



HDI
GERLING

03.03.2009
Cologne's tunnel tube disaster

Annual IMIA Conference - Berlin, 14.09.2010



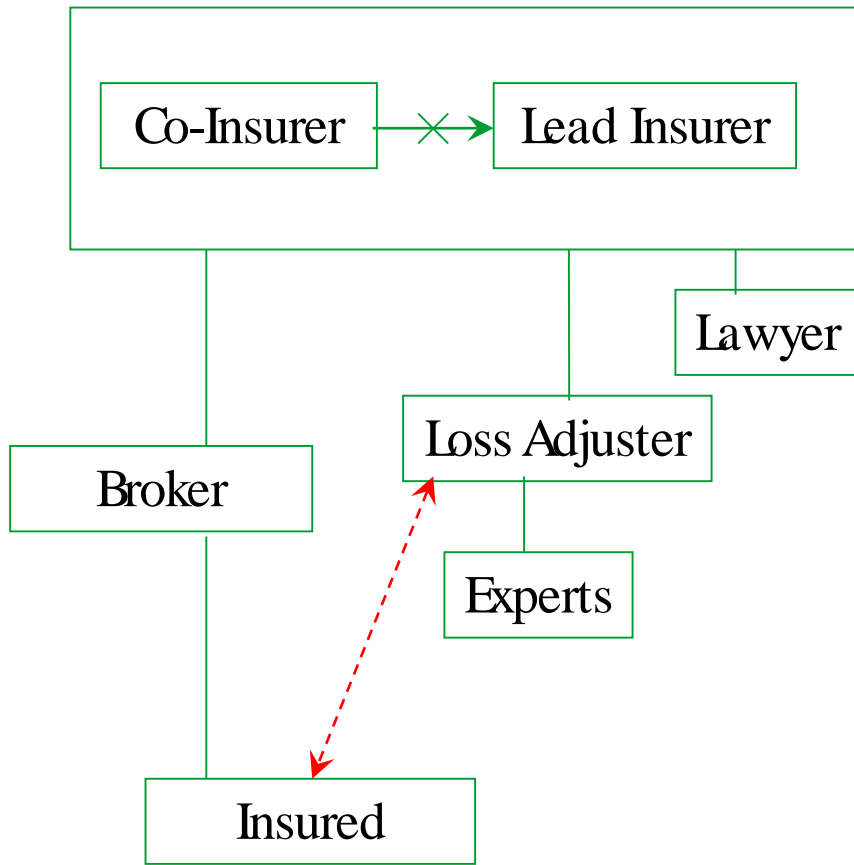
Jens Manderfeld
E-TVS Essen

Cologne's tunnel tube disaster

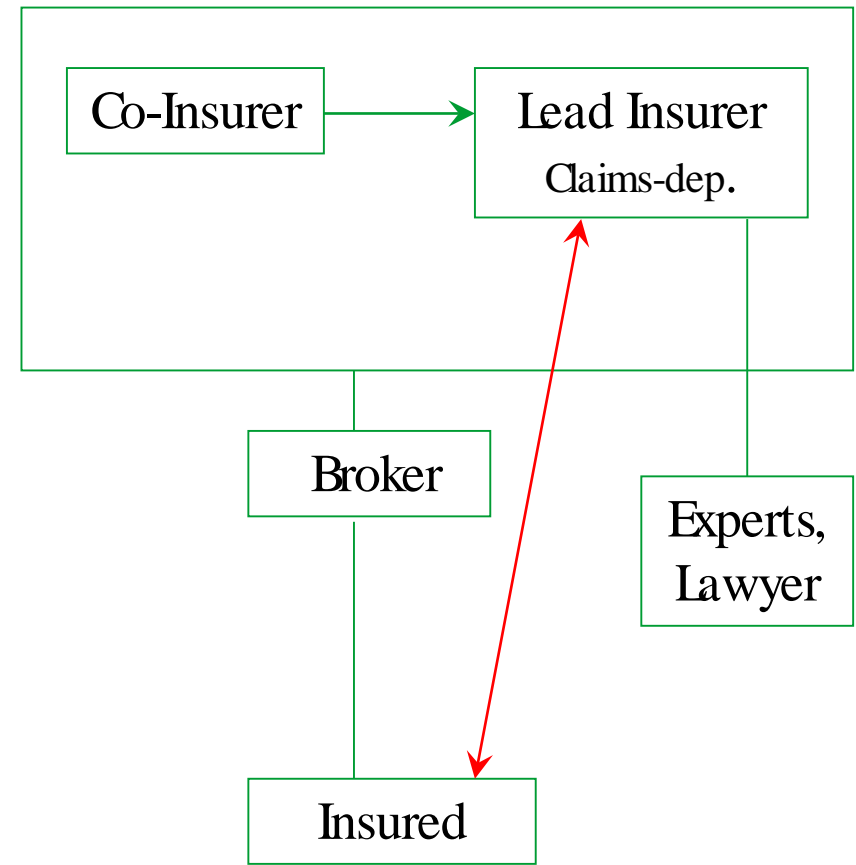
- Jens Manderfeld
- Degree in Civil Engineering and Business Administration and Engineering
- 1993 - 2001 Structural Engineer / Site Manager
- 2002 - 2003 Gerling Risk Management Department
- 2003 - today HDI-Gerling Claims Management Engineering (CAR / EAR)
- Responsible claims manager for the project “Nord-Süd-Stadtbahn Köln”

Cologne's tunnel tube disaster

International Engineering market



German speaking Eng. market



Cologne's tunnel tube disaster

- General information about the project
- Track crossover structure (Gleiswechselbauwerk)
- Collapse of the arch on March 3rd 2009
- Possible cause of loss
- Further site activities
- Characteristic of the German CAR Wordings

