CEDA
Central Dredging Association

IADC

Welcome

Central Dredging Association

Day Chairman

Dr Marc Gramberger, Prospex bvba

Contract Management for Dredging and Maritime Construction

International Association of Dredging Companies (IADC)
Central Dredging Association (CDA)

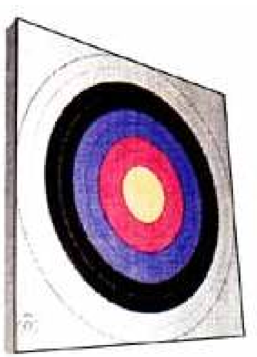
Introduction to the conference by

Dr. Marc Gramberger, Prospex

Conference Objectives

- **Bring together** contracting partners
  in the dredging industry

- **Increase insight in crucial issues** in contract
  management among partners in dredging and maritime
  struction



elop, amongst contracting partners,
nstructive approach to the planning, design and
ution of dredging and maritime construction projects

Format

Mornings

Presentations

Afternoons

Workshops & discussions

Facilitation & Reporting

Facilitation team

- Dr. Katia Tieleman
- Paul de Ruijter & Steven Libbrecht
- David Duerden
- Dr. Marc Gramberger

Reporters team

- Ilse Van Cauwenbergh
- Rebecca Warden
- Ard Jongsma
- Hans-Peter Lassche

Question

In contract management for dredging and maritime construction:

How well do the players in the field understand the perspectives of the other players?

Question part two

In contract management for dredging and maritime construction:

How well do <u>you personally</u> understand the perspectives of the other players in the field?

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Contract Management for Dredging and Maritime Construction

Pre-Tender Information

John Land
Dredging Research Ltd

Central Dredging Association

Purpose of pre-tender information

- Describes the site
- Defines the nature of the ground
- Describes physical & environmental constraints
- Identifies operational, statutory & legal constraints

It is as important as the Specification in describing to the tendering contractor the nature of the work to be done

Data Requirements

- Geological / geotechnical
- Hydrographic
  - Tides, currents, waves
  - Bathymetry
- Meteorology
  - Wind, fog, ice, rainfall
- Operational & legal constraints
- Obstructions / archaeology
- Siltation rates
- Environmental constraints

Bray et al., 1997

“It is important that the employer recognises that the contractor has come to the site for the purpose of providing a service to the employer, or to perform a specific task on behalf of the employer.

In return, he is entitled to expect fair payment and a reasonable profit for work that is performed satisfactorily.”

Bray et al., 1997

"If costs rise simply because conditions are more difficult than the contractor could have reasonably foreseen, it is not the fault of the contractor. Either the employer has failed to provide adequate information, or the adverse conditions were simply unforeseeable … the contractor should not be blamed nor should he suffer financially."

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Facts of Life

- Contractors will almost invariably seek to recover losses arising from unforeseeable conditions
- If disputed, costs always exceeds the loss
  - Cost = ORIGINAL LOSS + LEGAL COSTS etc

Nobody likes unpleasant surprises, especially Clients

Ground conditions - common problems

- Boulders
  - Inc. previous drilling & blasting
- Materials close to (under) the dredge level
- Ordnance / obstructions / debris
- Consolidation losses
- Stockpiles / surcharges
- Archaeological artefacts
- Quality of fill material

Claims for adverse ground conditions are often very substantial

Ground conditions

- All ground investigation data needs to be interpreted
- Accuracy
  - Contractor assumes data factually correct (????)
- Adequacy
  - Contractor probably able to determine if data are sufficient

In most cases, contractor is unable to undertake further investigations – must make best use of what he is given

The Contractor's dilemma

- The ground investigation data needs to be interpreted (as usual)
- The data suggest (but do not demonstrate) that adverse conditions could occur at one or more locations in the area to be dredged
- Assumption of the adverse conditions therefore involves speculation
- What to do?
  - Price-in the adverse conditions and lose the job
  - Ignore the potential problem and hope it doesn't arise or claim if it does arise

Lose the work or take a risk

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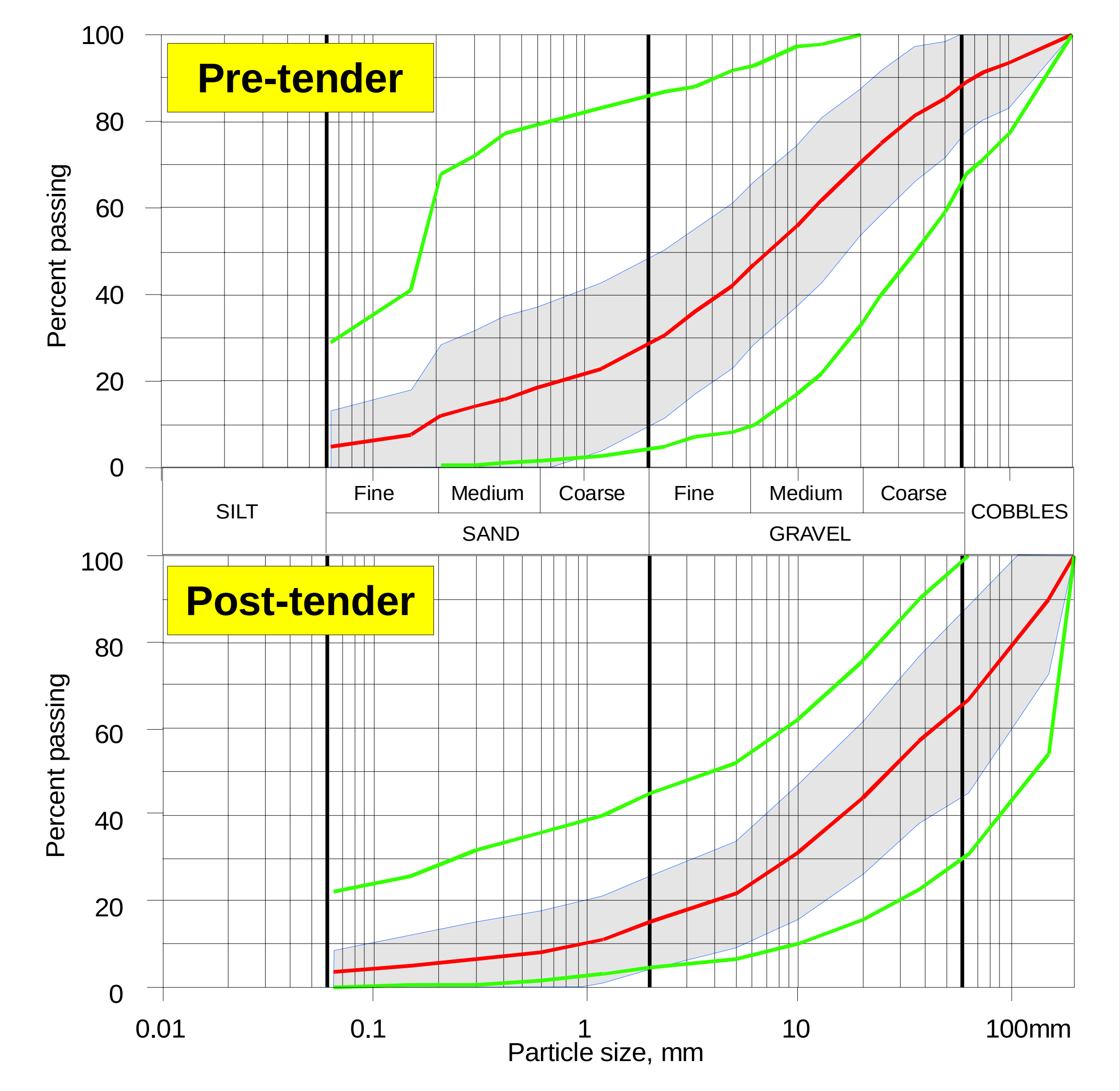
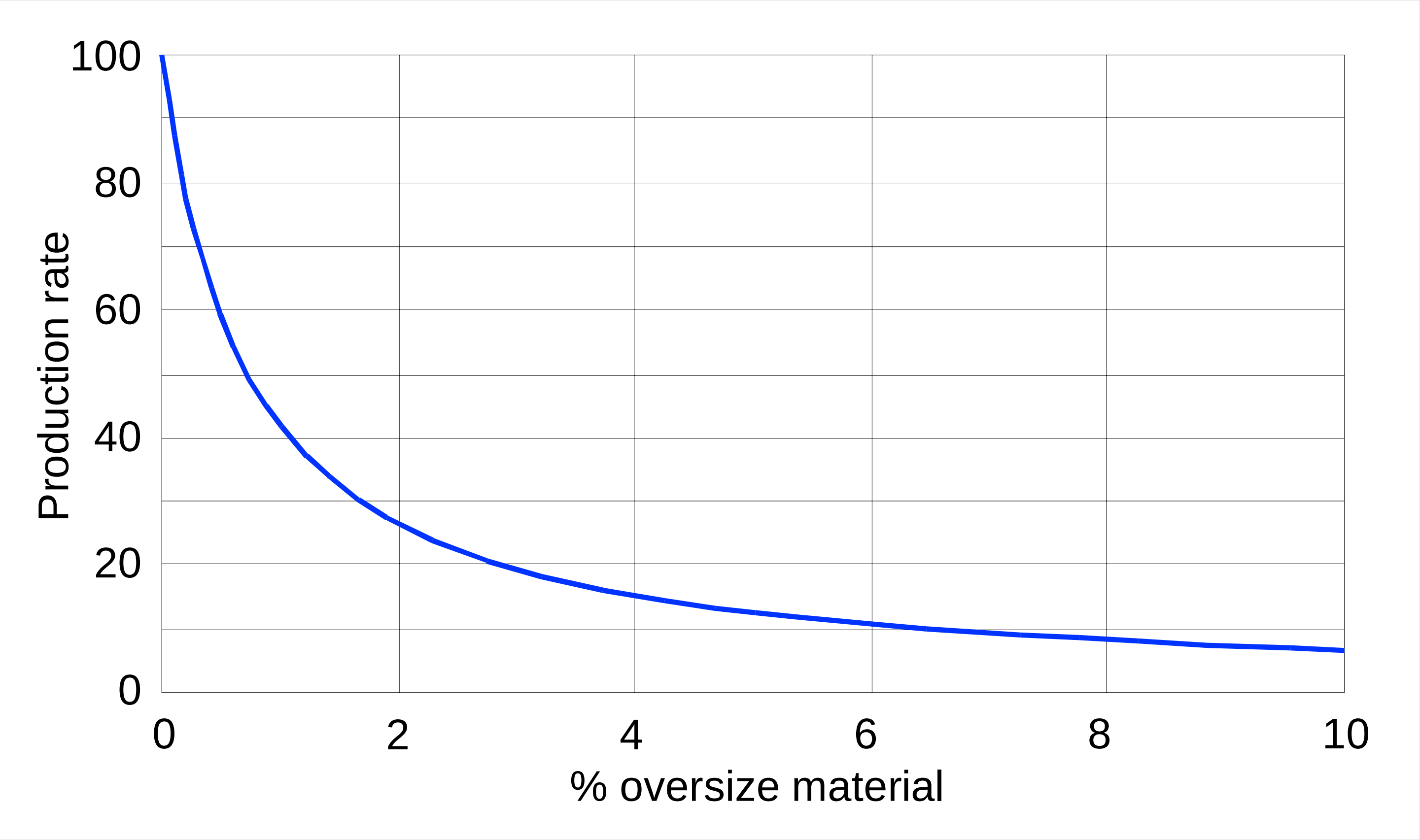
Boulders



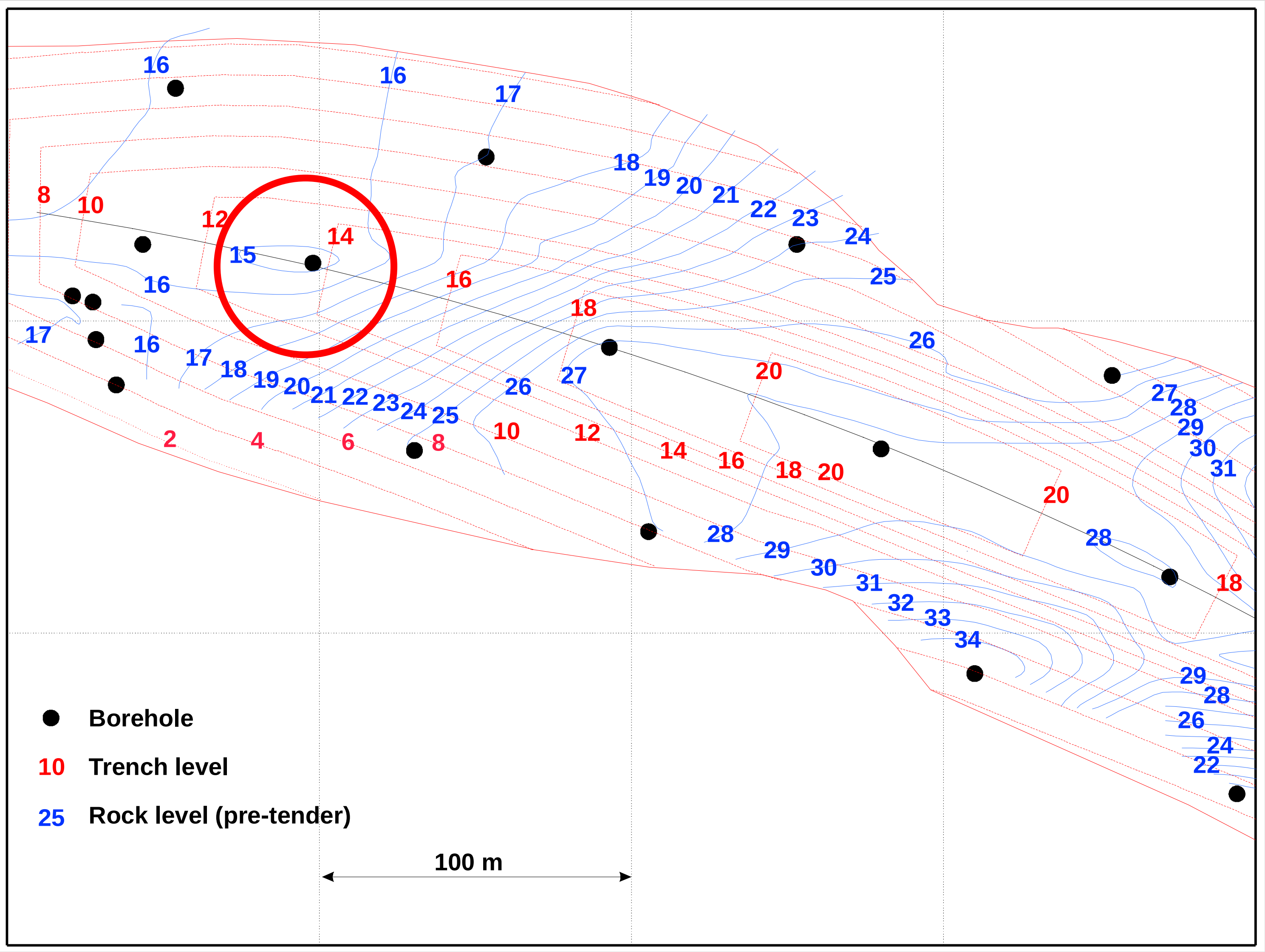
Pre-tender
Post-tender
Percent passing
100
80
60
40
20
0
SILT
Fine
Medium
Coarse
SAND
Fine
Medium
Coarse
GRAVEL
COBBLES
0.01
0.1
1
10
100mm
Particle size, mm

