The results of seismic downhole tests conducted at Hosoyama site were re-analyzed by looking at alternate picks of first arrival time for the length of the borehole. Three trials were conducted and pseudo interval velocity profiles as well as vertical travel time velocity profiles were generated for the given site.

The travel times were corrected from a slant travel time to corresponding vertical travel time using the following correction:

Correction = d / (d2 + s2)1/2

Where d refers to the depth to the receiver and s is the source offset distance.

Pseudo interval velocity profiles were generated by taking distances between successive depths and computing the time difference between them. Vertical travel time velocity profiles were generated by plotting travel times against depth and fitting linear best fit lines to demarcate specific layers and calculating the velocities of the respective layers.

A summary of the results are provided below.

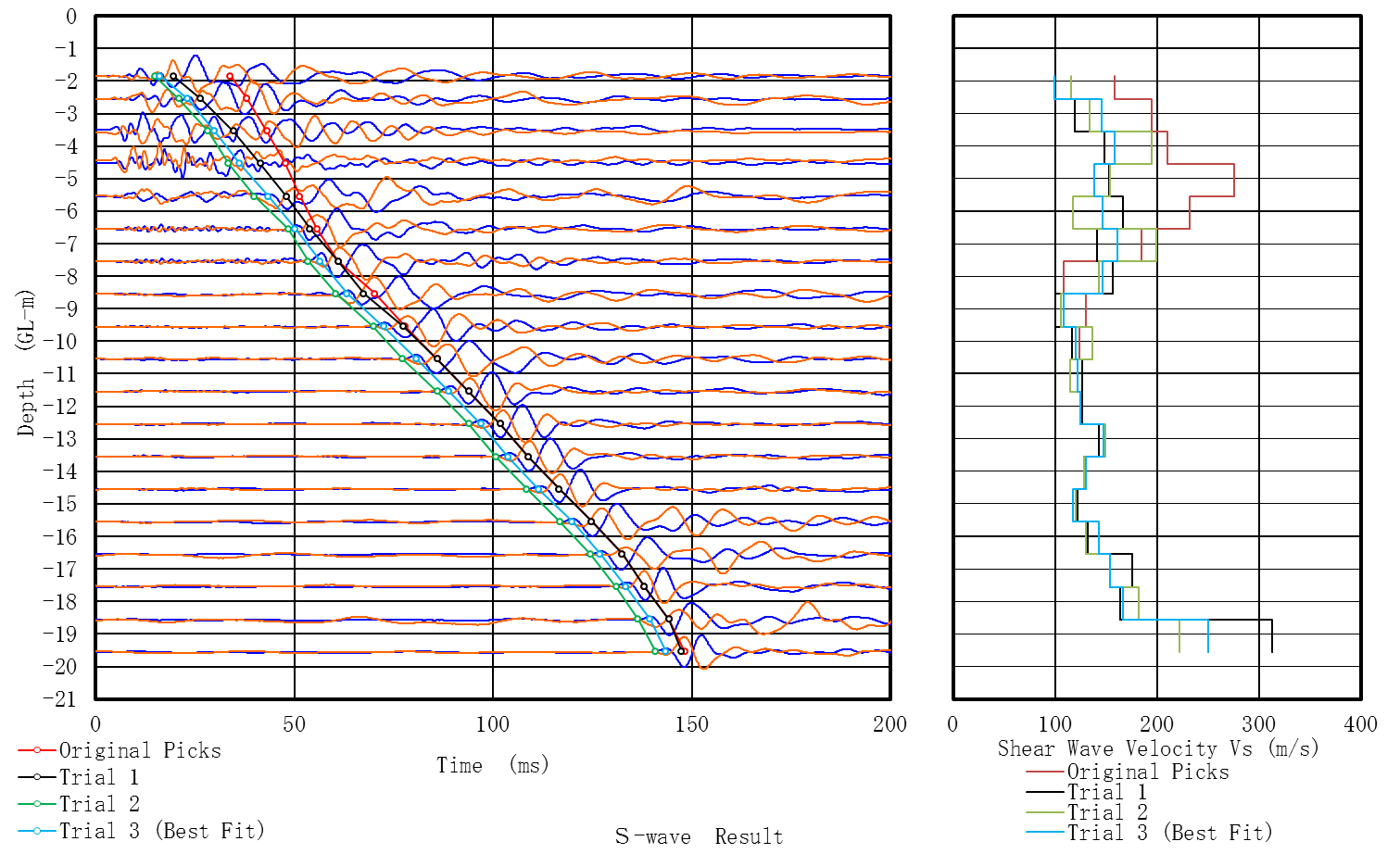


Figure 1: The different trials of first arrival picks along with their corresponding psuedo interval velocity profile

