

Introduction

Past research has shown that low skid resistance causes an increase in wet road crashes. Aggregates from the Tauhara quarry near Taupo have been tested using a new accelerated polishing method to determine their long term suitability as sealing chip and how the size of the aggregate influences the skid performance.

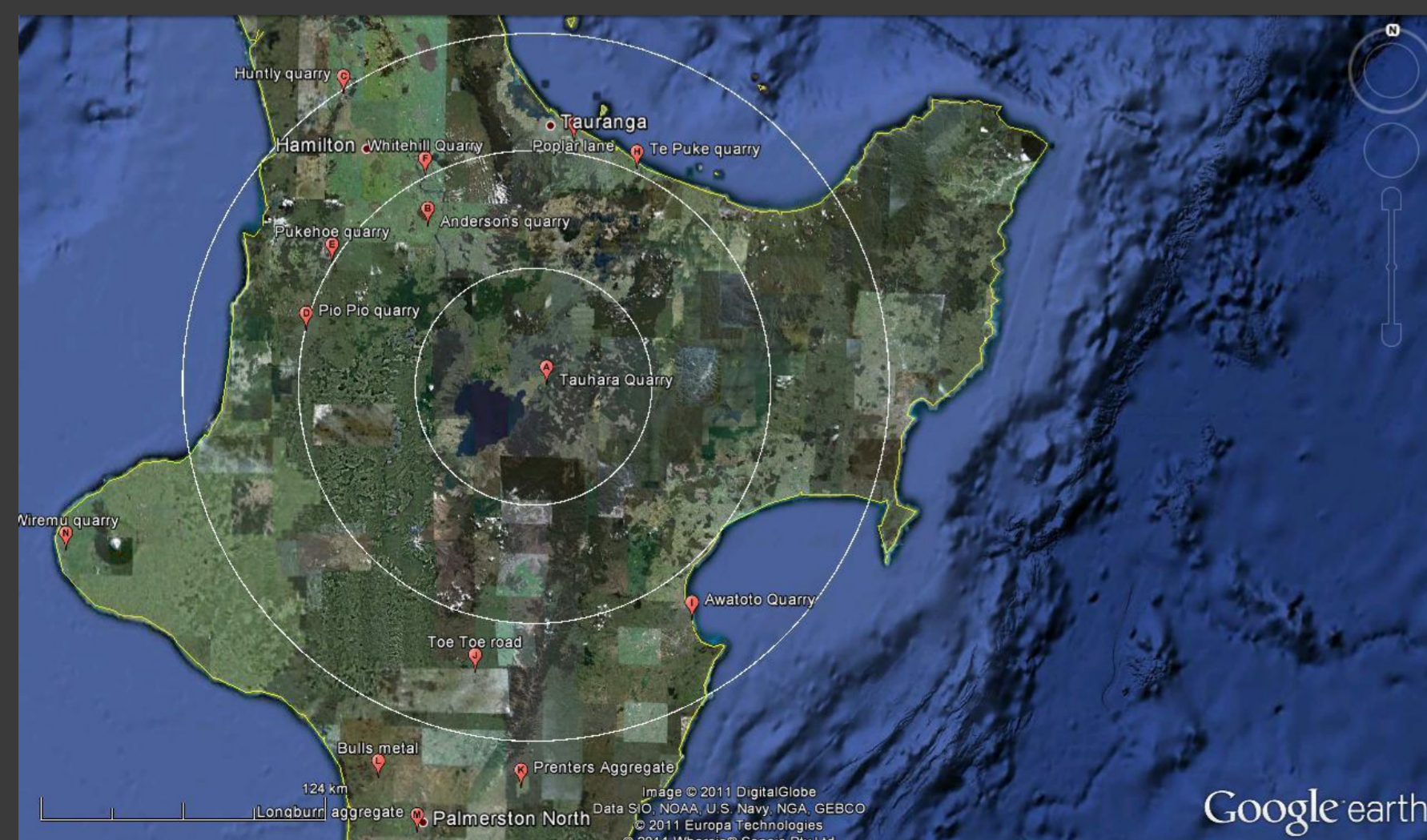
The current method for determining the skid resistance is the polished stone value, (PSV). However past research has shown that there is little relationship between the PSV of an aggregate and the final in situ skid resistance of a chip seal.



a) the DF Tester, b) Accelerated Polishing Machine

Relevance

By transporting aggregates over long distances we are placing additional heavy vehicle loads on the transport network causing them to wear at an accelerated rate. The below map shows the importance of the Tauhara quarry as it is the closest quarry to Taupo by over 50 km..