Effects of boulders on CSD



Stone box capacity $2m^3$

Material below (?) dredge level



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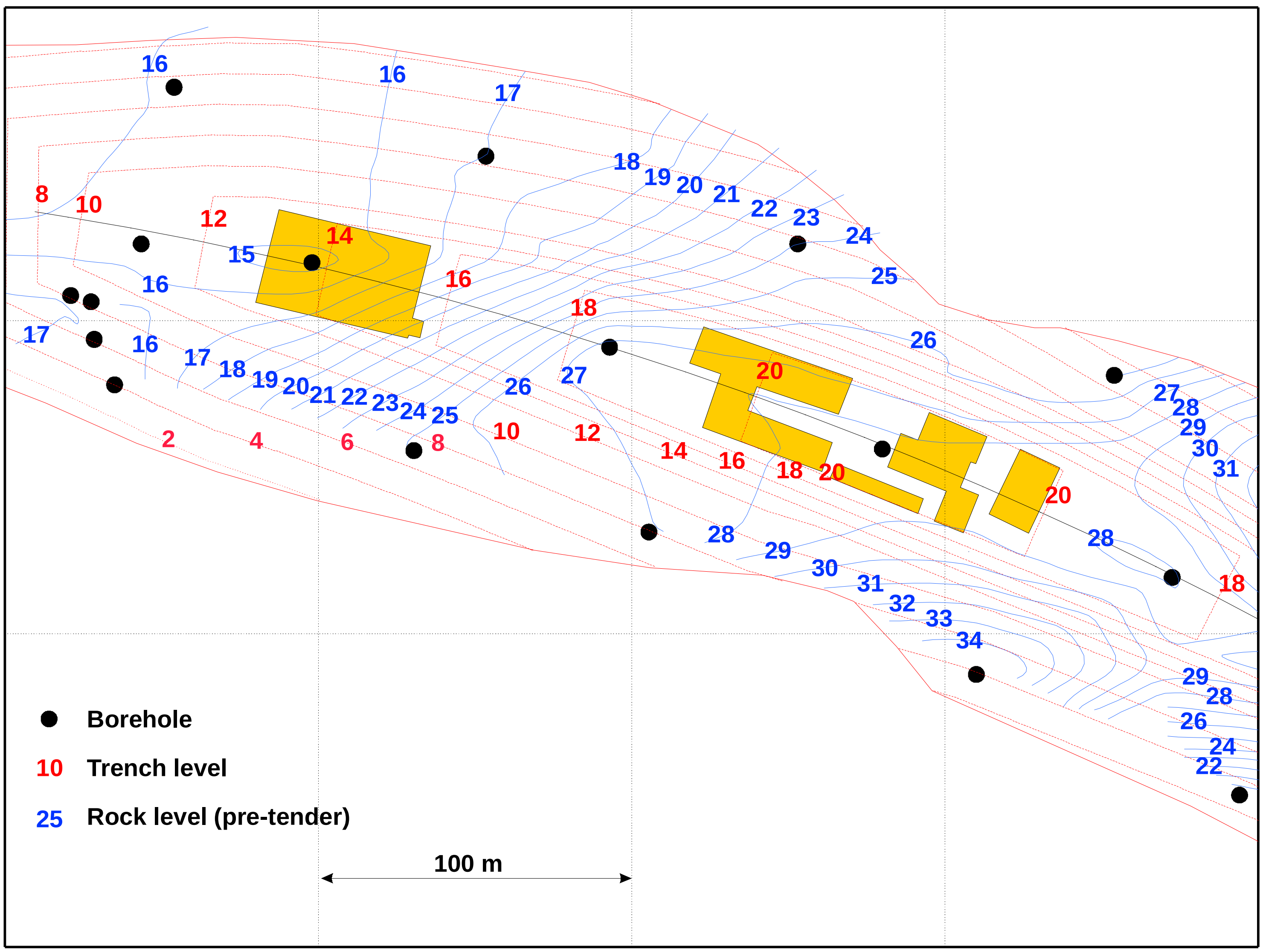
Material below (?) dredge level



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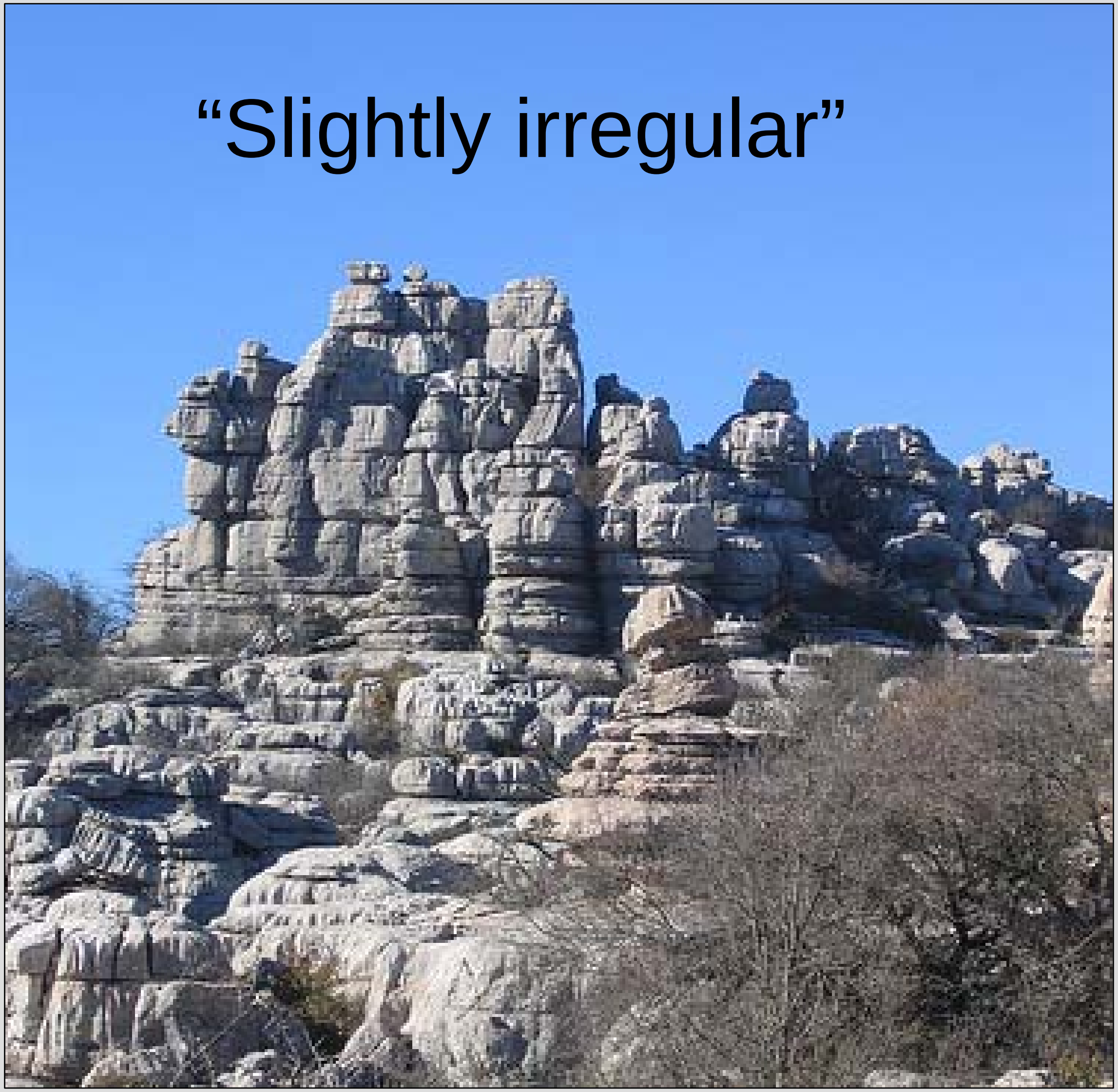
Karstic limestone



‘Foreseeable’ vs ‘Reasonably foreseeable’

- Contractor’s responsibility
  - To (expertly) interpret factual data provided
  - To develop a geotechnical model that conforms with the factual data at the investigation locations, and which …
  - … allows for some ‘reasonable’ degree of variance between investigation locations based on a general appreciation of the geological environment.
- ‘Reasonable’ – the key question
  - To what extent should the interpretation (and the contractors working method) allow for variations between borehole locations?

Speculation vs Reasoned Interpretation

- ‘Reasonable’
  - ‘*Rational*’, ‘*endowed with reason*’, ‘*just*’, ‘*not excessive*’ etc
  - Any allowance for variation must, logically, be based on use of the factual data. An interpretation which cannot be related to the factual data is merely speculation …
  - … eg. the fact that certain features can occur in karstic limestone formations should not mean that a contractor should assume them to be present (and allow for them) if the factual data does not support such an interpretation.

‘Reasonable’ is a matter of opinion

Risk Analysis

- Risk = probability x cost
- Establish sensitivity of cost to errors in assumptions / interpretation
- Permits identification of areas requiring more work

Can be applied to most types of pre-tender data

Data Types

- Geological / geotechnical
- Hydrographic
  - Tides, currents, waves
  - bathymetry
- Meteorology
  - Wind, fog, ice, rainfall
- Operational, legal & environmental constraints
- Obstructions / archaeology
- Siltation rates

Hydrographic Data

- Tides
  - Low risk
- Currents
  - Need long-term records
- Waves
  - Need long-term records
  - Potentially very high risk (to contractor!)

Probability can usually easily be established

- Bathymetry
  - Almost no risk if data are recent and of good quality

Meteorological Data

- Wind, fog, ice, rainfall
  - Data usually easy to obtain
  - Relatively low-risk as long as records extend over a sufficient period of time

Probability can usually easily be established

Obstructions / archaeology

- Debris
  - Very difficult to quantify
- Ordnance
  - Difficult to quantify in advance
  - .. easy to deal with in the contract

Probability can not easily be established

- Archaeology
  - New topic – not a universal problem
  - Risk to both employer and contractor
  - No guidance yet in place
  - Few resources available

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Siltation Rates

- Contractor responsible for maintenance before hand-over
- Trench landfalls a particular problem
- Can be relatively high risk unless subject to very detailed study
- Who does the study?

Probability of error can usually be estimated – but only after a detailed study

Operational, statutory and legal constraints

- Operational delays, e.g.
  - Shipping
  - Locks
  - Other contractors

Probability can easily be established

- Statutory & legal constraints

Should never be a problem!

Risk rating: based on (personal) experience

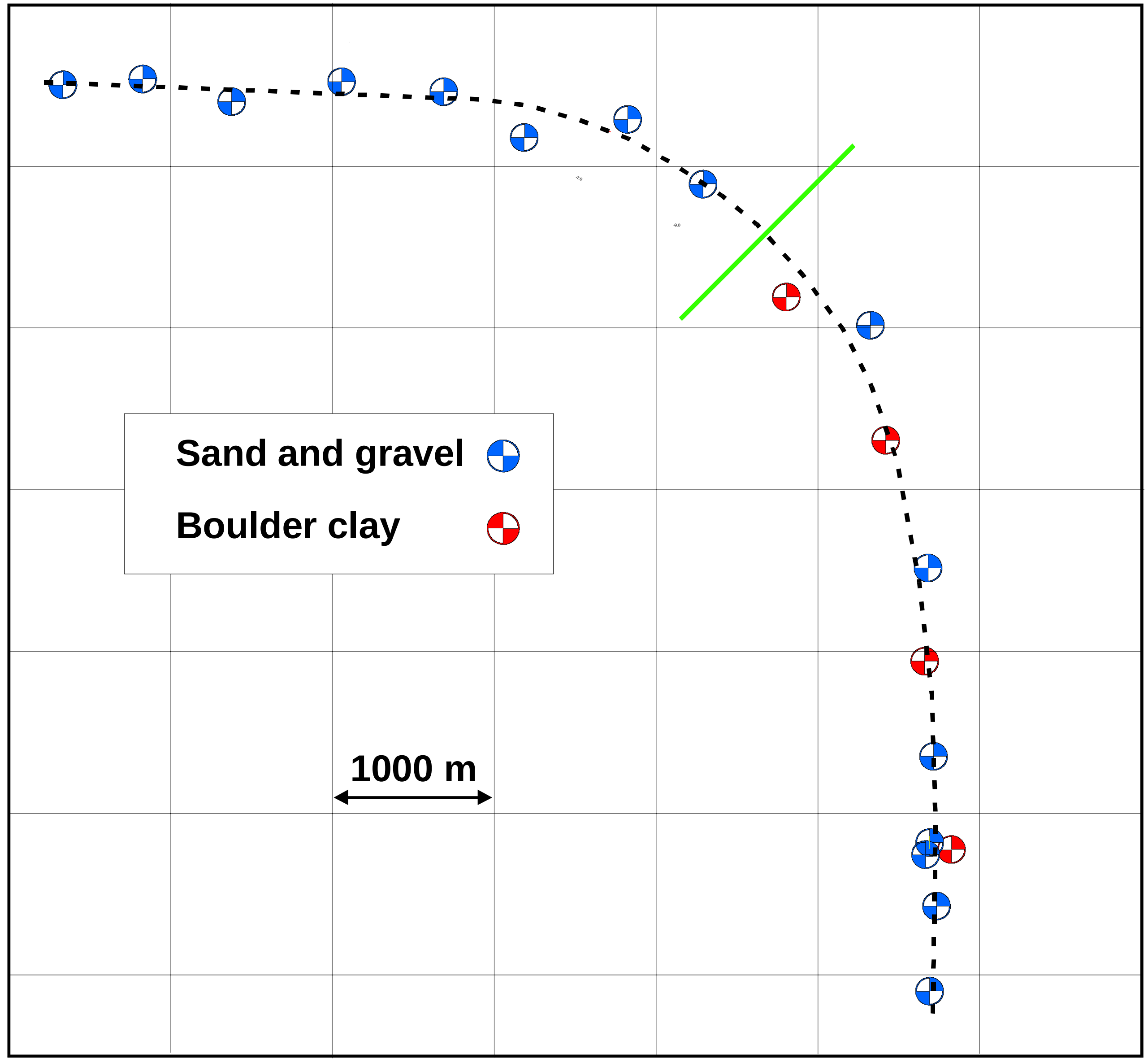
$100	Ground conditions (ex debris)
$50	Debris / ordnance
$25	Operational constraints
$10	Siltation rates
$2	Bathymetry
$0	Fog, ice, rainfall
$0	Tides & currents
$0	Statutory & legal
$0	Wind and waves

Based on number of claims encountered

Archaeology?