General information about the project

Location of the project



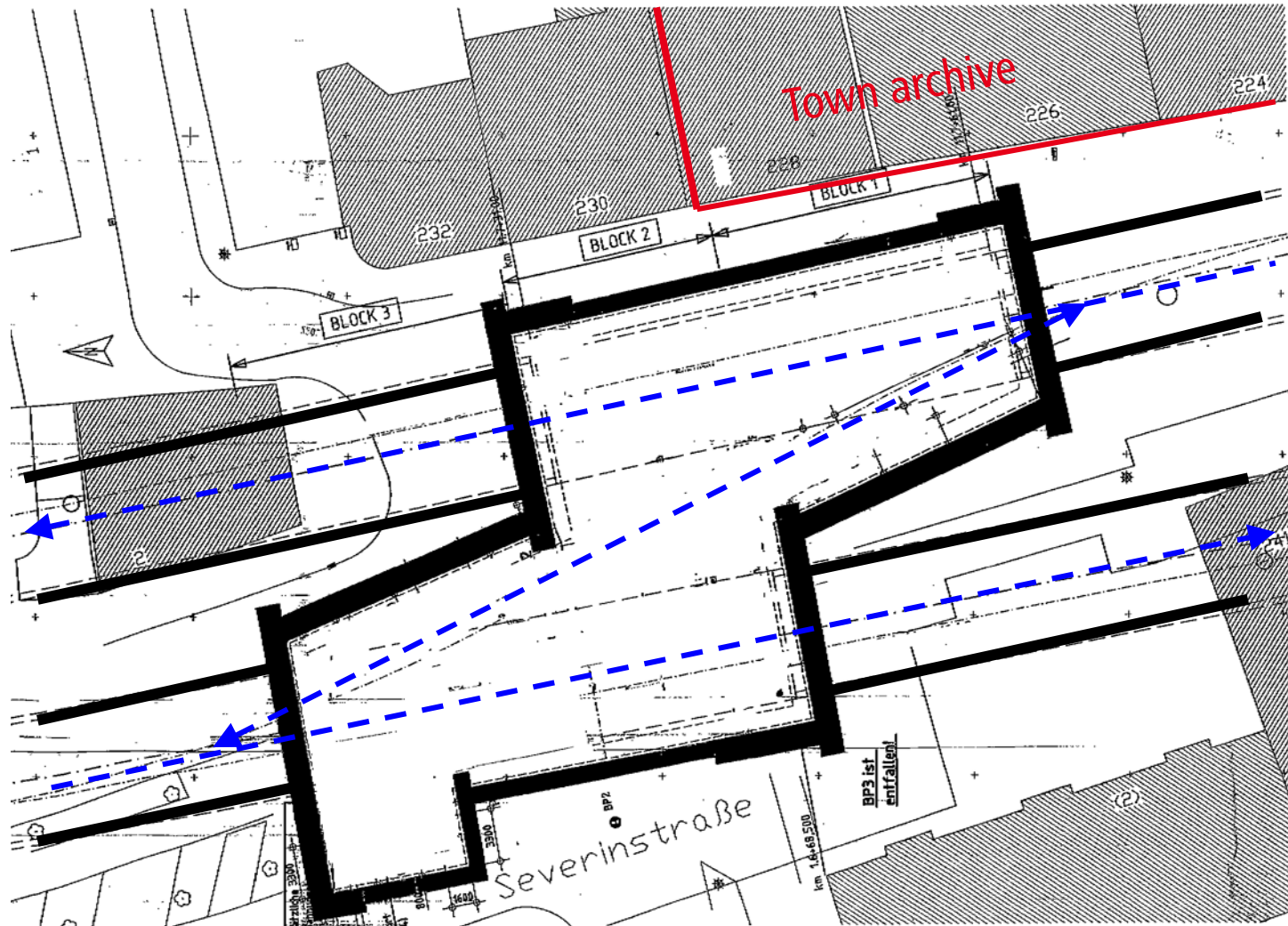
General information about the project

- Length ca. 4 km
- 8 underground stations
- Max depth: 30 meter
- Construction period (scheduled) 2004 – 2010
- Completion expected 2016
- Estimated constr. value / insured sum 630 Mio €
- Final constr. costs ? Mio €



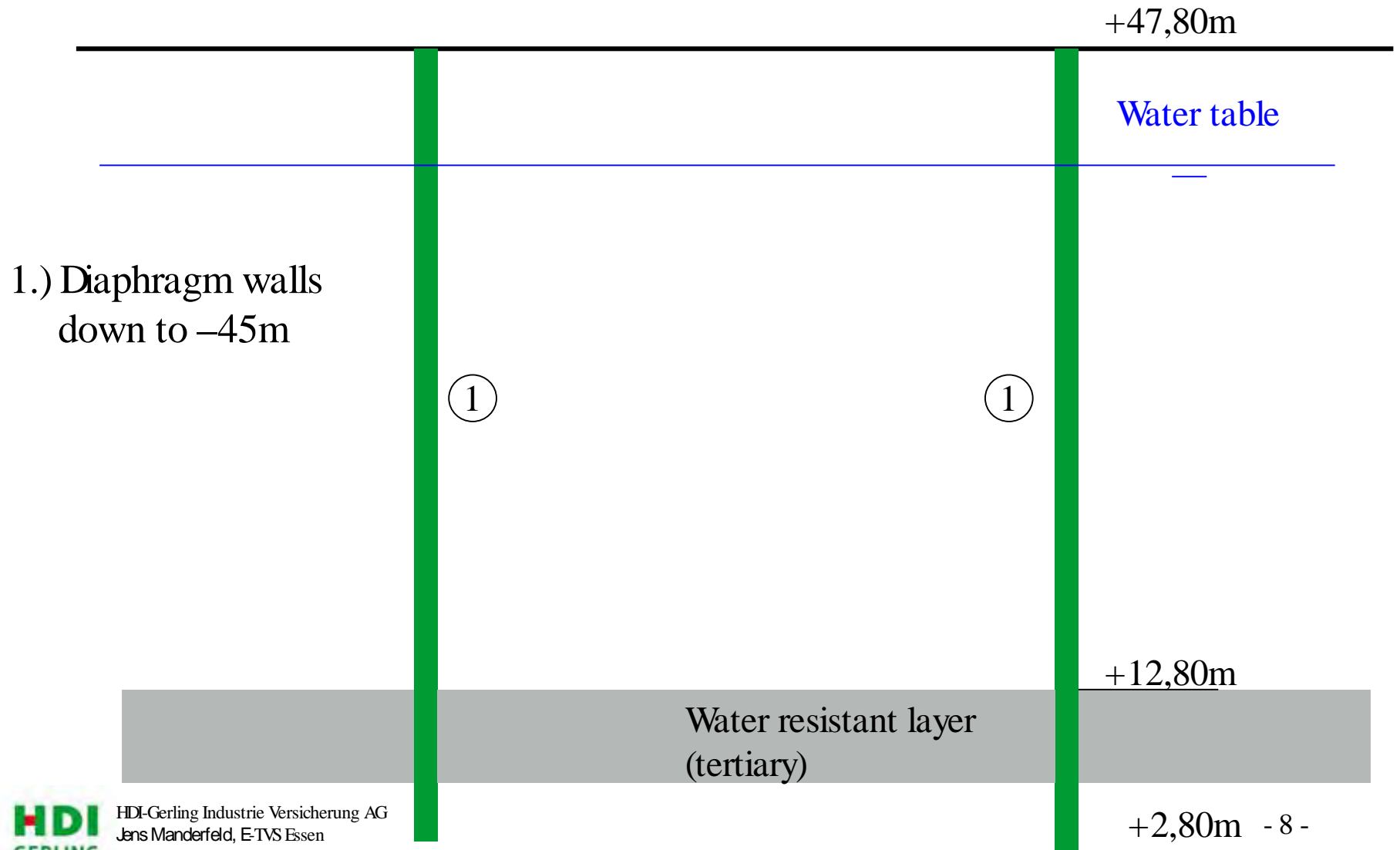
Track crossover structure (Gleiswechselbauwerk)

