North Sea: Landscapes of Coexistence.  
Transitional Spaces, Infrastructure and Power

Course Description:  
This studio examines the infrastructure of the metropolis and its influence on urban form and development.  
Topics include systems for transportation, energy use, water distribution, civic institutions, spaces of social exchange, and ecology.  
Students develop urban infrastructure propositions with reference to innovative urban projects worldwide.

Specific Description:  
"The urgency of sustainable and secure energy calls for a collective mobilization of intelligence and ambition that exceeds standard piecemeal solutions to climate change."

This studio takes on the interconnected scalar dynamics that this statement by Rem Koolhaas demands, within the regional territory of the North Sea.  
This then, necessitates a regional scale approach, as one cannot address these very real issues currently mandated by the Paris agreement for clean energy and the challenges of climate change without taking on the Delta 'Landscapes' as a part of the North Sea.  
These Delta 'Landscapes' which include much of Holland, parts of Belgium, Denmark and Great Britain, are in fact greatly affected by issues of climate change and the Urban forms and systems that have been established within these Delta 'Landscapes' for centuries are inevitably linked to these larger regional scale systems which enable and continue to support the Urbanization within this dynamic and transitional landscape.

The Netherlands, a large portion of which, is below sea level (-.8 to -2 meters) is in fact an Urbanized Delta.  
Here Land is not a given, but it is in fact ‘land’ scape - in Dutch ‘schap’ or ‘schop’ – which refers literally to the act of forming ‘land’ - the continually constructing and reconstructing process – to enable terra firma.  
Here these systems of ‘land’ scape and water infrastructure form the base of their culture, its’ histories and the very foundational form of their urbanity.  
It is so entwined that in fact city names reflect this history - Den Hague (a hedge/wicker enclosure); Leiden (to build into the lee of a hill/natural levee/dune in a
lowland/wooded vale) Amsterdam or Rotterdam, both dams; or Antwerp (built on a twerp/mound) all constructive or land forming strategies at the base of their Urban Form. These ground works then as Leatherbarrow suggests are “arguably the first and most fundamental act of topographical construction. Every terrain that has been transformed is the foundation of a broad range of human purposes. This in reality forms the bases of most cultural practices” and the very base of all cultural development. The Delta ‘Landscape’ urbanized due to, easy access to trade and resources (fish, shellfish…peat for fuel/heat) and to its seeming ease of adaption/malleability and human manipulations therefore this ‘line’ which in actuality was zone between land and water, between salt and sweet waters, is a dynamic one and that between the natural and cultural is a constructed one. It is as well a destructive one – where the Delta ‘Landscape’, creates a sort of dynamic equilibrium, where ecosystems [of peat bogs, water forests…] that engage the hydrological cycles keeping quantities in check] have been all but erased and fragmented into many tiny and almost silent events. If you will nature was replaced by technological mechanisms (Plodder, Winmills or the Dune Machine) creating ‘new worlds’, neither human nor nature and where “there is no such thing as either man or nature now, only a process that produces the one within the other and couples the machines together”. Gilles Deleuze and Félix Guattari, (1980) Anti-Oedipus 2)

So the Delta ‘Landscape’ connecting to the North Sea’s ebb and flow, which continually embeds the trace of this struggle over territory – the long and on-going process of making a cultures history – the struggle and story of the battle between nature, the North Sea and the Dutch. A battle where sometimes lands were lost and other times won (IJsselmeer/Biesbosch) and where land accrued through planning, organizations (water boards) and technological innovation (infrastructures such as windmills, dams, plodders, dike rings, sand machines, etc.) that were locally, provincially, nationally & transnationally regulated. These regulations mandate the imperatives set by climate change (sea level rise and storm surge) & the Paris accord (sustainable clean energy and reduction of C02) and demand that we think like OMA’s ‘Zeekracht’ proposal and M.U.D taking on worse case scenarios, and with a scale that not just local, but regional and international. It included not only the Dutch, but all the countries surrounding the North Sea and beyond. Programmatically addressing both Global (trade and multinational economies) and Locally, i.e. how to bring ‘people’ of varying interests to the table, i.e. how to ‘personally’ engage, whether that is programmatically, or
as a ritual, or as a marker. How can Infrastructure not just function as energy producer and protection, but be embedded in both natural and cultural processes (everyday/ritual).

