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## Norwegian Architecture Toward Sustainability

可持续发展的挪威建筑

**Norwegian Architecture Toward Sustainability**  
可持续发展的挪威建筑



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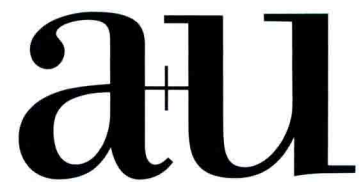


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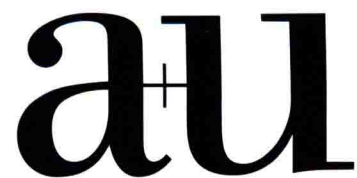
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*Cover: Summer House Storfjord by Jensen & Skodvin Architects.*

*Photo courtesy of the architect.*

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Feature:

# Norwegian Architecture Toward Sustainability

专辑:

可持续发展的挪威建筑



In Norway, where the nature is abundant and the climate is severe, architecture must serve as a shelter while at the same time relish the nature. Under such circumstance, Norwegian architects have always searched for the relationship with the environment and developed their own architectural expression. National Tourist Route Project – started its construction in 2000 and is expected to finish in 2025 – is a national land development project which was made possible because of such architectural tradition. Those buildings built in the midst of the natural expanse provide us an insight into how to autonomous architecture can be created.

In the central Oslo, on the other hand, “Fjord City” and other redevelopment projects are being realized. The museum, opera house, and many apartment projects along the coast may, at first glance, appear to be designed with the global architectural language of our time. How, then, do these urban projects succeed the environmental attitude nurtured by Norwegian architecture for a long time?

In this edition, we introduce 13 works and two essays “Landscape Rituals – National Tourist Routes in Norway” and “Custom Made”. We invite our readers to explore how Norwegian architecture – evolved with the natural environment – faces the today’s global theme, sustainability in architecture. (a+u)

挪威自然环境优越，但气候严寒。挪威建筑不仅必须挡风蔽雨、保暖防寒，同时还尊重和融合于自然环境。因此，挪威建筑师一直致力于在建筑与环境之间建立和谐关系，并逐渐形成本国特有的建筑表现风格。在这样的建筑传统激发之下，“国家旅游路线”项目应运而生。该全国性土地开发项目于2000年开工，预计2025年完成。一座座挪威建筑伫立在一望无际的大自然中，人们可从中观察和了解自主式建筑是如何形成的。

另一方面，奥斯陆市中心有一批重建项目（包括“峡湾之都”）正在施工建设中。初看之下，那些博物馆、歌剧院和一幢幢海滨公寓似乎已经全面采用了全球化时代的建筑语汇。那么，它们是否也承袭了挪威建筑长期以来所秉持的环境理念呢？

本期 a+u 介绍了 13 个挪威建筑项目及两篇相关论文——《景观的仪式——挪威国家旅游路线》和《量身定制》。诚望读者随同我们踏上挪威建筑的探索之旅，考察这些与自然环境协同成长的建筑是如何应对今天的全球化和可持续性议题的。

(编者)



Essay:

# Landscape Rituals – National Tourist Routes in Norway

Karl Otto Ellefsen

论文:

景观的仪式——挪威国家旅游路线

卡尔·奥托·艾勒夫森



*This page, above: Bench and boathouse in Northern Norway. Photo by Jarle Wæhler. This page, below: View of Sysendammen which is a hydroelectric power reservoir in Eidfjord. Photo courtesy of the author.*

本页，上：挪威北部的船坞与座椅；下：艾德峡湾地区水力发电厂的塞森达曼水库。

Nature envelopes Norwegian architecture. The Norwegian built environment is immersed in nature. Like most one-liners this is not entirely true. Cities are growing at the moment faster in these northern environments than in most countries. Numbers, however, suggest that there must be something to it – population only about 4.9 million; biggest area with an urban morphology about 500,000 people; arable land as a percentage of total land 2.7%; and population per square kilometer 15.1, compared to Japan's 336.2. Ways of life are also indicated by the prevailing housing typology. More than half of all dwellings are single-family wooden houses (1.2 million), most of them free standing in a piece of cultivated nature. Norwegian territory also includes 400,000 holiday homes (one for every ten persons), a figure that in terms of population surpasses that of all other countries. One could argue that these figures indicate a certain flavor in Norwegian culture, and also a certain "character" or "genius" in Norwegian architecture, as Christian Norberg-Schulz liked to underline.