Environmental

The Contractor's dilemma



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Conclusions

- Pre-tender information describes the site, the working environment and constraints to operations
  - It is therefore as important as the Specification
- Risk analysis should be an integral part of acquisition and dissemination of pre-tender data
  - Identifies areas where more work is required
  - Improves cost-effectiveness of acquisition
- There is scope for more frequent application of pre-tender data as a benchmark for payment or E.O.T
  - Reduces or shares risk
  - Reduces cost (probably/possibly!)

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Environmental Issues during Project Preparation

Contract Management for Dredging and Marine Construction

Van Oord

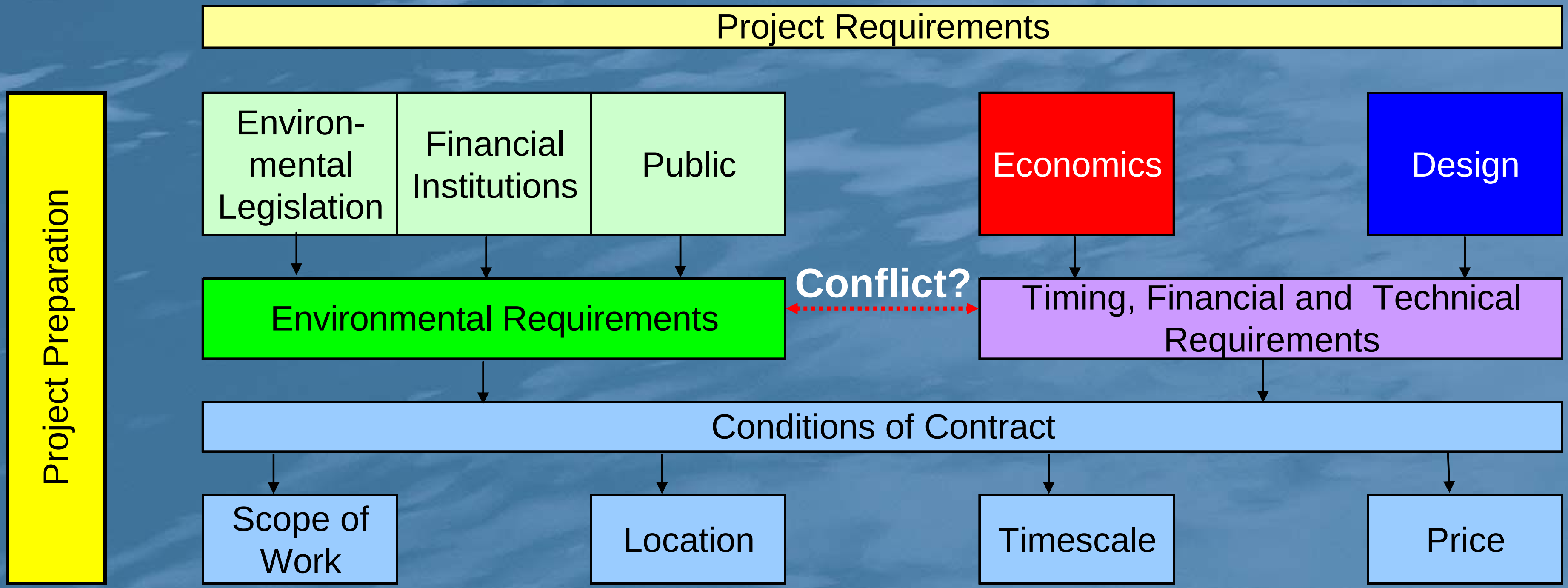
Environmental Issues during Project Preparation

- Environmental Impact Assessments
- Sense and nonsense of monitoring and mitigation
- Environmental requirements in tender documents
- Appropriate conditions of contract

Drivers behind Environmental Requirements

- Environmental Legislation
- Financial Institutions (Worldbank, OECD)
- Public Opinion and Politics
- General Awareness

The Project Preparation Phase



Complications

- Consultation process.
- Budget consequences.
- Legislation.
- Management.
  - Time is money.
  - Integrated solutions are too complicated.

Environmental Issues during Project Preparation

Environmental requirements a threat?

How to turn them into a manageable Challenge?

Dealing Successfully with Environmental Issues

- Comprehensive Environmental Impact Assessment.
- Sensible mitigation and compensation.
- Project specific environmental requirements.
- Appropriate conditions of contract.

Environmental Impact Assessments

Typical Observations:

- No Environmental Impact Assessment.
- Impact of dredging is often poorly quantified.
- Impact is based on wrong assumptions.
- EIA results transposed in Planning permission.

Environmental Impact Assessments

Hydrodynamic modelling result is often part of the EIA.

(example KBR, 2003)

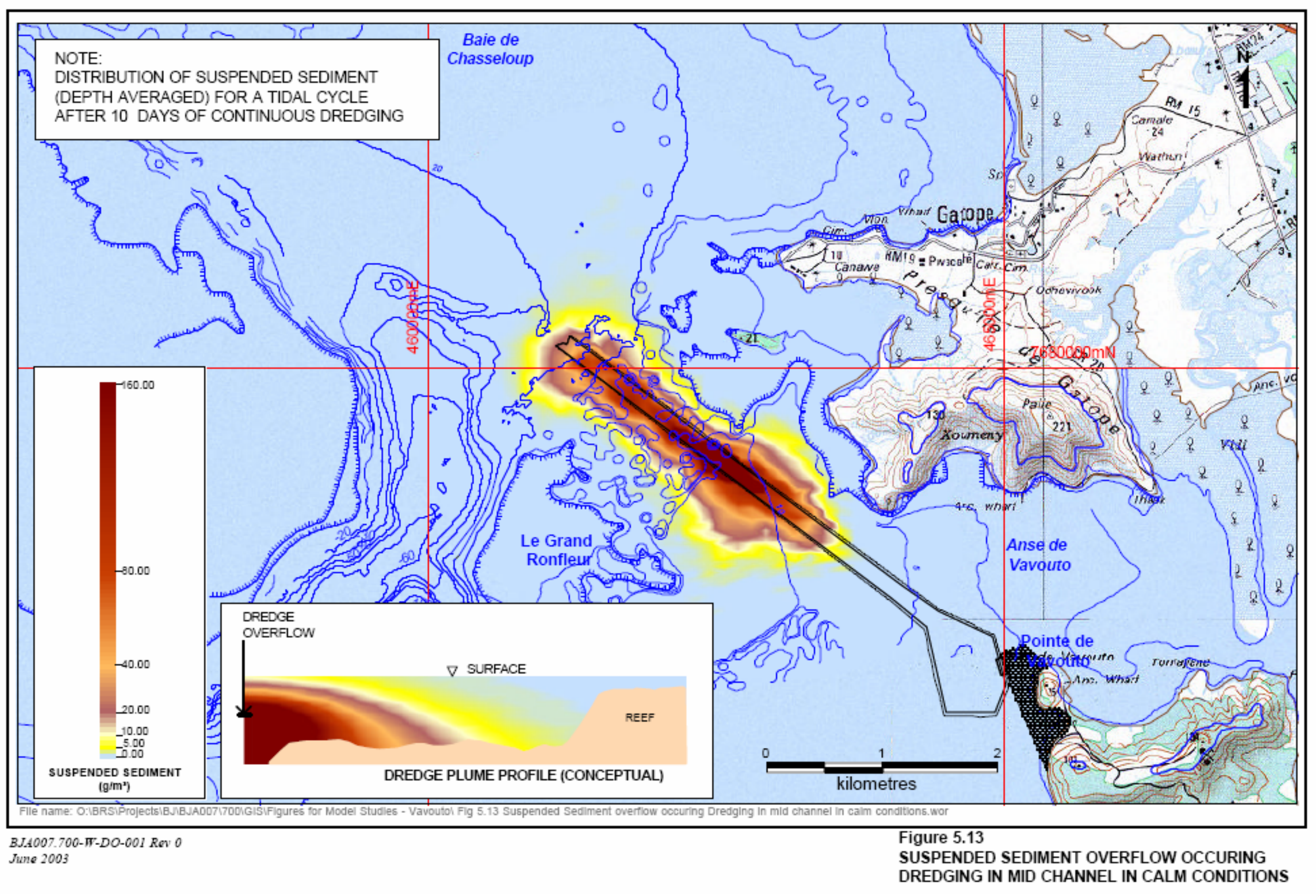


Figure 5.13
SUSPENDED SEDIMENT OVERFLOW OCCURING DREDGING IN MID CHANNEL IN CALM CONDITIONS

Environmental Impact Assessments

Impact of dredging is estimated on the basis of wrong assumptions.

- The EIA:
  - Hydrodynamic model used to predict dredge plumes.
  - Assumed productions were unrealistically low.
  - Results presented in average concentrations.
- Consequences:
  - Underestimate of the physical impact close to the operation.
  - Proposed protection procedures that could not be achieved.

Environmental Impact Assessments

Challenges

- EIA should always be prepared in the project preparation phase.
- EIA to consider other impacts and natural fluctuations.
- Prediction of impacts for different scenarios.
- Recommendation for monitoring at the sensitive receptor areas.

Sense and Nonsense of Monitoring and Mitigation

Typical Observations

- A lack of baseline data.
- Monitoring near the dredging or construction site.
- Impossible mitigation measures.

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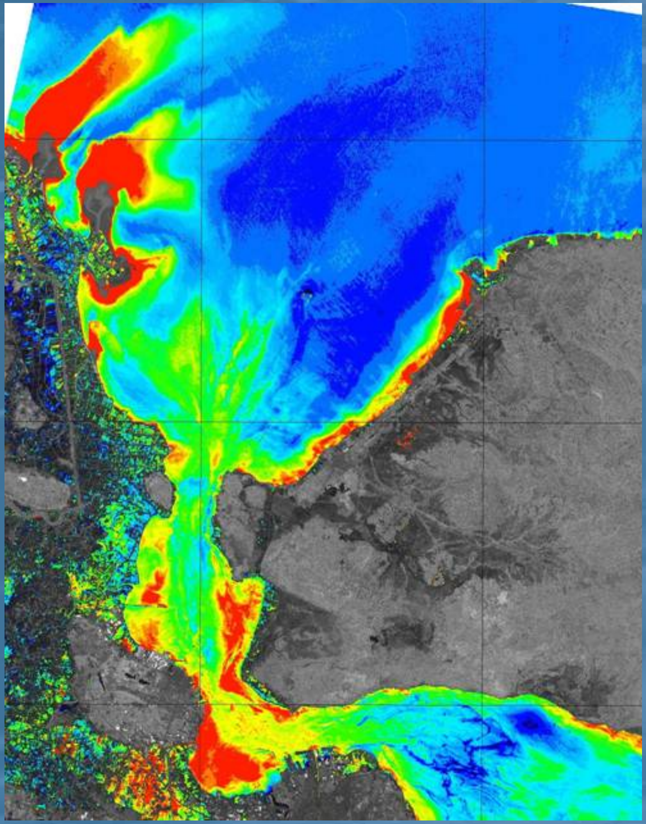
Sense and Nonsense of Monitoring and Mitigation

Sense and Nonsense of Monitoring and Mitigation

Challenges

- Assess the effectiveness of mitigation measures.
- Sufficient baseline data should be collected.
- Remote Sensing data.

Sense and Nonsense of Monitoring and Mitigation



Remote sensing data to monitor water quality

Environmental Requirements in Tender Documents

Typical Observations

- Copied specifications.
- Conflicting specifications.
- Not flexible.
- Vague requirements.

Environmental Requirements in Tender Documents

Copied Specifications

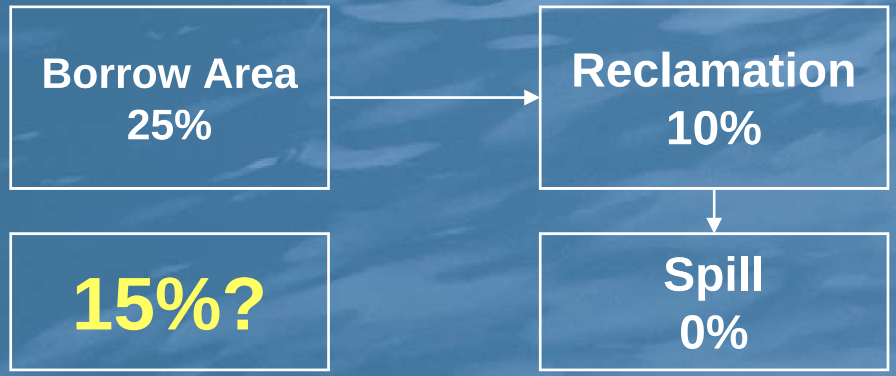
- Tender Document:
  - Turbidity shall not exceed 29 NTU.
  - Many Tender docs. in the Caribbean and the Middle East.
  - Origin: DEP of the State of Florida.

- Consequences:
  - This may be harmful to the environment
  - Or unnecessarily inflate project costs!

Environmental Requirements in Tender Documents

Conflicting Requirements

- The Tender Document:



- Consequences: Magic or fraud?

Environmental Requirements in Tender Documents

How much is allowed? And what to specify in the tender documents?

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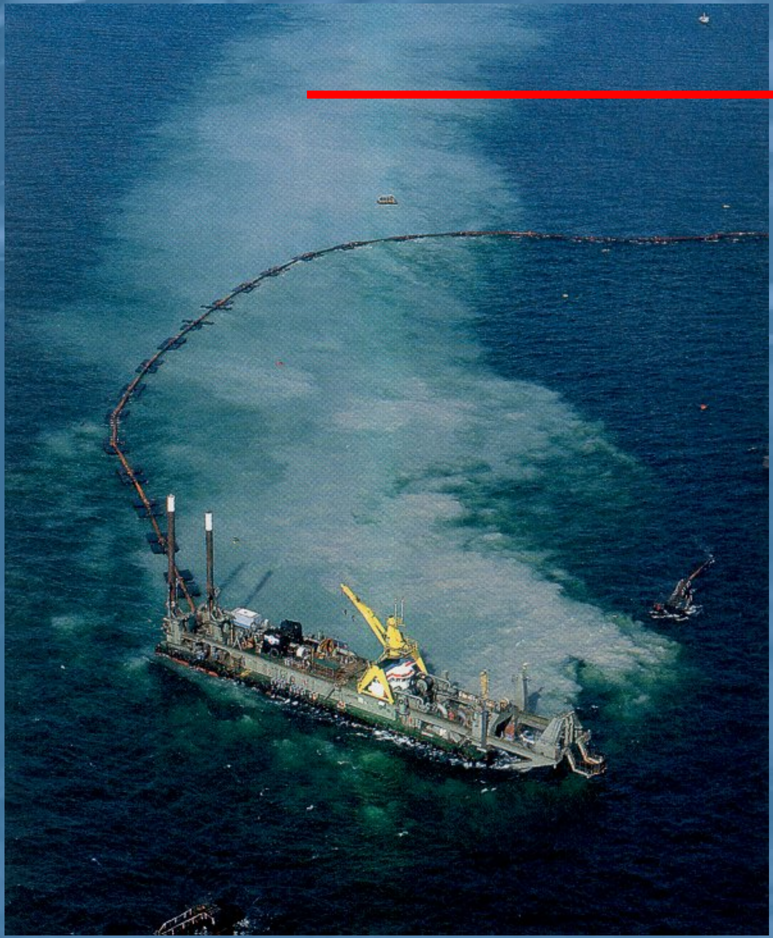
Environmental Requirements in Tender Documents

Challenges

- Requirements that can be managed.
- Functional Environmental Requirements.
- Allow for flexibility in execution method.
- Adaptive environmental management and re-measurement.