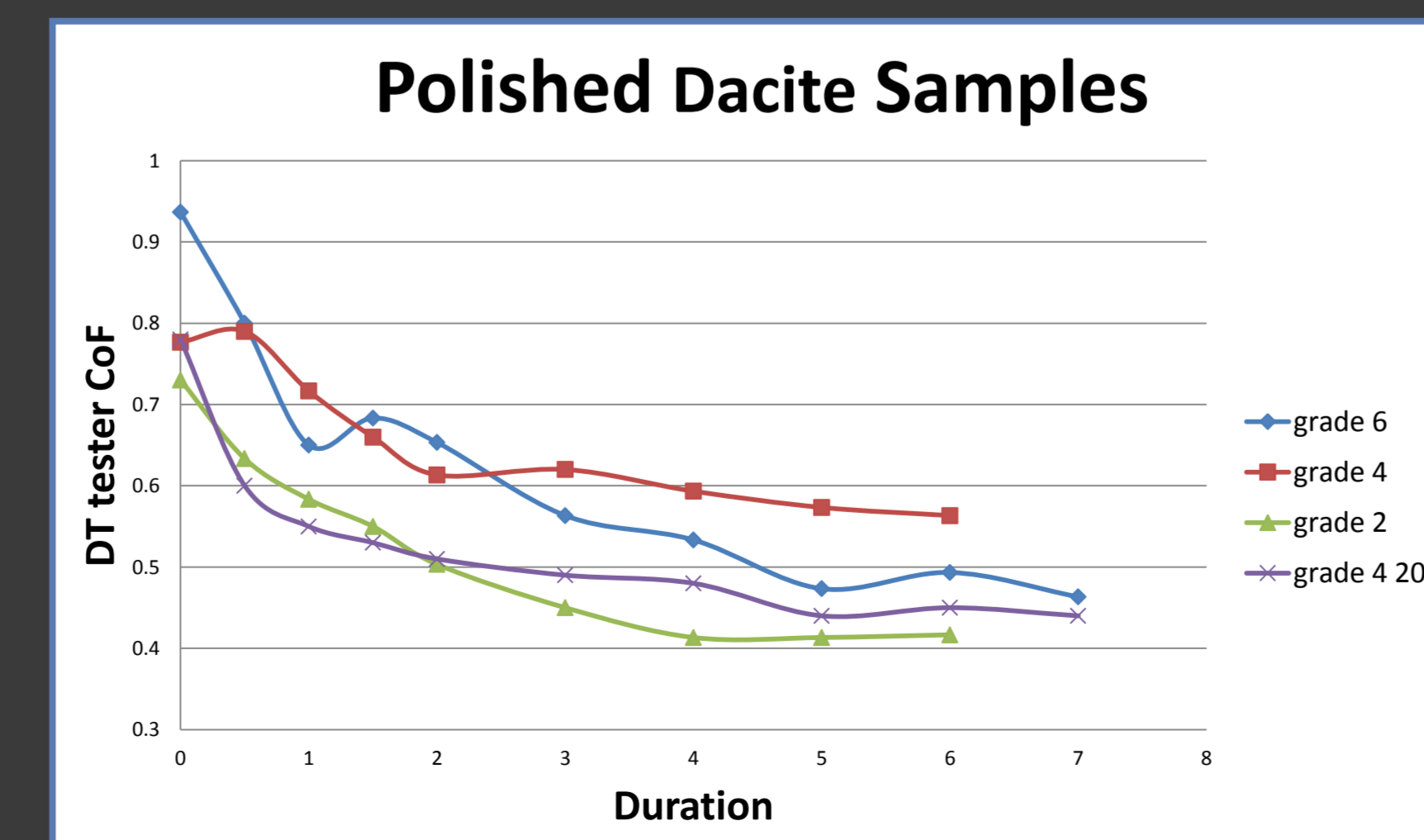