In parts of Norwegian building practice, there is, for a number of reasons, still latitude to create works to a high standard. The main reason is the affluence of the oil-driven economy, which during the last two decades has proven a fertile seedbed for new projects. Second, Norway is a country where the geography requires scattered settlement, and which indulges a regional politics supporting this dispersal of the population and provides in this way many new, strange and challenging sites for development. And finally there still exists a decentralized and small-scale building industry, under the proud banner of the artisan. This might also be one of the reasons why the structure of architectural offices has so far not really been subject to any significant rationalization. The structure of architectural practices remains in fact finely grained. And these factors have constituted a breeding ground for young architects that have been willing to exploit the opportunities. This means not competing with streamlined offices doing property development, not trying to establish their practice by entering the oil-money driven market for signature cultural buildings, but rather to establish practices that recognize the architectural potential inherent in the surroundings of everyday life, operating creatively within the confines of simple functionality and limited funding.

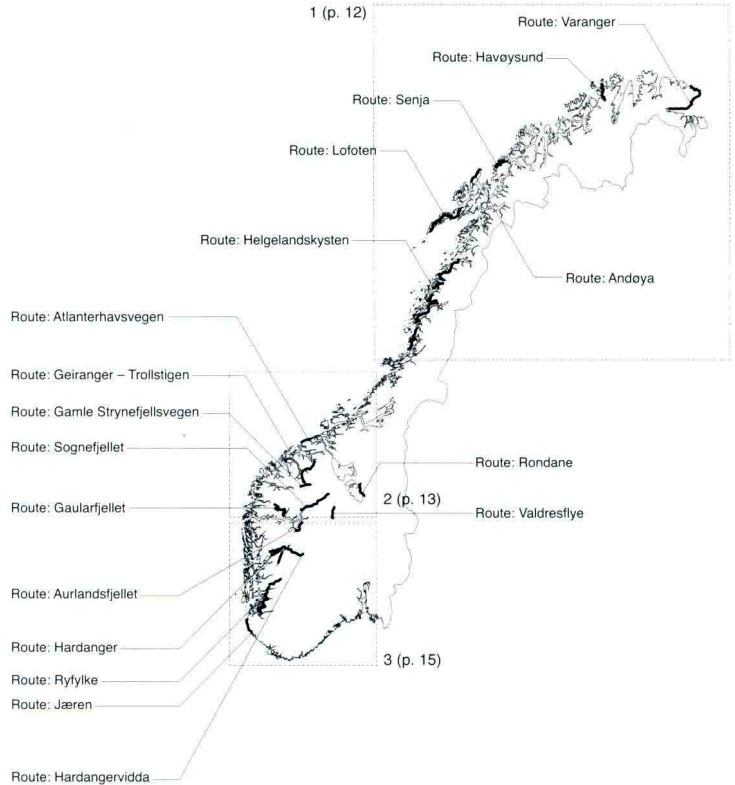
National Tourist Routes in Norway are an important part of this "breeding ground", widely publicized as a network of small projects that very intentionally exhibits both infrastructure and landscape. The Routes also link to architectural policies. Eighteen established old roads through the most spectacular part

