Eco-friendly, safe and economically feasible energy concepts and technologies for European Inland Shipping

Holland Hospital

A Case Study

Grant Agreement: 633929
(Sub)Work Package: 4.3
Deliverable No: [Deliverable No]
Author: Langstraat, Edwin
Version (date): April 24, 2017

This project has received funding from the European Union's Horizon 2020 research and innovation programme under Grant Agreement No 633929

Document history

Document version (date)	Comments (changes compared to previous version)	Authorised by
0.1 (20161004)		T. Jongkind
0.2 (20170421)		T. Jongkind

Authors of the document

Responsible organisation	Principle author
STC-Group	E.H. Langstraat

Table of Contents

Introduction

PTC is a Dutch cooperation of independent entrepreneurs in inland navigation. They offer their combined ships and knowledge of inland waterway transport services to clients in all kind of cargo markets.
Their market approach is based on own research and information gathered. The own commercial department and the shippers - who are underway and therefore see and hear - collect market trends and incentives that lead to acquisition of cargo for potential and current clients.

Your commercial manager at PTC is offering you the following information after visiting a prospect.

The people in the Netherlands tend to get older, which leads to additional investments in the healthcare sector in a mix of private and public initiatives. In 2015, the specialist medical care only costed € 22 billion. 37% of the Dutch people is consulting a medical specialist. 7% of the population is staying in a hospital for one day/night or longer (Nederlandse Zorgautoriteit, 2015). More than half of healthcare costs is 'absorped' by practioners and hospitals. Dutch healthcare is big business; substantially contributing to the GDP (12%) and national employment. Ageing of the population, population growth and technological advancement are drivers for a growing healthcare sector in the Netherlands. Official projections for 2040 are that the healthcare sector will claim somewhere between 19 to 31% of the GDP and that the sector creates at least 20% of all the Dutch jobs (CPB, 2011).

One of the effects is the need for new and large new build hospitals and medical centers. For local and provincial governments fulfilling this need poses a real challenge. Apart from finding strategic locations that have enough potential for incorporating a hospital, there is a concern how to cope with social, logistics and environmental issues. Governments, politicians and hospital management do not want to put much strain on the local neighbourhood around the building site and – for many years to come – on a full, 24/7 functioning hospital where all ages are treated and lives are saved. Hospitals work like a magnet, attracting patients, work force, suppliers, visitors and waste collectors.

Actual situation

Hendrik-Ido-Ambacht is a Dutch town, close to Rotterdam and located in the very populated province of South-Holland (3.6 million inhabitants).

The municipality of Hendrik-Ido-Ambacht offers a development project in the Nieuwe Bospolder (see map 1) with a total area of 70,000 m^2 comprising a functional floor surface area of 40,000 m^2. The projected ground level will be +1 meter above sea level (NAP).

Map 1: Nieuwe Bospolder development area (boundaries in red)

BBN, a combination of construction companies, namely BAM Utilities BV and Ballast Nedam special projects, is rewarded with the assignment to construct a hospital – without movable properties and supplies - for a fixed budget of € 150 million (ex VAT, year 2015 price index). The architect is EGM Architects from Dordrecht. Construction advisors are Royal Haskoning technical installations from Rotterdam and Peutz consulting engineers construction physics from Zoetermeer. The new hospital will be named Holland Hospital.

The idea is to design and construct a hospital with 375 beds: 175 (clinical), 75 (surgical and ICU), 50 (women, children and babies), 25 (mental), and 50 (day care). In the projection

for the first five years of operations, 20.000 patients per year are expected for short term and longer treatments and recoveries. The hospital bed/population ratio is aiming at 2.15.

The construction project time line is: start November 1st, 2016; finish September 15th, 2018. (see chart below).

