The role of marine contractors in the making of the Delta of the Future

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Program Director Innovation, Van Oord

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The initial construction of the ‘Nieuwe Waterweg’
Some key moments and the link to contractors and innovation

- **1731**: Nicolaus Cruquius created a first design for a cut through the Hoek van Holland
- **1858**: Raad van de Waterstaat issues its advice for a cut through the Hoek van Holland (plan by Pieter Caland)
- **1863**: ‘Wet op den Waterweg van Rotterdam naar zee’ signed.
- **1864**: Start of construction of the piers
- **1865**: Award of contract for the dredging works (delay to landownership discussions)
- **1866**: The Prince of Oranje opens the project (‘eerste spade in de grond’)  
- **1868**: First connection to the North Sea is made
- **1872**: First vessels could pass Hoek van Holland and reach Rotterdam
- **1885**: The Nieuwe Waterweg is finally at the required depth, to a large part due to arrival of steam technology.

**Innovation** - Adriaan Volker, one of our legal predecessors, was one of the main contractors of this large project. He was one of the first to introduce steam dredgers in the Netherlands. This innovation was an important enabler of the Nieuwe Waterweg dredging project and a powerful driver to grow Volkers company.

**Enabling projects** - Large projects provided the conditions for dredging companies to invest in better equipment. The improved equipment made more ambitious project feasible. This phenomenon continues to this day.
Maintenance works for the ‘Rotterdamschen Waterweg’
Project specifications (bestek), tender document (inschrijvingbiljet), 1936 - 1941
- HAM 301 moved 466,098 m³ of soil over a period of in total 52 weeks
- Interesting observations on productions are reported
- Also at this time energy use was of interest (1631 tons of coal in total)

### Maintenance works for the ‘Rotterdamschen Waterweg’

#### Overview of the project progress, 1938

<table>
<thead>
<tr>
<th></th>
<th>&quot;H.A.W. 501 (810 m³)&quot;</th>
<th>&quot;H.A.W. 10 (1093 m³)&quot;</th>
<th>&quot;H.A.W.&quot; (690 m³)</th>
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<tbody>
<tr>
<td><strong>Gegesven:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grundverzet</td>
<td>206.717 m³</td>
<td>260.381 m³</td>
<td>466.098 m³</td>
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<tr>
<td>Aantal vrachten</td>
<td>251</td>
<td>576</td>
<td>84</td>
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<tr>
<td>Aantal vrachten per week</td>
<td>11,4</td>
<td>11,3</td>
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<tr>
<td>Aantal m³ per week</td>
<td>9.708</td>
<td>8.399</td>
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<tr>
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<td>788</td>
<td>1.213</td>
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<tr>
<td>% Werkuren</td>
<td>98,5 %</td>
<td>94 %</td>
<td>94 %</td>
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<tr>
<td>Werkuren</td>
<td>1.278</td>
<td>1.602</td>
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<tr>
<td>Draaiuren</td>
<td>1.186</td>
<td>1.480</td>
<td>2.604</td>
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<td>Percentage draaiuren - werkuren</td>
<td>90 %</td>
<td>93 %</td>
<td>92,6 %</td>
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<tr>
<td>m³ per werkuur</td>
<td>162</td>
<td>289</td>
<td>253</td>
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<tr>
<td>m³ per draaiuur</td>
<td>181</td>
<td>275,7</td>
<td>272</td>
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<tr>
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<td>5820 min.</td>
<td>6642 min.</td>
<td>9010 min.</td>
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<td>116 min.</td>
<td>107 min.</td>
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<td>0,02</td>
<td>0,06</td>
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<td>Arbeidsloon totaal</td>
<td>f. 640,89</td>
<td>f. 8627,86</td>
<td>f. 1564,34</td>
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<tr>
<td>Idem per m³</td>
<td>8.84 ct.</td>
<td>3,84 ct.</td>
<td>3,84 ct.</td>
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<tr>
<td>Idem per week</td>
<td>f. 504,91</td>
<td>f. 726,32</td>
<td>f. 286,04</td>
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<td>Kolen totaal</td>
<td>680 ton</td>
<td>901 ton</td>
<td>1601 ton</td>
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<tr>
<td>Idem per 1000 m³</td>
<td>3,52 ton</td>
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<tr>
<td>Idem per week</td>
<td>34,4 ton</td>
<td>55,7 ton</td>
<td>31,4 ton</td>
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<tr>
<td>Idem per draaiuur</td>
<td>0,68 ton</td>
<td>0,76 ton</td>
<td>0,4 ton</td>
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<tr>
<td>Idem per werkuur</td>
<td>0,07 ton</td>
<td>0,06 ton</td>
<td>0,06 ton</td>
</tr>
<tr>
<td>Percentage vrachten buiten</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ophoofd</td>
<td>62</td>
<td>65</td>
<td>13</td>
</tr>
</tbody>
</table>

Van Oord

Marine Ingenuity
New possibilities (around the turn of the 19th to 20th century)

Innovations enabling projects, and projects enabling innovation

Workers construct Suez canal (around 1860)

The Suez Canal caused a 178 percent increase in steamship use on Asian routes and gave rise to the Suezmax vessel class.

Workers construct Panama canal (around 1910)

Just like the Suez Canal, the Panama Canal also affected shipping world-wide (Panamax vessel class)
Other examples (throughout the 20th century)
Innovations enabling projects, and projects enabling innovation
Increased stakeholder involvement and environmental awareness
The dredging community invests heavily in new design methods
Industrial scale coral breeding: the Coral Engine (Bahamas)
Environmental innovation opening the door to new project designs?

WANT TO KNOW MORE?
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Environmental innovation opening the door to new project designs?
Other exciting examples of innovations that are paired with societal challenges

Innovations enabling projects, and projects enabling innovation

Boreas:
A new methanol electric installation vessel for offshore wind

Vox Ariane:
Van Oord’s first TSHD equipped with an LNG fuel system
Societal challenges and the innovations that are needed to face them have been in a continuous dance together.

The Nieuwe Waterweg is an inspiration, but the future will demand different things for which we must be ready.

Questions?