挪威的建筑被大自然所包围。挪威的人工环境沉浸在自然环境中。像很多这类评论一样，上述说法也许并不完全真实。但是，如今挪威北部的城市发展速度之所以远远超过其他很多国家，可以看看下面的数字——全国人口仅490万；最大的城市人口仅50万；可用耕地面积占国土面积的2.7%；人口密度为每平方公里15.1人，与日本每平方公里336.2人的人口密度形成强烈反差。此外，全国超过一半的住宅（约120万户）为独户木屋，大部分都是独立坐落于土地开荒以后的自然中，这种普遍的住宅类型主导了挪威人的生活方式。同时，挪威拥有40万栋度假别墅，其平均每10人就拥有1栋的比率也远远超过所有其他国家。这些数字体现了挪威文化的特色和诺伯·舒兹所强调的挪威建筑中特定的“性格”与“精神”。

由于诸多原因，在挪威的部分建筑实践中，仍然有很大的余地去打造高品质的作品。其首要原因是过去20年来石油产业经济的繁荣带来了对新建筑的需求。其次，挪威的地理环境决定了其分散式居住的特点，并形成了支持这种分散形式的区域政策，同时提供了很多新奇而富于挑战性的开发用地。再次，分散的小型建筑事务所以标榜工匠为骄傲，这也是很多建筑事务所尚未进行大规模机构改革的诸多原因之一。此外，小型建筑事务所的数量并没有减少。以上这些原因造就了适合寻求机会的年轻建筑师发展的环境。因为在这种环境中他们不需要与地产开发一线的建筑事务所去竞争，也不需要附会标志性的文化设施而去讨好由石油产业驱动的市场，他们只需要用有限的资金去完善朴素的功能要求，并从周边日常生活中掘取建筑的内在潜能。

挪威国家旅游路线便是这种“成长环境”的一个重要部分，它以一系列展示基础设施与自然景观的小规模项目而闻名。同时它也与各种建筑政策有联系。项目筛选出18条拥有超凡景观的老旧公路作为日后改造的对象。这项工程从2000年持续到2025年，200个预期项目中现已建成100余个。公共道路管理部门每年投入150万欧元，到项目结束时，对于这个既富雄心而又严谨的地区性工程来说，其开销会远远少于斯诺海塔在奥斯陆设计的国家歌剧院新馆（a+u 08:09）。

挪威的地形条件极具挑战性，但其基础设施优良的公路体系可通达任何居住区。挪威景观的独特之处在于自然与乡村的融合，开荒的历史依然清晰地体现在丰富的景观中。大多数森林、山地、峡湾地区都有人居住，在社会福利和公民权益的作用下配套了公共基础设施。这便是国家旅游路线项目试图完善

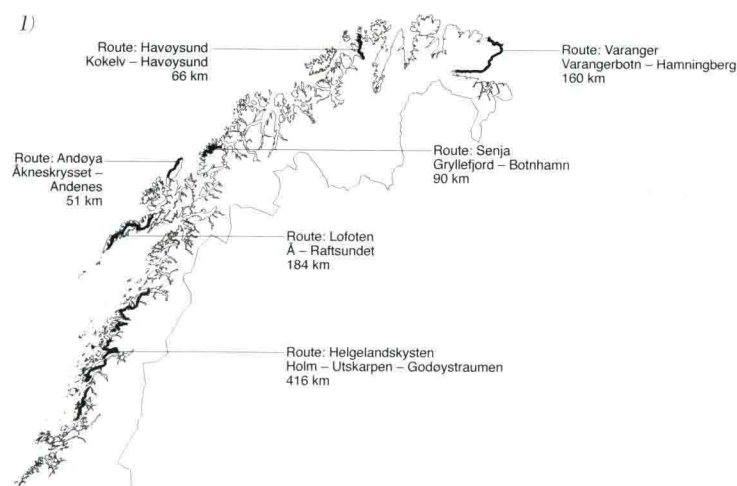


Whole map of National Tourist Routes  
国家旅游路线全图

*National Tourist Routes Project is a tourism development project which began in 1994. Total length of 18 routes which were developed by 2012, is 1,991 km. The project is still underway; scheduled for completion in 2023. Maps on pp. 7–11 was made from the map provided by Norwegian Public Roads Administration, the Tourist Routes Project.*

