans and topples, as if symbolising the continual resistance and capitulation experienced by the Jewish community over the centuries.

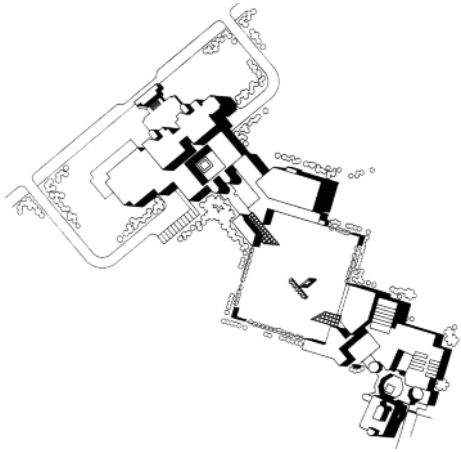
Mosques

Of all the buildings created for the purpose of worship by the Abrahamic religions, the mosque has the most clearly defined structure. If one leaves aside historical and regional differences and its associated social and cultural functions – which often account for the greater proportion of its overall area – the mosque itself is an almost empty space for prayer. Unlike churches or synagogues, the mosque is almost entirely free of primary elements that define its spatial arrangement. The only determinants that should be realised in any design are the qibla wall and mihrab, the main wall that faces towards Mecca and the niche located in the centre of this wall.

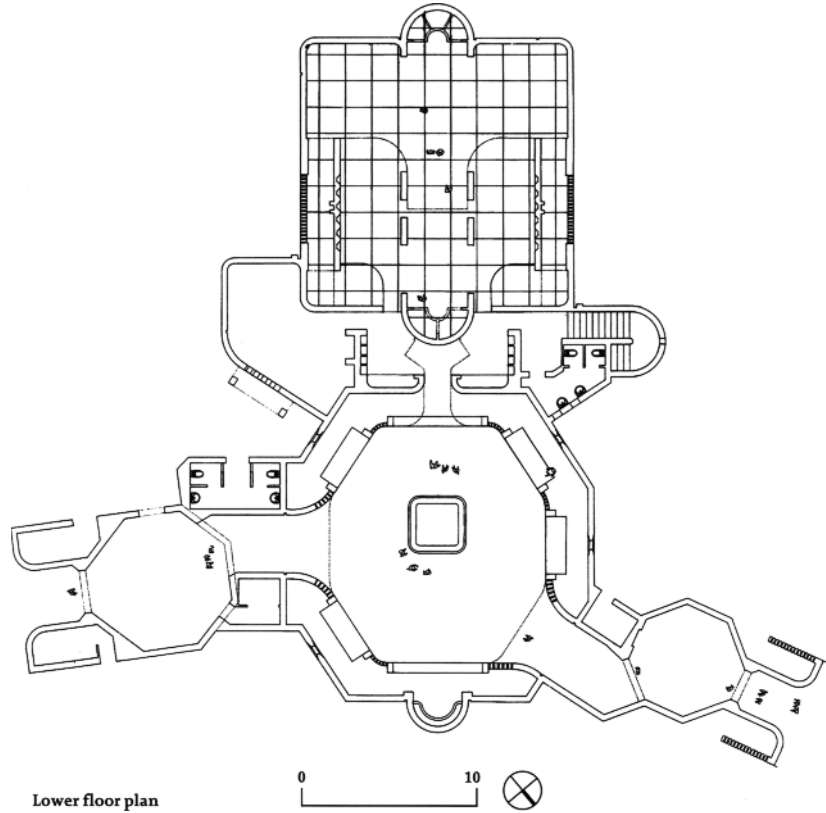
As can be seen in the Bin Madiya Mosque by Alexandros N. Tombazis in Dubai, United Arab Emirates, in many cases a conflict results between the direction of the qibla wall and the surrounding urban network of roads and flight lines. As a result, mosques with an internal space that is rotated diagonally out of the grid with several smaller rooms arranged around its four sides are particularly widespread.

After decades of clandestine existence, mostly in the form of “back-room mosques”, Muslims are now gradually establishing their own roots and home in Europe. It is no coincidence that recent examples of mosque architecture have gone largely unnoticed by the architectural press. In most cases, the Muslim communities wish to see their new mosque resemble forms from the architectural canon of their homelands. The traditional oriental vocabulary is often regarded by western architects as being “historicist”. However, those architects who view the calligraphy and ornamentation on the walls and ceilings of mosques – a product of the Islamic prohibition of figurative representation – purely from a modernist viewpoint fail to appreciate the specific qualities of the Islamic culture.

The eight case studies collected in the following chapter show examples of new mosques that attempt to mediate between the architectural tradition of countries from Morocco to Pakistan and modernist tendencies in countries in Europe and America. A leading example in this respect is the Ismaili Centre in Lisbon, Portugal, by Raj Rewal. Its unity of structure and decoration – in which surface is far more than mere superficial covering – provides an answer to the question of how Islamic architecture could develop in Europe.



Site plan with shadow projections showing the buildings originally planned between the student union and cafeteria to the northwest and the mosque in the southeast



Lower floor plan



View from one of the smaller forecourts through to the fountain in the large forecourt | View of the large forecourt in front of the mosque | The contrast between the brickwork and glazed tiles in the entrance area | View of the mihrab



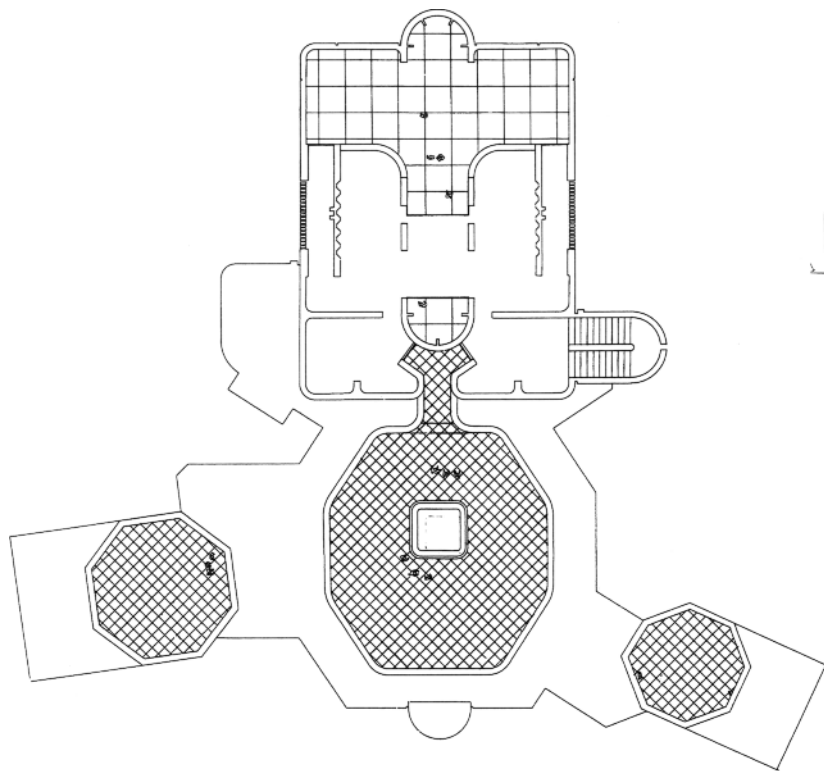
Mosque of Jondishapour University

Ahvas, Iran

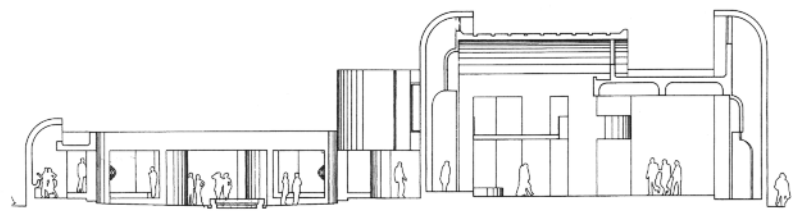
Architect	Kamran T. Diba
Client	Planning and Finance Department of the Imperial Government of Iran, Tehran
Completion	1975
Footprint	ca. 235 m ²
Seating capacity	Main ca. 180, gallery ca. 90

In the capital city of the province of Khusistan in the far west of Iran, a new university was planned for 4000 students at the end of the sixties, a time when Ahvaz was growing rapidly as a result of its new-found oil reserves. A large part of the campus lies on an arid level site either side of a narrow pedestrianised walkway. Like a backbone, it traverses the site from the north-west to the southeast, before turning eastwards alongside a water channel. The path begins from a building that contains the student union and cafeteria and ends at a sports hall. The mosque is positioned directly at the bend in the path.

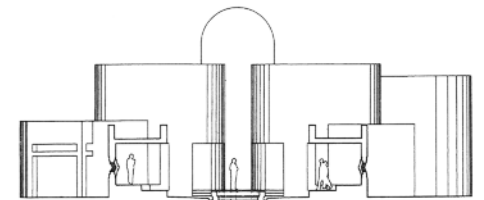
Regardless of whether one arrives from one or the other end of the path, one must first of all pass through



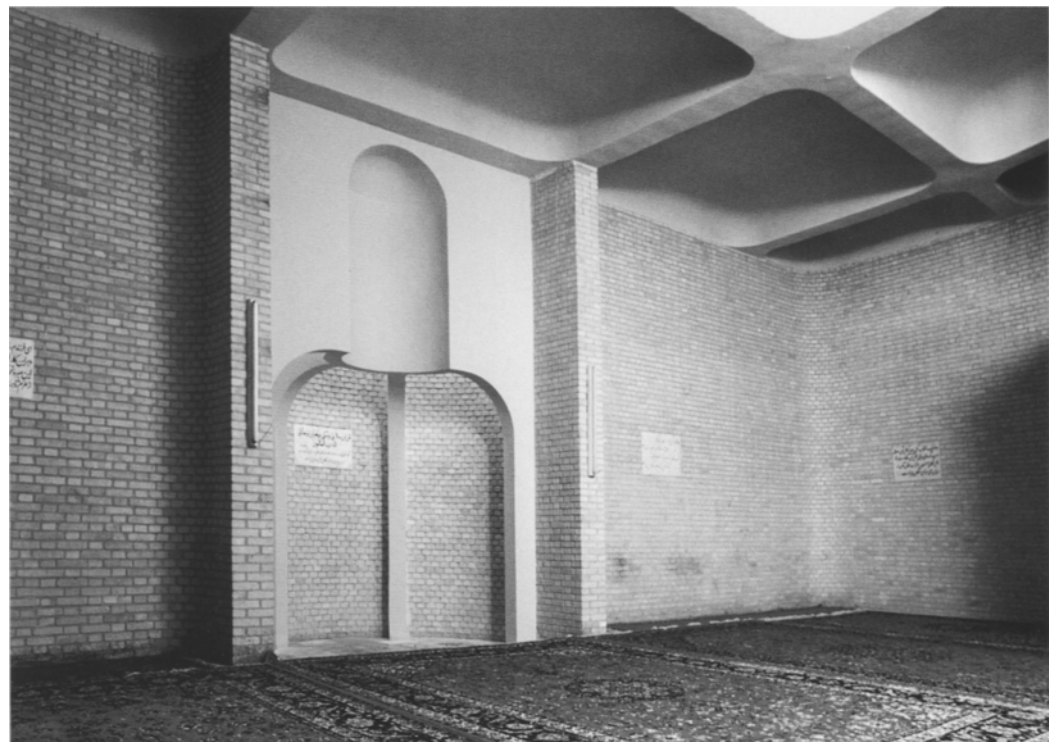
Upper floor plan



Longitudinal section



Cross section



a small and then a larger forecourt, each of which has an octagonal plan. The larger octagon, whose centre is marked by a fountain, is surrounded on all sides by arcades with recessed seating and “peepholes” in its rear walls. Although the mosque itself is comparatively small, its entrance is no less monumental. The contrast between the wheat-coloured brickwork and the aquamarine turquoise of the glazed tiles signals its function. The curvature of the walls draws the visitor towards a half-rounded surface, which in turn leads the visitor to the left or right, passing either the door to the reading room on one side or the door to the stair on the other, before proceeding on into the prayer hall.

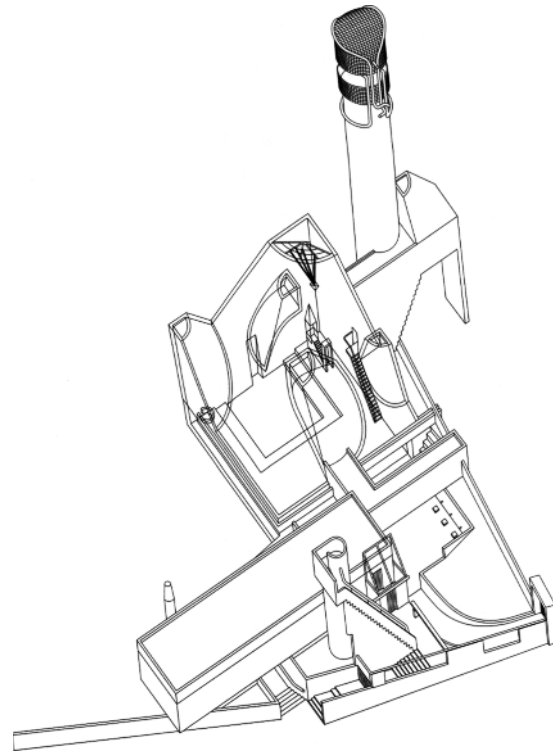
The prayer hall, with a floor plan of 15 by 15 metres has no clear geometric orientation. The entrance and the mihrab on the opposite wall, through which subdued natural light falls into the room, form a central axis, which is further emphasised by a division in the women’s galleries and the half barrel vault above it. The rest of the ceiling of the mosque is coffered.

The symmetry of the building lends it a characteristic, almost inescapable spatial order: the octagon of the forecourts leading on into the square of the prayer hall. Elements that do not fit into this clear order – the reading room and staircase – are arranged in such a way that they are barely perceived either from inside or from outside. As if echoing modernist princi-

ples, the building eschews the populist attraction of typology and tradition. Although the architect does not provide a place for the Muezzin to fulfil his ritual, or a wall for the calligrapher to embellish, his intention was nevertheless to provide a “friendly, uplifting mosque” that promoted communication among its users. To this end, he drew on the traditional close relationship between mosque and bazaar that is common in Iran. Although the mosque’s three courtyards are not actually used for a market, they act as a hinge between the two main axes of the path that runs through the centre of the campus, serving as a stopover in the coming and going of the students and generally as a means of “intensifying interaction”.



Site plan



Axonometric



Sherefudin's White Mosque

Visoko, Bosnia-Herzegovina

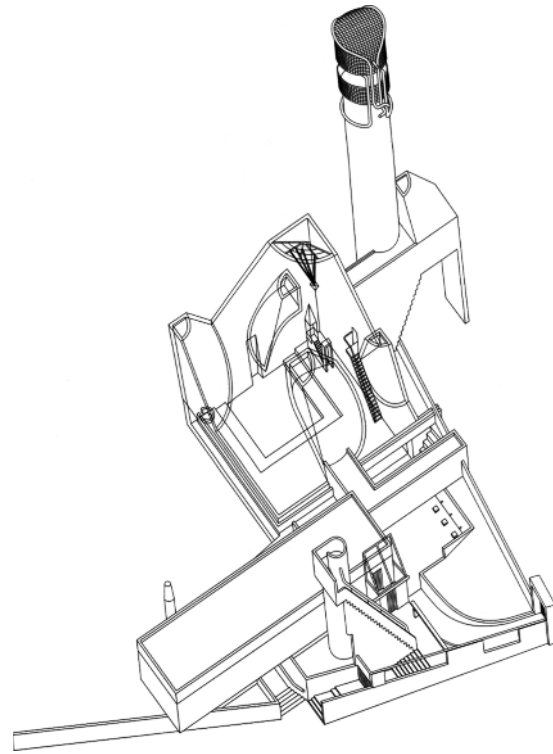
Architect	Zlatko Ugljen
Client	Muslim Community of Visoko
Completion	1980
Footprint	Entire building 435 m ² , mosque 169 m ²
Seating capacity	ca. 300

Visoko lies on the banks of the Fojnica and Bosna rivers. Together with the neighbouring villages, the local community numbers some 45,000 inhabitants. That such a small town can be the home to a mosque of this size – and moreover, such a radically modern mosque – should wonder only those whose view of Europe is limited to the “Christian West” in which the influence of Muslim architecture is to be seen only in the Moorish palaces in southern Spain. In reality the culture of Islam influenced Europe for hundreds of years, not only in the southwest but also in southeastern Europe.

Like the rest of Bosnia, Visoko was part of the Ottoman Empire from 1463 to 1878. During this period its rulers established the spatial distribution of municipalities.



Site plan



Axonometric



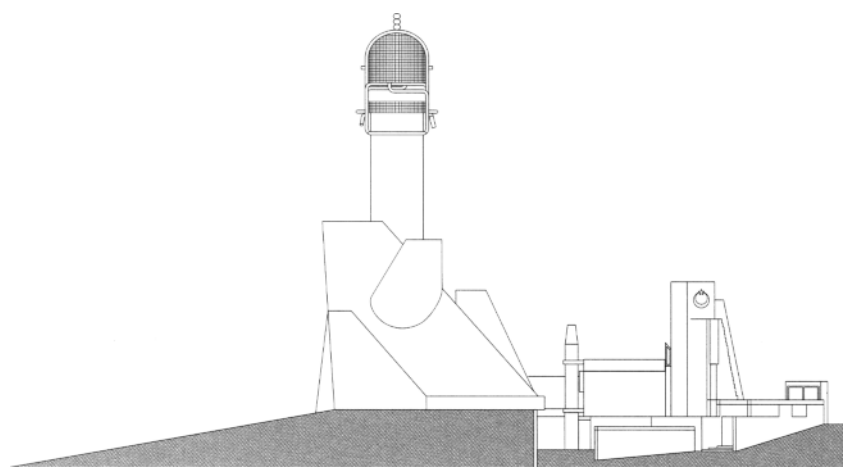
Sherefudin's White Mosque

Visoko, Bosnia-Herzegovina

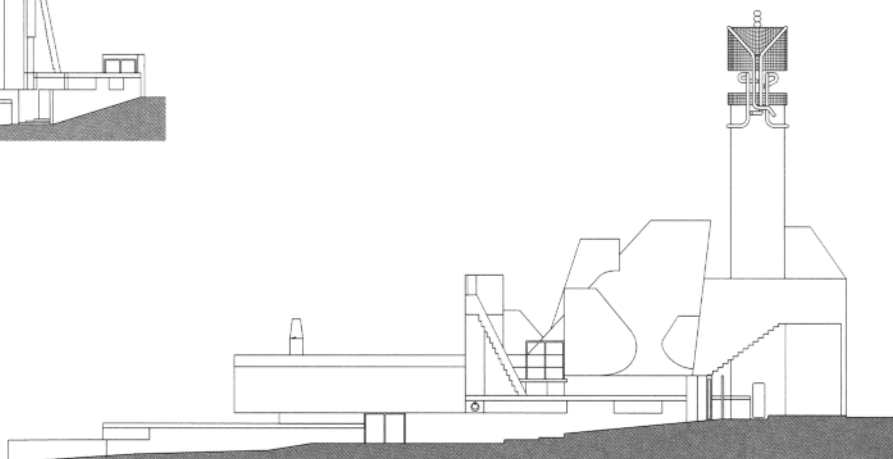
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Northeast elevation



Northwest elevation



Sherefudin's White Mosque in the midst of the town | The mosque from the southeast, in the foreground the cemetery | The mosque from northwest, in the foreground the forecourt and the entrance | Smaller minaret behind the entrance to the annexe

In the 20th century, too, during socialist Yugoslavia, the city remained true to its identity and its history. In this one town there were a total of seven mosques. Of these, Sherefudin's Mosque was by far the largest. The wooden building was used for Friday Prayers until its community outgrew it. Thanks to a degree of goodwill on the part of the state, in 1967 the Muslim community decided to build a new mosque on the same site.

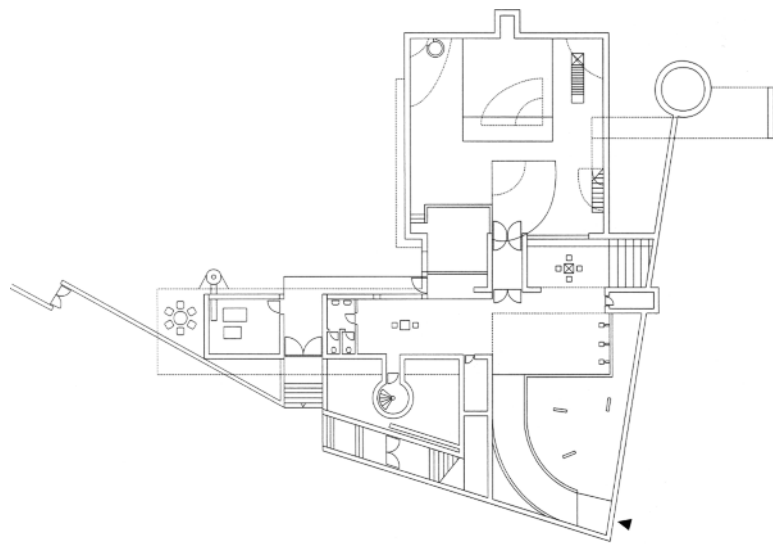
The mosque stands on a triangular site with sides of roughly equal length. To the southwest and southeast it is surrounded by low dwellings with shops and workshops, all with red pitched roofs. While at the back the cemetery with its grass and grave posts separates the building from the houses, at the front the building is

both set back and cut into the ground. The prayer hall itself is shaped like a quarter pyramid, the two minarets are both cylindrical and the annexe containing community and administration spaces is rectangular.

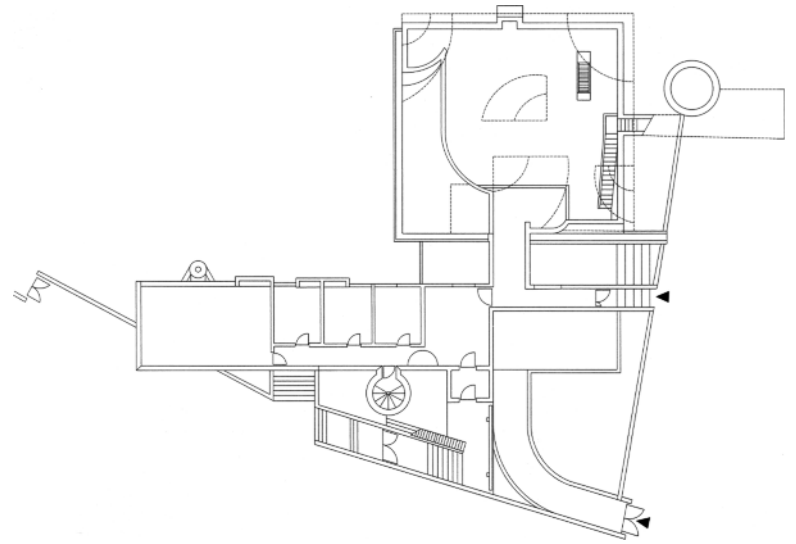
One reaches the mosque from the east edge of a market place. Without this open space, the building would not have such a strong presence in the dense network of streets. A path turns a quarter circle leading down past a grassy forecourt. The use of travertine on the floor and walls of the courtyard and white render for the in-situ concrete structure of the prayer hall serves two intentions: on the one hand the contrast between brown and white separates the lower and upper levels of the building, on the other it signifies a differentia-

tion between the earthly and heavenly for the believers. The chthonic and the celestial are closely interconnected, as the courtyard – whose fountain for ablutions has four spouts for men and women – and prayer hall are connected via a full-height, transparent glass pane without frame or mullions, a most unique gesture not seen in other mosques.

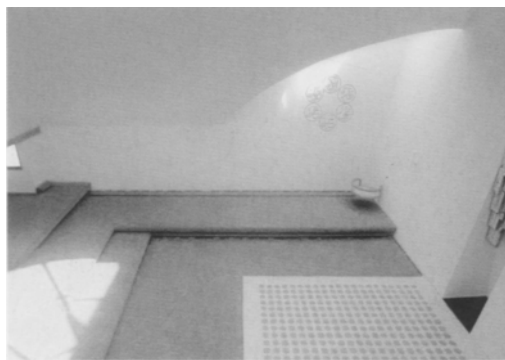
By arranging the prayer hall below ground level, the hall is less susceptible to noise from outside and to the extreme heat or cold that is not uncommon in Bosnia. The entrance and wind lobby lie on axis with the path that leads towards the niche, which points in the direction of Mecca. The floor of the mosque is square with an edge length of 13 metres; the area on which the men



Lower floor plan



Upper floor plan



sit and pray is carpeted light green. Stylised wooden “muquarnas”, stalactite-like elements which have been a traditional element in Islamic architecture since the 11th century, hang from the lintel of the narrow mihrab. The tall minbar stands to the right of the niche, the prayer leader’s chair crowned by a small baldachin. Both the mihrab and minbar have a reassuring vernacular quality, almost folkloristic, which is also evident in the delicate decoration around the fountain.

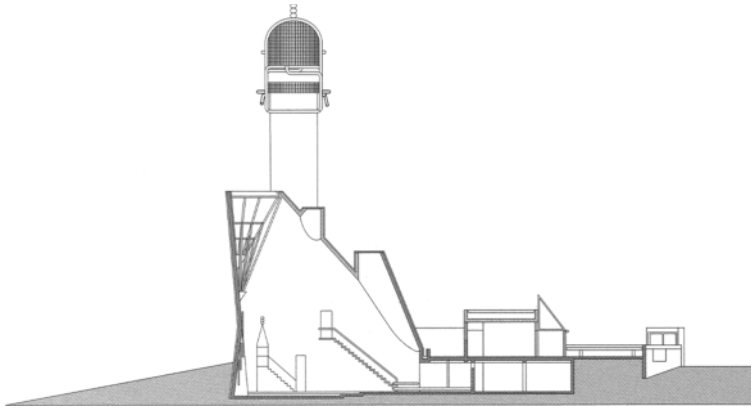
At the front of the room, the height of the plain white walls sinks to half the overall height of the space, at the rear to two-thirds thereof, intersecting with five sometimes smaller sometimes larger cupola-like skylights. The right angle that results where the latter

meet the ceiling are deliberately aligned with important parts of the sacred enclosure, for example, the central axis from the portal to the qibla. The five “cupola” – a permanent reminder of the five daily prayers and five most important commandments of Islam – are so close to one another that the ceiling appears to sway and surge. Thrusting upwards, the slope of the ceiling reaches a maximum height of 15.8 metres inside, 13 metres outside, on its south corner.

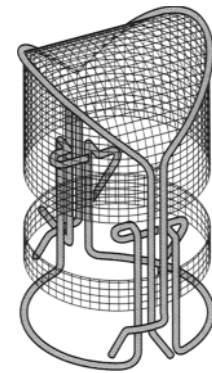
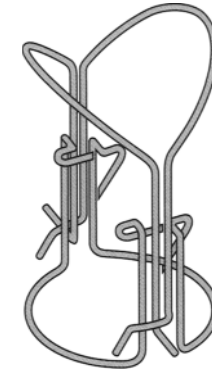
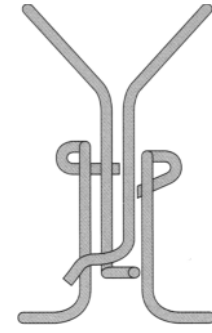
The annexe on the left-hand side of the forecourt has two storeys: a passageway below passes through to the cemetery; above it lies the entrance to the women’s gallery from which one can see the mihrab and minbar. The small minaret stands in front of the annexe

and encloses a spiral staircase that connects the lower floor with the upper floor. The Muezzin accesses the large minaret through the prayer hall. From inside the prayer hall a narrow stair ascends next to the minbar and leads to a room for meditation and contemplation and from there on to the minaret. With a total height of 26 metres, the cylinder of the minaret rises high above the houses and streets of Visoko below. The spire resembles a steel hood. Tubular green pipes surround its gridded screen shaped in the form of calligraphic Kufic characters that spell out the name of Allah across the roofs.

The prayer hall’s form, a quarter segment of a pyramid, derives from the form of earlier Bosnian mosques from



Southeast-northwest section



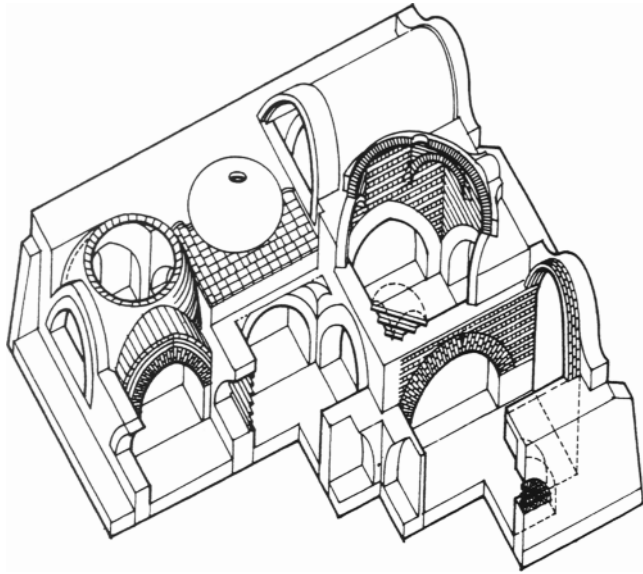
Detail of the 6.3 metre high spire



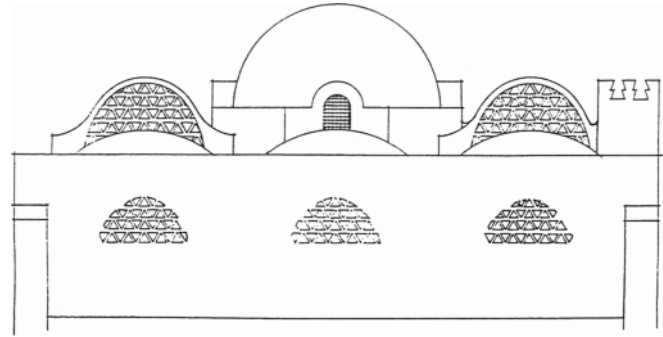
Mosque forecourt seen from the prayer hall | The zone in front of the mihrab and one of the five quarter-circle skylights | Prayer hall | Dome with a view of the highest point in the ceiling, on the right the stair to the room for meditation and contemplation

the era of the Ottoman Empire and from the shape of the nearby mountain Visocica. Despite these specific regional influences, Sherefudin's White Mosque, the design of which was completed much earlier in spring 1970, is an utterly modern example of sacred architecture. Clearly the building owes much to Le Corbusier, whose work the young architect grew to appreciate in his studies with his teacher Juraj Neidhardt. An even stronger parallel, particularly with regard to the broad and high sweep of its roof, seems to be a similarity with Alvar Aalto's churches. The use of stone, plaster and metal as well as the colour combination of brown, white and green reminiscent of some of James Stirling's details, presents historians with a conundrum. Sherefudin's White Mosque remains a singular attrac-

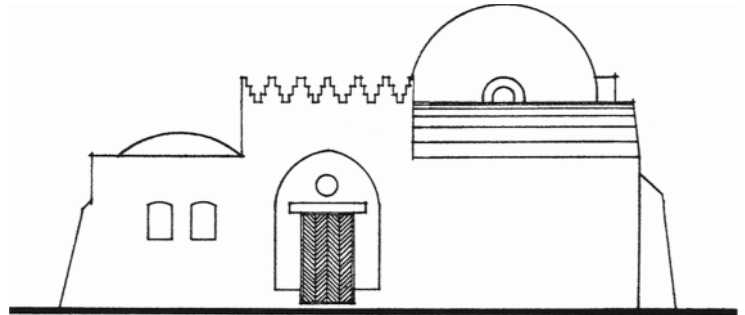
tion. The complexity of its architecture is unparalleled by late 20th century buildings designed elsewhere in Europe for Muslims. Were it not for the fact that the architect was awarded the Aga Khan Award for Architecture in 1983, the building would most probably have been forgotten: partly because, in the then socialist Yugoslavia, it lay off the beaten track and partly because its indebtedness to modernist heroes did not reflect what was fashionable in the eighties. Today, it is time that Sherefudin's White Mosque is accorded the recognition it should long have had as an exemplary piece of modern Islamic architecture.



Axonometric



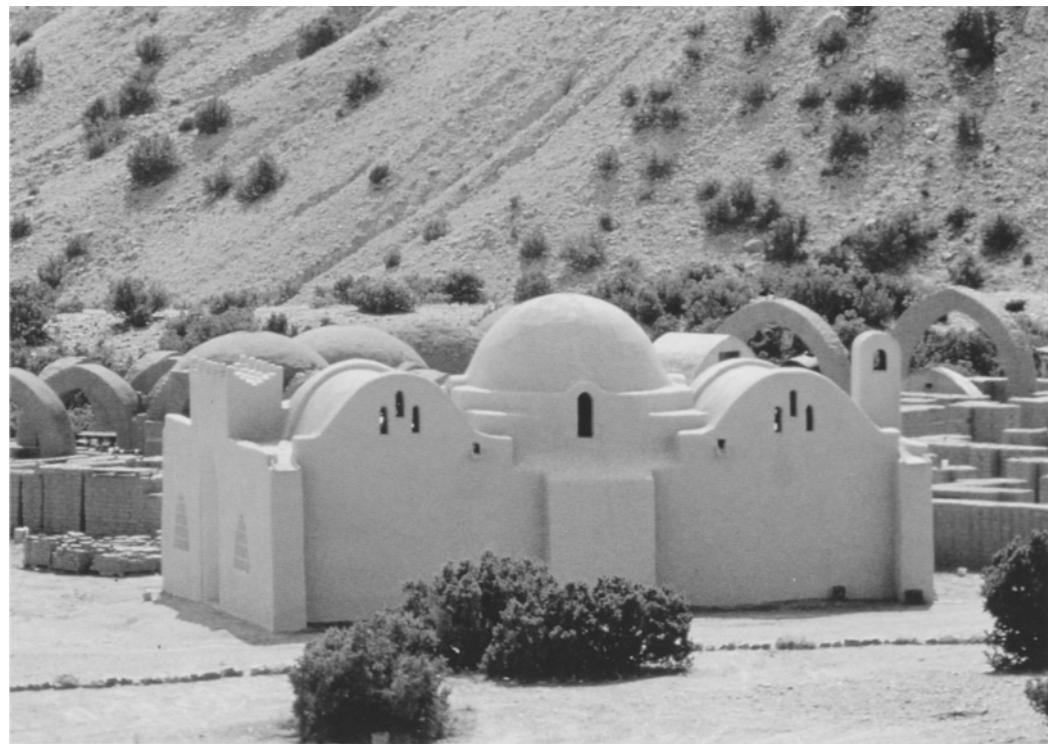
Northwest elevation



Southwest elevation



Aerial view of the partially completed complex of the mosque and school, mosque on the right | View of the mosque from the southeast, the mihrab is visible as a projection in the centre of the wall

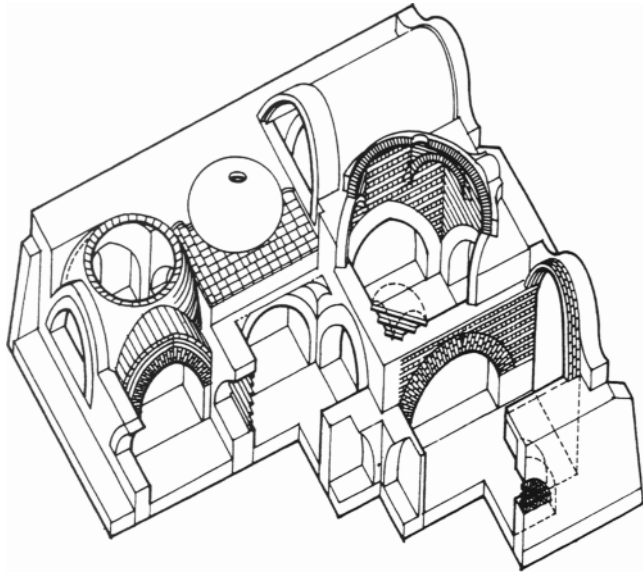


Dar Al Islam Mosque

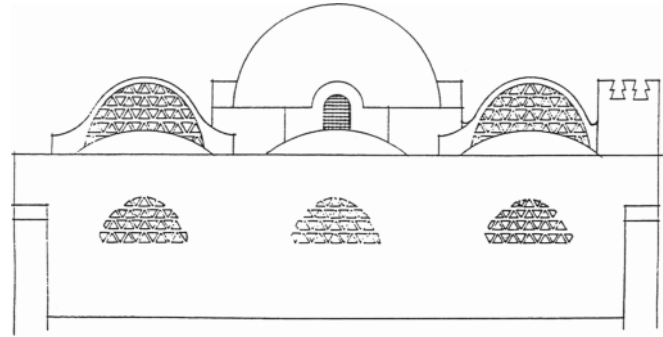
Abiquiu, New Mexico, USA

Architect	Hassan Fathy
Client	Dar Al Islam Foundation
Completion	1981
Footprint	191 m ²
Seating capacity	80

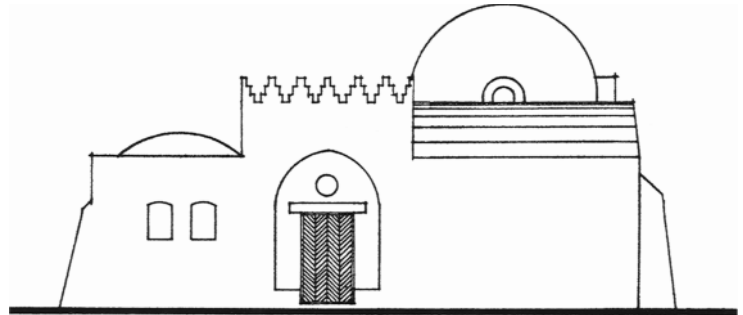
The mosque and school of the Dar Al Islam Foundation stand on a plateau above the Chama Valley, near the settlement of Abiquiu to the north of the capital Sante Fe. The buildings and its inhabitants are part of a project that was initiated in the late seventies. The project was born out of a utopian notion of a liberal Islamic community of learning and teaching, consisting of around 150 families in the otherwise predominantly Christian southwest of the U.S.. The project ultimately failed, however the mosque and school still remain. The modular architecture with its barrel vaults, semi-cupola, pointed arches and adobe screens is common to both buildings so that they appear as one, although the mosque stands at an angle to the rectangular form of the rest of the complex, highlighting its special role.



