

# APPENDIX A WAVEFORM ANALYSIS FIGURES

Figure 13: Waveform Analysis of Pile 1, 10M

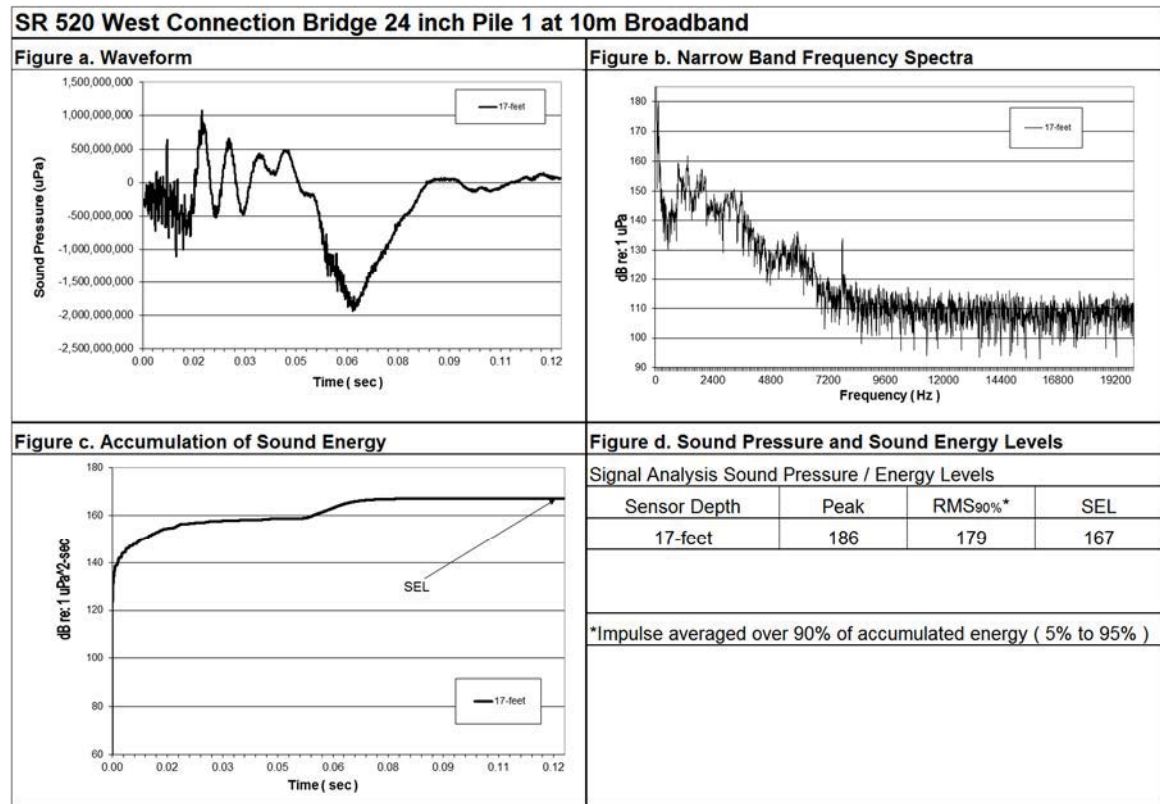


Figure 14: Waveform analysis of Pile 1, 3H

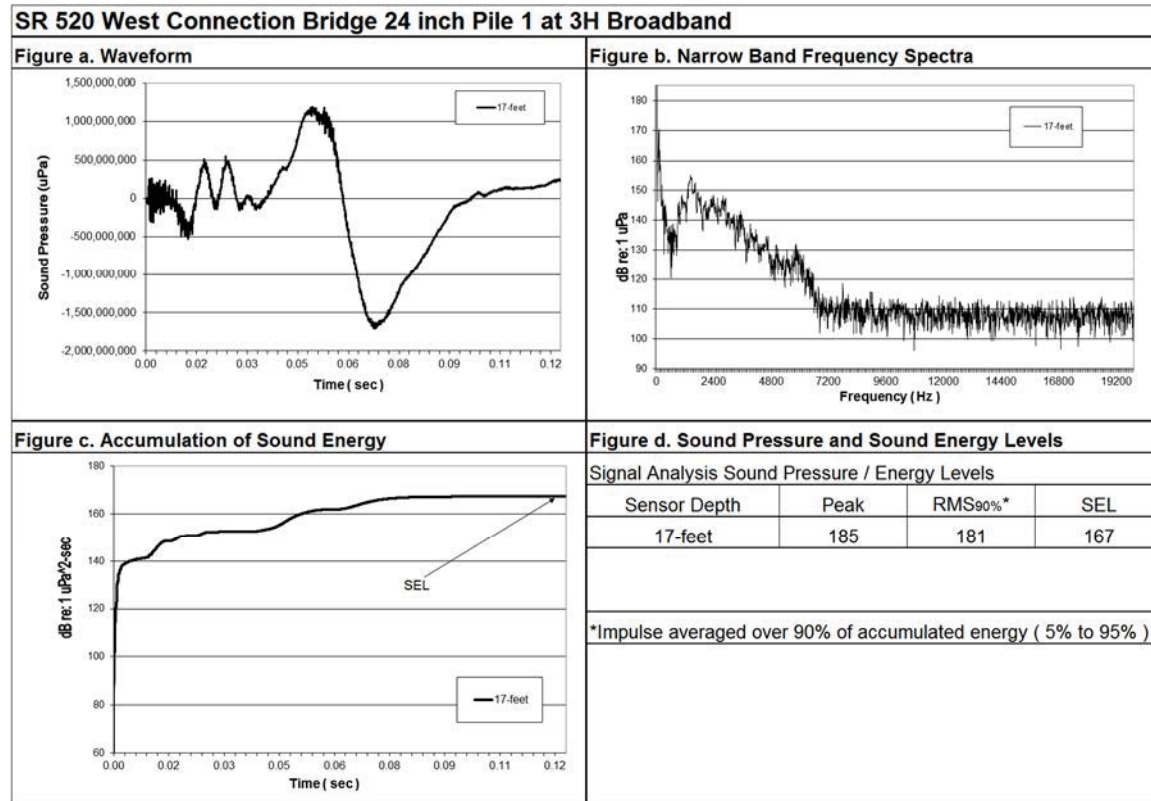


Figure 15: Waveform analysis of Pile 2a, 10M

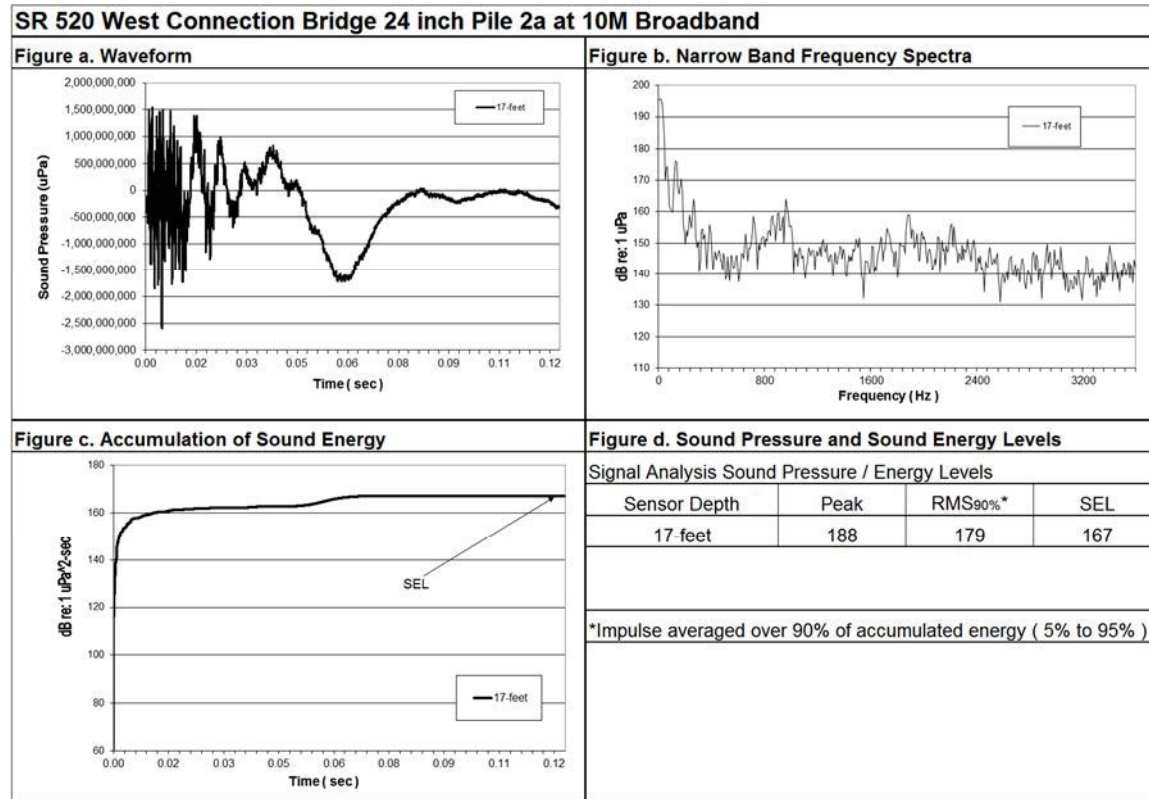


Figure 16: Waveform analysis of Pile 2a, 3H

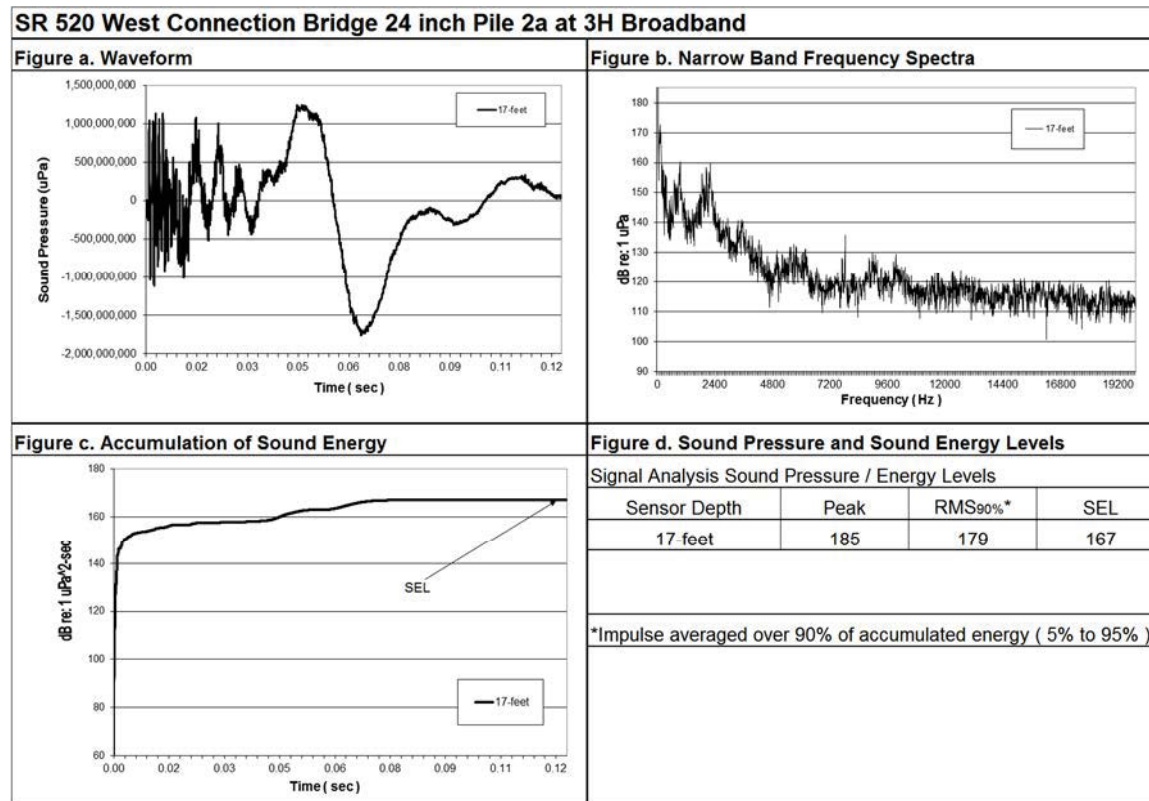


Figure 17: Waveform analysis of Pile 2b, 10M

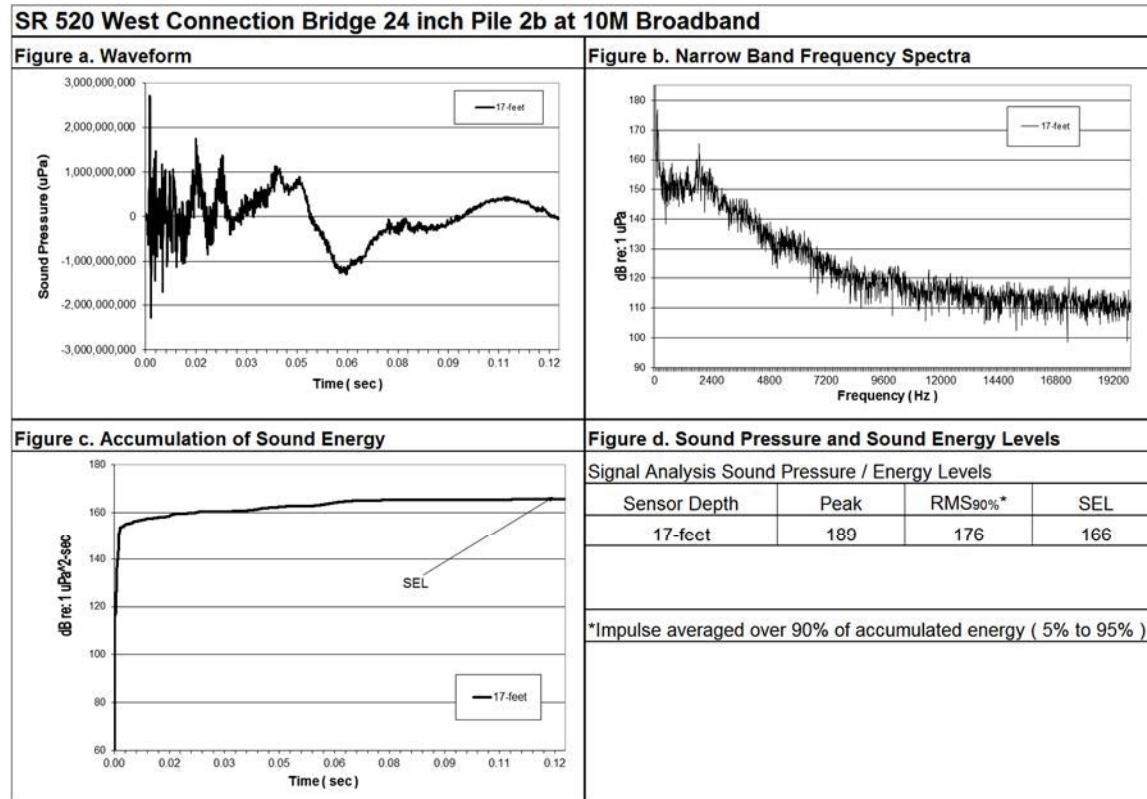
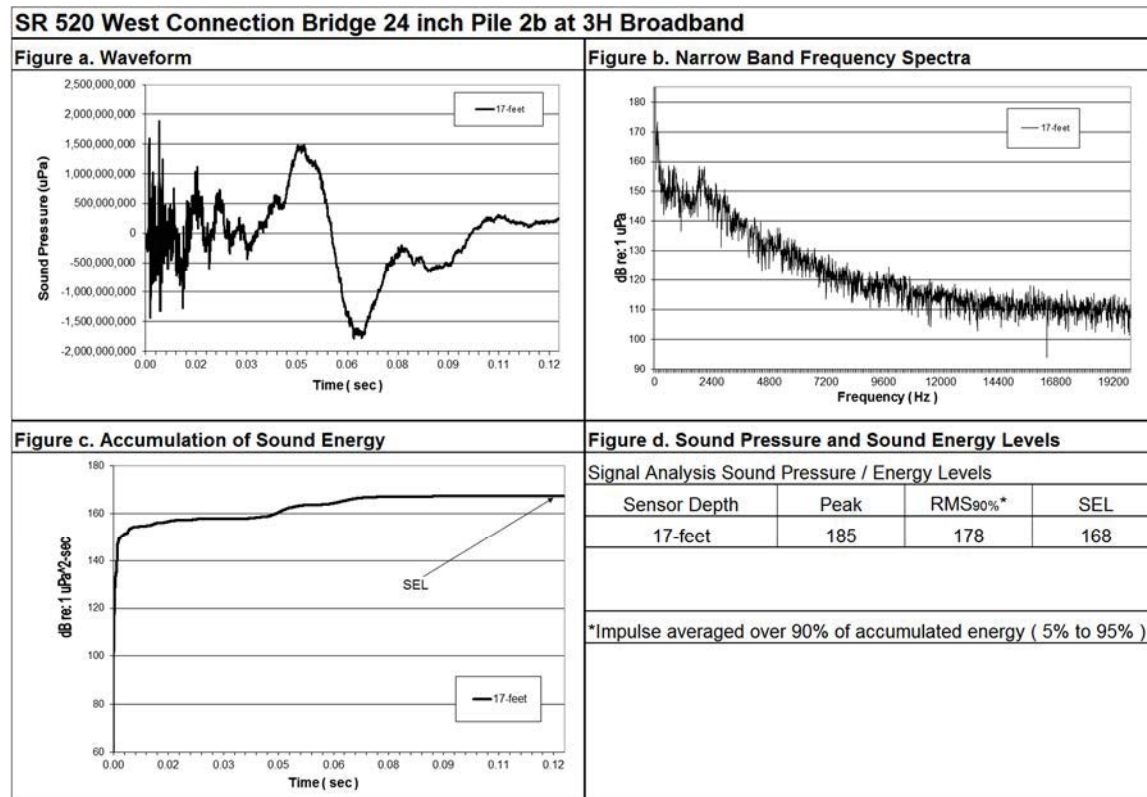
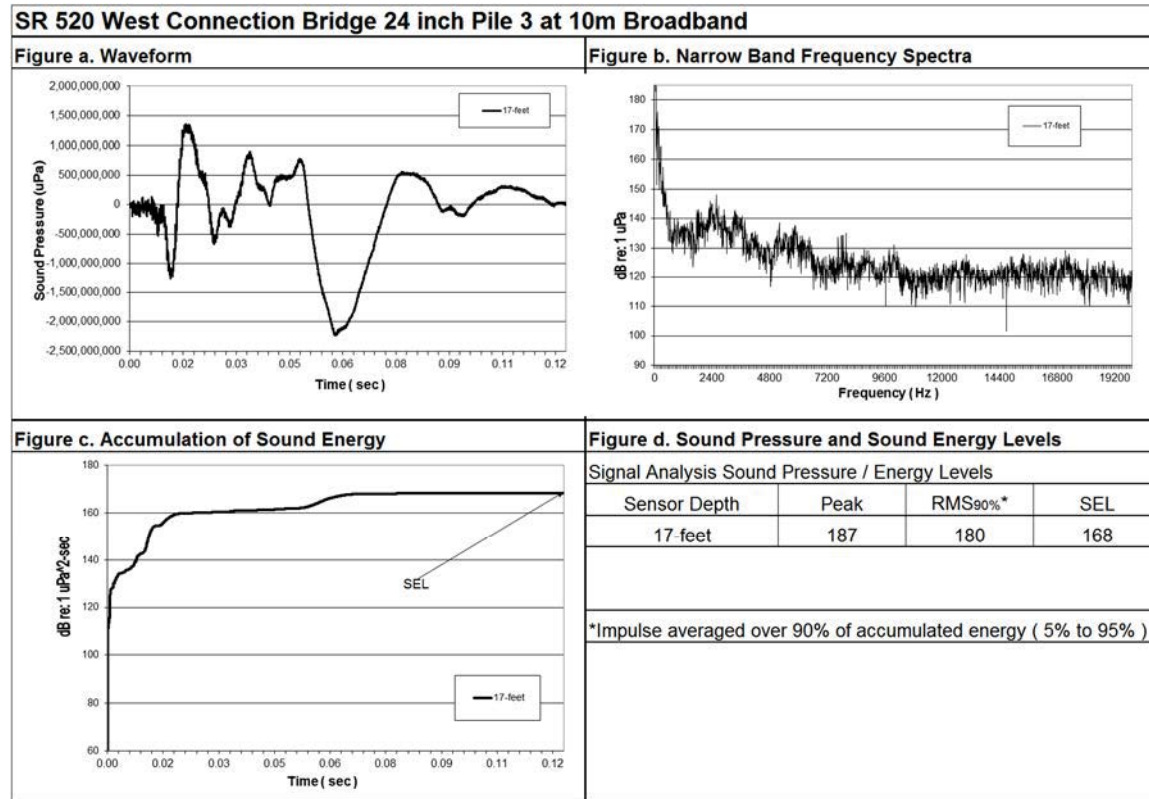


