

# TEMPJET METHOD

method, limitation of use, instalation  
December 2023

# PORR TEMPJET METHOD

## ... PROCESS DESCRIPTION

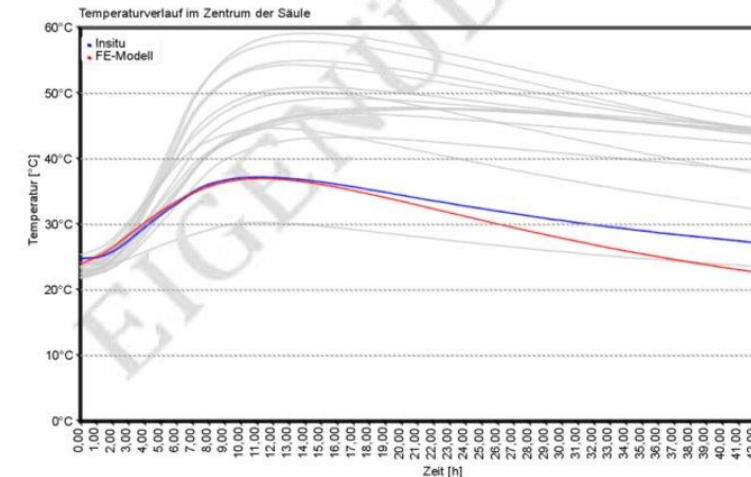
- Analysis of the cement in laboratory
  - Duration approx. 5 workdays
  - Sample size approx. 1 kg  
if possible from construction site
- „In Situ“ temperature measurement
  - Immediately in fresh jet grouted column
  - With measurement chain - sensor distance 30 cm
- Numerical calculation - result
  - diameter [m] and cement content [ $\text{kg}/\text{m}^3$ ]
  - Calculation each 30 cm possible
  - Variation of calculation / actual state <10%

### BODEN

|                                              |                 |                                                                                                |
|----------------------------------------------|-----------------|------------------------------------------------------------------------------------------------|
| Bodentyp:                                    | SCHLUFF, sandig |                                                                                                |
| Lagerungsdichte / Konsistenz:                | mitteldicht     |                                                                                                |
| Dichte feucht / Dichte trocken:              | 2050 / 2000     | [ $\text{kg}/\text{m}^3$ ] / [ $\text{kg}/\text{m}^3$ ]                                        |
| Wassergehalt / Sättigung:                    | 0.05 / 0.20     | [-] / [-]                                                                                      |
| Wärmespeicherkapazität / Wärmeleitfähigkeit: | 1714 / 6.91     | [ $\text{kJ}/(\text{m}^3\cdot\text{K})$ ]/[ $\text{kJ}/(\text{m}\cdot\text{h}\cdot\text{K})$ ] |

### DSV-SUSPENSION

|              |                   |
|--------------|-------------------|
| W/Z - Wert:  | 1.0               |
| Bindemittel: | 1487_Dolo_Blau_20 |



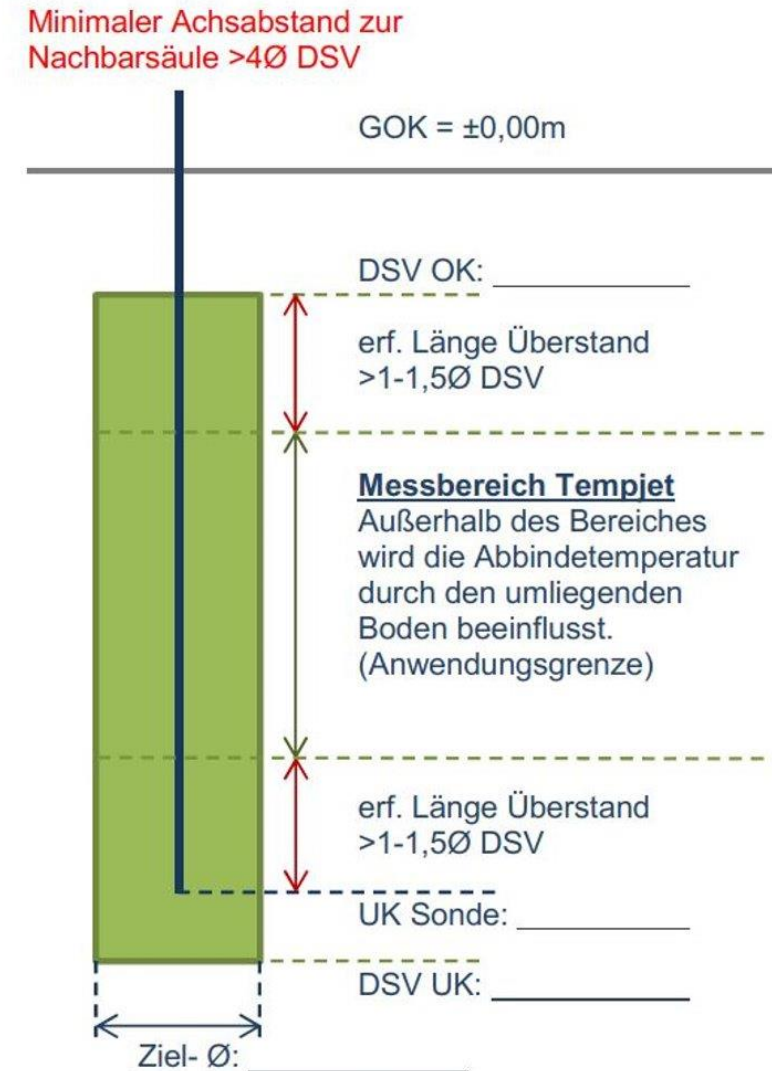
### ERGEBNIS

Durchmesser: 1.00 m  
Zementgehalt: 300  $\text{kg}/\text{m}^3$

# PORR TEMPJET METHOD

## ... LIMITATION OF USE

- Binder - Cement
  - CEMI and CEMII are well suitable
  - CEMIII is of limited suitability approval only with prior lab-test (low heat production)
- Geometrical limits
  - Center distance next column  $> 4 \times \text{target-}\varnothing \text{ JG}$
  - Center distance fixtures  $> 4 \times \text{target-}\varnothing \text{ JG}$
  - Excess length of JG on top and at the bottom of the desired measurement area  $> 1-1,5 \times \text{target-}\varnothing \text{ JG}$
- Geological limits
  - Subterranean water flows - ,erosion' of cement from the JG-column