Axonometric



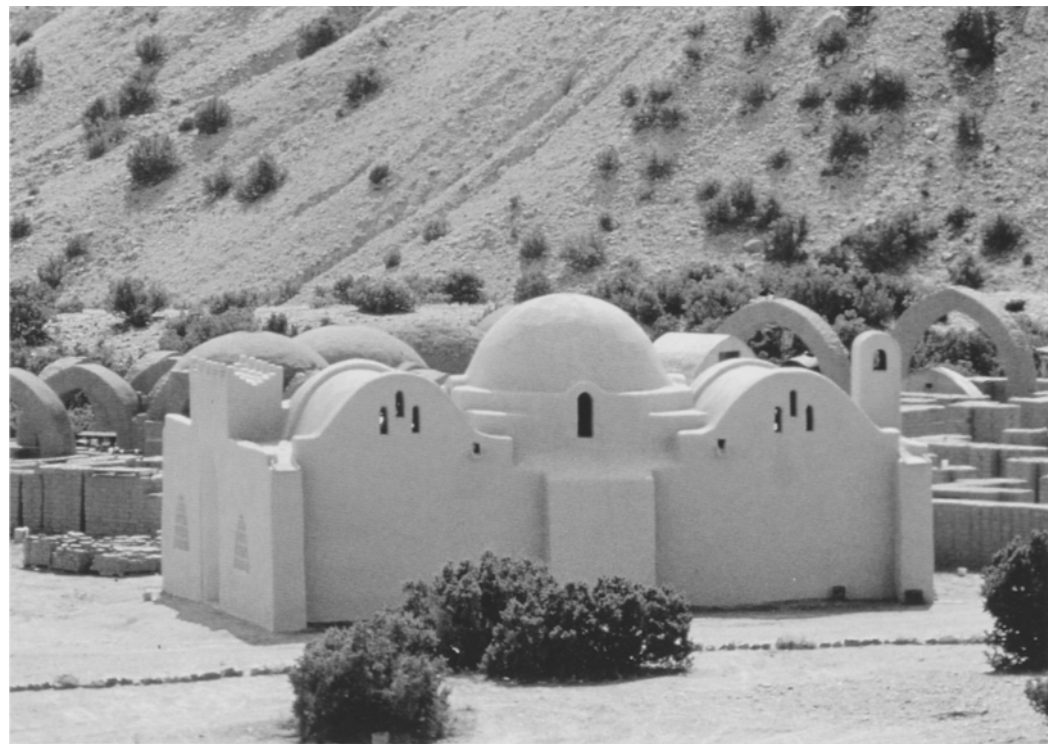
Northwest elevation



Southwest elevation



Aerial view of the partially completed complex of the mosque and school, mosque on the right | View of the mosque from the southeast, the mihrab is visible as a projection in the centre of the wall

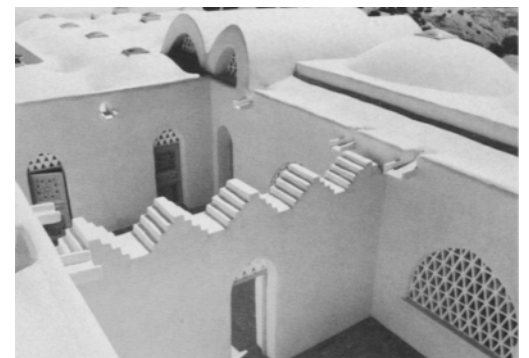
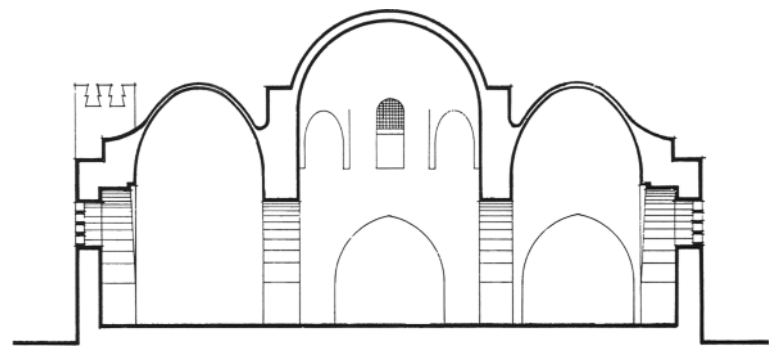
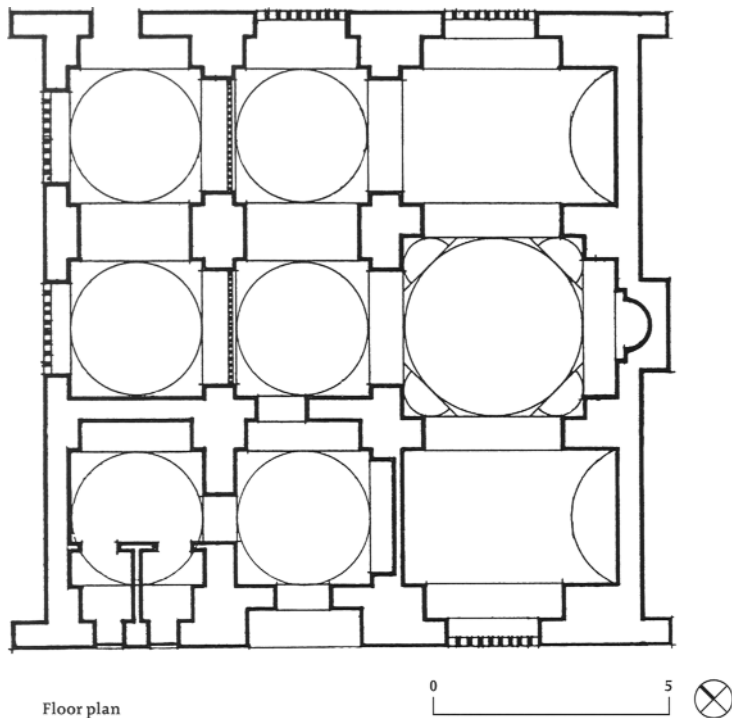


Dar Al Islam Mosque

Abiquiu, New Mexico, USA

Architect	Hassan Fathy
Client	Dar Al Islam Foundation
Completion	1981
Footprint	191 m ²
Seating capacity	80

The mosque and school of the Dar Al Islam Foundation stand on a plateau above the Chama Valley, near the settlement of Abiquiu to the north of the capital Sante Fe. The buildings and its inhabitants are part of a project that was initiated in the late seventies. The project was born out of a utopian notion of a liberal Islamic community of learning and teaching, consisting of around 150 families in the otherwise predominantly Christian southwest of the U.S.. The project ultimately failed, however the mosque and school still remain. The modular architecture with its barrel vaults, semi-cupola, pointed arches and adobe screens is common to both buildings so that they appear as one, although the mosque stands at an angle to the rectangular form of the rest of the complex, highlighting its special role.



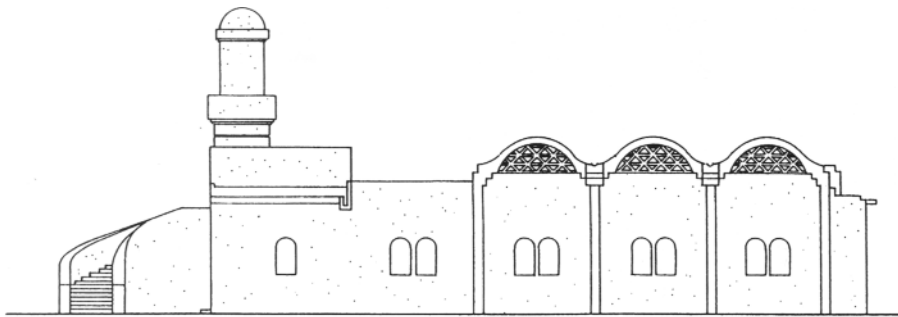
Interior of the mosque beneath the large dome, view northwest from the southeast | View into two courtyards of the school

The restricted vocabulary of the architecture had been refined previously over a period of 40 years by the Egyptian architect in the development of his earthen settlement at New Gouma near Luxor. The decision to build the complex entirely of earth has two reasons: New Mexico lies on the same latitude as northern Africa and shares a similar climate; and building with earth has a long tradition in the indigenous as well as Hispanic architecture of the southwestern U.S. Only its foundation is made of concrete. To protect the building against the extreme diurnal fluctuations between hot days and cold nights and the high level of humidity, the exterior was rendered with an emulsion of ground lime and crushed cellulose.

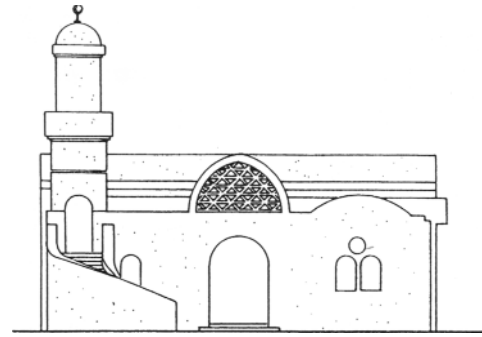
The mosque stands on a rectangular plan measuring 14.2 by 13.45 metres according to the plan drawings. The undulating roofscape of the building reveals its inner division into two unequal parts: six small, low Byzantine domes sit over the part to the northwest, a larger, higher, Sasanid dome and two barrel vaults on either side to the left and right cover the area to the southeast. This forms the centre of the house of prayer and accordingly faces towards Mecca.

Unlike many mosques, not to mention all rural mosques, in Abiquiu the entrance does not lie on axis with the mihrab but at right angles to it on the southwest wall. The central portion of this wall, crowned emphatically with a pointed zig-zag crenelation, emphasises

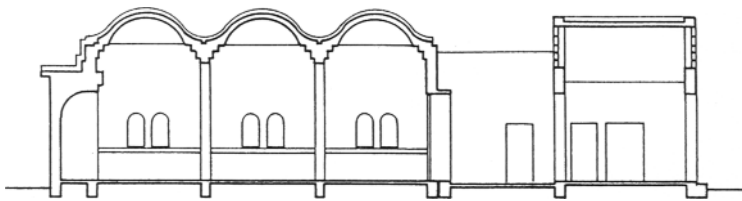
the bipartite pointed arch over the door. Immediately to the left of the entrance one finds a room for ablutions clad with white, blue and green tiles around the walls and basin. Beneath the large dome in front of the niche of the mihrab, squinch arches in the corners of the ceiling transform the square plan of the room into an octagonal dome. Suspended from this Sasanid dome is a ring with eight lanterns. The numerous smaller domed areas on either side lend themselves to creating separate zones for the men and women, which are separated from one another by trellis-like screens made of earth in intricate triangular or hexagonal patterns.



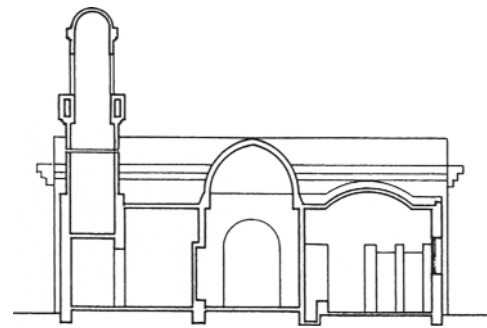
North elevation



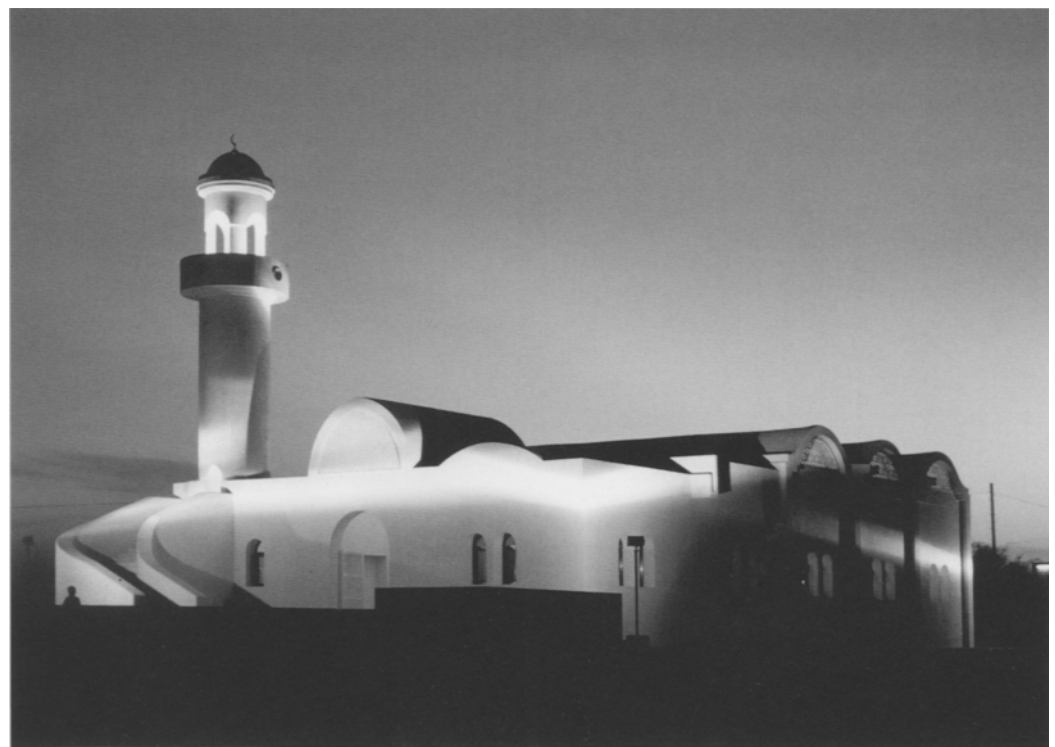
East elevation



Longitudinal section from west to east



Cross section through the vestibule



Night view from the northeast | Open staircase leading to the minaret | Vaulting over the prayer hall with arabesque elements, with the minaret behind

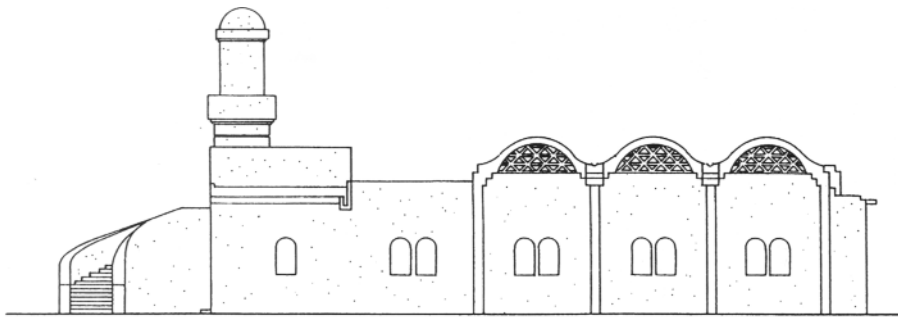
Al Furusia Mosque

Doha, Qatar

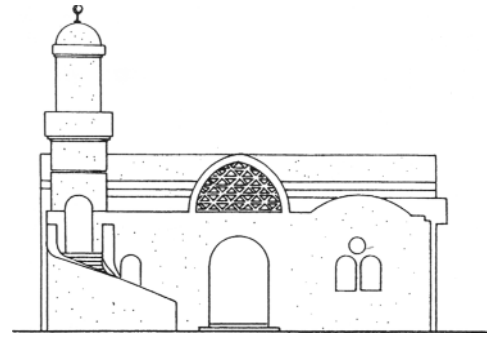
Architect	Anwar Atta
Client	Presidency of Sharia Courts, Doha
Completion	1984
Footprint	322 m ²
Seating capacity	200

Situated in Al Rayyan, a quarter on the outskirts of Doha, this relatively small mosque serves the immediate neighbourhood and adopts the same basic plan as some of the oldest mosques in the region. As with the first mosque erected in Yathrib under the prophet Muhammad or the mosque in Kairouan, both of which are derived from the traditional arrangement of an Arabic dwelling, this building is likewise characterised by a dualism of forecourt and prayer hall and does not have a dome.

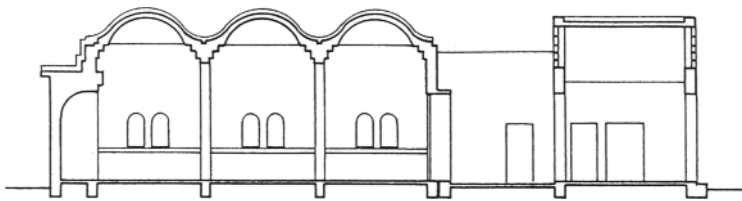
Although at first glance a relatively plain concrete and masonry building rendered with a thin white plaster, 23 metres long and approximately 14 metres wide, the mosque in Al Rayyan has a more powerful and dynam-



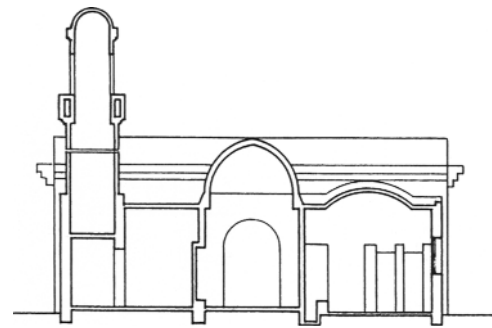
North elevation



East elevation



Longitudinal section from west to east



Cross section through the vestibule



Night view from the northeast | Open staircase leading to the minaret | Vaulting over the prayer hall with arabesque elements, with the minaret behind

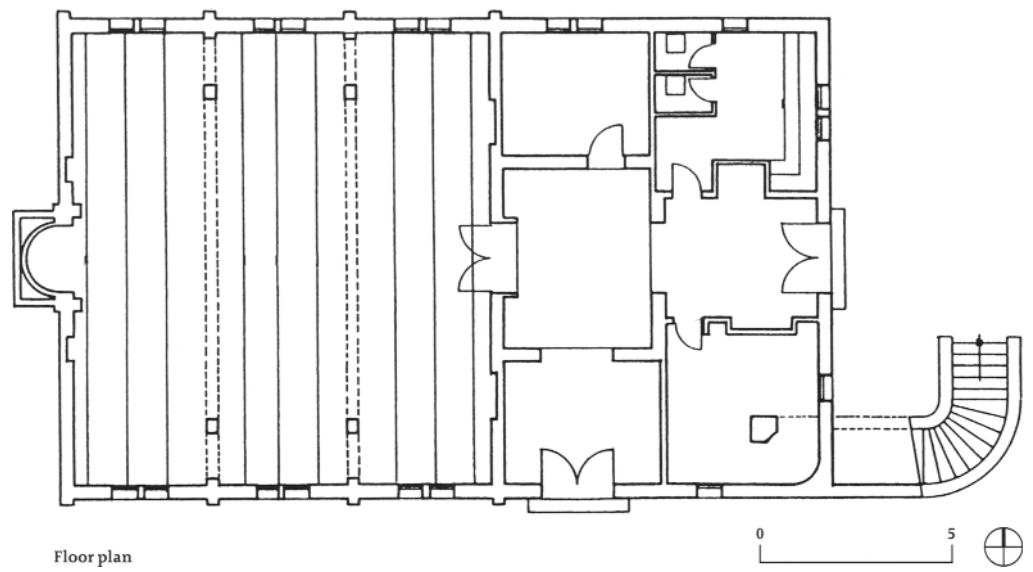
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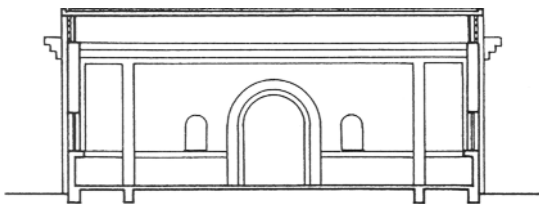
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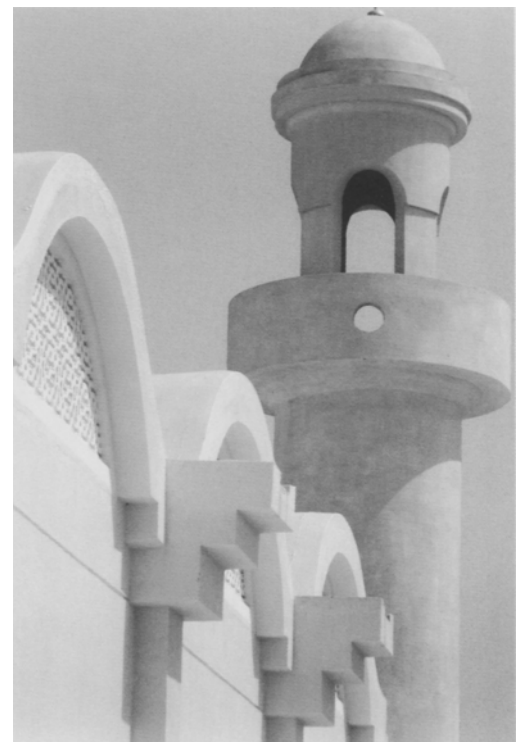
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Floor plan



Cross section through the prayer hall



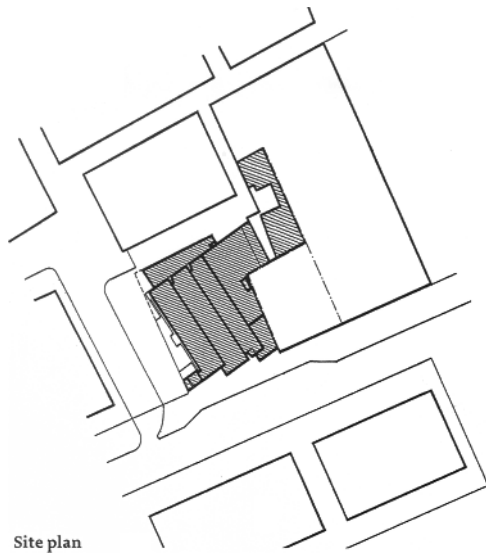
ic presence due to the longitudinal vault that covers the central section of the vestibule and the three lateral vaults that span the prayer hall. The unusual, almost baroque open staircase winds its way up to the circular tower of the minaret and heightens the dynamism of the building still further.

Seen in plan or elevation, the entrance vestibule occupies about two-fifths of the overall building, the prayer hall the remaining three-fifths. This relationship is also readily evident in reality: the proportions of two parts on one side and three on the other is immediately apparent in the subdivision of the building. From the entrance in the centre of the narrow end of the building next to the open stairway, the visitor pass-

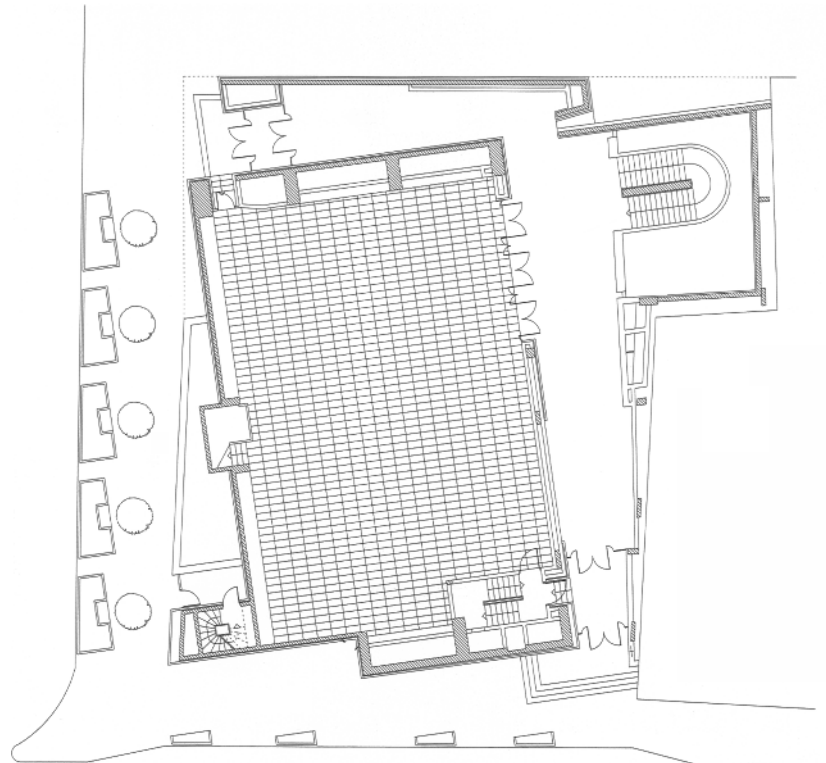
es beneath the barrel vault of the vestibule into a forecourt before proceeding on into the prayer hall. This almost square room is divided into equal parts by the three barrel vaults that span the room crosswise. The carpeted floor is green with lighter stripes marking ten rows for the faithful to pray. Each of the three wall panels to the left and right have a pair of smaller windows at ground level and a patterned grille or transenna in the arch beneath the roof formed out of plaster, the only decoration in the mosque. The prayer room has no women's gallery at all.

Doha is the capital of Qatar, one of the states on the Persian Gulf. Founded in the mid-19th-century, the municipality became more affluent with increasing

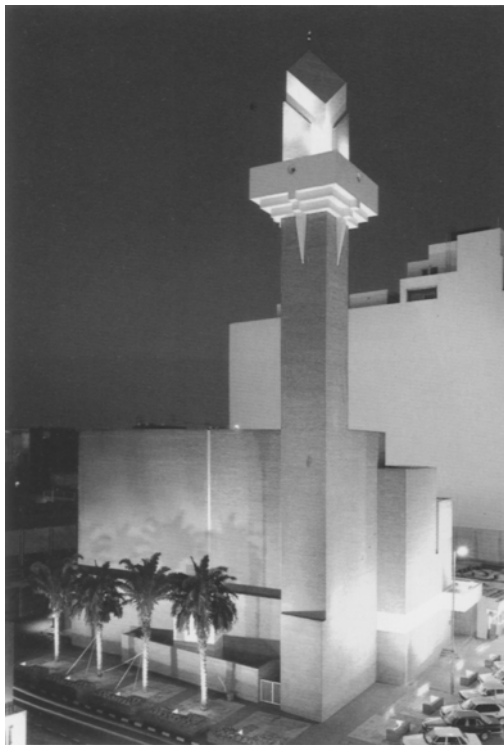
oil trade in the 1950s and today has a population of nearly 400,000. Large parts of Doha now have a nondescript character resembling many other "generic cities" as Rem Koolhaas has called them. The architect of the Al Furusia Mosque has instead called for a transformation of regional tradition as a means of maintaining the individual character and history of the nation, rather than unnecessarily subordinating its form and expression to a pattern of development driven by the global market economy.



Site plan



Floor plan vestibule, staircase and prayer hall

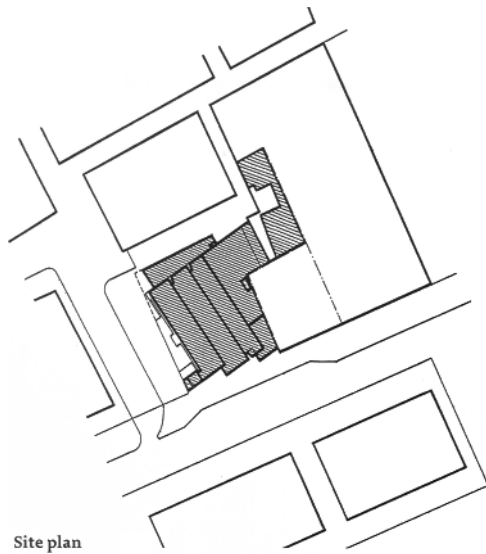


Bin Madiya Mosque

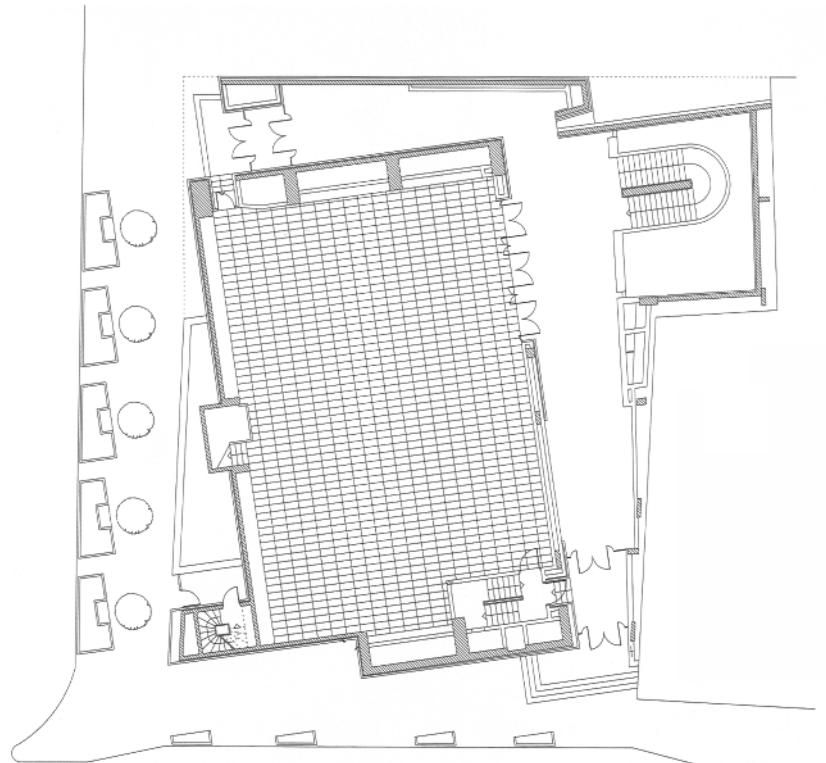
Dubai, United Arab Emirates

Architect	Alexandros N. Tombazis
Client	Majid Al Futtaim
Completion	1990
Footprint	2100 m ²
Seating capacity	Main 500, gallery 230

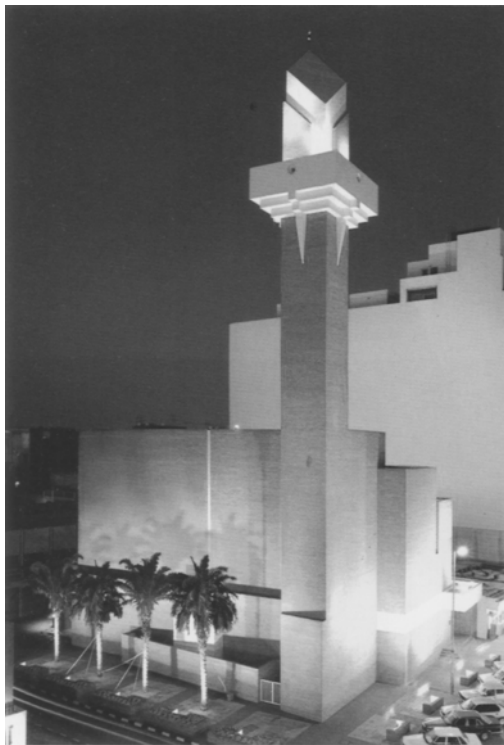
Situated in the middle of the exceptionally varied urban townscape northwest of Al Nasser Square in the quarter of Deira in central Dubai, the mosque stands slightly offset from its neighbours. This is the only way it can assert its sacred function in the midst of its high-rise surroundings. The building has a rectilinear, stepped concrete form that rises three times from east to west and is clad in brown brickwork. The stepped terraces rise from 13.2 metres to 16 and finally 18.8 metres and underline the importance of the west side of the building that faces Mecca. The mihrab projects from the centre of the base of this elevation in the form of a white marble box, marked additionally by a thin vertical marble stripe that continues upwards to the roof. At the corner of the building, the minaret



Site plan



Floor plan vestibule, staircase and prayer hall

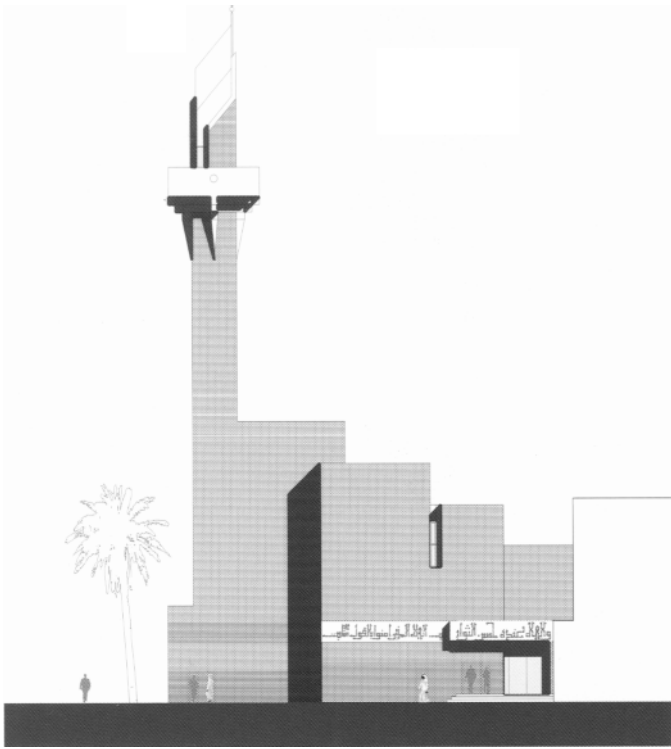


Bin Madiya Mosque

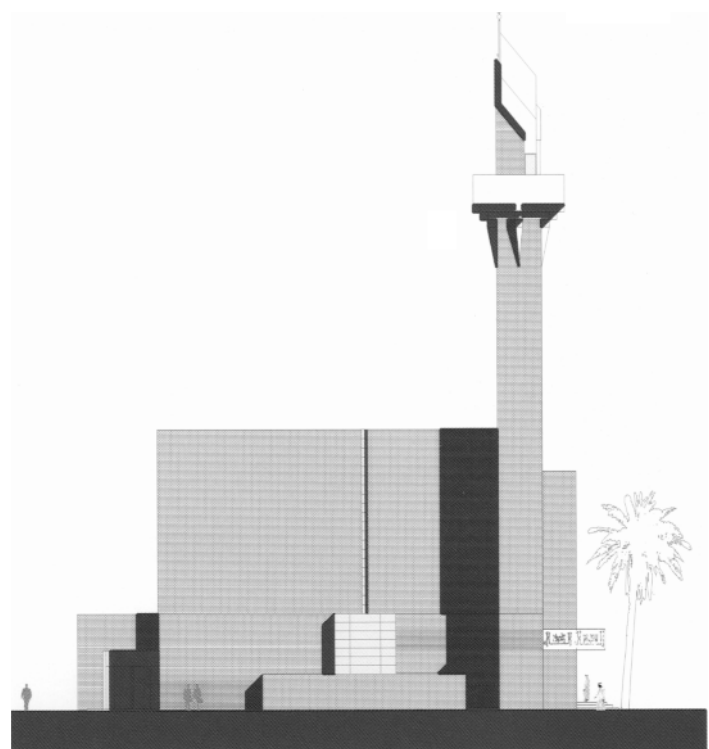
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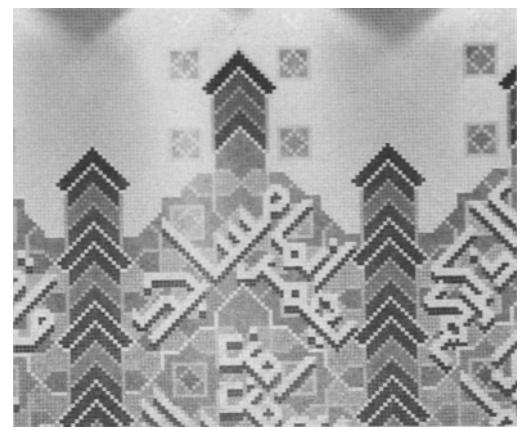
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View from the south



View from the west



Night view from the southwest | Vestibule with entrance to the prayer hall, at the rear left the entrance from the road | Staircase, with the glass-block floor of the shallow pool below | Prayer hall with mihrab on the right | Section of the mosaic on the west wall

rises 45.3 metres into the sky, its tip projecting high above the Muezzin's balcony.

Compared with this demonstrative symbol of faith, the two entrances are accorded less emphasis. The opening of one of the portals is located on the north-west corner of the mosque, the other on its south-east corner. A few steps invite the faithful to enter the building. A wide frieze over the lintel leads from right to left with Arabic script carved into the white marble relating texts from the Koran and intended as contemplative inspiration for the faithful.

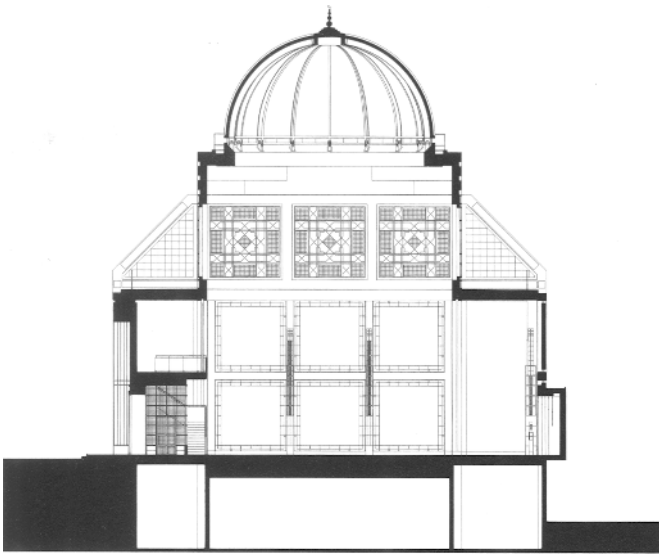
A dedicated small building for ablutions lies to one side, while the shelves for stowing shoes are located

directly next to the entrance to the mosque. One proceeds onwards into the depth of the narrow room. The predominantly marble-and-brick entrance hall has a large L-shaped plan with a wide, open staircase that winds around its corner and lends the entrance to the prayer hall and women's gallery a ceremonial character: on the one hand with a shallow pool beneath the landing, and on the other through two levels, each half rounded.

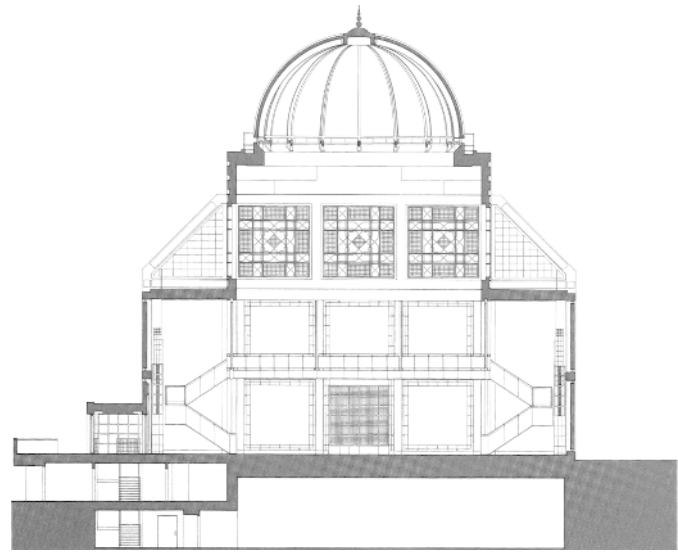
Morning light falls through the three horizontal clerestory windows in the vertical "risers" of the stepped volume, making the west wall the lightest part of the room. The broad panels of coloured mosaics to the left and right of the mihrab, whose pattern and calligraphy

oscillate between image and word, shine with a radiance not found anywhere else in the building. From afternoon into late evening, spotlights and lamps continue the effect of the morning light. The prayer hall is always light, and fully air-conditioned.

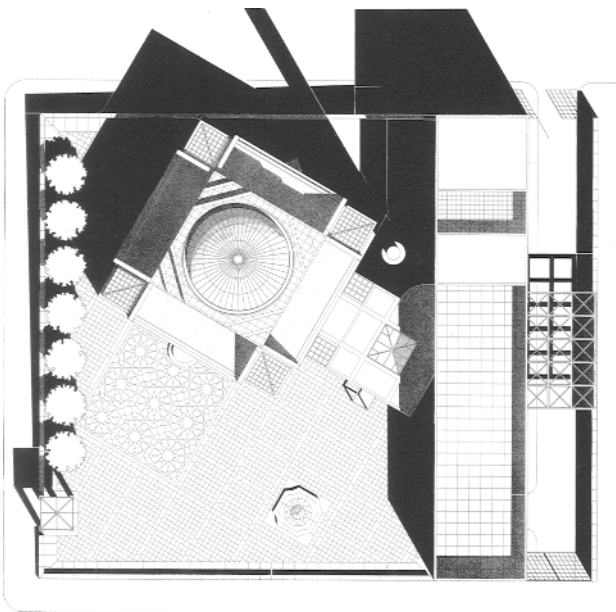
The entire building was financed by a private benefactor. The political climate of the United Arab Emirates imposes few restrictions on the activities of landowners and businessmen; fiscal restrictions are minimal. As such, a significant amount of private wealth has amassed in Dubai, without which the benefaction of such luxurious architectural creations as the Bin Madiya Mosque – which delights in refined materials without being showy – would never be possible.



