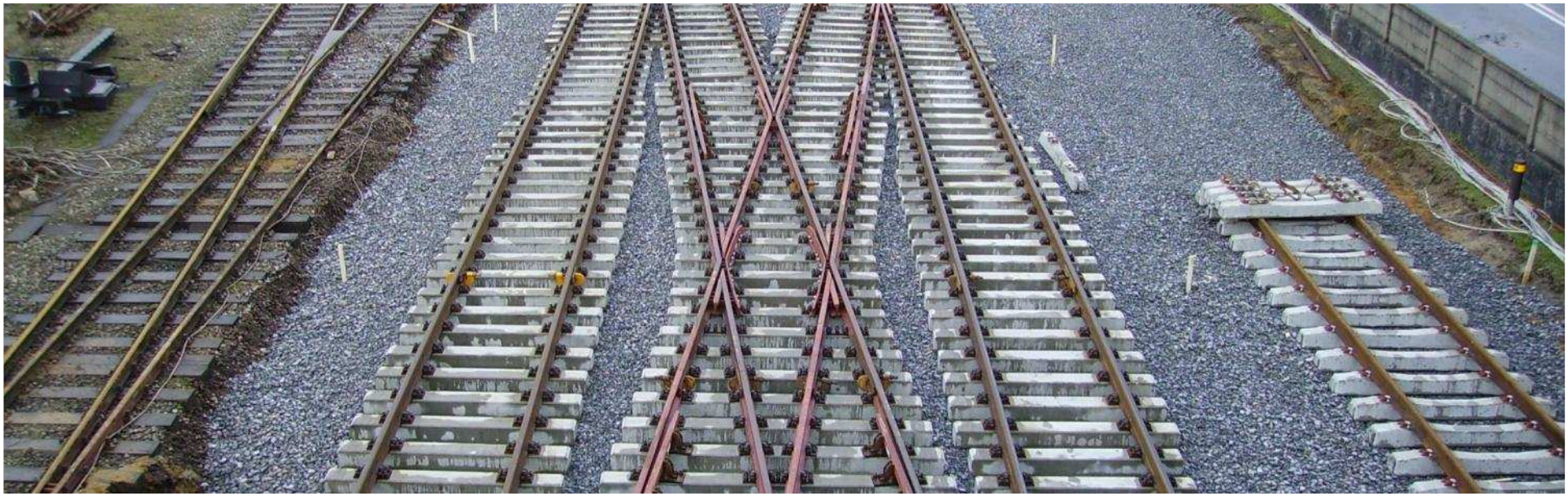


HOW TO HANDLE CONTAMINATED SOIL BEFORE AND DURING RAILWAY CONSTRUCTIONS

BEST PRACTICE

Mads Dige Toft

RAMBØLL

AGENDA

- Polluted areas
- The scenario
  - Gathering soil samples
  - Intermediate soil dumps
  - Soil disposal
- Considerations
  - What to do before and during excavating
  - Who will do what?
  - Time and logistics

WHERE CAN WE EXPECT CONTAMINATED SOIL?

- Station areas
  - Service areas (tanking, maintenance …..)
  - Where locomotives stop
  - Accidents
  - Exhaust gasses
  - Soil disposal
- Outside station areas
  - Contaminated soil is rare
  - Disposed soil from station areas

THE SCENARIO

- Determine if the soil is contaminated or not
- Where to deposit the soil
- Time and logistics
- Documentation

PROBLEMS TO CONSIDER

- Will you analyse the soil before the construction work?
  - What to do?
    - Historic investigation of possible known or potential sources for contamination
    - Dialogue with authorities
    - Gathering samples for analysis before start of construction work
    - Making material for contractor – Excavation plan

- Will you analyse the soil during the construction work?
  - The difference is that you gather samples during the construction work

GATHERING SAMPLES BEFORE EXCAVATING

- Necessary to stop traffic
- Typically 1 sample each 5-8 meters

GATHERING SAMPLES BEFORE EXCAVATING

PRO AND CONS

+ You know the amount of contaminated soil

+ You can start excavating and remove the soil directly from the spot

- If you have heavy contaminated soil next to clean soil. Where is the boundary? Supervision while excavating?

- If the project is changed the samples can become inadequate

GATHERING SAMPLES AFTER EXCAVATING

- Necessary to have areas to stack soil in piles
- Time to gather samples
- Time for analysis
- Expect the soil to be there for 5 days before the soil can be moved and deposited

GATHERING SAMPLES AFTER EXCAVATING

PRO AND CONS

+ Homogenization of soil

+ Minor or no supervision while excavating

+ Changes in the project does not affect

- Temporary depot for soil

- Time

SOIL ANALYSIS

- Logistic. Where/who can make the analyses?
- Time
- Analysis parameters
  - Hydrocarbons
  - Metals (Pb, Ca, Cu, Zi)
  - PAH (Polycyclic aromatic hydrocarbons)
  - Pesticides?