This studio focuses on the North Sea territory/region and particularly on expected transformations driven by energy production and by the consequences of extreme climate. See the recent studies see ‘Nature’ article concerning climate change scenarios, suggesting that by 2100 sea levels could rise up to 3 – 3.5 meters (instead of the 1.3 meter expected by the ‘extreme scenario’ of the Dutch Delta Program). We will explore the future geography of the North Sea in a shifting position between land and water, where the sea becomes not only a transnational ‘new ground’ for clean energy but perhaps also holds the potential for climate adaptation. As a ‘landscape’ the North Sea is the product of the dynamic relations between natural processes and the intensity of manmade activities creating progressive urbanisation.

Landscapes of Coexistence - A territorial perspective

In terms of Cultural History, the North Sea has been a contested territory. Bordering the mainland Europe it has been often turned into a platform for geopolitics whether with the UK or the Nordic countries. Such strategic role has manifested itself in various military, religious, economic, and social ties and divides, which has consequently made the North Sea a ‘common’ ground of conflict. Ongoing crisis whether refugees or the Brexit are only very recent examples of such a long history and as a result, the sea is not seen as a periphery of Europe but rather a central territory and a point of departure through which the idea of Europe would be defined or challenged. Further back in its’ history prior to the forming of the north sea as we know it today, under the surface of the North Sea embedded in the shallow shelf (of which Holland is a part) between Great Britain and Europe - archaeologist and scientist
have found evidence of habitation as per myth, *Ivy*, *Atlantis* and *Doggerland*, submerged with the retreat of the ice age and dramatic sea level rise, and so arguably a case for the challenges we face with climate change, but also that the *North Sea* has been urbanized before. It could then in fact help to understand and test strategies to retain or create forms of urbanizations that can withstand.

In this Studio we celebrate the very controversial aspects of the sea commons, not as an extra-territorial space and a limit to the land, but rather as the main point an autonomous entity through which the political, environmental, economic and societal questions could be addressed. In this way any spatial proposition, whether landscape, urban or architectural, would be challenged and revisited through the lens of the *North Sea* as a referenced territory for new spatial interventions. Students are encouraged to redefine the role of the territory of the sea, its land borders or coastal cities, addressing the complex and not so visible, spatial, juridical, environmental and geopolitical nature of the *North Sea* in their design of spatial interventions that are informed by climate adaptation and clean energy futures.

**Method**

The studio in conjunction with (ARCH610.03 section 1) which will investigate forms and modes of documentation, the map and the territory - analyzing both the *North Sea* and the *Delta Landscape as it developed through Time and Scale*. This ‘map’ is the base of understanding interconnected dynamic and scales and how the regional/landscape scale and sites of intervention are linked. Using what is learned in this course and the various *Land/Urban Typologies* (Edges) and *Technologies* (Plodder; Dikes/Levees, Ring Dike, Road and Rail Infrastructures; Artificial Lakes, Canals or Moats; Twerpen/Artificial Mounds and Temporary Flooding strategies; Windmill/Pump etc.) students (in Design Studio) will develop a territorial strategy, which they test, seeing How their strategy functions with its both local and territorial parameters.

Within the studio, students combine research and design, focusing initially on *Energy, an essential commodity*, and a system that has Regional, Urban and Individual Unit scales. This first section requires students to propose *unit* (energy types) and formations as a strategy(es) for ‘grounding’ a variety of network/system models (energy types & formations) that it well as several aggregate/field strategies, producing various *models for a Sustainable Energy Network*, for clean *Energy*, addressing issues of climate change adaption, the dynamics of the *Delta Landscape* and creating new ‘Vision’s and *future scenarios* for the *North Sea* and the *Delta* region.