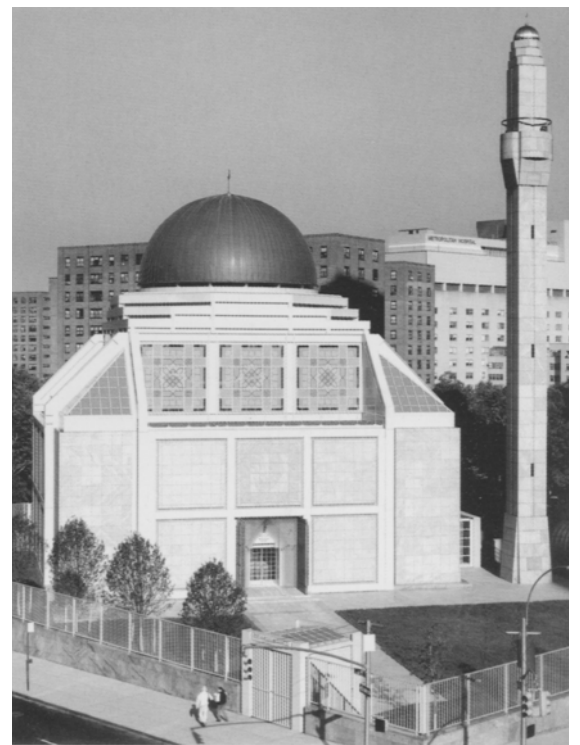
Southwest-northeast section



Southeast-northwest section



Axonometric with shadows showing the earlier position of the minaret at the rear of the complex; the annexe to the right was not realised | View from the road junction, the main entrance behind the minaret, in the foreground the bronze double doors



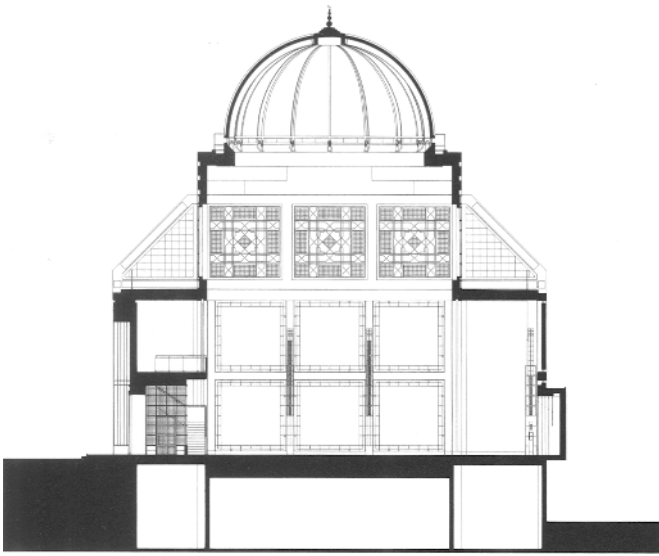
Islamic Cultural Center of New York

New York City, New York, USA

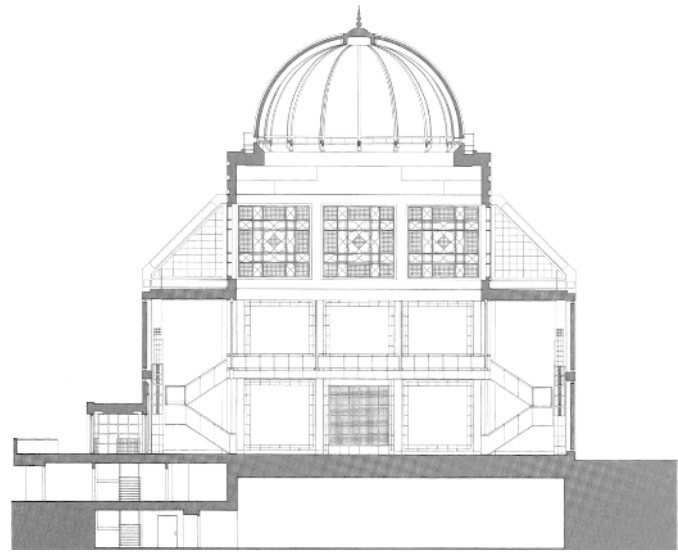
Architect	Skidmore Owings Merrill (SOM) Swanke Haden Connell
Client	The Islamic Cultural Center of New York Foundation
Completion	1991
Footprint	ca. 800 m ²
Seating capacity	Main ca. 800, gallery ca. 250

The mosque of the Islamic Cultural Center of New York is a free-standing building on a 61 metre wide and 73 metre long plot on a slight incline at the junction of East 96th Street and 3rd Avenue on the Upper East Side of Manhattan. Rotated at an angle of 29 degrees to the grid of streets, the building, which is reminiscent of Turkish mosque architecture, achieves two things: by departing from the order of the grid it stands out from its surroundings, and secondly, the mihrab can face towards Mecca as prescribed.

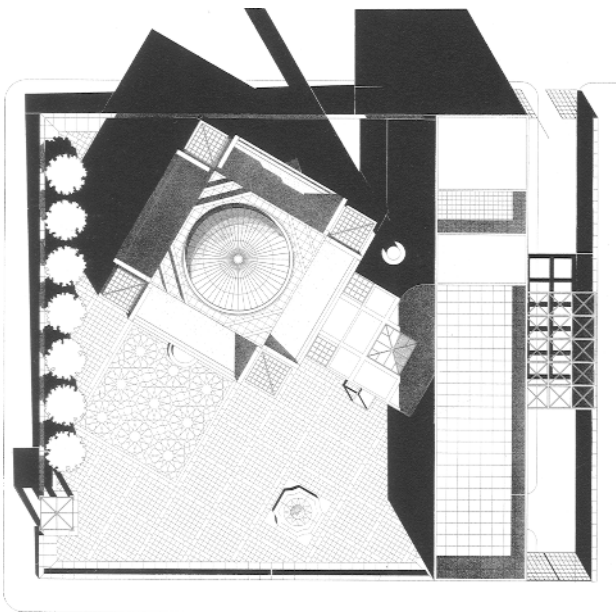
The design of the mosque is based on a pure cube with an edge-length of 27.4 metres. Eight columns and four trusses, which intersect one another, form the structural framework. Additionally, large Vierendeel trusses



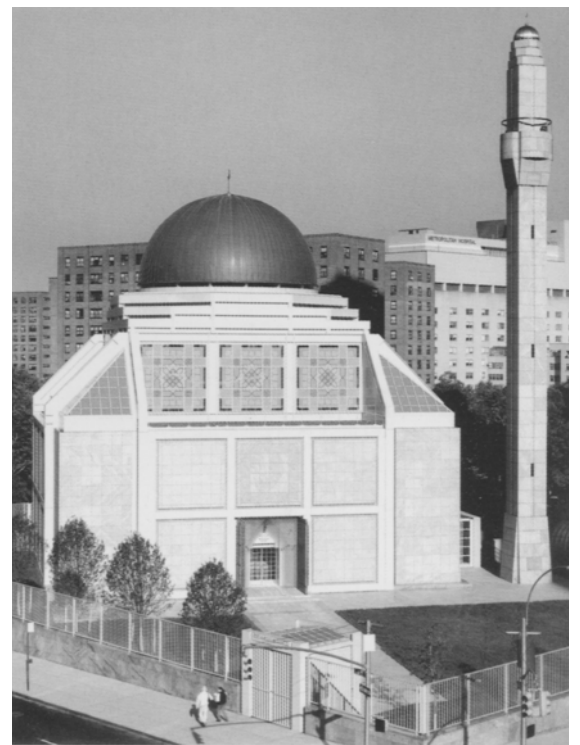
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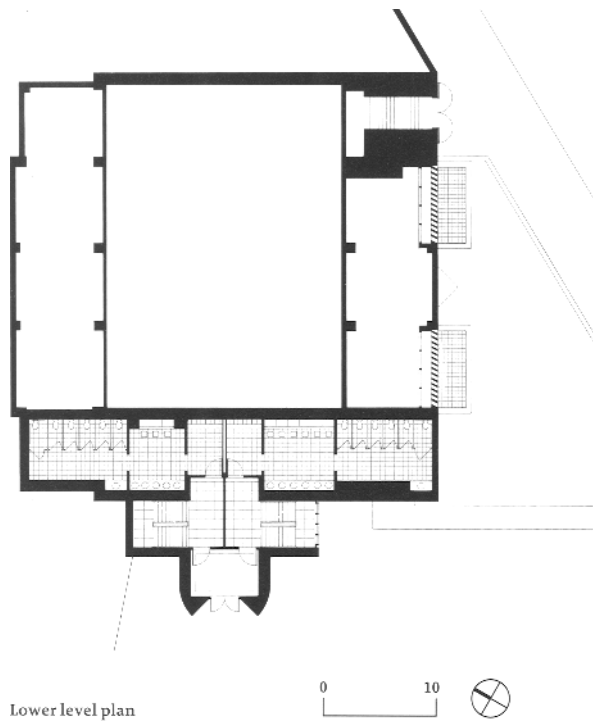
Islamic Cultural Center of New York

New York City, New York, USA

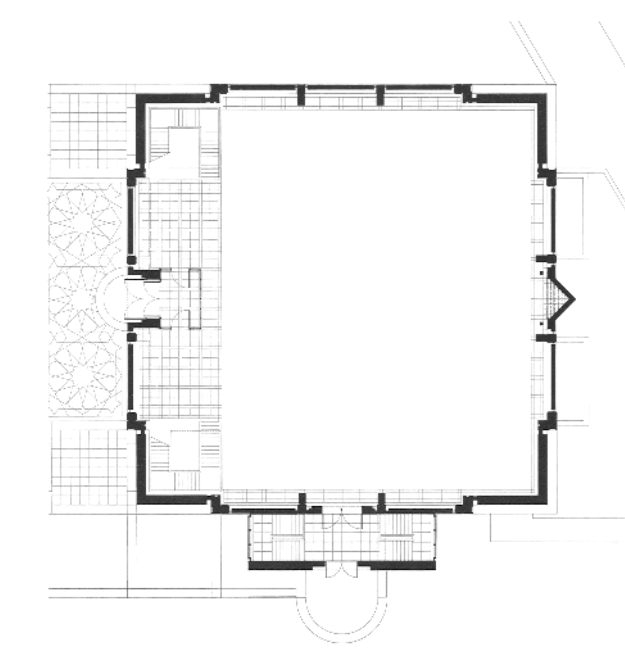
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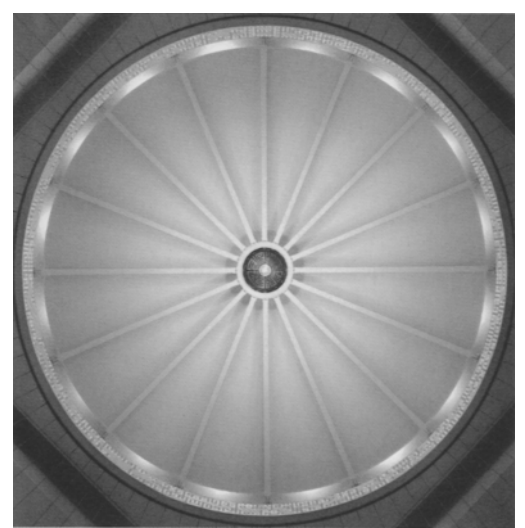
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Lower level plan



Upper level plan



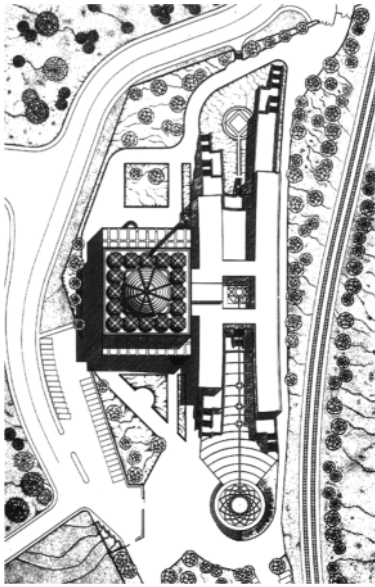
Entrance to the prayer hall, at the rear the wind lobby | Prayer hall, the mihrab and minbar at the back | View of the dome from below

on each façade ensure the rigidity of the building. All the façades share the same pattern of subdivisions: in the lower section, six infill panels containing slabs of pink granite with glass beading are suspended in front of welded steel tubes. In the middle band, a horizontal row of three identical windows are set back from the façade with an angled rooflight on the left and right turning the corners of the building. The uppermost section consists of a dome in the shape of a hemisphere resting on three stacked structural frames. Although the walls of the mosque are clad with stone from a quarry in Stony Creek, Bradford, Connecticut (only the dome is clad in copper), it is easy to differentiate between the structural and non-loadbearing elements of this centralised building.

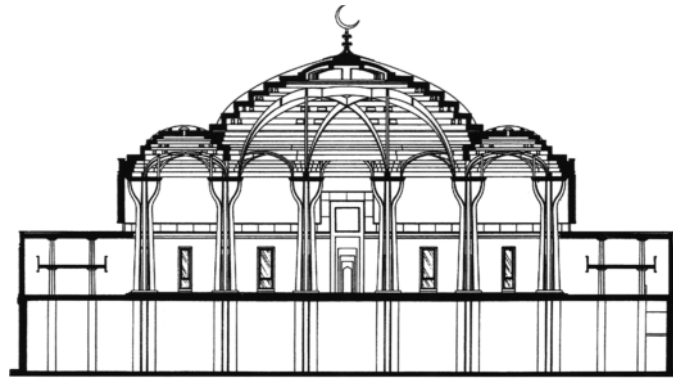
Like many other mosques, the Islamic Cultural Center of New York has two floors: separate washrooms for men and women, meeting and administration spaces below and the prayer hall above. One enters the mosque through a 4.6 metre high portal, bronze on the outside, glass on the inside, and proceeds via a stair to the prayer hall. The women's gallery is on the left, the mihrab on the right. The plan of the niche is triangular and emphasised by a surround made of brass decorated with Kufic script. Blue and green tinted daylight streams in through the windows and rooflights in the central section of the mosque. Small light bulbs hang from thin wires suspended from the lower rim of the dome forming a delicate ring of light. The rotunda and dangling cylinder help to centre the

space, but also detract somewhat from the prominence of the mihrab and minbar.

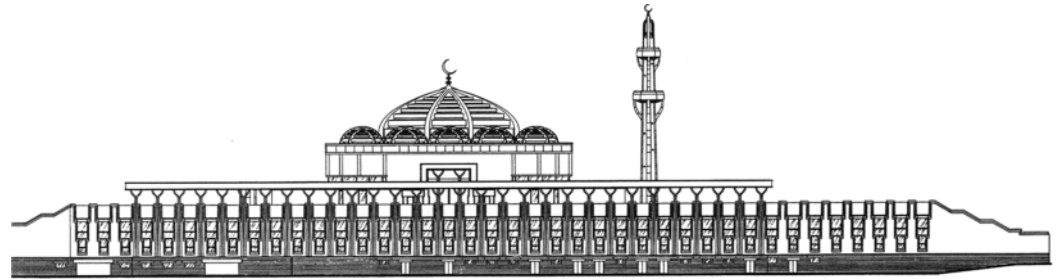
Although at the beginning of the nineties, some 200 mosques already existed in New York, the building of the Islamic Cultural Center of New York represented a turning point for the resident Muslim population, in particular those of Turkish, Lebanese, Yemeni and Pakistani origin. None of the other mosques in New York have a comparable urban presence, and none are crowned with such a sizeable dome or high minaret.



Site plan



Cross section through the mosque



Longitudinal section through the entire complex



Detail of the columns and capitals in the colonnade | Circular plaza, three steps lead up to the upper level with the two low annex buildings

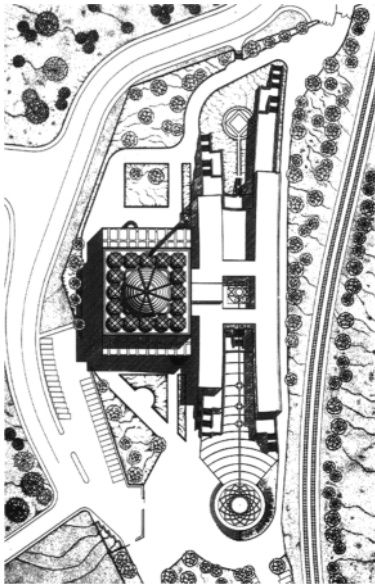


Mosque of Rome

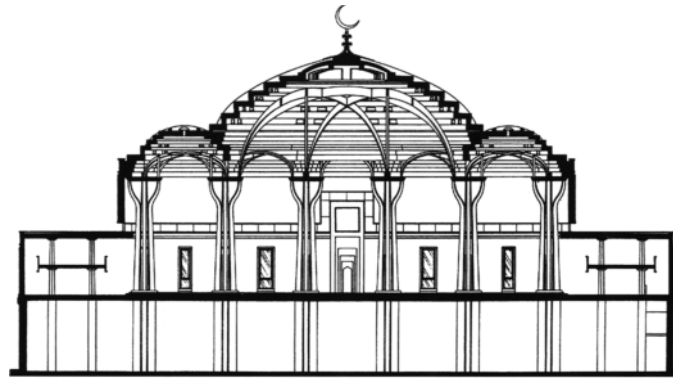
Rome, Italy

Architect	Paolo Portoghesi, Vittorio Gigliotti, Sami Moussawi
Client	Committee of the Embassy of Islamic Nations in the Republic of Italy, Rome
Completion	1995
Footprint	Prayer hall without galleries ca. 1600 m ²
Seating capacity	ca. 2000

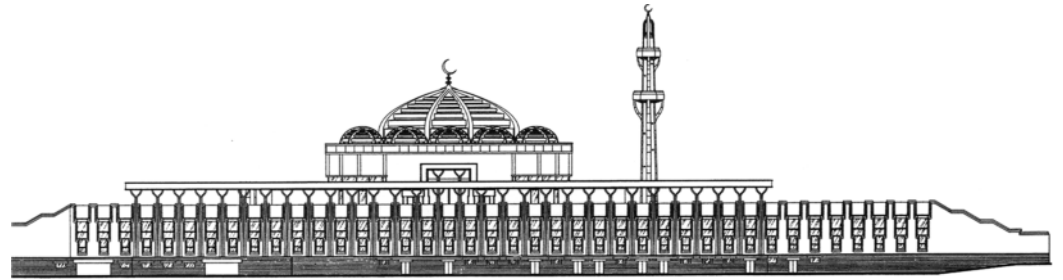
In northern Rome, sandwiched between sports buildings and playing grounds on one side and Monte Antenne on the other, lies an elongated 30,000 square metres large plot. The building is arranged in two parts on the rectangular, almost pentagonal site: two long low buildings face northwest and a rectangular block faces southeast. The two annex buildings contain a cultural centre with library and auditorium in the lower storey and two colonnades on the upper storey that lead to the courtyard in front of the rectangular block containing the mosque. The symmetrical complex is clad in pale-red brickwork. The rich use of brown travertine and green peperino on the façades is likewise a Roman tradition.



Site plan



Cross section through the mosque



Longitudinal section through the entire complex



Detail of the columns and capitals in the colonnade | Circular plaza, three steps lead up to the upper level with the two low annex buildings

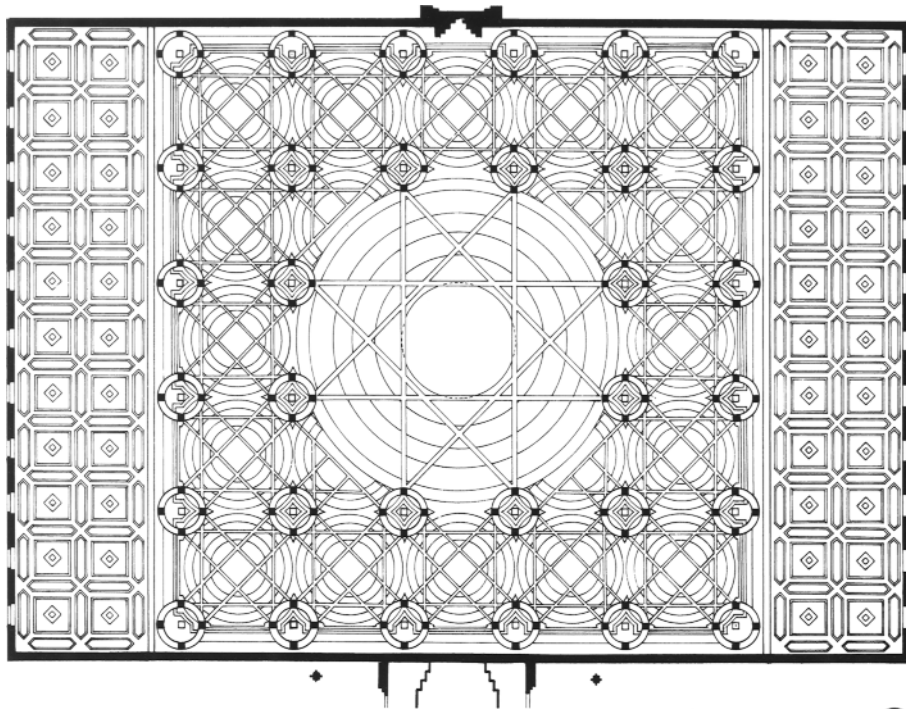


Mosque of Rome

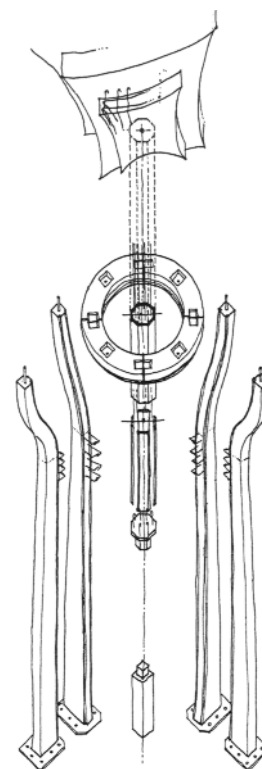
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Footprint	Prayer hall without galleries ca. 1600 m ²
Seating capacity	ca. 2000

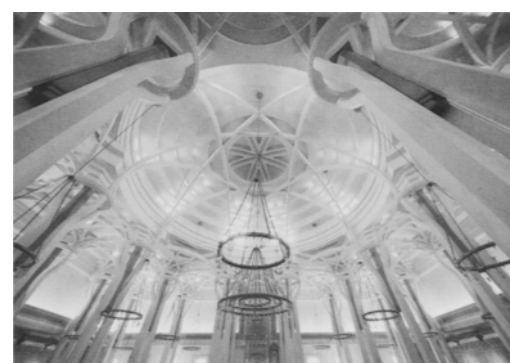
In northern Rome, sandwiched between sports buildings and playing grounds on one side and Monte Antenne on the other, lies an elongated 30,000 square metres large plot. The building is arranged in two parts on the rectangular, almost pentagonal site: two long low buildings face northwest and a rectangular block faces southeast. The two annex buildings contain a cultural centre with library and auditorium in the lower storey and two colonnades on the upper storey that lead to the courtyard in front of the rectangular block containing the mosque. The symmetrical complex is clad in pale-red brickwork. The rich use of brown travertino and green peperino on the façades is likewise a Roman tradition.



Ceiling plan of the dome and side galleries



Exploded view of a column

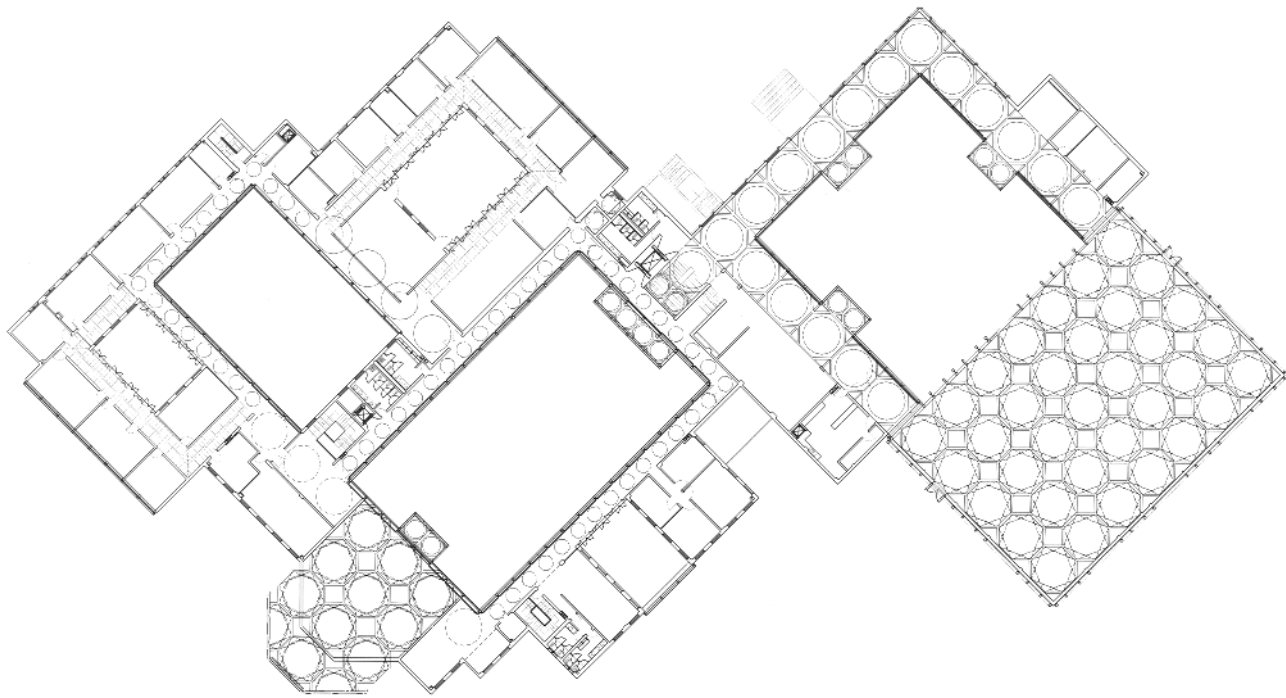


View into the prayer hall, on the right the mihrab and minbar | Looking up into the central dome

One approaches the building from a circular plaza, which leads on towards the ends of the two annex buildings. Broad steps on the left, right and in the centre lead the visitor to the upper level where slightly bowing colonnades draw one towards the portal of the mosque. The prayer hall measures 40 by 40 metres and is modelled on a hypostyle hall. The room is organised on a five-by-five grid. The axis from the portal to the mihrab defines the orientation of the space while the central dome emphasises the centre. Light comes from three sources: from small windows in the vertical steps of the dome, large windows in the qibla wall, and from window strips at approximately half height around all four walls which are covered by baffles inscribed with words from the Koran.

The spatial appearance of the prayer hall is defined less by its enclosing walls than the extraordinarily dynamic interplay of its 32 columns and 17 white concrete domes. All the columns consist of four identical shafts which draw together slightly towards the capital before spreading out like buds opening. Long black columns inserted between the shafts bear the weight of the seven rings of each cupola. The eight intersecting branches interwoven across each cupola serve to join the columns and do not support the weight of the domes. The blue shimmer of the prayer hall is due in part to the colour of the carpet on the floor as well as the colour of the rings of the cupola. The roof is coated with encaustic plaster, a traditional technique in which coloured pigments are applied using heated wax.

In the design for the Mosque of Rome, which was originally undertaken in 1975, the leading architect – whose name remains synonymous with the motto “La Presenza del Passato” from the 1st Architecture Biennale in Venice in 1980 – attempted to draw on influences from oriental as well as occidental architecture. The design exhibits clear references to early Arabic hypostyle mosques as well as the later Ottoman domed mosques, and to sacred architecture from the Baroque, such as the work of Francesco Borromini and Guarino Guarini. The influence for the tiered circles of the dome, however, derives from an earlier project by the architect for the ceiling of the Chiesa della Sacra Famiglia in Salerno, Italy.



Plan of the entire complex



View of the complex from the west | Entrance | View from the entrance through the courtyard garden towards the protruding entrance of the ambulatory | Prayer hall



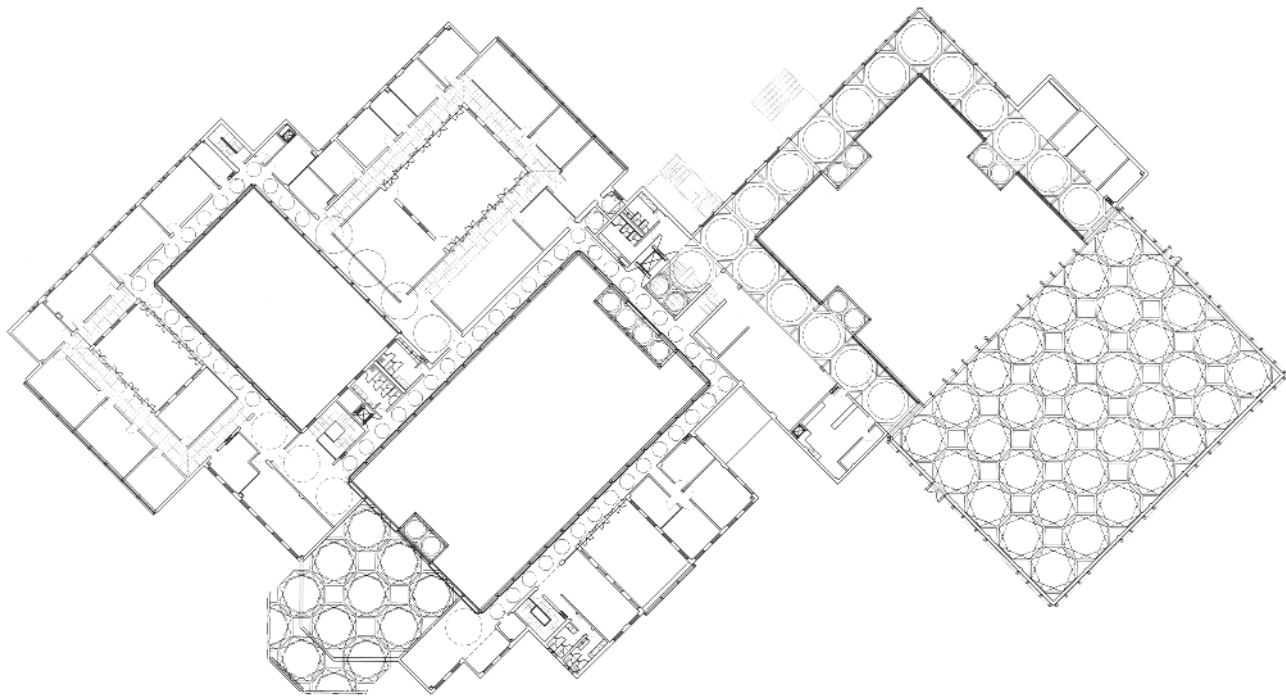
Lisbon Ismaili Centre

Lisbon, Portugal

Architect	Raj Rewal
Client	Ismaili Community of Portugal
Completion	2002
Footprint	Entire complex 5500 m ² , prayer hall 875 m ²
Seating capacity	ca. 950

While the Ismaili Centre in London stands in the midst of a 19th-century urban environment, the newer and larger Ismaili Centre in Lisbon is situated on the outskirts of the capital and occupies an "island" surrounded partly by traffic arteries and partly by high-rise developments.

The entrance to this configurational composition of several buildings and six courtyards is marked by half an octagon. Immediately behind this small entrance hall, one enters a peaceful courtyard garden, whose longitudinal and transverse axes, with water channels and a fountain at their intersection in the centre, recall the Persian Chahar Bagh garden layout so popular in Moorish Spain. To the left of this artificial and primarily rep-



Plan of the entire complex



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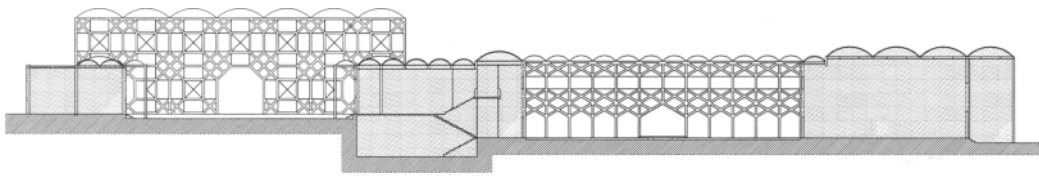
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Lisbon, Portugal

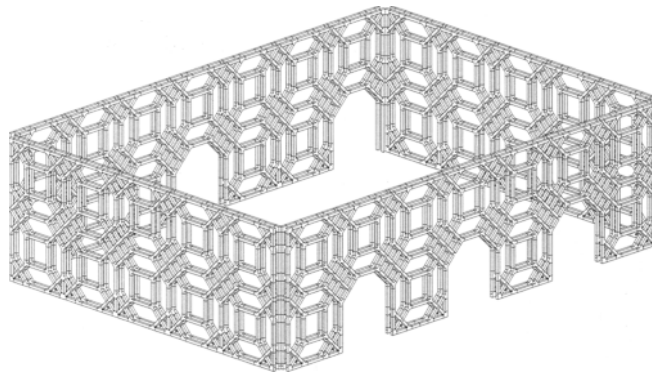
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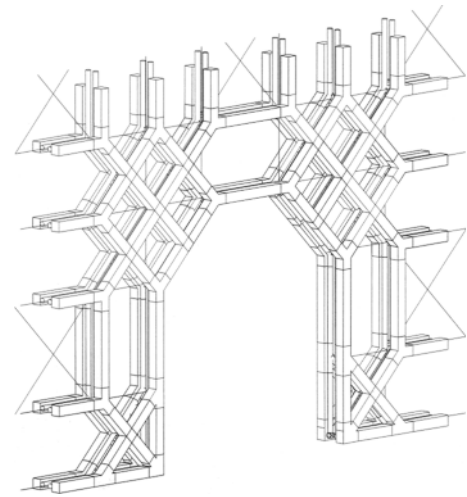
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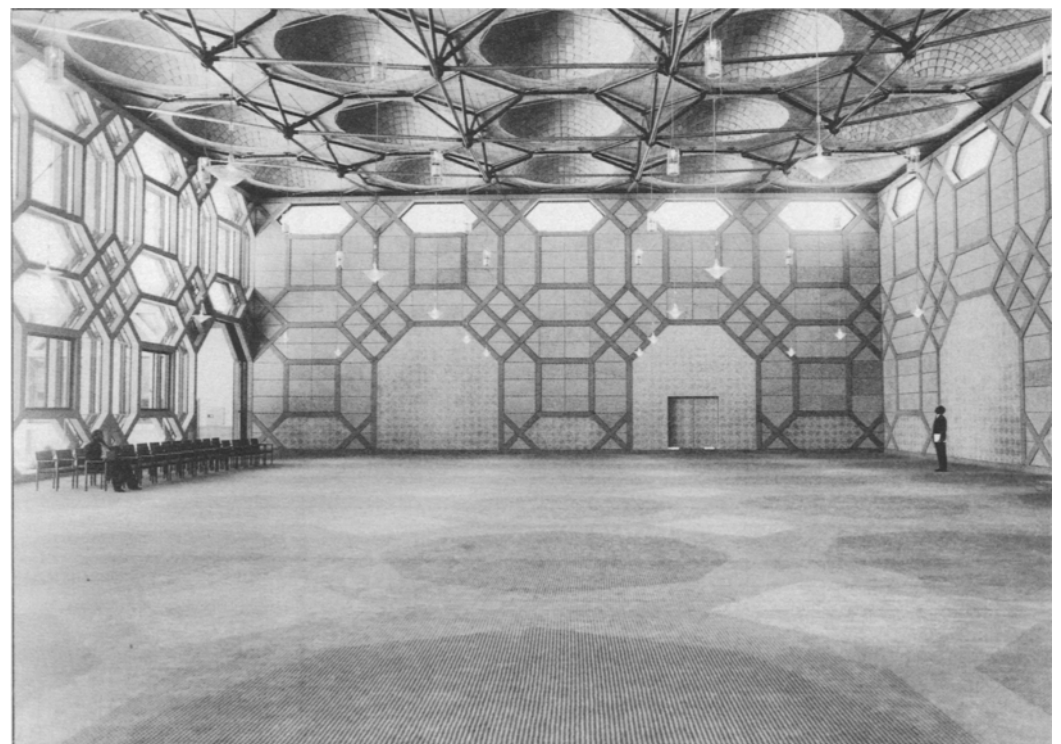
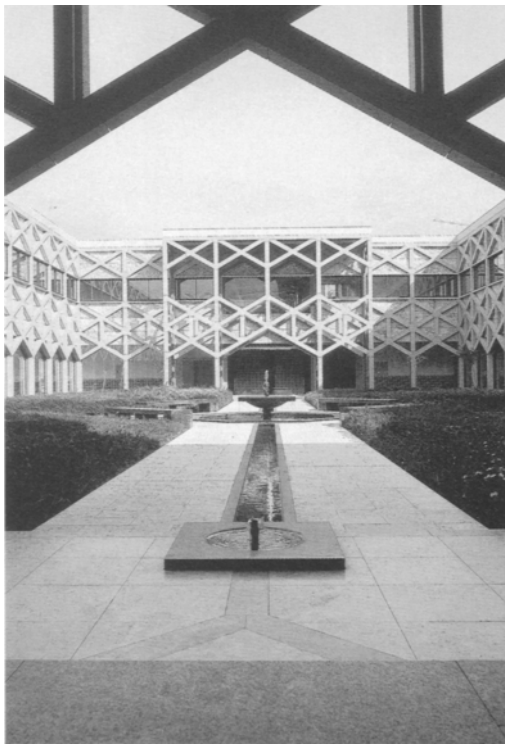
Section



Lattice framework of the prayer hall



Detail of the lattice framework with inner layer of tubular steel members and external stone facing



representational courtyard lie three communal buildings with cultural and social functions, to the right an exhibition building. The upper storeys accommodate offices and rooms for educational purposes.

The axis from the entrance through the courtyard garden directs the visitor in a straight line towards a projecting entrance in the ambulatory and leads on to the vestibule and portal of the prayer hall. The vestibule and prayer hall are slightly raised, detaching themselves from the rest of the complex. The prayer hall, which the Ismaili call Jamatkhana, is 35 metres wide and 25 metres deep. Thirty-five shallow cupola clad in beige-coloured Lioz limestone are supported by a tubular steel space frame that supports the entire ceiling.

Three of the walls are clad with panels: squares, hexagons and octagons form a tessellated wall decoration that is particularly distinctive. The mihrab on the qibla wall is not denoted by a niche but solely through its position in the centre of the rear wall.

If it were not for the powerful presence of its façades, which stand out in the otherwise anonymous surroundings, one might mistake the Ismaili Centre in Lisbon for a nondescript edge of city industrial complex. The latticework that encloses the Jamatkhana consists of a composite structure of 10 centimetre thick tubular steel and 20 centimetre wide strips of pink-coloured Sintra granite cladding and serves multiple purposes: it is wall, window and pattern. Accordingly, the struc-

ture and decoration share the same form. The entire northwest wall of the prayer hall has no infill panels and is fully glazed from floor to ceiling. From here, subdued evening light streams into the space.

The architecture of the Ismaili Centre in Lisbon draws on influences from Spain, Persia and India. The Alhambra in Granada and the Divan-i-has in Fatepur Sikri can be regarded as distant relatives. However, the ensemble is memorable not only for these references but also – or rather, above all – because of its treatment of ornamentation. As seen increasingly in architecture since the nineties, here ornamentation has found a new expression, in which structural and applied elements have entered into a hitherto unknown synthesis.

