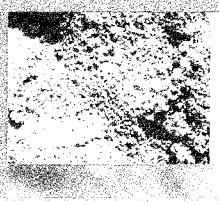
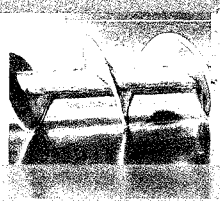



FOUNDATION TESTING
& CONSULTING, LLC

9100 Larsen Drive Overland Park, KS 66214
913-626-8499
913-439-1703

November 11, 2008

Mr. Jay Pool
Longfellow Drilling, Inc.
1209 County Highway J23
Clearfield, IA 50840-8814

Subject: CSL Report No. 1
Survey of Test Shaft
Highway 52 Replacement Bridge over I.C.E. RR and Mill Creek
Boone, Iowa
FTC Project Number 013-2008

Dear Mr. Pool,

Foundation Testing and Consulting, LLC (FTC) is pleased to present the results of our evaluation of the CSL survey for the referenced shaft. The survey was performed on November 10, 2008.

Summary of Results

Based upon data collected during our CSL survey, we find that full-length of the partial shaft constructed consists of good quality concrete with the exception of the upper 2 to 4 inches which appeared to correspond to poor quality concrete. Since the physical measurement of access tube stickup above the top of the shaft had to be made with the tape under water and concrete not visible, there is the possibility that this upper material consists of sediment or concrete laitance.

Shaft Dimensions

Key shaft information is summarized in Table 1 below.

Table 1 – Shaft Data

Shaft Name	Shaft Diameter (inches)	Number of Tubes	Cast Date	Survey Date	*Measured Length	Planned Length
Test Shaft	36	4	11/5/08	11/10/08	9.5	**

* Calculated based on maximum length of access tubes inside shaft
**Inspectors log for shaft was not available at time of survey

Survey Conditions

At the time of the survey, the weather was sunny with a temperate of approximately 40 degrees. We painted the northernmost tube (tube 1) yellow at the shaft. Key aspects of the shaft survey conditions are summarized in Table 2.

Table 2 – Shaft Survey Conditions

Shaft Name	Range in Tube Spacing (in)	Average Tube Stick-up (ft)	Location of Shaft Top Relative to Ground Surface	Adequate Water Filling of Access Tubes
Test Shaft	18.5 to 27.0	16.2	12 feet below	yes

The data were collected using the latest version of CSL equipment and software manufactured by Olson Instruments, Inc. Data were collected using a gain of 100 or 200 and a depth wheel setting of C (one data record for every 2.19 inches of shaft length). The data collection and analysis were performed by the undersigned.

Survey Results

Plots were generated of the first arrival time (FAT), stacked arrival time (waterfall) and the signal energy versus depth for each tube pair combination (refer to printed plots included with this report). Note that data above top of shaft was deleted from the plots. The following condition rating criteria were applied during our evaluation of results:

Table 3 – Concrete Condition Rating Criteria

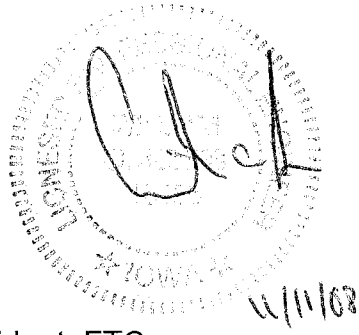
Concrete Condition Rating	Rating Symbol	Velocity Reduction	Indicative Results
Good	G	0 to 10%	Acceptable concrete
Questionable	Q	10 to 25%	Minor concrete contamination or intrusion. Questionable quality concrete.
Poor/Defect	P/D	>25%	Defects exist, possible water or slurry contamination, soil intrusion and/or poor quality concrete.
Water	W	Velocity = 4760 to 5005 ft/sec	Water intrusion, of water filled gravel with few or no fines present.
No Signal	NS	No signal received	Soil intrusion or other severe defect absorbed the signal, tube debonding if near shaft top.

Based upon our evaluation of the CSL results (FAT) using the criteria listed in Table 3 and signal energy, we find that the shaft consists of good quality concrete with the exception of the top 2 to 4 inches in all tube pairs as annotated on the attached signal and FAT versus depth plots. The anomaly at the top of the shaft was characterized by questionable to poor quality concrete with a velocity reduction ranging from 13 to 45 percent. Since the physical measurement of access tube stickup above the top of the shaft had to be made with the tape under water and concrete not visible, there is the possibility that this upper material consists of sediment or concrete laitance.

We understand that the test shaft will be used to conduct and O-cell test and will not be incorporated into the construction of the bridge.