Figure 18: Waveform analysis of Pile 2b, 3H



**Figure 19: Waveform analysis of Pile 3, 10M**



**Figure 20: Waveform analysis of Pile 3, 3H**

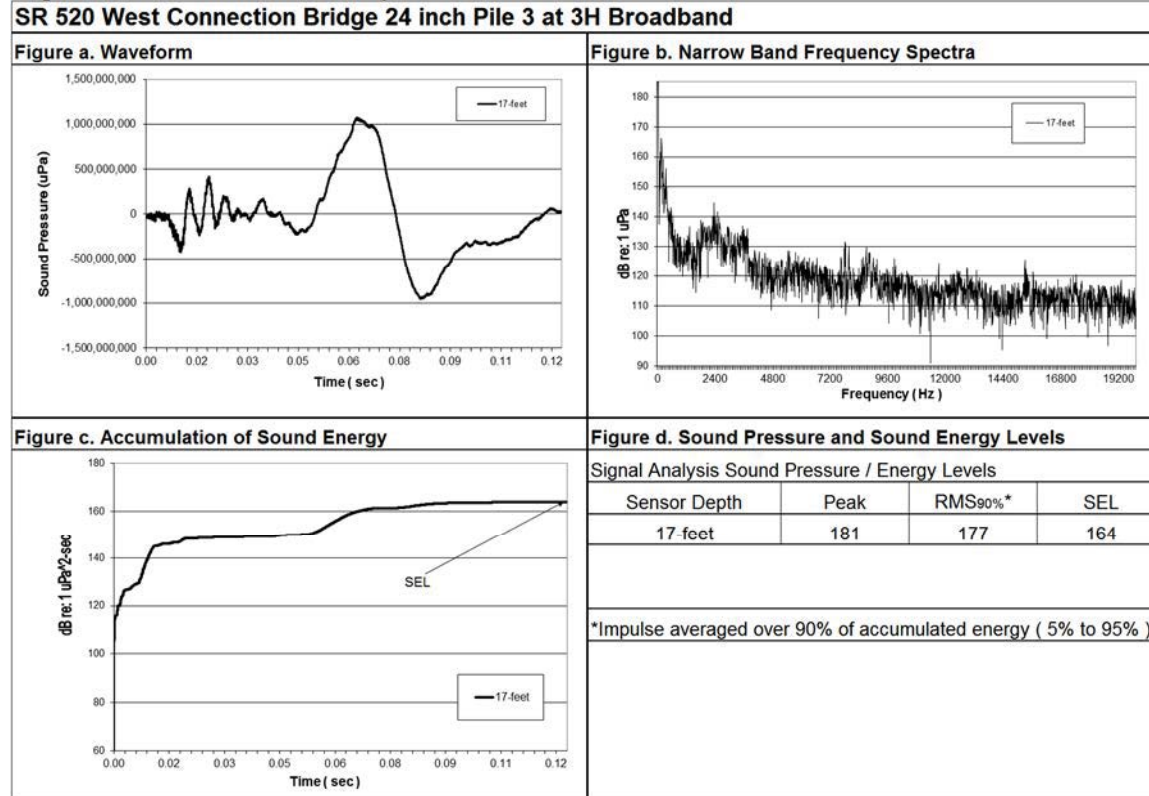


Figure 21: Waveform analysis of Pile 4, 10M

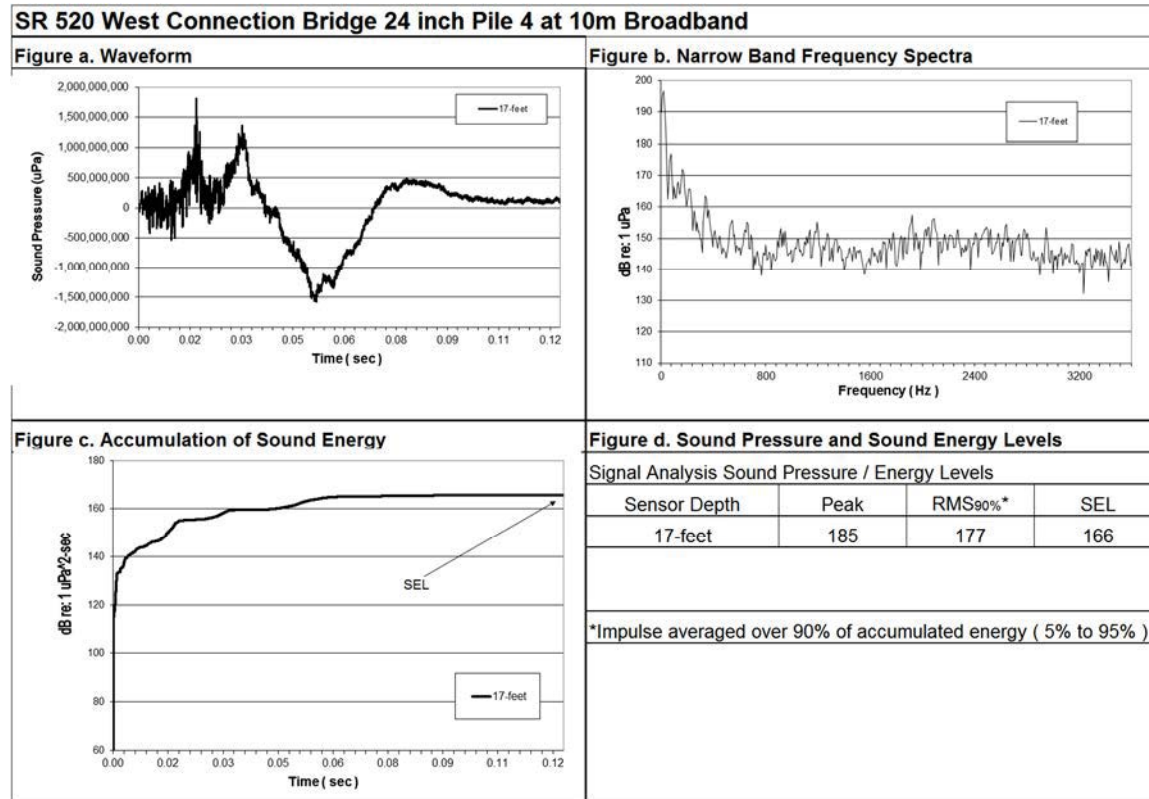


Figure 22: Waveform analysis of Pile 4, 3H

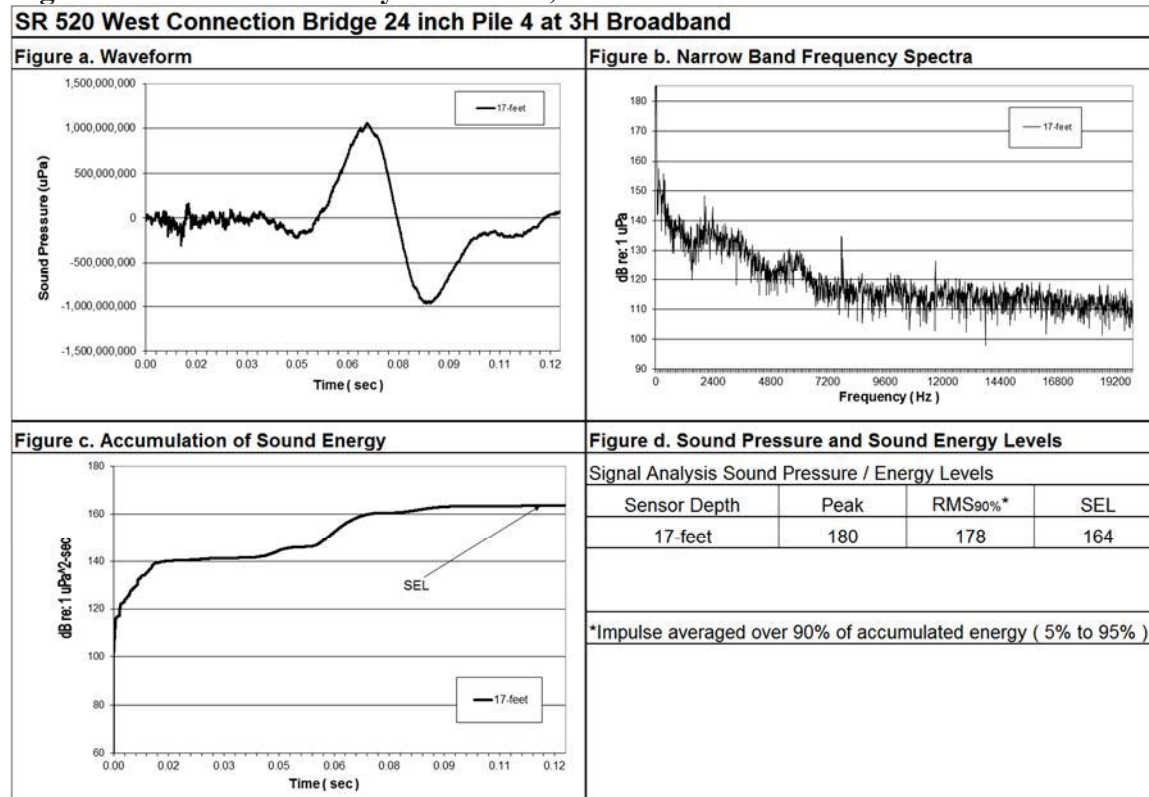
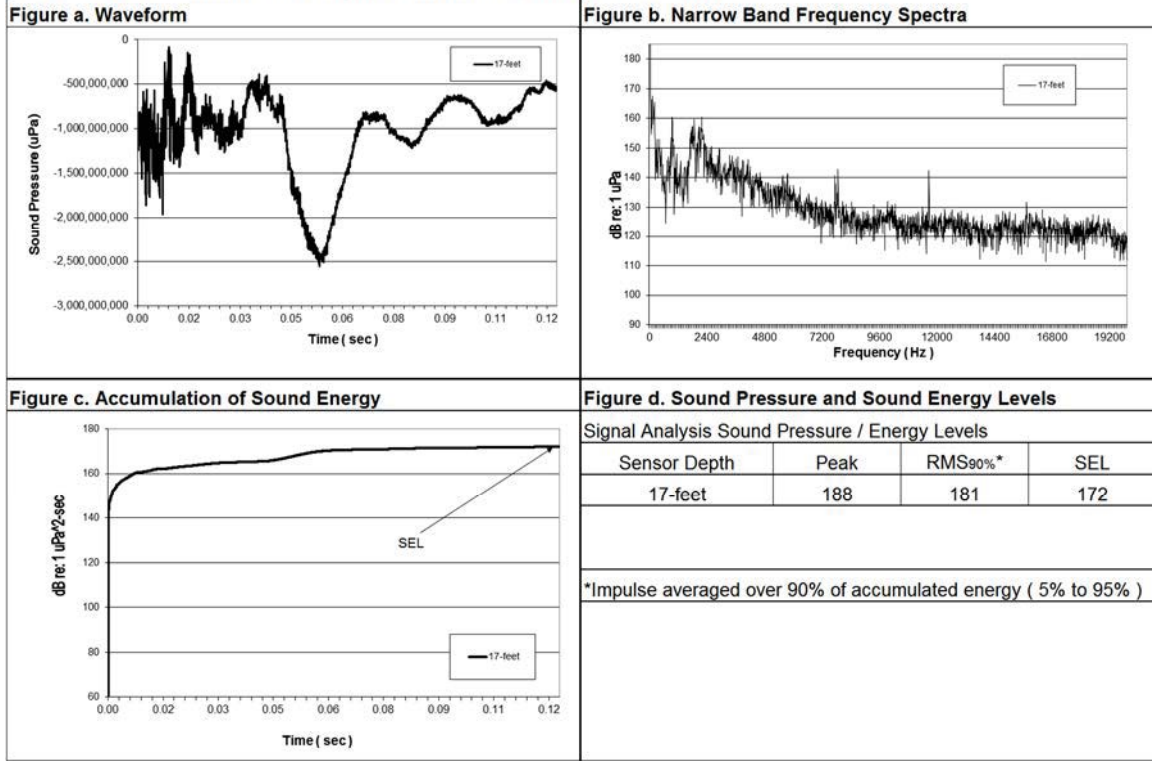


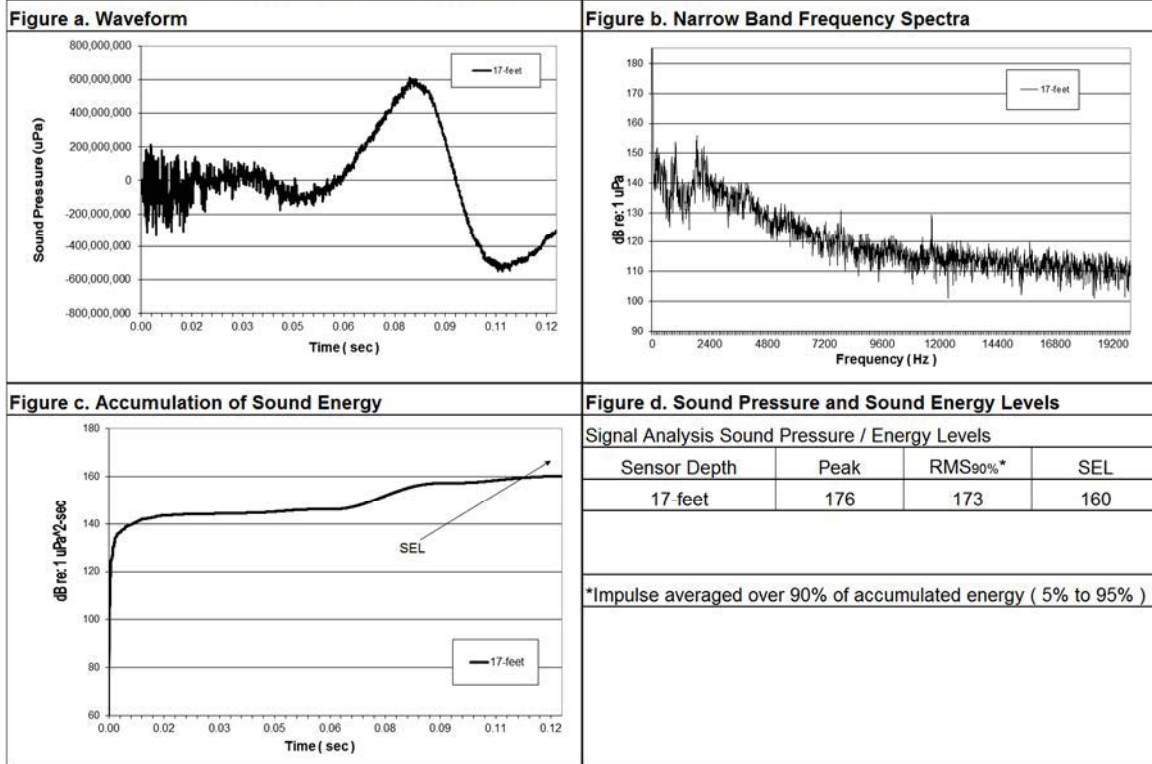
Figure 23: Waveform analysis of Pile 5, 10M