Crematoria and Chapels of Rest

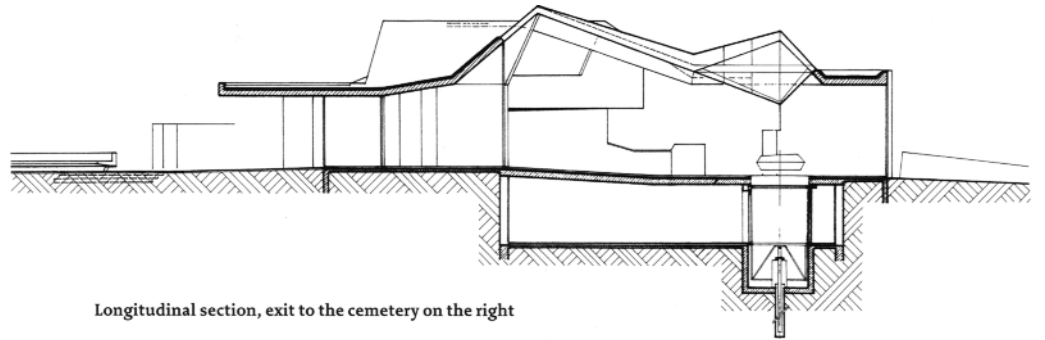
Whether above or below ground, whether on a hill or in a cave, whether in cells or temples, places for the dead are among the oldest buildings mankind has ever built. In archaic societies only places for the dead had any permanence and these were often lavishly constructed in preparation for the afterlife. By contrast, in the 20th century – an age in which, according to cultural commentators, death is largely “repressed” – the production of cemeteries was of little interest to the architectural avantgarde. Only in countries such as Spain, Italy and the south of France did architects repeatedly show interest in designing cemeteries or tombs. Carlo Scarpa’s Brion Mausoleum in the cemetery at San Vito d’Altivole, Italy and Aldo Rossi’s extension of the San Cataldo cemetery in Modena, Italy, testify to this spirit.

With regard to the building of crematoria, the situation is much the same. Historically, the crematorium is a relatively recent building type; the first was built in 1876 in Milan, the second in 1878 in Gotha, Germany. Between the 1880s and the 1960s, the Roman Catholic church prohibited any manifestation of cremation. Accordingly very few master builders of this period turned their attention to the design of crematoria. Of those who have successfully tackled the problem of unifying and separating the sacred above and in the foreground and the technical below and in the background, one can count the work of Peter Behrens in Hagen, Fritz Schumacher in Dresden, Clemens Holzmeister in Vienna and Erik Gunnar Asplund in Stockholm.

The six examples in the following chapter represent places of celebration and of mourning, whether in crematoria or in cemeteries. However, absent from the texts, plans and photos are descriptions of the technical facilities that are necessarily a part of such buildings. The crematorium by Fumihiko Maki in Nakatsu, Japan, on the one hand, and by Axel Schultes and Charlotte Frank in Berlin on the other illustrate the differences between the burial and cremation rituals in Asia and Europe.



Site plan



Longitudinal section, exit to the cemetery on the right

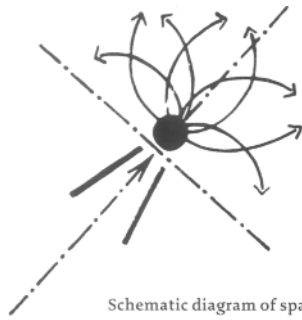


Chapel of Rest, Am Fließtal Cemetery

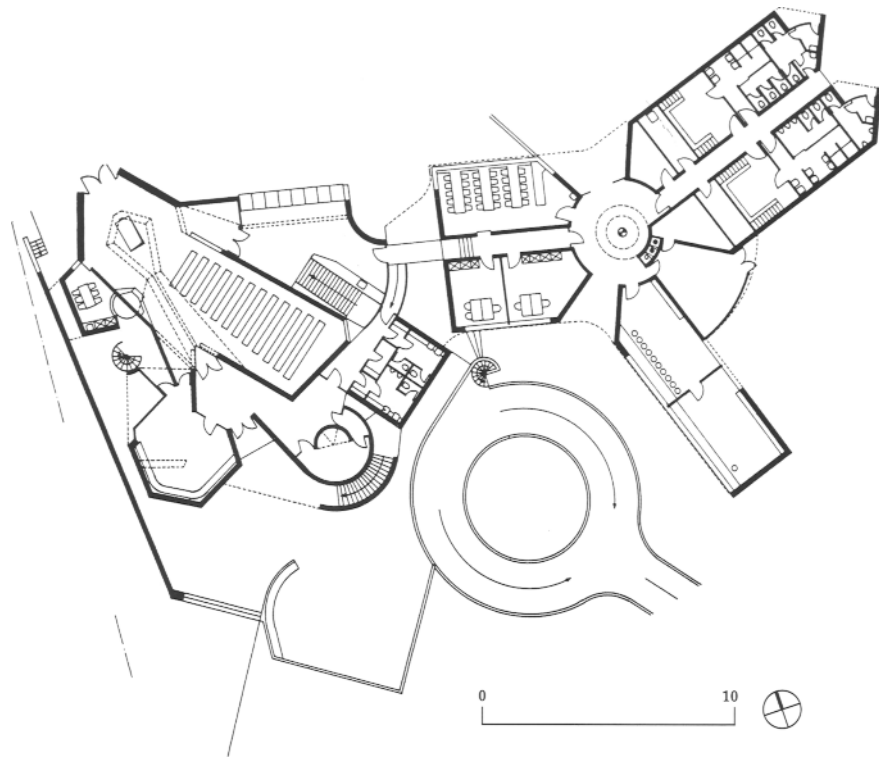
Berlin, Germany

Architects	Hermann Fehling, Daniel Gogel
Client	Reinickendorf District Authority, Berlin
Completion	1975
Denomination	Non-denominational
Footprint	Total 1148 m ²
Seating capacity	104

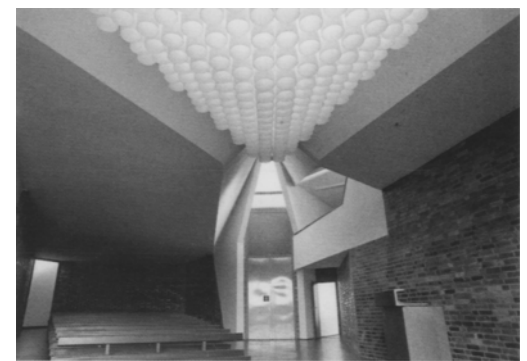
Although not situated on the periphery of the capital, the cemetery's immediate surroundings exhibit very similar qualities. Rounded to the west by a motorway feeder road, to the east by allotments and houses, its paths and open spaces open out onto the greenery of Tegel to the north. Visitors arrive from the road on the south side and are led in such a way that they are aware of the separation of chapel and ancillary spaces – which are accessible via a rotunda – but are deflected away from the latter by the arc of a concrete wall. The vehicular access for the funeral services and not least the underground floor with the coffin chamber are screened from view. The form and colour of the complex with the chapel have a chthonic, earthen character: the speckled brickwork in varying shades



Schematic diagram of spatial distribution and access routes in buildings by Hermann Fehling and Daniel Gogel



Ground floor plan, chapel on the left, ancillary spaces on the right



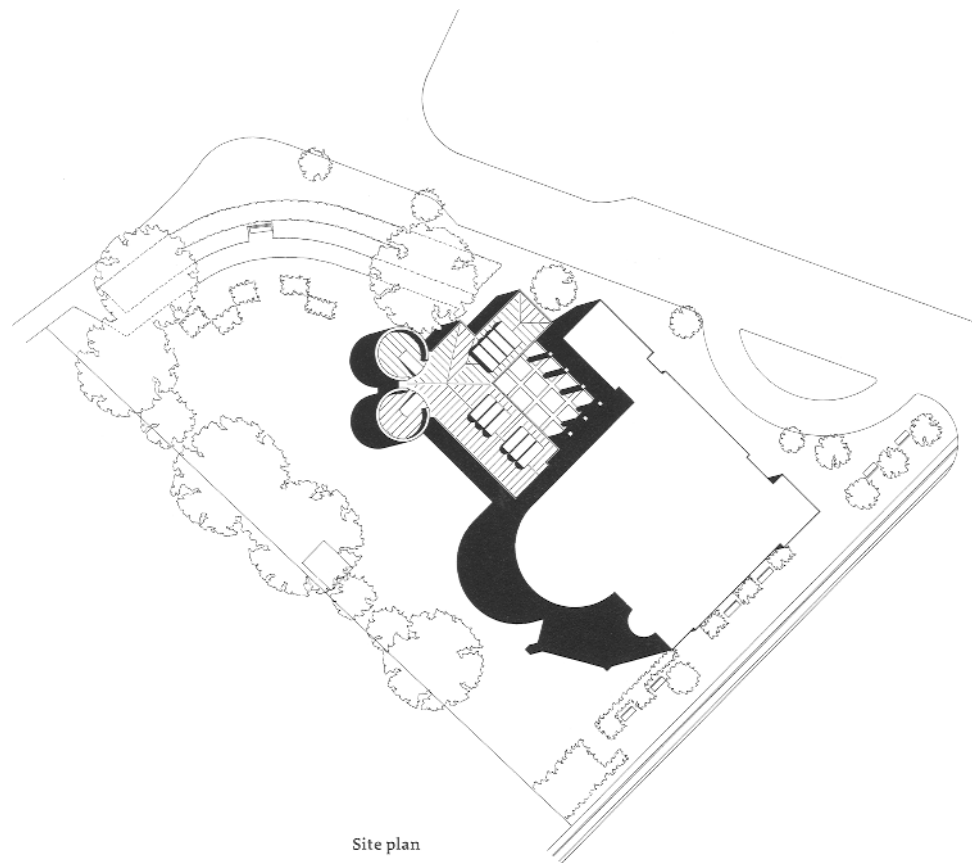
View from the south, waiting room on the left next to the entrance, columbarium on the right, gallery above | View from the north, in the centre the exit to the cemetery | View from the west, left the rooflight over the "catafalque", in the centre the round tower providing access to the gallery | Chapel, next to the diagonal wall the door to the room for flowers and wreaths | Chapel, axis from the entrance with chandelier beneath the rooflight and gallery in the background

of brown, the brown and green on the copper roofing, the molten and wire-glass windows of the openings sometimes green sometimes frosted. The architecture does not emphasise any particular façade. As such, it is all the more surprising that the building is so legible. All parts of the building are arranged on an axis, beginning with the double doors of the entrance and exit and marked by the folded-over form of the rooflight. If one walks around the building from the west to the south and from east to north, the winding staircase to the gallery is legible as a rounded glass tower, the gallery as a block, the waiting room as an octagon, the columbarium as a cylinder, the toilets as a cube and the room for the flowers and wreaths as a glass sloping roof.

The axis passes through the stainless-steel-clad double doors of the entrance and measures 16.2 metres to the rear of the chapel. Descending slightly, it marks the passage from this to the other world. The gallery is arranged high up to the left and provides space for an organist and choir, the twelve rows of pews for the funeral congregation to the right. The floor is an earth-coloured linoleum, the ceiling concrete with white plaster. The brick bond is stretcher/stretcher/header throughout except for behind the pews and at the front – to the left and right of the "catafalque" in front of the exit – where it gives way to a decorative brickwork lattice. Beneath the rooflight hangs a metal framework containing tubes of frosted glass in the form of a stretched hexagon. Longer in the middle

than at the sides, the tubes are not for artificial lighting but instead filter daylight from the rooflight and evoke associations with a chandelier or crown that floats over the deceased.

The influence of the work of Hans Scharoun, Hugo Häring and Max Taut on the oeuvre of both the architects is unmistakable. Certainly, at first glance the chapel at Am Fließtal cemetery appears expressive and organic. Even more apparent is its functionally and rationally determined form, designed from the inside to the outside. The geometry and materials of the building are identical internally and externally, creating a work of great transparency and harmony.



Site plan



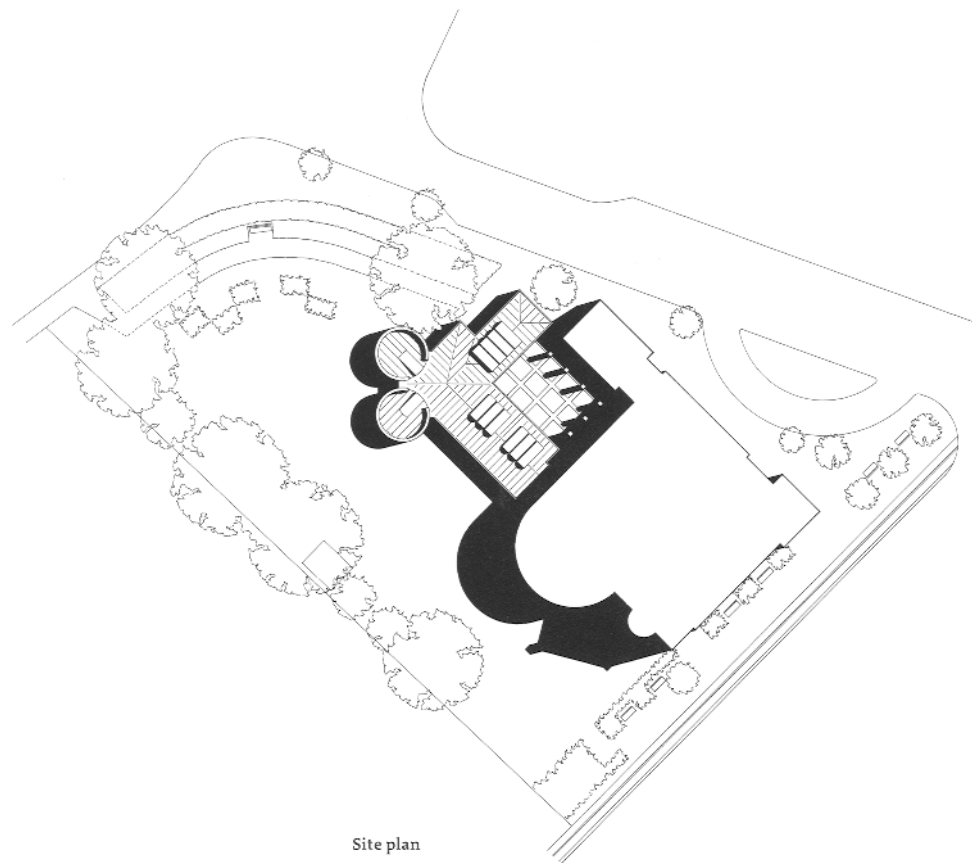
Courtyard garden looking northwest, with pool in the centre | View of the church from the west, the two chapels of rest in the foreground | View from the corridor of both chapel entrances | Interior of the chapel of rest with strip of light from above

Chapels of Rest, Skovshoved Church

Gentofte, Denmark

Architects	Vilhelm Wohlert, Viggo Kanneworff, Niels Munk
Client	Skovshoved Parish Church Council
Completion	1985
Denomination	Lutheran-Protestant
Footprint	Each ca. 16 m ²
Seating capacity	Each ca. 6

The church in Skovshoved, a small village in the vicinity of Copenhagen, stands in the fork of a junction between two roads and adjoins an expanse of green. The sizeable red brick building, whose nave measures 49 metres from the portal steps to the back of the apse, was designed by Alfred Brandt and dedicated in 1915. An annexe was added to the right of the entrance in 1930. A corner of land remained between the church and the extension which many decades later the parish decided to use for a further low, flat-roofed office and two chapels of rest. For the building's plan, the architect chose a right angle with equidistant arms that intersects at its corner with two circles and closes off a portion of the previously open space to the west.



Site plan



Courtyard garden looking northwest, with pool in the centre | View of the church from the west, the two chapels of rest in the foreground | View from the corridor of both chapel entrances | Interior of the chapel of rest with strip of light from above

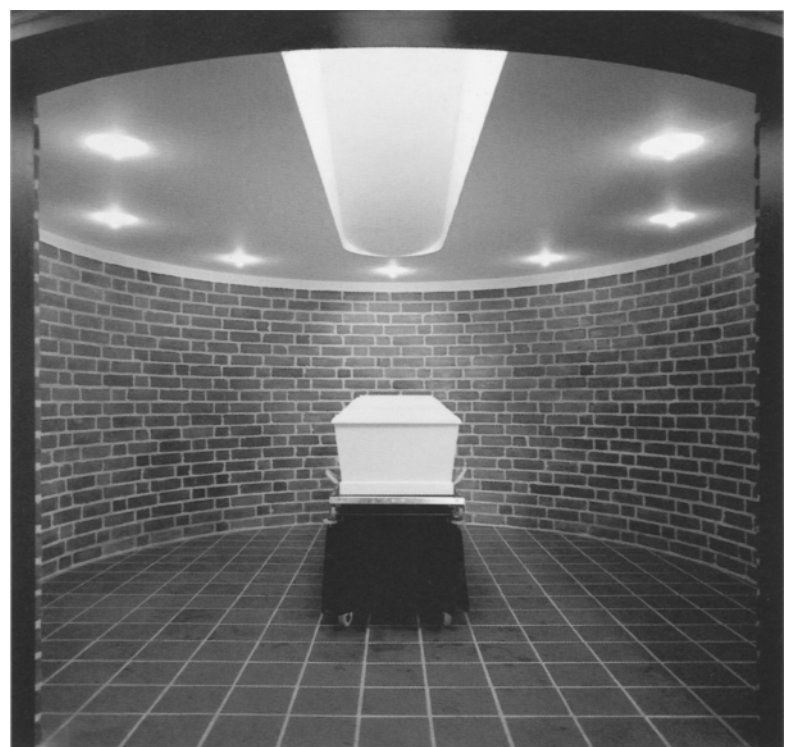
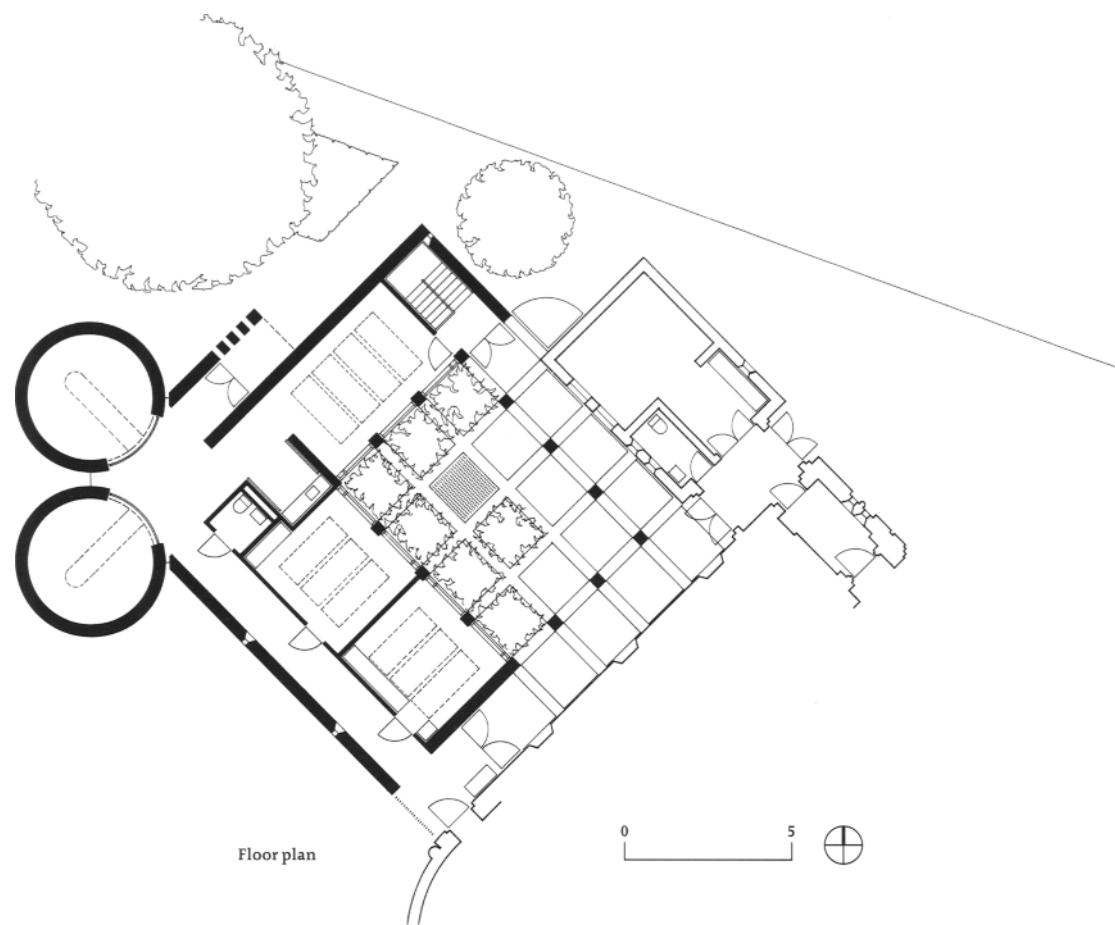


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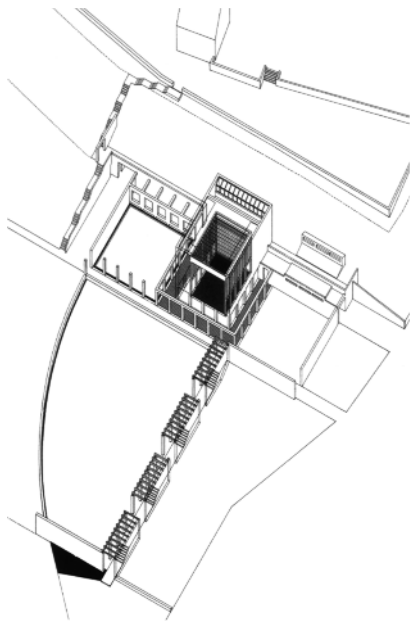


Together with the church, the previous extension and the new extension form a small courtyard. The building to the north contains spaces for the parish, the building to the south two smaller offices. The rooms with their horizontal windows all face the courtyard and are additionally lit from above by glazing in either three or four semicircular roof elements that span the roof. A corridor leads from the apse of the church past the offices to the corner of the building where two round chapels, with their matt black, metallic, double-wing doors, project into the corridor. These tiny chapels of rest – each with an interior diameter of no more than 4.4 metres – are entirely windowless; the only light is provided by a strip of white in the ceiling of the room. Such chapels, often found in towers, are a part

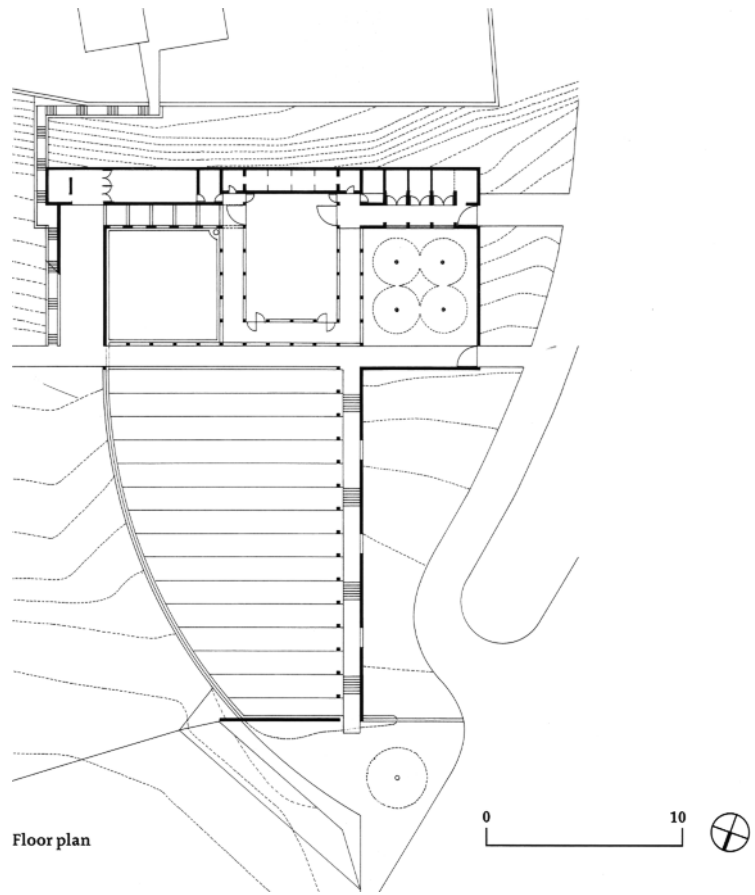
of the tradition and typology of churches in rural Denmark and are used for holding a vigil for the deceased in the presence of the coffin.

The complex is based on the plan of a square, a fact that is evident despite the “disruption” to the perfection of the square caused by the intrusion of the cylindrical chapels. Moreover, it is based on a grid of seven by seven squares, whose dimensions are determined by the church and the earlier extension, a fact that becomes evident by looking at the floor of the courtyard and the arrangement of its walls, planting and pool. Their order is not purely for decoration, but inscribes the grid on the courtyard.

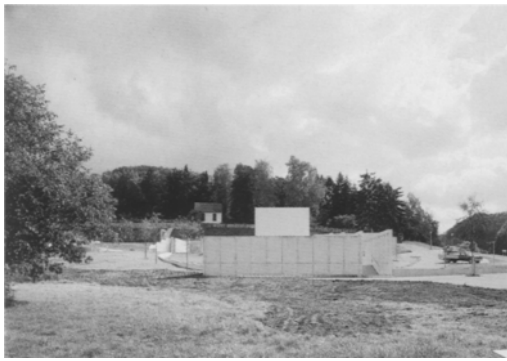
The architecture is introverted and the activities it houses turned inwards. Nevertheless, the old and new actively engage in a permanent dialogue, for instance through the monk bond of the brickwork – a repeating pattern of two stretchers and a header – or through the ambulatory with apse and arcade. It does not take an expert to recognise the pattern of the cloister with two chapels in Skovshoved. Here the assimilation of the Romanesque has taken place twice over: in 1915 the historicist approach of emulation and quotation; in 1985 the modernist approach of abstraction and reduction. The new addition, built right in the middle of a decade of postmodernism, establishes a connection with its history not through imitation but by creating a tension between continuity and transformation.



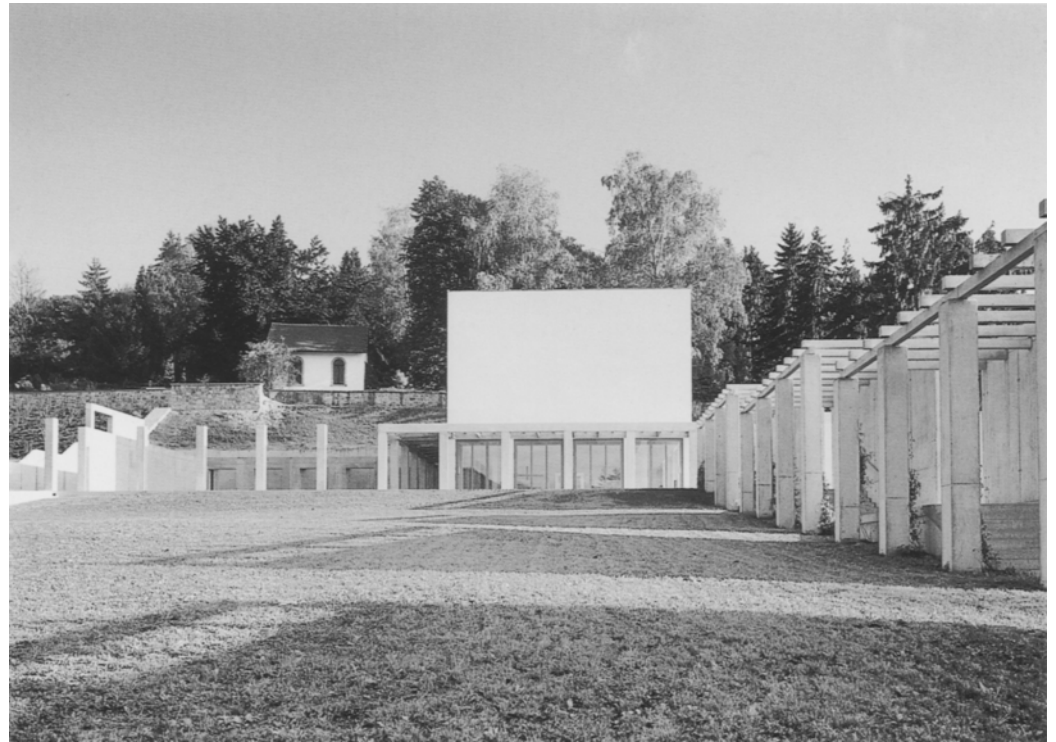
Axonometric



Floor plan



Chapel from the north with the village cemetery on the hill in the background | Funeral chapel with grass for anonymous burial in the foreground and pergola on the right



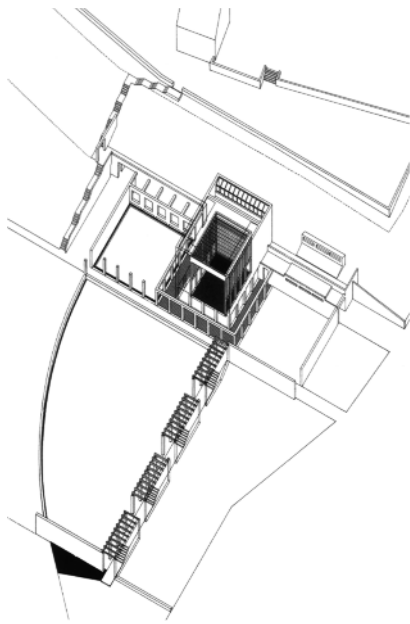
Funeral Chapel, Maulburg Cemetery

Maulburg, Germany

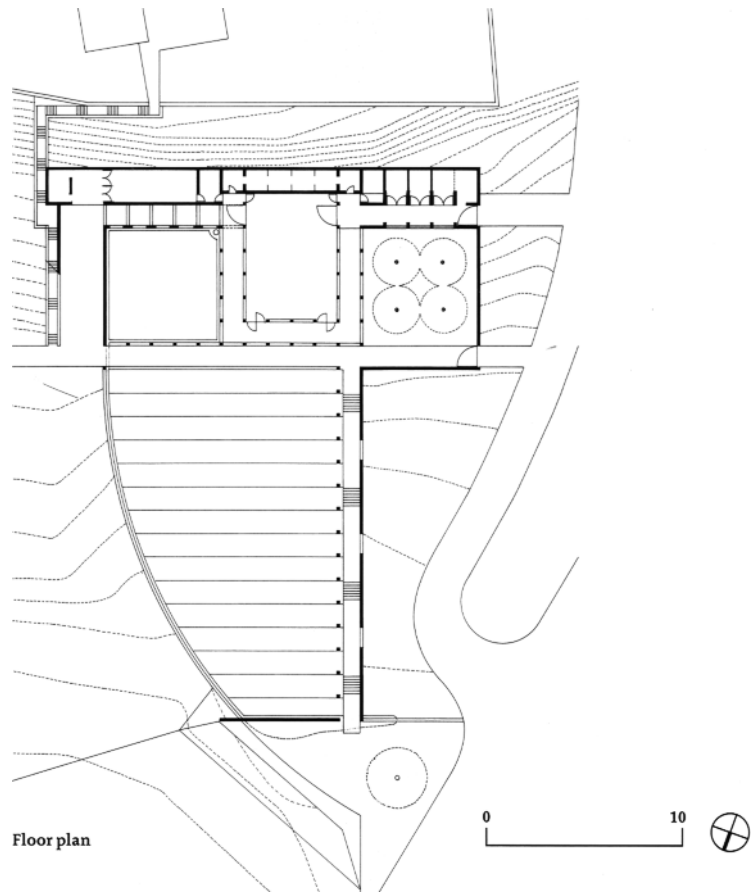
Architects	Günter Pfeifer, Roland Mayer
Client	Maulburg Parish
Completion	1991
Denomination	Non-denominational
Footprint	Chapel 283 m ²
Seating capacity	ca. 140

Maulburg cemetery in the Black Forest lies on an incline at the edge of the village. The new funeral chapel stands against a romantic backdrop of trees and the old chapel with its retaining wall. It is flanked on each side by a square courtyard. Visitors reach the 9.65 metre high rectangular building from the bottom of the incline; behind a heavy grey concrete slab to the right, a pergola made of prefabricated concrete elements ascends in four stepped sections to the chapel.

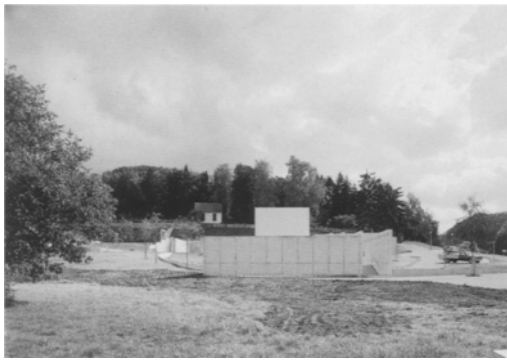
Before the funeral service begins, the mourners gather beneath the low green canopy of the four plane trees in the "Courtyard of the Living". To the rear of this level courtyard, concealed behind a narrow passageway are three viewing chambers.



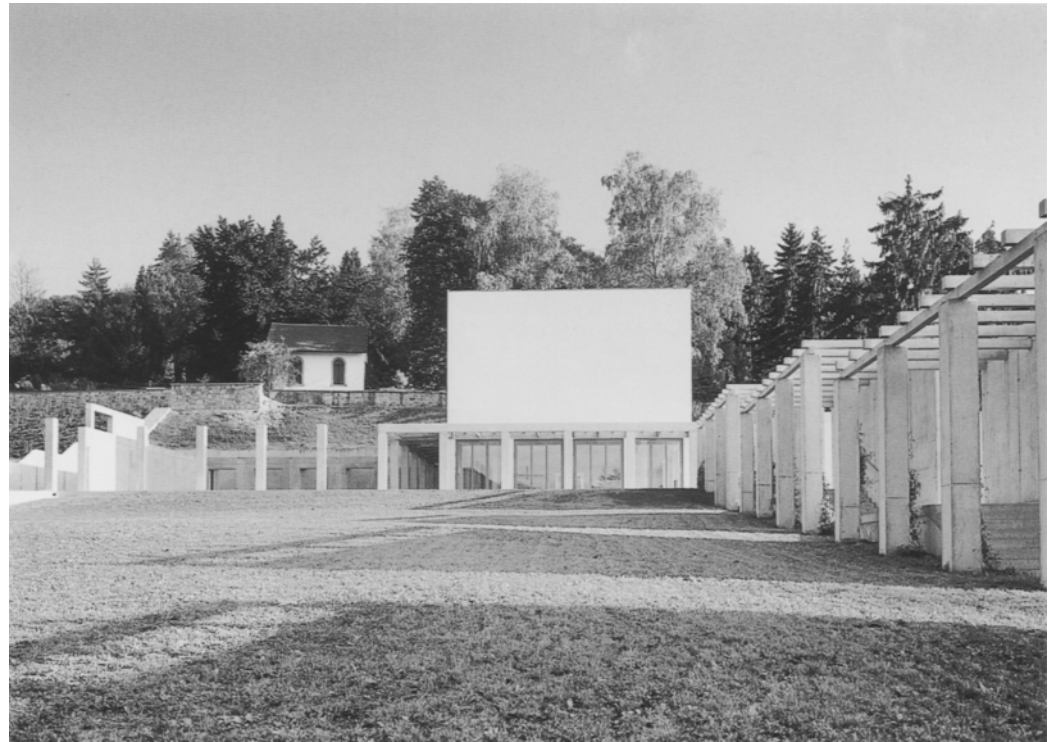
Axonometric



Floor plan



Chapel from the north with the village cemetery on the hill in the background | Funeral chapel with grass for anonymous burial in the foreground and pergola on the right



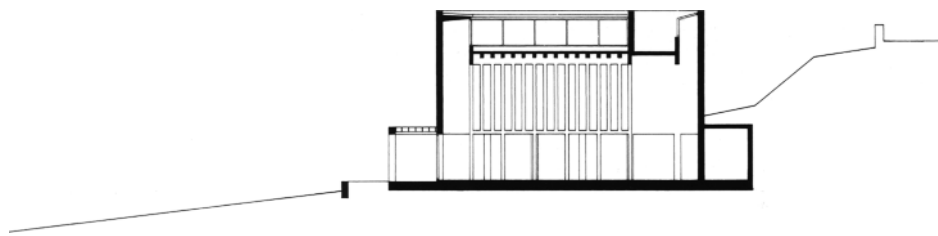
Funeral Chapel, Maulburg Cemetery

Maulburg, Germany

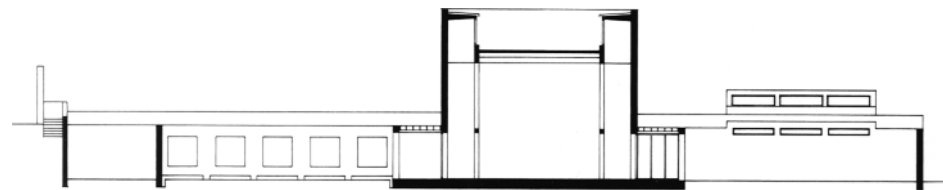
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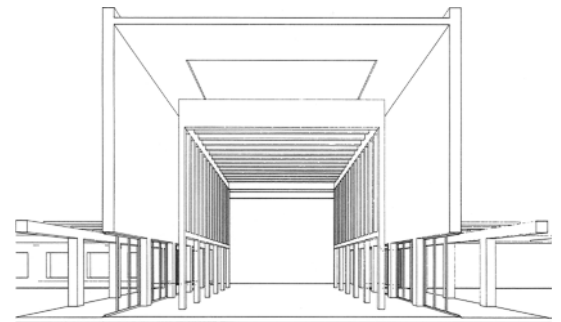
Before the funeral service begins, the mourners gather beneath the low green canopy of the four plane trees in the "Courtyard of the Living". To the rear of this level courtyard, concealed behind a narrow passageway are three viewing chambers.