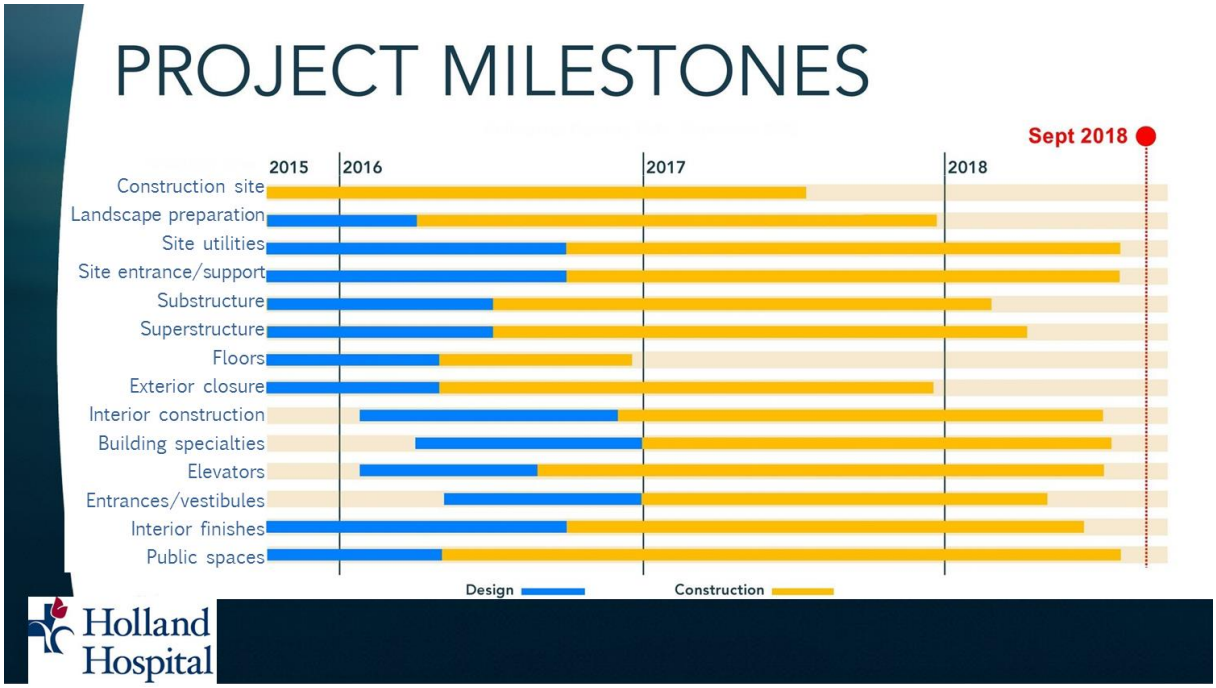

Chart 1: Construction project time line 2015-2018.

Why this new hospital?

The new hospital, Holland Hospital, is to be built in the Nieuwe Bospolder, municipality of Hendrik-Ido-Ambacht (the Netherlands).

The decision to build a new hospital in that region was fed by a need to have an own medical treatment facility, serving the urbanized areas of four nearby towns, namely Hendrik-Ido-Ambacht (30,000 inhabitants), Zwijndrecht (44,500 inhabitants), Ridderkerk (45,000 inhabitants) and Alblasserdam (20,000 inhabitants). Till now, people have to go for a hospital to either Rotterdam or Dordrecht, farther away. It was not easy to find an empty site, but the current choice is a lucky one.

The Nieuwe Bospolder is at the waterfront with space for an esplanade and garden. This area along the Rietbaan and the river Noord will attract patients, visitors and (medical) staff. The three buildings get pedestrian walkways and links, ensuring easy access and

efficient between buildings and around the hospital grounds, as well as between public transport and the hospital's main entrance. The proposed future adjacent busway and the expansion of the taxi stand will ensure the regional community will have trouble free and efficient transport to and from the hospital. Encouraging the use of public helps to minimize the strain on existing roads surrounding the facility.

Patient view point

Holland Hospital aims to be a healing environment. Design and interior give the patients comfort, ease and safety. Less stress means quicker recovery. These effects are obtained with the help of specific colors, clean air, garden views and seating and noise reduction.

Hospital view point

Holland Hospital wants to be a good and attractive employer and educational institute. A relevant aspect to that the location is well visible, within reach and in the middle of society. Easy to reach by bicycle (bike path on the esplanade) or public transport are aspects that make the hospital an attractive educational center and employer.

Environmental view point

Also from an environmental point of view this was a sensible decision. In the construction of the new hospital sustainability is kept in mind as much as possible; think of construction material, construction methods, energy saving etcetera. Construction practices comply with BREEAM-NL, which is the preferred environmental assessment method and certification scheme for healthcare buildings in the Netherlands. All in all it helps reducing the ecological footprint of Holland Hospital.

Local authorities view point

Local authorities support the decision to build a new hospital in the heart of their urbanized areas. The amount of inhabitants is expected to grow the coming decades. Holland Hospital is a significant employer for the towns of Hendrik-Ido-Ambacht, Ridderkerk, Zwijndrecht and Alblasserdam. Local suppliers can expect to serve a new client. Research showed the need for having a hospital nearby.

What does the basic construction plan look like?

Figure 2: Holland Hospital plan with buildings A, B and C, esplanade and garden.

Block A will accommodate: clinical care & services, laboratory and mental health.

Block B will accommodate: operative rooms, intensive care unit and ambulatory (cancer) care.

Block C will accommodate: main entrance hall, atrium, reception & check in, clinical care & services, medical imaging, technical services, medical supplies storage room and a parking garage with 100 spaces (staff & suppliers).

An outside car park will offer 100 ground spaces (public; pay and display).

The uniquely designed and landscaped esplanade and garden take 2 hectares.