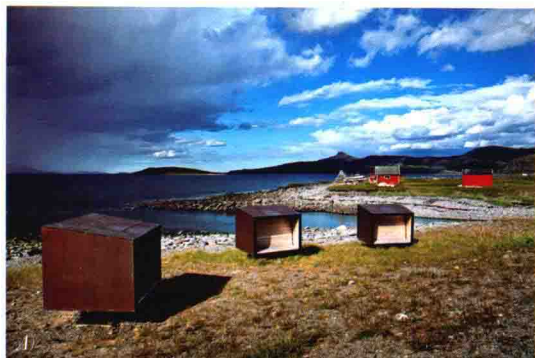
国家旅游路线项目始于1994年。该旅游发展项目全长共计1991 km，到2012年总共完成18条路线。目前该工程依然在进行中，预计2023年完工。





A) "Sneffjord" (PUSHAK Arkitekter). Rest area with shelter. B) "Bergsbotn" (Code Arkitektur), Rest Area. C) "Torvvalshalsen" (70° Nord), Rest Area. D) "Hellåga" (Nordplan), Rest area with toilet facilities. E) "Askevågen" (3RW Arkitekter), Lookout point. F) "Ornesvingen" (3RW Arkitekter), Lookout point. G) "Mefjellet" (Jensen & Skodvin Architects), Rest area. H) "Likholefossen" (Nordplan), Rest area and bridge to hiking path. All photos on pp. 8–11 courtesy of Norwegian Public Roads Administration.

A) "斯内峡湾" (PUSHAK 建筑师事务所), 休憩庇护所; B) "博格斯波特" (Code 建筑事务所), 休憩区; C) "托夫达莎尔森" (70° Nord), 休憩区; D) "海格拉" (Nordplan), 配有厕所的休憩区; E) "阿斯科瓦根" (3RW 建筑师事务所), 观景台; F) "奥涅斯文根" (3RW 建筑师事务所), 观景台; G) "美夫耶雷" (詹森与斯科德文建筑师事务所), 休憩区; H) "里克霍福森" (Nordplan), 休憩区与徒步路桥。

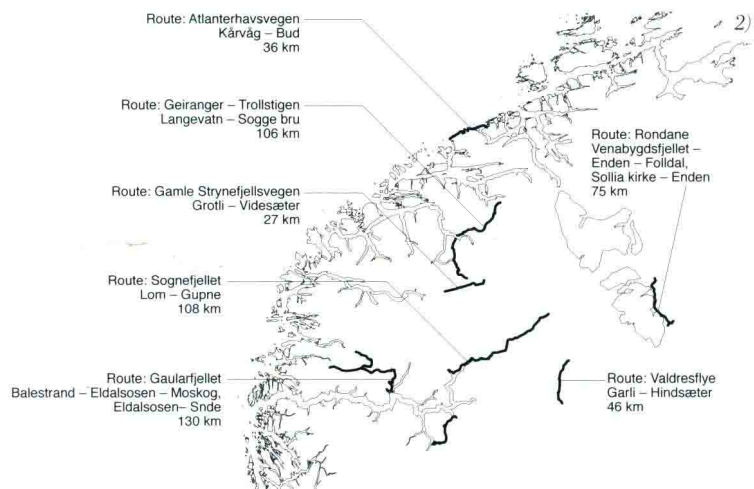


of Norwegian landscape were selected for further refinement. The project period was set from 2000 to 2025. Around 200 projects are planned along the Routes and more than 100 have been built. In terms of money the public road authorities invests at the moment 1.5 million euros yearly in the project. At the end of the building period the public costs for this both ambitious and humble territorial project will probably amount to far less than the cost of Snøhetta's beautiful The New National Opera House in Oslo (*a+u* 08:09).