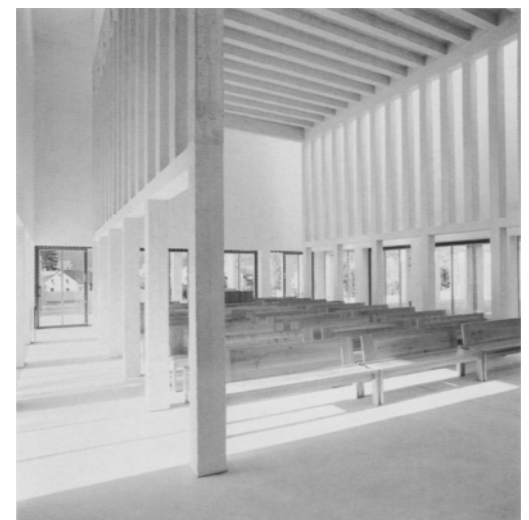
Longitudinal section



Cross section



Perspective of the chapel with inner "baldachin"



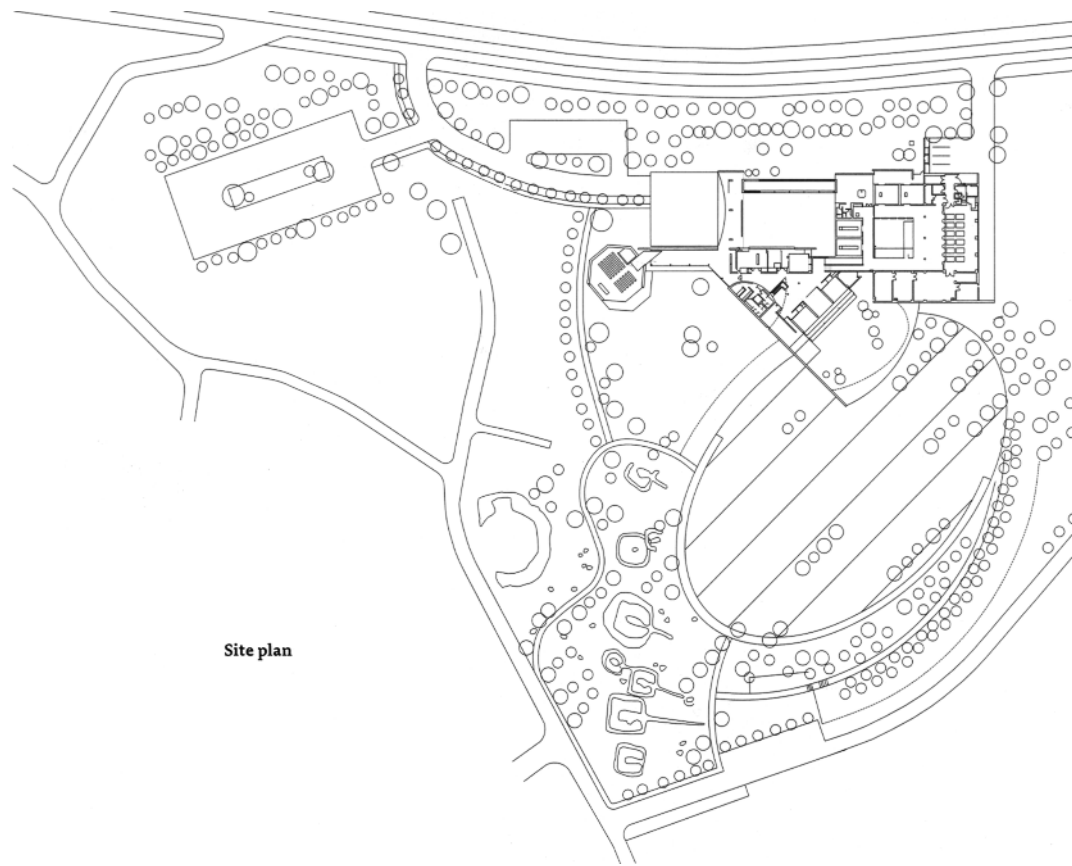
The "Courtyard of the Living" with its four plane trees | The funeral chapel, entrance from the northeast | The chapel interior, view from the southwest

The centre and culmination of the complex is the funeral chapel. One enters through the foremost of the three open and partially glazed ambulatory aisles. From inside, the solid square building appears suddenly lighter and brighter, more so even than the courtyards on either side. The concrete outer shell encloses a rectilinear skeletal structure of columns and ribs. Like a house within a house, it stands over the mourners like a protective, even respectfully ceremonial baldachin. In addition to light from the three ambulatory aisles at the sides, concealed rooflights allow light from above into the room. In front of the particularly bright south wall, likewise illuminated by a hidden rooflight, a steel cross projects from the side. The coffin is placed on a black floor slab. The pews, made of alder, offer seating

for up to 140 mourners. After the funeral service, the coffin is taken through to the "Courtyard of the Dead". This square, covered with gravel, resembles a Japanese garden. Three stone blocks lie in the southeast corner; in the southwest corner water bubbles from a spring and runs in a channel around all four sides of the courtyard before continuing along the gentle curve of a concrete wall down the hill until it collects in a pool at the bottom next to the entrance. The deceased are buried not only in the old cemetery behind the funeral hall but also as anonymous burials on the green to the side of the pergola.

The entire complex is based on a 1.38-metre grid. The ascent to the hall and the axial symmetry of courtyard/

building/courtyard reinforce the typical, i.e. familiar pattern of paying one's respects. Through its relationship between outside, inside and again outside, the design expresses the transition from before to after, from this world to thereafter, as a spatial as well as figurative opposition.



Site plan



The external courtyard, in the centre part of the "cloister" with garden court beyond, to the right the chapel | Aerial view from the south | Vestibule seen from the cloister, back left the sliding door to the viewing rooms, back right the entrance to the interior court | Viewing room



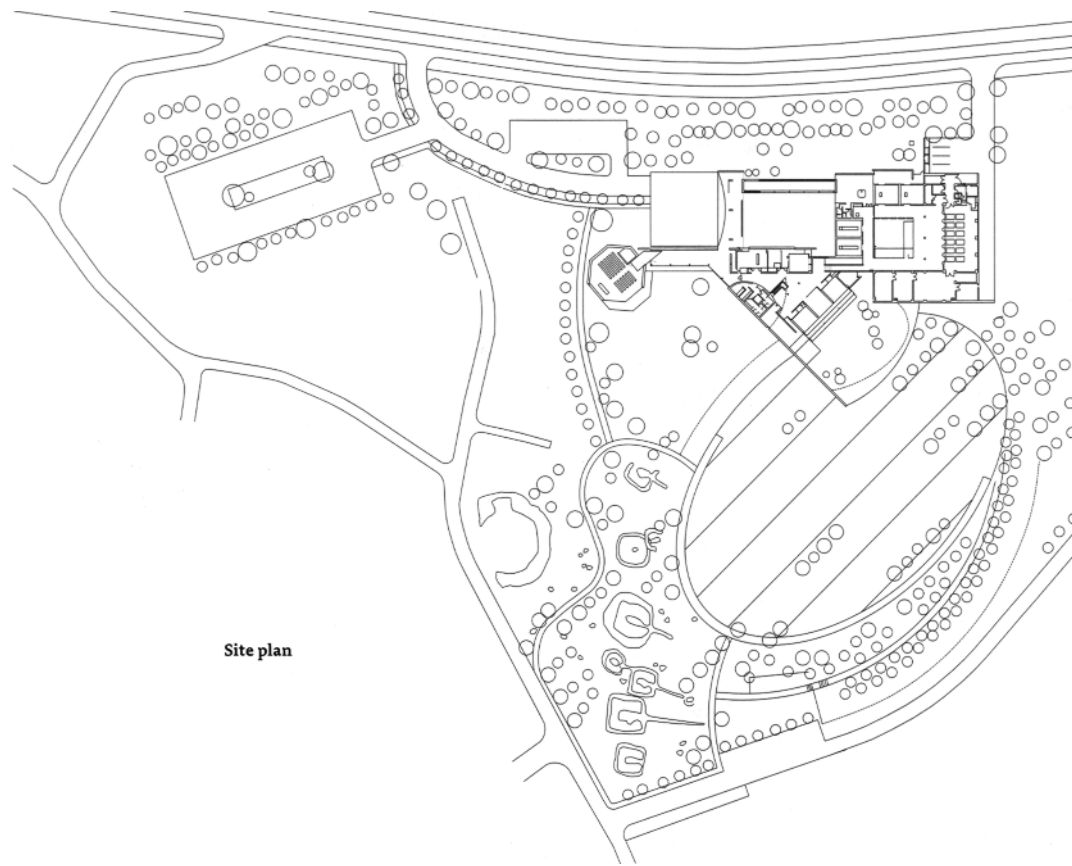
Hill of the Winds Crematorium

City of Nakatsu, Japan

Architect	Fumihiko Maki
Client	City of Nakatsu
Completion	1997
Denomination	Non-denominational
Footprint	ca. 2514 m ² Chapel of rest ca. 200 m ²
Seating capacity	Chapel ca. 100

In Japan, cremation has always been the most common form of funerary rite. The funeral itself can often take hours. The lengthy ceremony consists of a series of rituals, which have a set format, but are nonetheless open-minded. Unlike in central Europe, where almost all crematoria – such as Peter Behren's crematorium in Hagen from 1907 or Erik Gunnar Asplund's building in Stockholm from 1940 – observe a strict separation between the solemn ritual and the prosaic machinery of cremation, in Japan the actual cremation of the deceased is not entirely concealed from the funeral congregation.

The building stands on a 3.3-hectare site on the outskirts of Nakatsu, a municipality with 70,000 inhabitants in southern Japan. The site is bounded on the north by



Site plan



The external courtyard, in the centre part of the "cloister" with garden court beyond, to the right the chapel | Aerial view from the south | Vestibule seen from the cloister, back left the sliding door to the viewing rooms, back right the entrance to the interior court | Viewing room



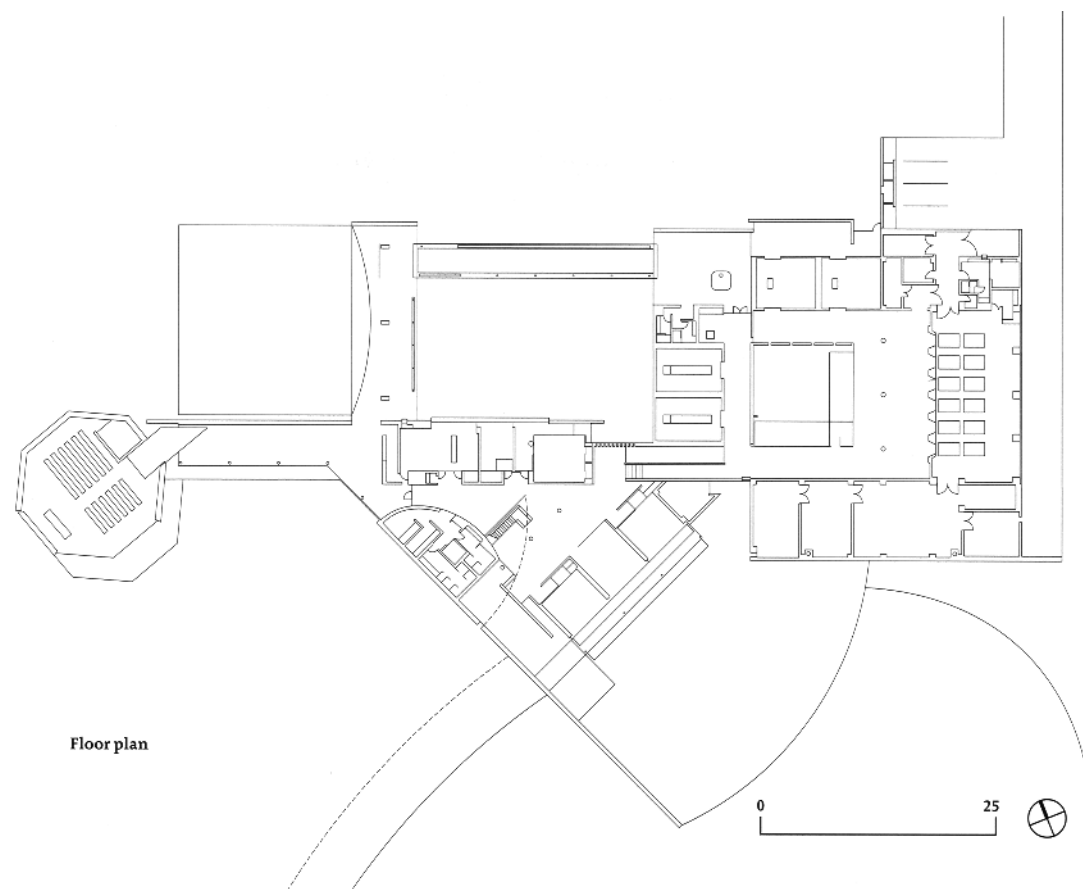
Hill of the Winds Crematorium

City of Nakatsu, Japan

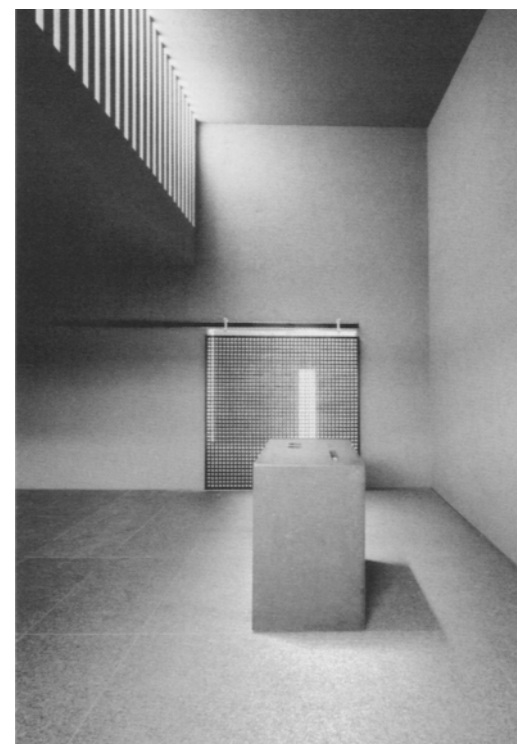
Architect	Fumihiko Maki
Client	City of Nakatsu
Completion	1997
Denomination	Non-denominational
Footprint	ca. 2514 m ² Chapel of rest ca. 200 m ²
Seating capacity	Chapel ca. 100

In Japan, cremation has always been the most common form of funerary rite. The funeral itself can often take hours. The lengthy ceremony consists of a series of rituals, which have a set format, but are nonetheless open-minded. Unlike in central Europe, where almost all crematoria – such as Peter Behren's crematorium in Hagen from 1907 or Erik Gunnar Asplund's building in Stockholm from 1940 – observe a strict separation between the solemn ritual and the prosaic machinery of cremation, in Japan the actual cremation of the deceased is not entirely concealed from the funeral congregation.

The building stands on a 3.3-hectare site on the outskirts of Nakatsu, a municipality with 70,000 inhabitants in southern Japan. The site is bounded on the north by



Floor plan



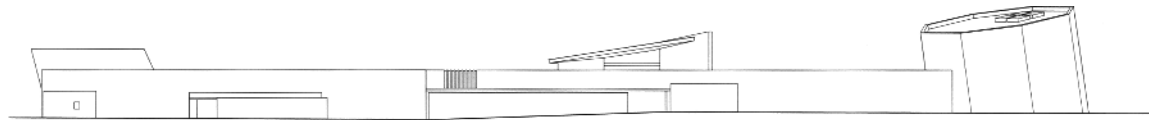
a road with open countryside to the south. Between the two lies a small park named the “Hill of the winds” – in Japanese “Kaze-no-Oka”. At the edge of the elliptical site, eight recently discovered burial mounds from the 3rd century can be found as well as a smaller old cemetery. The location therefore has a long history of its own, which the voluminous new building now extends into a new phase. Despite its size, the building attempts to appear as inconspicuous as possible, distributing the large extent of its volume in a wide, low-lying building. From the grounds, the building manifests itself as an abstract sculptural ensemble of boulder-like forms that appear to sink into the earth; an obvious allusion to mankind’s return to the bosom of mother nature.

The complex comprises an open courtyard, a garden court and an internal courtyard, as well as three buildings, each with distinctly different functions, geometry and materials. The first section is the crematorium, a quadratic volume made of grey concrete; the second is the waiting area, a triangle clad in brown corten steel; the third section is the funeral hall, an octagon faced with grey-brown brick. Slightly inclined corridors connect each of these elements to the next.

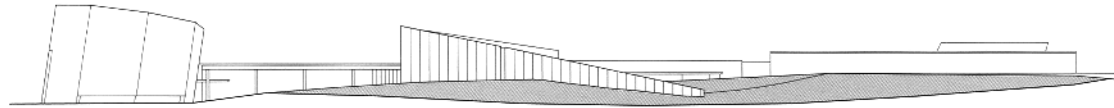
From the aforementioned open courtyard, a square measuring exactly 21.65 metres in each direction, the path leads around the edge of a covered “cloister”. Leaving the garden court on one side and proceeding onwards further and further, one finally arrives in an an-

teroom. Its entrance is the full height and width of the space – there is no fourth wall to the space. The three concrete walls to the left, right and rear bear traces of cedar timber shuttering, horizontal below and vertical above, creating the impression of a plinth and upper storey. A single cylindrical column stands in the middle of the stage-like room and disappears through an opening in the ceiling.

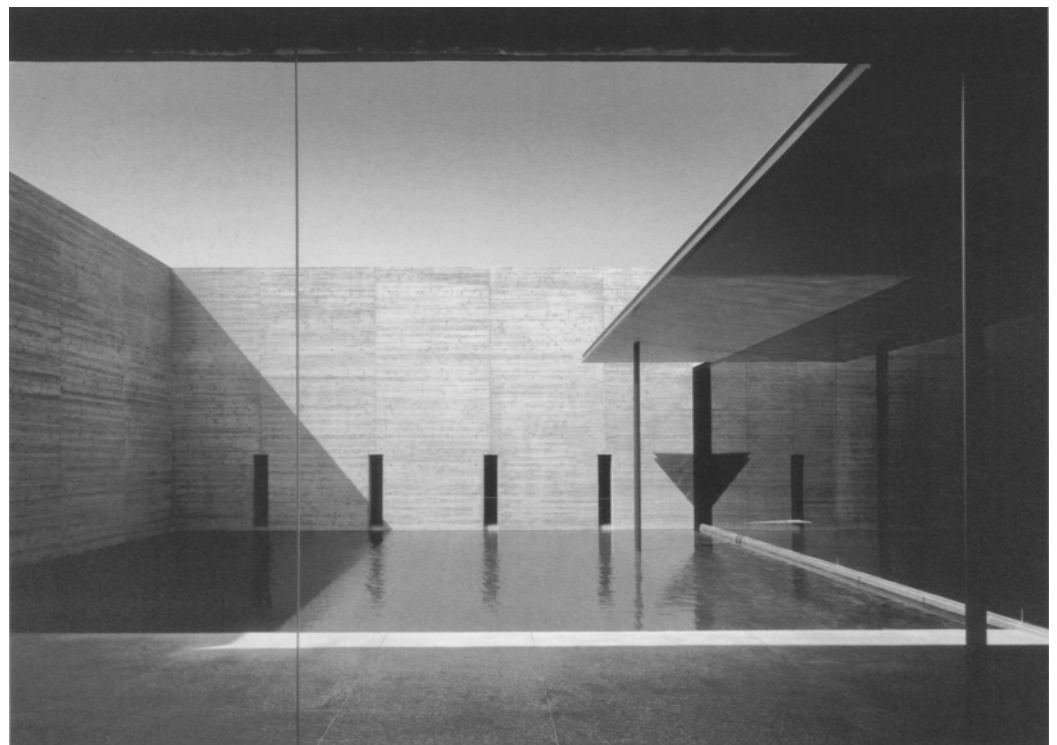
The process of taking leave from the deceased begins directly behind this anteroom in one of the viewing rooms located behind a sliding wood latticework door. Each of these measures 5.54 by 6.6 metres. Subdued light enters through slats high up in one of its white walls. The coffin rests on a black stone catafalque on



North elevation



South elevation



the narrow side of the room, from which soon after it will be taken for cremation. The deceased does not disappear through the floor – which would create the impression of a burial rather than of a cremation – but is taken to one of the six cremation furnaces on the east side of the building. After the cremation, the mourners receive the bones and ashes on a tray for transferral to the urn. This ceremony takes place in two enshrinement rooms whose form and atmosphere are similar to that of the viewing rooms.

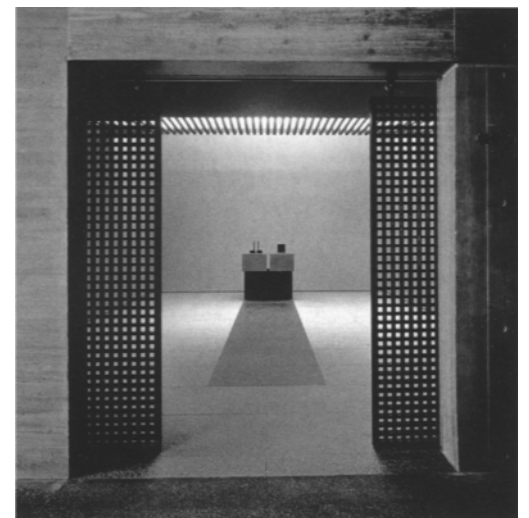
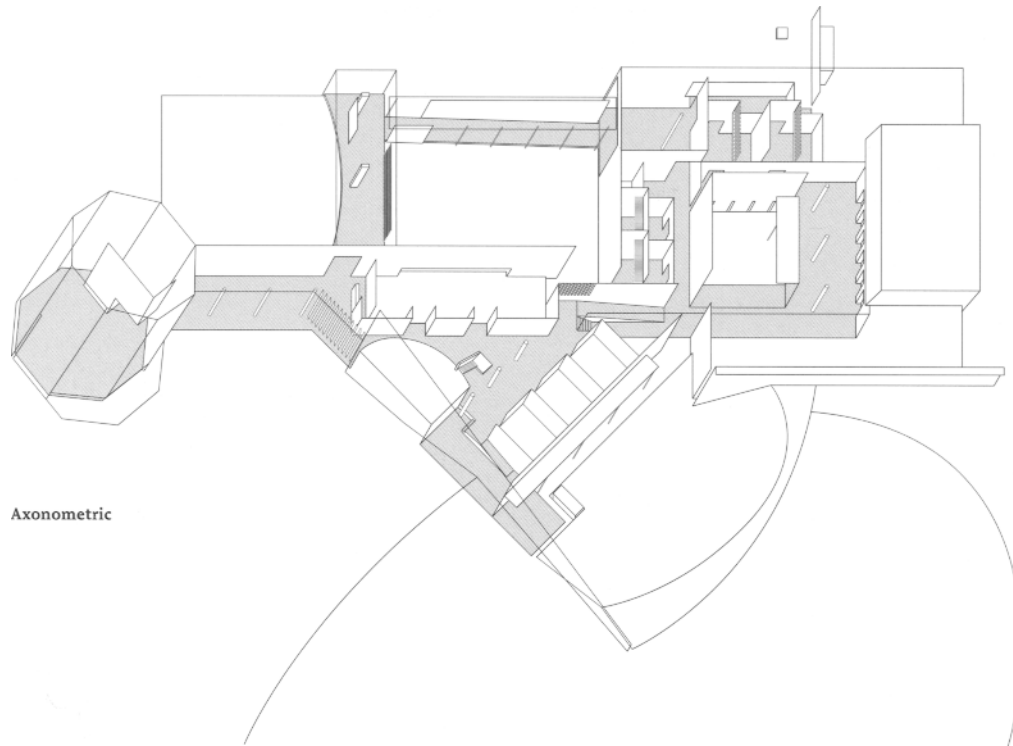
The four sparse rooms for the viewing and enshrinement as well as the narrow hall in front of the wall with the furnace doors surround the interior courtyard. This courtyard is half the size of the external court-

yard, but with a size of 10.8 by 10.8 metres is much more than simply a source of light. In the pauses between the rites, the funeral congregation can gather and wait in this plain hollow cube. Here one's view turns to the smooth reflective surface of a rectangular pool of water. The west and north sides are enclosed by impervious concrete walls, the east and south sides by contrast are open and glazed. A roof canopy reduces the intensity of the light streaming into the hall in front of the cremation furnaces.

In contrast to all the other areas of the ensemble, the waiting area – for the mourners while waiting for the cremation to finish – is lighter, warmer, open and friendlier. With its parquet flooring, elegant chairs and

broad expanse of windows with a view of the “hill of the winds” and the mountains in the distance, it resembles a lobby or a lounge. In the centre of the space, a set of steps lead to a small platform. Here the spatial form above and below is that of an arc of a circle, the only curved form in the entire building.

A little to the west of this area, at the end of a corridor leading southwards to the park, one reaches the funeral chapel. The octagonal form of the “chapel” does not sit straight, tipping forward markedly over its entrance. It has a diameter of 15.46 metres. There are absolutely no views into or out of the room. The white plastered walls and black slate floor of the room are instead lit from above by only four circular holes in the roof, from the



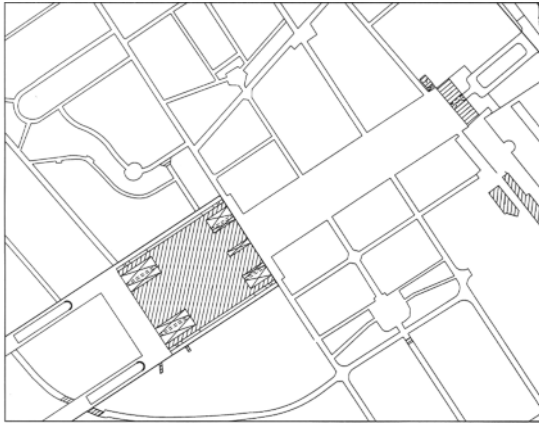
Waiting area with view of the park | The interior court from the south, on the right the roof canopy that shades the hall | Funeral chapel with daylight from circular, vertical and horizontal openings | Enshrinement room

right by a vertical slot behind the “altar” and from the left by a horizontal band above the floor that runs along two of the eight sides of the octagon. The facing brickwork on the outside are laid without joints or mortar and anchored to the concrete walls with steel ties.

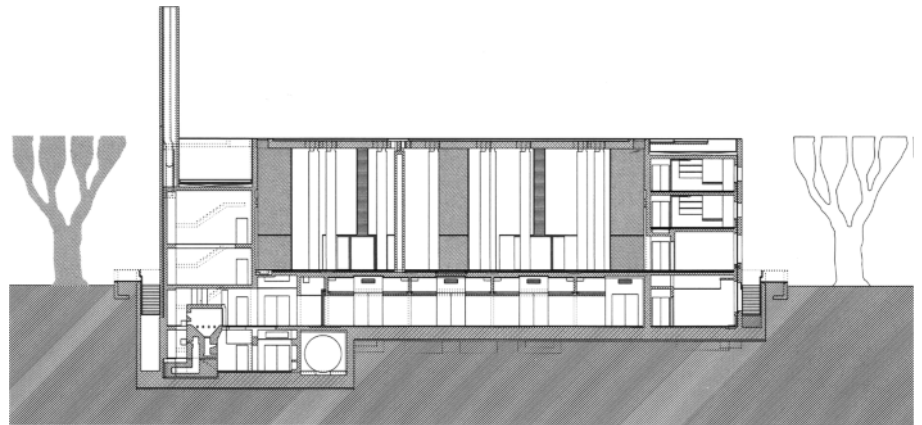
The ceremony reaches its end with the burial of the urn on the gentle grassy incline of the hill of the winds, reached via a path running around its perimeter.

The crematorium in Nakatsu has little interest in what journalists might term attractive architecture. More important than the resolution of such formal concerns was the arrangement of paths between the parts of the building. These are not designed with efficient func-

tional operation in mind, but as a physical and mental passage from stage to stage. The Japanese “rites of passage”, to use the terminology of the ethnologist Arnold van Gennep, accord this processional architecture great importance. The arrival of the coffin, the cremation of the corpse, the enshrinement of the ashes, the burial of the urn: with each step the route leads from predominantly light to increasingly dark, from wide expanse to increasingly constricted, from open to progressively closed. In this way, the building gradually leads one closer to a notion of the underworld. This slow movement from space to space is also reminiscent of the gradual unfolding of the spaces of a Shinto shrine.



Site plan



Northwest-southeast section in front of the rear wall



Front face of the building with the three forecourts | View from the centre of the entrance through the vestibule to the entrance of the large ceremonial hall behind, in the foreground at the left and right, the glazing of the smaller ceremonial halls | The vestibule or "campo stella" looking towards the southeast wall with small niches, on the right the entrance to the large ceremonial hall | Small ceremonial hall

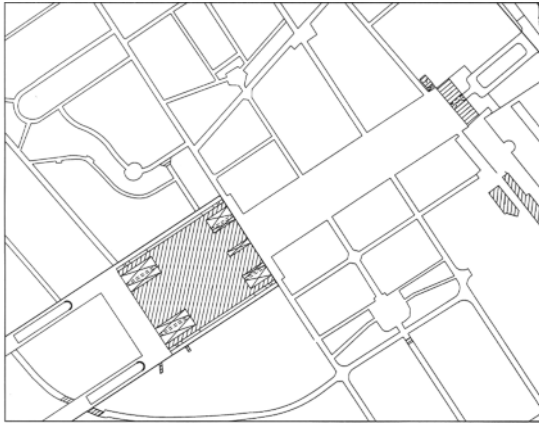


Baumschulenweg Crematorium

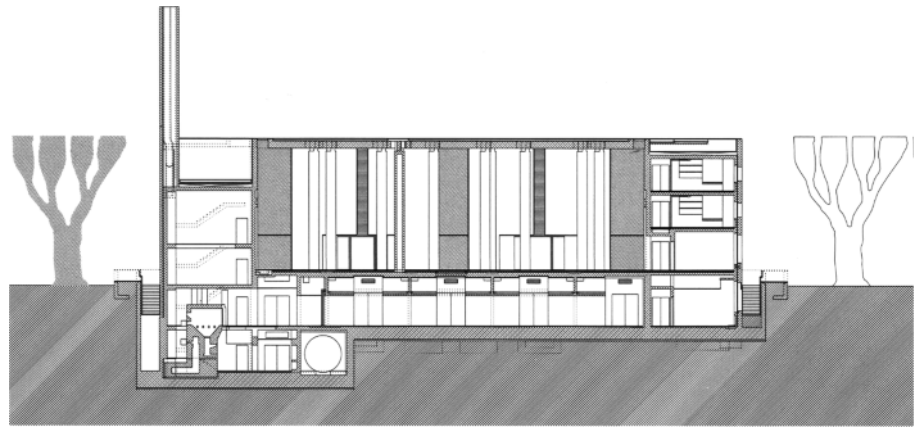
Berlin, Germany

Architects	Axel Schultes, Charlotte Frank
Client	Treptow District Authority, Berlin
Completion	1998
Denomination	Non-denominational
Footprint	3,290.11 m ²
Seating capacity	Large hall ca. 250, small halls each ca. 50

The building stands at the end of the northeast-southwest axis of a medium-sized cemetery. The crematorium itself is symmetrical about its axis. With a width of 48.96 metres, a depth of 67.2 metres and a height of 11 metres, the building is exceptionally large. The frontage is characterised by three tall recessed forecourts, two of them wide, one narrow. At the rear of each "narthex", is a glazed plane that reaches from floor to ceiling. A slot in the concrete ceiling directs one's gaze on ahead into the building; the entrance, however, is through a sliding door to one side. The 30 by 30 metre large rectangular vestibule within the building has the dimensions of an urban square. Concrete walls enclose the hall to the northwest and southeast. Indented niches structure their surfaces. The centre of



Site plan



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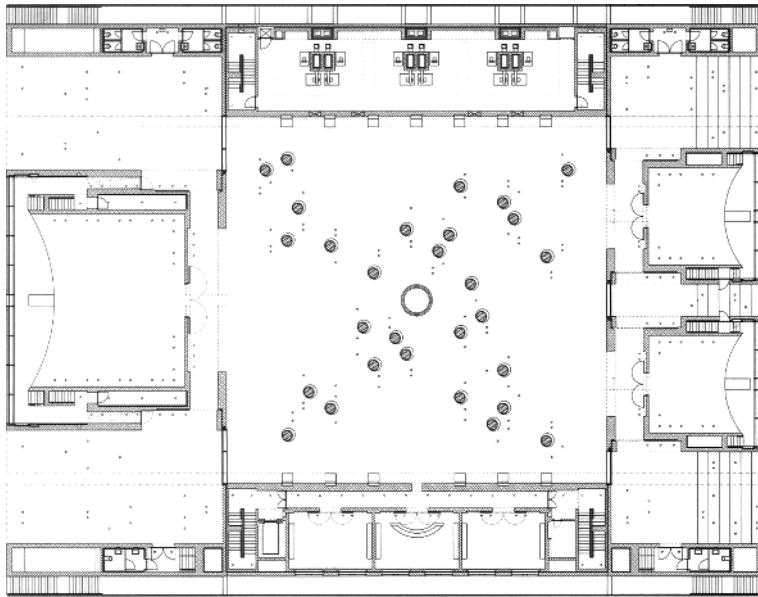


Baumschulenweg Crematorium

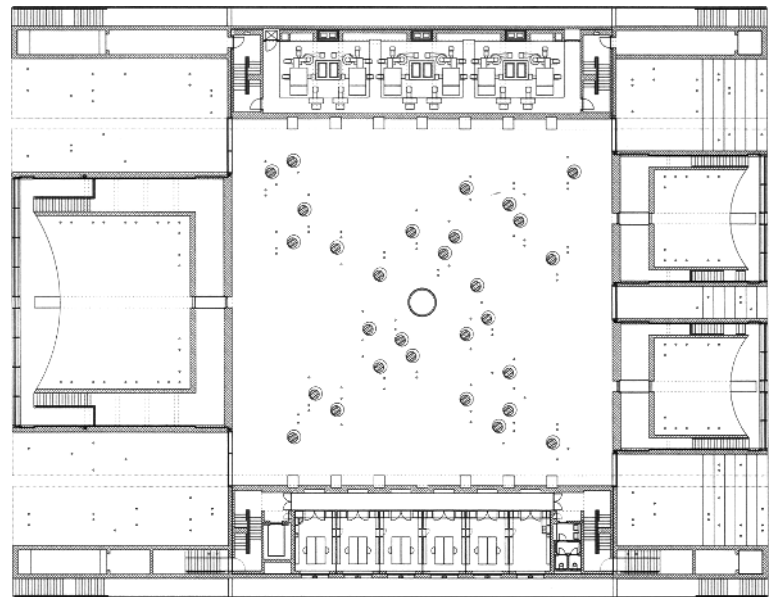
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Ground floor plan



First floor plan



the hall is marked by a shallow circular fountain. The concrete roof is borne by 29 circular columns. A short cantilevering bracket connects each column with the roof; in all other directions, column and roof are separated by an opening. The roof plane appears to float. Arranged freely in the space, more densely towards the centre and more loosely towards the edges, the columns structure the space and at the same time allow it to be perceived as a whole. The shafts form small "clearings"; in this "forest" each group of mourners can find their own space to congregate.

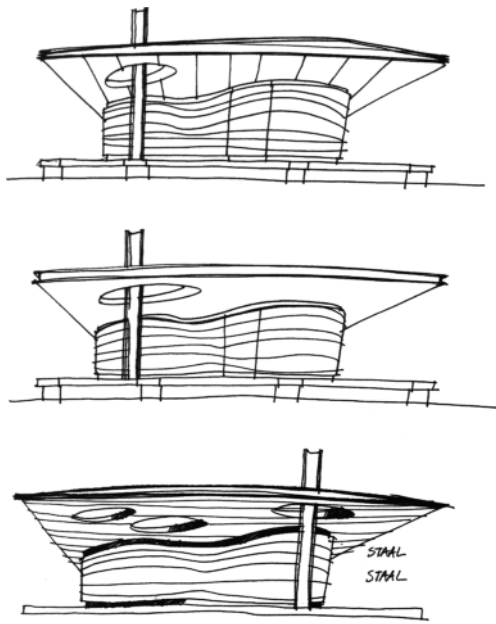
From the vestibule, one can enter the ceremonial halls, two smaller halls at the front seating 50 persons and a large hall at the rear seating 250 people. When lit from

inside, each of the three halls can be seen clearly from outside. Each hall consists of an inner box-like structure that is open at the front and an outer glazed envelope with metal louvres. These louvres allow the level of daylight to be controlled. The cool, light colours of the surfaces vary from grey to green to blue. The pews, the cut-out in the ceiling and the podium with the catafalque all follow the same curving arc, highlighting the front of the space where the coffin stands.

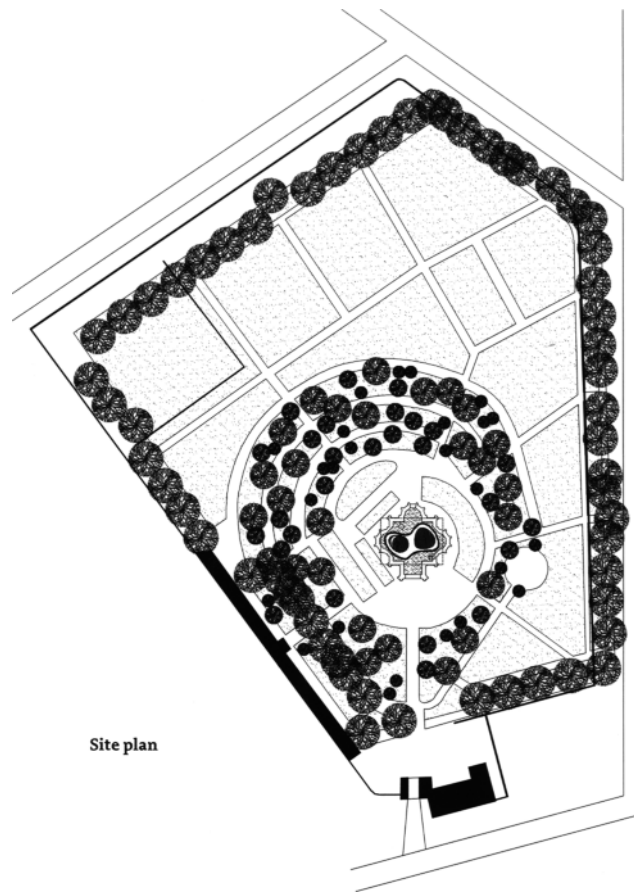
What happens before and after each ceremony is not seen by the mourners: whether the 652 storage units of the mortuary in the lower floor or what happens behind the side walls of the central vestibule. Behind each side wall of the building is a three-storey high

block accommodating offices and administration spaces on one side and on the other spaces for the six furnaces. A row of three barely visible concrete-clad chimneys are the only clues to the actual incineration itself.

Although the Baumschulenweg Crematorium is characterised by the inter-penetration of space and volume, the zones have different qualities. The external courtyards and the vestibule are open to the public and serve as circulation as well as access to the rooms behind. The ceremonial halls as well as the side-buildings are semi-public and for congregation and deliveries. The building's form is inspired less by precedents from Roman or Greek Antiquity but rather by the Egyptian temple of Karnak or the mosques of Marrakesh or Córdoba.



Design sketches



Site plan



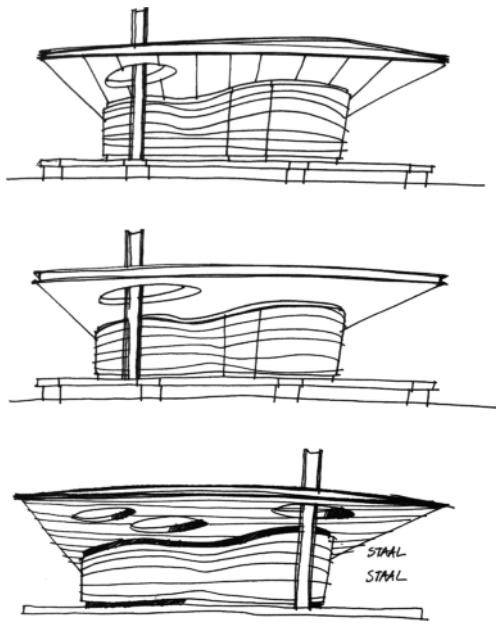
Chapel St Mary of the Angels

Rotterdam, Netherlands

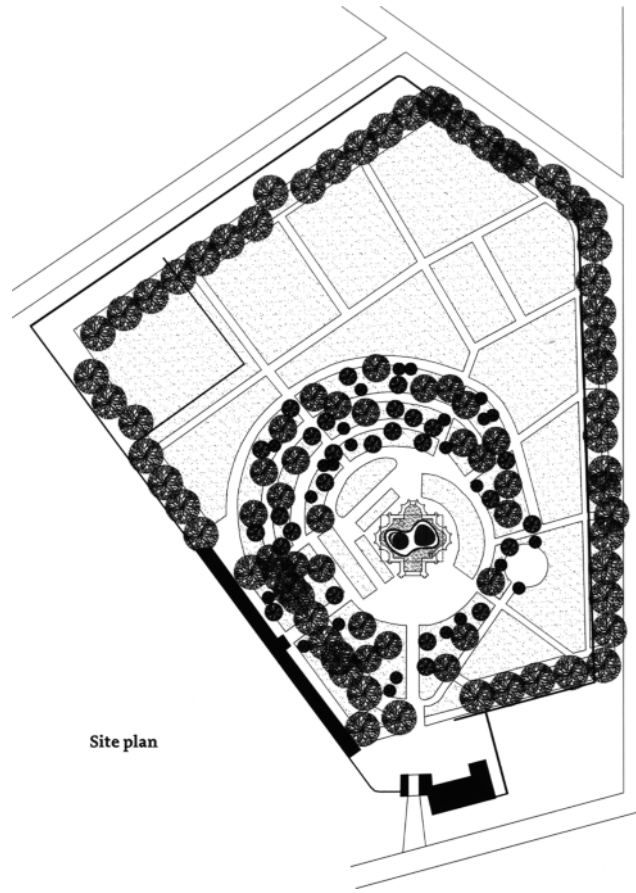
Architects	Mecanoo
Client	Roman-Catholic St Lawrence Cemetery, Rotterdam
Completion	2001
Denomination	Roman-Catholic
Footprint	ca. 120 m ²
Seating capacity	ca. 70

Although the design is influenced by the extravagances of Venetian sacred architecture, the new chapel at the Catholic St Lawrence Cemetery is more akin to a fragile pavilion. Indeed, its perimeter resembles the outline of a guitar. However, only once one has visited the building is one aware how strongly the building builds on the history of the chapel as the centre of the cemetery. Not only its location and plan, but also the space and envelope of the chapel are inconceivable without this notion of continuity and transformation.