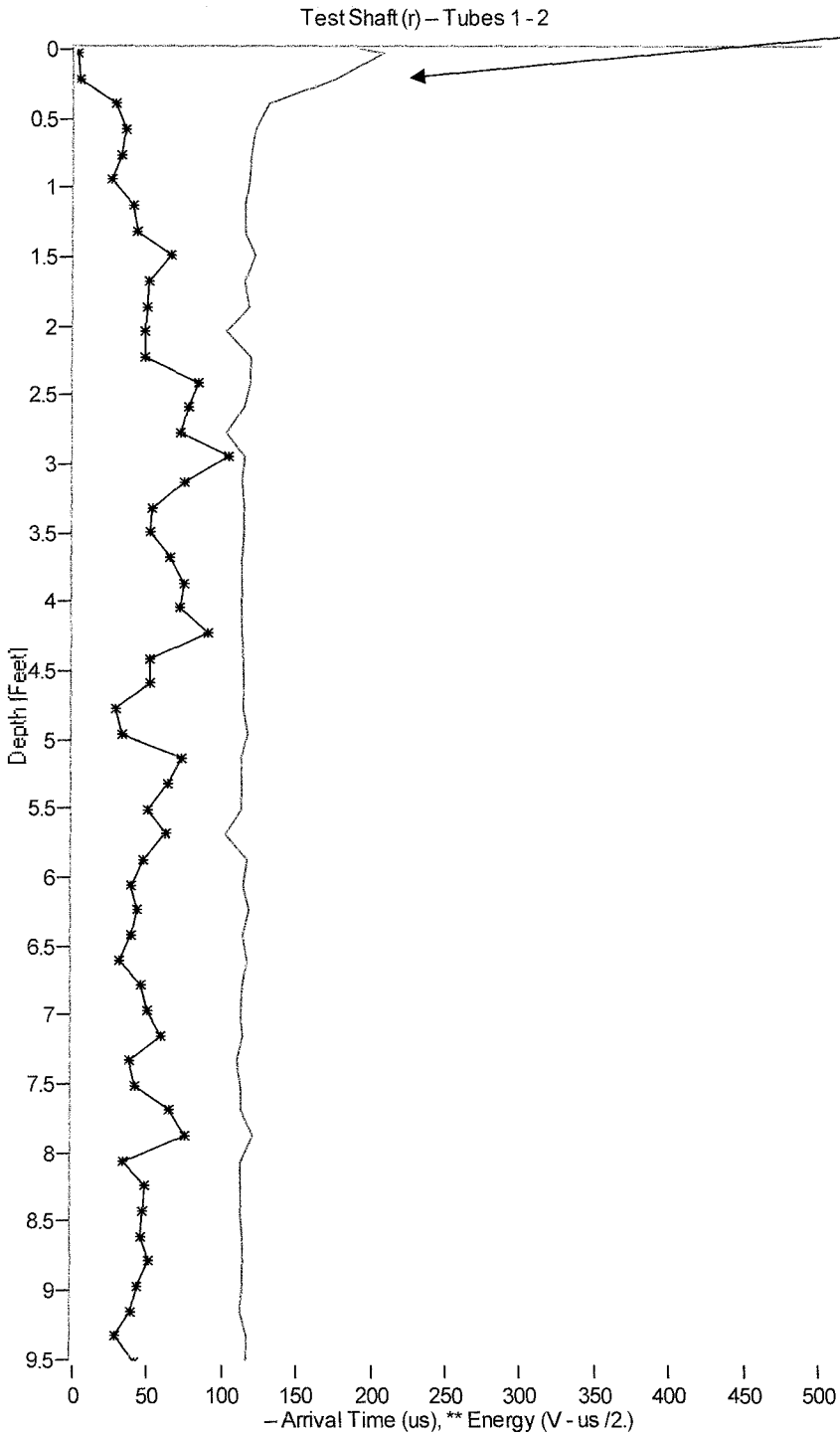
Please contact me if you have any questions.

Sincerely,



William C. Jones, P.E. – President, FTC

Attachment (12 Plots of signal energy, FAT and stack arrival time versus depth for each tube pair for the shafts surveyed)



Questionable to Poor Quality Upper 4 inches

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Phone: 913-626-8499
Fax: 913-439-1703

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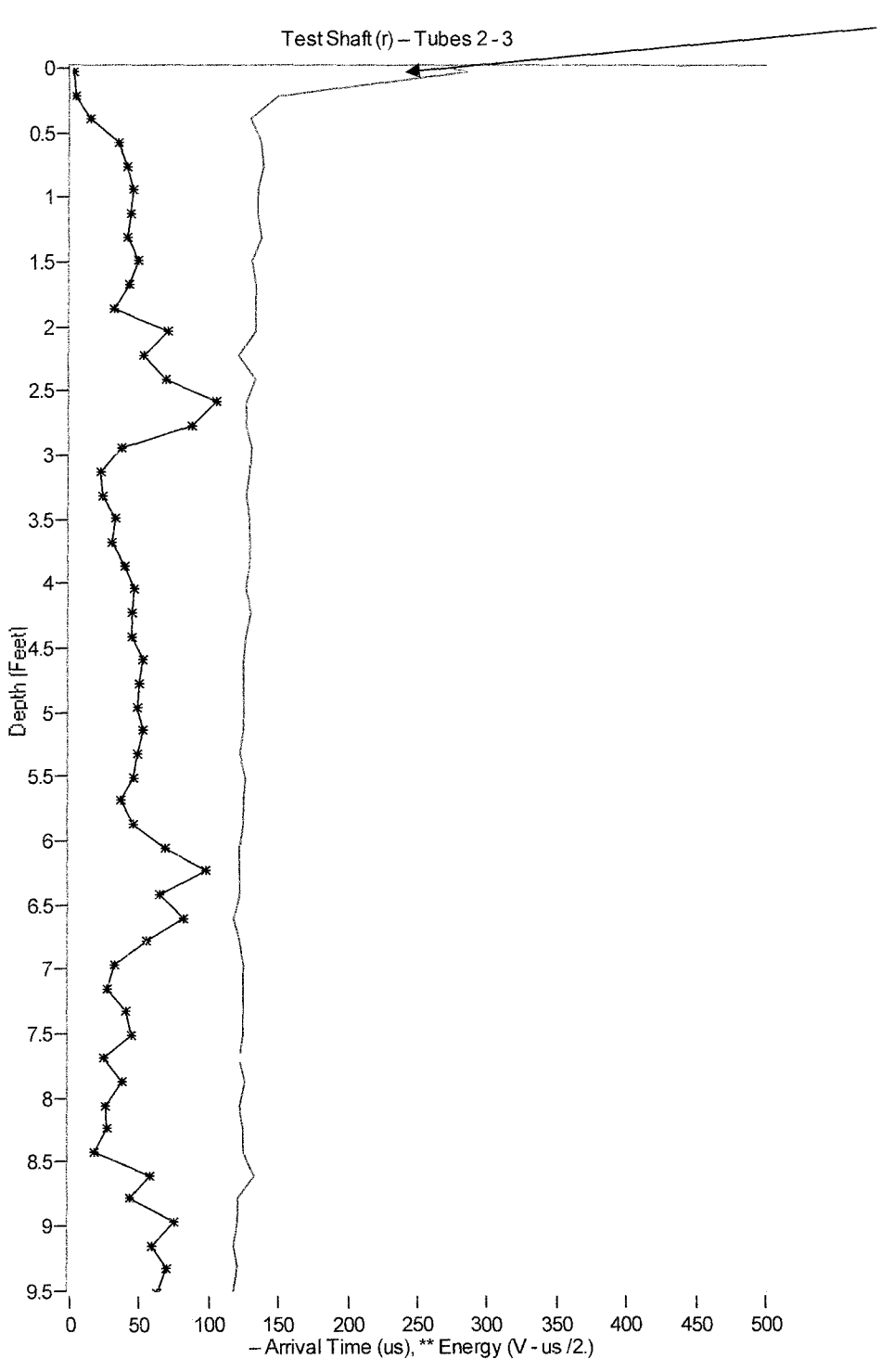

