

**Sustainable Architecture in Vorarlberg**



# **Sustainable Architecture in Vorarlberg**

**Energy Concepts and Construction Systems  
Ulrich Dangel**

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## Preface

Over the last thirty years, the small Austrian province of Vorarlberg has made a name for itself with its contemporary building culture. Widely considered a unique phenomenon throughout Europe, Vorarlberg has not only established its own regional identity, but also serves as a role model far beyond its own borders. The apparently universal consensus among local architects to use reasonable means and resources is paired with a relentless search for the most sensible, functional, and cost-efficient design solutions. The employment of innovative materials and construction principles, the integration of the latest technologies, and the development of new building products play a particularly important role. Rooted in the population's ingenuity, this pragmatism, simplicity, and rationality has resulted in a high number of exemplary buildings which almost appear to be an unintended byproduct of a thoughtful and sophisticated problem-solving process. The harmonious collaboration between architects, craftsmen, clients, and the local authorities continues to produce new architecture which is progressive, energy-efficient, and sustainable, and has earned Vorarlberg a widely admired reputation in the international design community.

Although I was raised in southern Germany, only about two hours from Vorarlberg, my introduction and exposure to its people and culture came several years later, ironically after I had moved away to the United States. Growing up, I was influenced by Swabian diligence and thrift from my German father's side – traits that can be readily found in Vorarlberg due to its geographical proximity. My mother's Austrian heritage contributed temperament and persistence, and also instilled my close affinity to her home country. This was complemented by my architectural education at Universität Stuttgart, which sparked a strong interest in building technology, including structure, assembly, materials, and sustainability. It appears that with my upbringing and educational background, it was only a matter of time before Vorarlberg's architecture would attract my attention.

Since my first visit, I have been captivated by the "Ländle" and its people. I have been particularly intrigued by Vorarlberg's vernacular tradition and craft, and how they have contributed to the development of a distinctive contemporary architectural language. Without claiming to be complete, this book is an attempt to give an overview of the region's architectural history and culture. Despite the fact that Vorarlberg is facing many of the same environmental, social, cultural, and economic issues as other parts of the world, the province has developed its own unique response which I believe could serve as inspiration to others. I hope that the reader will forgive the tendency to idealize the phenomenon in Vorarlberg, which is still considered by many to be a paradise for building.

Ulrich Dangel  
Austin, Texas, Spring 2009

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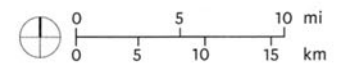
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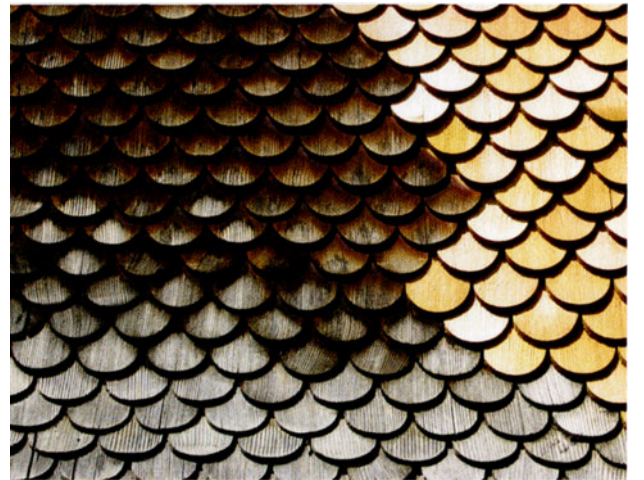
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# Tradition and Future

## **Elementary School Doren**

Lessons from Wood  
Cukrowicz Nachbaur

## **Ski Lodge Schneggarei, Lech am Arlberg**

Building on Traditional Values  
Katia Schneider + Gerold Schneider,  
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## **Parish Church St. Ulrich, Götzis**