**SR 520 West Connection Bridge 24 inch Pile 5 at 10m Broadband**

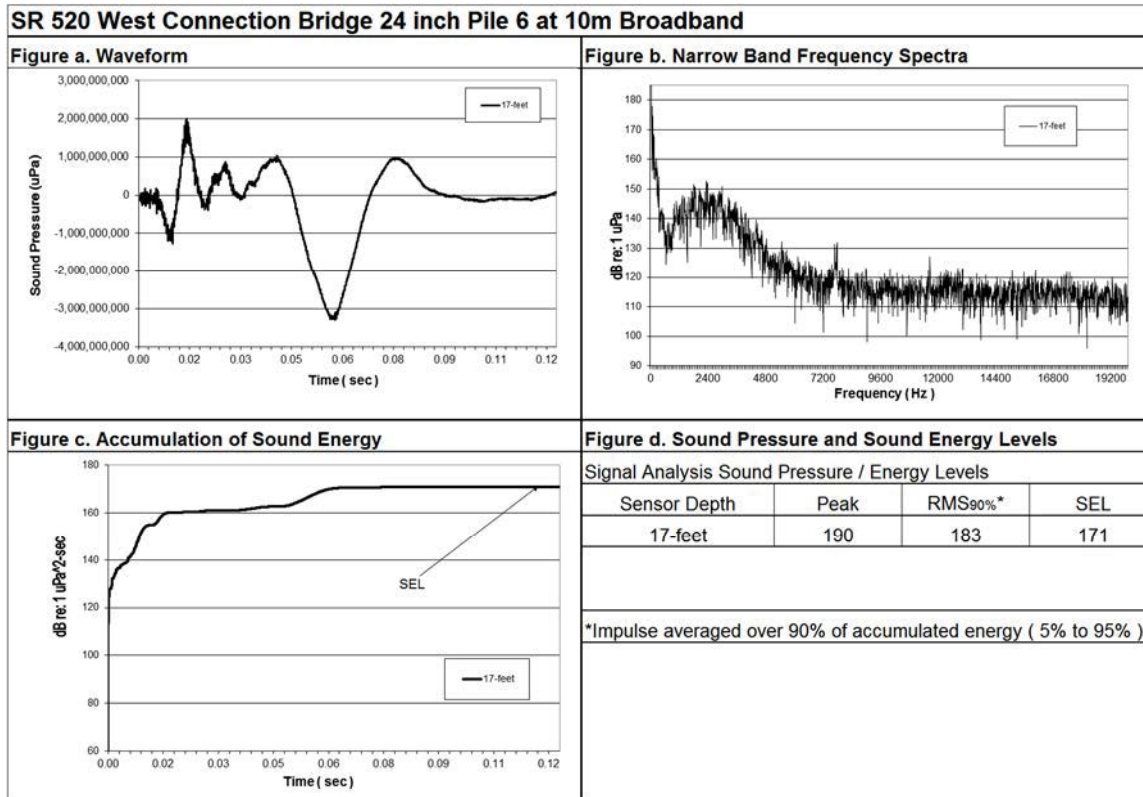


**Figure 24: Waveform analysis of Pile 5, 3H**

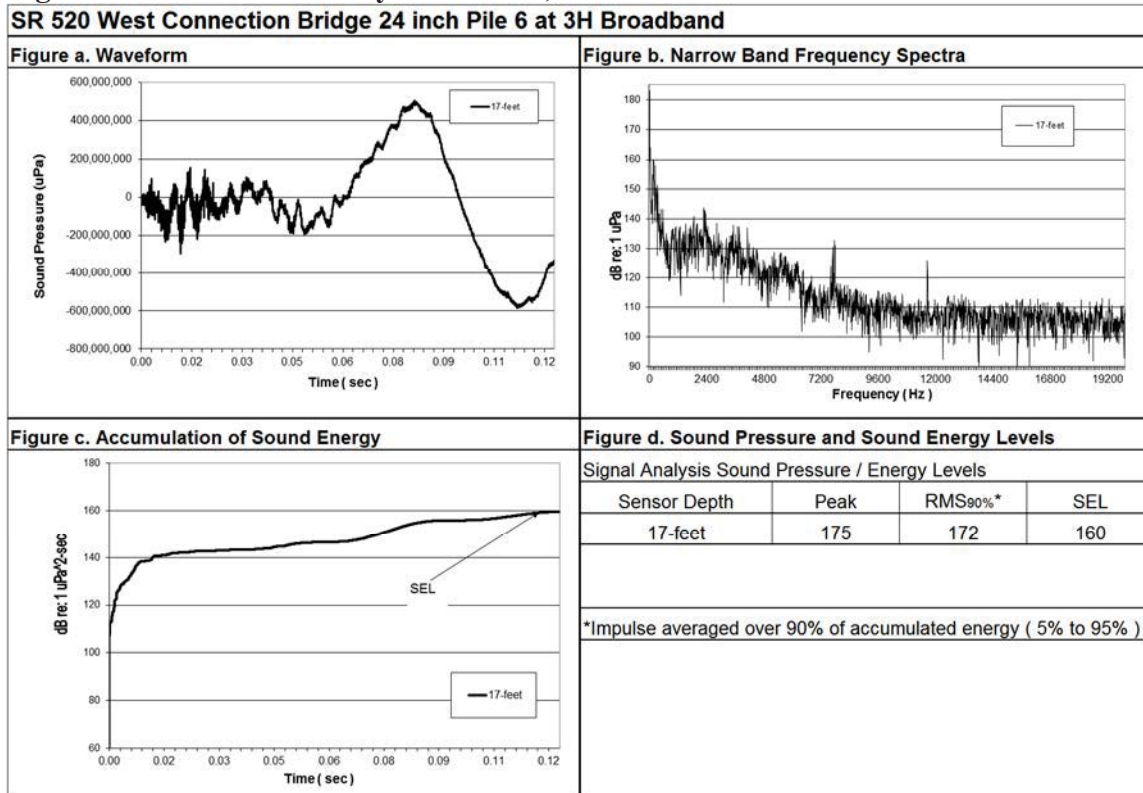
**SR 520 West Connection Bridge 24 inch Pile 5 at 3H Broadband**



**Figure 25: Waveform analysis of Pile 6, 10M**



**Figure 26: Waveform analysis of Pile 6, 3H**

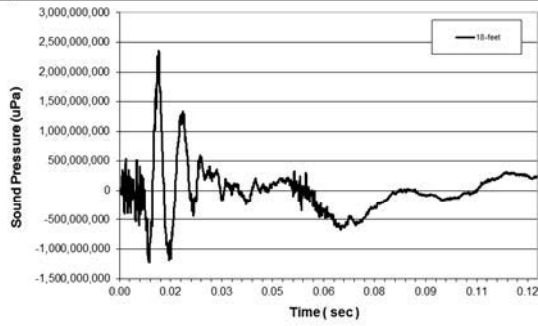


**Figure 27: Waveform analysis of Pile 7, 10M, Attenuated**

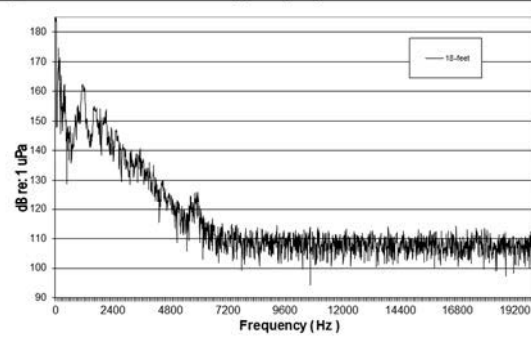


**SR 520 West Connection Bridge 24 inch Pile 7 at 10m Broadband, Attenuated**

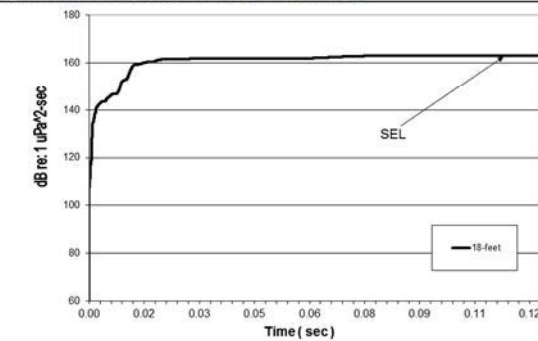
**Figure a. Waveform**



**Figure b. Narrow Band Frequency Spectra**



**Figure c. Accumulation of Sound Energy**



**Figure d. Sound Pressure and Sound Energy Levels**

Signal Analysis Sound Pressure / Energy Levels

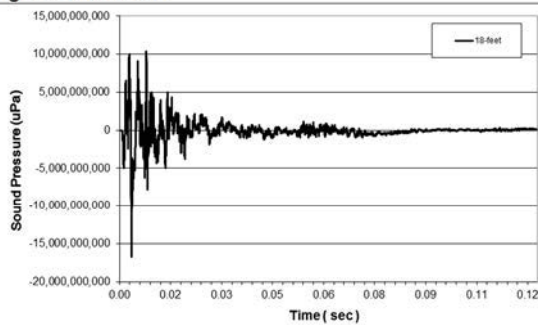
Sensor Depth	Peak	RMS <sub>90%</sub> *	SEL
18-feet	187	173	163

\*Impulse averaged over 90% of accumulated energy ( 5% to 95% )

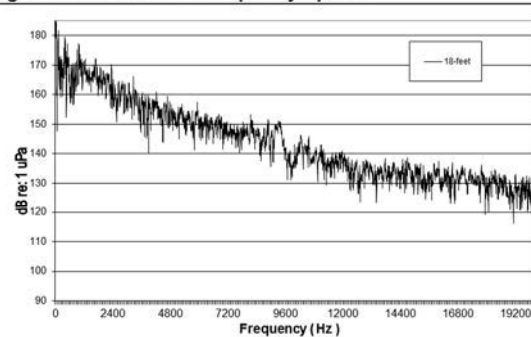
**Figure 28: Waveform analysis of Pile 7, 10M, Un-attenuated**

**SR 520 West Connection Bridge 24 inch Pile 7 at 10m Broadband, Un-attenuated**

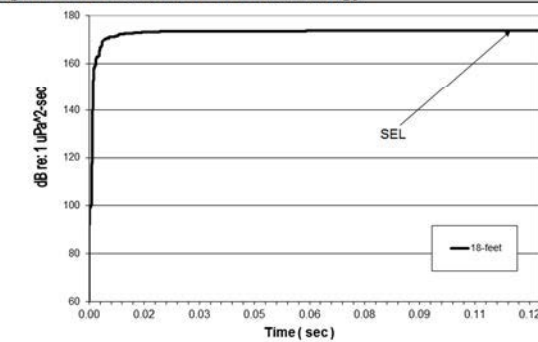
**Figure a. Waveform**



**Figure b. Narrow Band Frequency Spectra**



**Figure c. Accumulation of Sound Energy**



**Figure d. Sound Pressure and Sound Energy Levels**

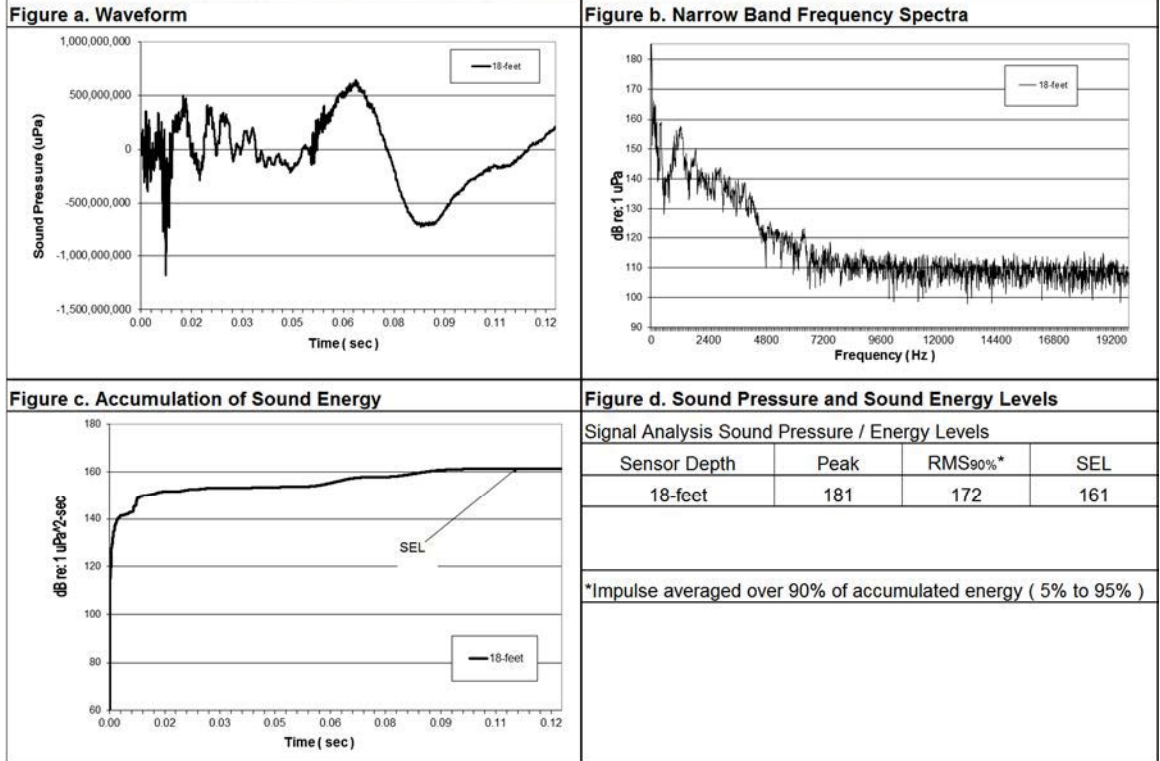
Signal Analysis Sound Pressure / Energy Levels