Topview



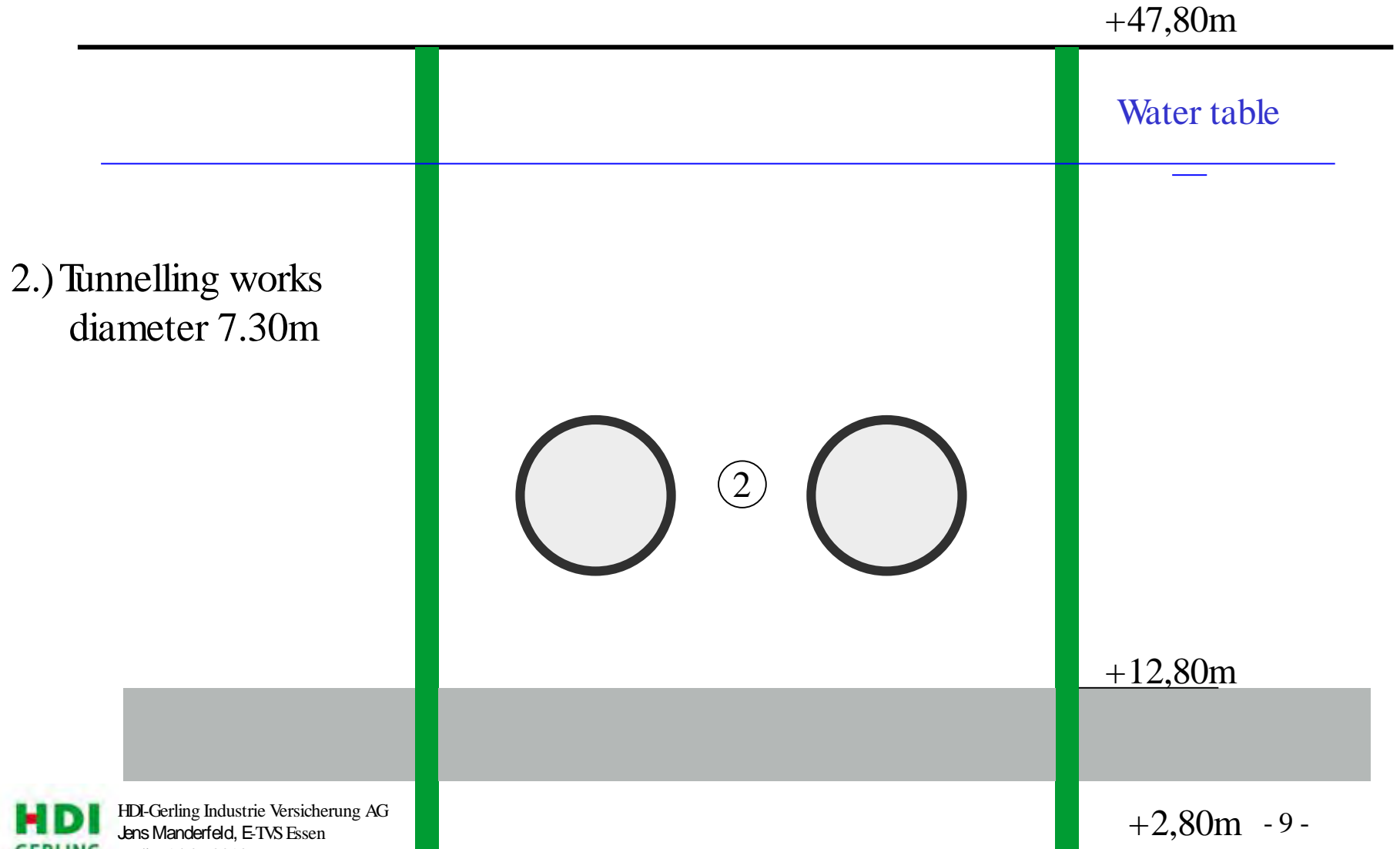
Track crossover structure

Construction sequence 1



Track crossover structure

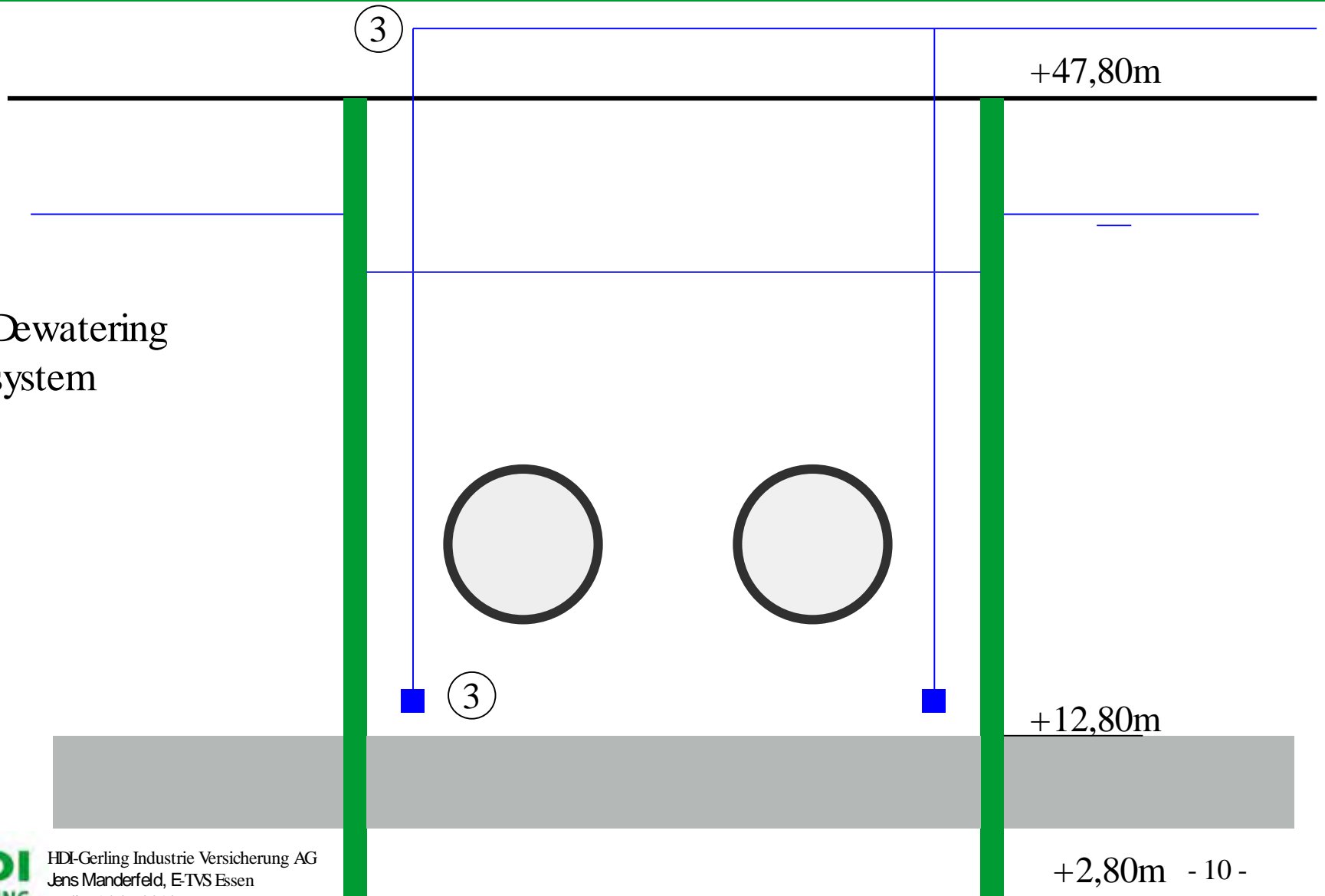
Construction sequence 2