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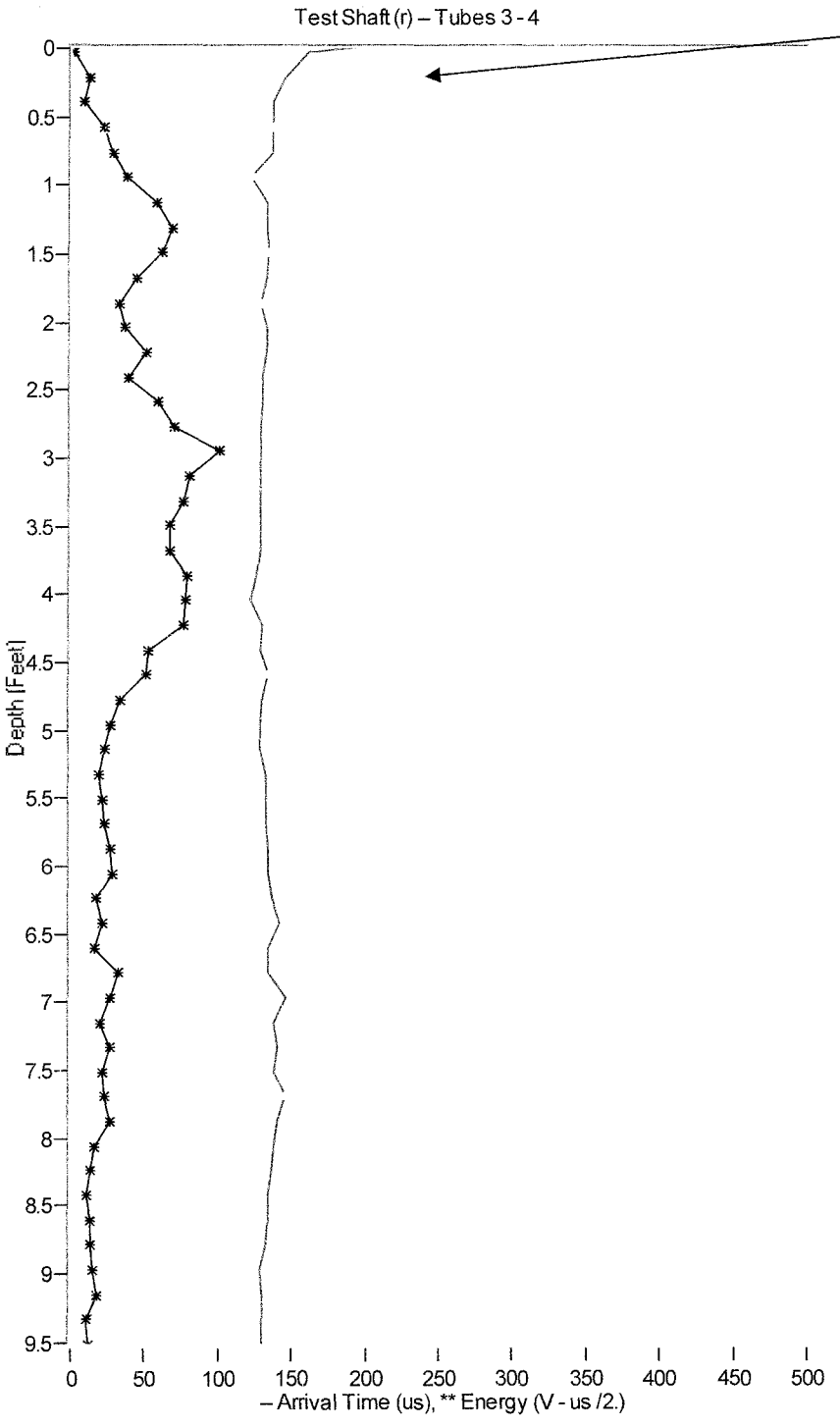

Questionable to
Poor Quality
Upper 2 inches

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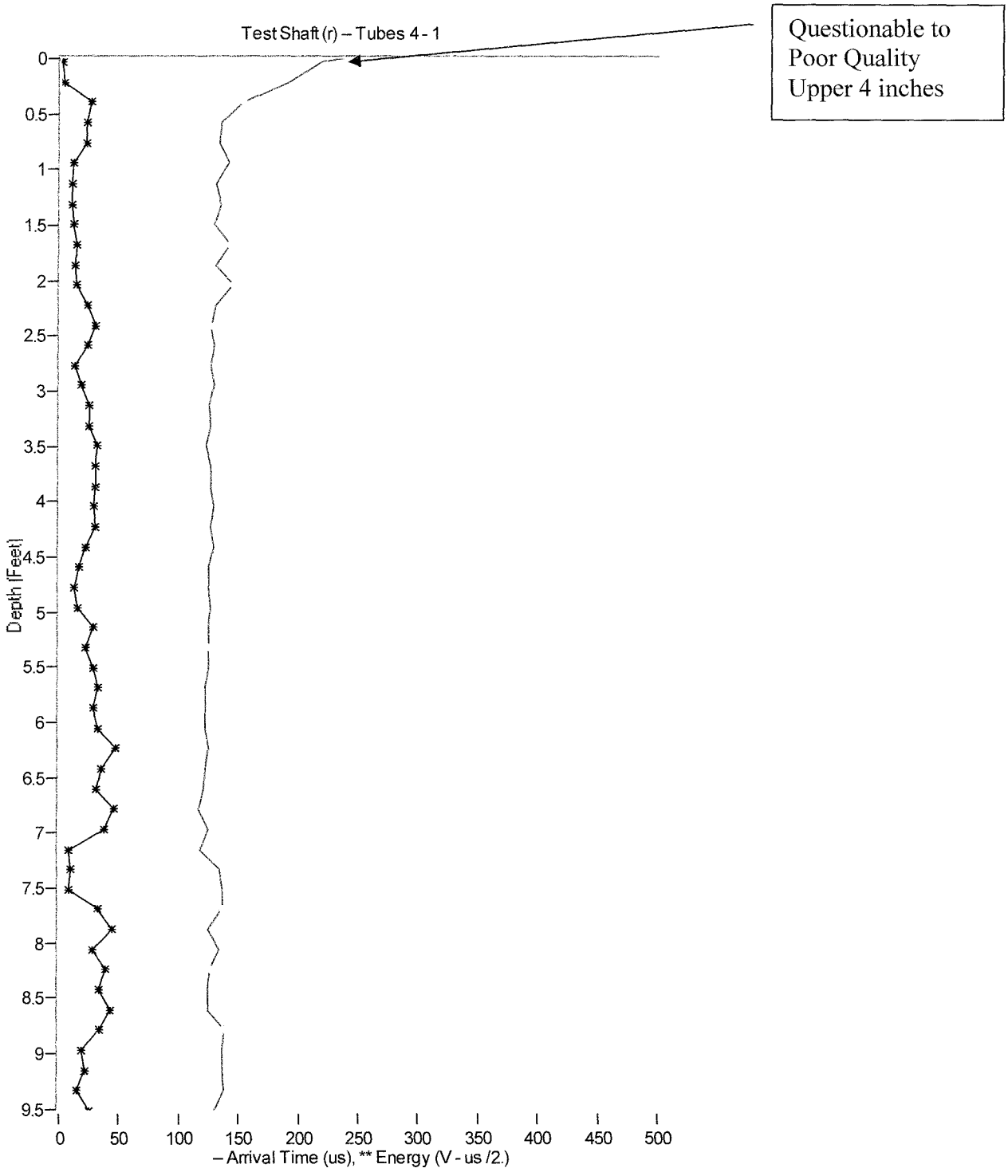