Sensor Depth	Peak	RMS <sub>90%</sub> *	SEL
18-feet	204	180	174

\*Impulse averaged over 90% of accumulated energy ( 5% to 95% )

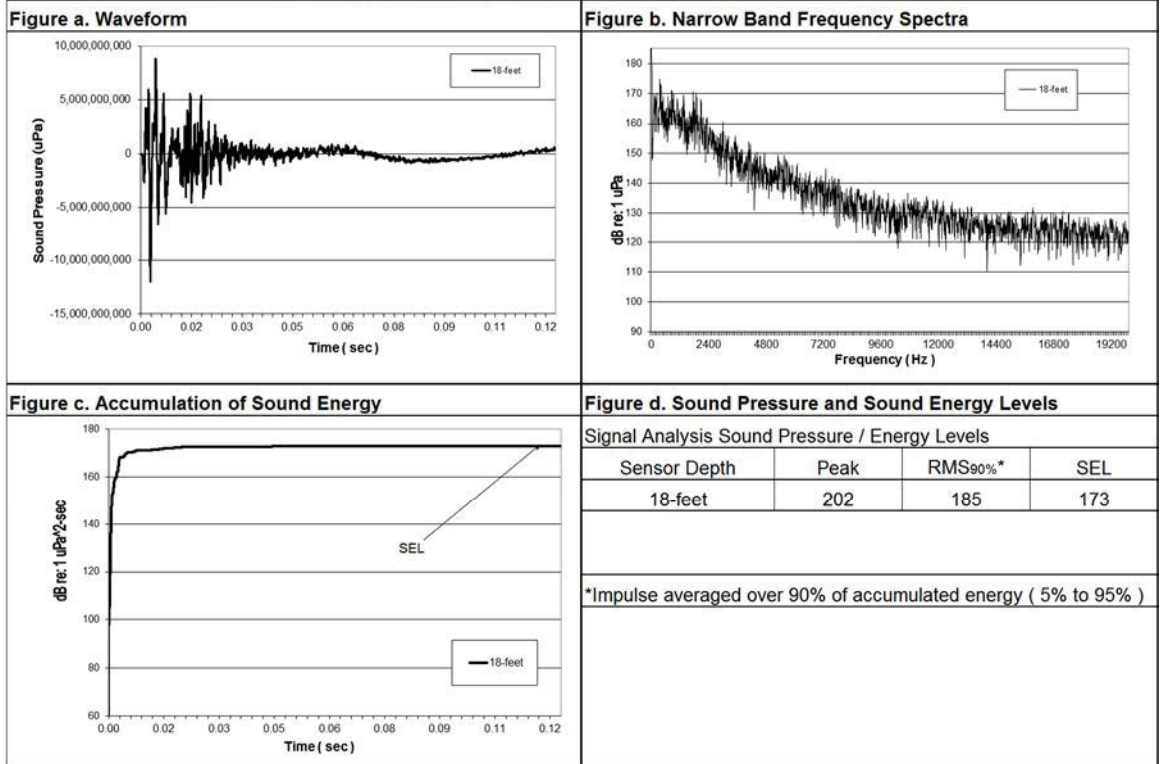
**Figure 29: Waveform analysis of Pile 7, 3H, Attenuated**

**SR 520 West Connection Bridge 24 inch Pile 7 at 3H Broadband, Attenuated**



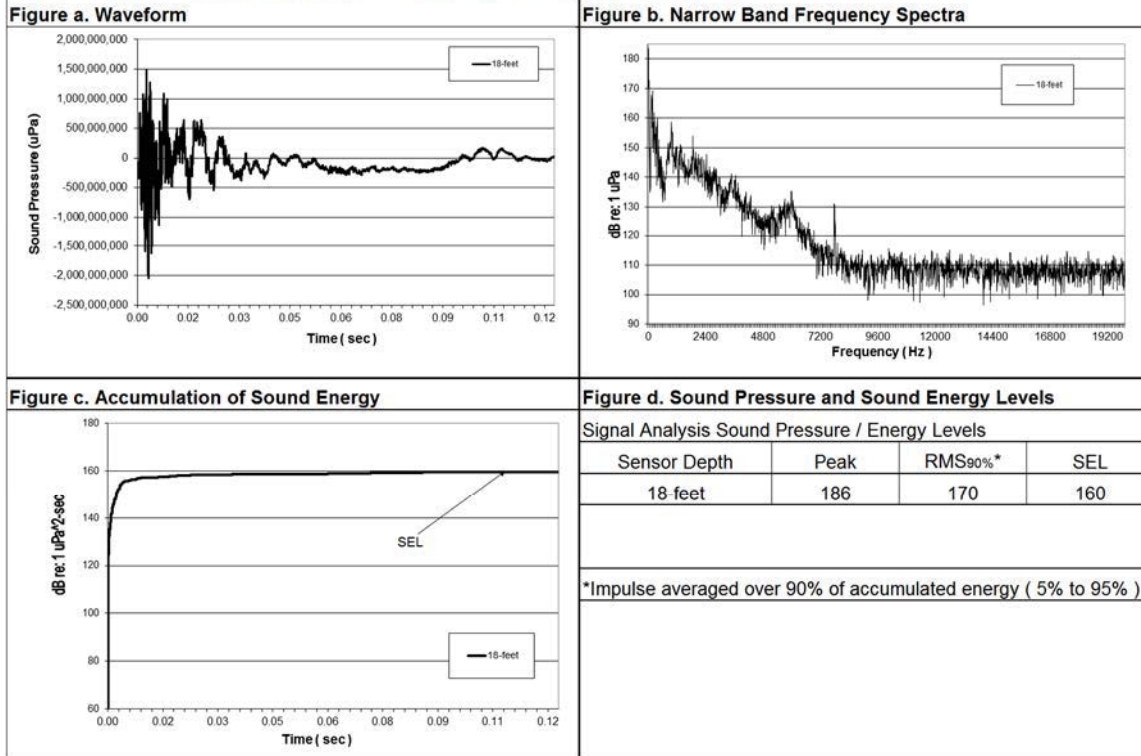
**Figure 30: Waveform analysis of Pile 7, 3H, Un-attenuated**

**SR 520 West Connection Bridge 24 inch Pile 7 at 3H Broadband, Un-attenuated**



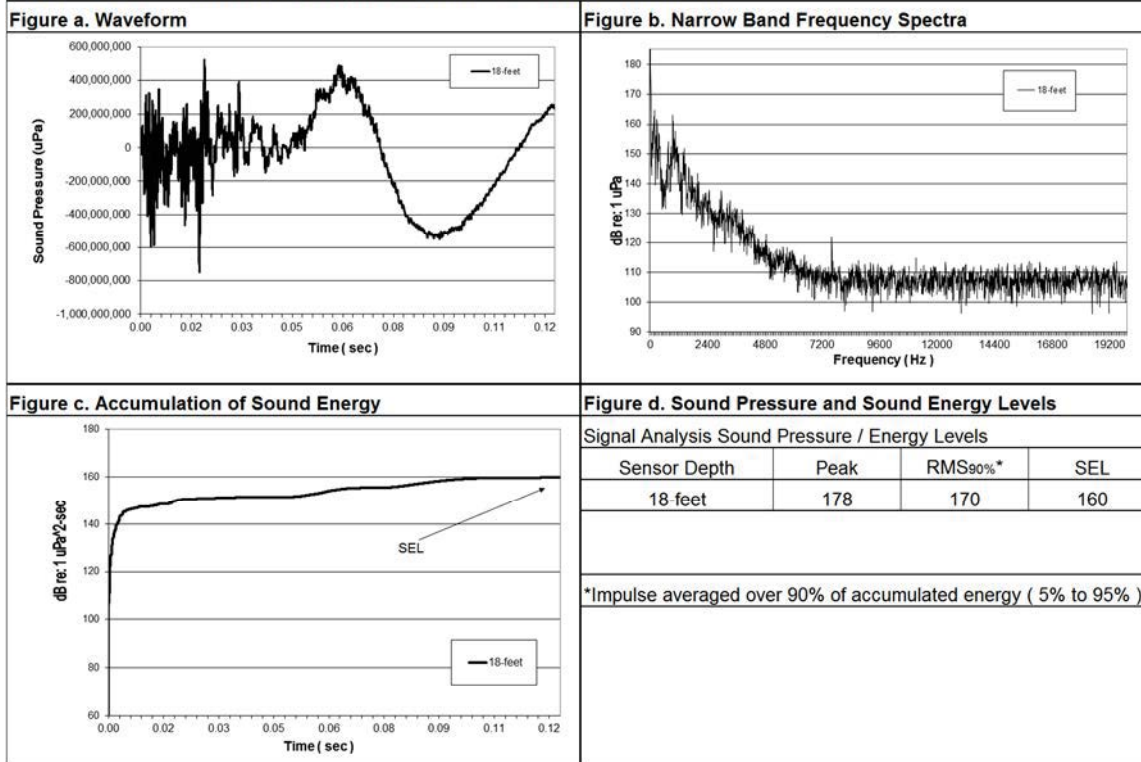
**Figure 31: Waveform analysis of Pile 8, 10M**

**SR 520 West Connection Bridge 24 inch Pile 8 at 10m Broadband**



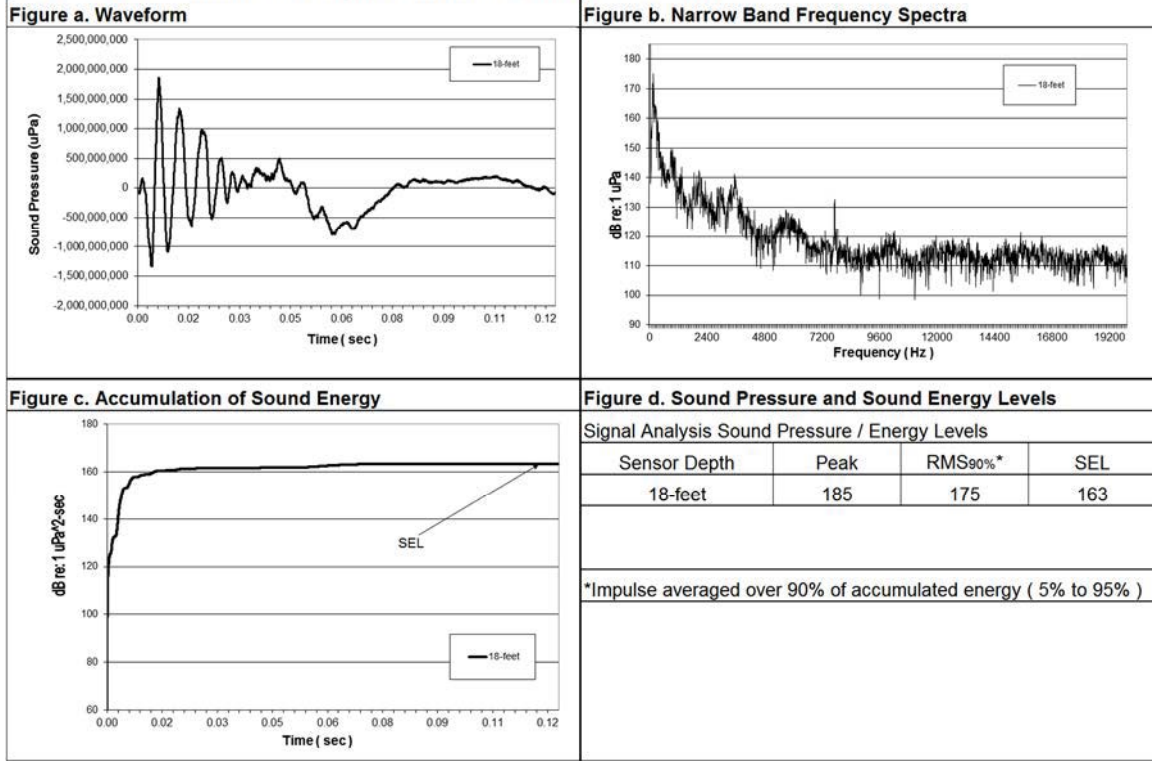
**Figure 32: Waveform analysis of Pile 8, 3H**