We are talking about a challenging country in terms of terrain, and the road system was built up as a very fine-grained infrastructure to reach all settlements. The unique character of the Norwegian landscape is the combination of nature and settlements, the history of cultivation that is still readable in the dramatic landscape. Most forests, mountain areas and fjords are still populated and, in tune with the argument of welfare and public rights, served by public infrastructure. This is to some extent the resource that National Tourist Routes Project tries to refine. In this system, each installation is intentionally developed as a specific piece of architecture, as an integral part of the road as a system for movement, as part of a landscape, and as a site offering views and vistas of landscapes. The project is ritualizing landscapes.

A Norwegian concept of relating to landscape and natural resources, and the way landscape is handled by infrastructure, from one point of view, has been rather unsentimental and pragmatic and deals with output and economic development. At the same time, the attitude dating back to National Romanticism and the Nordic aura in the 19th century is very romantic: in experiencing nature one experiences what is real and unspoiled and makes contact with the strange and mysterious forces that tend to inhabit areas far removed from city life. And not least, social democratic policies were also swayed by the old ideas of humbleness and scarcity in using landscape – walking, picking berries, collecting mushrooms, catching a fish for Sunday dinner, illustrating a culture of ecological use based on a moral of modesty and even the needs of future generations. These ways of relating to landscape might explain why Norwegian infrastructure has never been on display. The huge dams and hydroelectric power plant systems in the mountains are virtually unknown as physical artifacts, even to the Norwegian public. The engineering of offshore oil installations is a great achievement and changed Norwegian society profoundly, but these were never conceptualized as national symbols of engineering or architectural monuments. One could perhaps note a difference from the American or Chinese historical





的方面。在这个景观被“仪式化”的体系中，每一个设施都是设计独特的建筑，作为交通道路体系以及自然景观的组成部分，变成观赏风景的场所。

挪威这种将景观与自然资源相联系的理念和通过基础设施处理景观的方式，从某种角度上讲是提高生产率与促进经济发展的理智而务实的做法。同时，这种浪漫主义态度可追溯至 19 世纪的北欧气息和民族浪漫主义：从自然中体验真实与本质，远离都市去寻找陌生的神秘力量。此外，社会民主化的政策也被谦卑而克制地利用自然的传统观念所动摇——散步，采摘果实，收集蘑菇，为周末聚餐捕捉河鱼，这些活动阐述了一种基于谦逊品德和为后代谋求福利的与自然环境共生的文化。

这种与自然的关系也是挪威的基础设施从未追求自我表现的原因。即便对于挪威公众来说，山区中那些大型水坝和水力发电厂也从未因其形象而广为人知。海上石油设施工程是国家的重要成就，深刻变革了挪威社会，但挪威人始终都未曾认为这些是重要的建筑物或国家技术实力的象征。美国或中国的历史文化便体现出一种不同的态度，他们征服自然，醉心于基础设施的兴建，并把这些作为地标和能力、知识、骄傲与团结的象征。

挪威的自然景观从 19 世纪中期开始在贵族气息与国际化旅游产业的作用下产生了一种独特的理念与体验。挪威曾是一个尚未开发的处女地，峡湾有待探索，山脉有待征服，巨大的鲑鱼有待捕获。探索者们也许同一个冬天还在孟加拉捕虎，夏季就已经转战于东非大裂谷的大型游猎中了。在英国人和欧洲大陆的人们带来以捕鱼与狩猎为娱乐的理念之前，挪威人从未有过这种想法。但是，自 19 世纪交替之际，挪威基础设施的建设使得去最适宜捕捞沙丁鱼的河滩宿营成为可能，而西部峡湾的景观也随之展现出来。国家旅游路线项目延续了挪威的这种国际化自然旅游业的传统，基于对自然的展现与体验，多选择挪威最富盛名的地方，比如国家地理杂志旅游目的地榜首的西部峡湾以及午夜也依旧阳光明媚的北部沿海地区。即便如此，国家旅游路线也是第一次有目的地展现其基础设施与自然景观的国家级系统工程。

