

Qualification Requirements for Enlistment in Challenging Project List

ID	Specification	Qualification Requirement	
1	General		
1.1	Project Phase	Project must be under construction or already finished.	
1.2	Project Age	The project completion must not be older than 8 years.	
1.3	No. of Qualification	At least two of the stated requirements must be met by the project to become candidate.	
2.	Geology		
2.1	Hard Rock Tunnel	Any of the following criteria for 20 % of total tunnel length Unilat. Compressive Strength: MPa ≥ 300 Jointing: RQD [%] ≤ 25 Spacing [m] ≤ 0,06 Water Ingress at the face: l/s ≥ 30 Abrasivity: most severe class of the chosen test method Faults: prop. to length ≥ 20 % Squeezing: prop. to radius ≥ 10 %	
2.2	Soft Ground Tunnel	Water Permeability: Slurry m/s ≥ 10 ⁻² EPB m/s ≥ 10 ⁻³ Adhesion: Thewes Criteria red zone Abrasivity: most severe class of the chosen test method Applied Face Support Pressure: bar ≥ 5 Mixed face condition: ΔMPa ≥ 200 with at least 2 different strata	
3.	Tunnel Alignment		
3.1	Length	Without intermediate access: hard rock ≥ 15 km soft ground ≥ 5 km pipe-jacking ≥ 1,5 km	
3.2	Diameter	Bored diameter: hard rock ≥ 14 m soft ground ≥ 1,2 m soft ground ≥ 15 m	
3.3	Cover	Cover above tunnel lining: hard rock > 1.000 m soft ground (10%) ≤ 0,9 d _{TBM}	
3.4	Inclination	Up- or downwards hard rock ≥ 35 ° soft ground ≥ 6 %	
3.5	Radius	continuously excavated without lining ≤ 10 d _{tunnel} with lining ≤ 15 d _{tunnel}	
4.	Technology		

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4.1	General	<p>Any new technological development of the TBM means and methods. The development shall have been implemented and regularly used on the project.</p> <p>The development shall push the technology of mechanized tunnelling further, such it must have an impact on the general TBM application.</p>

Further Stipulations

1. Purpose of the “Challenging Project List”
The List shall demonstrate interested parties the benefits of using TBM technology. As well it shall show the current technical boundaries for this technology.
2. Right for Enlistment
There is no entitlement for project enlistment into the List. WG14 will enlist the projects based on the Qualification Requirements stipulated above.
3. Yearly Review
The objective is to have an up-to-date list with most recent projects. The list will be reviewed at least once a year, typically shortly after the ITA conference.