**SR 520 West Connection Bridge 24 inch Pile 8 at 3H Broadband**



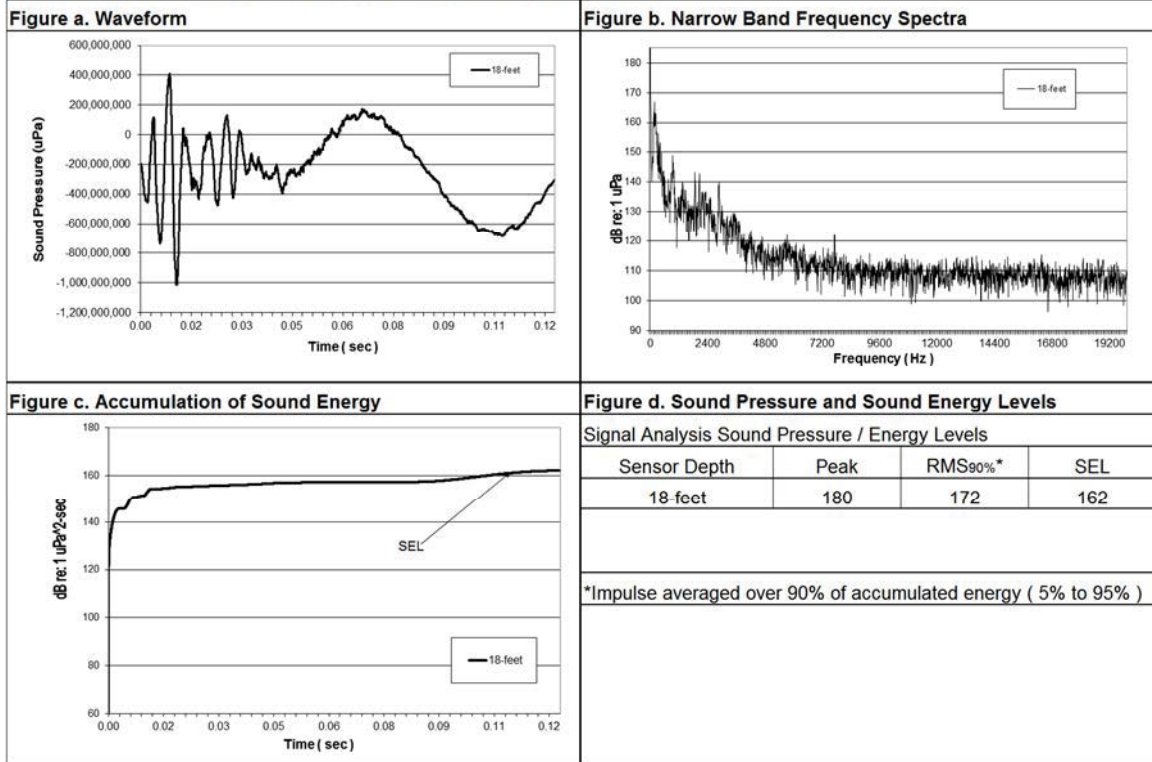
**Figure 33: Waveform analysis of Pile 9, 10M**

**SR 520 West Connection Bridge 24 inch Pile 9 at 10m Broadband**



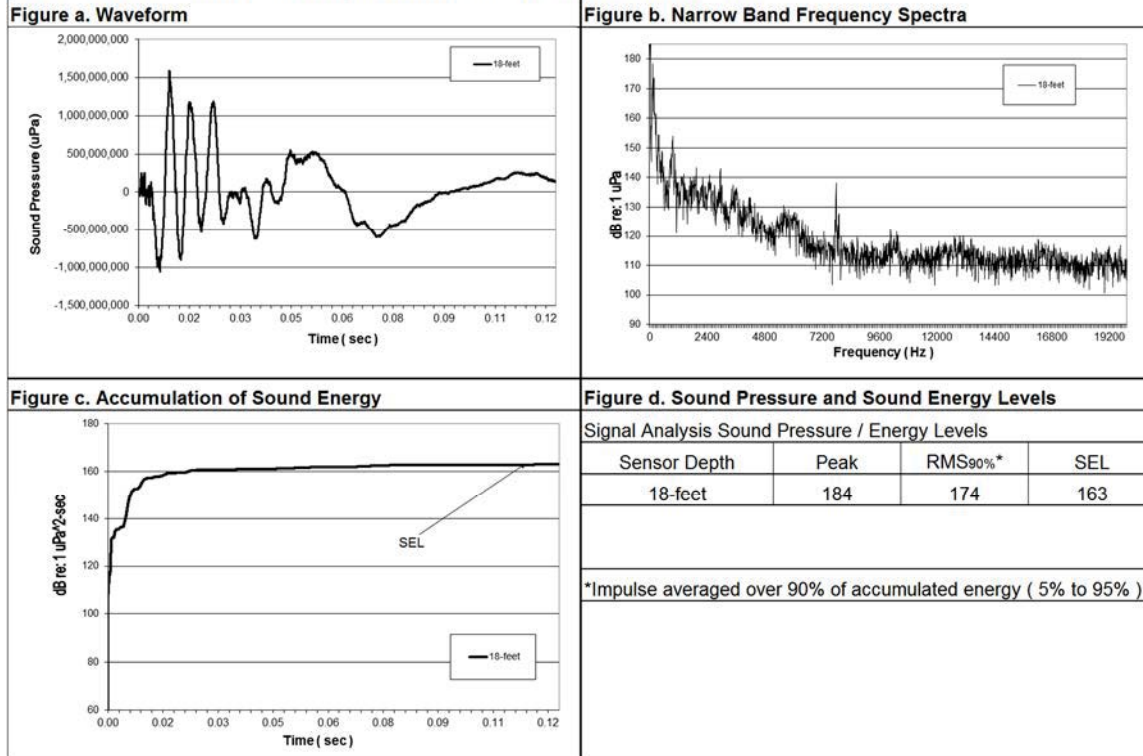
**Figure 34: Waveform analysis of Pile 9, 3H**

**SR 520 West Connection Bridge 24 inch Pile 9 at 3H Broadband**



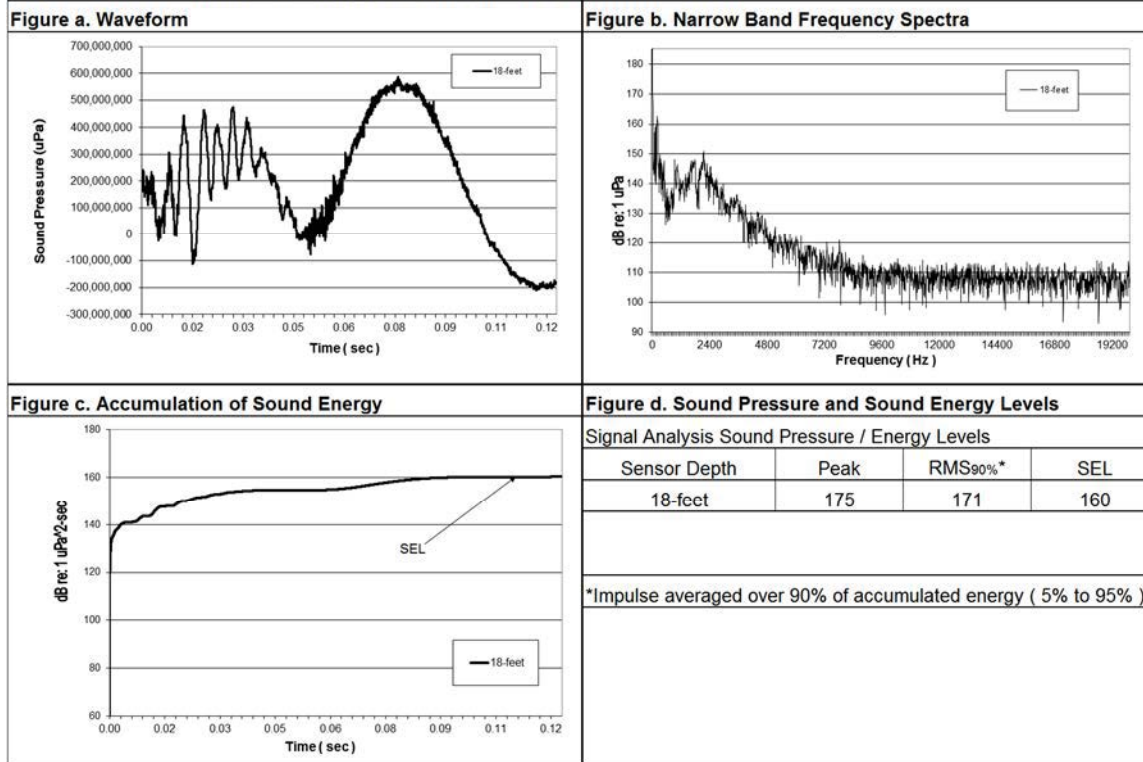
**Figure 35: Waveform analysis of Pile 10, 10M**

**SR 520 West Connection Bridge 24 inch Pile 10 at 10m Broadband**



**Figure 36: Waveform analysis of Pile 10, 3H**

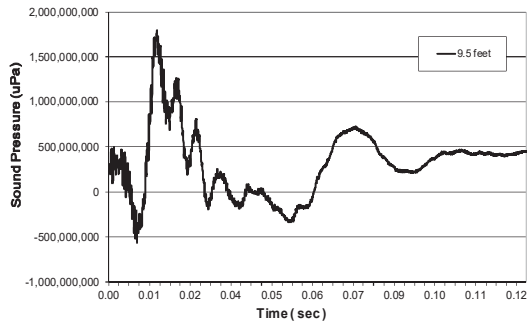
**SR 520 West Connection Bridge 24 inch Pile 10 at 3H Broadband**



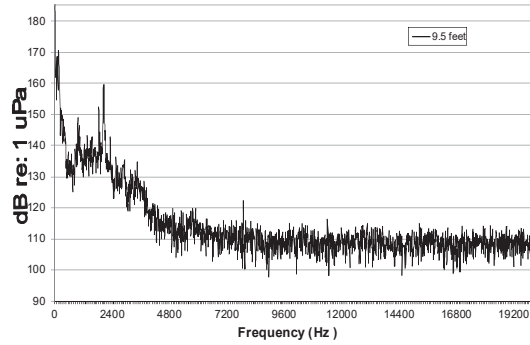
**Figure 37: Waveform analysis of Pile 11, 10M**

**SR 520 West Connection Bridge 24 inch Pile 11 at 10M**

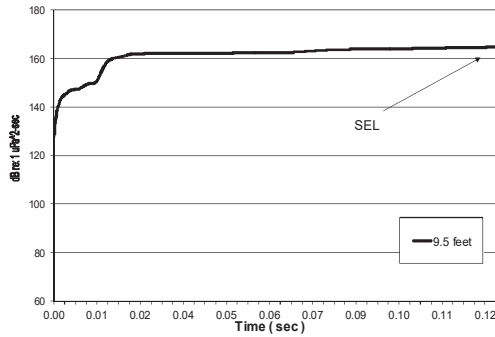
**Figure a. Waveform**



**Figure b. Narrow Band Frequency Spectra**



**Figure c. Accumulation of Sound Energy**



**Figure d. Sound Pressure and Sound Energy Levels**

Signal Analysis Sound Pressure / Energy Levels

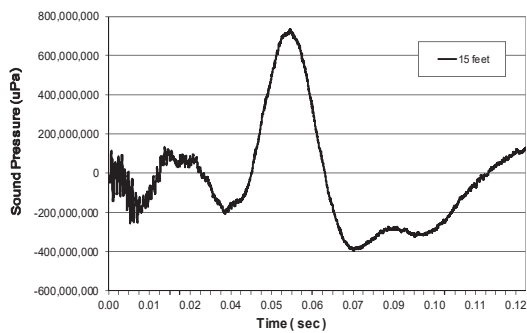
10 meters from pile	Peak	RMS <sub>90%</sub> *	SEL
9.5 feet	185	174	165

\*Impulse averaged over 90% of accumulated energy ( 5% to 95% )

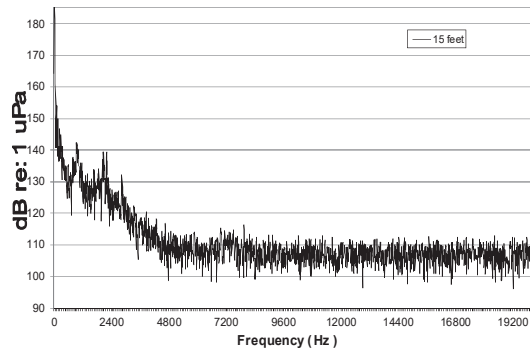
**Figure 38: Waveform analysis of Pile 11, 10M**