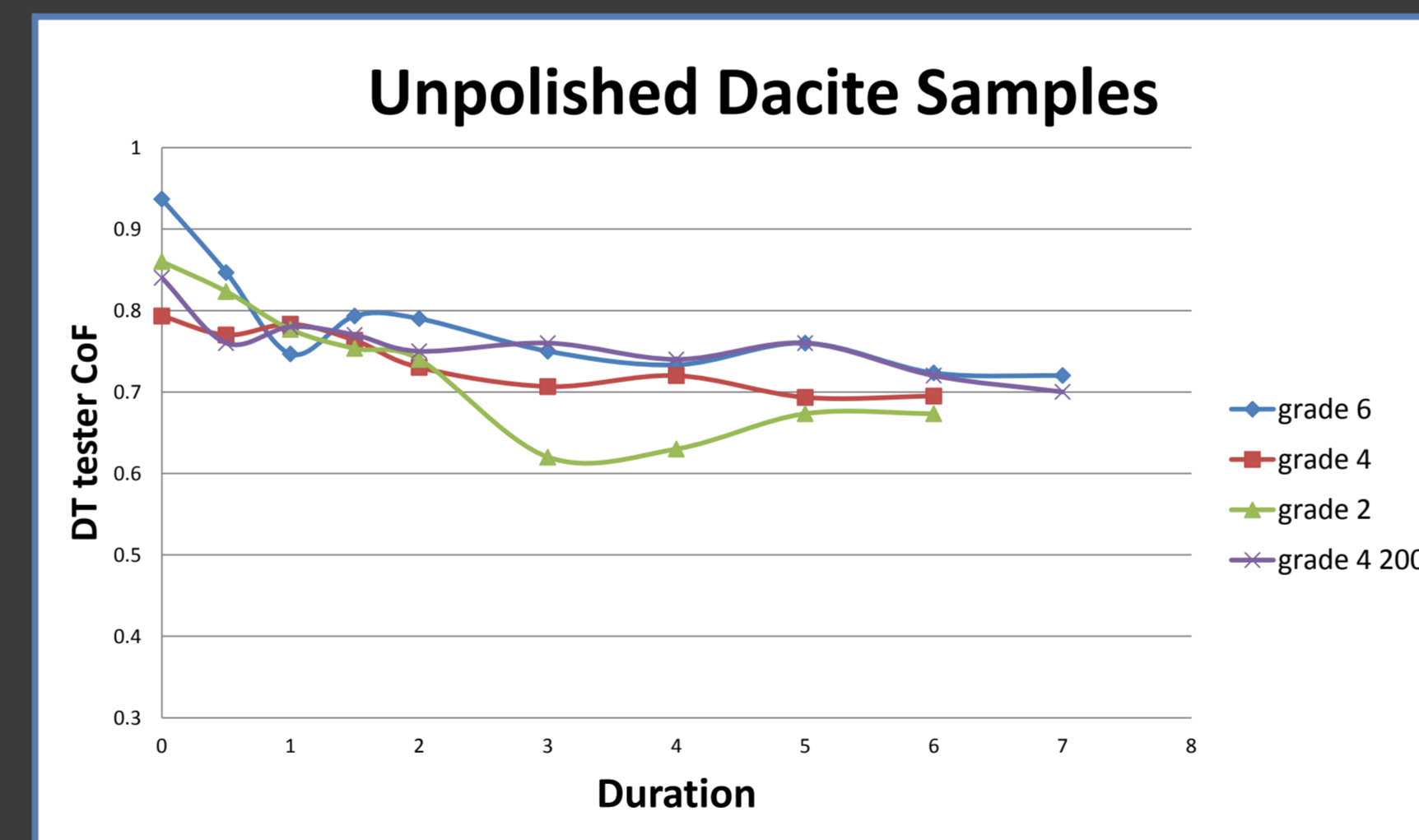