Students are asked to reflect on aspects of spatial morphology (scale, unit - aggregation, form - field, structure - network, performance - outcomes), landform (geology, altimetry/bathymetry, topography), and attachment to an urban center. A sort of programmatic deployment, which has the potential as the diachrony/ diversity of mechanisms (e.g. logistics, energy production, coastal management, migration) to engage with the continuously re-shaping of the *Delta ‘Landscape’* and by extension too, the *North Sea*. It takes on the engagement of complex processes as its main theme, how do we understand, represent, work with and design in relationship to the complex and dynamic process of the changing delta landscape. This international studio, with individual projects sited in different geographic locations: *Calais, Antwerp, Rotterdam/The Hague, Hamburg, Copenhagen, Oslo, London…* along the sea’s east and west coastlines. Within the scope of this studio, students will be able to formulate their research direction and designing an energy system of individual units that create a network field in order to address the interconnected scalar issues of site, city and region and that ranges from building(s), to regional infrastructure, and public spaces engaging of course the larger scale of landscapes systems.
This interdisciplinary (architecture, urbanism, landscape architecture, hydraulic structures/ flood risk, water management, policy analysis) design studio will focus on the transformations of delta landscapes – as a crucial urban system that regulates the dynamic relation between natural processes and societal practices as both an opportunity and threat for future urbanisation. The studios emphasises both the agency of spatial intervention in the production of territory and it traces the narrative of space occupation as drawn on the landscape over time. "In this context, infrastructure space is analysed and designed as a medium – manifesting the programmatic dimensions and the trans-scalar nature of the territorial project combining architecture, urban design and landscape design. The studio takes stock of contemporary landscape urbanism theories and practice, next to the mutual relationships between architecture and territory, to explore potential paths forward for robust design thinking."

How it connects to the North Sea Systems (Wind/Tides/Ecosystems); as well as to existing urban system/center(s) that surround is of course a challenging, but provocative proposition grounded in history, imagination and systems theories. The studio questions current as well proposed models of urbanization and asking are these enough and if not what could the potential new forms or systems be; does it become a sort of island(s) tethered to the Mainland? If so How does one depart/arrive, landing or returning from/to the sea and/or urban center; or is it a form of shoring up of existing urban centers and systems a new infrastructural for climate change adaption, or is it an extension of an existing urban system, a sort of bridge strategy similar to Kenzo Tange, Super Studio’s Infinite Grid, or OMA’s Zeekracht ‘city/system’ for Wind Energy does, where a ring infrastructure system is built to with stand and adapt to changes of climate, sea waves, etc. built like the oil platforms far from Land – a mirage on the horizon. Then, How is it inhabited and with what programs, are they temporary/permanent and does this mean we settle or ground areas within the North Sea? What does this mean to the existing cities of today? Looking for potential strategies within forgotten examples found in the structures of Ledoux’s Ideal city of Chaux for salt production, or the Utopian strategies for a ‘new forms of urbanization’ created by the Metabolists and Structuralists movement 1960/1970 with there embedded and underlying questions. Students are asked to experiment and learn how to ask a question, set parameters and test their design idea. To work through a cyclical methodology, understanding the relational parameters (forces, origins, extents) of their scheme and the nested scales in which they are operating. To find what the implied effects are to what they are proposing, what does it infer in terms of urban, social, economic (energy infrastructure), and ecological or hydrological impacts over time.

Taking on M.U.D and Zeekracht master plans where issues of Flood and Retreat or Control and Expand are used as a based for the development of the North Sea. In Zeekracht's masterplan “an Energy Super-Ring of offshore wind farms - the main infrastructure for energy supply, efficient distribution, and strategic growth; the Production Belt - the on-land industrial and institutional infrastructure supporting manufacturing and research; the Reefs - integrating ecology and industry by stimulating existing marine life alongside wind turbines and other installations; and an International Research Centre -
promoting cooperation, innovation and shared scientific development.” OMA 2014 and like the Kenzo Tange 1960, or other Utopic visions of growth like Buckminster Fuller’s Triton City 1960, Cedric Price Fun Palace of 1961, Yona Friedman Bridge City 1961, MVRDV Pig City 2001, Nicholas Szczepaniak a defensive Architecture 2009, etc. all hold in common the question of infrastructure as not just engineered function but as a device for structuring the civic realm. In the case of Zeekracht, its’ position in the North Sea, shifts attention from land to water, and that of “the increasingly desperate need for new sources of energy in the 21st century, the North Sea could - must - become a fulcrum of global energy production.” This is strategy setting the fame of engagement on processes enables a more futuristic/utopian model that can engage the larger scale and the dynamic processes of climate change and territorial reclamation, driven by appropriation and a systems approach, but also have potential of creating innovative ways to tackle these old issues. So as suggested by OMA masterplan "cannot be a fixed prescription. The project is conceived as a reciprocal system, fed and reinforced from the top down in terms of technology, industrial development and policy; and from the bottom up in terms of local decisions, involvement and support. A multi-layered undertaking at the scale of the North Sea, the present is an inappropriate limit. Echoing the ethos of renewable energy, potential must drive development… a multi-dimensional approach based on optimizing potential, productivity and profitability of offshore wind farms enhanced by synthesizing with existing. North Sea activities: shipping, oil & gas extraction, + new programs (eco stimulation and tourism...) and the pursuit, promotion and benefit of research & development in offshore renewable energies - from wind to wave to tidal to biomass and through pooling of resources and intelligence, advancing these technologies and create a renewable energy infrastructure that places Europe at the forefront of the 21st century’s most critical industry.” OMA. Zeekracht, Year : 2008; Client : Natuur en Milieu; Text from Commissioned Study.