Track crossover structure

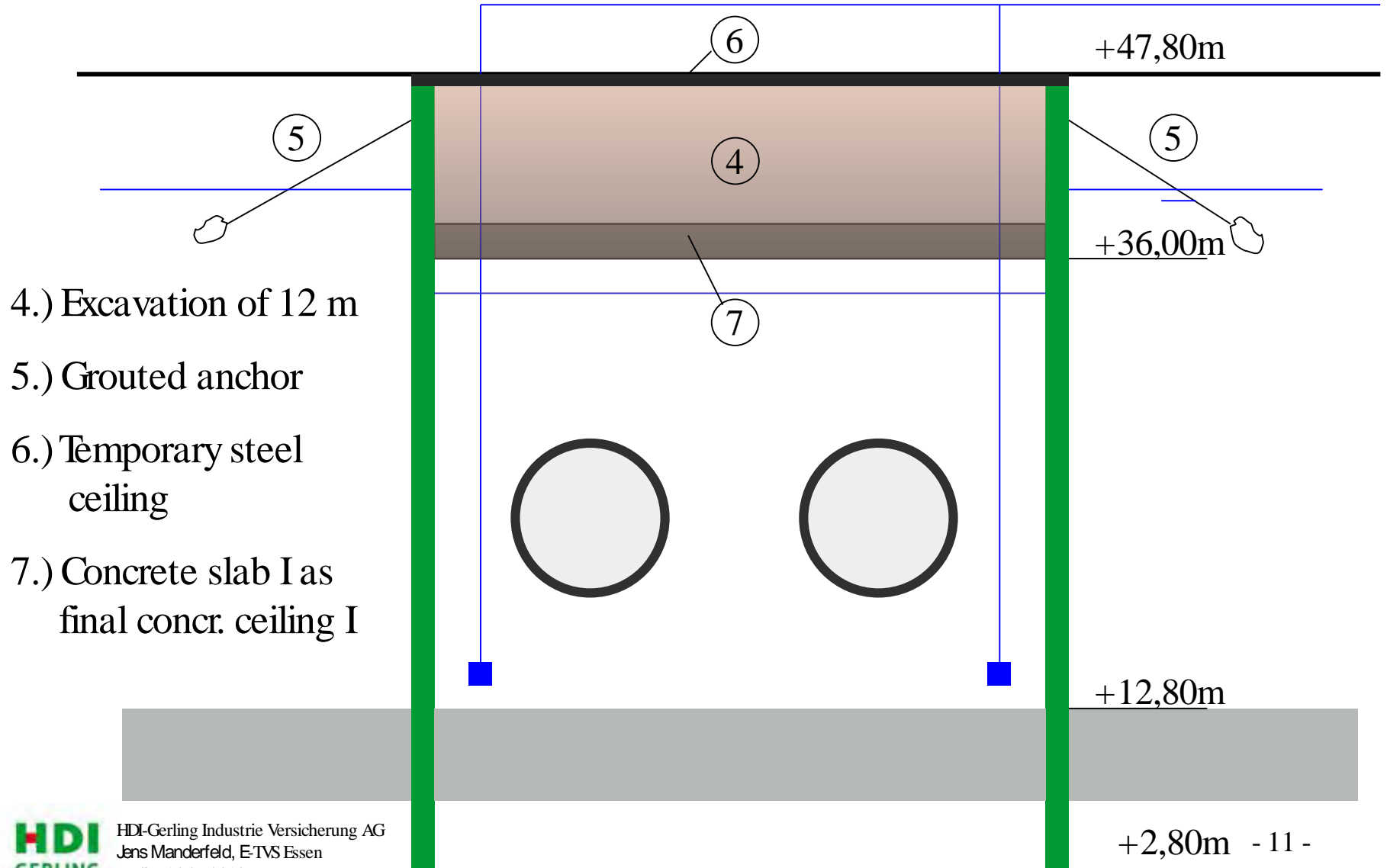
Construction sequence 3

3.) Dewatering system



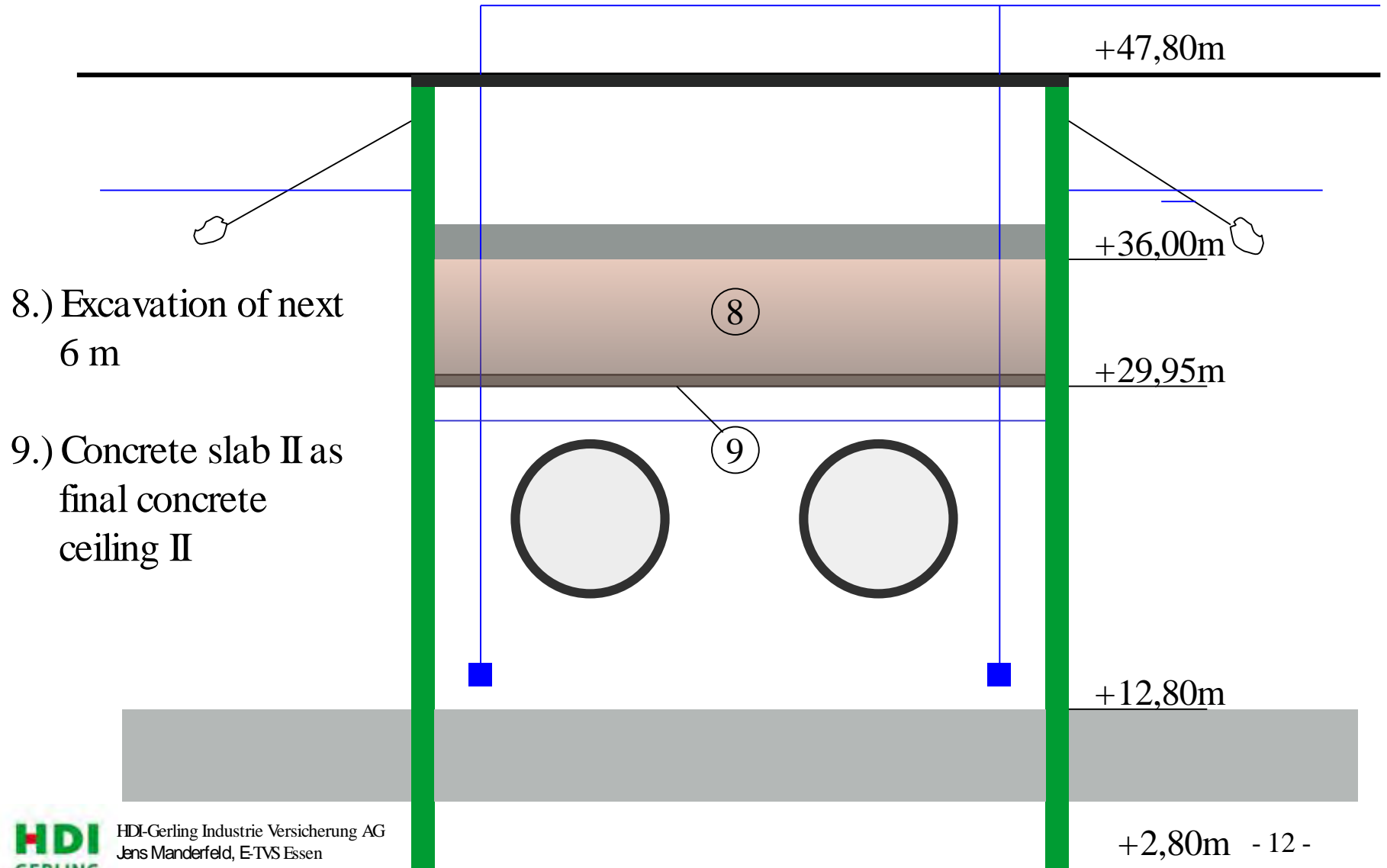
Track crossover structure