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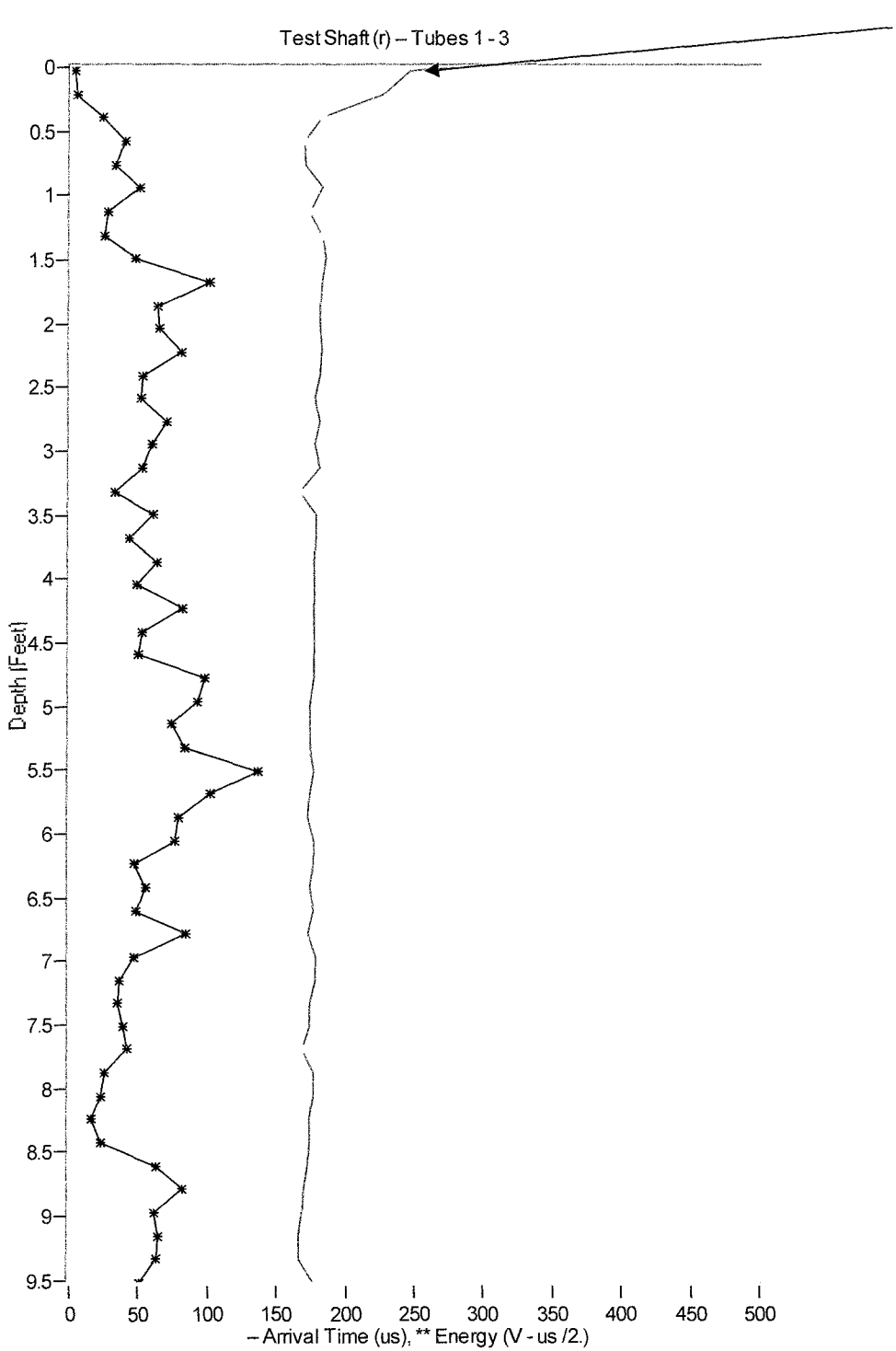

