A soil management and recycling concept for Stuttgart 21

Deutsche Bahn AG
Rolf Gerhardt
Sanierungsmanagement FRS-SW
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Stuttgart 21 / Wendlingen-Ulm
Main European Railroad Lines
Stuttgart 21 / Wendlingen - Ulm
Cutting Travel Time

Köln to Ulm: 255 min
Frankfurt to Ulm: 137 min
Mannheim to Ulm: 97 min
Stuttgart Hbf to Ulm: 54 min
Filderbahnhof to Ulm: 95 min

Current travel time: dark
Stuttgart 21 / Wendlingen - Ulm
Cutting Travel Time

Travel time S21: light
Stuttgart 21 / Wendlingen - Ulm
Projekt base facts

Stuttgart 21
Track length: 57 km
Stuttgart 21 / Wendlingen - Ulm
Projekt base facts

Track length 57 km
Tunnels 32.8 km
Number of Tunnels 16
longest Tunnel 9.5 km
Number of bridges 18
Stuttgart 21 / Wendlingen - Ulm
Projekt base facts

NBS Wendlingen – Ulm
Track length: 60 km
Stuttgart 21 / Wendlingen - Ulm
Projekt base facts

Track length 60 km
Tunnels 32.8 km
Number of tunnels 7
Longest tunnel 8.71 km
Number of bridges 11
Longest bridge 470 m
Stuttgart 21 / Wendlingen - Ulm
Projekt base facts

4.8 Billion €
Stuttgart 21 2.8 Bill €
Wendingen-Ulm 2.0 Bill €
Building time over 12 years
Soil recycling- and deposition concept (BOVEK)
# Soil Recycling- and Deposition Concept (BOVEK)

Planning steps detailed in RiL 809, based on HOAI* specifications

<table>
<thead>
<tr>
<th>BoVEK preliminary phase</th>
<th>BoVEK main process phase</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Preliminary planning</strong></td>
<td><strong>Implementation planning</strong></td>
</tr>
<tr>
<td>Stocktaking</td>
<td>Support of Purchasing</td>
</tr>
<tr>
<td>Information basis for</td>
<td>Support in filling out</td>
</tr>
<tr>
<td>BoVEK check</td>
<td>forms</td>
</tr>
<tr>
<td>BoVEK check</td>
<td></td>
</tr>
<tr>
<td>Summary concept</td>
<td></td>
</tr>
<tr>
<td>Field investigation</td>
<td></td>
</tr>
<tr>
<td>Analyses</td>
<td></td>
</tr>
<tr>
<td>Detailed concept</td>
<td></td>
</tr>
<tr>
<td>Consulting with</td>
<td></td>
</tr>
<tr>
<td>Authorities</td>
<td></td>
</tr>
<tr>
<td>Fine-tuning of detailed</td>
<td></td>
</tr>
<tr>
<td>concept</td>
<td></td>
</tr>
<tr>
<td>Execution</td>
<td>Technical consultancy</td>
</tr>
<tr>
<td>Approval / commission-</td>
<td>Expert reports and support</td>
</tr>
<tr>
<td>ing</td>
<td>Immediate waste</td>
</tr>
<tr>
<td></td>
<td>management measures</td>
</tr>
<tr>
<td>Documentation /</td>
<td></td>
</tr>
<tr>
<td>conclusion</td>
<td></td>
</tr>
</tbody>
</table>

*Official Scale of Fees for Services by Architects and Engineers

Mobility Networks Logistics
Soil recycling- and deposition concept (BOVEK)

**Motive**

- Unintended / unplanned expenditures for soil dumping/recycling within construction projects of DB AG / DB ProjektBau

- Improving management of contaminated material (clean up-, construction operations)
Soil recycling- and deposition concept (BOVEK)

Results

- Minimizing costs time and effort using a preventive risk management system including any type of soil treatment and disposal
- Improved legal- and planning security
- DB AG-corporate- wide standardized course of action, installation of a soil management
- Avoiding or reducing supplementary claims (claim management)
- Synergies and profit contribution by use of internal railroad infrastructure
- Process introduction into all planned and performed investment projects
Soil recycling- and deposition concept (BOVEK)