**SR 520 West Connection Bridge 24 inch Pile 11 at 3H**

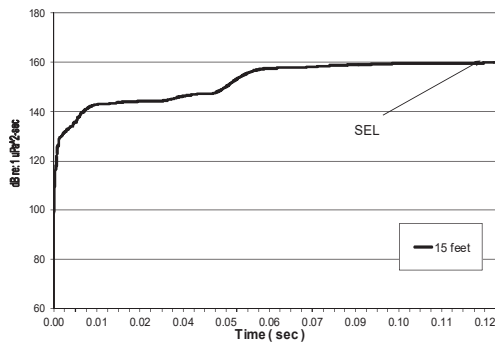
**Figure a. Waveform**



**Figure b. Narrow Band Frequency Spectra**



**Figure c. Accumulation of Sound Energy**



**Figure d. Sound Pressure and Sound Energy Levels**

Signal Analysis Sound Pressure / Energy Levels

16 meters from pile	Peak	RMS <sub>90%</sub> *	SEL
15 feet	177	172	160

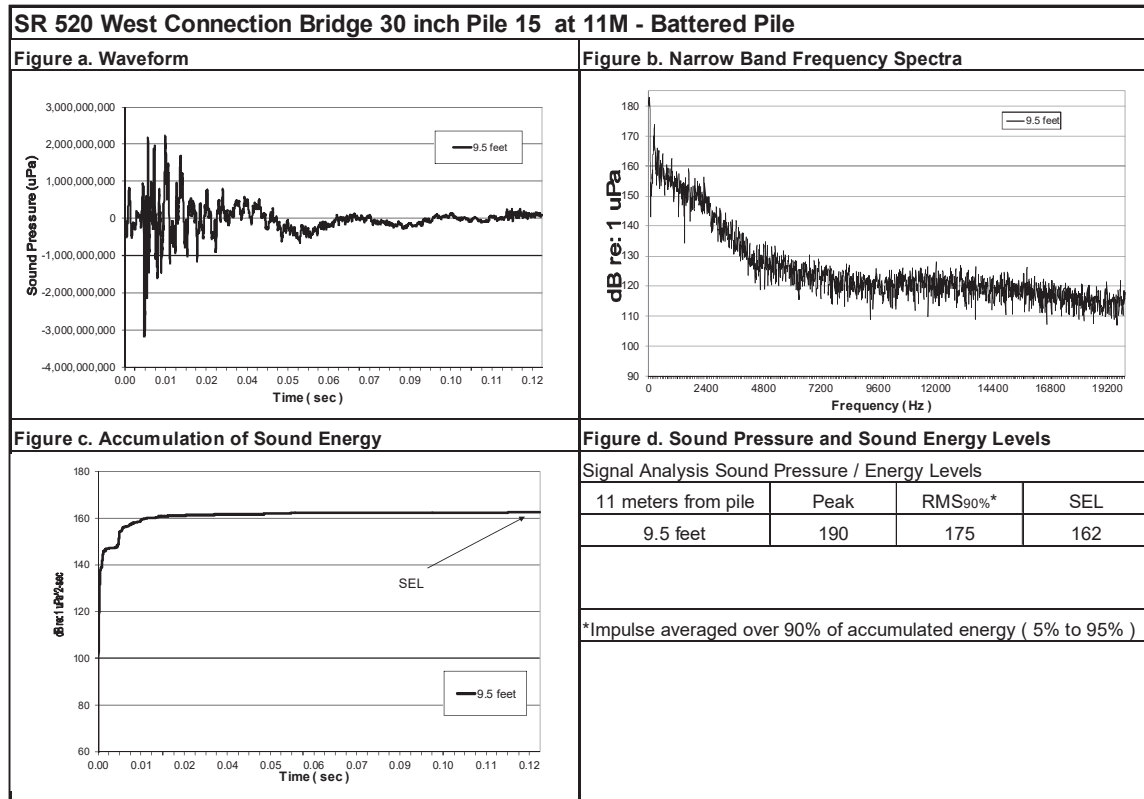
\*Impulse averaged over 90% of accumulated energy ( 5% to 95% )