AREAS FOR INTERMEDIATE SOIL DUMP

- For new and old materials
- For stacking up soil in piles
- Reloading soil from railway wagons to trucks
- Bigger is better …!
- Authorities

AREAS FOR INTERMEDIATE SOIL DUMP

- Important because of the logistics
- Projects move in a bad way if the intermediate dumps are too few and/or too small
- Bigger is better – A truck with 6 axles needs 500 m^2
- Intermediate dumps are necessary both when soil is analyzed before or during the project
- Stacking in piles requires space

AREAS FOR INTERMEDIATE SOIL DUMP

- Also necessary for other materials
  - Sleepers
  - Ballast stones
  - Concrete and asphalt scrap

WHERE TO LOCATE INTERMEDIATE AREAS

- Adjacent to the track

WHERE TO LOCATE INTERMEDIATE AREAS

- Station areas
- Industrial areas
- Concrete or asphalt layered areas is preferred
    - Prevents to make the contamination level higher in the ground because of the intermediate stacking of soil

WHERE TO LOCATE INTERMEDIATE AREAS

- Agricultural areas

ALTERNATIVE ….

- External soil dumps.
  - Intermediate/permanent
- Still necessary to have areas for reloading – most times

SOIL DISPOSAL

- Decontamination or certified receivers
- Rebuild in the project

DEPOSITION OF SOIL

- Heavy contaminated soil
  - Decontamination
  - The price is solely determined by the analyses
- Moderate contaminated soil
  - Disposal in gravel pits, noise barriers or recycle it in the project (requires permission from authorities)
- Clean soil
  - Disposal in gravel pits (cheapest) or recycle it in the project (requires normally permission from authorities)

DISPOSAL OF SOIL

- Rebuild contaminated soil in the project ……if it's possible?
  - Strengthening of railway dams
  - Landscape modeling
  - Do it aesthetic!
  - Authorities

CONSIDERATIONS

- What to do before the excavations
- What to do during the excavations
- Be aware of …….

WHO WILL PLAN AND DO THE ENVIRON-MENTAL WORK

- Owner or adviser makes project material
- Owner of contractor?
    - Pros and cons

BEFORE EXCAVATING

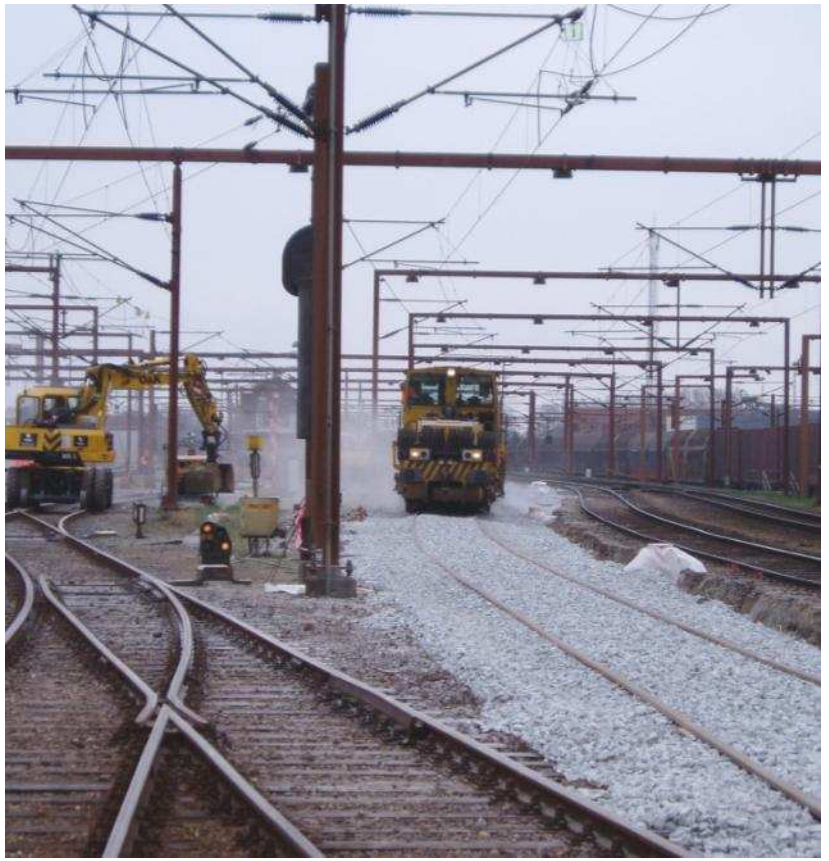
- Authorities
- Find intermediate areas
- … or find external dumps
- Check the amount of soil that has to be handled – Don’t forget the amount originating from sewer and drainage work

BEFORE EXCAVATING

- Detailed project material
- Consider all kinds of situations
- The good project will minimize extra expenses
- Expect that the contractor knows the project material better than you

DURING CONSTRUCTION WORK

- Who is responsible for:
  - Gathering soil samples
  - Contact to authorities
  - Owner or contractor?
- Manage the contractor and make sure that he acts as described in the project material
- Act quick



DURING CONSTRUCTION WORK

- If the soil cannot be handled quickly, it can obstruct the project. Examples:
  - Missing permissions from authorities (also noise and dust)
  - Intermediate areas are too small
  - The expenses are small compared to the whole budget

BEWARE

- Environmental work is normally considered as a minor thing in a project
- Contaminated soil is often the reason why budgets is exceeded
- What you can’t see is unknown
  - Unless preliminary surveys are made

SUMMARY

- Plan the detailed project
- Contact authorities
- Collect data
- Minimize extra expenses

THANK YOU