Environmental Requirements in Tender Documents



Øresund specification:

- Spill Limit 5%. Bonus system!
- Flexibility in equipment, methodology and spill monitoring system.
- Reference conditions.

FIDIC Conditions of Contract

4th Edition 1987

Clause 19.1(c)	Reasonable steps to protect the environment ……

Construction Contract 1999

Clause 4.18	Contractor shall not exceed threshold values

Dredging and Reclamation Contract 2006

Clause 2.3	Employer to provide data
Clause 6.1 q)	Employer responsible for unavoidable damage

Appropriate Conditions of Contract

- Scope of Works:
  - Functional, sensible and measurable requirements.
  - Flexibility in execution method and equipment choice.
- Location:
  - Monitoring locations outside the project site.
- Timing:
  - Allow for extension of time.
- Price:
  - Allow for mechanism to compensate for cost.

Environmental Issues during Project Preparation

Thank you for your attention!

Contract Management for Dredging and Marine Construction

BALANCE BETWEEN TECHNICAL AND FUNCTIONAL REQUIREMENTS

Dirk Heijboer – Royal Haskoning

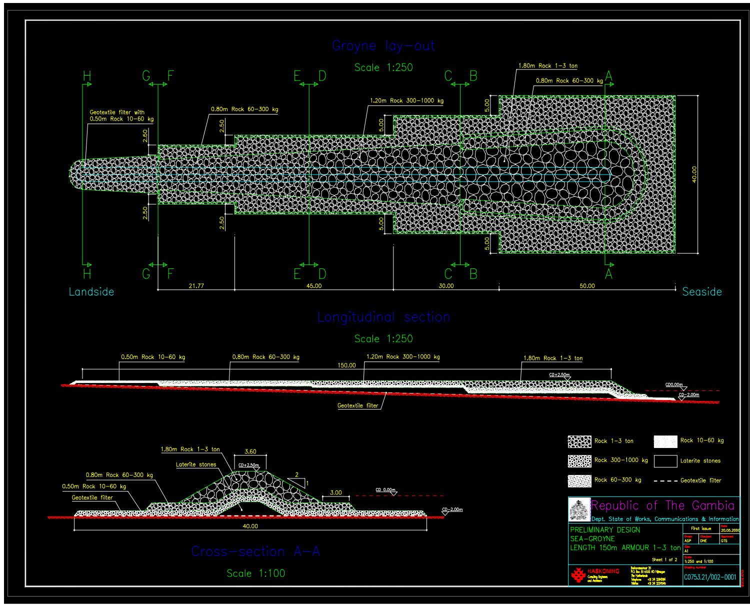
Hilton Docklands – London – UK

12-13 October 2006

DESIGN PROCESS DREDGING & MARINE WORKS

Main steps:

- Problem Identification
- Boundary Conditions
- **Functional Analysis**
- Generation of Alternatives
- Comparison and Selection
- Final Design and Detailing
- Cost Assessment
- Quality Assurance



ROYAL HASKONING

FUNCTIONAL REQUIREMENTS PROJECT

Main items:

- **Feasibility, holistic project function**
- Serviceability, is it fit for purpose
- Maintenance, in broadest sense

Project Functions:

- **Technical** (the outcome of the works should do where they are meant for)
- Economical-Financial
- Socio-Environmental
- Client’s specific wishes, political drive, etc.

DESIGN AND SPECIFICATIONS

Based on sound engineering practices:

- **Available concepts for solutions** (e.g. beach replenishment, rubble mound breakwaters, caisson breakwaters, offshore reefs, groynes, revetments)
- **Boundary conditions** (e.g. hydraulic and morphological regime, subsoil conditions, availibility/scarcety of construction materials)
- **Flexibility for adaptations of functional requirements and/or boundary conditions in the future** (e.g. port expansion, usage change of facilities, sea level rise)
- **Specific Clients' requests** (e.g. visual impact, material quality, preferred suppliers, etc.)

ROYAL HASKONING

TECHNICAL FUNCTIONS BREAKWATER

- **Scour Protection**: erosion protection
- **Core Filling**: attenuation of wave transmission, geotechnical stability, armour support
- **Berm and Toe**: attenuation of wave overtopping, geotechnical stability, stable footing for armour
- **Underlayer**: filtration and drainage, base for armour layer
- **Armour Layer**: wave energy dissipation, erosion prevention of breakwater
- **Crest and Crown Wall**: accessibility, attenuation of wave overtopping, carrier of facilities

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thinking in
all dimensions

INBALANCE SPECIFICATIONS – FUNCTION

Typical items in Marine Dredging:

- **Thin layer dredging** (e.g. some overdepth is might be more practical and saves on maintenance
- **Tolerances in bottom level** (e.g. small little peaks and heaps are acceptable)
- **Tolerances in side slopes** (e.g. design can only be made with high-tech operations-monitoring tools instead of straight forward box-cut)
- **Threshold figures of pollution and turbidity** (e.g. too theoretical and too strict, causing unnecessary complex working methods)
- **Waste of suitable fill materials** (e.g. due to non-integrated project approach)

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INBALANCE SPECIFICATIONS – FUNCTION

Typical items in Marine Rockworks:

- **Tolerances** (e.g. too strict to be made, inappropriate for random placement requirement of armour)
- **Settlement requirements** (e.g. overheight can be more practical than extensive soil improvement)
- **Quarry-yield finetuning** (inefficient use of quarry, leaving behind an overburden of quarried materials)
- **Rock grading specifications** (e.g. too theoretical and too tight, causing unnecessary complex selection and waste)
- **Rock property specifications** (e.g. not available in the region)

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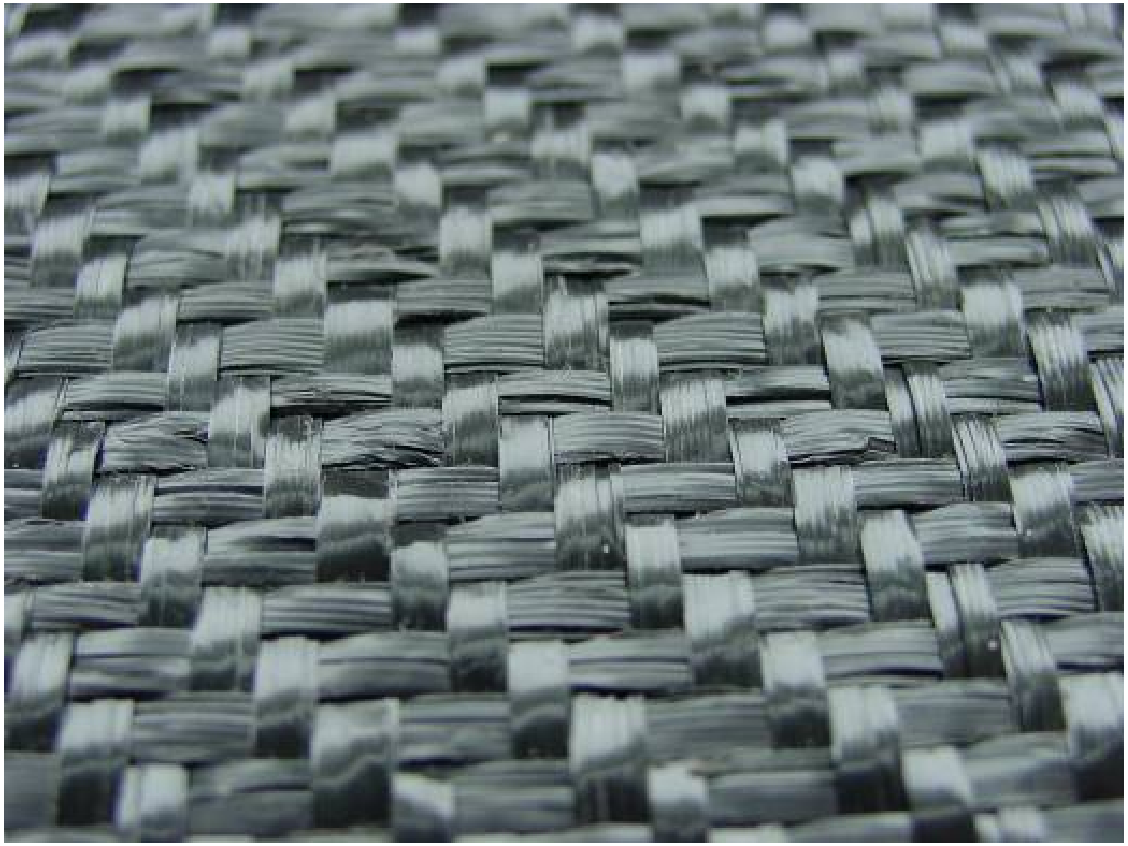
INBALANCE SPECIFICATIONS – FUNCTION

Typical items in Marine Rockworks:

- **Geosynthetics** (e.g. geosystems: tubes, mattresses, and materials: woven, non-woven, PP, PET)



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Geotube

CAUSES OF THIS IMBALANCE

- **Lacking knowledge-exchange** between designers, dredging and marine contractors, and suppliers (e.g. rock quarries, geosynthetics suppliers);
- Often too much **budget and thus time-constraints** in the preparatory and advance stage of project, where "thinking" and design takes place;
- A limited design budget may lead to **copy-paste culture**, which does not allow for proper "from functional requirement to specification" analysis
- **Scarcity of well-educated and in-field experienced design engineers** (too many managers, heavy international work-load at the moment)

CAUSES OF THIS IMBALANCE

- Dredging and marine work is on **each project unique** and need its own approach. Not only the environment varies a lot, the corps of Client’s is also pluriform
- **Corrective actions and optimisations during the works** often “blocked” by the Resident Engineer, who operates more as Contract Manager instead of responsible Engineer
- In high-tech projects, **contractors and equipment do miracles** with respect to obtained tolerances. Related tight specifications do not need to be necessarily copied to the “standard” structures

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CAUSES OF THIS IMBALANCE

- Project Planning: **time between design and implementation** often too long, design criteria (e.g. morphological conditions) and continuous developing design criteria can easily be altered with time. This may lead to an unsatisfied Client and unplanned variations of the works

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HOW TO IMPROVE

- **More effort to be spent on design process**, specification preparation and peer review, allocate more budget to it
- Design Engineers should have a **well-balanced mix of field- and desk-knowledge**, training on the job is essential
- **Design–construct type of Contracts** can be favourable, where Contractors use their own engineering department or hired-in specialist Consultants

HOW TO IMPROVE

- Resident Engineers should be knowledgeable and enough **“flexible” to take corrective actions** or relax specifications where it won’t have impact on the quality of the work (often in contrary, it will improve)
- The project’s Quality Management should in particular **focus on functionality – specifications – constructability** and not only on procedures

EXAMPLE

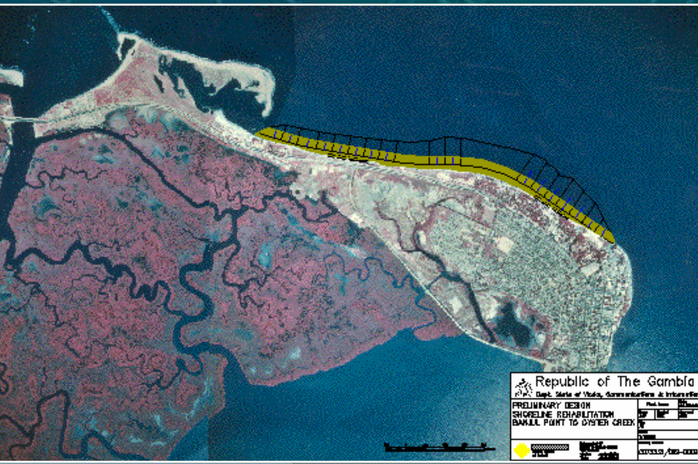
- Groyne Scheme in The Gambia: scheme was optimised from 4 long ones in design to 5 shorter ones due to unexpected soft soils encountered during construction at deeper sections

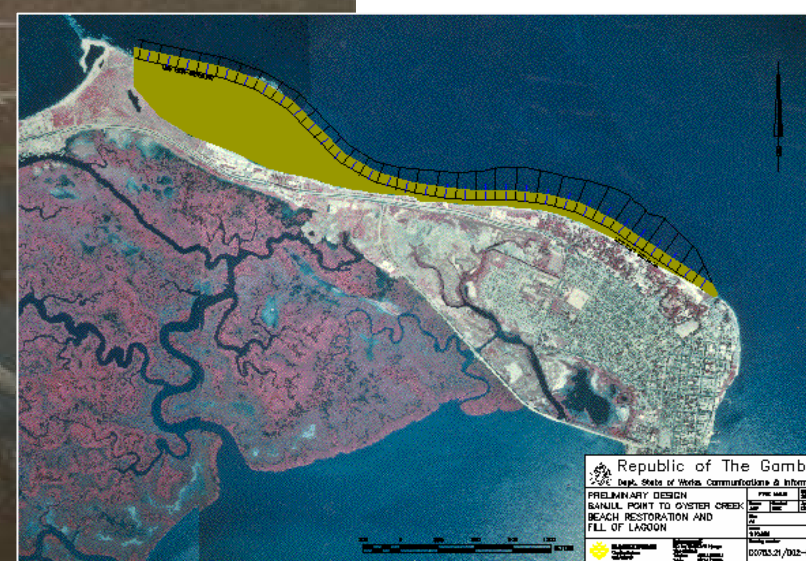

Republic of The Gambia
PRELIMINARY DESIGN
SEA-GROYNE
CAPE POINT

EXAMPLE

- Sandtrap dredging in The Gambia: the sandtrap at a ferry terminal jetty appeared to be not cutter-dredgeable due to enormous amount of debris. Scheme re-scheduled to additional overdepth dredging and fill for sustainability purposes on other part of project

