Graduation Plan

Master of Science Architecture, Urbanism & Building Sciences
Graduation Plan for AE students

Personal Information
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Studio
Name of studio Architectural Engineering
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Title
Playing with light
‘The intertecture of daylight and sport facilities’

Graduation Project

Problem Statement
The design of traditional sports halls has tended to exclude natural light. Mostly due to problems such as glare, overheating and local cooling. Variation in light quality and quantity can be unmanageable and fenestration can lead to unwelcome distractions. However, the resulting designs are rarely compatible with attractive architecture and pleasing indoor environments. When I think back of my gym lessons at elementary school, the design of the sport hall relied totally on artificially lighting to provide a glare and shadow free environment. This meant that all the benefits of natural light have had to be sacrificed.

Objective
Therefore, my interest is to explore better practice within the context of creating attractive, healthy and manageable sports facilities that are environmentally responsible in relation to users. The objective of my graduation project is to seek for methods for linking daylight with sport activities and to see how daylight can be an integral part of the design of a sports facility. My research assesses the arguments facing traditional sports hall designs, to identify whether more contemporary and creative approaches to the design of naturally lit, energy efficient, modern and safe sports hall designs can be made widely obtainable. With this inquiry alternatives are found where daylight is an integral part of the sports halls instead of using only artificial light in order to meet the technical requirements.

Overall design question
How can the use of daylight be optimised within the design of an indoor environment with a mixture of sports in the Marine area?

Thematic Research Question
How can the relationship between daylight and sports hall designs in the Netherlands be defined compared to other European countries, whereby the CEN (European Committee for Normalization) is the guideline for sports lighting at European level?
Methodologies
Various methodologies will be used to be able to answer the research question. I will start with a literature study into daylight in sport facilities. Alongside my literature study a number of reference projects will be analysed by either visiting projects in the Netherlands or analysing projects outside the Netherlands. This together will generate a project database which can be used further on during the design process. Reference projects for the project database can be different kinds of sport facilities, although mainly sports halls, and from this the specific daylight qualities can be researched. From each case study/case visit I will point out some learning aspects and design solutions concerning the use of daylight. The idea is that out of the database a set of guidelines for the design will be created. Furthermore, I will schedule some interviews with persons/organisations who are involved and specialized in regulations of sports facilities and the use of daylight in buildings related to sports.

Relevance
In the recent years sustainability has been one of the leading trends in architecture. Moreover, we came back of not only using artificial light anymore. It is now more acceptable that daylight, when available, should be the prevalent form of lighting in most types of building. Since there are no specific daylight requirements in the Dutch building code for sports halls, window becomes an excluded element from the sports hall design. Windows are normally considered as the potential glare source which may cause visual discomfort for users. However, with increased concern for users and environment, daylight, which is essential for humans being health, is often introduced into different types of building to reduce lighting consumption and ensure architecture quality. If the daylight system is appropriately designed, it can minimize visual discomfort, improve the users experience and reduce the energy consumption. With my graduation project I would like to aim to change currently the way how a large part of our sport buildings in the Netherlands are designed without having natural light. Why are we doing that? It is convenience, tradition or costs? Or simply because changing regulations is not that simple as it may seem. The method and extent to which daylight is to be used must be considered from the very outset of building programming and design, and then as well for the design of a sports-related building, where daylight is often excluded from the beginning.

Literature