Questionable to Poor Quality Upper 4 inches

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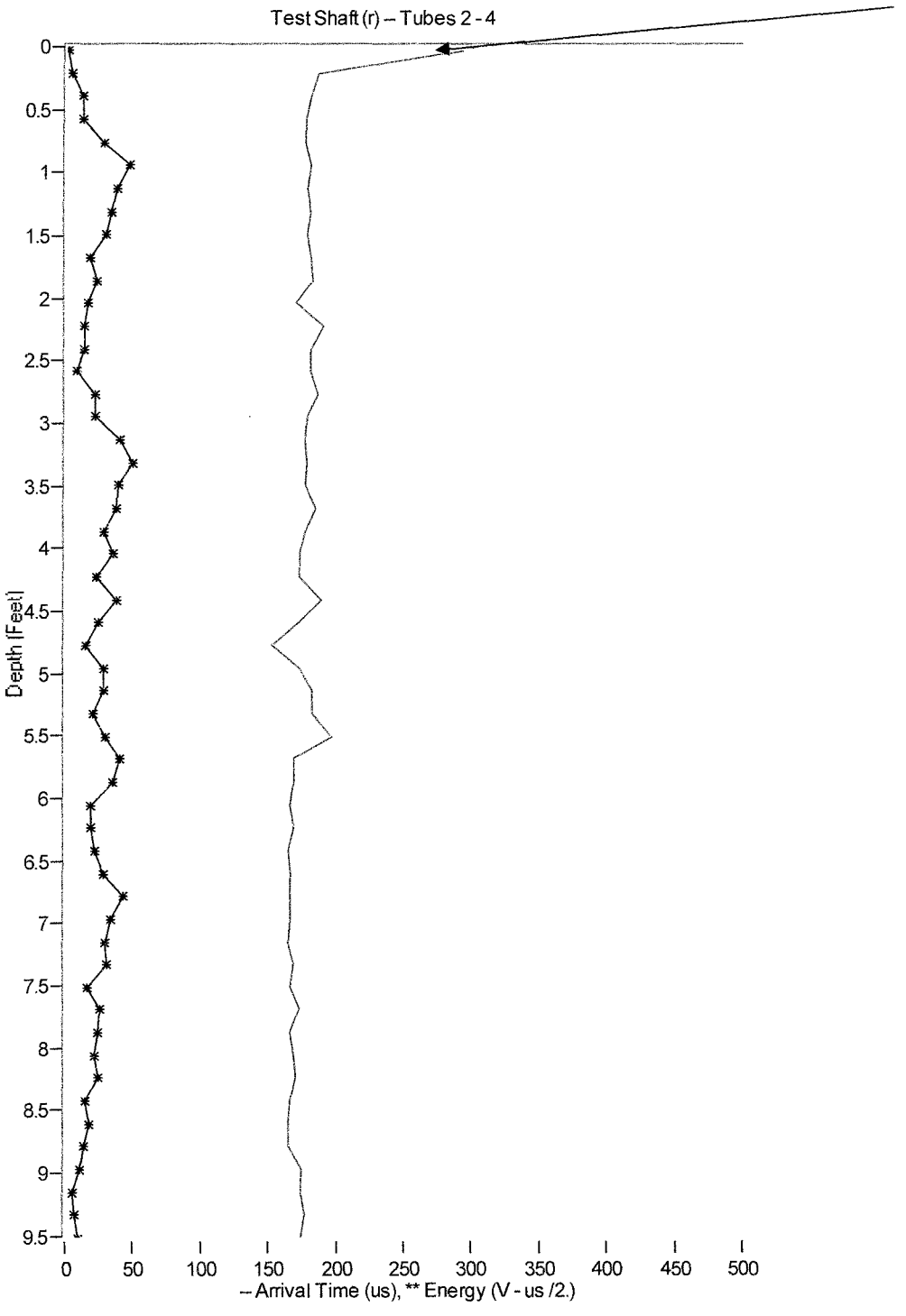

Questionable to Poor Quality Upper 4 inches

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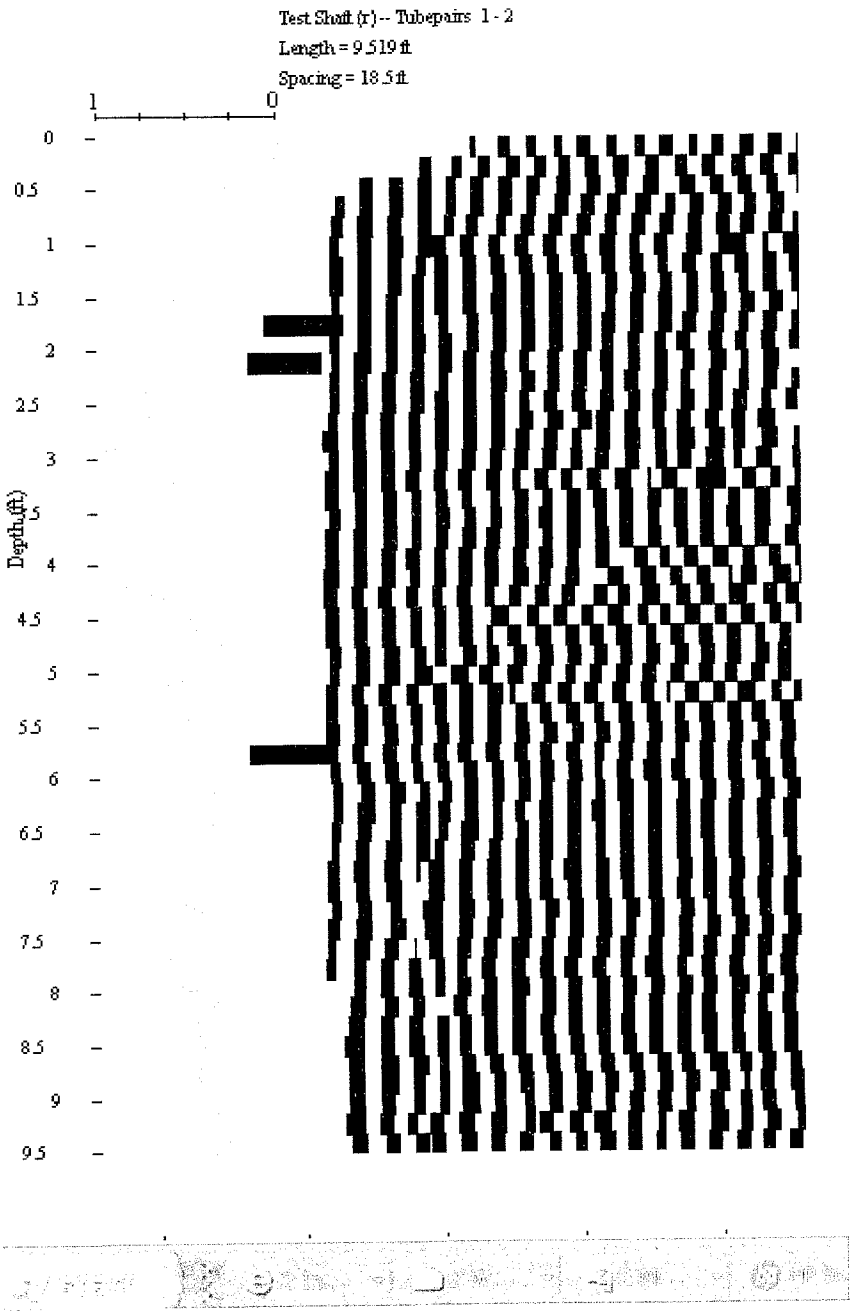