ROYAL HASKONING





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MESSAGE:

Strengthen knowledge and skills (desk–field)

Do not overspecify if not needed

Be purpose (functionality) - focussed

Be flexible and reasonable with site variations where possible

Be careful in case of severe project delays: things might have been changed

Communication / cooperation between consultants (engineers) and contractors in design stage of complex projects can be very useful

THANK YOU

Contract Management for Dredging and Marine Construction

BALANCE BETWEEN TECHNICAL AND FUNCTIONAL REQUIREMENTS

Dirk Heijboer – Royal Haskoning

Hilton Docklands – London – UK

12-13 October 2006

Royal Boskalis Westminster nv

Royal Boskalis Westminster nv

Choice of form of contract

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London 12 October 2006

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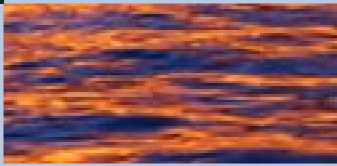
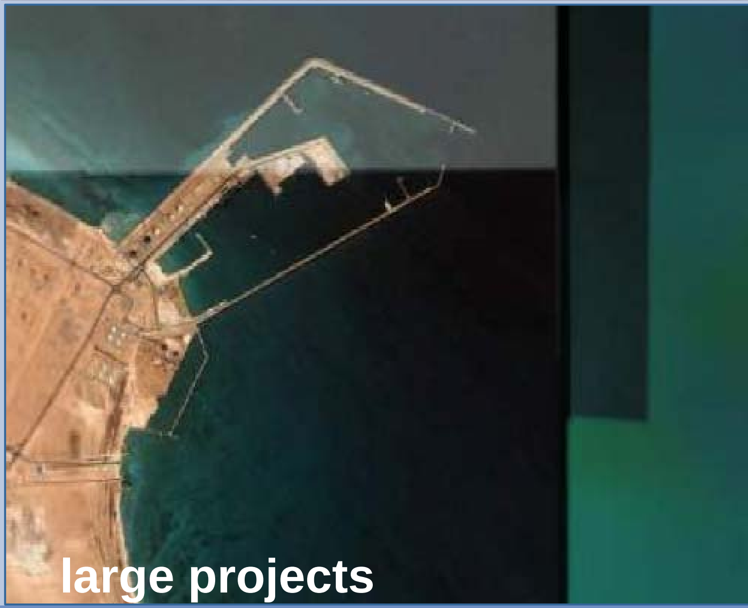


- Choice of form of contract
- Cases
- Questions

Choice of form of contract



Choice of form of contract

Why do we need contracts?

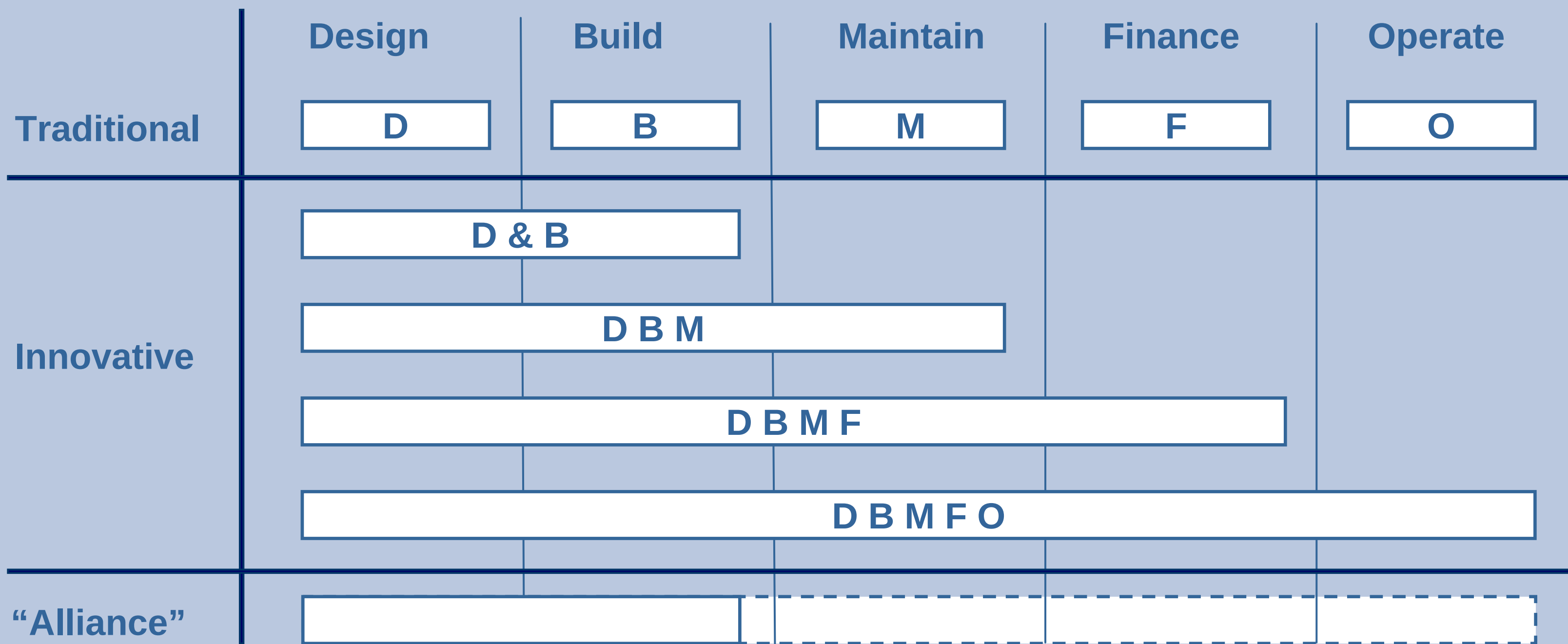
- Formally register the agreement between client and contractor
- For client: e.g. quality, time, budget, environment, etc.
- For contractor: e.g. technical specifications, time schedule, payment conditions, etc.
- Risk management
- Describe exceptions, prevent claim situations

Choice of form of contract

However, it is not about the contract itself, it is about:

- the realisation of the project
- the cooperation between parties
- sharing knowledge

Choice of form of contract



- Each form of contract requires a different type of project management team

Cases

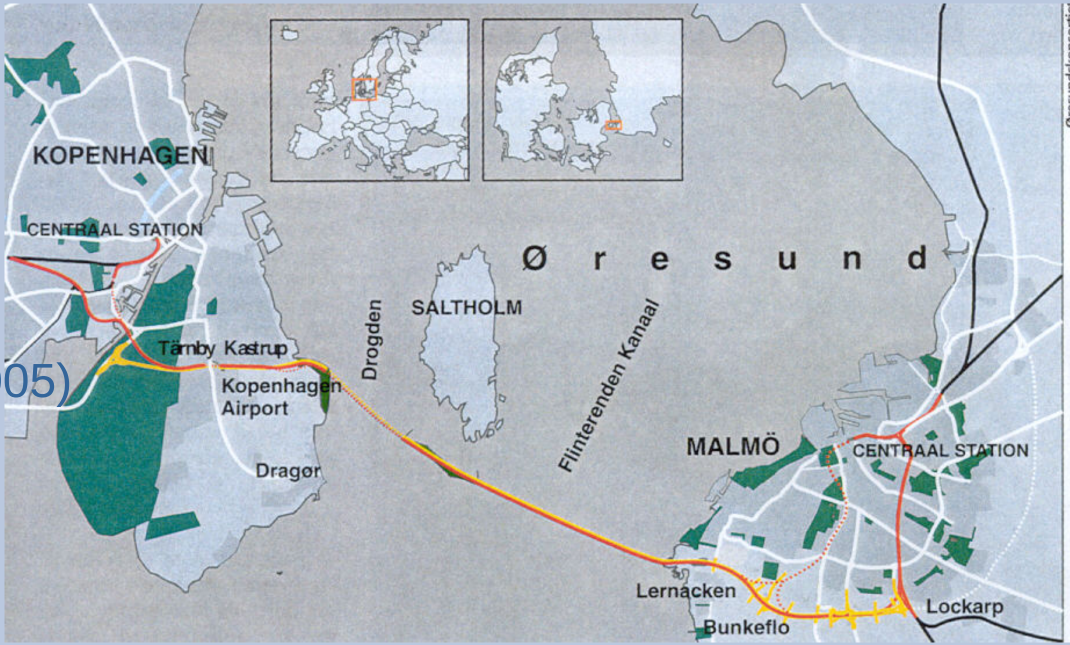
- D&C: Øresund Link from Denmark to Sweden
- PFI/PPP: Pevensey Bay Sea Defences, East Sussex, UK
- Alliance: Betuweroute in the Netherlands
- Alliance: Access channel Port Phillip, Melbourne, Australia
- D&C: MV2 Port of Rotterdam, the Netherlands

Cases

Case: Øresund Tunnel, Denmark-Sweden (“D&C contract”)

Characteristics:

- Length 3.5 km
- 20 elements (175*40*8.6m)
- 500 M Euro
- Mechanical & Electrical parts
- 5 year maintenance (2000-2005)



Main results:

- Good risk allocation
- Executed within client’s schedule of 5 years
- Optimisations & innovations:
  - tunnel elements built in factory
  - tunnel sections formed in one go
  - tunnel foundation on gravel bed

}

- On time completion
- Within client budget
- No claims
- Bonus to all contractors

Royal Boskalis Westminster nv

Cases

Case: Øresund Tunnel, Denmark-Sweden (“D&C contract”)

Tender stage

- Client: no reference design but ‘illustrative design’
- Client issued a book specifying interfaces
- Client extensively informed tendering parties
- 3% of contract sum budgeted for detailed design
- Financial risk reduced
- Currency risk reduced

Cases

Case: Øresund Tunnel, Denmark-Sweden ("D&C contract")

Tender stage

- Client: no reference design but 'illustrative design'
- Client issued a book specifying interfaces
- Client extensively informed tendering parties
- 3% of contract sum budgeted for detailed design
- Financial risk reduced
- Currency risk reduced

Risk Management

Cases

Case: Øresund Tunnel, Denmark-Sweden (“D&C contract”)

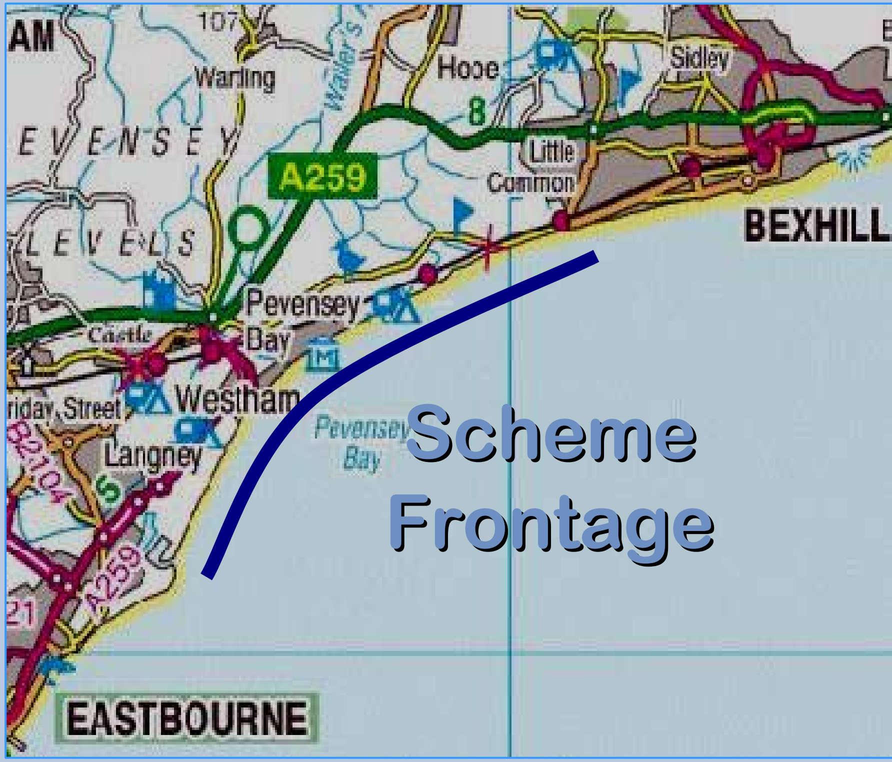
Execution stage

- Client announced a bonus for the timely execution of the Øresund project (euro 30 million)
- A ‘Disputes Review Board’ was set up consisting of 3 persons. The DRB visited the site at least once a month
- All problems were resolved on the job
- Project completed without claims

Case: Pevensey Bay Sea Defences, East Sussex, UK ("PFI/PPP")

Characteristics:

- Improve & Maintain Defences
- 25 year contract to 2025
- Protect 50km² low lying land of which 35km² Site of Special Scientific Interest
- Ramsar Site of International Wetland Importance



Case: Pevensey Bay Sea Defences, East Sussex, UK (PFI/PPP)

The PFI/PPP Approach:

- Shareholder Funding
- Better Allocation of Risk
- No Spending Constraints
- Opportunity for Innovation
- Early Benefit of Delivered Service

Case: Betuweroute2, The Netherlands ("Alliance Contract")

Characteristics:

- 22km railway
- 14 crossovers
- 150 cable/pipe crossings
- 2 bridges
- 220 M Euro

Main results:

- Contractor's planning: optimal flexibility
- Contractor's design: no sheet piles
- 20% less sand
- 40% less drainage measures
- No time lost on extra design reviews
- Short lines of communication
- Reduced design & organization costs

}

- On time completion
- 10% reduction in Contract Sum
- No claims

Cases

Case: Betuweroute2, The Netherlands (“Alliance Contract”)

Transition of contract forms:

- Feasibility stage: Unit price
- Tender stage: Lump sum
- Execution stage: Alliance

Transition allowed for:

- economical optimizations
- risk allocation/sharing
- increased flexibility project execution

Case: Melbourne, Australia (“Alliance”)

Characteristics:

- Dredging access channel
- 23Mm3 dredging in Port Phillip Bay
- 0,24Mm3 hard rock in entrance

Main reason for “Alliance”:

- Few capable Contractors
- Environmental permits / work method
- Technically very difficult (rock, sea state)
- Risk sharing → Open Books!