Structure:
The studio is structured by a series of Conceptual Pairings (Scalar - Lenses) and Workshops/Themes designed to work in conjunction with the Co-requisite: ARCH 6510.03 (Architectural Documentation & Analysis) ‘Mapping’, which is instrumental in the understanding, development and connecting scales, times, systems and flows that influence the area of the North Sea. The Workshops will help you select a site, create a strategy and develop a multi-dimensional (spatial/temporal/scalar) method of working; enabling you to set parameters, develop prototypes and test your design/architectural ‘scaffolding’ both locally and regionally at the scale of the urban/landscape/infrastructural system. We will also draw on expertise of the various experts and other academics at TUDelft, Delft; RCA Royal College of Art, London; AA School Architecture, London; UNESCO-IHE Institute for Water Education; & the Het Nieuwe Institute who will be involved in Fieldtrip.

Workshop Themes
1 Landing
Defining Territorial Systems (Arch 6510- Group), Setting Parameters, Mapping Formation & Time (Limits/Extents, Function/Relationships, Factors/Elements)
Research Energy and Landscape Systems (Group)
Design/Defining Energy Form (Individual)
Component Parts - Unit + Initial Aggregation Tests

2 Grounding & Finding
Fieldtrip (Leaving Halifax Sept 29/30, Halifax-Amsterdam & Returning Sunday Oct 15th)
Documenting, Analyzing and Situating - Site Visits and Lectures will be held @ TUDelft BK

3) Founding/Design
Field and Aggregation
Aggregation of Units, Deployment Strategy and Applying Site/Region Situational Parameters (Geological, Hydrological and Ecological), Testing of Strategy and Flows Consequences and Outcomes

4) Design Development
Cycle through Scales and Change Parameters
Repeat and Develop Materiality/Habitational/Representational and Details
Assessment & Evaluation Criteria:

Requirements

• **Critiques:** Requirements for each critique will be specified a few days before the pin-up. Work should stop at 12:00 midnight before each major critique. No work can continue during a critique unless it is designated a “working critique.” There are NO acceptable excuses for not presenting work due to digital media issues. Please produce + print your digital work well before the due date. All drawings for presentation shall abide by a regularized format.

• **Readings:** All reading shall be completed before the class it is assigned. A one paragraph synopsis or commentary of each reading is required to be handed in after the discussion.

• **Workshops:** You will be assigned a series assignments under the theme of LANDING, GROUNDING, FINING and FOUNDING and that will be due as indicated on the Workshop Handouts. You are responsible to complete each assignment so you can maintain the continuity of the process. Any late work will be accepted, with the submittal of a Doctors Note or equivalent, otherwise work will automatically receive a grade that is dropped by one letter-grade, i.e., from an A to a B. All written work must be typed and printed on the computer or it will not be accepted.

• **Attendance and Participation:** Three unexcused absences will automatically drop your grade by one letter-grade, i.e., from an A to a B. All students are required to participate in class discussions; active dialogue is encouraged.

Students are asked to develop 3 **Main Representations** over the course of the semester. These are not the direct outcomes of the process done in the workshops and field trip but are informed by them (research, documentation, analysis + testing). The idea is expected to be tested at 4 scales XL Regional; L Urban System - Delta; M Local Area & S habitation.

1) **The Map** (3 Scalar renditions – Regional, Urban + Site) Arch 6510.03 (XL-S); 2) **The Model** with No Ground (L-M) and 3) **The Vision Drawing/Section** (M-S); these are then accompanied with:

   + **Explanatory Diagrams:**
     i. Energy Unit and Aggregation Form/Model
     ii. Edges, Connection/Access, Flow/Directionality,
     iii. Growth/Adaption and Deployment
   + **Process** (Research & Testing Ideas)
     i. Energy Unit and Aggregation
     ii. Hydrological, Ecological and Geological
   + **Habitation** Expierential aspects of their project (S)
     i. Perspective/Arial Drawings
     ii. Details showing

**Final Design submission should Demonstrate:**

• **Regional/System Scale:** Design a contemporary and innovative Regional System [1:10,000+]

• Resolution of **Tectonic Details** with materials, constructions [Detail [1:50& 1:20]

• Individual **Site** intervention/ concept within the group site model [1:500/1000]

• Resolution of **Building scale** [1:200/1:100] (interior/exterior), programmatic relationships, expressing the designer’s concept+attitude: public/private; landscape/urban/; infrastructure connections/ access, [1:200 & 1:100].