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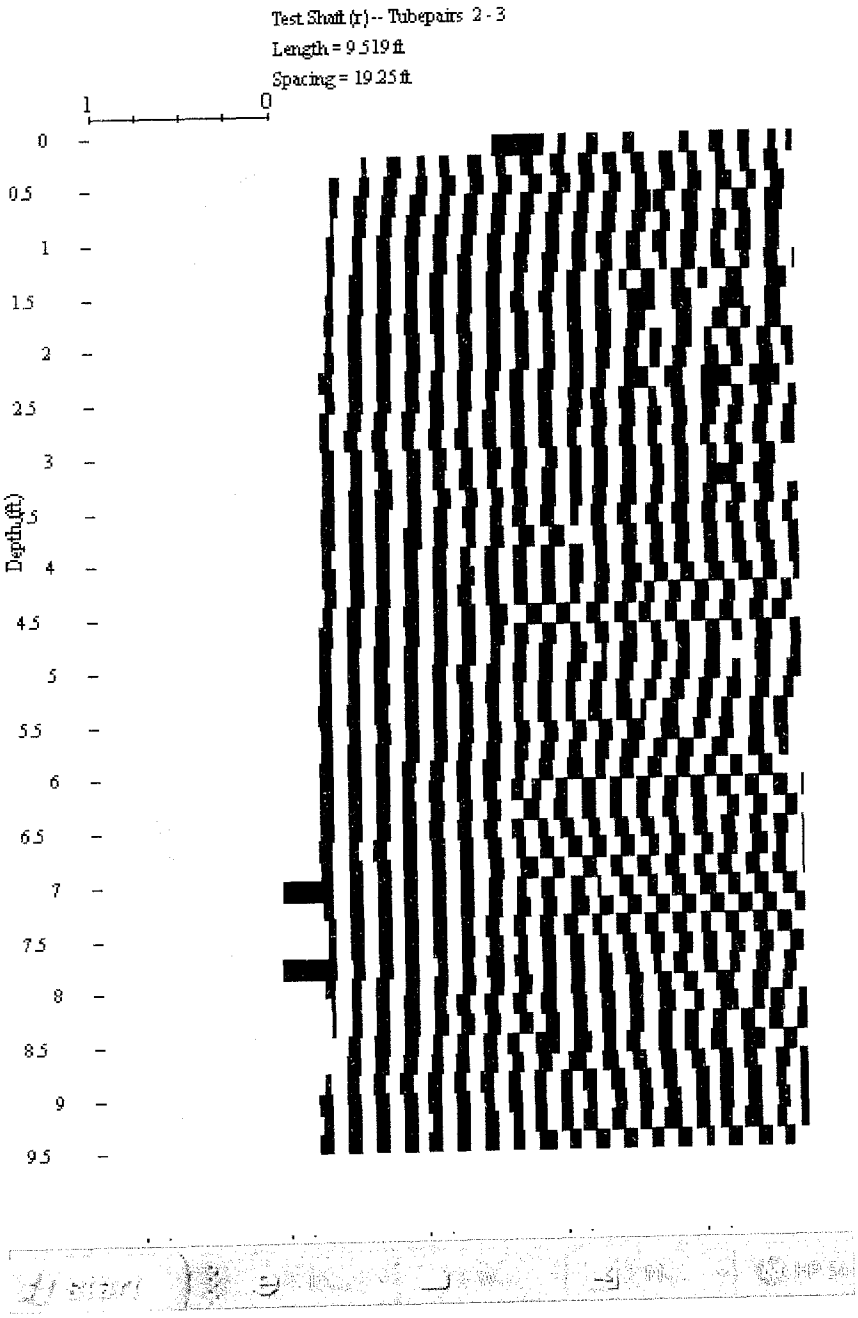

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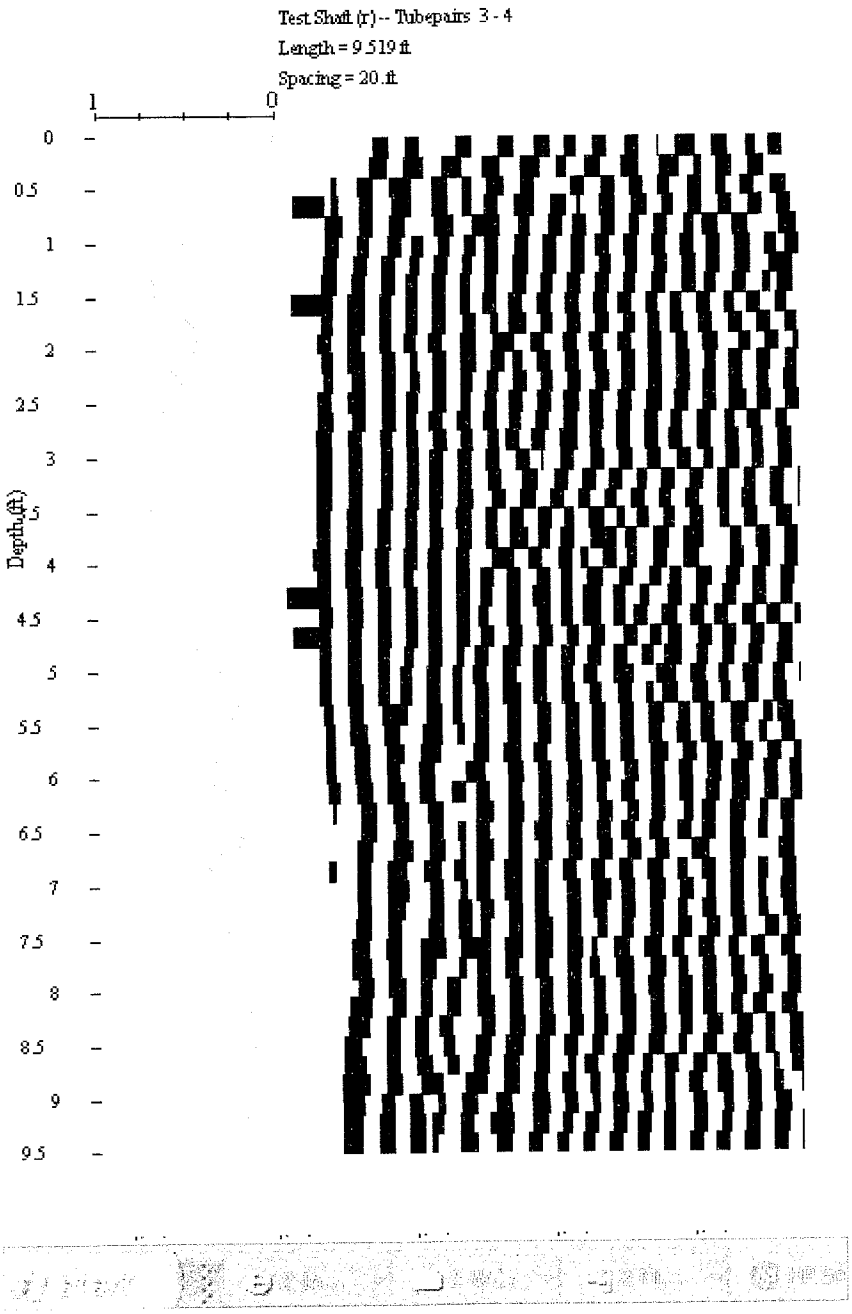

