

IID-Framework: aspects and interrelationships of transport and water infrastructures



Hypothetical-lenses to explore design issues and to define design objectives & criteria



Levels of integration related to transport and water infrastructures



Design approach to analyse and to solve actual design issues



# INTEGRATED INFRASTRUCTURE DESIGN

INTER FACULTY MINOR  
DESIGN - ENGINEERING - GOVERNANCE

## INTEGRATED INFRASTRUCTURES

- are functional, technical and architectural well designed & built structures
- are appropriately integrated in a larger transport or water system/network
- are appropriately embedded in its spatial and environmental context
- connect different scales and bridge morphological barriers
- connect regions & places, cities & neighbourhoods, communities & people
- support societal functions & programmes, economic sectors & markets
- enable users to perform their present and future social and economic activities
- contribute to accessibility, livability, economic competitiveness of cities/regions
- contribute at the end to welfare, prosperity and safety for societies

*But how to design a bridge, fly-over, underpass, dike, route, metro or train station within an urban or natural environment?*



Fly-over Waarderpolder, Joris Smits - Royal HaskoningDHV

In this comprehensive minor you will learn and experience an integrated design approach to solve actual design issues from practice by multidisciplinary teams in a studio setting. For design and engineering students an opportunity to develop your understanding and skills in the challenging world of transport and water infrastructures



Student's final project - Course year 2015/2016 & 2016/2017

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Social interaction by excursions, workshops and studio work



Actual designs for assignments from commissioners of practice



Societal & scientific partners

## BK7932 - Introduction to Integrated Infrastructure Design



Sydney Harbour Bridge elevation 1924.  
J.J.C. Bradfield & Dorman Long Middlesbrough

**CONTENT**  
Introduction to the theme of the minor from various perspectives

- Historical, theoretical, practical and methodological framework of integrated design for transport and water infrastructures
- Current manifestations
- Future design challenges

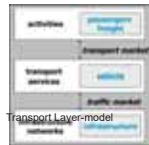
Introduction to set about writing an essay

**DELIVERY FORM**  
Lectures, excursions, feedback-sessions

**ASSESSMENT**  
Essay in which students individually are to reflect on an infrastructure and the notion of Integrated Design

3 ECTS

## CT3200 - Infrastructure Planning & Governance



Transport Layer-model

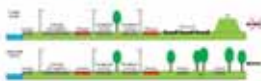
**CONTENT**  
• Planning and governance of transport infrastructures  
• Kaleidoscopic overview of relevant aspects  
• Methods/approaches to plan, design and implement transport infrastructures

**DELIVERY FORM**  
Lectures, group work

**ASSESSMENT**  
Report on a transport infrastructure case

3 ECTS

## BK7935 - Environment & Infrastructures: Urban Systems



Student work – Course year 2015/2016

**CONTENT**  
• Analysis, understanding and assessment of urban infrastructures as combinations of complex urban systems V3.0  
• Focus on traffic system, flood defense system and green/public space system  
• Considering three scales – city, zone, section - its interrelations and effects of an intervention

**DELIVERY FORM**  
Lectures, exercises, presentations, readings, discussions in studio setting

**ASSESSMENT**  
Individual exercises and group work

### Landscapes

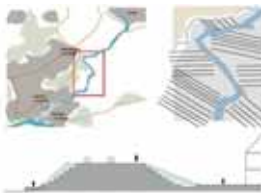
**CONTENT**  
• Engineering and integrated infrastructure design considerations in a landscape context  
• Principles of flood defense systems and route design in a landscape  
• The formative role of infrastructure in the development of landscape and the notion of landscape as infrastructure  
• Perception of landscape from various speeds and modalities  
• Integrated design at different scales focused on "Waterscapes" (river and coastal flood defense, dikes, waterfronts) and "Roadscapes" (paths & cycleways, roads & highways)

### Integrated project

**DELIVERY FORM**  
Lectures, exercises, presentations, readings, discussions in studio setting

**ASSESSMENT**  
Individual exercises and integrated project by groups

6 ECTS



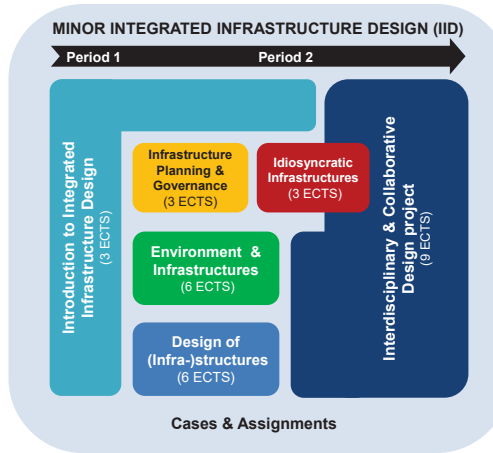
Student work – Course year 2015/2016



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INTER FACULTY MINOR  
DESIGN - ENGINEERING - GOVERNANCE

## PROGRAMME & COURSES



### WHY THIS MINOR?

- It offers you a comprehensive and coherent programme with interrelated courses
- It combines theory and practice of integrated design for transport and water infrastructures
- It explores societal issues and contexts and teaches you to design innovative solutions on different scales from a variety of perspectives and various disciplines
- It has lecturers from academia and professionals from practice
- It stimulates multidisciplinary team work in a studio setting
- It develops your understanding of actual infrastructure design and your design skills in an interfaculty, multidisciplinary and collaborative context

## BK7934 - Design of (Infra-) structures



Joris Smits - Royal HaskoningDHV

**CONTENT**  
• Introduction to transport infrastructures  
• The design of an infrastructure such as a bridge, fly-over, underpass or a series of civil structures stretches from the integration in the urban or landscape context to the architectural engineering of the design  
• Two assignments in order of complexity from commissioners of practice

**DELIVERY FORM**  
Cross-over and introductory workshops, (guest-) lectures and studio work

**ASSESSMENT**  
Oral and written presentations with drawings, sketches, schemes and models by teams of students based upon the assignments for the design of transport infrastructures

6 ECTS

## BK7933 - Idiosyncratic Infrastructures



Flora Ruchat-Roncati + Renato Salvi

**CONTENT**  
• Introduction to several categories of idiosyncratic infrastructures  
• Allocation individual case with infrastructural object from category aligned to assignment final project, presentations and discussion within particular area and team of course CT3201  
• Analyzing specific circumstances which conditioning idiosyncratic infrastructures  
• Investigating modes of representation specific to infrastructure and focusing on the very "thingness" of the infrastructural object  
• Re-engineering by re-drawing individual case

**DELIVERY FORM**  
Seminar, exercises, presentations, discussion, studio work

**ASSESSMENT**  
Individual presentation, poster and booklet with drawings/renderers documenting infrastructural object

3 ECTS

## CT3201 - Interdisciplinary & Collaborative Design Project



Kaart van de Stad - Municipality Rotterdam

**CONTENT**  
• Multidisciplinary teams work autonomously on a design issue which must result in an integrated design as final project of the minor  
• Central attention is the design like a bridge, metro or train station and its integration into a larger system, scale, and environment as part of the urban master and traffic plan for Rotterdam  
• Teams must set up a project plan and apply a systematic design approach on basis of the knowledge and competences from other courses

**DELIVERY FORM**  
Consultation sessions by lectures and external experts, site-visits, studio work

**ASSESSMENT**  
Team presentation, poster and report with conceptual and detailed drawings/renderers, schemes, arguments

9 ECTS