一般来说，该工程的自然景观首先强调一条路线曲折、体验丰富且尚未被旅行者全面了解的路线。驱车沿挪威海岸全程 240 km 的国家旅游路线行进，你会时而经过海岸边的群岛，时而驶入荒凉的岩石地带，欣赏到广袤的冰川景观。这个项目大爱无形，景观建筑简单实用。其次，国家旅游路线工程的自然景观强调“就在那里”的理念，观景场所精心挑选，以体现出其“仪式化”





culture of conquering nature and celebrating infrastructural achievements, making them into landmarks and symbols of ability, knowledge, pride and unity.

Norwegian landscape as a unique concept and experience was established by the aristocratic, international and nature-based tourism that began in the mid-19th century. Norway was a country not yet explored where fjords could be investigated, mountains conquered and huge salmon caught by men who in the same winter might have been hunting tigers in Bengal and who would move on to big-game safari in the Rift Valley of East Africa later in the summer. No Norwegian fished and hunted for sport before the English and people from the continent exported the idea. But already at the turn of the 19th century infrastructure was built up for accessibility and lodging along the abundant and most fishable salmon rivers and to provide vistas of the western fjords. National Tourist Routes Project follows the convention of international nature tourism in Norway, meaning that the project is based on the display and experience of nature, and that the objects on display are the most famous parts of Norway, the western fjords that top the National Geographic's list of tourist destinations, and the coastal midnight sunlit areas in the north. National Tourist Routes, however, is the first Norwegian network of projects that very intentionally exhibits both infrastructure and landscape.

Speaking generally, I would say that landscape in the project is conceptualized firstly as movement through a landscape that is never comprehended by the observer as a whole, as a set of experiences that are being offered along the undulating routes. Driving the full 240 kilometers of National Tourist Routes along the coast of Nordland, one moves at times near the ocean with an archipelago of islands passing by, while at other times one is enclosed by a barren and rocky landscape that sometimes opens up to views of huge glaciers. The projects are nearly not made notable; the landscape architecture is simple and functional. Secondly, landscape in National Tourist Routes Project is defined as "out there", and the view is more ritually exhibited in chosen and defined places. Viewing platforms stretching out hundreds of meters above the fjords, and deliberately selected rest areas along the road. Controlling and setting the scene for the tourist's gaze, often in places already made accessible and illustrated in 19th century tourism. Thirdly, the landscape is interpreted as a tactile bodily experience of a very specific situation and as an intellectual comprehension of tangible ecologies on site. Subject to the smells and light of the pine forests, to the spray and damp of cascades from waterfalls and to the experience of multi-faceted nature ecologies. Compared to nature as view

and sublime visual experience, this conceptualization displays a more contemporary meaning. Landscape is presented both in a rational and even scientific way and at the same time offering individual sensuous experiences that go far beyond visual aesthetics.

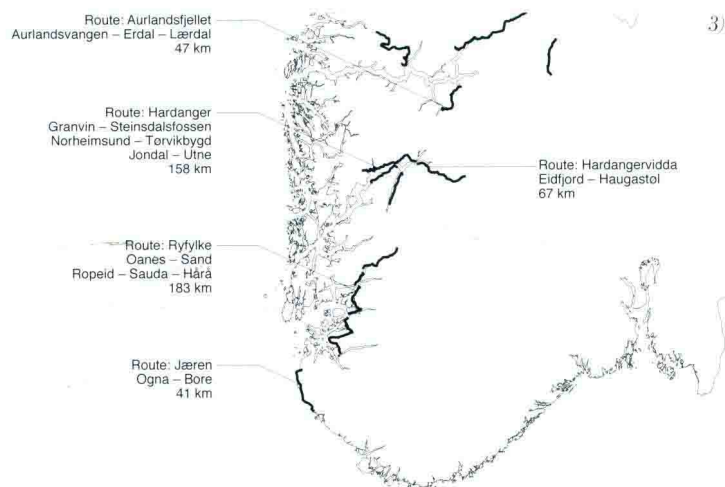
#### Notes

Part of this article, describing the conceptualization of landscape in National Tourist Routes Project is adapted from the author's essay "Detoured Infrastructure: The architecture of the National Tourist Routes Project", in the 2010 exhibition catalogue for the project.