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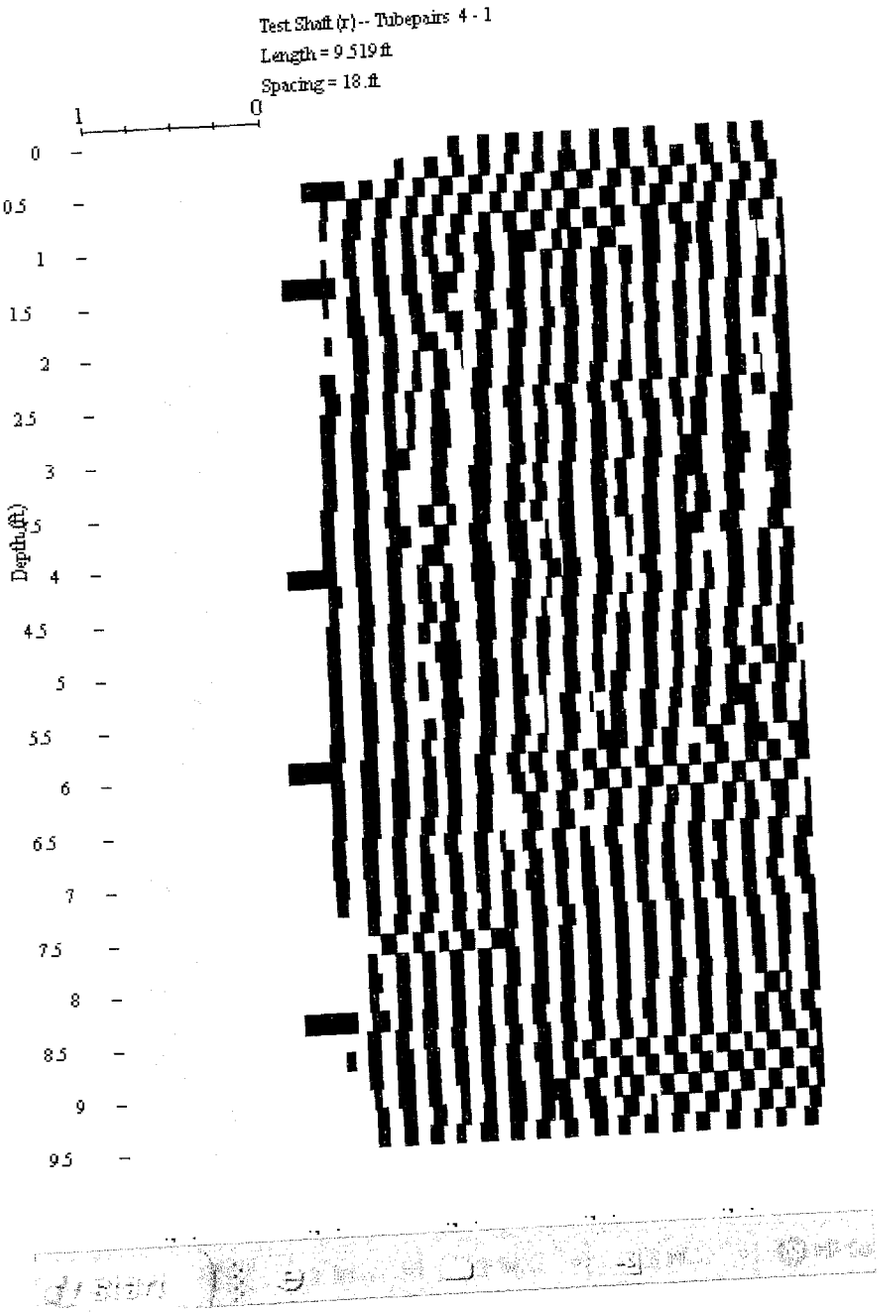