Construction stages Holland Hospital:

Construction site and landscape preparation

- Remove river sediments (water bound)
- Clearing and grubbing (surface)
- Demolition of abandoned buildings (former industrial estate)
- Remove surface soil layers (excavate 10 meter)
- Subsurface drainage of groundwater
- Drive concrete piles

Site utilities

- Potable water
- Power station/Electricity
- Sanitary sewer system
- Trash/waste receptacles, dumpster locations

Site entrance and support

- Build up tower crane 1 and 2
- Vehicular and Pedestrian Access
- Parking spaces
- Access Provisions for service vehicles
- Sidewalks, fencing, gate, traffic controls, and barriers

Building Elements:

- Substructure

  e.g. concrete piles, fill sand (2 meter), basement/parking garage, groundwater control, waterproofing, under-slab insulation
- Superstructures

  e.g. steel frames, precast concrete slabs, glass wall panels
- Floor materials

  composite slabs, reinforced concrete
- Exterior Closure

  e.g. exterior elements such as wall, window, door, roof construction
- Interior Construction

  e.g. partitions, doors, ceiling suspension system, access flooring, etc.

- Building Specialties

  e.g. toilet compartments and accessories, drinking fountains, patio garden
- Elevators

  separated for visitors/services and patients/staff
- Interior Finishes

  e.g. floor treatments, walls, doors, windows, window coverings, ceiling treatments,

  colors, textures, etc.
- Public Spaces

  Waiting areas, recreation areas, sign posting, public safety
- Entrances and Vestibules
- Building Support Spaces

  e.g. general use restrooms, equipment and maintenance areas, custodial spaces, etc.
- Specialty Areas

  e.g. cafeteria kitchens, dining areas, child care centers, etc.
- Exterior Finishes: Texture, colors, damage resistance

Practical completion and landscaping

Dismantle tower crane 1 and 2

Testing, certification and auditing of hospital installations

Medical devices testing, certification and auditing

Complete and hand-over buildings A, B and C

Finalise parking lot

Access provisions for service vehicles

Finalise sidewalks, fencing, gate, traffic controls, and remove barriers

Finalise esplanade and hospital garden.

What are you now expected to do?

The main question for the student is, from the information given, to deliver a successful transportation proposal for the complete building plan including all the construction stages of the hospital (indicative construction time 1.5 year). The students will be able to present their proposals (transport solutions) end of the week to the PTC Sales & Acquisition Manager.

He asked you to prepare a quotation with proposal. Main question is, from the information given, to deliver a successful transportation proposal for the complete building plan including all the construction stages of the hospital (indicative construction time 1.5 year).

The success is defined by:

- Assigning as much construction project related cargo as possible to inland waterway transport;
- Reduce the CO2 emission footprint (caused by all transportation legs) as much as possible;
- Make use of smart logistics concepts, Including (temporary) loading and unloading facilities, cargo bundling, network optimisation, lead time reduction, just-in-time delivery, etc.
- The quotation is based on fair and reasonable (overall) freight prices.

Tasks and activities

Imagine you are working for the commercial department of PTC, executing the following tasks. Use the online blog provided on the learning management system "ILIAS" to document the progress of your work and share information with your colleagues.

Date	Tasks
Kick-off	• Case will be handed out. • Role: manager gives assignment to his (junior) staff
Self-study	• Analyse the case and the information provided within it. • Identify the advantages and disadvantages of different transport modes • Compare the transport modes with regard to the transportation of materials and finished goods for construction, facilities and infrastructure, and hospital services, as mentioned in the case • Elaborate on possible ways of transportation of these flows based on the inland waterway system. • Study the database 'Construction site deliveries' provided on "ILIAS" (analyse, complete). • Evaluate and decide for an eco-friendly transport solution draft.
Team meeting	• Organize an online meeting with your tutor, give a status report and use Q+A to gather new information and insights. • Discuss the transport solution draft. • Role: (junior) staff is discussing preliminary analysis and outlines with the manager in a team meeting.
Self-study	• Write a proposal (transport solution) based on the draft and on the feedback you get, work out the eco-friendly transport/ commercial strategy for PTC in details as mentioned in the case. • Do make use of the data provided within the case. • Prepare a well-structured presentation (15 minutes) and discussion (15 minutes) to introduce and get consensus on your transport solution.
Staff meeting	• Presentation of the solution (15 min.) and discussion (15 min.). • Role: manager evaluates output of his (junior) staff.

Recommended Links and other sources

Company (PTC)

http://www.ptcba.nl
2016 PTC Offerte voorbeeld.docx

Dutch governmental bodies

CPB. (2011). *Zorg blijft groeien.* Centraal Planbureau.

Nederlandse Zorgautoriteit. (2015). *Stand van de zorgmarkten 2015.* Opgeroepen op 09 30, 2016, van www.nza.nl: https://www.nza.nl/1048076/1048181/Stand_van_de_zorgmarkten_2015.pdf

Construction

http://www.breeam.nl
https://aec-business.com/logistics-key-construction-site/

Inland Waterway Transport

Dutch Inland Navigation Information Agency (BVB), see:
http://www.bureauvoorlichtingbinnenvaart.nl/index.php?id=53

Vries, K. de (2016), "The power of inland navigation. 2016-2017", see:
http://www.bureauvoorlichtingbinnenvaart.nl/assets/files/WaardeTransport_spreads-UK.pdf

www.pcnavigo.com

Spreadsheet

"Construction site deliveries.xlsx", see ILLIAS