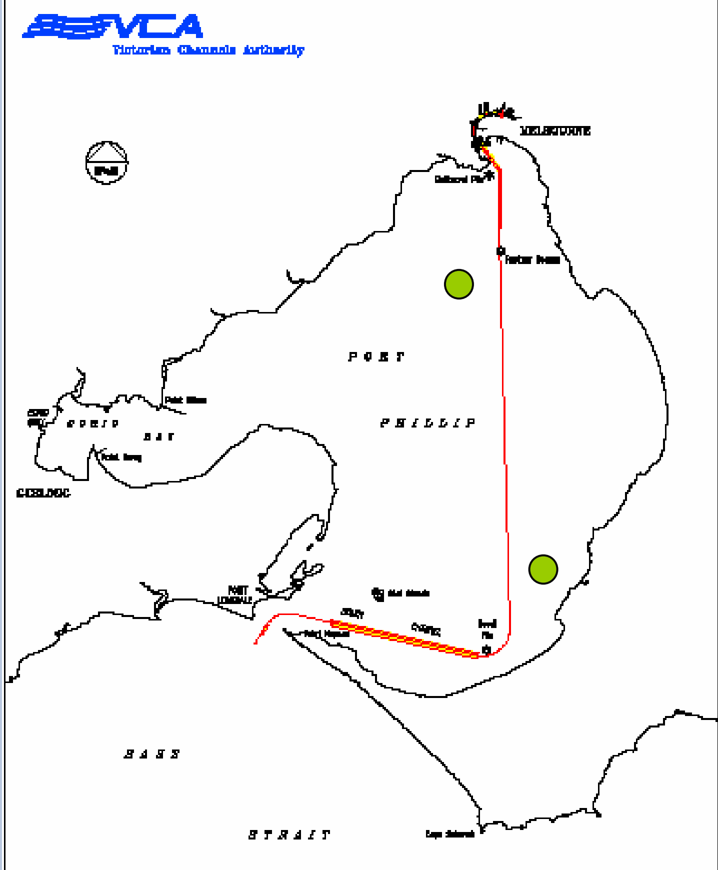


FIG. 1 - OVERALL LOCALITY PLAN

VCA CHANNEL DEEPENING PROJECT

Cases

Case: Melbourne, Australia ("Alliance")

Tender stage

- Selection period 12 months ->6 - 3 -2 -1 contractor
- Contractors to give budget price with a range in order to facilitate selection
- As part of selection contractors: 4 workshops
- During workshop also proposed staff judged

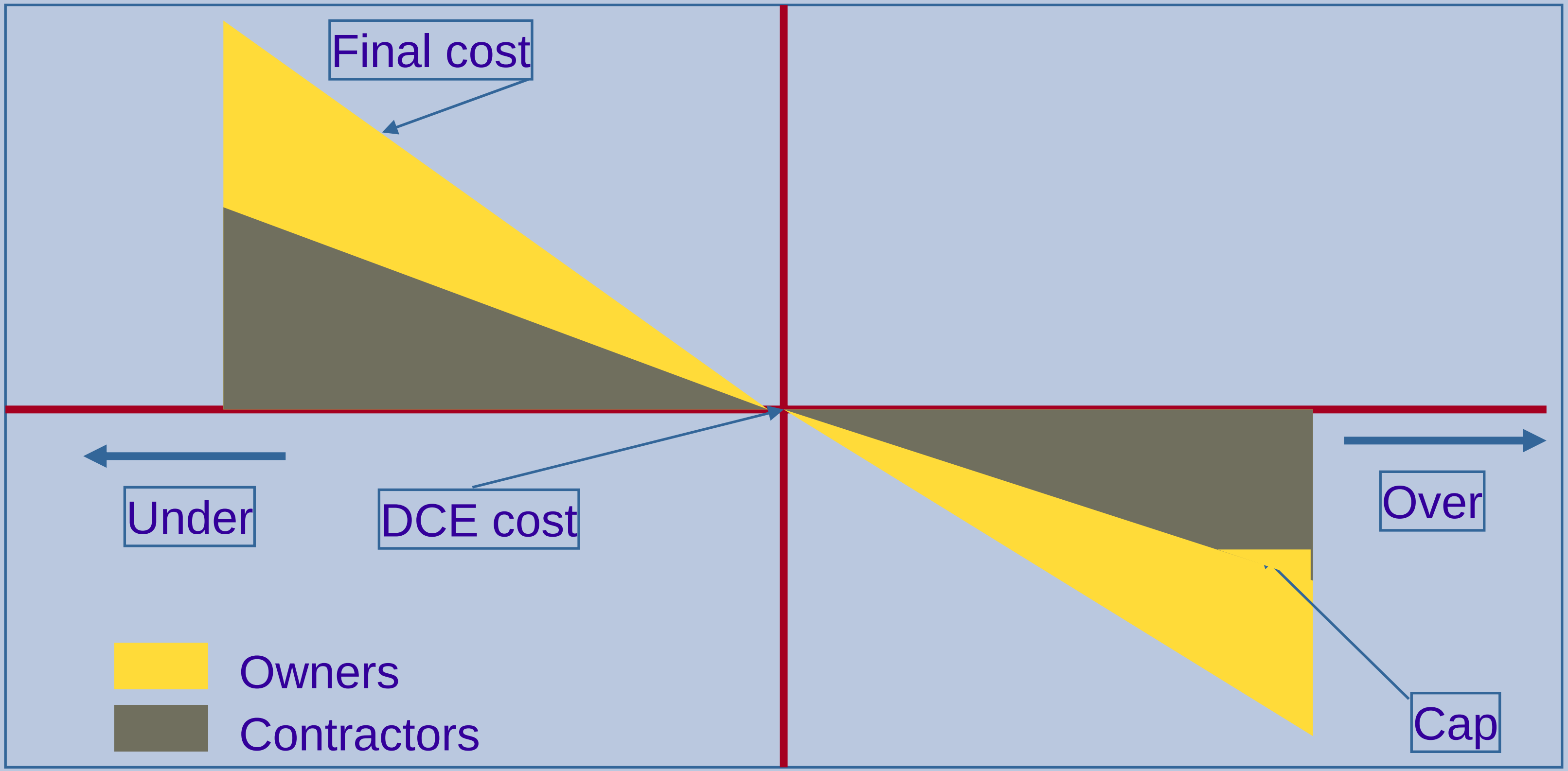
Execution stage

- Cooperation between parties for optimisation work method versus environmental requirements
- Trial dredging to prove technical and ecological feasibility

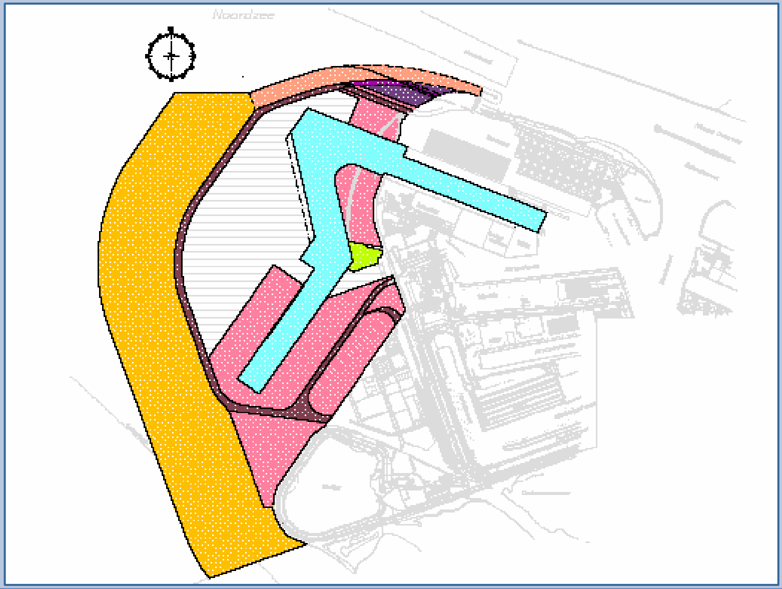
Cases

Example cost incentive schema

- Open books: Shared Pain/Gain relative to Direct Cost Estimate, example:



Case: MV2, Rotterdam (D&C)



Characteristics:

- Extension Port of Rotterdam
- 10km coastal defense + 1000 Ha new terrain
- 300 million M3 dredging
- 10 millionTonnes of stones
- Budget client: approx. 1.5 Billion Euro
- Assumed execution period: 2008-2012

Cases

Case: MV2, Rotterdam (D&C)

- First offer: summer 2006, BAFO summer 2007
- Extensive pre-qualification puts stress on contractors' resources

- Tender costs approx.: Euro 5 million
- Contractors become more selective
- Invitation to tender: 3 participating contractors for offer
- Within a few months 1 contractor withdrew

To conclude

What is important:

- Type of contract fits the type of project. Don’t complicate
- Risk management and risk allocation
- Fast (realistic) selection/tender process
- Cooperation and sharing of knowledge between parties
- Skilled personnel with the right attitude

Choice of form of contract

See you all at the workshop(s)!

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Workshop Conclusions

Plenary Session

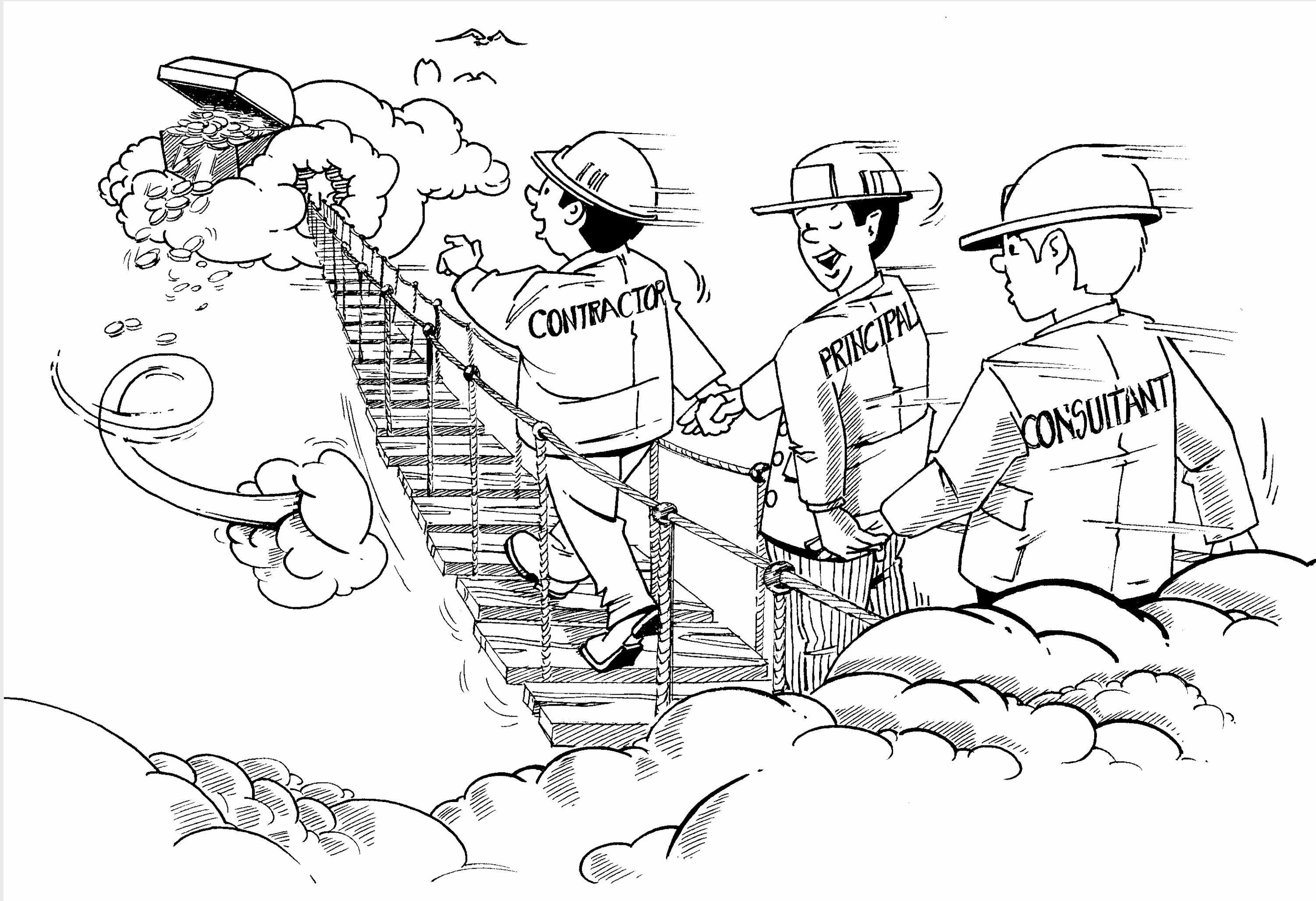
Central Dredging Association

Lessons learned from the past: a job from hell and a job from heaven

Hugo De Vlieger
General Manager
Baggerwerken Decloedt, DEME Group

Divina Comedia

CEDA Central Dredging Association



Dredging contractors want to share risks and to share gains

The dredging business
is keen to work hand in hand
with clients and consultants
for creating mutual benefits.

