**APPENDIX 1**

Mohr-Coulomb criterion:

| $$σ\_{11}=UCS+Nσ\_{33}$$ | (A.1.1) |
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where *σ11* and *σ33* are maximum and minimum principal stress respectively and the constant *N* equals:

| $$N=\left(\sqrt{μ^{2}+1}+μ\right)^{2}=tan^{2}\left(\frac{π}{4}+\frac{φ}{2}\right)=\frac{1+sin\left(φ\right)}{1-sin\left(φ\right)}$$ | (A.1.2) |
| --- | --- |

where *μ* is a coefficient of internal friction.