Conclusions

- Before the double-lining cracks, the contribution the bearing capacity of the tunnel is 3.7% for the sandy soil; it increases to 2.4% for the highly weathered argillaceous siltstone. As a real the diable-lining cracks when the internal water pressure is 0.33 MP under sandy soil, while it cracks at 0.40 MPa under highly weathered argillace as silts one.
- After the double-lining cracks, the toil plays a more vital role in bearing internal water pressure. The contribution increases to 10.5% for the sandy soil, and 27.8% for the highly weathers argillaceous siltstone. Thus, the ultimate bearing capacity of double-lining rises from 0.70 MPa to 0.97 MPa when the soil condition hanges from sandy soil to highly weathered argillaceous siltstone.
- The contribution of wil to the bearing capacity increases with the elastic modulus of soil. As the elastic modulus of soil increases to 3 GPa in the elastic stage and 500 MPa in the damage stage, the contribution of soil reaches about 20%, which should be considered at the design stage.