1. Preliminary planning
2. Basic evaluation
3. Basic concept
4. Analysis of deficits
5. Blueprint planning
6. Detailed concept
7. Implementation planning
8. BoVEK as part of bidding
9. Execution
10. BoVEK application
11. Expert monitoring
Soil recycling- and deposition concept (BOVEK)

- Preliminary planning
- Blueprint planning
- Implementation planning
- Execution

- Basic evaluation
- Basic concept
- Analysis of deficits
- Detailed concept
- BoVEK as part of bidding
- BoVEK application
- Expert monitoring
BoVEK Basic concept
Deposition

noise barriers

Quarries, gravel pits, Landfills, excavations
BoVEK Basic concept
Deposition

- Quality
- total capacity
- Daily capacity
- type of access roads
BoVEK Basic concept
FRS landfill program
Soil recycling- and deposition concept (BOVEK)

1. Preliminary planning → Basic evaluation
2. Blueprint planning → Basic concept
3. Implementation planning → Analysis of deficits
4. Execution → Detailed concept
5. BoVEK as part of bidding
6. BoVEK application
7. Expert monitoring
BoVEK Basic concept
FRS landfill program
BoVEK Basic concept
FFH Directive
BoVEK Analysis of deficits

Soil quality
Contaminations
Groundwater
Clean up
Data integrity
BoVEK Analysis of deficits
Soil quality, contaminations

Assessment area

Cleared track area

Platforms new station

Future subsurface trace
BoVEK Analysis of deficits
Soil quality, contaminations

Assessment area

Data evaluation

Supplementary sampling
of ground water

of soil

Identification of contaminated areas
Soil recycling- and deposition concept (BOVEK)

- Preliminary planning
- Basic evaluation
- Analysis of deficits
- Basic concept
- Detailed concept
- Blueprint planning
- BoVEK as part of bidding
- Implementation planning
- BoVEK application
- Execution
- Expert monitoring
Detailed Concept

Example: Tunnel driving
Method 1:

Full-cut-tunnelling
Access points full-cut tunnelling
Stuttgart 21
PFA 1.2 Fildertunnel

length: 9.5 km
Different geological formations

Access point

→ 2.73 Mio m³
← 0.2 Mio m³
Machine transfer requires complex infrastructure
Method 2:

New austrian tunnelling method (NATM)
Main logistic area Nordbahnhof

Access points (NATM) Stuttgart 21
NATM

- Many access points
- Small mass flow
- Different mass consistency
- Slow driving

Full cut tunneling

- Less access points
- Large mass flow
- Different mass consistency
- Fast driving

Material Variables

- Sludge, concrete
- Contaminations, water
Updates

- mass concept
- amount
- consistency
- timing
- when, where

21/08/2006
Updates

Transport logistics

Access points

Type of transport

Timing

location
size
design
ship
tuck
rail
seasonable variables
transport chain
Updates

Landfills
Deposition

location
size
backup
sealing
approvals
BoVEK as part of bidding
Implementation planning

Preliminary planning → Basic evaluation
Blueprint planning → Basic concept
Implementation planning → Analysis of deficits
Execution → Detailed concept

BoVEK as part of bidding
BoVEK application
Expert monitoring
BoVEK as part of bidding
Implementation planning

Implementation Planning
Tunnel driving
Transport logistic
mass concept
landfill programm

bidding

DB AG, R. Gerhardt, FRS-SIV - Sao Paolo Nov. 8th, 2007, 23.11.2007
BoVEK application
Execution

Preliminary planning → Basic evaluation

Blueprint planning → Basic concept

Implementation planning → Analysis of deficits

BoVEK as part of bidding

Execution → BoVEK application

Expert monitoring
BoVEK application
Execution

mass concept

Transport logistic

Tunnel driving

Implementation Planning

landfill programm
BoVEK status
Nov 2007

- Preliminary planning
- Basic evaluation
  - Basic concept
    - Analysis of deficits
  - Blueprint planning
    - Detailed concept
  - Implementation planning
    - BoVEK as part of bidding
  - Execution
    - BoVEK application
      - Expert monitoring