

Detailing Exercise – Steel Staircases

Generally

Studies in construction comprise a series of three integrated practice assignments, which selectively explore the main construction materials, design sites and design scales. Studies are part of the compulsory lecture courses.

Basic Course 2nd year:

Wood – wooden single-storey house - preparation of main plans, scales 1/500-1/100.

Professional Course 3rd year:

Exercise 1: concrete multi-storey building with one concrete structure – preparation of working drawings, scales from 1/50 to 1/10.

Exercise 2: steel – small scale object – preparation of detail drawings, scales from 1/25 to 1/1

These courses are further complemented by the course in Construction Technique, which provides basic knowledge for architectural structures.

Detailing Exercise - Steel Staircases

The aim of the detail assignment is to familiarise students concretely with a small-scale design task. The staircase was selected as the subject because as such it is always sufficiently limiting, but on the other hand includes all the key elements of design: the functional, the structural and the aesthetic.

The time allowed for the detail exercise is twelve weeks, half of which to be spent on the student's own documentation in parallel with the other assignment of the course, the second half being more supervised study.

The course includes some twenty five to thirty students. One academic assistant and two part-time teachers are responsible for the supervision of practice assignments. There are also two to three visiting lecturers on the courses. All the teachers concerned are architects.

We arranged this practical work for the first time this year. It comprised three integrated elements: research of the subject, the design task and the concrete implementation/experimentation.

1) Study and Research ("Exploring Steel")

The aim was to get to know steel as a material, how to use it, its characteristics and the design solutions typical of steel. Students moreover came to know an object, in this case the design of a staircase, according to the instructions of officials and the functional requirements, and also practised concretely preparing the detail drawings.

The first task was to examine and measure the steel staircase. Each student selected a staircase from the list of subjects, measured it and prepared detail drawings in keeping with common layout instructions. The drawings were prepared together with the teacher. The completed drawings were displayed on the wall, giving a total of twenty five different steel staircase details as a basis for future design work.

Familiarity with the subject was enhanced both through the actual lectures of the course and special guest lectures, where practising architects presented the subject with regard to both detail and design.

The purpose of this part was to apply what was learned in the study and research part. We held a small competition within the course in the form of a small design task, the subject being the replacement of the existing concrete staircase in hallway of our own institution with a new steel staircase. We encouraged the students to take both a structural and creative approach to the competition job. We wanted to make the competition relatively light: the number of documents required was small and the time allowed for the entries was only three weeks.

2) "Designing in Steel"



3) "Experiencing Steel"

Experiencing and doing things hands-on were connected to the previous course elements at different stages.

After the documentation task a whole-day round was made of the documented sites. On the spot the individual doing the documentation presented the staircase and its detail. On the same tour a visit was also made to a local metal workshop to see how steel is processed from the design board to the paint shop.

One of the visiting lecturers had experience in the processing of steel. In addition to the lectures delivered by this person the day was spent visiting three of the workshops at our institution, where we saw how steel is shaped using various welding techniques.

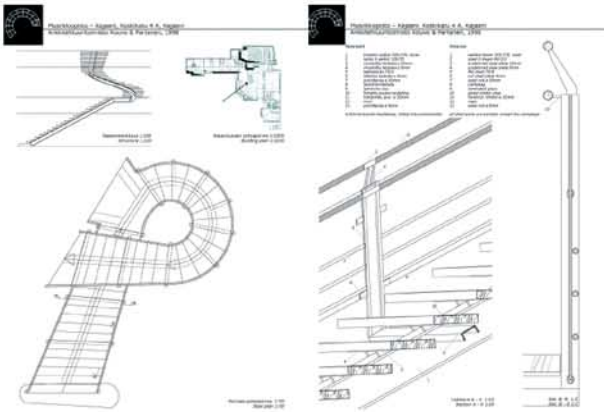
At the end of the course we made a two-day trip to the town of Hämeenlinna, where the largest factory for steel plates is situated. In addition to the factory visit we intended to realise a piece of a few of the entries in the steel staircase competition. In the local workshop we made initial preparations for the parts of the staircases and in the training premises for sheet metal workers all students had an opportunity to have a try at welding their respective staircase designs. These pieces of staircase were exhibited together with the documentation drawings and the competition entries in the lower hall of the institution to tell about the course. A small publication telling about the course is also in the making.

"Exploring the steel"



Documentation

Workshop/factory visits



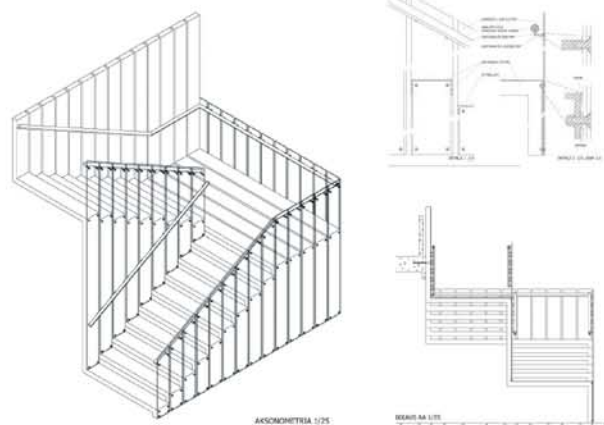
Detail drawings of measured staircase by Hukka Pyykari



Visiting lecturers

In-situ visits

"Designing the steel"



Staircase competition entry by Merja Kiviranta

"Experience the steel"



Learning by doing

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Detailing Exercise – Steel Staircases

Year in which it is taught: Third year

Optional or Compulsory: Compulsory

Detailing Exercise is part of the lecture course, see paragraph "generally"

Duration of study: The time allowed for the detail exercise was thirteen weeks, half of which to be spent on the student's own documentation in parallel with the course's other assignment, the second half being more supervised study.

Staff/student ratio: The course included some 25-30 students. One academic assistant and two part-time teachers were responsible for the supervision of practice assignments. There were also 2-3 visiting lecturers on the courses.

Specialisation of teachers: All the teachers concerned are architects.

Deliverables:

- 1) Drawings of selected existing staircase in scales 1/5 to 1/50
- 2) Drawings of own design in a staircase competition in scales 1/5 to 1/50

Supporting material and teaching: visiting lectures, factory and metal workshop visits, in site excursion.

Description of the exercise

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The first task was to examine and measure the steel staircase. Each student selected a staircase from the list of subjects, measured it and prepared detail drawings in keeping with common layout instructions. The drawings were prepared together with the teacher. The completed drawings were displayed on a wall, giving a total of 25 different steel staircase details as a basis for future design work.

Familiarity with the subject was enhanced both through the actual lectures of the course and special guest lectures, where practising architects presented the subject with regard to both detail and design.

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