**Figure 39: Pile 12, DATA NOT SAVED**

**Figure 40: Pile 13, DATA NOT SAVED**

**Figure 41: Pile 14, DATA NOT SAVED**

**Figure 42: Waveform analysis of Pile 15, 10M**



**Figure 43: Waveform analysis of Pile 15, 3H**

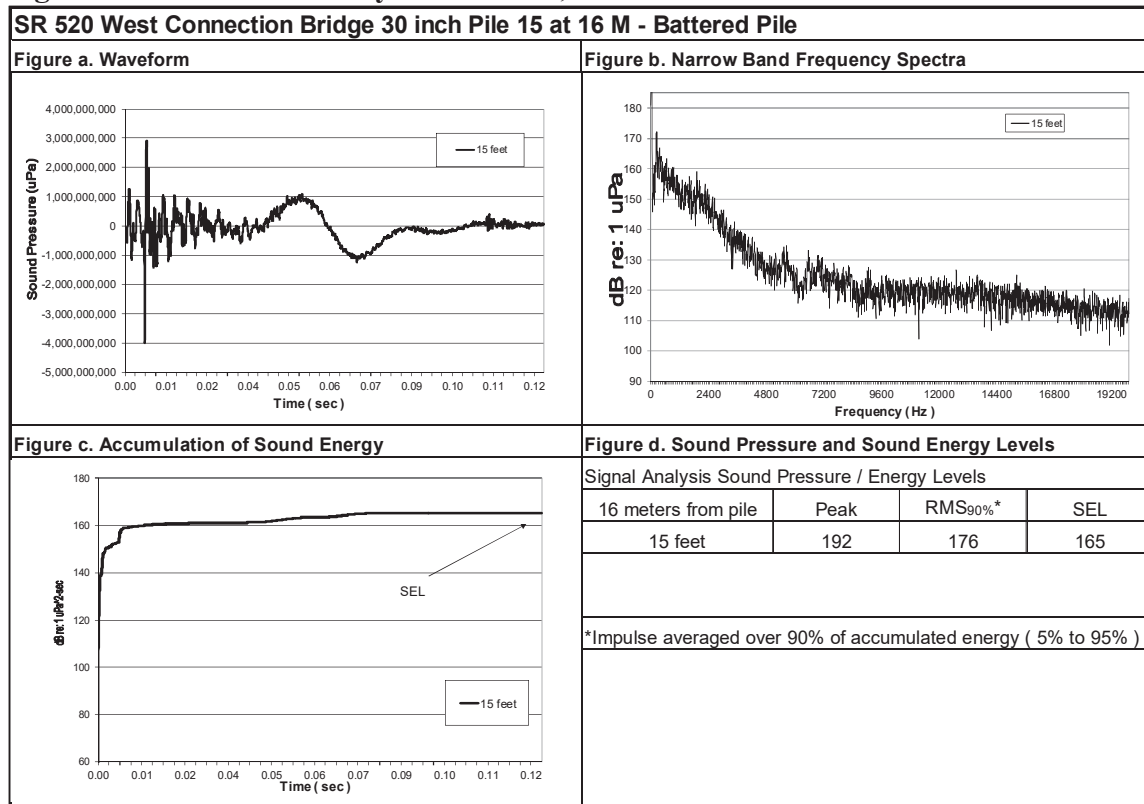




Figure 44: Waveform analysis of Pile 16, 10M

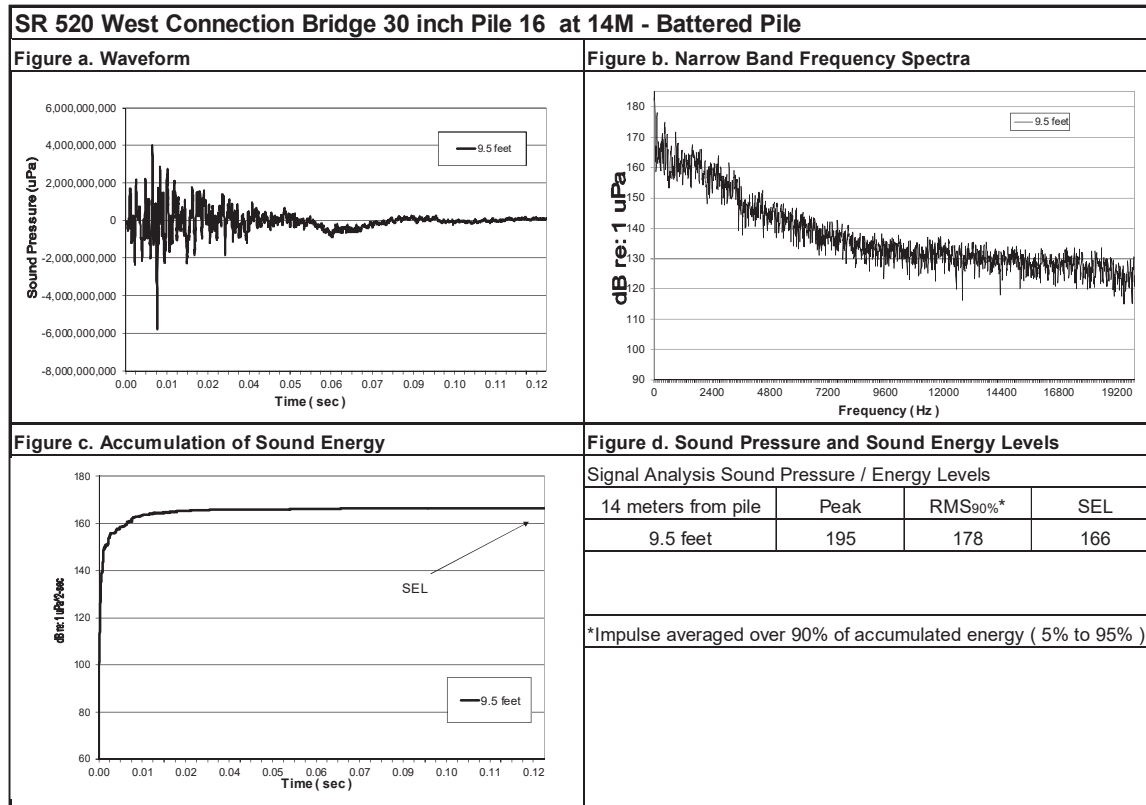