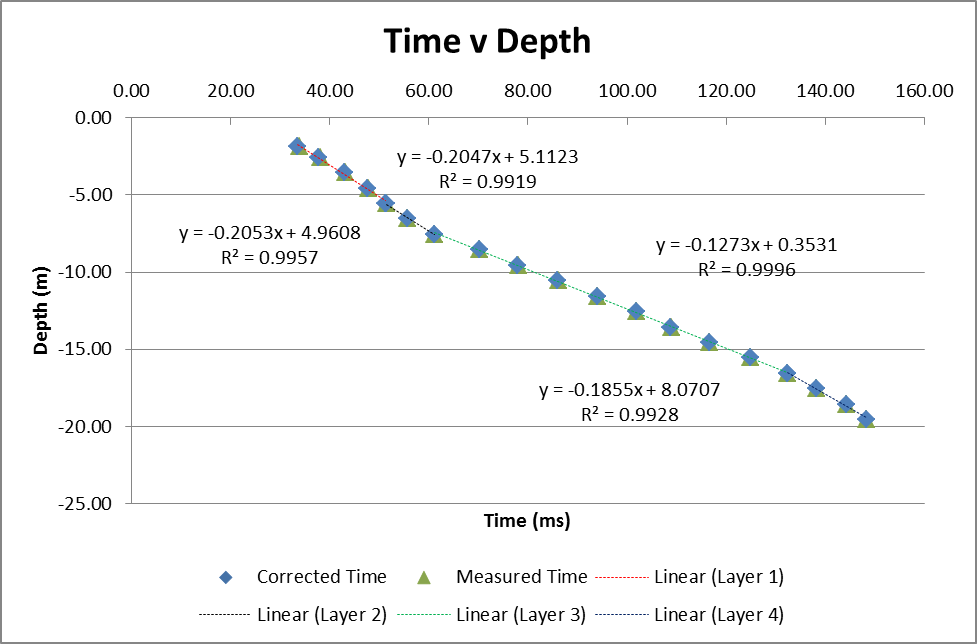


Figure 2: Fitting linear best fit lines to demarcate layers for original picks

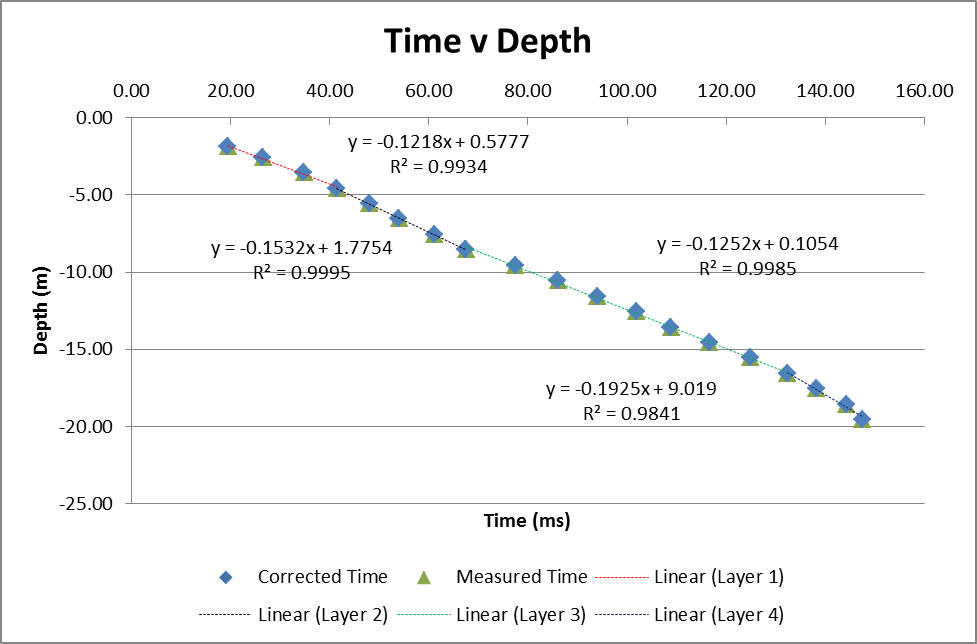


Figure 3: Fitting linear best fit lines to demarcate layers for trial 1 (Black Picks)