Construction sequences 4 - 7



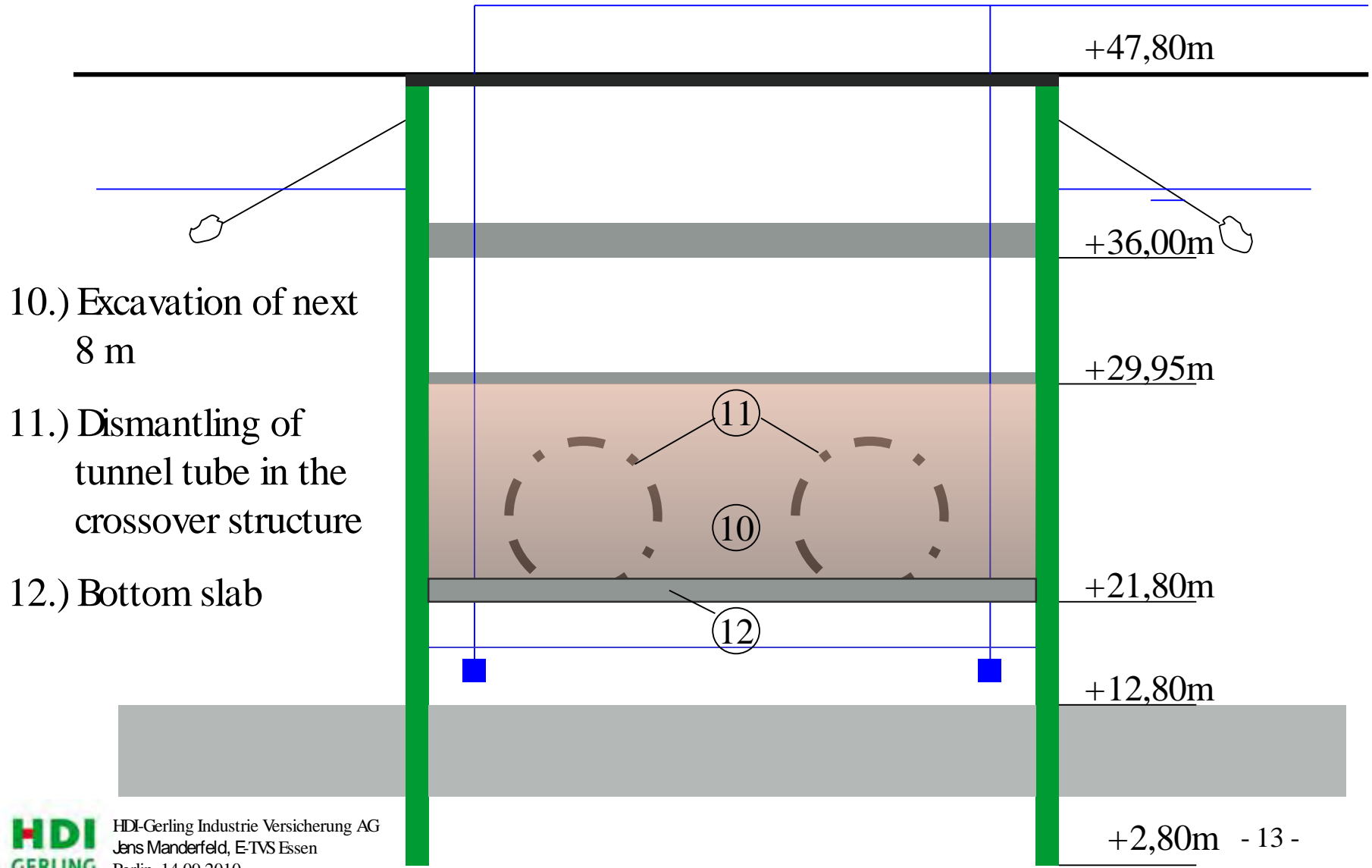
Track crossover structure

Construction sequences 8 - 9



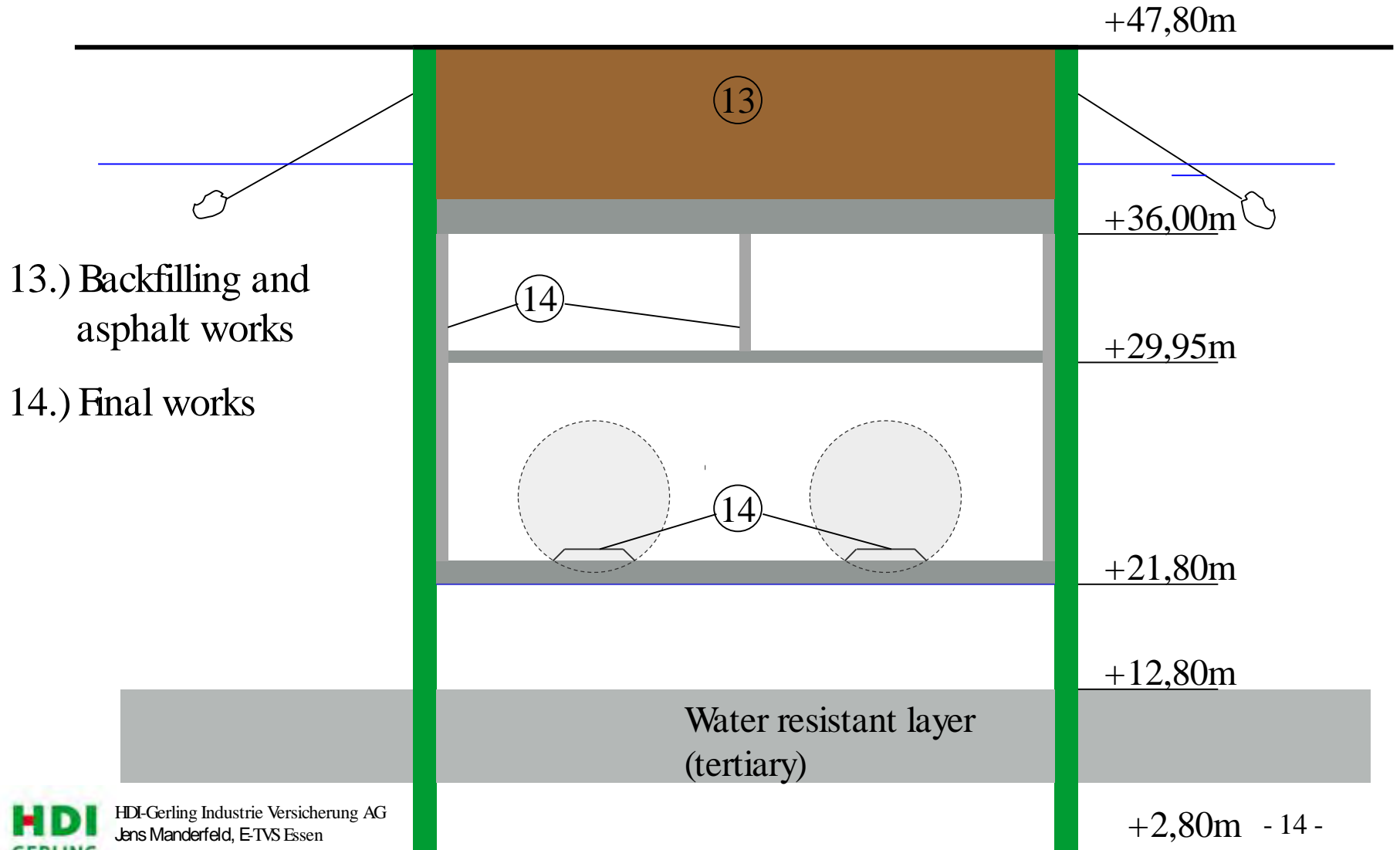
Track crossover structure