The chapel replaces its predecessor from 1963, which in turn replaced a neo-Gothic chapel from 1869. The building stands on a gravel plateau the shape of the footprint of the foundation walls of the first chapel. Three



Design sketches



Site plan



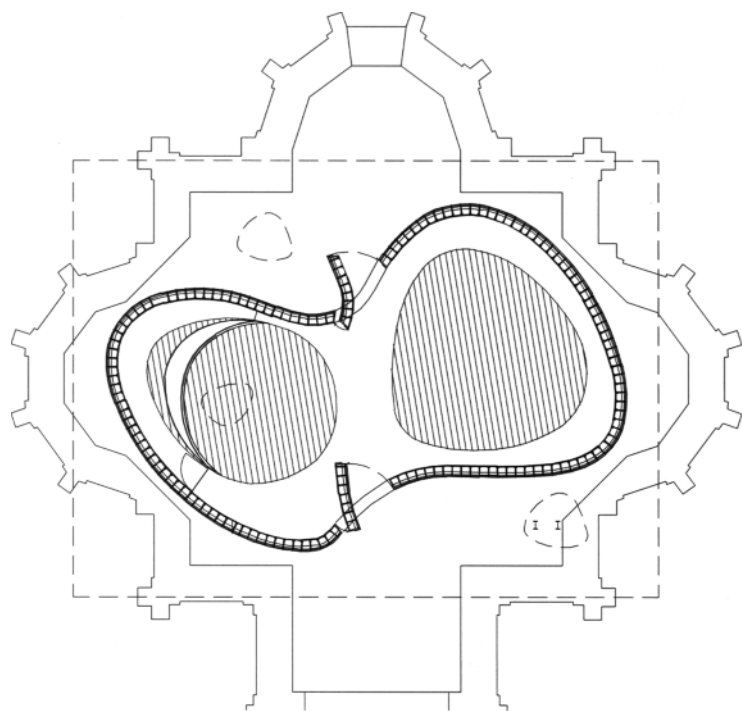
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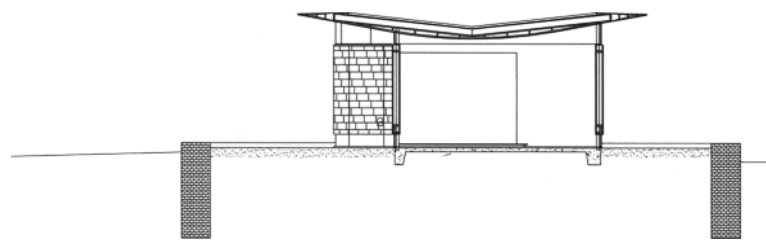
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Floor plan



Section looking west



Floating wavy appearance of wall and roof, entrance open | Entrance face of the chapel, "campanile" on the right | Passage between the entrance door on the left and the exit on the right, altar, ambo and catafalque in the background | Chapel looking east, candle holders surrounding the pews

aspects of the new plan refer to the previous buildings: the open elliptical form, which adapts to fit two of the three original apses, the sliding entrance and exit, which lie in the central axis of the old chapel, and its floating roof plane, which echoes the square of the second chapel. The architects speak of the site as a "palimpsest", inscribed over and over again without removing the traces of what was previously there.

The front, south-facing side of the chapel is marked by an 8 metre high steel "campanile" that stands to the right and projects through the roof. Whilst both the wall and roof exhibit a sometimes convex, sometimes concave wavy form, horizontal glass strips at the base and top of the wall, which allow light into the space in-

side, separate the two in such a way that each appears to float. The wall is like a wavy band. It is constructed of 18 load-bearing circular steel columns and a timber framework, clad on the outside with flat grey tin-plated copper strips.

The building has a height of 4.4 metres and a length of up to 16.5 metres. The roof sags towards the centre like a gold-coloured baldachin; the walls are plastered a smooth vibrant blue colour. Hand-written passages from the Requiem are inscribed in long lines around the walls. With its gold and blue colours, the space makes reference to the name of the chapel, as according to Catholic "colour theory", gold is associated with the image of angels, blue with the image of Mary.

When both doors are open, a passageway passes through the centre of the chapel, visually separating the two main spaces. These also serve different functions: the eastern part for the funeral congregation, the western part for the priests. The concrete altar and ambo and the oak catafalque are surrounded by a freestanding curved plane. The space behind this serves as a tiny sacristy. Tall steel candle holders stand all around. The candles are lit during the ceremony – as a result a column of smoke and light forms beneath the opening over the altar.

Bibliography

Alvar Aalto | Church of the Resurrection of Mary

Alvar Aalto. Vol. II 1963-1970, Zurich and Munich 1971, pp. 170- | Alvar Aalto. Vol. III Projekte und letzte Bauten, Zurich and Munich 1978, pp. 142- | The Architectural Review, no. 3/1979, pp. 140- | L'Architecture d'Aujourd'hui, no. 191/1977, p. 102 | Architecture and Urbanism, no. 1/1979, pp. 11- | Arkkitehti, no. 1/1979, cover, pp. 28-, pp. 55- | Chiesa Oggi, no. 2/1992, pp. 62- and no. 12/1993, pp. 24- | De Seta, Cesare: Architetture della fede in Italia. Dalle origini ai nostri giorni, Milan 2003, pp. 179- | Deutsche Bauzeitschrift, no. 4/1981, pp. 485- | Domus, no. 587/1978, pp. 8- | Ecclesia, no. 16/1998, pp. 16- | Futagawa, Yukio: Light and Space. Modern Architecture 2, Tokyo 1994, p. 315 | Gil, Paloma: El templo del siglo XX, Barcelona 1999, p. 131, pp. 133- | GA Global Architecture Document, Special Issue 1970-1980, Tokyo 1980, pp. 266- | Gresleri, Giuliano, Gresleri, Glauco: Alvar Aalto. La chiesa di Riola, Bologna 2004 | Heathcote, Edwin, Moffatt, Laura: Contemporary Church Architecture, Chichester 2007, pp. 66- | L'Industria delle Costruzioni, no. 87/1979, cover, pp. 13- | Kunst und Kirche, no. 1/1980, pp. 32- | Lindstrom, Randall S.: Creativity and Contradiction. European Churches since 1970, Washington D.C. 1988, pp. 128-, p. 139 | The Line. Original Drawings from the Alvar Aalto Archive, exhibition catalogue, Helsinki 1993, pp. 112- | Das Münster, no. 4/1987, p. 275, p. 278 | Muratore, Giorgio (et al.): Italia. Gli ultimi trent'anni. Guida all'architettura moderna, Bologna 1988, p. 274 | Parametro, no. 62/1977, cover, pp. 30- and no. 68/1978, pp. 3- and no. 202/1994, pp. 2- and no. 255/2005, pp. 4- | Pearman, Hugh: Contemporary World Architecture, London 1998, p. 148 | Polano, Sergio, Mulazzani, Marco: Guida all'architettura italiana del novecento, Milan 1993, pp. 320- | Progressive Architecture, no. 3/1979, pp. 57- | Quantrill, Malcolm: Alvar Aalto. A Critical Study, London 1983, pp. 202-, p. 279 | Schildt, Göran: Alvar Aalto. The Mature Years, New York 1991, pp. 223- | Schildt, Göran: Alvar Aalto. The Complete Catalogue of Architecture, Design and Art, London and Berlin 1994, pp. 35- | Schildt, Göran: Alvar Aalto. Masterworks, London 1998, p. 192- | Stock, Wolfgang Jean (Ed.): European Church Architecture 1950-2000, Munich 2002, pp. 150- | Stock, Wolfgang Jean: Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, pp. 212- | Trebbi, Giorgio: Chiesa di Riola, Bologna 1999 | Trencher, Michael: The Alvar Aalto Guide, New York 1996, pp. 206- | Werk, Archithese, no. 19/20/1978, p. 82 | Weston, Richard: Alvar Aalto, London 1995, p. 213

Tadao Ando | Chapel of the Light

Althaus, Birgit: Kirchen. Die schönsten Gotteshäuser des Christentums, Eftstadt 2003, p. 123 | Tadao Ando, Zurich and Munich 1990, pp. 120- | Tadao Ando. Album de l'Exposition, exhibition catalogue, Paris 1993, p. 25 | Tadao Ando. Light and Water, Basel 2003, pp. 64 | Architecture (revue) Créé, no. 253/1993, pp. 66-, p. 69 | AIT Architektur, Innenarchitektur, Technischer Ausbau, no. 5/1993, pp. 28- | Architettura e spazio sacro nella modernità, exhibition catalogue, Milan 1992, pp. 224 | AV Monografías, NR. 95/2002, p. 40- | Berton, Franco: Minimalistische Architektur, Basel 2002, p. 206- | Botond, Bogнар: Die neue japanische Architektur, Stuttgart 1991, pp. 124- | Bogнар, Botond: The Japan Guide, New York 1995, p. 220 | Casabella, no. 558/1989, p. 15- | Chiesa Oggi, no. 2/1996, pp. 56- | El Croquis, no. 44/1990, pp. 98- | Detail, no. 3/1991, Konstruktionsstufen und no. 7/1999, p. 1225- | Domus, no. 712/1990, pp. 25- | Drew, Philip: Church on the Water. Church of the Light, Tadao Ando, London 1996, cover, pp. 40- | Faith and Form, no. winter/1992/1993, p. 12 | Flügge, Ingeborg (Ed.): Jahrbuch für Licht und Architektur 1993, Berlin 1994, pp. 39- | Flügge, Matthias, Meschede, Friedrich (Ed.): warum! Bilder diesseits und jenseits des Menschen, exhibition catalogue, Ostfildern-Kuit 2003, p. 279, p. 282 | Frampton, Kenneth: Tadao Ando, exhibition catalogue, New York 1991, cover, pp. 38- | Fujiki, Takao (Ed.): Religious Facilities. New Concepts in Architecture and Design, Tokyo 1997, pp. 51- | Furuyama, Masao: Tadao Ando, Basel 1995, p. 140- | Furuyama, Masao: Ando. Die Geometrie des menschlichen Raums, Cologne 2006, cover, p. 4, pp. 36- | Futagawa, Yukio: Light and Space. Modern Architecture 1, Tokyo 1994, p. 201 | Futagawa, Yukio (Ed.): Tadao Ando. Details, Tokyo 1991, pp. 156- | Glancey, Jonathan: 20th C. Architecture. The Structures that Shaped the Century, London 1998, p. 117 | GA Global Architecture Document, no. 22/1989, pp. 88- | Heathcote, Edwin, Spens, Iona: Church Builders, London 1997, pp. 134- | Heneghan, Tom: The Colours of Light, Tadao Ando Architecture, Richard Pare Photography, London 1996, pp. 66-, p. 220- | The Japan Architect, no. 6/1989, pp. 18- and no. 11/2/1989, pp. 25- and no. 1/1991, pp. 126- | Jodidio, Philip: Tadao Ando, Cologne 1997, back cover, p. 9, p. 23, p. 32, p. 38, p. 47, pp. 84- | Jodidio, Philip: Ando. Complete Works, Cologne 2004, pp. 124- | Kind-Barkauskas, Friedbert (et al.): Beton Atlas. Entwurf mit Stahlbeton im Hochbau, Basel 2002, pp. 196- | Krafft, Anthony (Ed.): Architecture Contemporaine, Vol. 12 1990/1991, Lausanne 1990, pp. 246- | Major, Mark (et al.): Made of Light. The Art of Light and Architecture, Basel 2005, p. 68 | Matsuba, Kazukiyo: Ando Architect, Tokyo 1998, pp. 129- | Montagnana, Francesco: Birkhäuser Architekturführer, Japan. 20. Jahrhundert, Basel 1997, pp. 204- | Ottogono, no. 134/1999, pp. 38- | Pearman, Hugh: Contemporary World Architecture, London 1998, pp. 164- | Progressive Architecture, no. 2/1990, cover, pp. 88-, p. 95 | Sabatucci, Antonio (Ed.): Costantino Ruggeri. L'Architettura di Dio, Milan 2005, p. 138, p. 141- | Steele, James: Architecture Today, London 1997, pp. 116- | Techniques et Architecture, no. 405/1992, cover, pp. 73- | Thiel-Siling, Sabine (Ed.): Architektur! Das 20. Jahrhundert, Munich 1998, pp. 164- | Thorne, Martha (Ed.): The Pritzker Architecture Prize. The First Twenty Years, Chicago 1999, pp. 151-

Anwar Atta | Al Furusia Mosque

Architettura e spazio sacro nella modernità, exhibition catalogue, Milan 1992, p. 226 | Atta, Anwar: Moscheebau in Qatar, thesis, Vol. 1, Munich 1993, p. 211, pp. 269- | Atta, Anwar: Moscheebau in Qatar, thesis, Vol. 2, Munich 1993, pp. 87-

Shigeru Ban | Paper Church

The Architectural Review, no. 9/1996, pp. 20- and no. 12/1999, p. 71 | L'Architecture d'Aujourd'hui, no. 306/1996, pp. 40- | Shigeru Ban, New York 2001, pp. 100- | Cargill Thompson, Jessica: 40 Architects under 40, Cologne 2000, pp. 93- | Constantinopoulos, Vivian (Ed.): 10 x 10. 10 Critics 100 Architects, London 2000, p. 70 | Deutsche Bauzeitschrift, no. 6/1997, pp. 33- | Ecclesia, no. 5/1996, pp. 64- | Heathcote, Edwin, Moffatt, Laura: Contemporary Church Architecture, Chichester 2007, pp. 150- | The Japan Architect, no. 30/1998, pp. 86- and no. 42/2001, pp. 50- | McQuaid, Matilda: Shigeru Ban, London 2003, pp. 42-, p. 235 | Richardson, Phyllis: New Sacred Architecture, London 2004, pp. 202-

Francisco Javier Bellosillo Amunátegui

Church and Chapel in Parque de San Francisco

Arquitectura Viva, no. 94/95/2004, p. 31- | Baldellou, Miguel Angel, Capitel, Antón: Summa artis. Historia general del arte. Vol. XI. Arquitectura española del siglo XX, Madrid 1996, pp. 575- | Capitel, Antón, Wang, Wilfried (Ed.): Architektur im 20. Jahrhundert. Spanien, exhibition catalogue, Munich 2000, p. 249 | El Croquis, no. 37/1989, pp. 54- | Das Münster, no. 2/1989, pp. 119- | On Diseño, no. 87/1987, pp. 18- | Rispa, Raúl (Ed.): Birkhäuser Architekturführer. Spanien. 1920-1999, Basel 1998, p. 128 | Techniques et Architecture, no. 3/1/1987, pp. 116-, p. 140

Bengt Blasberg, Henrik Jais-Nielsen | Church Centre

Arkitektur DK, no. 1/1971, pp. 35-, pp. A26

Mario Botta | Cymbalista Synagogue

Architecture, no. 9/1996, pp. 58- | AIT Architektur, Innenarchitektur, Technischer Ausbau, no. 7/8/1998, p. 27- | Area, no. 47/1999, pp. 74- | Arquitectura Viva, no. 61/1998, p. 7- | Bauwelt, no. 26/1996, p. 1505 and no. 23/1998, p. 1277- | Mario Botta. Architetture del sacro, exhibition catalogue, Bologna 2005, pp. 116-, pp. 181-, p. 200- | Branca, Maria (Ed.): Mario Botta. The Cymbalista Synagogue and Jewish Heritage Center, The Tel Aviv University, Corte Madera / Kalifornien 2001 | Cappellato, Gabriele (Ed.): Mario Botta. Luce e gravità. Architetture 1993-2003, exhibition catalogue, Bologna 2003, cover, pp. 58-, p. 247 | Dornie, David: New Stone Architecture, London 2003, pp. 90-, p. 229- | Domus, no. 806/1998, pp. 8- | L'Industria delle Costruzioni, no. 328/1999, p. 34- | Jodidio, Philip: Mario Botta, Cologne 2003, cover, pp. 156- | Molinari, Luca (Ed.): Mario Botta. Öffentliche Bauten 1990-1998, exhibition catalogue, Milan 1998, pp. 197-, p. 225 | Neue Zürcher Zeitung, Internationale Ausgabe, no. 4. 1996, p. 34 and 20. 6. 1996, p. 33 and 23/24. 5. 1998, p. 34- | Neue Zürcher Zeitung, Schweizer Ausgabe, 5. 7. 1996, p. 57- | Ottogono, no. 134/1999, p. 37 | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 78 | Pizzi, Emilio (Ed.): Mario Botta. Das Gesamtwerk, Vol. 3 1990-1997, Basel 1998, pp. 178-, p. 239 | Sachs, Angeli, Voolen, Edward van (Ed.): Jewish Identity in Contemporary Architecture, Munich 2004, p. 36, pp. 98- | Süddeutsche Zeitung, 7. 11. 2005, p. 12 | Techniques et Architecture, no. 442/1999, pp. 81- | Werk, Bauen und Wohnen, no. 9/1998, p. 56 and no. 9/2005, pp. 36-

William P. Bruder | Temple Kol Ami

The Architectural Review, no. 11/1997, p. 54- | L'Architecture d'Aujourd'hui, no. 307/1996, pp. 92- | L'Architettura Cronache e Storia, no. 485/1996, pp. 158- | Cerver, Francisco Asensio: Zeitgenössische Architektur. (n.p.) Königswinter 2005, pp. 372- | Gruber, Samuel D.: American Synagogues. A Century of Architecture and Jewish Community, New York 2003, pp. 196-, p. 234 | Jodidio, Philip: Building a New Millennium, Cologne 1999, pp. 120- | Lotus International, no. 105/2000, p. 96- | Pearman, Hugh: Contemporary World Architecture, London 1998, pp. 140- | Progressive Architecture, no. 7/1995, p. 86- | Sachs, Angeli, Voolen, Edward van (Ed.): Jewish Identity in Contemporary Architecture, Munich 2004, pp. 108-

Augusto Romano Burelli, Paola Gennaro | Church of Reconciliation

Aión, no. 12/2006, pp. 82- | Augusto Romano Burelli Paola Gennaro. Entwürfe für Potsdam, 1991 2001, exhibition catalogue, Potsdam 2001, pp. 68-, pp. 161- | Bauwelt, no. 1/2/1998, p. 6- | Casabella, no. 640/641/1996/1997, pp. 124- | Goetz, Christine, Hoffmann-Lauschwitz, Matthias (Ed.): Kirchen Berlin Potsdam. Führer zu den Kirchen in Berlin und Potsdam, Berlin 2003, p. 230, p. 346 | Kirschke, Andreas: Die Potsdamer Kirchen, Passau 2001, pp. 74- | Krier, Rob, Kohl, Christoph: Potsdam Kirchsteigfeld. Eine Stadt entsteht, Bensheim 1997, p. 17, p. 28, pp. 46-, p. 74, pp. 110-, p. 168- | Wöhler, Till: Neue Architektur. Sakralbauten, (n.p.) Berlin 2005, pp. 64-

Raffaele Cavadini | Oratory of San Bartolomeo

Bamberg, Thomas, Pellandini, Paola: Tessin Architektur. Die junge Generation, Munich 2004, pp. 118- | Baumeister, no. 6/1999, pp. 22- | Raffaele Cavadini Architetto. Opere dal 1987-2001, exhibition catalogue, (n.p.) Münsingen (n.d.) 2003, pp. 38-, p. 63 | Chiesa Oggi, no. 42/2000, pp. 33- | Deutsche Bauzeitung, no. 7/1999, pp. 64- | Gantenbein, Köbi (Ed.): Bauen in der Schweiz. Ein Führer zur Gegenwartsarchitektur, Zurich 2002, pp. 180- | Neue Zürcher Zeitung, Schweizer Ausgabe, 3. 4. 1998, p. 77 | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 523 | Stock, Wolfgang Jean: Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, frontispice, pp. 262- | Werk, Bauen und Wohnen, no. 7/8/1998, pp. 42-

Trevor Dannatt | Quaker Meeting House, Blackheath

The Architectural Review, no. 4/1973, pp. 265- | Concrete Quarterly, no. 101/1974, p. 5- | Trevor Dannatt. Buildings and Interiors 1951/72, London 1972, pp. 21- | McKean, Charles, Jestic, Tom: Modern Buildings in London. A Guide, London 1976, p. 81

Kamran T. Diba | Mosque of Jondishapour University

L'Architecture d'Aujourd'hui, no. 195/1978, pp. 9- | Cruickshank, Dan (Ed.): Sir Banister Fletcher's A History of Architecture, Twentieth Edition, Oxford 1996, p. 1456 | Kamran Diba. Buildings and Projects, Stuttgart Bad Cannstatt 1981, pp. 66-, p. 240 | Frishman, Martin, Khan, Hasan-Uddin (Ed.): The Mosque. History, Architectural Development and Regional Diversity, London 1994, p. 261- | Holod, Renata, Khan, Hasan-Uddin: The Mosque and the Modern World. Architects, Patrons and Designs since the 1950s, London 1997, p. 151, pp. 155-, p. 266, p. 275

Rainer Disse | St John the Baptist Church

Baumeister, no. 8/1973, pp. 1023- | Beton Prisma, no. 29/1974, pp. 3- | Deutsche Bauzeitschrift, no. 7/1974, p. 1227- | Disse, Rainer: Kirchliche Zentren, Entwurf und Planung, Vol. 24, Munich 1974, pp. 122- | Glasforum, no. 6/1974, pp. 29- | Hoffmann, Gretl: Dekorative Türen. Einzelfertigungen und Sonderkonstruktionen in Metall, Glas und Holz, Stuttgart 1977, p. 70 | Hoffmann, Gretl, Maurach, Jürgen: Schmiede- und Schlosserarbeiten von heute. 300 Beispiele von Gartentoren und Einfahrten, von Trenn- und Fenstergittern, von Treppen- und Brüstungsgeländern, Leuchtern und Kreuzen, Stuttgart (n.d.) 1974, p. 133, p. 135, p. 152- | Katholisches Pfarramt Hornberg / Schwarzwaldhahn (Ed.): Katholisches Zentrum Hornberg, Jähr (n.d.) 1976 | Lindstrom, Randall S.: Creativity and Contradiction. European Churches since 1970, Washington D.C. 1988, p. 57, p. 102, p. 144

Richard England | Saint Joseph's Church

Abel, Chris: Manikata Church 1962-1974, Richard England, London 1995 | Architecture and Urbanism, no. 10/1981, pp. 15- | Architettura e spazio sacro nella modernità, exhibition catalogue, Milan 1992, p. 255 | Chiesa Oggi, no. 6/1993, pp. 46- | Richard England. The Spirit of Place, Milan 1998, pp. 23- | England, Richard, Schubert, Linda: Transfigurations. Places of Prayer, Melfi 2000, p. 8, p. 15, pp. 56-, p. 78 | Heathcote, Edwin, Richard England, Chichester 2002, pp. 24- | Heathcote, Edwin, Spens, Iona: Church Builders, London 1997, pp. 109- | Henvaux, Emile: The Work of Architect Richard England in Malta. A Research towards a Contemporary Regionalism. With Introductory Notes on the Maltese Vernacular, Brussels 1969, pp. 100- | Kneivt, Charles: Manikata. The Making of a Church, Manikata 1980 | Kneivt, Charles: Connections. The Architecture of Richard England 1964-1984, London 1984, pp. 86- | Krafft, Anthony (Ed.): Architecture Contemporaine, Vol. 2 1980/1981, Paris and Lausanne 1980, pp. 175-

Aldo van Eyck, Hannie van Eyck | Maranatha Moluccan Church

Archis, no. 2/1993, pp. 17- | De Architect, no. 12/1992, pp. 52- | The Architectural Review, no. 1/1985, cover, pp. 14- and no. 4/1992, pp. 46- | L'Architecture d'Aujourd'hui, no. 235/1984, pp. 21- | Bergeijk, Herman van, Mäcel, Otakar: Birkhäuser Architekturführer. Belgien Niederlande Luxemburg. 20. Jahrhundert, Basel 1998, p. 180- | Broeksmä, Friso (Ed. et al.): Architectuur in Nederland. Jaarboek 1992/1993, Rotterdam 1993, pp. 54- | Casabella, no. 517/1985, pp. 12- and no. 605/1993, pp. 60-, pp. 70-71 | Groenendijk, Paul, Vollaard, Piet: Architectuurgeds Nederland 1900-2000, Rotterdam 2006, pp. 110 | Ligtelijn, Vincent (Ed.): Aldo van Eyck. Werke, Basel 1999, pp. 220- | Niet om het even, wel evenwaardig. Van en over Aldo van Eyck, Amsterdam (n.d.) 1986, pp. 148- | Strauven, Francis: Aldo van Eyck. The Shape of Relativity, Amsterdam 1998, pp. 598- | Techniques et Architecture, no. 405/1992, pp. 64-

Hassan Fathy | Dar Al Islam

Architectural Record, no. 12/1980, p. 39 | Architettura e spazio sacro nella modernità, exhibition catalogue, Milan 1992, p. 213 | Ekistics, no. 304/1984, pp. 56- | Faith and Form, no. Winter/1990/1991, p. 23 and no. 3/2001, pp. 10- | Holod, Renata, Khan, Hasan-Uddin: The Mosque and the Modern World. Architects, Patrons and Designs since the 1950s, London 1997, pp. 214, pp. 270, p. 279 | Progressive Architecture, no. 6/1983, pp. 90- | Richards, J.M. (et al.): Hassan Fathy, Singapore and London 1985, pp. 140, pp. 168 | Serageldin, Ismail, Steele, James (Ed.): Architecture of the Contemporary Mosque, London 1996, pp. 154- | Steele, James: Hassan Fathy, London and New York 1988, pp. 115, p. 139, p. 141 | Steele, James: The Hassan Fathy Collection. A Catalogue of Visual Documents at The Aga Khan Award for Architecture, Geneva 1989, p. 86, pp. 92- | Steele, James: An Architecture for People. The Complete Works of Hassan Fathy, London 1997, pp. 146-

Hermann Fehling, Daniel Gogel**Chapel of Rest, Am Fließtal Cemetery**

Architecture and Urbanism, no. 8/1978, p. 5, pp. 23- | Architekten- und Ingenieur-Verein zu Berlin (Ed.): Berlin und seine Bauten. Teil X Band A Anlagen und Bauten für die Versorgung, 3 Bestattungswesen, Berlin and Munich 1981, pp. 70, p. 106 | Bucciarelli, Piergiacomo: L'Architettura di Fehling e Gogel. Vitalità dell'espressionismo, Bari 1981, pp. 66- | Conrads, Ulrich, Sack, Manfred: Hermann Fehling und Daniel Gogel. Werkmonographie, Braunschweig and Wiesbaden 1981, pp. 38-, p. 65

Johan Fogh, Per Følner | Tornbjerg Church

Architektur und Wettbewerbe, no. 174/1998, cover, pp. 44- | Arkitektur DK, no. 8/1995, cover, pp. 444-, p. 478 | Dirckinck-Holmfeld, Kim: Guide to Danish Architecture 2. 1960-1995, Copenhagen 1995, p. 315 | Kunst und Kirche, no. 1/1998, pp. 30-

Mauro Galantino | St Ireneo Church

Arosio, Giuseppe: Chiesa nuove verso il terzo millennio. Diocesi di Milano 1985-2000, Milan 2000, pp. 122- | Casabella, no. 572/1990, p. 25 and no. 687/2001, pp. 66- | Chiesa Oggi, no. 2/1992, pp. 75- and no. 49/2001, pp. 46- and no. 66/67/2004, p. 15 | L'Industria delle Costruzioni, no. 360/2001, pp. 40- | Prove d'Architettura, no. 2/1998, pp. 96- | Techniques et Architecture, no. 459/2002, pp. 60-

Douglas Garofalo, Greg Lynn, Michael McInturf**Korean Presbyterian Church**

L'Arca, no. 115/1997, cover, pp. 20- | De Architect, no. 11/1999, pp. 76- | Architectural Design, no. 5/2002, p. 73 | Architectural Record, no. 11/2000, pp. 80- | Architecture, no. 1/1997, pp. 80- and no. 10/1999, cover, pp. 87- | Architecture and Urbanism, no. 6/1997, cover, pp. 82- | Architektur Aktuell, no. 242/2000, cover, p. 49, pp. 122- | Arquitectura Viva, no. 76/2001, pp. 46- | Assemblage, no. 38/1999, pp. 6- | Cachola Schmal, Peter (Ed.): Digital real. Blobmeister. Erste gebaute Projekte, exhibition catalogue, Basel 2001, pp. 110- | Carter, Brian, Lecuyer, Annette: All American. Innovation in American Architecture, London 2002, p. 227, pp. 230- | Casabella, no. 673/674/1999/2000, pp. 62- | Constantinos, Vivian (Ed.): 10 x 10. 10 Critics 100 Architects, London 2000, pp. 238- | Gray, Christopher: Changing New York. The Architectural Scene, New York 1992, p. 90 | Harris, Bill, Brockmann, Jörg: 1000 New York Buildings, Cologne 2002, pp. 434- | Heathcote, Edwin, Moffatt, Laura: Contemporary Church Architecture, Chichester 2007, pp. 212- | Jodidio, Philip: Architecture Now!, Cologne 2001, pp. 192- | Lynn, Greg: Animate Form, New York 1999, pp. 8- | The New York Times, Late Edition, 28. 7. 1996, section 9, p. 7 and 5. 9. 1999, section 2, p. 30 and 26. 12. 1999, section 2, p. 49 | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 704 | Quadersen, no. 232/2002, pp. 138- | Richardson, Phyllis: New Sacred Architecture, London 2004, pp. 26- | Werk, Bauen und Wohnen, no. 5/2000, pp. 34-, p. 78, pp. 80- | White, Norval, Willinsky, Elliot: AIA Guide to New York City, New York 2000, pp. 810- | Zellner, Peter: Hybrid Space. New Forms in Digital Architecture, London 1999, pp. 142-

Francesco Garofalo, Sharon Yoshie Miura**Santa Maria Josefa Church**

Domus, no. 844/2002, pp. 82- | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 575

Meinhard von Gerkan, Joachim Zais | Christus Pavillon

Adolphsen, Helge, Nohr, Andreas (Ed.): Sehnsucht nach heiligen Räumen. Eine Messe in der Messe. Berichte und Ergebnisse des 24. Evangelischen Kirchentages 31. Oktober bis 3. November 2002 in Leipzig, Darmstadt 2003, pp. 54-, pp. 100- | Aión, no. 12/2006, pp. 92- | L'Arca, no. 146/2000, p. 77 | The Architectural Review, no. 9/2000, pp. 78- | Der Architekt, no. 1/2/2004, pp. 26- | Architektur und Wettbewerbe, no. 174/1998, pp. 64- | Arquitectura Viva, no. 72/2000, pp. 64- | Ballard Bell, Victoria, Rand, Patrick: Materials for Architectural Design, London 2006, pp. 164- | Chroniques d'Art Sacré, no. 64/2000, pp. 18- | Detail, no. 4/1999, pp. 601- | Deutsche Bauzeitschrift, no. 3/1999, p. 18 and no. 10/2001, p. 10 and no. 11/2001, pp. 86- | Deutsche Bauzeitung, no. 11/2001, pp. 112- | Expo 2000 Hannover GmbH (Ed.): Architektur Expo 2000 Hannover, Ostfildern 2000, pp. 54- | Feireiss, Kristin, Commerell, Hans Jürgen (Ed.): Architektur der Besinnung. Von Gerkan, Marg und Partner, exhibition catalogue, Berlin 1998, pp. 4-, pp. 12- | Gerkan, Meinhard von: von Gerkan, Marg und Partner. Architecture 1999-2000, Basel 2002, pp. 11-, pp. 58- | Meinhard von Gerkan. Geometrie der Stille,

exhibition catalogue, Darmstadt 2002, pp. 17-, pp. 30-, pp. 52-, pp. 60- | Gerkan, Meinhard von, Marg, Volkwin (Ed.): Von Gerkan, Marg und Partner. Bauten, Munich 2007, p. 341, pp. 350- | Glasforum, no. 5/2000, pp. 11- | Heathcote, Edwin, Moffatt, Laura: Contemporary Church Architecture, Chichester 2007, pp. 228- | Käßmann, Margot, Ameling, Dieter (Ed.): Der Christus-Pavillon. Von der Expo 2000 zum Kloster Volkenroda. Nachhaltige Architektur in Stahl und Glas, Düsseldorf 2001 | Kunst und Kirche, no. 1/2000, pp. 30- | Ludwig, Matthias, Mawick, Reinhard (Ed.): Gottes neue Häuser. Kirchenbau des 21. Jahrhunderts in Deutschland, Frankfurt am Main 2007, pp. 12-, pp. 62- | Michel, Karl-Heinz: Christus-Pavillon Volkenroda, Kleine Kunstführer no. 2525, Regensburg 2004 | Orte Architekturnetzwerk Niederösterreich, Nitschke, Marcus (Ed.): Raum und Religion. Europäische Positionen im Sakralbau. Deutschland, Österreich, Polen, exhibition catalogue, Salzburg and Munich 2005, pp. 19-, pp. 78- | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 483 | Schittich, Christian (Ed.): Gebäudehüllen. Konzepte Schichten Material, Munich and Basel 2001, pp. 102-, p. 194 | Schwebel, Horst (Ed.): Über das Erhabene im Kirchenbau. Symposium, Münster 2004, pp. 102- | Stahl-Informations-Zentrum (Ed.): Stahl und Form. Christus-Pavillon. Von der Expo 2000 Hannover nach Volkenroda (Thüringen). Demontage und Wiederaufbau, Düsseldorf 2002 | Steinzeit, no. 2/2000, pp. 26- | Stock, Wolfgang Jean (Ed.): European Church Architecture 1950-2000, Munich 2002, pp. 302- | Stock, Wolfgang Jean: Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, pp. 94- | Süddeutsche Zeitung, 3. 5. 2000, supplement Expo 2000, p. V3/5 | Wöhler, Till: Neue Architektur. Sakralbauten, (n.p.) Berlin 2005, pp. 138-f

Volker Giencke | St Florian's Church

The Architectural Review, no. 4/1992, pp. 70- | Architektur Aktuell, no. 147/1992, pp. 62- | Architekturzentrum Wien (Ed.): Architektur in Österreich im 20. und 21. Jahrhundert, exhibition catalogue, Basel 2006, p. 239 | L'Architettura Cronache e Storia, no. 452/1993, pp. 448- | Architettura e spazio sacro nella modernità, Exhibition catalogue, Milan 1992, p. 261 | Becker, Annette (Ed. et al.): Architektur im 20. Jahrhundert. Österreich, exhibition catalogue, Munich and New York 1995, pp. 236- | Berghaler, Wolfgang (Ed. et al.): Funktion und Zeichen. Kirchenbau in der Steiermark seit dem II. Vatikanum, Graz and Budapest 1992, pp. 93-, pp. 204- | Blundell Jones, Peter: Dialogues in Time. New Graz Architecture, Graz 1998, pp. 184- | Chiesa Oggi, no. 22/1996, pp. 28- | Deutsche Bauzeitschrift, no. 1/1994, pp. 35- | Volker Giencke. Projekte, Vienna and New York 2001, pp. 60- | Glasforum, no. 2/1994, pp. 15- | Kunst und Kirche, no. 2/1995, pp. 122- | Pelkonen, Eeva-Jiisa: Achtung Architektur! Image and Phantasm in Contemporary Austrian Architecture, Cambridge / Massachusetts and London 1996, p. 59, pp. 62- | Stock, Wolfgang Jean (Ed.): European Church Architecture 1950-2000, Munich 2002, pp. 90- | Techniques et Architecture, no. 405/1992, pp. 76-

Glauco Gresleri, Silvano Varnier | Church of Our Lady of Lourdes

Art d'Eglise, no. 158/1972, pp. 276-, p. C | Gresleri, Glauco, Varnier, Silvano: Costruire l'architettura, Milan 1981, pp. 66-, p. 171 | Muratore, Giorgio (et al.): Italia. Gli ultimi trent'anni. Guida all'architettura moderna, Bologna 1988, p. 229 | Nostra Signora di Lourdes a Navarons di Spilimbergo. Glauco Gresleri e Silvano Varnier Architetti, Udine 1971 | Lo spazio eloquente. Architettura sacra nel Triveneto 1963-1986, exhibition catalogue, Pordenone 1987, p. 191

Pascale Guignard, Stefan Saner | Place of Contemplation

Architecture and Urbanism, no. 2/2000, p. 32- | Archithese, no. 5/1997, p. 70- | Arco Team: Minimalismus. Geschichte, Mode, Möbel und Design, Architektur, Inneneinrichtungen, Königswinter 2006, pp. 594- | AV Monografias, no. 83/2000, p. 64- | Bauwelt, no. 1/2/1999, p. 56 | Dworschak, Gunda, Wenke, Alfred: Metamorphosen. Neue Material- und Raumkonzepte in Stein, Holz, Metall, Glas, Textil, Kunststoff, Düsseldorf 2000, pp. 118- | Kunst und Kirche, no. 1/2007, p. 50 | Schirmbeck, Egon (Ed.): Raumstationen. Metamorphosen des Raumes im 20. Jahrhundert, Ludwigsburg 2001, pp. 148- | Stock, Wolfgang Jean (Ed.): European Church Architecture 1950-2000, Munich 2002, pp. 306- | Stock, Wolfgang Jean: Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, pp. 270- | Wöhler, Till: Neue Architektur. Sakralbauten, (n.p.) Berlin 2005, pp. 206-

Rudolf Guyer, Esther Guyer | Glaubten Reformed Church

Architecture and Urbanism, no. 12/1981, pp. 59- | Evangelisch-Reformierte Kirchenpflege Zürich-Affoltern (Ed.): Einweihung Kirchliches Zentrum Glaubten Zürich-Affoltern, Festschrift, Zurich 1972 | Faith and Form, no. Spring/1984, p. 29 | Ineichen, Hannes (Ed.): Rudolf und Esther Guyer. Bauten und Projekte 1953-2001, Monografien Schweizer Architekten und Architektinnen, Vol. 4. Blauen 2002, pp. 136-, p. 283 | Rucki, Isabelle, Huber, Dorothee (Ed.): Architektenlexikon der Schweiz 19./20. Jahrhundert, Basel 1998, p. 243