Equipment and Materials

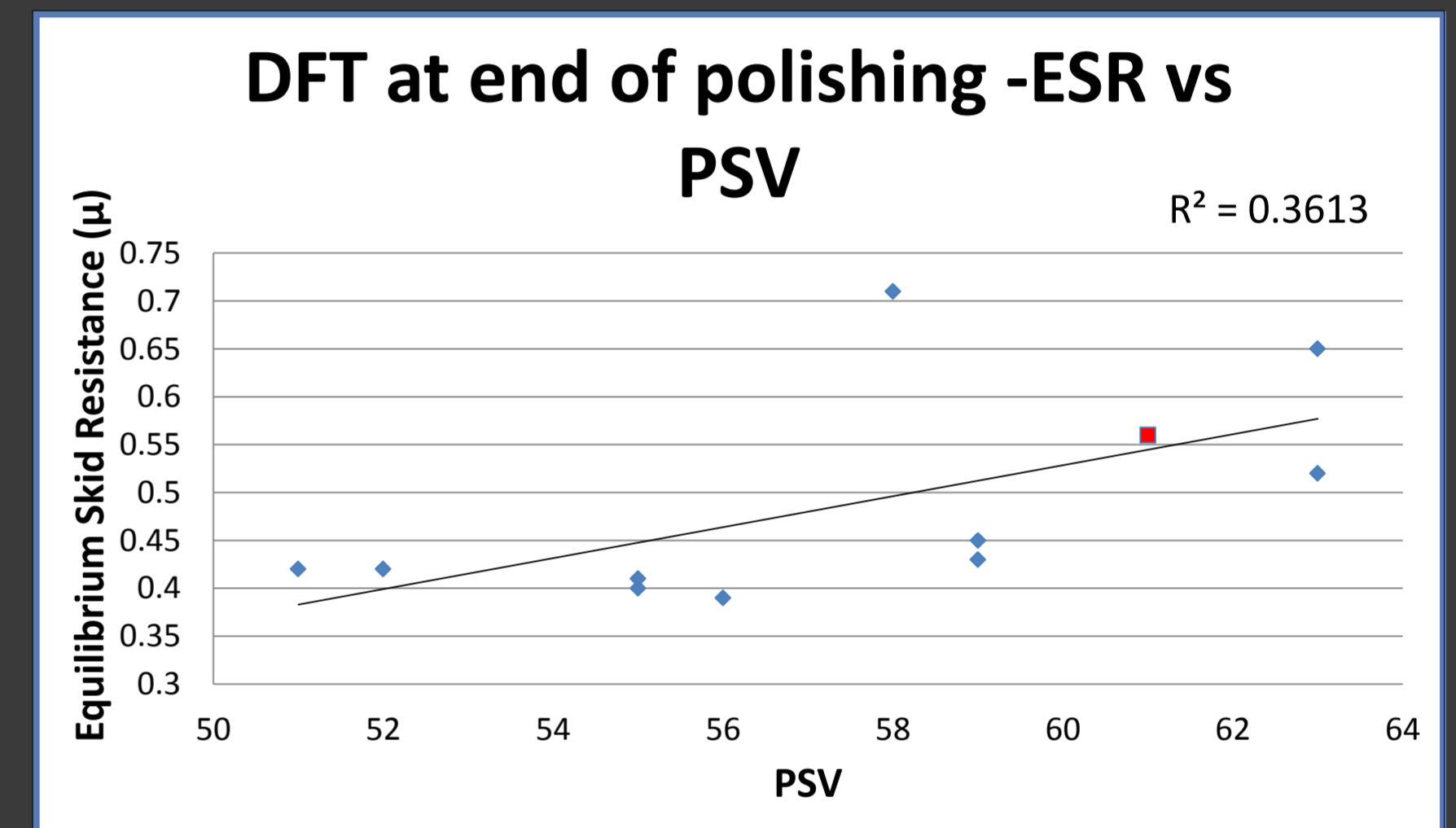
Samples replicating road surfaces made of Tauhara Dacite sealing chip were polished (to replicate road use) with the Auckland University developed Accelerated Polishing Machine (APM) and then friction tested at regular intervals using a Dynamic Friction Tester (DFT). The process was continued until the DFT showed no further decrease in the skid resistance of the sample surface (equilibrium skid resistance)

Results

Comparisons are made between different grade of Tauhara aggregate (PSV =61) and a previous test result of the same aggregate (PSV=57) using the University of Auckland method. The results are shown below



In addition, results were compared with other aggregates accelerated polishing test results from the University of Auckland. The results shown below, indicate there is a weak relationship between DFT equilibrium skid resistance and the PSV value of an aggregate, providing further evidence that PSV is not a good measure of an aggregate skid resistance



Conclusions

- The Tauhara grade 4 chip is the best performing chip in terms of skid resistance
- The smaller grade 6 chip is effected by polishing more that other grades of aggregate.
- Our results confirm that the higher a PSV value the better the skid resistance. However the small change in PSV compared to the large difference in DF tester skid resistance provides further evidence that the PSV values provide little evidence as to how well an aggregate will perform in situ.
- Further research into developing a direct relationship between PSV and the results from the Dynamic Friction Tester so that it can be applied directly to road surfaces.

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