Construction sequences 10 - 12



Track crossover structure

Construction sequences 13 - 14



Collapse of the archive on March 3rd 2010

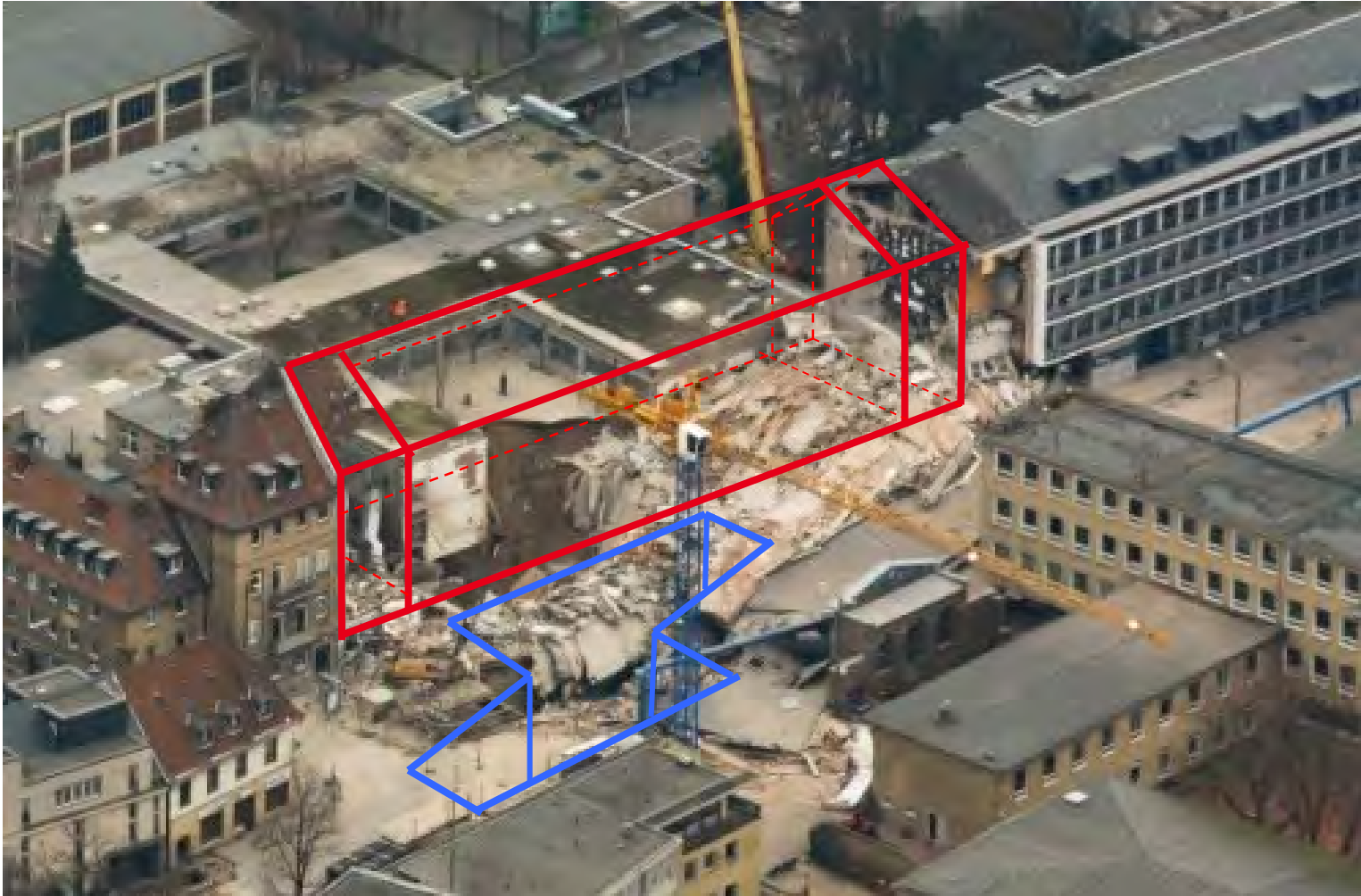
Historical town archive Cologne



- Built in 1971
- Largest town archive north of the alps
- 30 km storage space
- Oldest document dates back to the year 922
- Contents sum insured 60 Mio. €