Franck Hammoutène | Our Lady of the Pentecost Church

The American Institute of Architects (Ed.): 2002 DuPont Benedictus Awards, Washington D.C. 2002, pp. 23- | L'Arca, no. 183/2003, cover, pp. 22- | Architecture Intérieure Créée, no. 283/1998, pp. 78- and no. 299/2001, pp. 102- | Ayers, Andrew: The Architecture of Paris. An Architectural Guide, Stuttgart and London 2004, p. 311 | Bauwelt, no. 8/1997, p. 335 and no. 4/2003, p. 8- | Les Cahiers Techniques du Bâtiment, no. 219/2001, pp. 23- | Chroniques d'Art Sacré, no. 64/2000, pp. 22- | Laminated Glass News, no. 21/2002, p. 1 | Martin, Hervé: Guide de l'Architecture Moderne à Paris, Paris 1996, p. 303 | Le Monde, 22. 2. 2001, p. 29 | AMC Le Moniteur Architecture, no. 116/2001, pp. 57- | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 375 | Roberts, Nicholas W.: Building Type Basics for Places of Worship, Hoboken / New Jersey 2004, p. 227 | Stock, Wolfgang Jean (Ed.): European Church Architecture 1950-2000, Munich 2002, p. 11 | Stock, Wolfgang Jean: Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, pp. 184- | Techniques et Architecture, no. 459/2002, pp. 42- | 1000 x European Architecture, (n.p.) Berlin 2007, p. 257

George E. Hartman, Warren J. Cox**Florence Hollis Hand Chapel, Mount Vernon College**

AIA American Institute of Architects Journal, no. 6/1971, p. 47 and no. 9/1979, p. 79 | The Architectural Forum, no. 3/1971, pp. 56-, p. 89 | Faith and Form, no. Fall/1971, p. 5

Zvi Hecker | Duisburg Jewish Community Centre

Architecture, no. 11/1999, pp. 98- | Architektur Aktuell, no. 232/1999, pp. 44- | L'Architettura Cronache e Storia, no. 535/2000, pp. 282- | Bauwelt, no. 29/1999, cover, p. 1590- | Beton Prisma, no. 79/2001, cover, pp. 1- | Brockhaus, Christoph (Ed.): Stadtbild Duisburg. Identität, Wandel und Vision, exhibition catalogue, Duisburg 1999, pp. 115- | Casabella, no. 675/2000, pp. 44- | Centrum. Jahrbuch Architektur und Stadt 1999-2000, Basel 2000, pp. 166- | Domus, no. 823/2000, pp. 40- | Frankfurter Allgemeine, 24. 6. 1999, p. 49 | Korn, Salomon: Geteilte Erinnerung. Beiträge zur deutsch-jüdischen Gegenwart, Berlin 1999, pp. 65- | Kunst und Kirche, no. 4/1999, pp. 240- and no. 4/2001, p. 222- | Mewes, Claus (Ed.): Zvi Hecker. Architektur ist Landschaft, exhibition catalogue, Hamburg and Berlin 1997, p. 1, pp. 16- | Das Münster, no. 3/1999, pp. 254- | Neue Zürcher Zeitung, Internationale Ausgabe, 26./27. 6. 1999, p. 49 | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 457 | Richardson, Phyllis: New Sacred Architecture, London 2004, pp. 34- | Sachs, Angeli, Voolen, Edward van (Ed.): Jewish Identity in Contemporary Architecture, Munich 2004, pp. 116- | Wettbewerbe Aktuell, no. 8/1996, pp. 77- and no. 11/1999, pp. 91-

Henrik Hille, Ervin Strandskogen | St Clara Church

The Architectural Review, no. 3/2003, pp. 62- | Byggekunst, no. 8/2001, pp. 20- | Detail, no. 9/2004, pp. 966-, p. 1080

Steven Holl | Chapel of St Ignatius

Architectural Record, no. 7/1997, cover, pp. 40- and no. 4/1998, p. 15 | The Architectural Review, no. 11/1995, pp. 54- and no. 8/1997, pp. 26- | Archithese, no. 6/1998, pp. 8- | Area, no. 34/1997, pp. 18- | Arquitectura Viva, no. 56/1997, p. 7 and no. 58/1998, pp. 46-, p. 114 | Ars Sacra, no. 0/1996, p. 74 and no. 3/1997, pp. 36-, p. 124 | Browning, Dominique, Editors of House and Garden: House of Worship. Sacred Spaces in America, New York 2006, pp. 30- | Cerver, Francisco Assensio: Zeitgenössische Architektur, (n.p.) Königswinter 2005, pp. 368-, pp. 380- | Chiesa Oggi, no. 45/2000/2001, pp. 32- | El Croquis, no. 78/1996, pp. 180- and no. 88/89/1998, pp. 212- and no. 93/1998, pp. 86- | Crosbie, Michael J.: Architecture for the Gods, Mulgrave 1999, pp. 166- | Domus, no. 796/1997, pp. 18- | Faith and Form, no. 2/1997, cover and no. 1/1998, p. 19 | Flagge, Ingeborg (Ed.): Jahrbuch Licht und Architektur 2001/2002, Cologne 2002, pp. 92- | Frampton, Kenneth, Ingersoll, Richard (Ed.): World Architecture 1900-2000. A Critical Mosaic. Vol. 1 Canada and the United States, Vienna and New York 2000, pp. 242- | Garofalo, Francesco (Ed.): Steven Holl, Milan 2003, pp. 120-, p. 237 | GA Global Architecture Document, no. 53/1997, cover, pp. 36- | Heathcote, Edwin, Spens, Iona: Church Builders, London 1997, pp. 186- | Heathcote, Edwin, Moffatt, Laura: Contemporary Church Architecture, Chichester 2007, pp. 190- | Holl, Steven: The Chapel of St. Ignatius, New York 1999 | Holl, Steven: Parallax, Basel 2000, p. 70, p. 80, pp. 94-, pp. 154- | Holl, Steven: Written in Water, Baden 2002, pp. 44-, p. 73 | Holl, Steven: Architecture Spoken, New York 2007, pp. 56-, p. 287 | L'Industria delle Costruzioni, no. 342/2000, pp. 24- | Jodidio, Philip: Contemporary American Architects, Vol. IV, Cologne 1998, pp. 86- | Mari, Antonella: Steven Holl, Rome 2001, pp. 82- | Neue Zürcher Zeitung, Internationale Ausgabe, 20. 1. 1999, p. 33 | Ottagnon, no. 134/1999, pp. 32- | Pearman, Hugh: Contemporary World Architecture, London 1998, pp. 156- | Richardson, Phyllis: New Sacred Architecture, London 2004, pp. 18- | Roberts, Nicholas W.: Building Type Basics for Places of Worship, Hoboken / New Jersey 2004, p. 165, p. 167, pp. 182-, colour inlay ill. 5 | Techniques et Architecture, no. 459/2002, cover, pp. 20-, pp. 36- | Thureau, Vanessa (Ed.): Ultimate Lighting Design. Projects by Hervé Descottes / L'Observatoire International, Kempen 2005, pp. 38-, p. 502 | Weston, Richard: Material, Form and Architecture, London 2003, pp. 188-

Theodor Hugues | Rudolf-Alexander-Schröder House

The Architectural Review, no. 12/1974, p. 391 | Detail, no. 5/1974, Konstruktionstafeln | Kunst und Kirche, no. 2/1981, pp. 80-

Norman C. Jaffe | Gates of the Groves Synagogue

The American Institute of Architects Long Island Chapter, The Society for the Preservation of Long Island Antiquities: AIA Architectural Guide to Nassau and Suffolk Counties Long Island, New York 1992, pp. 100- | Architecture, no. 12/1989, cover, pp. 68- | L'Architettura Cronache e Storia, no. 4/17418/1990, pp. 556- | Chiesa Oggi, no. 8/1994, pp. 46- | Faith and Form, no. Winter/1989/1990, cover, pp. 45- and no. Spring/1992, pp. 15- and no. 1/1998, p. 22 | Gordon, Alastair: Romantic Modernist. The Life and Work of Norman Jaffe, Architect, New York 2005, p. 11, p. 196, pp. 203-, p. 231 | Gruber, Samuel D.: American Synagogues. A Century of Architecture and Jewish Community, New York 2003, p. 174, pp. 184-, p. 234 | Kunst und Kirche, no. 1/1991, pp. 20- | Meek, Harold A.: The Synagogue, London 1995, pp. 226- | The New York Times, Late Edition, 3. 10. 1993, section 13, p. 16 | Progressive Architecture, no. 12/1990, p. 83 | Stolzman, Henry, Stolzman, Daniel: Synagogue Architecture in America. Faith, Spirit and Identity, Mulgrave 2004, p. 62, pp. 204-

E. Fay Jones | Thorncrown Chapel

AIA American Institute of Architects Journal, no. 5,2/1981, cover, pp. 140- | Architectural Record, no. 3/1981, cover, pp. 88- | The Architectural Review, no. 7/1981, pp. 39- | Architecture and Urbanism, no. 6/1981, pp. 95- and no. 2/1991, pp. 73- | L'Architettura Cronache e Storia, no. 3/14/1981, pp. 216- | Baumeister, no. 10/1982, pp. 998- | Chiesa Oggi, no. 7/1994, pp. 50-, p. 53 | Chroniques d'Art Sacré, no. 42/1995, p. 11, p. 13 | Debuyst, Frédéric: Dix petites églises pour aujourd'hui. Suivi de Philosophie de la promenade, Ottignies 1999, pp. 48- | Domus, no. 626/1982, pp. 26- | Faith and Form, no. Fall/1989, pp. 10- | Heathcote, Edwin, Spens, Iona: Church Builders, London 1997, pp. 178- | Ivy, Robert Adams: The Architecture of E. Fay Jones, Washington D.C. 1992, pp. 32- | Kieckhefer, Richard: Theology in Stone. Church Architecture from Byzantium to Berkeley, New York 2004, pp. 130-, pp. 322- | Kunst und Kirche, no. 1/1991, cover, p. 4-, p. 12- | Das Münster, no. 4/1995, p. 320 | Norman, Edward: The House of God, Church Architecture, Style and History, London 2005, pp. 298- | Pearman, Hugh: Contemporary World Architecture, London 1998, pp. 143- | Steele, James: Architecture Today, London 1997, pp. 262- | Tzonis, Alexander (et al.): Architektur in Nordamerika seit 1960, Basel 1995, pp. 190-

**Johannes Kister, Reinhard Scheithauer, Susanne Gross
Church of St Maria Magdalena**

Ach, Egon, no. 7/2004, p. 8 | Bauwelt, no. 3/2004, pp. 24- | DAM Jahrbuch 2004. Architektur in Deutschland, Munich 2003, pp. 58- | Detail, no. 9/2004, pp. 974-, p. 1012, p. 1081 | Deutsche Bauzeitung, no. 8/2004, p. 15 and no. 11/2004, p. 36- | Deutsches Architektenblatt, no. 11/2005, pp. 16- | E.ON Ruhrgas AG Essen (Ed.): Architektur in Deutschland 2005. Deutscher Architekturpreis 2005, Stuttgart und Zürich 2006, p. 96- | Feireiss, Kristin, Commerell, Hans Jürgen (Ed.): Kister Scheithauer Gross. Doppelkirche für zwei Konfessionen, (n.p.) Berlin 2004 | Frankfurter Allgemeine, 20. 7. 2004, p. 34 | Goldbach, Ines (Ed.): Neue Architektur Oberrhein, (n.p.) Basel 2007, cover, pp. 102- | Kramm, Rüdiger, Schalk, Tilman (Ed.): Sichtbeton, Betrachtungen. Ausgewählte Architektur in Deutschland, Düsseldorf 2007, pp. 146- | Kunst und Kirche, no. 3/2001, pp. 184- and no. 3/2005, p. 151, pp. 192- | Löffelhardt, Markus: Architektur in Freiburg. Stadtführer zeitgenössischer Architektur ab 1990, Freiburg im Breisgau 2006, p. 36- | Ludwig, Matthias, Mawick, Reinhard (Ed.): Gottes neue Häuser. Kirchenbau des 21. Jahrhunderts in Deutschland, Frankfurt am Main 2007, front and back cover, pp. 10-, pp. 124- | Das Münster. Sonderheft/2004, cover, pp. 244- | Orte Architekturnetzwerk Niederösterreich, Nitschke, Marcus (Ed.): Raum und Religion. Europäische Positionen im Sakralbau. Deutschland, Österreich, Polen, exhibition catalogue, Salzburg und Munich 2005, pp. 66- | Ottogono, no. 196/2006, inlay after p. 34, pp. 164- | 1000 x European Architecture, (n.p.) Berlin 2007, p. 503 | Wettbewerbe Aktuell, no. 3/2000, pp. 65- and no. 8/2004, pp. 85- | Wöhler, Till: Neue Architektur. Sakralbauten, (n.p.) Berlin 2005, p. 12-

Peter Kulka, Konstantin Pichler

House of Silence at Königsmünster Benedictine Abbey
Der Architect, no. 1/2/2004, pp. 42- | Bauwelt, no. 31/2001, pp. 12- | Beton Prisma, no. 83/2004, pp. 34- | Detail, no. 7/2001, p. 1221 | Domus, no. 849/2002, pp. 44- | Förster, Yorck, Flagge, Ingeborg (Ed.): Peter Kulka. Minimalismus und Sinnlichkeit, exhibition catalogue, Stuttgart and London 2006, pp. 36-, p. 47, pp. 55-, pp. 123- | Frankfurter Allgemeine, 29. 8. 2001, p. 45 | Herzog, Thomas (et al.): Fassaden Atlas, Basel 2004, pp. 112- | Kraft, Sabine: Räume der Stille, Marburg 2007, pp. 59-, p. 106 | Kramm, Rüdiger, Schalk, Tilman (Ed.): Sichtbeton, Betrachtungen. Ausgewählte Architektur in Deutschland, Düsseldorf 2007, pp. 178- | Kunst und Kirche, no. 3/2002, cover, p. 129 | Ludwig, Matthias, Mawick, Reinhard (Ed.): Gottes neue Häuser. Kirchenbau des 21. Jahrhunderts in Deutschland, Frankfurt am Main 2007, pp. 56- | M-AI Museum für Architektur und Ingenieurkunst NRW (Ed.): Nordrhein-Westfalen. 60 Jahre Architektur und Ingenieurkunst, exhibition catalogue, (n.p.) Essen 2007, pp. 228-, p. 231 | Neue Zürcher Zeitung, Internationale Ausgabe, 28. 1. 2002, p. 22 | Orte Architekturnetzwerk Niederösterreich, Nitschke, Marcus (Ed.): Raum und Religion. Europäische Positionen im Sakralbau. Deutschland, Österreich, Polen, exhibition catalogue,

Salzburg and Munich 2005, p. 49 | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 459 | Schwarz, Ullrich (Ed.): New German Architecture. A Reflexive Modernism, exhibition catalogue, Ostfildern-Ruit 2002, pp. 106- | Stock, Wolfgang (Ed.): Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, pp. 88- | Wöhler, Till: Neue Architektur. Sakralbauten, (n.p.) Berlin 2005, p. 118-

Hans van der Laan | Franciscan Convent Roosenberg

De Architect, no. 9/1981, pp. 117- and no. 4/1984, p. 69 | Bauwelt, no. 4/2003, p. 35 | Bergeijk, Herman van, Mäcel, Otakar: Birkhäuser Architekturführer. Belgien Niederlande Luxemburg. 20. Jahrhundert, Basel 1998, p. 48 | Casabella, no. 634/1996, pp. 56- | Dubois, Marc: Belgio. Architettura, gli ultimi vent'anni, Milan 1993, pp. 80- | Ferlenga, Alberto, Verde, Paola: Dom Hans van der Laan. Works and Words, Amsterdam 2001, pp. 23-, pp. 94- | Laan, Hans van der: Negen brieven van de architect over de bouw van het klooster Roosenberg, unpublished manuscript, Vaals 1975 | Maas, Ionn: De eigen wetgeving der architectuur. Doctoraalscriptie over woorden en werken van Dom H. van der Laan en de Bossche School, unpublished manuscript, Delft 1988, p. 8, pp. 90- | Padovan, Richard: Dom Hans van der Laan. Modern Primitive, Amsterdam 1994, pp. 192-, p. 208

Henning Larsen | Enghøj Church

Architektur und Wettbewerbe, no. 174/1998, pp. 20- | Arkitektur DK, no. 8/1995, pp. 428-, p. 478 | Dirckinck-Holmfeld, Kim: Guide to Danish Architecture 2. 1960-1995, Copenhagen 1995, p. 317 | Lind, Olaf: Jutland Architecture Guide, Copenhagen 2002, p. 162 | Lund, Nils-Ole: Arkitekt Henning Larsen, Copenhagen 1996, pp. 38-, p. 131, pp. 268-

Anssi Lassila | Käsämäki Church

Architecture and Urbanism, no. 8/2006, pp. 18- | Arkitehti, no. 4/2004, cover, pp. 38-, p. 87 | Bauwelt, no. 35/2005, pp. 26- | Kasvio, Maija, Mänttäri, Roy (Ed.): Arkitehtuura Puusta, exhibition catalogue, Helsinki 2005, back cover, pp. 32-, pp. 42- | Techniques et Architecture, no. 476/2005, pp. 86-

Juha Leiviskä | Myyrämäki Church

Architectural Research Quarterly, no. 1/2004, pp. 61-, pp. 72- | The Architectural Review, no. 6/1987, pp. 63- | Architecture, no. 9/1989, cover, pp. 58- | Architecture and Urbanism, no. 7/1991, cover, pp. 76- | Architektur und Wettbewerbe, no. 174/1998, pp. 36- | Arkitehti, no. 8/1984, cover, pp. 36-, p. 78 | Architettura Viva, no. 30/1993, pp. 25- | Curtis, William J.R.: Modern Architecture since 1900, London 1996, pp. 675- | Deutsche Bauzeitschrift, no. 8/1989, pp. 1011- and no. 12/1991, pp. 1791- | Ecclesia, no. 8/1996, pp. 38- | Frampton, Kenneth, Wang, Wilfried (Ed.): World Architecture 1900-2000. A Critical Mosaic. Vol. 3 Northern Europe, Central Europe and Western Europe, Vienna and New York 2000, pp. 212- | Heathcote, Edwin, Spens, Iona: Church Builders, London 1997, pp. 152- | Ilonen, Arvi: Helsinki. Espoo Kauniainen Vantaa. An Architectural Guide, Helsinki 1990, p. 173, p. 175 | Kunst und Kirche, no. 2/1989, pp. 69- and no. 2/1993, p. 84 | Norberg-Schulz, Christian: Skandinavische Architektur. Neue Tendenzen im Bauen der Gegenwart, Stuttgart 1993, pp. 92- | Norri, Marja-Riitta, Paatero, Kristiina (Ed.): Juha Leiviskä, exhibition catalogue, Helsinki 1999, pp. 74-, p. 200 | Norri, Marja-Riitta (Ed. et al.): 20th-Century Architecture. Finland, exhibition catalogue, Munich 2000, pp. 276- | Poole, Scott: The New Finnish Architecture, New York 1992, pp. 102- | Quantrill, Malcolm: Juha Leiviskä and the Continuity of Finnish Modern Architecture, Chichester 2001, pp. 46- | Stock, Wolfgang Jean (Ed.): European Church Architecture 1950-2000, Munich 2002, pp. 286- | Stock, Wolfgang Jean: Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, pp. 172-

Sol Madridejos Fernández, Juan Carlos Sancho Osinaga

Chapel for a Country Estate and Hunting Lodge
Architectural Record, no. 4/2001, pp. 73- | Architecture and Urbanism, no. 7/2003, pp. 92- | Architektur Aktuell, no. 5/2006, p. 2 | Cargill Thompson, Jessica: 40 Architects under 40, Cologne 2000, pp. 456- | Cohen, Jean-Louis, Moeller, G. Martin (Ed.): Liquid Stone. New Architecture in Concrete, Basel 2006, pp. 160- | Construction Moderne, no. 122/2006, back cover, p. 31, pp. 34- | El Croquis, no. 106/107/2001, pp. 198- | Deutsche Bauzeitung, no. 9/2002, pp. 51- | Heathcote, Edwin, Moffatt, Laura: Contemporary Church Architecture, Chichester 2007, pp. 110- | Kunst und Kirche, no. 1/2002, p. 27 | AMC Le Moniteur Architecture, no. 138/2003, pp. 106- | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 433 | Richardson, Phyllis: New Sacred Architecture, London 2004, pp. 38- | Riley, Terence: On-Site. New Architecture in Spain, exhibition catalogue, New York 2005, pp. 40- | Techniques et Architecture, no. 452/2001, pp. 86- | 1000 x European Architecture, (n.p.) Berlin 2007, p. 162 | 10 x 10 - 2. 100 Architekten 10 Kritiker, Berlin 2006, pp. 322-

Fumihiko Maki | Hill of the Winds Crematorium

Architectural Design, no. 3/4/1997, pp. 22- | Architectural Record, no. 2/1998, cover, pp. 92- | Architektur und Wettbewerbe, no. 192/2002, pp. 54- | L'Architettura Cronache e Storia, no. 537/538/2000, cover, pp. 432- | Area, no. 83/2005, pp. 136- | Casabella, no. 658/1998, pp. 4- | Cerver, Francisco Ascensio: Zeitgenössische Architektur, (n.p.) Königswinter 2005, pp. 374- | Chroniques d'Art Sacré, no. 58/1999, p. 30 | Fujiki, Takao (Ed.): Religious Facilities. New Concepts in Architecture

and Design, Tokyo 1997, pp. 170- | GA Global Architecture Document, no. 52/1997, pp. 6-, pp. 30- | Heathcote, Edwin: Monument Builders. Modern Architecture and Death, London 1999, pp. 146- | The Japan Architect, no. 16/1994, pp. 124- and no. 27/1997, cover, pp. 10- and no. 65/2007, pp. 70- | Jodidio, Philip: Building a New Millennium, Cologne 1999, pp. 330- | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 182 | Sewing, Werner: Architecture: Sculpture, Munich 2004, pp. 96- | Taylor, Jennifer: The Architecture of Fumihiko Maki. Space, City, Order and Making, Basel 2003, p. 10, p. 91, p. 96, p. 112, pp. 114-, p. 125, pp. 173-, pp. 177- | Thorne, Martha (Ed.): The Pritzker Architecture Prize. The First Twenty Years, Chicago 1999, pp. 142-

Mecanoo | Chapel St Mary of the Angels

De Architect, no. 7/8/2001, pp. 58- | The Architectural Review, no. 11/2001, pp. 41- | L'Architecture d'Aujourd'hui, no. 337/2001, pp. 46- | Architektur Aktuell, no. 17/2002, p. 26 | Architektur und Wettbewerbe, no. 192/2002, cover, pp. 34- | Bilò, Federico: Mecanoo, Rome 2003, cover, pp. 136- | Bouw, no. 11/2001, pp. 44- | Deutsche Bauzeitung, no. 11/2001, p. 16 | Domus, no. 840/2001, p. 3 | GA Global Architecture Document, no. 65/2001, pp. 37- and no. 67/2001, pp. 60- | Groenendijk, Paul, Vollaard, Piet: Architectural Guide to the Netherlands 1900-2000, Rotterdam 2006, p. 471 | Heathcote, Edwin, Moffatt, Laura: Contemporary Church Architecture, Chichester 2007, pp. 104- | Hoogewoning, Anne (Ed. et al.): Architectuur in Nederland. Jaarboek 2001/2002, Rotterdam 2002, pp. 96- | Houben, Francine, Mecanoo Architects: Composition Contrast Complexity, Basel 2001, pp. 183-, p. 247 | Houben, Francine (et al.): En het eeuwige licht verlichte haar. R.K. Kapel Heilige Maria der Engelen, Rotterdam 2003 | Ibelings, Hans (Ed.): Architecten in Nederland. Van Cuypers tot Koolhaas, Amsterdam and Gent 2005, p. 197 | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 352 | Richardson, Phyllis: New Sacred Architecture, London 2004, pp. 48- | Techniques et Architecture, no. 459/2002, pp. 81- | Valle, Pietro: Mecanoo. Experimental Pragmatism, Milan 2007, pp. 130-, pp. 211-

Paulo Archias Mendes da Rocha | St Peter's Chapel

Architektur Aktuell, no. 5/2006, p. 14 | AV Monografias, no. 95/2002, pp. 78- | Casabella, no. 693/2001, pp. 20- | Deutsche Bauzeitung, no. 2/1995, p. 86 | AMC Le Moniteur Architecture, no. 161/2006, p. 28 | Montaner, Josep Maria, Villac, Maria Isabel: Mendes da Rocha, Barcelona 1996, pp. 66- | Projeto, no. 128/1989, pp. 52- | Solot, Denise Chini: Paulo Mendes da Rocha. Estrutura. O êxito da forma, Rio de Janeiro 2004, pp. 88- | Spiro, Annette: Paulo Mendes da Rocha. Bauten und Projekte, Sulgen and Zurich 2002, pp. 182-, p. 263

C. F. Møllers Tegnestue | Ravnsbjerg Church

Arkitektur DK, no. 3/1977, pp. 89-, p. A 56 | Bauen und Wohnen, no. 3/1978, pp. 121- | Dirckinck-Holmfeld, Kim: Guide to Danish Architecture 2. 1960-1995, Copenhagen 1995, pp. 198- | Johannsen, Hugo, Smidt, Claus M.: Danmarks Arkitektur. Kirkens huse, Copenhagen 1981, p. 195 | Lind, Olaf: Jutland Architecture Guide, Copenhagen 2002, p. 219 | Lindstrom, Randall S.: Creativity and Contradiction. European Churches since 1970, Washington D.C. 1988, pp. 40-, p. 45, p. 135 | Lund, Nils-Ole: Bygmesteren C.F. Møller, Århus 1998, pp. 126-, p. 134, pp. 148- | Møller, Mads: Romantik og Snusfornuft, Arkitektfirmaet C.F. Møllers Tegnestue, Haderslev 1993, p. 23, p. 30, p. 43, p. 54, p. 68

José Rafael Moneo | Cathedral of Our Lady of the Angels

Architectural Design, no. 11/12/1999, pp. 80- | Architectural Record, no. 11/2002, cover, pp. 124- | Architectural Research Quarterly, no. 3/4/2003, pp. 333- | The Architectural Review, no. 3/2003, pp. 44- | Architecture and Urbanism, no. 10/1998, pp. 36- and no. 3/2003, pp. 60- | Architektur Aktuell, no. 1/2/2003, pp. 44- | Area, no. 67/2003, pp. 88- | Architettura Viva, no. 51/1996, p. 7 and no. 58/1998, pp. 60-, p. 115 and no. 84/2002, p. 5 and no. 85/2002, pp. 92- | AV Monografias, no. 95/2002, cover, pp. 106- and no. 113/2005, p. 171, pp. 174- | Ars Sacra, no. 3/1997, cover, pp. 6-, p. 123 and no. 18/2001, pp. 18-, pp. 177- | Bauwelt, no. 26/1996, p. 1505 and no. 47/2000, pp. 30- and no. 4/2003, pp. 26- | Capella, Juli: Rafael Moneo. Diseñador, Barcelona 2003, pp. 64- | Casabella, no. 677/2000, pp. 8-, pp. 90- | Chiesa Oggi, no. 45/2000/2001, pp. 28- and no. 64/65/2004, pp. 28- | Chroniques d'Art Sacré, no. 83/2005, p. 24 | El Croquis, no. 91/1998, pp. 118- and no. 98/1999, pp. 160- | Domus, no. 853/2002, pp. 34- | Faith and Form, no. 4/2001, pp. 11- and no. 1/2004, p. 28 and no. 3/2004, pp. 18- | Flagge, Ingeborg, Schneider, Romana (Ed.): Die Revision der Postmoderne, exhibition catalogue, Hamburg 2004, pp. 278- | Frankfurter Allgemeine, 3. 9. 2002, p. 35 | GA Global Architecture Document, no. 58/1999, pp. 72- and no. 72/2002, pp. 94- | Heathcote, Edwin, Moffatt, Laura: Contemporary Church Architecture, Chichester 2007, pp. 178- | Neue Zürcher Zeitung, Internationale Ausgabe, 14./15. 12. 2002, p. 53 | On Diseño, no. 237/2002, cover, pp. 138- | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 670 | Richardson, Phyllis: New Sacred Architecture, London 2004, pp. 162- | Roberts, Nicholas W.: Building Type Basics for Places of Worship, Hoboken / New Jersey 2004, pp. 51-, pp. 92-, p. 115, p. 169, p. 173, p. 181, pp. 204-, p. 219, p. 222, pp. 226-, colour inlay ill. 1, ill. 2, ill. 3, ill. 4a, ill. 4b | Techniques et Architecture, no. 463/2002/2003, pp. 102-

Tamás Nagy | Dunaujváros Church

Akademie der Künste (Ed.): Baustelle : Ungarn. Neuere ungarische Architektur, Berlin 1999, p. 64, p. 67 | Axis, no. 3/4/1999, p. 98, pp. 100-101 | Domus no. 804/1998, p. 45 | Morris, Alison, Lockie, Finlay (Ed.): Next. 8th International Architecture Exhibition, exhibition catalogue, Vol. 2, New York 2002, p. 71 | Stock, Wolfgang Jean: Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, pp. 310-

Bernt Nyberg | Höör Chapel

Arkitektur, no. 4/1996, pp. 20- | Caldenby, Claes (Ed. et al.): Architektur im 20. Jahrhundert. Schweden, exhibition catalogue, Munich 1998, p. 325 | Svenson, Rune G.: Klockarebackens Kapell Höör. Arkitekt Bernt Nyberg, Höör 2004 | Wærn, Rasmus (et al.): Guide till Sveriges Arkitektur. Byggnadskonst under 1000 år, Stockholm (n.d.) 2001, p. 35

Manuel Pauli | Christ Church

Altermatt, Josef (et al.): Kirchliches Zentrum Langendorf, Kleine Kunstführer no. 1294, Munich and Zurich 1981 | Architektur und Wettbewerbe, no. 54/1968, pp. 15- | Brentini, Fabrizio: Bauen für die Kirche. Katholischer Kirchenbau des 20. Jahrhunderts in der Schweiz, Luzern 1994, pp. 236- | Christen, Willi E. (Ed.): Schweizer Architekturführer 1920-1990, Vol. 2, Zurich 1994, p. 138 | Ineichen, Hannes (Ed.): Manuel Pauli. Bauten und Projekte 1956-1983. Stadtarchitekt von Luzern 1983-1995, Monografien Schweizer Architekten und Architektinnen, Vol. 3, Blauen 2001, pp. 104- | Kunst und Kirche, no. 3/1978, pp. 122- | Müller, Gerhard (Ed.): Theologische Realenzyklopädie, Vol. XVIII. Katechumenat/Katechumenen - Kirchenrecht, Berlin and New York 1989, plate 24 before p. 481 | Das Münster, no. 2/3/1972, pp. 98- | Rucki, Isabelle, Huber, Dorothee (Ed.): Architektenlexikon der Schweiz 19./20. Jahrhundert, Basel 1998, p. 412 | Wälchli, Roland: Impulse einer Region. Solothurner Architektur 1940-1980, Solothurn 2005, pp. 194- | Werk, no. 4/1972, pp. 214- and no. 6/1972, pp. 357-

John Pawson | Cistercian Monastery Our Lady of Nový Dvůr

Althaus, Birgit: Kirchen. Die schönsten Gotteshäuser des Christentums, Erfstadt 2007, pp. 52- | The Architectural Review, no. 4/2004, pp. 69- | L'Architecture d'aujourd'hui, no. 356/2005, cover, pp. 76- | Arquitectura Viva, no. 79/80/2001, p. 11 | El Croquis, no. 127/2005, p. 15, pp. 86- | Detail, no. 9/2004, pp. 94- | Heathcote, Edwin, Moffatt, Laura: Contemporary Church Architecture, Chichester 2007, pp. 172- | Icon, no. 5/2003, pp. 50- | Jodidio, Philip: Architecture Now! Vol. 4, Cologne 2006, pp. 426- | Morris, Alison, Lockie, Finlay (Ed.): Next. 8th International Architecture Exhibition, exhibition catalogue, Vol. 1, New York 2002, pp. 354- | John Pawson. Themes and Projects, London 2002, pp. 104- | Richardson, Phyllis: New Sacred Architecture, London 2004, pp. 130- | Techniques et Architecture, no. 451/2000/2001, pp. 92-

Andrés Perea Ortega, Julián Franco López,**José Manuel Palao Nuñez | Church of Santa Teresa de Jesús**

The Architectural Review, no. 11/1995, pp. 52- | Architettura e spazio sacro nella modernità, exhibition catalogue, Milan 1992, p. 192, p. 296 | Arquitectura, no. 286/287/1990, pp. 138- | Baidellou, Miguel Angel, Capitel, Antón: Summa artis. Historia general del arte. Vol. XL. Arquitectura española del siglo XX, Madrid 1996, pp. 600- | Campo Baeza, Alberto, Poissay, Charles (Ed.): Young Spanish Architecture, Madrid 1985, p. 142 | Capitel, Antón, Wang, Wilfried (Ed.): Architektur im 20. Jahrhundert. Spanien, exhibition catalogue, Munich 2000, p. 254 | Chiesa Oggi, no. 15/1995, pp. 58- | El Croquis, no. 6/1982, pp. 20- and no. 46/1991, advert p. 5, pp. 132- | Kunst und Kirche, no. 1/2002, pp. 14- | On Diseño, no. 127/1991, pp. 140- | Rispa, Raúl (Ed.): Birkhäuser Architekturführer. Spanien. 1920-1999, Basel 1998, p. 284 | Stock, Wolfgang Jean (Ed.): European Church Architecture 1950-2000, Munich 2002, pp. 196- | Stock, Wolfgang Jean: Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, pp. 256-

Günter Pfeifer, Roland Mayer | Funeral Chapel, Maulburg Cemetery

Adolphsen, Helge, Nohr, Andreas (Ed.): Sehnsucht nach heiligen Räumen. Eine Messe in der Messe. Berichte und Ergebnisse des 24. Evangelischen Kirchbautages 31. Oktober bis 3. November 2002 in Leipzig, Darmstadt 2003, pp. 69- | Bauwelt, no. 33/1993, pp. 1730- | Beton Prisma, no. 62/1992, pp. 26- and no. 65/1993, pp. 22- | Bund Deutscher Architekten Landesverband Baden-Württemberg (Ed.): Architektur 1990-1993 in Baden-Württemberg, Stuttgart 1994, pp. 214- | DAM Architektur Jahrbuch 1993, Munich and New York 1993, pp. 126- | Deutsche Bauzeitung, no. 11/1994, pp. 112- | Goldbach, Ines (Ed.): Neue Architektur Oberrhein, (n.p.) Basel 2007, cover, pp. 130- | Kunst und Kirche, no. 1/2005, pp. 17- | Nerdinger, Winfried, Tafel, Cornelius: Birkhäuser Architekturführer. Deutschland. 20. Jahrhundert, Basel 1996, p. 394 | Pfeifer, Günter (et al.): Exposed Concrete. Technology and Design, Basel 2005, pp. 156-

Renzo Piano | Padre Pio Pilgrimage Church

Acocella, Alfonso: L'architettura di pietra. Antichi e nuovi magisteri costruttivi, Florence and Lucca 2004, p. 298, pp. 356- | Architectural Design, no. 11/12/1999, pp. 82- | Architectural Record, no. 11/2004, cover, pp. 184- | The Architectural Review, no. 3/2003, pp. 66- and no. 9/2004, pp. 64- and no. 4/2005, pp. 10- | Architecture Intérieure Créée, no. 318/2005, cover, pp. 124- | Architektur Aktuell, no. 7/8/2004, p. 26 | Arquitectura Viva, no. 58/1998, pp. 56- | AV Monografias, no. 95/2002, pp. 82- and no. 119/2006, pp. 40- | Art, no. 10/2004, p. 115 | Baumeister, no. 7/2001, pp. 58- | Berliner Zeitung, 1. 7. 2004, p. 10 | Chiesa Oggi, no. 39/1999/2000, pp. 42- and no. 66/67/2004, pp. 27- and no. 68/2004, cover, p. 7, p. 15, pp. 26- | Crossing, no. 2/2001, pp. 14- | Derric, David: New Stone Architecture, London 2003, pp. 158- | De Seta, Cesare: Architettura della fede in Italia. Dalle origini ai nostri giorni, Milan 2003, pp. 207- | Detail, no. 9/2004, pp. 976- | Ecclesia, no. 1/1995, pp. 48- | Faith and Form, no. 1/2006, pp. 12- | Frankfurter Allgemeine, 3. 7. 2004, p. 40 | GA Global Architecture Document, no. 81/2004, pp. 84- | Heathcote, Edwin, Moffatt, Laura: Contemporary Church Architecture, Chichester 2007, pp. 132- | Jodidio, Philip: Piano. Renzo Piano Building Workshop. 1966-2005, Cologne 2005, pp. 442- | Kunst und Kirche, no. 3/2001, pp. 154- | Naturstein Architektur, no. 1/2001, p. 55 | Oddo, Maurizio (Ed.): La chiesa di Padre Pio a San Giovanni Rotondo. Renzo Piano Building Workshop, Milan 2005 | Ottogono, no. 134/1999, p. 31 | Renzo Piano. Architekturen des Lebens, exhibition catalogue, Ostfildern-Ruit 2000, pp. 90- | Pizzi, Emilio: Renzo Piano, Basel 2003, pp. 180- | Richardson, Phyllis: New Sacred Architecture, London 2004, pp. 170- | tec 21, no. 38/2004, pp. 6- | Techniques et Architecture, no. 445/1999, pp. 70- | Die Zeit, 22. 12. 2003, p. 11- and 1. 7. 2004, p. 41

**Paolo Portoghesi, Vittorio Gigliotti, Sami Moussawi
Mosque of Rome**

L'Arca, no. 70/1993, pp. 4- | The Architects' Journal, 5. 12. 1996, supplement Concrete Quarterly, pp. 6- | Architectural Design, no. 1/2/1980, pp. 24- and no. 3/4/1997, pp. 70- | L'Architecture d'aujourd'hui, no. 200/1978, pp. XIX- and no. 213/1981, pp. 57- | L'Architettura Cronache e Storia, no. 478/479/1995, p. 549 | Architettura e spazio sacro nella modernità, exhibition catalogue, Milan 1992, pp. 64- | Arca, no. 70/2003, pp. 118- | Controspazio, no. 4/1975, cover, pp. 74- | Coppa, Alessandra: La moschea di Roma. Paolo Portoghesi, Milan 2002 | Dal Co, Francesco (Ed.): Storia dell'architettura italiana. Il secondo novecento, Milan 1997, p. 229, p. 231 | Deutsche Bauzeitschrift, no. 7/1992, pp. 983- | Di Stefano, Cristina, Scatena, Donatella: Paolo Portoghesi Architetto, Rome 1999, front and back cover, pp. 200- | Domus, no. 294- | Domus, no. 379- | Domus, no. 387 | Domus, no. 720/1990, cover, pp. 33- | Ercadi, Maria (Ed.): Paolo Portoghesi. Disegni 1949-2003, Milan 2003, pp. 46- | Faith and Form, no. 2/2004, p. 17- | Frishman, Martin, Khan, Hasan-Uddin (Ed.): The Mosque. History, Architectural Development and Regional Diversity, London 1994, pp. 252- | Grundmann, Stefan (Ed.): Architekturführer Rom. Eine Architekturgeschichte in 400 Einzeldarstellungen, Stuttgart and London 1997, pp. 353- | Holod, Renata, Khan, Hasan-Uddin: The Mosque and the Modern World. Architects, Patrons and Designs since the 1950s, London 1997, p. 226, pp. 203- | Kraft, Sabine: Islamische Sakralarchitektur in Deutschland. Eine Untersuchung ausgewählter Moschee-Neubauten, Münster 2002, p. 62, p. 295 | Kunst und Kirche, no. 2/1996, pp. 132- | Massobrio, Giovanna (et al.): Paolo Portoghesi. Architetto, Milan 2001, pp. 188- | Moschini, Francesco (Ed.): Paolo Portoghesi. Progetti e disegni 1949-1979, Florence 1979, pp. 70- | Muratore, Giorgio (et al.): Italia. Gli ultimi trent'anni. Guida all'architettura moderna, Bologna 1988, p. 354 | Norberg-Schulz, Christian: Architekturen di Paolo Portoghesi e Vittorio Gigliotti, Rome 1982, pp. 102- | Pearman, Hugh: Contemporary World Architecture, London 1998, pp. 157- | Pisani, Mario: Paolo Portoghesi, Milan 1992, p. 18, p. 86 | Paolo Portoghesi. Opere, exhibition catalogue, Modena 1985, pp. 43- | Portoghesi, Paolo: Natura e architettura, Milan 1999, p. 149, pp. 222- | Priori, Giancarlo (Ed.): Paolo Portoghesi, Bologna 1985, cover, pp. 84- | Priori, Giancarlo: L'architettura ritrovata. Opere recenti di Paolo Portoghesi, Rome 1985, pp. 22- | Rossi, Piero Ostilio: Roma. Guida all'architettura moderna 1909-2000, Rome and Bari 2000, pp. 354- | Serageldin, Ismail, Steele, James (Ed.): Architecture of the Contemporary Mosque, London 1996, pp. 150- | Techniques et Architecture, no. 405/1992, pp. 38- | Werk, Bauen und Wohnen, no. 11/1996, pp. 54-