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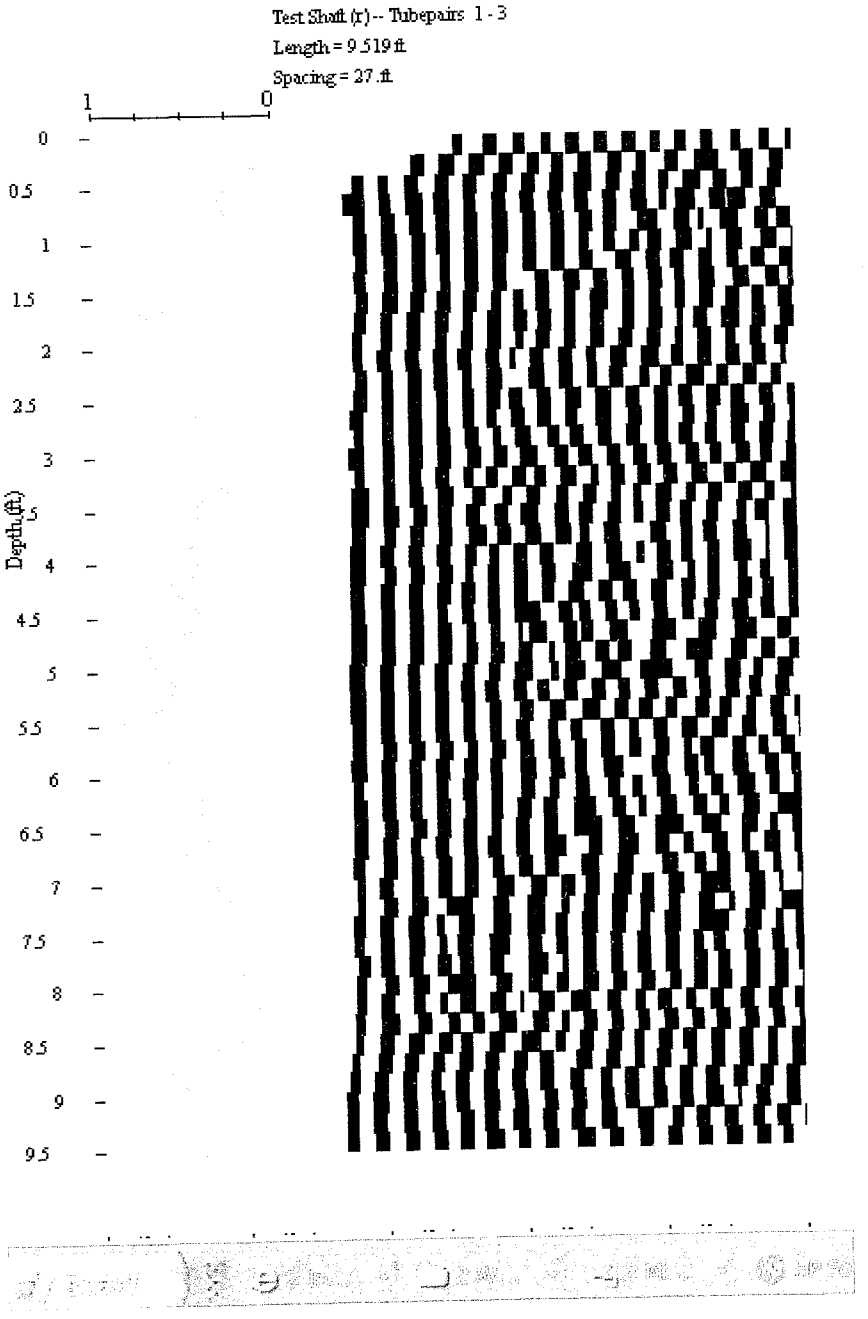

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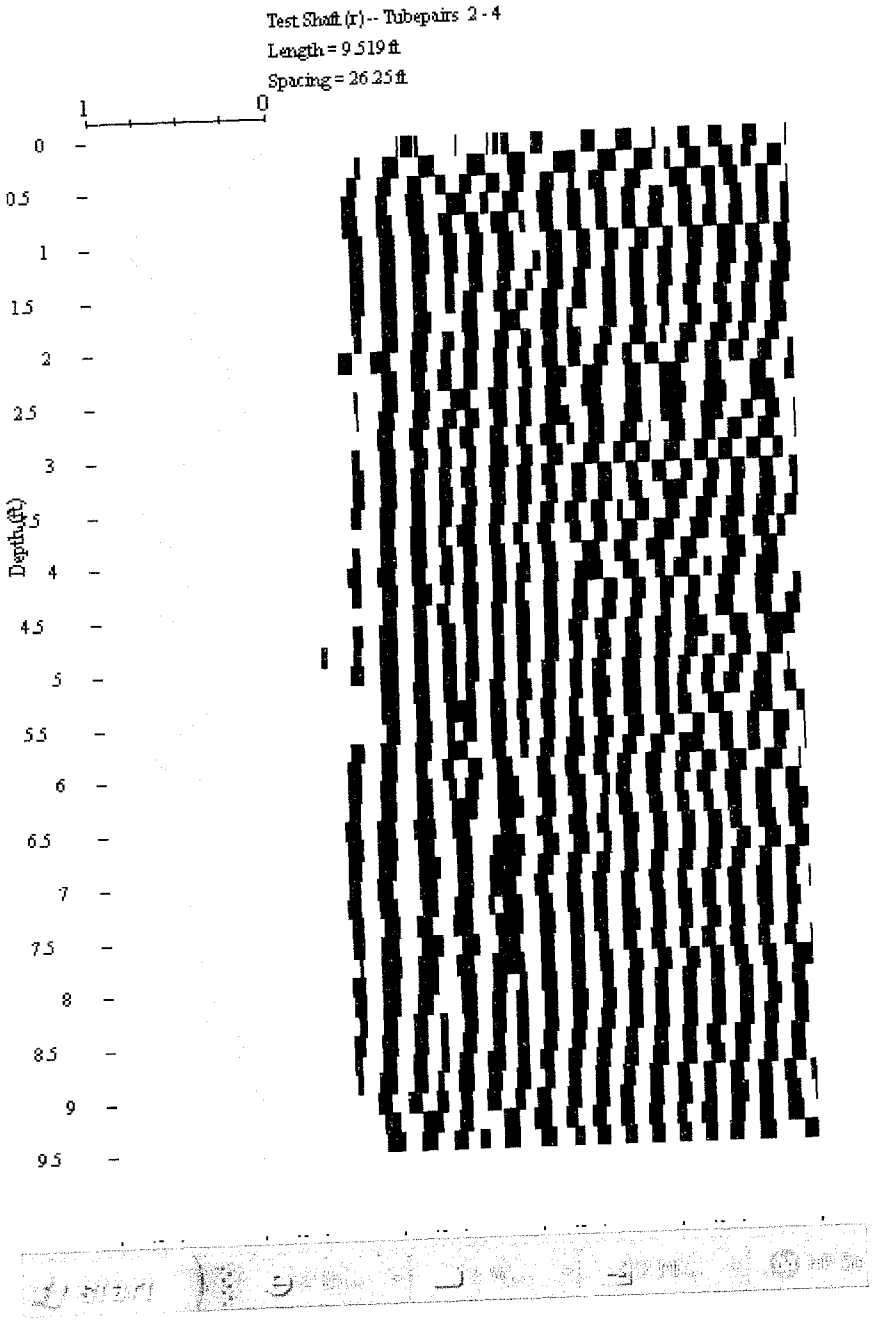

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