• Resolution of **Structure/Connection** Ground/Below Water, Enclosure [1:100] & Material Detail [1:20] or Experiential perspectives, which shows resolution of tectonics/detail.

• A summary of testing of Designs functionality at both locally and overall for watersheds, ecosystems and humans scales and reflecting concepts of the projects sustainability.
Evaluation

Workshops I, 2, 3 & 4 both Research (Arch 6510.03 sec 1 & Group - Workshop 1) and Individual are represented in your Process Portfolio (your part in the group assignments should be indicated), this work is worth 30% of your Grade. Midterm, and Penultimate Reviews are your Individual work showing how you bring forward your ideas from research, to form, to testing results and deployment will be worth in total 20% of the term grade, and your Individual Synthesis Design Resolution at the End of Term Review will be worth 50% of the final design grade. All work submitted late will be subject to a penalty equal to a third of a letter grade per day. Grades will be done with advice from other Design Instructors and using the grading policies upheld by Dalhousie Graduate Studies. Students are expected to bring skill, imagination, critical awareness and self-motivation to all aspects of their design work. The proposed site strategy and architectural scheme must be developed to a high level of resolution and show refinement at all scales. All studio work will require design development and meet comprehensive design guidelines. All work is thought of as cumulative and building to the final presentation.

Each ‘Project’ must include the comprehensive scales of the larger ‘territorial’ systems, the building scale and the smaller scale of habitation, and material detail. The student’s work must articulate the juncture where infrastructure, natural + energy systems and human being meet. Students are asked to create imaginative proposals where innovation of technologies and materials; architectural & urban forms can be adaptable (flow & usage), and which create a “sustainable” way that human activities, and existing conditions (fixed systems) can be transformed.

Learning Objectives

This Urban Systems Studio looks at Urban/Regional Infrastructures and Delta Systems (Geological / Hydrological and Ecological) to develop a design-research methodology that investigates the interconnected scales and nested contexts of a design project, and its influence on urban form and development. It tests a hypothesis through various scales (including the urban/regional, site context, building, habitational tectonics) and how placement/site strategy, program and construction integrate and inform an architectural project. Students will develop urban/regional energy infrastructural propositions that can include Public Buildings and Public spaces, Mixed Use Housing, Community / Civic Institutions/spaces of social exchange, Transportation (Airport / Train / Intermodal / Wildlife Crossing, etc.), Water /Energy/ Agricultural - Research / Distribution Centers, referencing innovative urban projects worldwide.

Developing knowledge and skills in:

• Innovative exchange with other disciplines (Architecture, Urbanism, Landscape, Water Eng. & Policy), and being able to share & integrate knowledge from other disciplines.
• In undertaking analytical research at a large territorial scale, of delta regions, creating an inclusive interdisciplinary design/research methodology that can inform design decisions and innovation.
• It prepares students to work both in research innovation & design projects in advance design practices. Learning to work collaboratively as well as individually through the various stages of a project.
• Design methodology, building on a study of site and context developed in other courses. Adding an understanding of the interconnected relationships between scales, between local and regional systems and enabling students to develop analytical research skills and critical thinking, that enable them to create designs that engages both the large territorial scale of delta regions & trans-scalar and temporal dimension.
• Students will be able to formulate a highly individualised design approach, able to apply innovative design methodologies & creative techniques for their design.
• Students will learn to express & represent their design ideas at appropriate scales and understand how construction methods, material usage & site strategies can enable a more sustainable development. Learning how to define programs based on reading of existing contexts, current events and trends and how different cultures & communities, histories & contexts can help to inform a design project.
• Learning from first principals and the dynamic relationships between systems, as well as presidents of historic & current significance (whether urban, natural and built forms and processes).

