

Approval & Reception Procedure

DG – Geotechnical Department	
Jet Grouting	Document No.: ARP/DG/021
	Date: 2020/03/30
	Page: 1 of 4

1. Reference Standard

Technical code for ground treatment of buildings (JGJ 79-2012)

Technical code for testing of building foundation soils (JGJ 340-2015)

Code for Foundation Design on Port and Waterway Engineering (JTS 147-2017)

Technical specification of jet grouting for hydropower and water resources projects
(DL/T 5200-2004)

REGULAMENTO DE FUNDAÇÕES

2. Information to be submitted

2.1 Geotechnical information (site investigation) ;

2.2 Site condition (including location 、 elevation 、 size 、 site boundaries 、 terrain 、 slope 、
access 、 limitation 、 excavation depth 、 ground water level and tidal information, etc.) ;

2.3 Design drawings and technical specifications for the project ;

2.4 Method statement of construction ;

2.5 Construction Record :

- Jet grouting reference number
- Elevation of top and bottom of each jet grouting
- Used amount of cement of each jet grouting
- Jet pressure and flow of cement grout
- Rotating and lifting speed of shaft

Approval & Reception Procedure

DG – Geotechnical Department	
Jet Grouting	Document No.: ARP/DG/021
	Date: 2020/03/30
	Page: 2 of 4

Besides the above mentioned points, any information listed in JGJ 79-2012 would be required.

Site investigation report, required information listed in Artigo 42 and 43 of 《REGULAMENTO DE FUNDAÇÕES》 and clause 5.2 of EN 1536:1999 should be submitted.

3. Cement Material

Cement grout used in jet grouting must be conformed with required component and water-cement ratio by the design drawings. Trial Mixed must be verified by LECM, and submit the following test result:

- compression test of minimum 3 cement cubes at the age of 14 days ;
- compression test of minimum 3 cement cubes at the age of 28 days ;

All cubes must be produced from same batch of cement grout.

In the process of constructing jet grouting, minimum 3 cement cubes at the age of 28 days should be made for compression test in each batch of cement grout.

4. Construction Control

According to ‘Technical code for ground treatment of buildings’ (JGJ 79-2012) :

- Jet pressure should not remain less than 20 MPa, flow should remain more than 30 L/min ;
- Jet air pressure should remain larger than 0.7 MPa ;
- Uplift speed should remain 0.1~0.2 m/min.

Approval & Reception Procedure

DG – Geotechnical Department	
Jet Grouting	Document No.: ARP/DG/021
	Date: 2020/03/30
	Page: 3 of 4

According to the various geology condition and design requirement, trial test should be performed before construction as reference for parameter during construction.

5. Construction Monitoring

According to ‘Technical code for ground treatment of buildings’ (JGJ 79-2012) :

- Deviation of drilling position cannot excess 50mm ;
- Deviation of verticality cannot excess 1% ;
- In the case of sudden variation of jet pressure or froth condition, constructor should find out the problem and fix it.

6. Testing

In 28 days after jet grouting, the following test shall be performed according to the project requirement :

- Integrity test of jet grouting ;
- For any bearing capacity is required in the project, loading test should be performed ;
- For any seepage or permeability property is required in the project, permeability test should be performed ;
- According to the project requirement, verification test should be performed for the treatment effect on soil between jet grouting.

6.1 6.1 Integrity test of jet grouting

- Select randomly 1% of the total jet grouting for excavation to check the integrity, with a minimum number of 3 jet grouting ;

Approval & Reception Procedure

DG – Geotechnical Department	
Jet Grouting	Document No.: ARP/DG/021
	Date: 2020/03/30
	Page: 4 of 4

- Mechanical core test for the integrity of jet grouting :
 - The number of selected samples for test should be 1% of total jet grouting, a minimum number of 3 tests would be undertaken ;
 - For any strength is required for jet grouting, minimum 3 samples should be selected for compression test in each tested jet grouting ;
 - SPT or dynamic penetration test can be carried out when mechanical core test is not able to do.

6.2 Bearing capacity of jet grouting

- Select randomly 1% of the total jet grouting, with a minimum number of 3 points, to perform the composite foundation bearing capacity test, plate load test can be chosen ; ;
- For any single jet grouting bearing capacity is required for the project, static load test can be performed.

6.3 Permeability property of jet grouting

- Permeability test can be carried out according to the projected requirement.

6.4 Verification test on soil between jet grouting

- Suitable test shall be carried out to verify the treatment effect, such as CPT, SPT, field vane shear test and/or laboratory soil test.

7. Acceptance criteria

Test results should comply with the requirements specified in technical specification

旋噴樁施工檢查記錄表

Jet Grouting Constructing Inspection Form

工程名稱： Project Name :		施工單位 Construction :	
		日期 Date :	
設計要求 Design :	樁徑 Diameter (m) : _____	間距 Seperation(m) : _____	樁長 Length (m) : _____

記錄 Record

編號 SerialNumber	施工時間 Construction time		樁底標高 Bottom Level (M.S.L)	樁長 Length (m)	旋噴壓力 Jet Pressure (MPa)	噴射流量 Flow (L/min)	轉速 Rotating Speed (r/min)	提升速度 Lifting speed (m/min)	水灰比 Water- cement ratio	水泥用量 Cement Used (kg)	
	開始 Start	結束 Finish								設計 Design	實際 Used

檢查 Inspection _____	審核 Verification: _____
------------------------	---------------------------