**Karl Otto Ellefsen** is professor of architecture and urbanism at The Oslo School of Architecture and Design (AHO). He also heads AHO as Rektor of the school and is Chairman of the Board of OAT – The Oslo Architectural Triannual. Ellefsen has from the start had different constituting roles in the development of National Tourist Routes Project in Norway.

I) "Stegastein" (Todd Sanders & Tommie Wilhelmsen), Lookout point.  
J) "Hereiane" (Asplan Viak, 3RW Arkitekter), Toilet building and rest area.  
K) "Svandalsfossen" (Haga Grov, Helge Schelderup), Bridge to hiking path by waterfall.

I) "斯塔格斯坦" (托德·桑德斯与托米·威海姆森建筑师事务所), 观景台; J) "海雷恩" (阿斯普兰·威阿克, 3RW 建筑师事务所), 配有厕所的休憩区; K) "斯文达福森" (哈格·格罗夫, 海格·施尔德鲁普), 瀑布旁的徒步路桥。



的特点。观景平台在峡湾上方悬挑出近百米，沿途还设有休憩区。这些主导游客观赏方式的景点自 19 世纪起便已是旅游热点。第三，自然景观诠释了一种实在的对特定环境的身体体验，并成为对地区本土生态的知性理解。可感受松树林的味道与光线、瀑布洒下的潮湿水汽，体验自然生态的多样性。这种理念不仅关乎自然观赏以及神圣的视觉体验，而且具有更当代的涵义：自然景观以一种理性而科学的方式展现出来，同时为观者带来一种独特的超乎视觉美学的感性体验。

(肖靖 译)



#### 注解

本文阐述国家旅游路线项目的景观理念的部分改编自该项目 2010 年展览目录所收录的作者的文章《迂回的基础设施：国家旅游路线工程的结构体系》。

卡尔·奥托·艾勒夫森是奥斯陆建筑与设计学院 (AHO) 的院长和建筑与城市设计学科的教授，他同时担任奥斯陆建筑三年展 (OAT) 的委员会主席。艾勒夫森在挪威国家旅游路线项目之初就参与其中，并发挥了主导作用。





# Reiulf Ramstad Architects

Trollstigen National Tourist Route

*Rauma, Norway 2012*

雷乌夫·兰姆斯塔德建筑师事务所

特洛思迪根国家旅游路线

挪威，劳玛 2012









**Credits and Data**

Project title: Trollstigen National Tourist Route  
Client: Norwegian Public Roads Administration  
Program: National tourist routes project  
Location: Rauma, Møre og Romsdal, Norway  
Design year: 2004–2011  
Construction year: 2005–2012  
Completion: 2012  
Architect: Reiulf Ramstad Architects (RRA)  
Project team: Reiulf D Ramstad (responsible project manager),  
Christian Skram Fuglset (project manager),  
Kristin Stokke Ramstad (project communication), Anja Hole Strandskogen,  
Ragnhild Snustad, Kanog Anong Nimakorn, Espen Surnevik, Atle Leira,  
Christian Dahle, Lasse A. Halvorsen  
Structural engineer: Dr. Techn. Kristoffer Apeland AS, Oslo Norway  
Building area: 800 m<sup>2</sup> (visitor center with restaurant and gallery),  
950 m<sup>2</sup> (flood barrier structure)  
Site: 200,000 m<sup>2</sup>  
Renderings: Reiulf Ramstad Architects/MIR  
Commission type: Invited competition (1st prize) in cooperation with  
Multiconsult 13.3 landscaping (2004)  
Type of construction: Corten steel and cast-in-place concrete