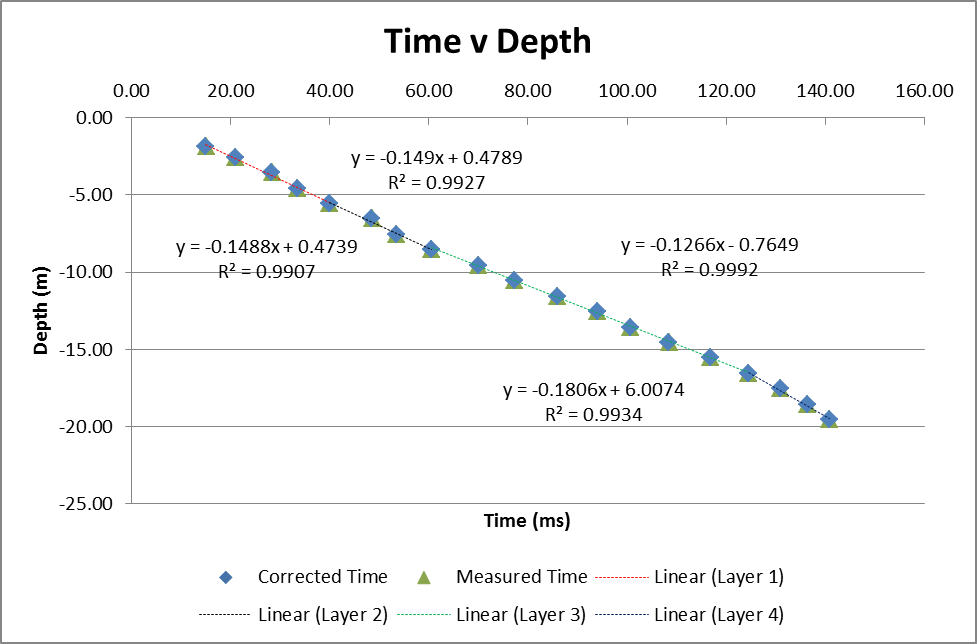


Figure 4: Fitting linear best fit lines to demarcate layers for trial 2 (Green Picks)

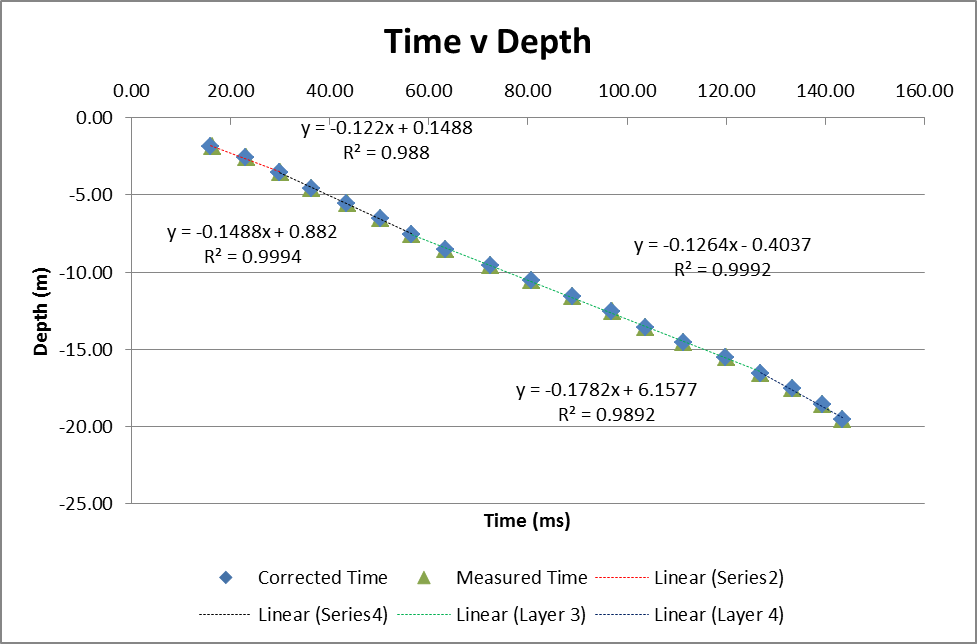


Figure 5: Fitting linear best fit lines to demarcate layers for trial 3 (Blue, best fit picks)

Using the layers demarcated above, vertical travel time velocity profile for each trial were generated as shown below:

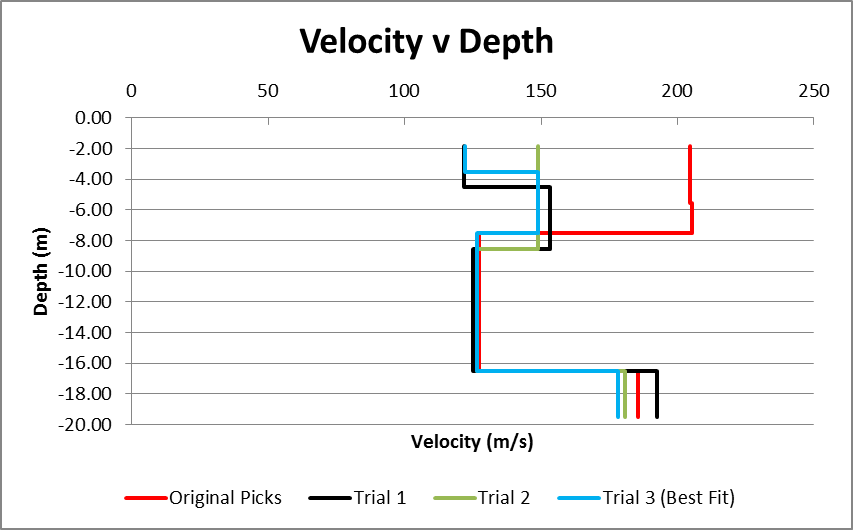


Figure 6: Vertical Travel Time Velocity Profiles

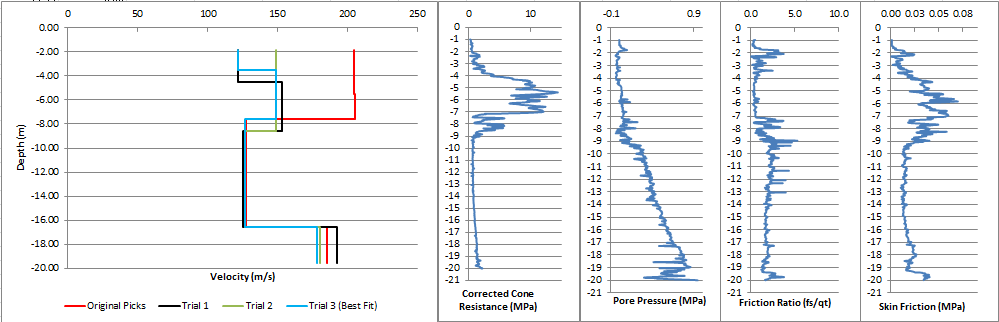


Figure 7: Comparison of Velocity Profiles with CPT log. Dotted lines indicating changes in layers in best case profile correspond with changes in the Cone Resistances and Skin Friction from the CPT logs.

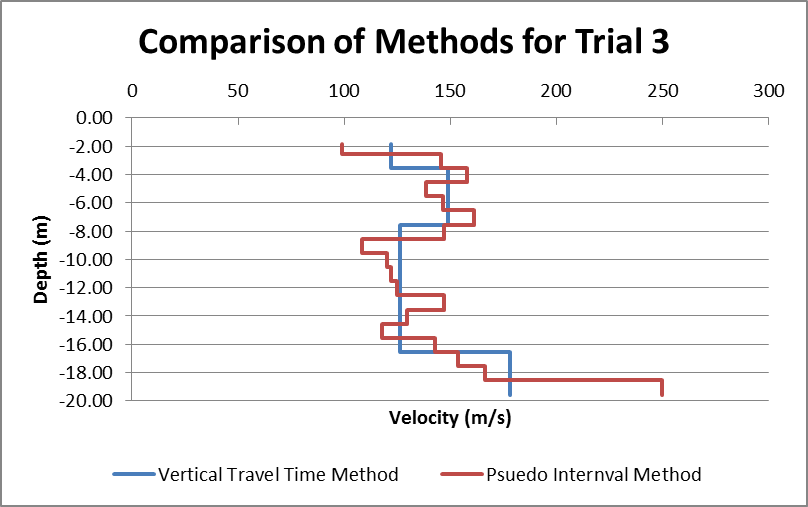


Figure 8: Comparison of the two velocity profile methods for trial 3 (Best Fit)

Table of velocity profile for Trial 3 (best fit):

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Layer** | **Start Depth (m)** | **End Depth (m)** | **Layer Thickness (m)** | **Shear Velocity (m/s)** |
| 1 | 1.85 | 3.55 | 1.70 | 122 |
| 2 | 3.55 | 7.55 | 4 | 148.8 |
| 3 | 7.55 | 16.55 | 9 | 126.4 |
| 4 | 16.55 | 19.55 | 3 | 178.2 |