Rudolf Reitermann, Peter Sassenroth | Chapel of Reconciliation

Architektur Aktuell, no. 3/2001, pp. 66- | Architektur in Berlin. Jahrbuch 2001, Hamburg and Dresden 2001, pp. 92- | Berliner Festspiele, Architektenkammer Berlin (Ed.): Berlin Offene Stadt. Die Stadt als Ausstellung. Der Wegweiser, Berlin 2001, pp. 53- | Detail, no. 6/2003, pp. 652- | Deutsche Bauzeitung, no. 11/2001, cover, pp. 70- and no. 3/2007, p. 66, pp. 69- | Flagge, Ingeborg (Ed.): Jahrbuch Licht und Architektur 2001/2002, Cologne 2002, pp. 90- | Goetz, Christine, Hoffmann-Tauschwitz, Matthias (Ed.): Kirchen Berlin Potsdam. Führer zu den Kirchen in Berlin und Potsdam, Berlin 2003, pp. 152- | Haubrich, Rainer (et al.): Berlin. Der Architekturführer, (n.p.) Berlin 2005, pp. 288- | Kapfinger, Otto: Martin Rauch. Lehm und Architektur, Basel 2001, pp. 82- | Kunst und Kirche, no. 1/2000, pp. 44- | Ludwig, Matthias, Mawick, Reinhard (Ed.): Gottes neue Häuser. Kirchenbau des 21. Jahrhunderts in Deutschland, Frankfurt am Main 2007, pp. 36- | Minke, Gernot: Building with Earth. Design and Technology of a Sustainable Architecture, Basel 2006, cover, pp. 192- | Das Münster, no. 1/2002, pp. 65- | Neue Zürcher Zeitung, Internationale Ausgabe, 28. 1. 2002, p. 22 | Nieden, Günter zur, Ziegert, Christof: Neue Lehm-Häuser international. Projektbeispiele, Konstruktionen, Details, Berlin 2002, front cover, pp. 22- | Orte ArchitekturNetzwerk Niederösterreich, Nitschke, Marcus (Ed.): Raum und Religion. Europäische Positionen im Sakralbau, Deutschland, Österreich, Polen, exhibition catalogue, Salzburg and Munich 2005, pp. 126- | Oswald, Philipp: Berlin Stadt ohne Form. Strategien einer anderen Architektur, Munich 2000, pp. 190- | Rave, Rolf: Bauen seit 1980 in Berlin. Ein Führer zu 400 Bauten in Berlin von 1980 bis heute, Berlin 2005, no. 474 | Richardson, Phyllis: New Sacred Architecture, London 2004, pp. 78- | Scherz-Schade, Sven: Kirchen in Berlin. Kirchen, Synagogen, Moscheen und Tempel, Berlin 2005, pp. 190- | Schneider, Günter, Cobbers, Arnt: Berlin. Die neue Architektur, Berlin 2005, pp. 116- | Stock, Wolfgang Jean (Ed.): European Church Architecture 1950-2000, Munich 2002, pp. 298- | Stock, Wolfgang Jean: Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, pp. 76- | Der Tagesspiegel, 9. 12. 2001, p. S5 | 1000 x European Architecture, (n.p.) Berlin 2007, p. 426 | Wöhler, Till: Neue Architektur. Sakralbauten, (n.p.) Berlin 2005, pp. 56- | Zwischenspiel II. Fifty : Fifty. Gebaute und nicht gebaute Architektur in Berlin 1990-2000, exhibition catalogue, Berlin 2002, pp. 66-

Raj Rewal | Lisbon Ismaili Centre

The Architectural Review, no. 3/2003, pp. 52- | L'Architecture d'aujourd'hui, no. 338/2002, pp. 22- | Detail, no. 9/2004, pp. 978- | Jodidio, Philip: Under the Eaves of Architecture. The Aga Khan. Builder and Patron, Munich 2007, pp. 184- | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 444 | Richardson, Phyllis: New Sacred Architecture, London 2004, pp. 86-

Peter Riepl, Gabriele Riepl | Church of St Francis

Architektur Aktuell, no. 11/2001, pp. 130- | Architekturzentrum Wien (Ed.): Architektur in Österreich im 20. und 21. Jahrhundert, exhibition catalogue, Basel 2006, p. 248 | Archithese, no. 5/2003, p. 66, pp. 68- | AV Monografias, no. 95/2002, pp. 86- | Baumeister, no. 12/2001, pp. 76- | Bauwelt, no. 37/2003, pp. 18- | Detail, no. 9/2004, pp. 992- | Häusler, Wolfgang, Lienhardt, Conrad (Ed.): Keith Sonnier. Skulptur Licht Raum, Ostfildern-Ruit (n.d.) 2002, pp. 59- | Kunst und Kirche, no. 2/2001, pp. 124- | Lienhardt, Conrad (Ed.): Sakralraum im Umbruch. Kirchenbau der katholischen Kirche in Oberösterreich seit 1948, Regensburg 2004, pp. 180- | Neue Zürcher Zeitung, Schweizer Ausgabe, 4. 4. 2003, p. 81 | Orte ArchitekturNetzwerk Niederösterreich, Nitschke, Marcus (Ed.): Raum und Religion. Europäische Positionen im Sakralbau, Deutschland, Österreich, Polen, exhibition catalogue, Salzburg and Munich 2005, pp. 26- | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 539 | Riepl, Riepl Architekten. Sites, Vienna and New York 2008, pp. 150- | Stock, Wolfgang Jean (Ed.): European Church Architecture 1950-2000, Munich 2002, pp. 206- | Stock, Wolfgang Jean: Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, pp. 232- | Wöhler, Till: Neue Architektur. Sakralbauten, (n.p.) Berlin 2005, pp. 158-

Axel Schultes, Charlotte Frank | Baumschulenweg Crematorium

Adolphsen, Helge, Nohr, Andreas (Ed.): Glauben sichtbar machen. Herausforderungen an Kirche, Kunst und Kirchenbau. Berichte und Ergebnisse des 25. Evangelischen Kirchbautages 29. September bis 2. Oktober 2005 in Stuttgart, Hamburg 2006, pp. 1- | Der Architekt, no. 3/1999, pp. 42- | The Architectural Review, no. 1/1999, pp. 52- | Der Architekt, no. 3/2001, p. 53 | Architektur Aktuell, no. 223/1998, pp. 36- | Arco Team: Minimalismus. Geschichte, Mode, Möbel und Design, Architektur, Inneneinrichtungen, Königswinter 2006, pp. 600- | Arca, no. 50/2000, pp. 14- | Arquitectura Viva, no. 66/1999, p. 13 | Ballard Bell, Victoria, Rand, Patrick: Materials for Architectural Design, London 2006, p. 52, pp. 82- | Bauwelt, no. 34/1992, p. 1882 and no. 18/19/1996, pp. 1104- and no. 37/1998, pp. 2092- | Bennett, David: Exploring Concrete Architecture. Tone Texture Form, Basel 2001, pp. 76- | Beton Prisma, no. 78/2000, pp. 40- | Construction Moderne, no. 115/2004, cover, pp. 32- | DAM Architektur Jahrbuch 1993, Munich and New York 1993, pp. 168- | DAM Architektur Jahrbuch 1999, Munich 1999, pp. 134- | Detail, no. 1/2001, pp. 79- | Deutsche Bauzeitung, no. 11/1992, pp. 162- | Domus, no. 817/1999, pp. 34- | Faith and Form, no. 2/1999, cover, p. 6 | Flagge, Ingeborg (Ed.): Jahrbuch Licht und Architektur 2000, Cologne 2000, pp. 174- | Frankfurter Allgemeine, 10. 6. 1999, p. 49 | Haberlik, Christina, Zohlen, Gerwin: Ein Stadtführer zur Architektur des neuen

Berlin. 60 Bauten im Überblick, Berlin 2002, pp. 114- | Haubrich, Rainer (et al.): Berlin. Der Architekturführer, (n.p.) Berlin 2005, p. 268 | Jaeger, Falk: Architektur für das neue Jahrtausend. Baukunst der neunziger Jahre in Berlin. Stuttgart und Munich 2001, pp. 181- | Jodidio, Philip: Building a New Millennium, Cologne 1999, pp. 426- | Kind-Barakauskas, Friedbert (u.a.A.): Beton Atlas. Entwerfen mit Stahlbeton im Hochbau, Basel 2002, pp. 244- | Kramm, Rüdiger, Schalk, Tilman (Ed.): Sichtbeton. Betrachtungen. Ausgewählte Architektur in Deutschland, Düsseldorf 2007, pp. 242- | Kunst und Kirche, no. 3/1999, pp. 181- and no. 2/2000, p. 80 and no. 1/2005, pp. 7- | Lepik, Andres, Schmedding, Anne (Ed.): Architektur in Berlin. Das XX. Jahrhundert, Cologne 1999, pp. 120- | Merkur, no. 6/2001, pp. 476- | Paetz, genannt Schieck, Eberhard (Ed.): Neuer Expressionismus 2004. Eine Darstellung der Architektorentwicklung seit circa 1920 bis heute, Darmstadt 2004, p. 231, pp. 237- | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 479 | Rave, Rolf: Bauen seit 1980 in Berlin. Ein Führer zu 400 Bauten in Berlin von 1980 bis heute, Berlin 2005, no. 644 | Ruhigas AG Essen (Ed.): Architektur in Deutschland '01. Deutscher Architekturpreis 2001, Stuttgart und Zürich 2002, pp. 56- | Schwarz, Ulrich (Ed.): New German Architecture. A Reflexive Modernism, exhibition catalogue, Ostfildern-Ruit 2002, pp. 174- | Senatsverwaltung für Bau- und Wohnungswesen Berlin (Ed.): Realisierungswettbewerb Krematorium Baumschulenweg, Ausschreibung, Berlin 1992 | Senatsverwaltung für Bau- und Wohnungswesen Berlin (Ed.): Realisierungswettbewerb Krematorium Baumschulenweg, Ergebnisprotokoll, Berlin 1992, cover, pp. 10- | p. 13, Anhang Arbeit 009 | Stock, Wolfgang Jean: Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, pp. 77- | Werk, Bauen und Wohnen, no. 10/2000, pp. 50- | Wöhler, Till: Neue Architektur. Sakralbauten, (n.p.) Berlin 2005, pp. 60- | Zwischenspiel II. Fifty: Fifty. Gebaute und nicht gebaute Architektur in Berlin 1990-2000, exhibition catalogue, Berlin 2002, pp. 70-

Alvaro Siza | Santa Maria Church

Anfone e Zeto, no. 12/2001, cover, p. 3, p. 5, p. 24- | Archis, no. 8/1997, pp. 38- | Architectural Design, no. 6/2001, pp. 96- | The Architectural Review, no. 8/1998, pp. 60- | Architecture, no. 10/1998, pp. 112- | Architecture and Urbanism, no. 4/2000, pp. 24- | Architektur und Wettbewerbe, no. 174/1998, pp. 48- | Architettura e spazio sacro nella modernità, exhibition catalogue, Milan 1992, p. 315 | Area, no. 70/2003, p. 141 | Arkitektur, no. 6/2004, pp. 24- | Arquitectura Viva, no. 58/1998, cover, pp. 34-, p. 114 | AV Monografias, no. 95/2002, pp. 42- | Baumeister, no. 6/1999, pp. 16- | Bauwelt, no. 8/1997, pp. 344 | Becker, Annette (Ed. et al.): Architektur im 20. Jahrhundert. Portugal, exhibition catalogue, Munich and New York 1997, pp. 314- | Casabella, no. 640/641/1996/1997, pp. 130- | Cerver, Francisco Asensio: Zeitgenössische Architektur, (n.p.) Königswinter 2005, pp. 386- | Chiesa Oggi, no. 43/2000, cover, pp. 20- | Chroniques d'Art Sacré, no. 64/2000, cover, pp. 14- | Cornoldi, Adriano (Ed.): L'Architettura dell'edificio sacro, Rome 1997, pp. 272- | El Croquis, no. 68/69/1994, pp. 240- and no. 91/1998, pp. 48- and no. 95/1999, pp. 52- | Cuito, Aurora (Ed.): Alvaro Siza, Kempen 2002, pp. 28- | Demie, David: New Stone Architecture, London 2003, pp. 26- | Domus, no. 802/1998, pp. 16- | Flagge, Ingeborg, Schneider, Romana (Ed.): Die Revision der Postmoderne, exhibition catalogue, Hamburg 2004, pp. 276- | Frampton, Kenneth: Alvaro Siza. Complete Works, London 2000, p. 54, pp. 56-, p. 67, pp. 379 | GA Global Architecture Document, no. 50/1997, cover, pp. 6- | GA Global Architecture Document Extra, no. 11/1998, pp. 36- | Heathcote, Edwin, Spens, Jona: Church Builders, London 1997, pp. 202- | Heathcote, Edwin, Moffatt, Laura: Contemporary Church Architecture, Chichester 2007, pp. 162- | L'Industria delle Costruzioni, no. 313/314/1997, pp. 29 | Jodidio, Philip: Alvaro Siza, Cologne 1999, pp. 118- | Jodidio, Philip: Building a New Millennium, Cologne 1999, pp. 448- | On Diseño, no. 194/1998, cover, pp. 180- | Ottogono, no. 134/1999, pp. 40- | Sabatucci, Antonio (Ed.): Costantino Ruggeri. L'Architettura di Dio, Milan 2005, pp. 142- | Stock, Wolfgang Jean (Ed.): European Church Architecture 1950-2000, Munich 2002, pp. 200- | Stock, Wolfgang Jean: Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, pp. 246- | Techniques et Architecture, no. 439/1998, cover, pp. 44 | Toto Shuppan (Ed.): Alvaro Siza, Tokyo 2007, pp. 174- | Werk, Bauen und Wohnen, no. 9/1998, pp. 38-

Skidmore Owings Merrill (SOM), Swanke Haden Connell

Islamic Cultural Center of New York
Architectural Record, no. 8/1992, pp. 90- | Browning, Dominique, Editors of House and Garden: House of Worship. Sacred Spaces in America, New York 2006, pp. 68- | Crosbie, Michael J.: Architecture for the Gods, Mulgrave 1999, pp. 100- | Faith and Form, no. Winter/1992/1993, p. 18 | Frishman, Martin, Khan, Hasan-Uddin (Ed.): The Mosque. History, Architectural Development and Regional Diversity, London 1994, p. 246 | Holod, Renata, Khan, Hasan-Uddin: The Mosque and the Modern World. Architects, Patrons and Designs since the 1950s, London 1997, pp. 248-, p. 273, p. 279 | Kraft, Sabine: Islamische Sakralarchitektur in Deutschland. Eine Untersuchung ausgewählter Moschee-Neubauten, Münster 2002, p. 39, p. 295 | Metcalf, Barbara Daly (Ed.): Making Muslim Space in North America and Europe. Berkeley / Kalifornien 1996, pp. 20- | The New York Times, Late Edition, 26. 4. 1992, section 2, p. 38 | Progressive Architecture, no. 12/1990, p. 84 | Roberts, Nicholas W.: Building Type Basics for Places of Worship, Hoboken / New Jersey 2004, pp. 60-, colour inlay ill. 21, ill. 22 | White, Norval, Willensky, Elliot: AIA Guide to New York City, New York 2000, p. 433

Michael Szyszkowitz, Karla Kowalski | Brother Claus Church

Akademische Druck- und Verlagsanstalt Graz, Forum Stadtpark Graz (Ed.): Architektur-Investitionen. »Grazer Schule«. 13 Standpunkte, Graz 1986, pp. 108-, p. 163 | The Architectural Review, no. 12/1988, pp. 66- | Architecture and Urbanism, no. 4/1986, pp. 32- and no. 7/1990, pp. 109- | Architektur Aktuell, no. 12/1987, p. XI | Architektur und Bauforum, no. 139/1990, pp. 24- | Architektur und Wettbewerb, no. 133/1988, p. 11 | L'Architettura Cronache e Storia, no. 402/1989, pp. 278- and no. 422/1990, pp. 87- | Archithese, no. 5/1988, p. 47, p. 50 | Bauwelt, no. 30/1988, cover, pp. 1248- | Berghaler, Wolfgang (Ed. et al.): Funktion und Zeichen. Kirchenbau in der Steiermark seit dem II. Vatikanum, Graz und Budapest 1992, p. 46, p. 93, pp. 190- | Blundell Jones, Peter: Dialogues in Time. New Graz Architecture, Graz 1998, pp. 180- | Bruder-Klaus-Pfarrkirche Graz-Ragnitz (Ed.): Die Bruder-Klaus-Kirche in Graz-Ragnitz, Graz 1989 | Chiesa Oggi, no. 9/1994, pp. 52- | Deutsche Bauzeitschrift, no. 8/1989, p. 1010 | Deutsche Bauzeitung, no. 2/1992, p. 35 | Faith and Form, no. Spring/1993, pp. 32- | Flagge, Ingeborg (Ed.): Jahrbuch für Licht und Architektur 1993, Berlin 1994, pp. 183- | Gleiniger, Andrea: Szyszkowitz und Kowalski. 1973-1993. Tübingen und Berlin 1994, pp. 140- | Krafft, Anthony (Ed.): Architecture Contemporaine, Vol. 11 1989/1990, Paris 1989, pp. 268- | Kunst und Kirche, no. 2/1989, pp. 92- | Parametro, no. 151/152/1986, p. 54 | Techniques et Architecture, no. 394/1991, pp. 78- | Zentralvereinigung der Architekten Österreichs Landesverband Steiermark (Ed.): Architektur in Graz 1980-1987, Graz und Vienna 1987, p. 33

Heinz Tesar, Marc Tesar | Donau City Church

Architektur Aktuell, no. 3/2001, pp. 54- | Architekturzentrum Wien (Ed.): Architektur in Österreich im 20. und 21. Jahrhundert, exhibition catalogue, Basel 2006, p. 248 | Area, no. 56/2001, pp. 18- | AV Monografias, no. 95/2002, pp. 90- | Baumeister, no. 1/2001, p. 16 | Bauwelt, no. 31/2001, pp. 24- and no. 4/2003, p. 35 | Boyken, Immo: Heinz Tesar. Christus Hoffnung der Welt. Wien, Stuttgart und London 2002 | Chiesa Oggi, no. 53/2002, pp. 22- | Crossing, no. 4/2002, pp. 42- | Detail, no. 9/2004, pp. 970- | p. 1081 | Flagge, Ingeborg (Ed.): Jahrbuch Licht und Architektur 2001/2002, Cologne 2002, pp. 82 | Heathcote, Edwin, Moffatt, Laura: Contemporary Church Architecture, Chichester 2007, pp. 4-, pp. 138- | Kunst und Kirche, no. 4/1998, pp. 246- and no. 3/2001, pp. 157- | Das Münster, no. 1/2002, pp. 68- | Nerding, Winfried (Ed.): Heinz Tesar Architektur, exhibition catalogue, Munich and Milan 2005, cover, pp. 37-, pp. 224- | Neue Zürcher Zeitung, Internationale Ausgabe, 14./15. 12. 2002, p. 53 | Oris, no. 11/2001, pp. 44- | Orte Architekturnetzwerk Niederösterreich, Nitschke, Marcus (Ed.): Raum und Religion. Europäische Positionen im Sakralbau. Deutschland, Österreich, Polen, exhibition catalogue, Salzburg und Munich 2005, pp. 86 | Panek, Sandy, Steinmetz, Mark: Wien. Der Architekturführer, (n.p.) Berlin 2007, p. 272- | The Phaidon Atlas of Contemporary World Architecture, Comprehensive Edition, London 2004, p. 550 | Richardson, Phyllis: New Sacred Architecture, London 2004, p. 62, pp. 98- | Samitz, August: Wien. Neue Architektur 1975-2005, Vienna and New York 2003, cover, p. 198 | Steinmetz, Mark: Architektur Neues Wien. Wiener Baukultur 1996-2006, (n.p.) Berlin 2006, p. 135 | Stock, Wolfgang Jean (Ed.): European Church Architecture 1950-2000, Munich 2002, pp. 92- | Stock, Wolfgang Jean: Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, pp. 240- | 1000 x European Architecture, (n.p.) Berlin 2007, p. 769 | Wöhler, Till: Neue Architektur. Sakralbauten, (n.p.) Berlin 2005, pp. 176- | Die Zeit, 19. 12. 2001, p. 35

James N. Thorp | Central Methodist Church Annexe

The Architects' Journal, 9. 12. 1970, pp. 1365- | The Architectural Review, no. 10/1970, p. 255- | Concrete Quarterly, no. 88/1971, pp. 7- | Disse, Rainer: Kirchliche Zentren, Entwurf und Planung, Vol. 24, Munich 1974, p. 12 | AC Internationale Asbestzement-Revue, no. 64/1971, pp. 21-

Alexandros N. Tombazis | Bin Madiya Mosque

Holod, Renata, Khan, Hasan-Uddin: The Mosque and the Modern World. Architects, Patrons and Designs since the 1950s, London 1997, pp. 26-, p. 29, p. 256, p. 274 | Tombazis, Alexandros N., Schmiedeknecht, Torsten: Tombazis and Associates Architects. Less is Beautiful, Milan 2002, pp. 12-

Zlatko Ugljen | Sherefudin's White Mosque

Architectural Record, no. 9.2/1983, pp. 68- | The Architectural Review, no. 10/1983, pp. 89- | Architecture and Urbanism, no. 2/1988, pp. 18- | Der Architekt, no. 11/1986, pp. 499- | Architettura e spazio sacro nella modernità, exhibition catalogue, Milan 1992, p. 325 | Bauwelt, no. 40/1983, pp. 1622 | Bernik, Stane: Arhitekt Zlatko Ugljen, Tuzla 2002, p. 13, pp. 26-, pp. 32-, pp. 56-, p. 243 | Cantacuzino, Sherban (Ed.): Architecture in Continuity. Building in the Islamic World Today, New York 1985, pp. 102 | p. 188 | Domus, no. 645/1983, pp. 10- | Faith and Form, no. Winter/1990/1991, p. 22 | Frishman, Martin, Khan, Hasan-Uddin (Ed.): The Mosque. History, Architectural Development and Regional Diversity, London 1994, pp. 251-, p. 259 | Grover, Razia: Mosques, London 2006, pp. 134- | Holod, Renata, Khan, Hasan-Uddin: The Mosque and the Modern World. Architects, Patrons and Designs since the 1950s, London 1997, pp. 196-, p. 201, pp. 269-, p. 274 | Krafft, Anthony (Ed.): Architecture Contemporaine, Vol. 6 1984/1985, Paris and Lausanne 1984, pp. 137- | Kultermann, Udo: Zeitgenössische Architektur in Osteuropa, Cologne 1985, p. 220 | Kunst und Kirche, no. 4/2004, pp. 231- | Oris, no. 12/2001, pp. 18- | Pearman, Hugh: Contemporary World Architecture, London 1998, p. 154 | Pašić, Amir: Islamic Architecture in Bosnia and Herzegovina, Istanbul 1994, pp. 203- | Straus, Ivan: Arhitektura Jugoslavije. 1945-1990, Sarajevo 1991, pp. 248-

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AIA American Institute of Architects Journal, no. 9/1979, pp. 76- | De Architect, no. 10/1984, pp. 62- | Architectural Design, no. 7/8/1982, pp. 106- | The Architectural Review, no. 3/1979, pp. 146- | Architektur und Wettbewerbe, no. 113/1983, p. 34 | Arkitektur DK, no. 3/1982, pp. 81- | AV Monografias, no. 55/1995, p. 57, p. 65 and no. 95/2002, pp. 36- | Ars Sacra, no. 1/1997, pp. 21- | Bauwelt, no. 5/2006, p. 33 | Casabella, no. 649/1997, pp. 24- | Cornoldi, Adriano (Ed.): L'Architettura dell'edificio sacro, Rome 1997, pp. 252- | Curtis, William J.R.: Modern Architecture since 1900, London 1996, pp. 610- | Deutsche Bauzeitung, no. 1/1984, p. 22 | Dirckinck-Holmfeld, Kim: Guide to Danish Architecture 2. 1960-1995, Copenhagen 1995, pp. 196- | Faber, Tobias: A History of Danish Architecture, Copenhagen 1978, pp. 274-, pp. 278- | Ferrer Forés, Jaime J.: Jørn Utzon. Obras y proyectos, Barcelona 2006, pp. 264- | Frampton, Kenneth: Grundlagen der Architektur. Studien zur Kultur des Tektonischen, Munich and Stuttgart 1993, pp. 318-, p. 323-, p. 339 | Fromont, Françoise: Jørn Utzon. The Sydney Opera House, Corte Madera / California 1998, p. 188, pp. 210-, p. 226 | Futagawa, Yukio: Light and Space. Modern Architecture 2, Tokyo 1994, p. 320 | Gil, Paloma: El templo del siglo XX, Barcelona 1999, pp. 225- | GA Global Architecture Document, Special Issue 1970-1980, Tokyo 1980, pp. 214- | Johannsen, Hugo, Smidt, Claus M.: Danmarks Arkitektur. Kirkens huse, Copenhagen 1981, pp. 191- | Keiding, Martin, Dirckinck-Holmfeld, Kim (Ed.): Utzon and the New Tradition, Copenhagen 2005, pp. 200-, p. 243- | Kunst und Kirche, no. 1/1984, pp. 9- | Lind, Olaf, Lund, Annemarie: Architektur-Guide Kopenhagen, Copenhagen 1996, pp. 332- | Lind, Olaf, Lund, Annemarie: Arkitektur Guide København, Copenhagen 2005, pp. 388- | Lindström, Randall S.: Creativity and Contradiction. European Churches since 1970, Washington D.C. 1988, pp. 92-, p. 134 | Nieto, Fuen-santa, Sobejano, Enrique (Ed.): Jørn Utzon, Salzburg und Munich 1999, pp. 92- | Norberg-Schulz, Christian: Jørn Utzon. Church at Bagsværd, near Copenhagen, Denmark. 1973-76, GA Global Architecture, no. 61/1981 | Norberg-Schulz, Christian: Skandinavische Architektur. Neue Tendenzen im Bauen der Gegenwart, Stuttgart 1993, pp. 66- | Norberg-Schulz, Christian: Nightlands. Nordic Building, Cambridge / Massachusetts and London 1996, pp. 29-, pp. 184- | Pearman, Hugh: Contemporary World Architecture, London 1998, pp. 150- | Progressive Architecture, no. 9/1980, pp. 165 | RIBA Journal, no. 10/1978, pp. 425- | Stock, Wolfgang Jean (Ed.): European Church Architecture 1950-2000, Munich 2002, pp. 282- | Stock, Wolfgang Jean: Architectural Guide Sacred Buildings in Europe since 1950, Munich 2004, pp. 44- | Jørn Utzon Logbook. Vol. II Bagsværd Church, Hellerup 2005 | Weston, Richard: Utzon. Inspiration, Vision, Architecture, Hellerup 2001, pp. 278- | p. 421 | Woodward, Christopher: The Buildings of Europe. Copenhagen, Manchester and New York 1998, p. 96, p. 102

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Authors

Dorothea Baumann

Dorothea Baumann studied music at the Zurich Academy of Music, and musicology, physics and contemporary German literature at the University of Zurich. Since 1976 she has taught at the University of Zurich as an associate lecturer and as a guest lecturer at the University of Bern from 1979 to 1993. In 1987 she was a visiting professor at the Graduate Centre of the City University of New York, in 1998 at the University of Innsbruck, Austria. She has lectured on numerous topics and published widely on interdisciplinary subjects related to historical and systematic musicology. Her specialist fields include the acoustic of spaces, musical acoustics, music psychology and the practice of musical performance.

Negar Hakim

Born in 1971 in Esfahan, Iran, Negar Hakim studied history of art at the University of Vienna, completing her doctorate in 2007 on the development of modern architecture in Iran in the second half of the 20th century. In Vienna she has co-curated exhibitions on topics in the field of art and architecture. She is actively involved in cultural management and cultural transfer between Iran and Europe, not least through the organisation of art exchanges. Since 2003 she is co-editor of the Iranian architecture magazine "Mémor", in which she has published numerous articles. She is particularly interested in the tension between tradition and modernity and the search for a specific contemporary language of architecture in the Islamic nations.

Roman Hollenstein

Born in 1953, Roman Hollenstein received his doctorate from the University of Bern in 1983 on the adoption of Greece in early 19th century art. He has worked as a research assistant for the Private Collections of the Prince of Liechtenstein in Vaduz and Vienna, and held teaching positions, lecturing among other things on the history of art and architecture at Zurich College of Art and Design. From 1987 to 1990 he led the department of art history at the Swiss Institute for Art Research in Zurich, before becoming a member of the editing board of the *Neue Zürcher Zeitung*. Here he introduced the art trade supplement and expanded the architecture supplement. His primary expertise is in Swiss and international contemporary art and architecture. He is especially interested in synagogue architecture and architecture in Israel.

Eva-Maria Kreuz

Eva-Maria Kreuz studied architecture at Berlin Technical University under Oswald Mathias Ungers. Between 1968 and 1972 she was a research assistant at the Institute for Principles of Modern Architecture at Stuttgart University and undertook her doctorate studies (1983) under Horst Rittel. Between 1969 and 1990 she lectured at universities in Kassel, Stuttgart and Hamburg. In 1990, together with Matthias Kreuz, she founded the office Kreuz + Kreuz which specialises in lighting and lamp design for churches. Their lighting concepts have been realised in numerous churches from all ages – from the Romanesque to modern day – primarily in southern Germany. She has written articles for magazines and handbooks and is a member of the Professional Lighting Designers' Association (PLDA) and the German Lichttechnische Gesellschaft (LTG) e.V.

Christina Niederstätter

Christina Niederstätter studied architecture in Innsbruck and Venice as well as music at the Conservatorio Claudio Monteverdi in Bolzano and the Conservatorio in Cuneo/Turin. Her main instrument is the flute. She has taught music in several schools in the Alto Adige region. In 1989 she was awarded a scholarship and began to specialise in acoustics. At Eindhoven Technical University she investigated the relationship between architecture and acoustics, and studied spatial acoustics at the University of Bern. In 2003, she became a member of the "committee for the development of guidelines for the design of state music schools" in the Province of Bolzano. Together with Dorothea Baumann from the University of Zurich she has been responsible for the design and/or reconstruction of particularly sensitive acoustic spaces. She has published and lectured widely on the topic of acoustics and architecture.

Rudolf Stegers

Born in 1952, Rudolf Stegers studied German Literature and Romance language and literature at Münster University and the Freie Universität in Berlin, completing the state examination for secondary school teachers in 1982. Between 1978 and 1988 he worked as an editor, first for "Werk und Zeit", published by the Deutsche Werkbund, later for the magazine "Ästhetik und Kommunikation". He now works as a freelance editor and critic in the field of architecture, focusing during the 1990s on Berlin in particular. He has conducted research into aspects of architecture and design for exhibitions in Berlin, Essen and Potsdam and, together with Romana Schneider, curated the exhibition "Glück Stadt Raum" at the Academy of Arts in Berlin. In 2000 he published a monograph on Rudolf Schwarz.

Deutsche Bauzeitung, no. 11/2001, pp. 54- | Deutsche Werkstätten Heller-
lerau GmbH (Ed.): Deutsche Werkstätten Hellerau. Werkstättenbericht
10, Dresden 2002, pp. 3- | Deutsches Architektenblatt, no. 12/2001,
pp. 30- | E.ON Ruhrgas AG Essen (Ed.): Architektur in Deutschland '03.
Deutscher Architekturpreis 2003, Stuttgart and Zurich 2004, pp. 64- |
Frankfurter Allgemeine, 10. 11. 2001, p. 39 | Franzke, Jo (Ed.): Architek-
tur in Frankfurt am Main 1999-2003. Ein Buch von Volker Albus, Ham-
burg 2002, pp. 188- | Hirsch, Nikolaus: On Boundaries, New York 2007,
pp. 125-, pp. 279- | Just, Gunter (Ed.): Bauplatz Dresden. 1990 bis heute,
Dresden 2003, pp. 34- | Korn, Salomon: Geteilte Erinnerung. Beiträge
zur »deutsch-jüdischen« Gegenwart, Berlin 1999, pp. 66- | Kramm, Rüdiger,
Schalk, Tilman (Ed.): Sichtbeton, Betrachtungen. Ausgewählte
Architektur in Deutschland, Düsseldorf 2007, pp. 206- | Kunst und
Kirche, no. 4/2001, pp. 233- | Lange, Barbara (Ed.): Vom Expressionis-
mus bis heute, Geschichte der bildenden Kunst in Deutschland Vol. 8,
Munich 2006, p. 368 | Mäckler, Christoph (Ed.): Werkstoff Stein. Mate-
rial, Konstruktion, zeitgenössische Architektur, Basel 2004, pp. 124- |
Neue Zürcher Zeitung, Internationale Ausgabe, 10./11. 11. 2001, p. 48 and
12. 11. 2001, p. 21 | Nippa, Annegret, Herbstreuth, Peter: Eine kleine
Geschichte der Synagoge aus dreizehn Städten, Hamburg 1999, pp. 317-
pp. 328- | Pavan, Vincenzo: Neue Steinarchitektur in Deutschland, Basel
2005, pp. 76- | The Phaidon Atlas of Contemporary World Architecture,
Comprehensive Edition, London 2004, p. 488 | Richardson, Phyllis:
New Sacred Architecture, London 2004, pp. 176- | Roberts, Nicholas
W.: Building Type Basics for Places of Worship, Hoboken / New Jersey
2004, colour inlay ill. 17, ill. 18 | Sachs, Angeli, Voolen, Edward van (Ed.):
Jewish Identity in Contemporary Architecture, Munich 2004, front and
back cover, pp. 124- | Schneider, Romana (Ed. et al.): Architektur im
20. Jahrhundert. Deutschland, exhibition catalogue, Munich 2000, pp.
364- | Schwarz, Ullrich (Ed.): New German Architecture. A Reflexive
Modernism, exhibition catalogue, Ostfildern-Ruit 2002, pp. 196- | Sew-
ing, Werner: Architecture : Sculpture, Munich 2004, pp. 110- | Der Tag-
esspiegel, 8. 11. 2001, p. 28 | Techniques et Architecture, no. 459/2002,
pp. 88- | 1000 x European Architecture, (n.p.) Berlin 2007, p. 551 | Tietz,
Jürgen (Ed.): Was ist gute Architektur? 21 Antworten, Munich 2006,
pp. 60- | Werk, Bauen und Wohnen, no. 1/2/1999, p. 64, p. 66 | Wett-
bewerbe Aktuell, no. 9/1997, p. 33, pp. 38- | Wöhler, Till: Neue Architektur.
Sakralbauten, (n.p.) Berlin 2005, pp. 134- | Die Zeit, 8. 11. 2001, p. 42

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Chapels of Rest, Skovshoved Church
Arkitektur DK, no. 2/1987, pp. 60-

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Architecture and Urbanism, no. 1/1997, cover, pp. 9- and no. 2/1998,
Extra Edition, cover, pp. 44-, p. 205 | Architektur und Bauforum,
no. 153/1992, p. 96, pp. 98- | L'Architettura Cronache e Storia, no. 522/
1999, p. 246 | Archithese, no. 6/1990, cover, pp. 29- | Arkitektur, no.
5/1997, pp. 26- | Batz, Hans: Die Kirchen und Kapellen des Kantons
Graubünden, Vol. VIII, Chur (n.d.) 2005, pp. 136- | Brentini, Fabrizio:
Bauen für die Kirche. Katholischer Kirchenbau des 20. Jahrhunderts
in der Schweiz, Luzern 1994, pp. 257-, p. 299 | Christen, Willi E. (Ed.):
Schweizer Architekturführer 1920-1990, Vol. 1, Zurich 1992, p. 91 | Chro-
niques d'Art Sacré, no. 42/1995, pp. 13- and no. 46/1996, p. 24 | Daguerre,
Mercedes: Birkhäuser Architekturführer. Schweiz. 20. Jahrhundert, Basel
1997, p. 303 | Debuyst, Frédéric: Dix petites églises pour aujourd'hui.
Suivi de Philosophie de la promenade, Ottignies 1999, pp. 43- | Deut-
sches Architektur Museum (Ed.): Das Geheimnis des Schattens. Licht
und Schatten in der Architektur, exhibition catalogue, Tübingen and
Berlin 2002, pp. 148- | Domus, no. 710/1989, pp. 44- | Du, no. 5/1992,
pp. 61- | Flügge, Matthias, Meschede, Friedrich (Ed.): warum! Bilder
diesseits und jenseits des Menschen, exhibition catalogue, Ostfil-
dern-Ruit 2003, p. 284, p. 286 | Gantenbein, Köbi (et al.): Bauen in
Graubünden. Ein Führer zur zeitgenössischen Architektur, Zurich 2006,
pp. 180- | Helfenstein, Heinrich: Farben sind wie der Wind. Jean Pfaffs
architektonische Farbinterventionen, Basel 2001, pp. 20- | Herzog,
Thomas (et al.): Holzbau Atlas, Basel 2003, p. 274 | Kunst und Kirche,
no. 1/1990, pp. 12- | Mayr Fingerle, Christoph (Ed.): Neues Bauen in den
Alpen. Architekturpreis 1992, (n.p.) Bozen 1992, pp. 8- | Das Münster,
no. 4/1995, p. 321 | Natterer, Julius (et al.): Holzbau Atlas, Cologne 1996,
p. 28 | Neue Zürcher Zeitung, Schweizer Ausgabe, 23. 6. 1989, p. 67 | Ot-
tagono, no. 97/1990, pp. 50- | Parametro, no. 207/1995, p. 66 | Partituren
und Bilder. Architektonische Arbeiten aus dem Atelier Peter Zumthor
1985-1988, exhibition catalogue, Luzern 1988, pp. 11- | Stock, Wolfgang
Jean (Ed.): European Church Architecture 1950-2000, Munich 2002,
pp. 178-, p. 188, p. 190 | Stock, Wolfgang Jean: Architectural Guide Sacred
Buildings in Europe since 1950, Munich 2004, pp. 282- | Werk, Bauen
und Wohnen, no. 4/1989, pp. 24- | Weston, Richard: Material, Form and
Architecture, London 2003, pp. 205- | Peter Zumthor Häuser. 1979-1997,
Baden 1998, pp. 53-

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