Collapse of the town archive on March 3rd 2009

Location of archive and track crossover structure



Collapse of the town archive on March 3rd 2009

Location of archive and track crossover structure



Collapse of the town archive on March 3rd 2009



Collapse of the town archive on March 3rd 2009



Collapse of the town archive on March 3rd 2009

3.000m³ of soil (gravel)



Collapse of the town archive on March 3rd 2009

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Collapse of the town archive on March 3rd 2009

3.000m³ of soil (gravel)



Collapse of the town archive on March 3rd 2009

Demolition rubble in the structure



Collapse of the town archive on March 3rd 2009

Protection measures for the archive contents



Collapse of the town archive on March 3rd 2009

Recovery of archive contents



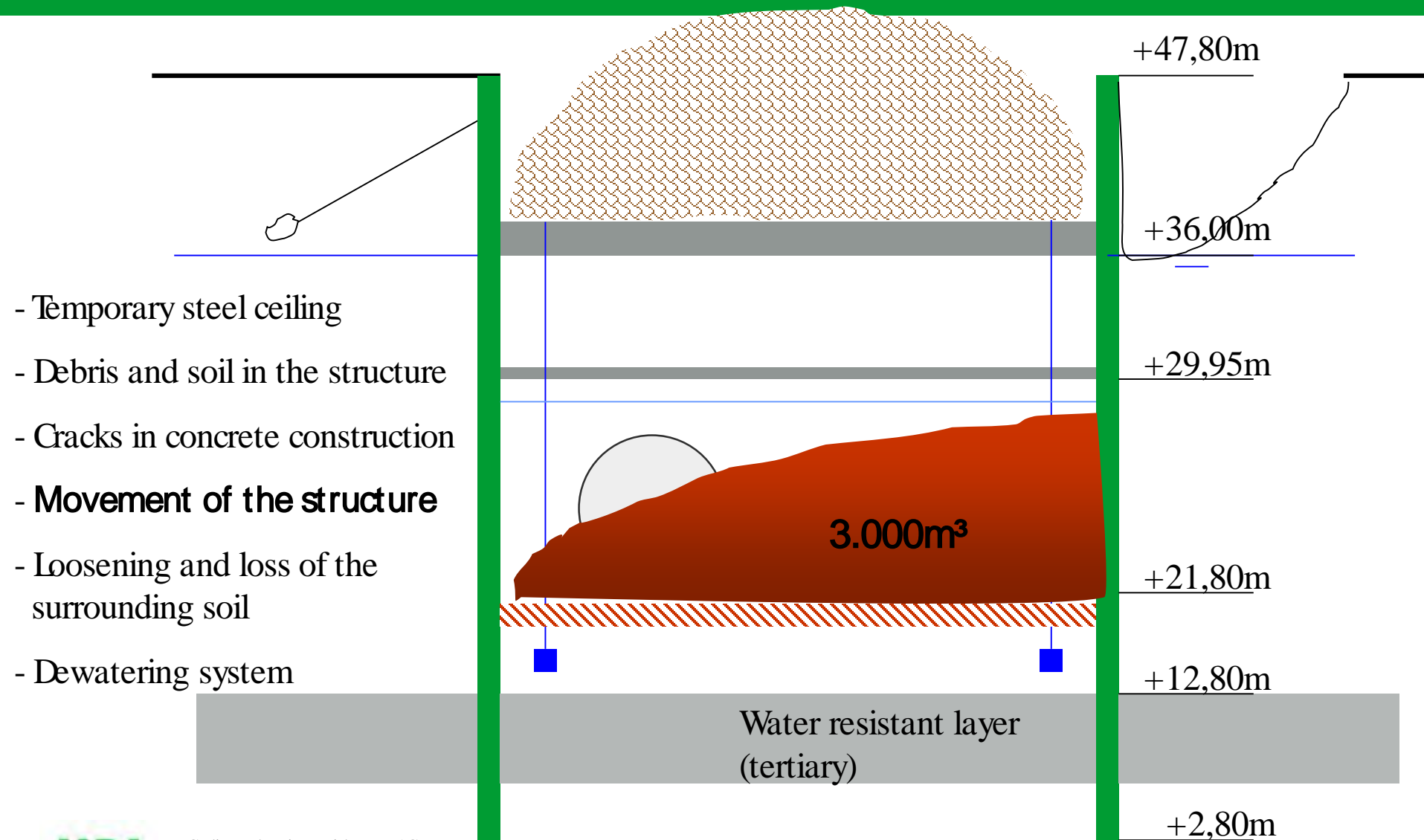
Collapse of the town archive on March 3rd 2009

Situation today



Collapse of the town archive on March 3rd 2009

Damaged property



Cologne's tunnel tube disaster

Possible cause of loss

Cause is still under investigation by

- The public attorney's office
- The independent experts nominated by the court

Cologne's tunnel tube disaster

Possible cause of loss - Scenario I



Scenario I

Removal of soil by the dewatering system has caused a local separation

Cologne's tunnel tube disaster

Possible cause of loss - Scenario II



Scenario II

Imperfection in the diaphragm wall

Cologne's tunnel tube disaster

Possible cause of loss



Soil investigation
18.11.2009

Cologne's tunnel tube disaster

Further site activities



Next steps:

- 1.) Temporary structure for the recovery of remaining archives contents
- 2.) Temporary structure for the inspection of the diaphragm wall
- 3.) Reinstatement works

Cologne's tunnel tube disaster

Characteristic of the German CAR Wordings

- Building materials, prefabricated parts

Insured property in standard German wordings

- Construction work

- Temporary structures

Cologne's tunnel tube disaster

Characteristic of the German CAR Wordings

On application: the surrounding building ground / subsoil up to a first risk sum.

Examples for clauses:

- Surrounding Building ground / subsoil is insured against all kind of perils
- Surrounding Building ground / subsoil is insured only as a result of **covered** loss
- Surrounding Building ground / subsoil is insured only as a result of a loss

Cologne's tunnel tube disaster

- The collapse of the archive is **not** the result of a typical tunnel risk
- The collapse of the archive is the result of an excavation pit risk