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Tough on the Outside, Soft Inside  
Matthias Hein

## **Olperer House, Ginzling**

Low Energy at High Altitude  
Hermann Kaufmann



1 Bizau and Reuthe in the Bregenzwald region

Page 10 top: Day Care Centre, Landegg  
(Fink Thurnher Architekten)

Page 10 bottom: Gasthof Adler, Schwarzenberg,  
renovation 1991 (Hermann Kaufmann)

## The Province of Vorarlberg

Located on the northwestern slopes of the Austrian Alps and bordering the countries of Germany, Switzerland, and Liechtenstein, Vorarlberg is the second smallest Austrian province, but also the second most densely populated after Vienna. Its population of 368,000 <sup>[i]</sup> is hardly even that of a medium-sized European city, and inhabits an area of roughly 2,600 square kilometers <sup>[ii]</sup>. Vorarlberg is geographically closed off from the rest of Austria, and the only connections to the neighboring province of Tyrol are provided by three surface roads, as well as the railroad and street tunnel through the Arlberg mountain. Due to its isolated location, most of the province's population speaks a distinctive German dialect which many of the country's other inhabitants find hard to understand. It is similar to the Alemannic dialects spoken in Switzerland, Liechtenstein, the Alsace region in France, and parts of southwestern Germany, whereas the dialects spoken in the rest of Austria form part of the Bavarian-Austrian language group. Many towns and villages even have their own distinct sub-dialects.

Vorarlberg is an alpine region and extremely mountainous, and therefore offers unfavorable conditions for intensive farming. <sup>[1-2]</sup> It also does not possess any significant valuable natural resources. For centuries, the land could not feed the population, and the younger generations were sent abroad as seasonal workers to the more prosperous neighboring countries. The province had a strong rural agricultural tradition, but it experienced an early industrialization at the beginning of the nineteenth century, particularly in the field of textile manufacturing. The rise of the textile industry had its origins in the traditional production of linen, and benefited greatly from the craftsmanship and skill set of the farming population, which in turn became heavily involved in the home-based manufacturing of industrial textiles and other goods. Up to the nineteenth century, Vorarlberg was sparsely inhabited, and its population was mostly homogeneous. The regulation of the River Rhine, the construction of the railroad, and the use of water-power gave the province a basis for its own economic growth, and also led to an influx of foreign labor, particularly from Italy and Turkey. <sup>[iii]</sup> Today, Vorarlberg is the most heavily industrialized region of Austria, but it produces with the lowest energy consumption. About 96 percent of the province's electricity is generated from hydroelectric power, with the Ill valley being the center of power production. <sup>[iv]</sup> Of the 169,000 people employed, only 3,000 still work in farming and forestry, but 67,000 work in textile, electrical, and machine manufacturing, and construction. <sup>[v]</sup> The per capita production of export goods is four times higher than in the United States or Japan, and is only surpassed by Switzerland.



2 Fontanella, Sonntag and Raggal in the Great Walser Valley

Due to Vorarlberg's size, it might come as a surprise that the emergence of its contemporary and innovative architecture over the last three decades is unparalleled in Europe. Deeply rooted in the region's longstanding tradition of building craft, a number of pioneering architects have established a strong technical, cost-efficient, and functional vocabulary that has evolved into a unique architectural culture. Today, this exclusive setting serves as a laboratory in which architects and craftsmen search for a symbiotic connection between a specifically regional architecture on the one hand, and a progressive architectural formal language on the other. In addition, they explore the relationship between technology and ecology, as well as between housing needs and the requirements of the industry.