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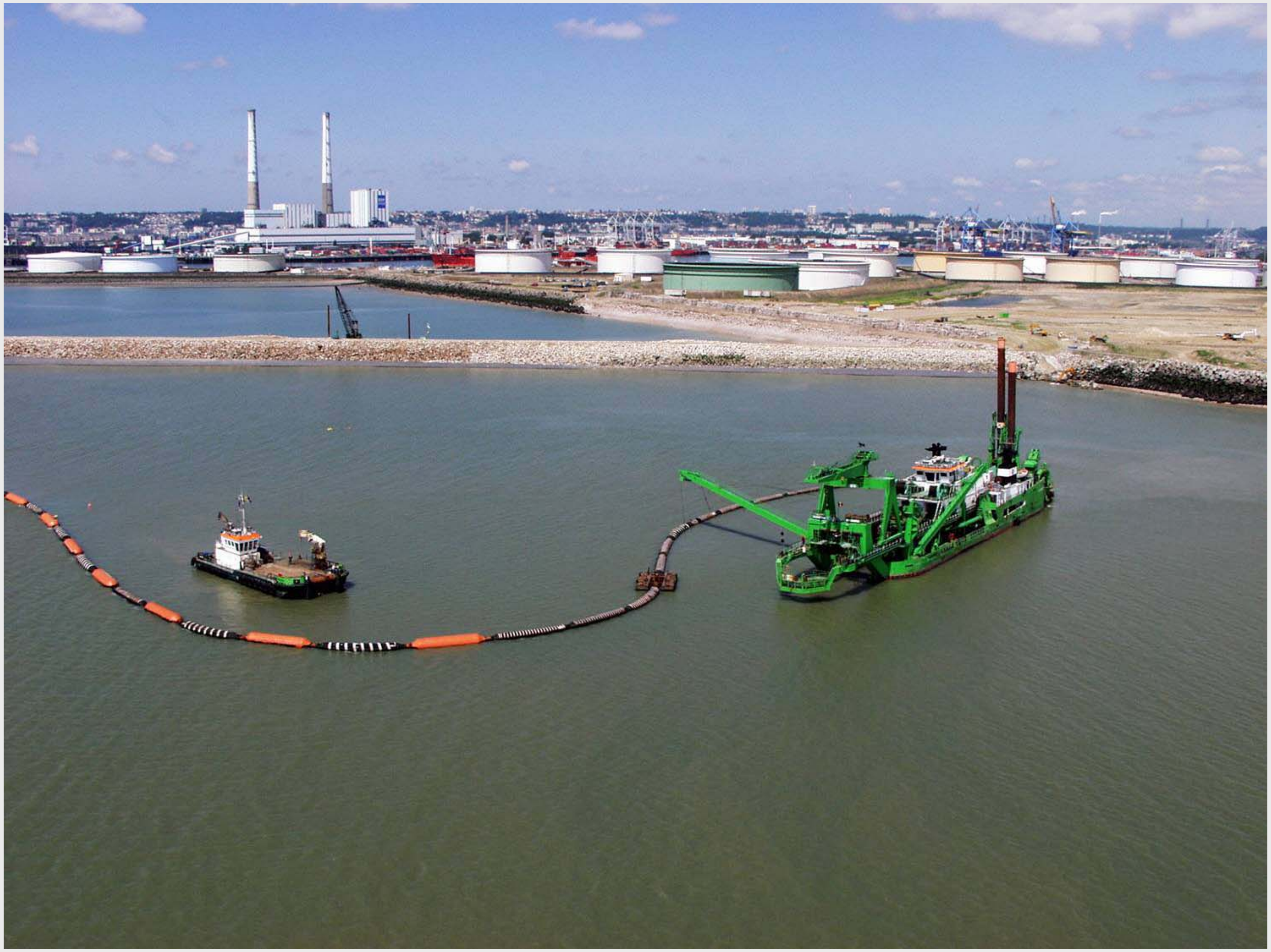
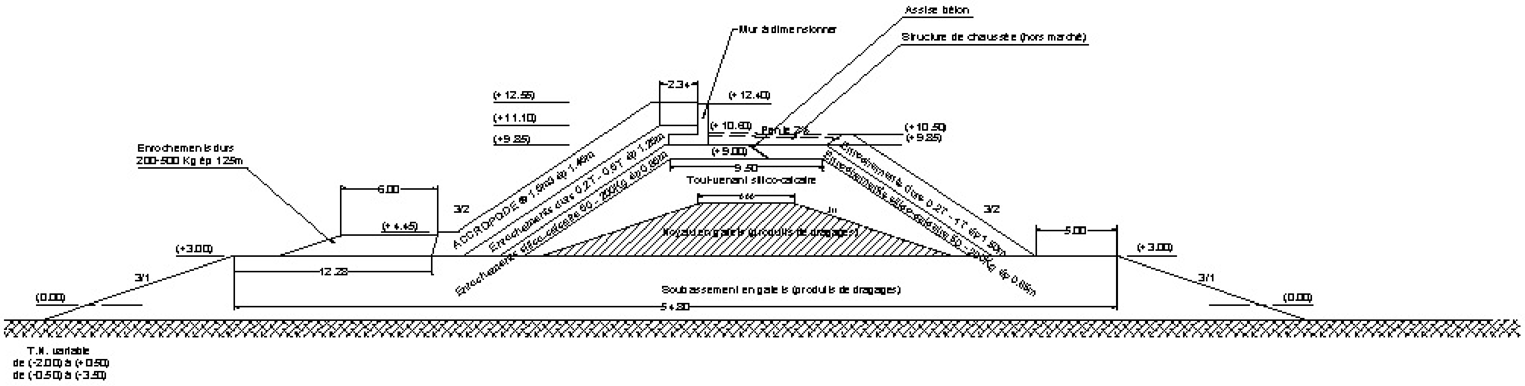
Port 2000, Le Havre, France

CEDA Central Dredging Association



Port 2000, Le Havre, France
Bayard II & Vlaanderen XIX closing final gap

Digue sud type A



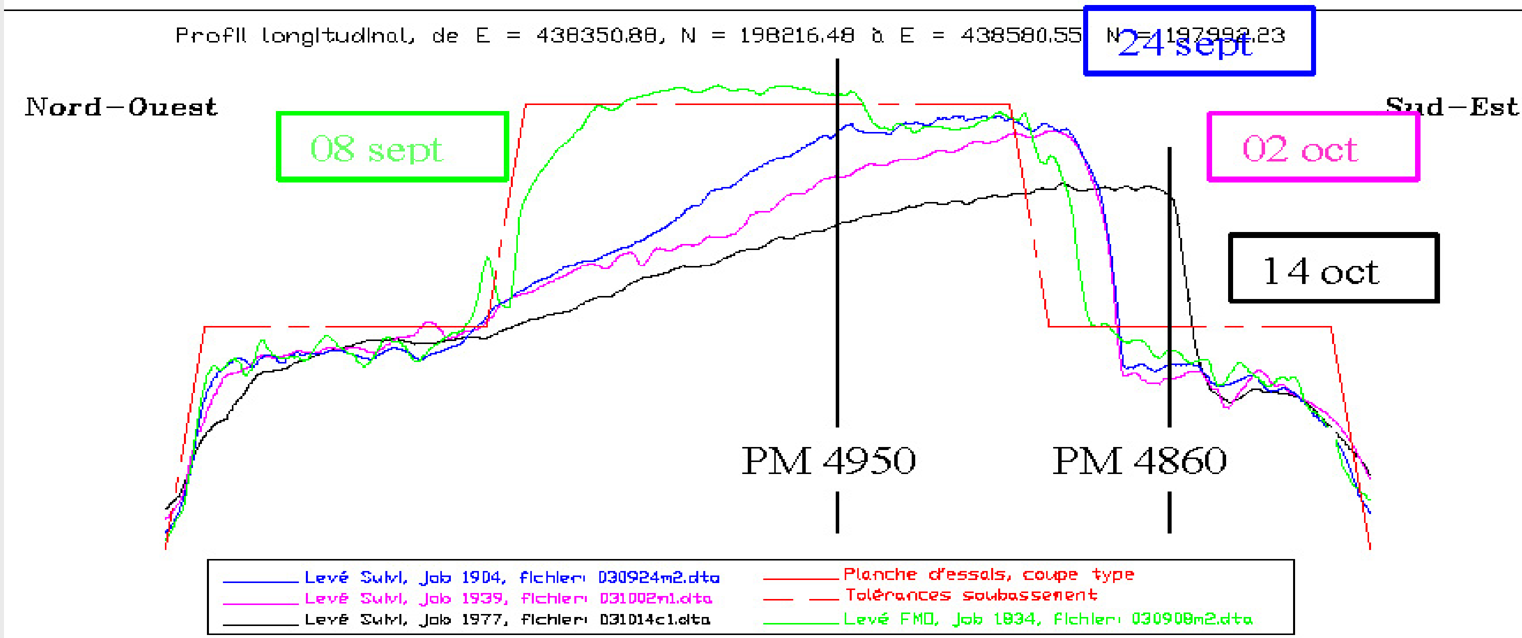
Port 2000, Le Havre, France
Breakwaters






Port 2000, Le Havre, France

Port 2000, Le Havre, France



Port 2000, Le Havre, France
Deplacements soubassements









Palm Islands & Pearl of the Gulf

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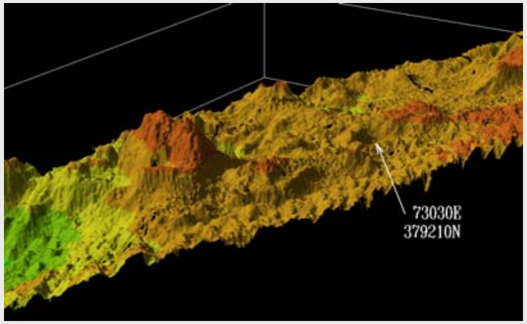
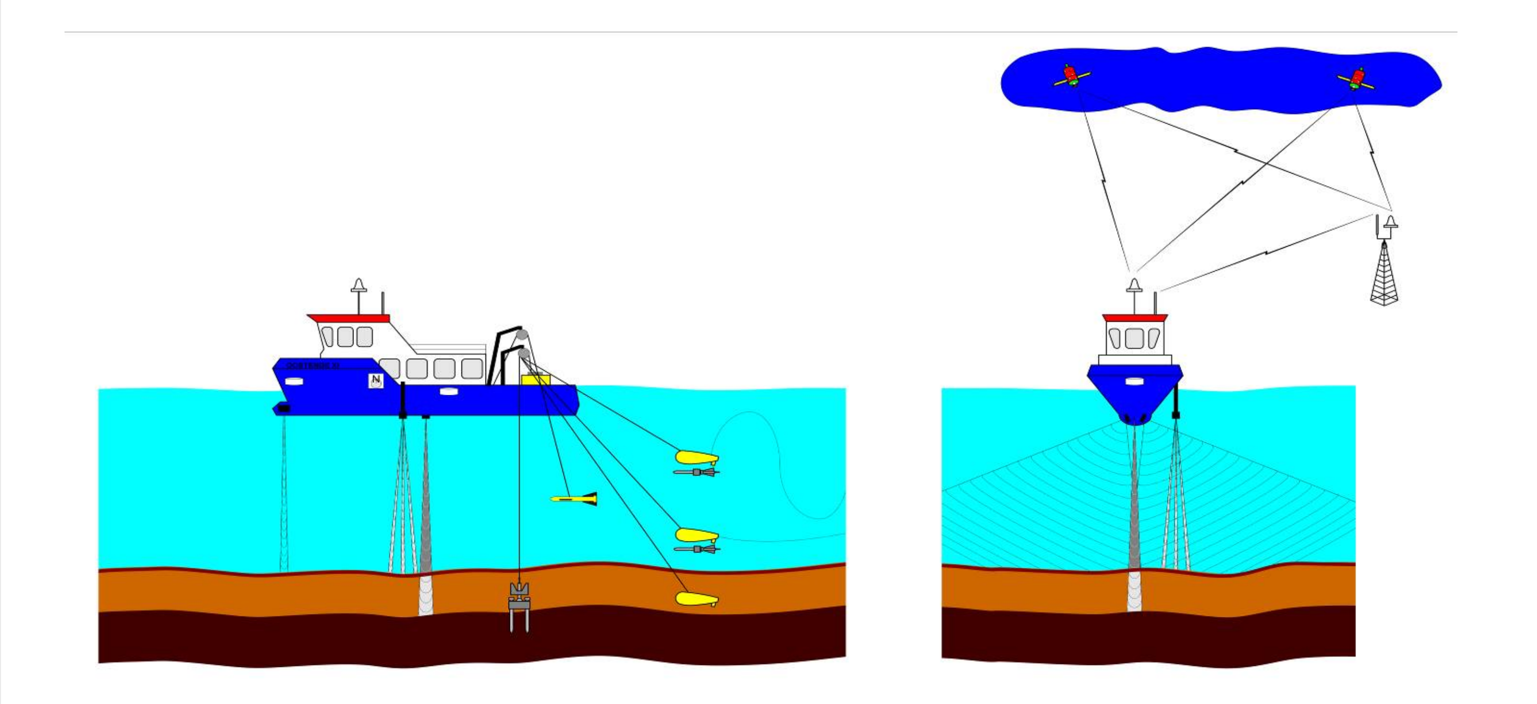
Jurong Tuas, Singapore

Central Dredging Association

Hulhumale, Maldives
Amazone





Navitracker

Central Dredging Association

Blani

CEDA
Central Dredging Association

Blani

Central Dredging Association

Pixie

Svartsjö Projektet, Hultsfred, Sweden





Svartsjö Projektet, Hultsfred, Sweden





Kansai airport, Osaka, Japan





Co-operative agreements among contractors, consultants, legal advisers, and public authorities will, more than ever, be needed.

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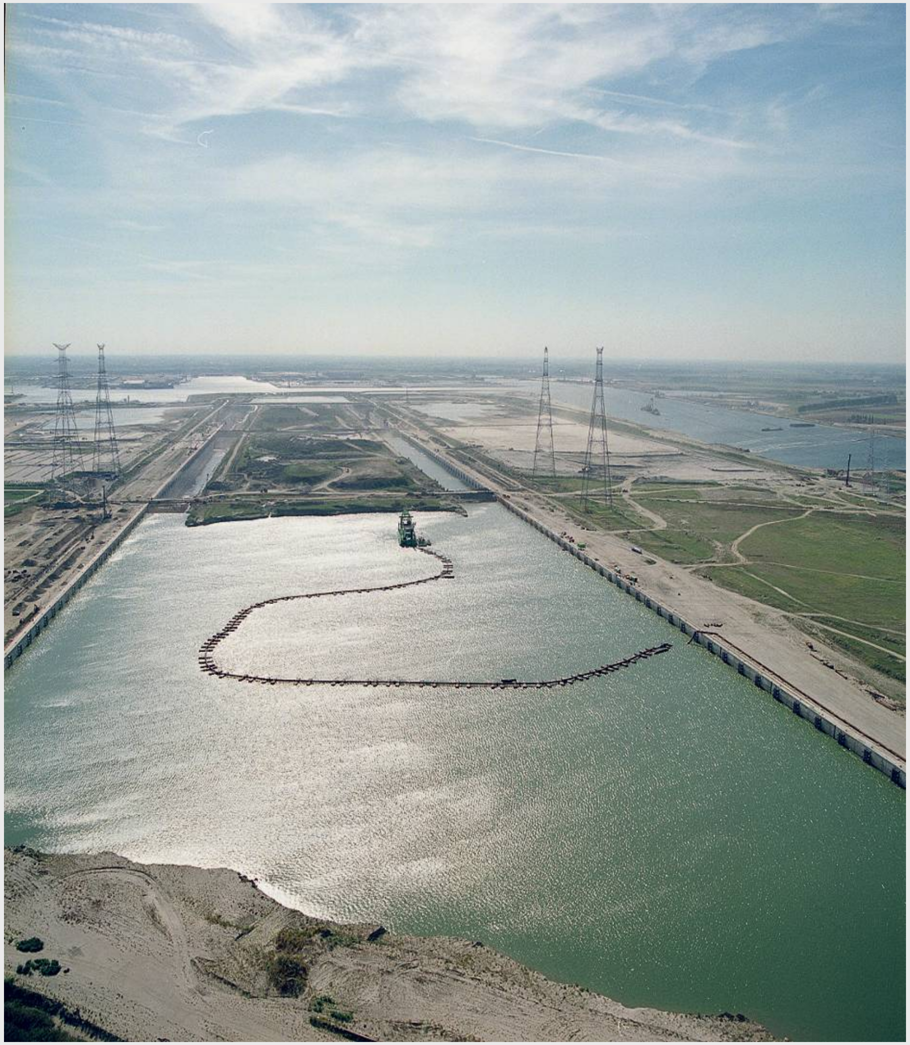