Student Rights and Responsibilities

See the School of Architecture’s "Academic Regulations" page (http://tinyurl.com/dal-arch-regulations) for a summary of university policies affecting academic courses: Accommodation Policy for Students; Academic Integrity; Code of Student Conduct; Services Available to Students.
Schedule

Classes will be held twice a week Tuesdays and Fridays 2:00 pm - 5:30 pm
Assignments are informed and linked to those in Arch 5400 Documentation

<table>
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<tr>
<th>Dates</th>
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<td><strong>Week 1</strong></td>
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<tr>
<td>Tues Sept. 12th</td>
<td>Introduction</td>
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<td>- Fri Sept. 15th</td>
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<td><strong>Week 2-3</strong></td>
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<td>Tues Sept. 19/26th</td>
<td>Landing</td>
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<td>- Fri Sept. 22/29th</td>
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<td>1 Defining Systems</td>
<td>(See Arch 6510 Outline)</td>
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<td>and Define Energy Components &amp; the Unit (INDIVIDUAL)</td>
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<td>(Preparation for Field Trip to Holland Tuesday Sept 26th)</td>
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<td><strong>Weeks 4-5</strong></td>
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<td>Tues. Oct. 3rd/10th - Fri Oct. 6th/13th</td>
<td>Grounding &amp; Finding</td>
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<td>2 Fieldtrip in discussion with SF &amp; TUDelft</td>
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<td>(Week 3-4-5)</td>
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<td>Documenting, Analyzing and Situating</td>
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<td>[Note: Field Trip Schedule finalized by Early/Mid July so arrangements for Tickets, Accommodation… in Holland.]</td>
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<td><strong>Weeks 6-7</strong></td>
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<td>3 Desk Crits</td>
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<td>Field and Aggregation</td>
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<td>Possible Aggregation of Units, Initial Deployment Strategy</td>
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<td>Applying Situational Parameters</td>
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<td>Tues. Oct. 31th</td>
<td>Studio</td>
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<td>- Friday, Nov. 3rd</td>
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<td>Friday, Nov. 3, M2 Design Mid-Term Reviews (all day)</td>
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<td><strong>Week 9</strong></td>
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<td>Monday, Nov. 6th</td>
<td>- Friday, Nov. 10th</td>
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<td>Fall study break - no classes</td>
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<td><strong>Week 10 –12</strong></td>
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<td>Tuesday, Nov. 14th/21st - Friday, Nov 24th/Dec.1st</td>
<td>Design Development</td>
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<td>3 + 4 Desk Crits</td>
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<td>Tuesday, Dec 5th</td>
<td>- Friday, Dec. 8</td>
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<td>Tuesday Dec 5th Penultimate Review</td>
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<td>Friday, Dec. 8: last day of weekly classes</td>
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<td><strong>Week 14</strong></td>
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<td>Monday, Dec. 11th</td>
<td>- Friday, Dec. 15th</td>
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<td>Wednesday, Dec. 13 and Thursday, Dec. 14: M2 Design Final Reviews</td>
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Field Trip Cost
The approximate Total Cost of the trip is $1530.00 +/-

i) Flight Halifax to Amsterdam Return $ 800-1000.00; ii) Accommodations $430 @ 24-90/night (Amsterdam $90(x 2), Rotterdam/Delft/Den Hagen and up the coast $27/36); and iii) Train + Bicycle Rental $ 75 -100

Funding SWIFT information can be found at http://tinyurl.com/dal-swift

Other Website Information:
Cycle Route Planner

Camping
https://boek.krim.nl/krim/type71&datemargin=0&lan=en&startdate=02102017&tab=campsite&accokindid=49&mincapacity=6&maxcapacity=10&dc=DlIN

Hostels
http://www.hostelworld.com/hostels/Netherlands
References:

Dutch/Landscape References


https://www.youtube.com/watch?v=0TAMpQ2mIkE


Holl, Steven, Young Architects Second Nature, (NYC, Princeton Architectural Press 2001)

Illich, Ivan. H2O and the Waters of Forgetfulness, (Berkeley Ca, Heyday Books,1985)


*MacHarg, I. Design with Nature


Urban References

Constance, Caroline, The Modern Architectural Landscape (Minneapolis, University of Minnesota Press 2012).

Digital References
[dutchdikes.net](http://dutchdikes.net)
[http://www.spatialagency.net/database/price](http://www.spatialagency.net/database/price)
The Future Commons 2070, Map C01 – Harwich to Hoek van Holland and Dover Strait.
https://vimeo.com/41912534 (dutch)