

**heijmans**  
INFRA

## Heijmans Infra Techniek

Fullservice contractor  
Micro tunnelling and Horizontal Directional Drilling

**Project; Pipe Jacking A13 – crossing length 908 mtrs in diameter DN1600**

14 februari 2007

**heijmans**

### Contents presentation

- Contents presentation
- Introduction Heijmans Infra Techniek
- Pipe Jacking project A13

**heijmans**

### Heijmans Infra Techniek

Part of Heijmans Infra

```

graph TD
    Directie[Directie] --- Secretariaat[Secretariaat]
    Directie --- Administratie[Administratie]
    Directie --- Personeel[Personeel en Opleiding]
    Directie --- Inkoop[Inkoop]
    Directie --- Operatie[Operationele ondersteuning]
    Directie --- Commercie[Commercie]
    Directie --- Projectbureau[Projectbureau]
    Directie --- Productgroepen[Productgroepen]
    Productgroepen --- Energie[Energie- en warmtetransport]
    Productgroepen --- Rooi[Rooi- water- en boortschik]
    Productgroepen --- Bodem[Bodem]
    Productgroepen --- Fundering[Funderingstechnieken]
    Productgroepen --- Secundaire[Secundaire grondstoffen]
  
```

**heijmans**

### PMC Micro tunnelling and directional drilling

**heijmans**

### PMC Microtunnelling and drilling

```

graph TD
    Microtunnelling[Microtunnelling and drilling] --- Engineering[Engineering]
    Microtunnelling --- Workshop[Workshop and Service]
    Workshop --- Microtunnelling[Micro-tunnelling]
    Workshop --- HDD[HDD]
    Workshop --- Thrust[Thrustborings]
    Workshop --- Auger[Guided auger borings]
    Workshop --- Ramming[Impact ramming]
  
```

**heijmans**

### Micro tunnelling Pipe jacking project A13

**The search for the "missing link"**  
A sewage project close to "The Hague" area - NL

**Micro tunnelling**  
**Pipe jacking project A13**

heijmans

**Location**

**Micro tunnelling**  
**Pipe jacking project A13 – basic design**

heijmans

**Micro tunnelling**  
**Pipe jacking project A13 – basic design**

heijmans

From basic design 908 meter in DN1600 → Detailed design

Geological conditions;

- Top (holocene) layers (water table -1 mtr)
- Bottom (pleistocene) layers (sand)

**Micro tunnelling**  
**Pipe jacking project A13 – detailed design**

heijmans

**AHR Delfland- crossing A13 / RSK**  
908 meter concrete pipe jacking .  
Crossings; highway A13 and canals  
Launch; -13,88 mtrs at angle; 5,2 degr.  
Reception; - 13,51 mtrs at angle; 2,3 degr.  
Radius; 1500 mtrs  
Depth; ~25 mtrs  
Design constraint; geodrains

**Micro tunnelling**  
**Pipe jacking project A13 – detailed design**

heijmans

**Calculation intermediate jacking stations**

**Perskracht prognose**

| Conclusie                   | 7.500 | 7.500 | 7.500 | 7.500  | 7.500  | 7.500  | 7.500  |        |     |
|-----------------------------|-------|-------|-------|--------|--------|--------|--------|--------|-----|
| max perskracht              | 1.743 | 2.286 | 6.978 | 15.760 | 22.542 | 29.325 | 36.107 | 42.709 |     |
| max perskracht op de buizer | 1.743 | 2.286 | 6.990 | 6.782  | 6.782  | 6.782  | 6.782  | 6.600  |     |
| perskracht TS 1             |       | 0     | 6.690 | 6.690  | 6.690  | 6.690  | 6.690  | 6.690  |     |
| perskracht TS 2             |       |       | 0     | 6.782  | 6.782  | 6.782  | 6.782  | 6.782  |     |
| perskracht TS 3             |       |       |       | 0      | 6.782  | 6.782  | 6.782  | 6.782  |     |
| perskracht TS 4             |       |       |       |        | 0      | 6.782  | 6.782  | 6.782  |     |
| perskracht TS 5             |       |       |       |        |        | 0      | 6.782  | 6.782  |     |
| perskracht TS 6             |       |       |       |        |        |        | 0      | 6.600  |     |
| afstand                     |       | 0     | 12    | 160    | 310    | 460    | 610    | 760    | 908 |

**Micro tunnelling**  
**Pipe jacking project A13 – detailed design**

heijmans

**Calculated minimum/maximum slurry support pressure**

**Micro tunnelling**  
Pipe jacking project A13 – time schedule

heijmans

Heijmans Technische Infra bv  
Graafschap 17  
6188 ZP Maastricht  
The Netherlands

**Rijswijk-Zuid**

Hoogheemraadschap van Delfland

| Description                              | week |   |   |   |   |   |   |   |   |    |    |    |
|--|------|---|---|---|---|---|---|---|---|----|----|----|
|  | 1    | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| Reception shaft at "Jaagpad"             |      |   |   |   |   |   |   |   |   |    |    |    |
| Pipe jacking 915 meter                   |      |   |   |   |   |   |   |   |   |    |    |    |
| Intermediate jacking stations + clean up |      |   |   |   |   |   |   |   |   |    |    |    |
| Welding steel liner + concrete finish    |      |   |   |   |   |   |   |   |   |    |    |    |
| Connecting jacking pipes to landlines    |      |   |   |   |   |   |   |   |   |    |    |    |
| Hydro test and clean up                  |      |   |   |   |   |   |   |   |   |    |    |    |

**Micro tunnelling – pipejacking A13**

heijmans

Mobilisation start shaft and construction of thrustwall

**Micro tunnelling – pipejacking A13**

heijmans

Mobilisation equipment and water trap

Preparation water trap

**Micro tunnelling – pipejacking A13**

heijmans

Mobilisation jacking frame

Installation microtunneller

**Micro tunnelling – pipejacking A13**

heijmans

Installation watertrap in launch pit

Jacking microtunneller through watertrap

**Micro tunnelling – pipejacking A13**

heijmans

**Micro tunnelling – pipejacking A13** heijmans

**Micro tunnelling – pipejacking A13** heijmans

Reception pit Reception microtunneller

**Micro tunnelling – capabilities** heijmans

**Pipejacking, thrustborings and guided auger borings**

- From small (DN500) up to large (DN3000)
- Length up to 1000 meters
- Highly accurate even in curves
- Remote controlled
- In concrete, steel, GRP and concrete with steel cores.
- Development and manufacturing of micro tunnelling equipment

**Microtunnelling and directional drilling - Workshop** heijmans

**Workshop**

- Full equipped
- Design and manufacturing of microtunnelling equipment.
- Maintenance
- Participating in innovation and project development
- Service and repairs on projects

**Thanks for your attention** heijmans

Heijmans Infra Techniek your partner for Micro tunnelling, drilling and guided auger borings

**At the end** heijmans

Questions ?

Heijmans Infra Techniek b.v  
 PO Box 68  
 5240 AB Rosmalen  
 Please contact; Klaas Adelaar  
 +31 (0)73 543 68 01  
 +31 6 5498 2282 (GSM)



heijmans