Deurganckdok, Doel, Belgium

CEDA Central Dredging Association

Silvamo, Kortemark, Belgium

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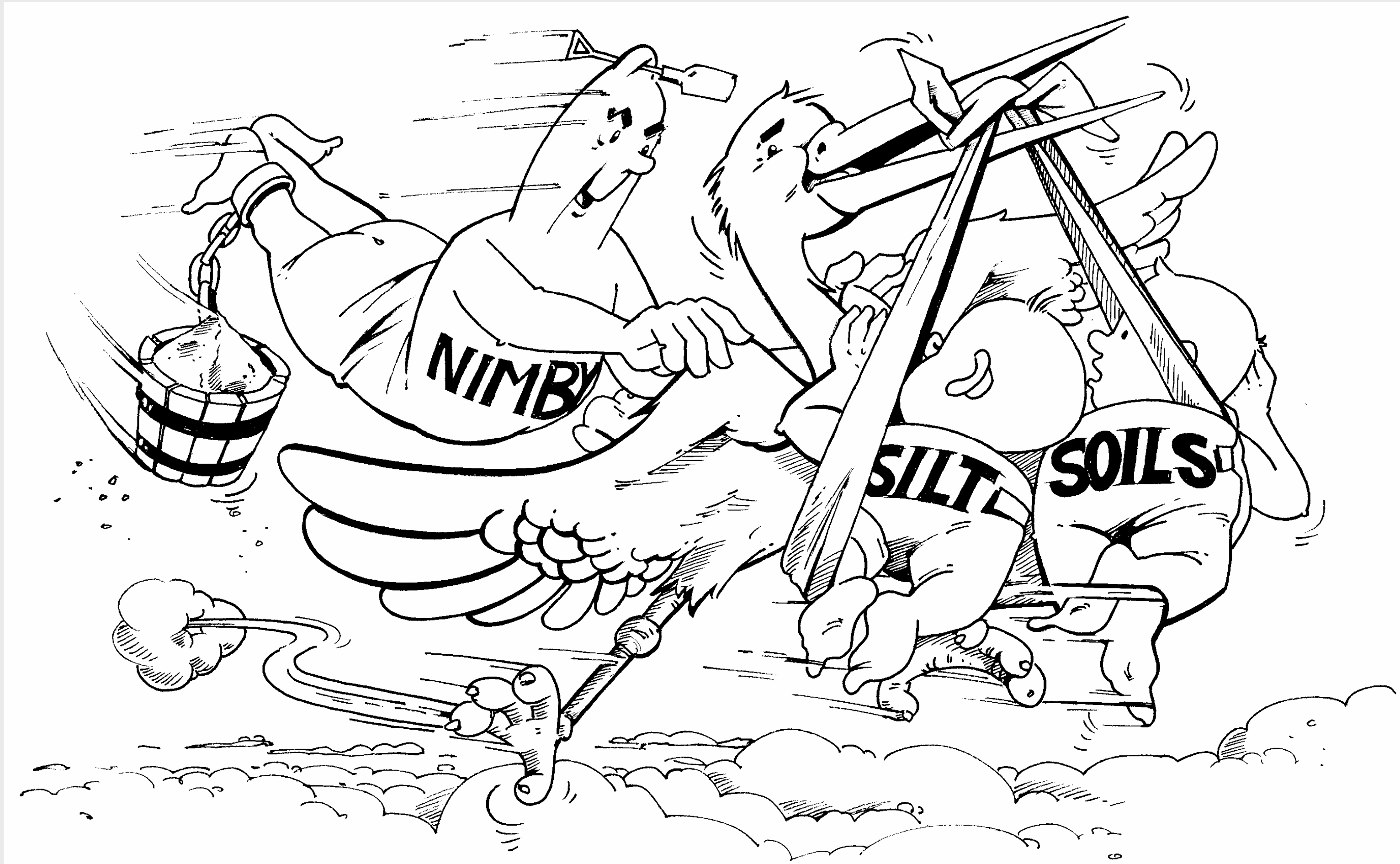

NIMBY-syndrome

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SILT

Soils

Your contractor
for sludge treatment

Your partner
in soil remediation

Silt & Soils







Steendorp, Belgium

CEDA
Central Dredging Association

STAD GENT

DEC
Environmental Contractors

FASIVER

domo®

Provincie
Oost-Vlaanderen

AG Stadsontwikkelingsbedrijf Gent

Fasiver, Zwijnaarde (Ghent), Belgium







Fasiver, Zwijnaarde (Ghent), Belgium

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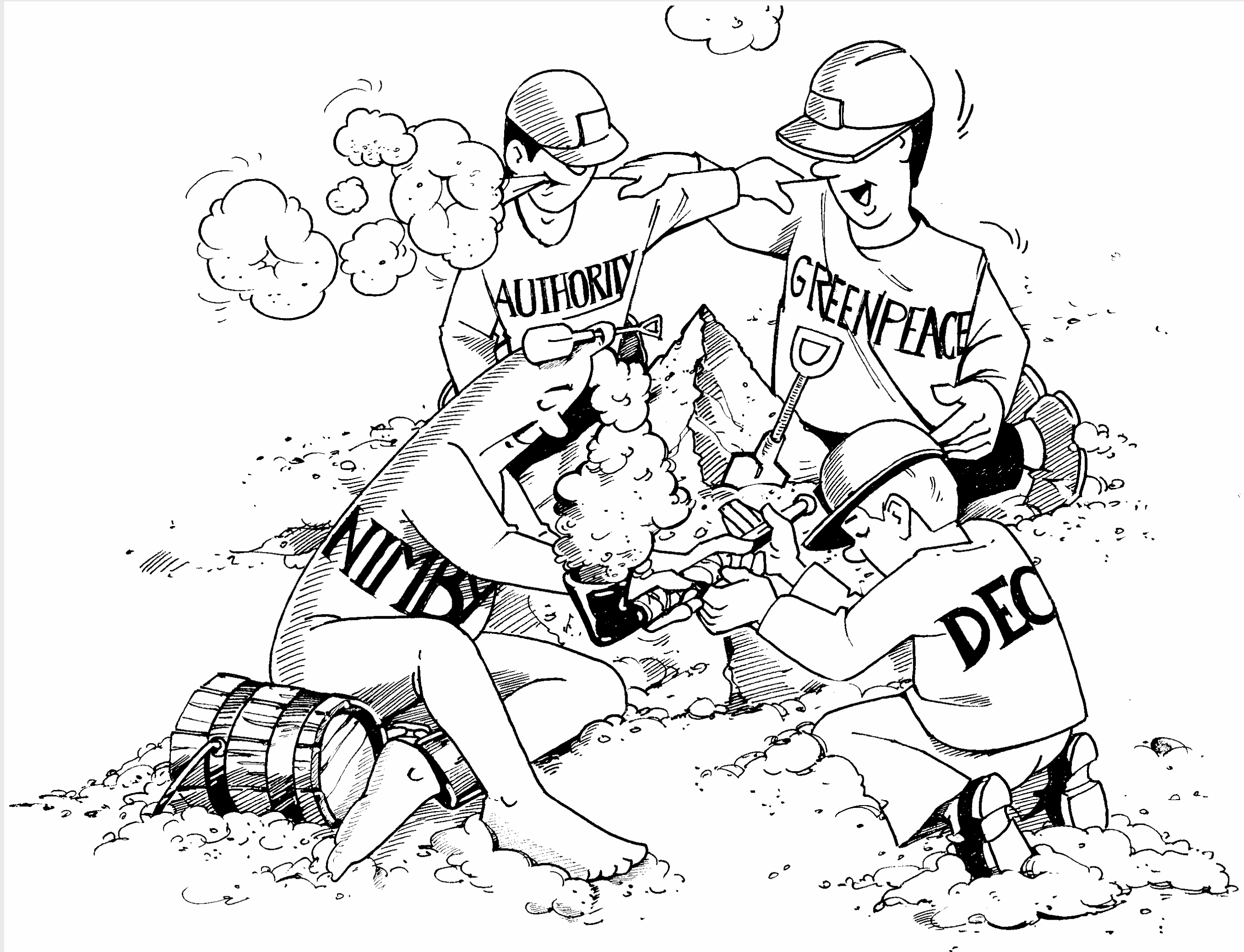

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UITVOERINGSCOMBINATIE 3D

DREDGING INTERNATIONAL

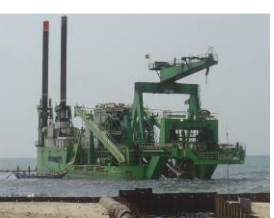
DURA VERMEER

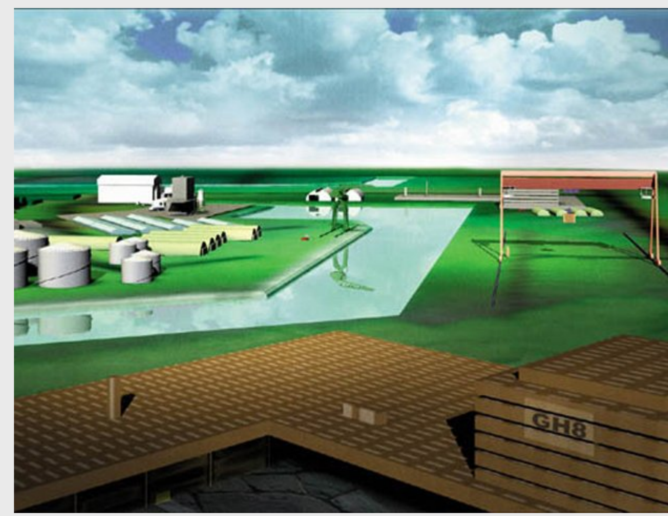
Gemeente Kampen

Gemeente Zwolle

Provincie Overijssel

Kampen, the Netherlands

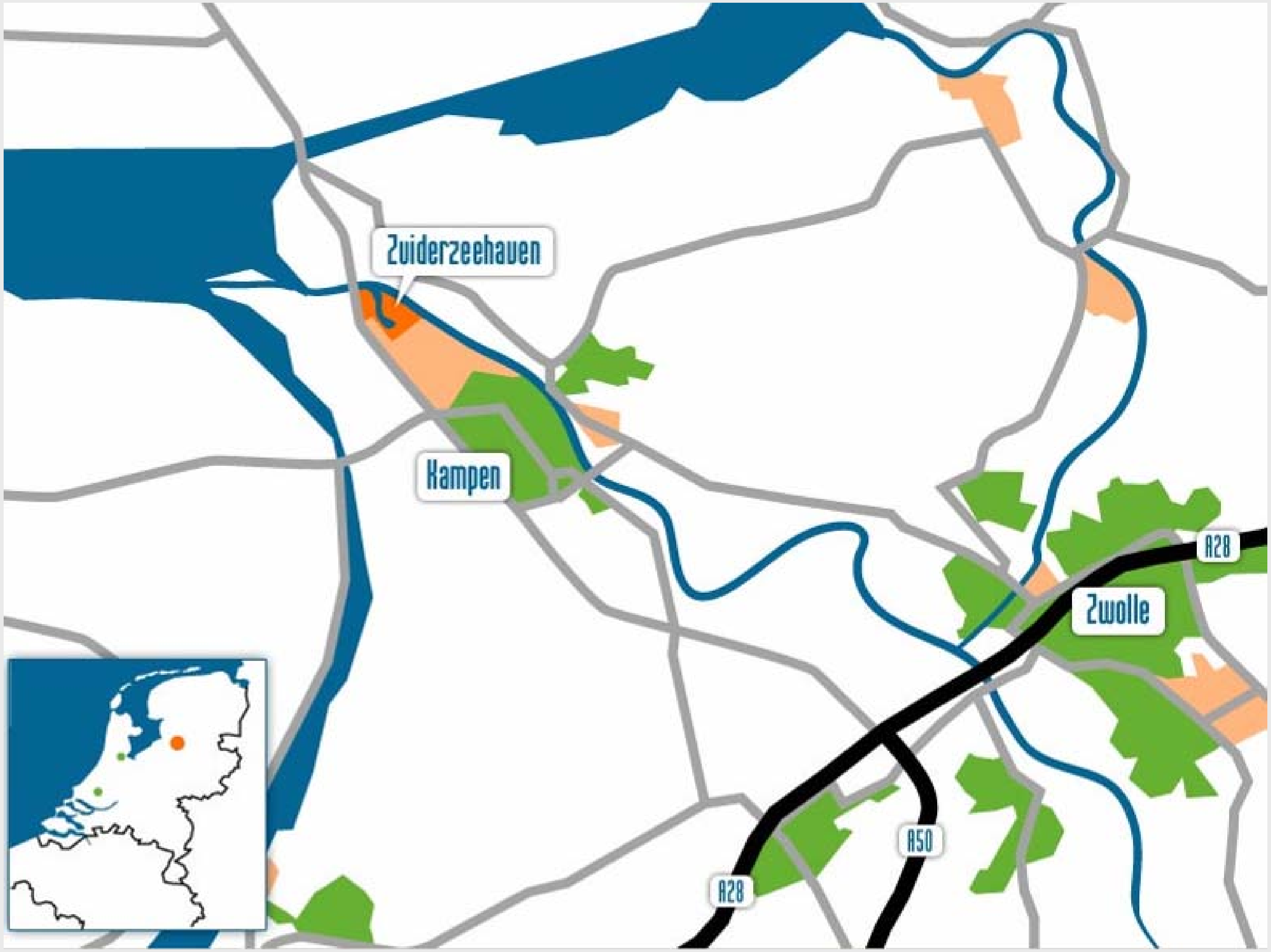




Kampen, the Netherlands







Kampen, the Netherlands

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In a capital intensive environment such as the dredging business, co-operative agreements with both the client and high level professional advisors, are a prerequisite.

All of us, we must find ways to build strong partnerships that yield mutual benefit.





Win-win situations will arise in every project, provided all contractual partners and stakeholders work hand in hand from the start, as if they were in a joint venture agreement, with shared risks and shared benefits.

Conclusions





Pre-contract information is of crucial importance, and should be provided by the client, in cooperation with highly skilled geotechnical contractors and surveyors.

Conclusions

Environmental implications of a planned project should be tackled in a very early stage, involving local communities and conservation organisations.

Conclusions

Contractually, innovative formulas like PPP & DBFM must be stimulated where feasible, because they involve principal, consultant and contractor in a fair responsibility-sharing formula from the start, which leads to fair prices and avoids sending claims to one another.

Conclusions





Contractors have to prepare themselves technologically, to be ready to tackle all problems related to environmental friendly dredging & the handling & treatment of contaminated dredged material.

Conclusions





Environmental regulations, be it at national, European or international level, have to be established in good mutual consultation between regulators, port operators, ship-owners, and dredging contractors. Only this way a balanced set of rules will be generated, that saves our environment, while respecting economic growth.

Conclusions

Imagine, there's no heaven

It's easy if you try

No hell below us.

Above us, only sky…

Imagine, by John Lennon

Central Dredging Association

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Discussion

CEDA Central Dredging Association

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Day Chairman

Dr Marc Gramberger, Prospex bvba