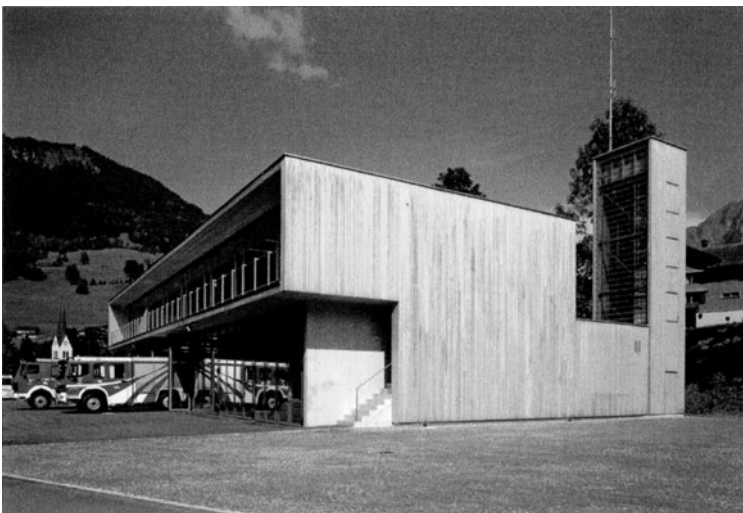
### **Architecture Today**

Vorarlberg's contemporary architecture is a result of unprecedented regional development. As a continuation of a movement that started in the 1960s, the local architects have worked systematically over the last three decades to establish expertise in technology, cost efficiency, and functionality. Their work is not based on purely aesthetic aspects, but primarily focuses on influences from today's construction industry and manufacturing technology. Spaces are conceived through an exploration and integration of structure, assembly, and function, and not through short-lived superficial formalisms. Concepts are grounded in structural efficiency, maximum use of minimal resources, usability, and the client's needs which results in simple, yet very functional spaces. This sophisticated simplicity should not be misconstrued as being plain or basic, and is best described using German architect Heinrich Tessenow's words: "The simplest form is not always the best, but the best is always simple."

The initial group of architects was fundamentally opposed to a formal regionalism based on misunderstood tradition. Their intention was not to replicate traditional forms, but to translate and update traditional processes and principles. As a result, architects and craftsmen together have been successful in finding a contemporary answer to the continuation of the local timber building tradition. Vorarlberg's architecture is unique in that it encompasses extremely modern tendencies such as the promotion of modular living accommodation or the use of the latest industrial building components, without ignoring or abandoning traditional construction skills and housing typologies of the region. The harmonious juxtaposition of old building stock with contemporary interpretations proves that it is possible to respect tradition while at the same time not rejecting contemporary life. <sup>[3-5]</sup>



3 Apartment building Lechblick (Christian Lenz)



4 Fire and Mountain Rescue Station, Mellau (Dietrich Untertrifaller)



5 Stürz Residence, Dalaas (Gohm Hiessberger)



6-8 SU-SI Building System (Johannes und Oskar Leo Kaufmann)



7



8

Initially, this critical discourse involved small-scale private projects which allowed the architects to easily test ideas and concepts. The invaluable knowledge gained through this experience enabled them to successfully transition to working with investors and public authorities on more complex and larger public commissions. <sup>[vi]</sup> This unique development was not the product of the architects alone. Enlightened clients, a climate of open discussion, the cooperation of the authorities, and a broad consensus on aesthetic qualities and energy consumption have contributed to the appreciation and promotion of contemporary and sustainable architectural principles at all levels of society.

The traditional carpentry trade has successfully made the transition to modern fabrication techniques, and plays an active and important role in the planning and design process by setting extremely high standards of workmanship. Today, there are many open-minded timber manufacturers that have a vested interest in cooperating with architects in order to improve and promote their building products. Prefabrication plays a very important role, but it is rooted in the carefully crafted customization of the carpentry trade, rather than inexpensive industrialized mass production. <sup>[vii]</sup> Many manufacturers offer entire prefabricated kit houses, which have been developed in collaboration with architects. <sup>[6-8]</sup>