# PORR TEMPJET METHOD

## ... TEMPJET FACTSHEET

- General data of the project
  - Address, cost center, etc.
  - Binder/cement and W/B value
- JG production facts
  - Top edge - bottom edge
  - expected diameter of JG column
  - Bottom of measurement chain = position of the lowest sensor
  - Production parameters
- Soil - layer succession
  - Density wet and density dry
  - Groundwater levels and possible movement
- Exceptional incidents
  - Installation delayed, equipment failure, etc...

|                                         |                                       |
|-----------------------------------------|---------------------------------------|
| Projektname: <u>DSV Musterprojekt</u>   | Kostenstelle: <u>103010 1234 K003</u> |
| Adresse: <u>Am Staudamm 47/2</u>        |                                       |
| PLZ/Ort: <u>2500 Baden</u>              | Land: <u>Österreich</u>               |
| Ausführende Firma: <u>Porr Bau GmbH</u> |                                       |
| Bauleiter: <u>MusterbauleiterIn</u>     | Polier: <u>Musterpolier</u>           |
| DSV Nummer: <u>DSV-100</u>              | Bindemittel: <u>Rohnjekt S90A</u>     |
| Seriennummer Sonde: <u>00795_JG</u>     | W/Z – Wert: <u>1</u>                  |

Minimaler Achsabstand zur Nachbarsäule >4Ø DSV

|                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>GOK = ±0,00m</p> <p>DSV OK: -1,0m</p> <p>erf. Länge Überstand &gt;1-1,5Ø DSV</p> <p><b>Messbereich Tempjet</b><br/>Außerhalb des Bereiches wird die Abbinde temperatur durch den umliegenden Boden beeinflusst. (Anwendungsgrenze)</p> <p>erf. Länge Überstand &gt;1-1,5Ø DSV</p> <p>UK Sonde: -6,0m</p> <p>DSV UK: -6,5m</p> <p>Ziel- Ø: 1,20m</p> | <p>Bodenprofil / Grundwasserstand / Anmerkungen<br/>(Bodenschichten, -typen, Lagerungsdichte/Konsistenz)</p> <p>0,00-1,20m Auffüllung</p> <p>1,20-2,50m sandiger Kies, locker</p> <p>2,50-2,80m Ton, schluffig, halbfest</p> <p>2,80-5,50m abwechselnd Kiese und Sande, mitteldicht</p> <p>5,50-7,50m Ton, schluffig, fest</p> <p>GW bei -4,50m (eventuell. Schichtgrundwasser)</p> <p>Anmerkung:<br/>Bohrhindernisse in 4,0m Tiefe, eventuell Blöcke</p> <p>HINWEIS:<br/>Es können theoretisch unendlich viele Zeichen in diesem Textblock eingegeben werden. Die Schriftgröße verkleinert sich automatisch!!</p> <p>Ein Bodengutachten ist vom AG einzufordern und dem Erfassungsbogen beizulegen!!</p> |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                                                                                                                               |                                                                                                                             |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| <b>Herstellungparameter:</b><br>Bohrgerät: <u>C6</u><br>Düse(n): <u>1x 4,0mm</u><br>Umdrehungen [U/min]: <u>10 U/min</u><br>Susp.-Druck [bar]: <u>350 bar</u> | Monitor: _____<br>Luftdruck [bar]: <u>12 bar</u><br>Hub/Ziehzeit: <u>6cm/6s</u><br>Durchfluss [l/min]: <u>280 Liter/min</u> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|

# PORR TEMPJET METHOD

## ... REQUIRED SUPPLY MATERIAL

- Delivered from PORR
  - Data logger incl. charging cable
  - Measuring chain incl. connector plug
- Provided by the client on site
  - PVC tubes Ø 18-20mm (conduit pipe) for the whole drilling length incl. reserve
  - Iron rod / reinforcement steel D20mm length ca. 0,5 bis 1,0m for each column
- Required drilling tools
  - Hollow drilling bit with passage > 30 mm



# PORR TEMPJET METHOD

## ... ASSEMBLY OF PVC TUBES

- Connection of the iron rod
  - To weight down the PVC tubes preventing uplift
- sealing / lock into position
  - With common sticky tape
- Extending the PVC tube
  - By sticking together the pipe couplings
  - Fix into position with sticky tape



# PORR TEMPJET METHOD

## ... INSTALLATION OF PVC TUBES

- After production of the JG column
  - Pull the drilling rods
  - Exchange the drilling bit for the hollow drilling bit
  - Drill down to the required depth again with slurry flushing
  - Disconnect the drilling rod at the top
- Installation of PVC tubes
  - Insert the PVC tube to the center of the drilling rod
  - Fill the PVC tube with water
  - Seal the opening of the PVC tube with sticky tape
  - Pull out the drilling rod (oszillating)
- Installation of measuring chain
  - Insert measuring chain to the previously installed PVC tube
  - Connect the data-logger



# PORR

PORR AG . Absberggasse 47, 1100 Wien  
T +43 50 626-0 . [office@porr-group.com](mailto:office@porr-group.com)