Due to the decline of traditional farming, many centuries-old timber structures throughout the region became redundant and were, until recently, thoughtlessly demolished. At the same time, the postwar building stock from the 1950s and 1960s is starting to reach the end of its service life since envelope and energy systems no longer meet current building codes. The new generation of architects has become increasingly engaged with the sensitive renovation and adaptive reuse of many of these old buildings while at the same time addressing concerns of ecology, sustainability, and the conservation of resources. The refurbishment and upgrading of these valuable historic structures to today's building standards presents technical challenges and demands creative design solutions. <sup>[viii]</sup> The labor-intensive and sometimes difficult restoration and conservation process keeps traditional craftsmanship skills alive, contributes to the creation of highly specialized expertise, and introduces new technologies to the field of historic preservation. The "Ländle," as Vorarlberg is affectionately called by its inhabitants, has managed to develop new architectural customs and craftsmanship practices by successfully building on its vernacular past.

I Amt der Vorarlberger Landesregierung, Landestelle für Statistik, *Bevölkerung aktuell* (www.vorarlberg.at, December 2008).

II Statistik Austria, [http://www.statistik.at/web\\_de/Redirect/index.htm?dDocName=022138](http://www.statistik.at/web_de/Redirect/index.htm?dDocName=022138) \ *Regionale Gliederungen Bundesländer* (www.statistik.at, 01.01.2008).

III See Otto Kapfinger, "The Vorarlberg School of Architecture," in Otto Kapfinger, *Constructive Provocation: Contemporary Architecture in Vorarlberg*, ed. by Vorarlberger Architekturinstitut (Salzburg: Verlag Anton Pustet, 2003), 22.

IV Amt der Vorarlberger Landesregierung, Abt. Allgemeine Wirtschaftsangelegenheiten, Bereich Energie, *Energiebericht 2008* (www.vorarlberg.at, October 2008), 12.

V Wirtschaftskammer Vorarlberg, *Vorarlberg in Zahlen*, Ausgabe 2008 (www.wko.at/vlbg, 2008), 8.

VI Otto Kapfinger, *Baukunst in Vorarlberg seit 1980. Ein Führer zu 260 sehenswerten Bauten* (Ostfildern-Ruit: Verlag Gerd Hatje, 1999), 6.

VII Traugott Zech, *Holzbauten in Vorarlberg. Eine Dokumentation der letzten 20 Jahre* (Feldkirch: Rheticus-Gesellschaft, 1985), 7.

VIII See Otto Kapfinger, "New Spaces in Architecture," in *Constructive Provocation*, 85.

**Elementary School Doren**  
**Cukrowicz Nachbaur**

# Lessons from Wood

The small community of Doren is part of the Bregenzerwald region, a mountain range of the Northern Limestone Alps. Most of the working population in this part of Vorarlberg is employed in tourism and agriculture, although the latter workforce is rapidly decreasing due to the large variety of job opportunities in the nearby Rhine river valley. Doren's new elementary school is on a steep hill site in the center of the village. Directly adjacent to the church, rectory, and municipal offices, it offers panoramic views of the surrounding mountain ranges. The building's program, consisting of a gymnasium, day care, four classrooms, two workshops, a multipurpose space, and a teacher's lounge, proved to be a challenge to fit on the extremely small site.

With their proposal for a hard-edged, compact building volume, architects Andreas Cukrowicz and Anton Nachbaur-Sturm beat 17 other firms to win a design competition held in 2001. Their design combines all functions on five levels, taking advantage of the sloped site to reduce the building's overall height. At first glance, the new elementary school seems to mark a break with the rural building tradition of the Bregenzerwald region. However, the new building completes the ensemble of church, community center, and school, and restores the spirit of the place.

The solid structure plays with ideas of rotation and superimposition of layers in a horizontal and vertical fashion. Each individual story frames a different view of the landscape beyond, and this change of direction creates appealing spatial relationships within the simple volume. The steep hillside allows the building to have entrances on multiple levels and establishes two main orientations: the gymnasium entrance on the lower