Figure 45: Waveform analysis of Pile 16, 3H

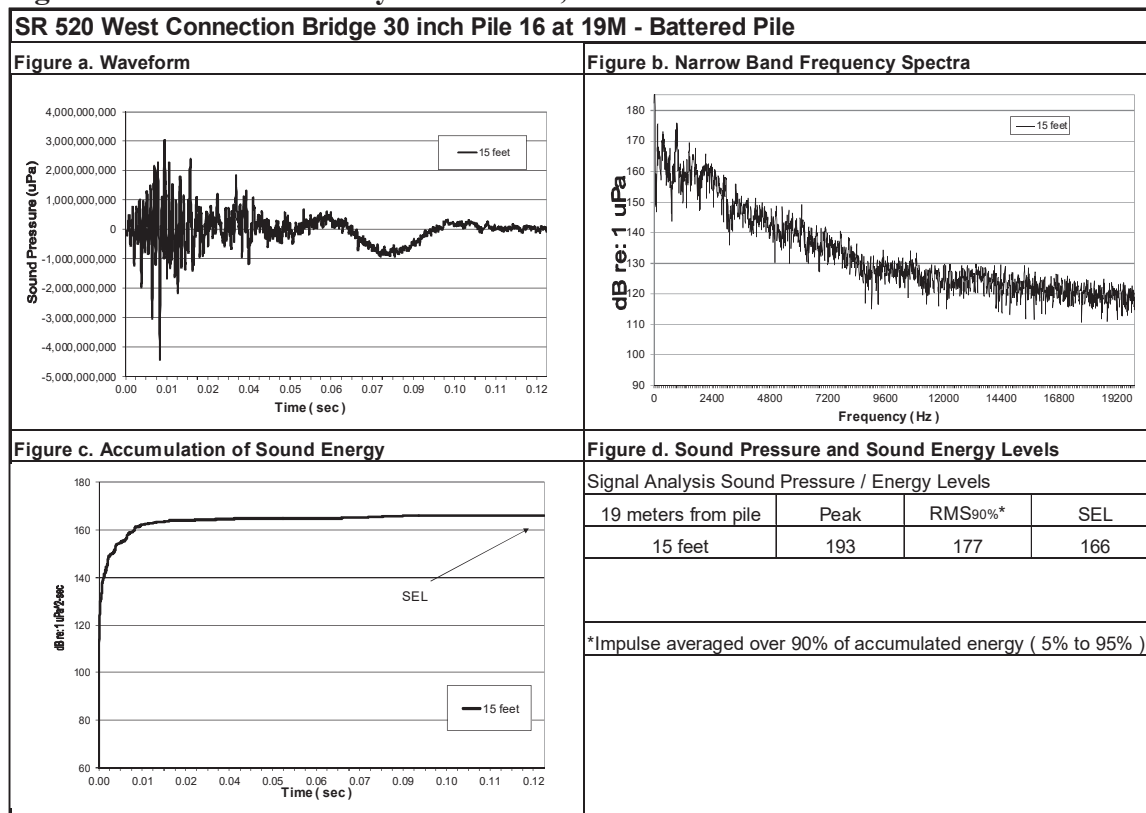


Figure 46: Waveform analysis of Pile 17, 10M

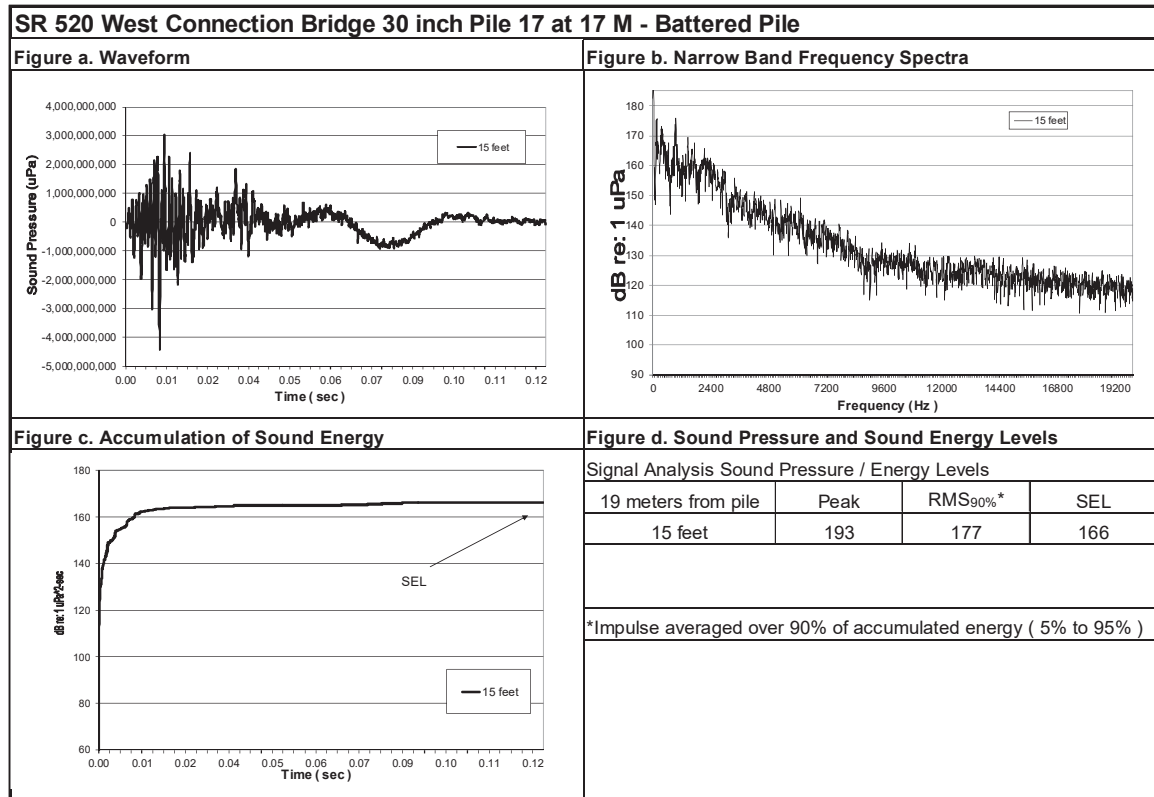


Figure 47: Waveform analysis of Pile 18, 10M

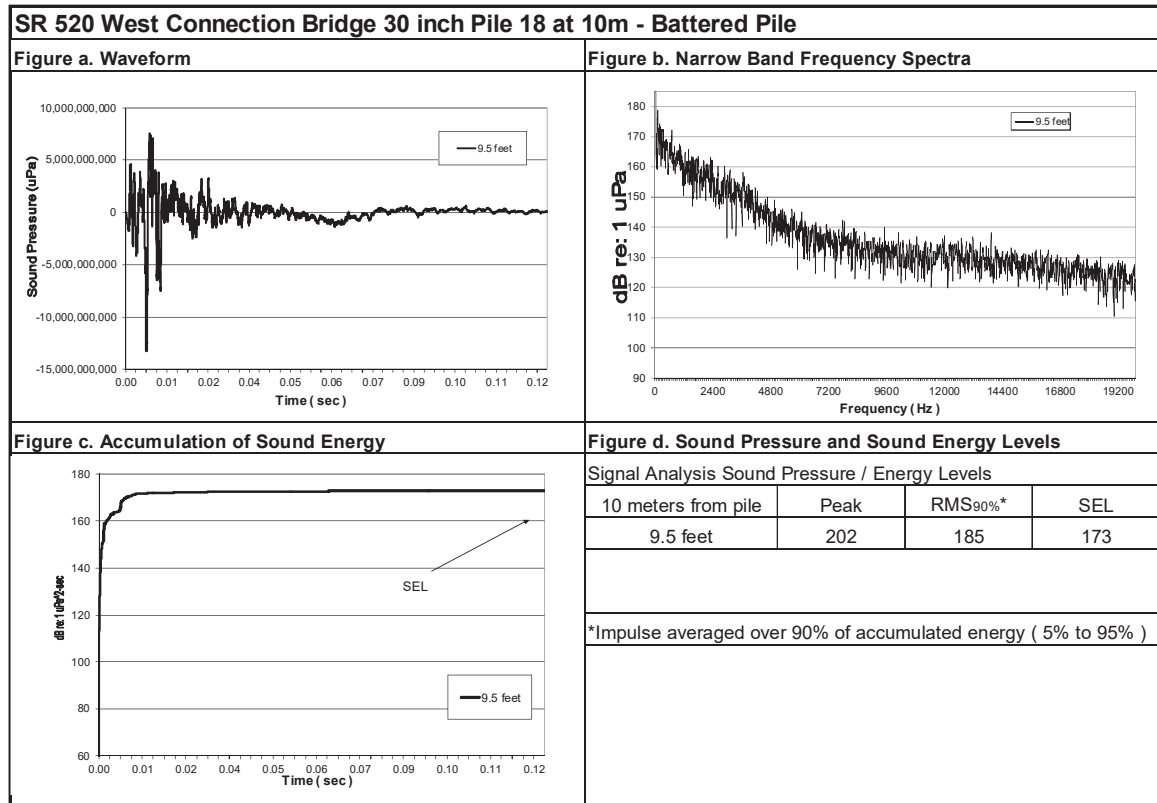
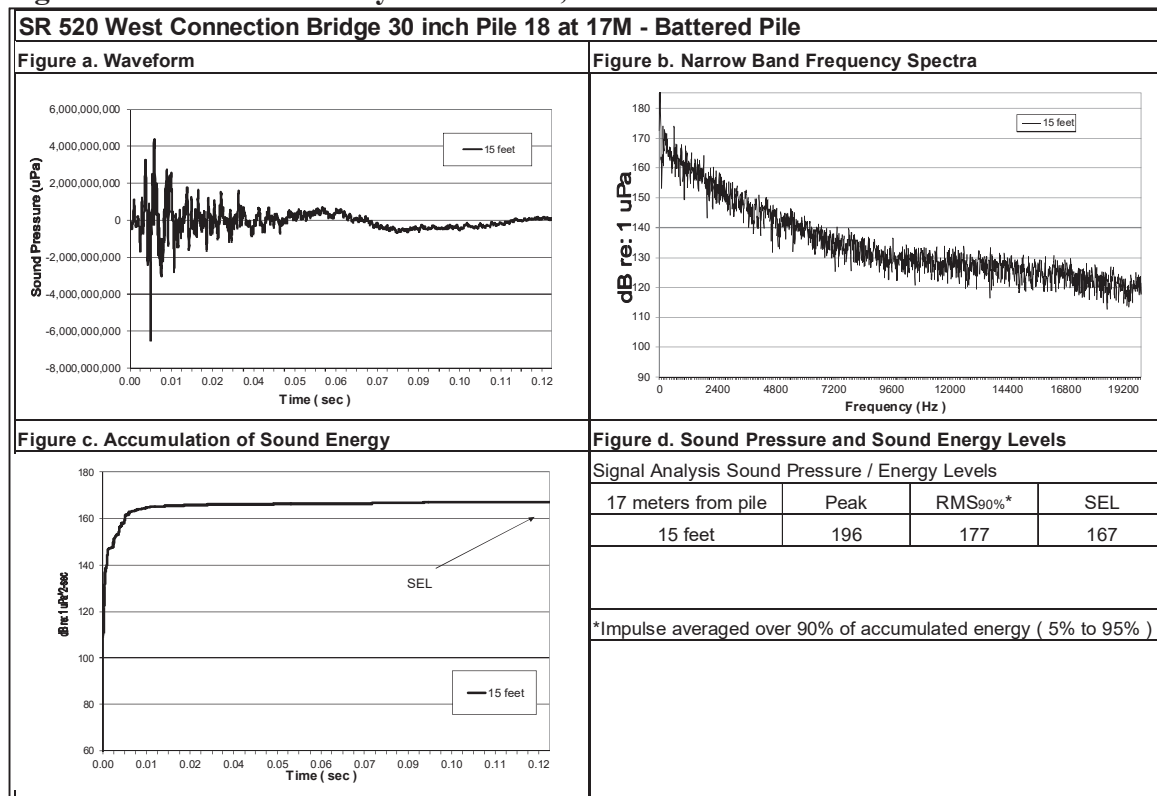
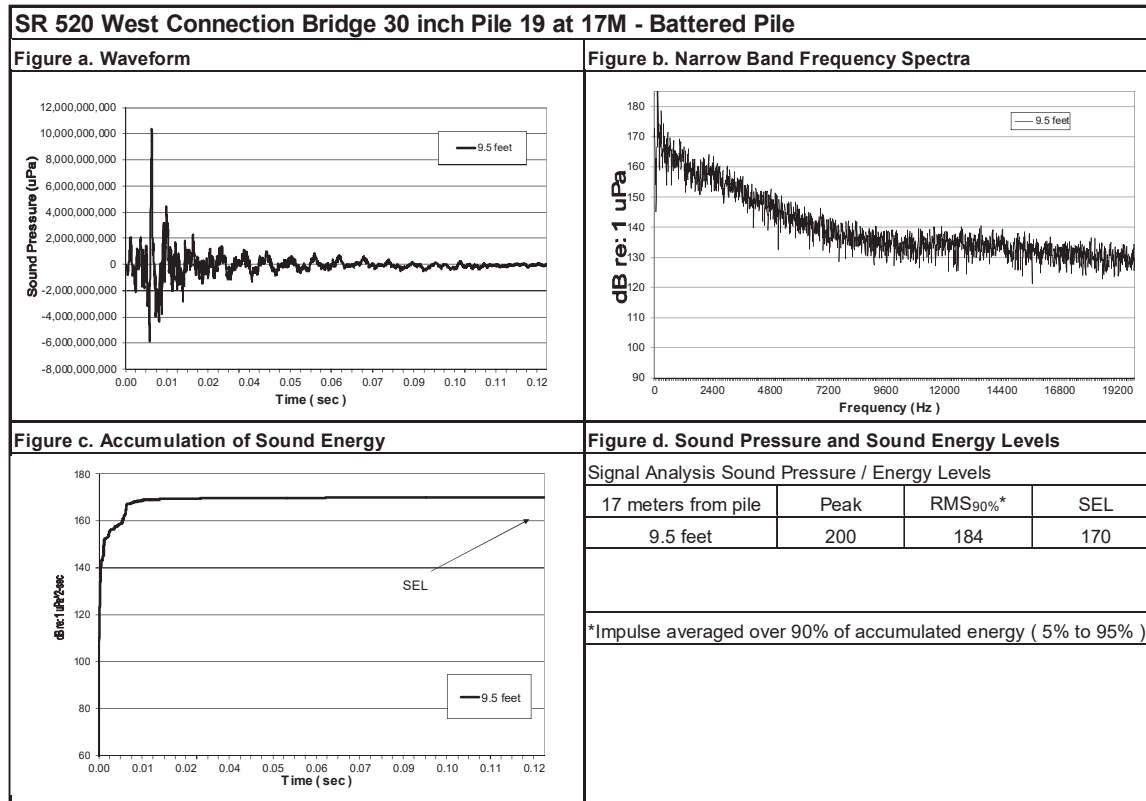


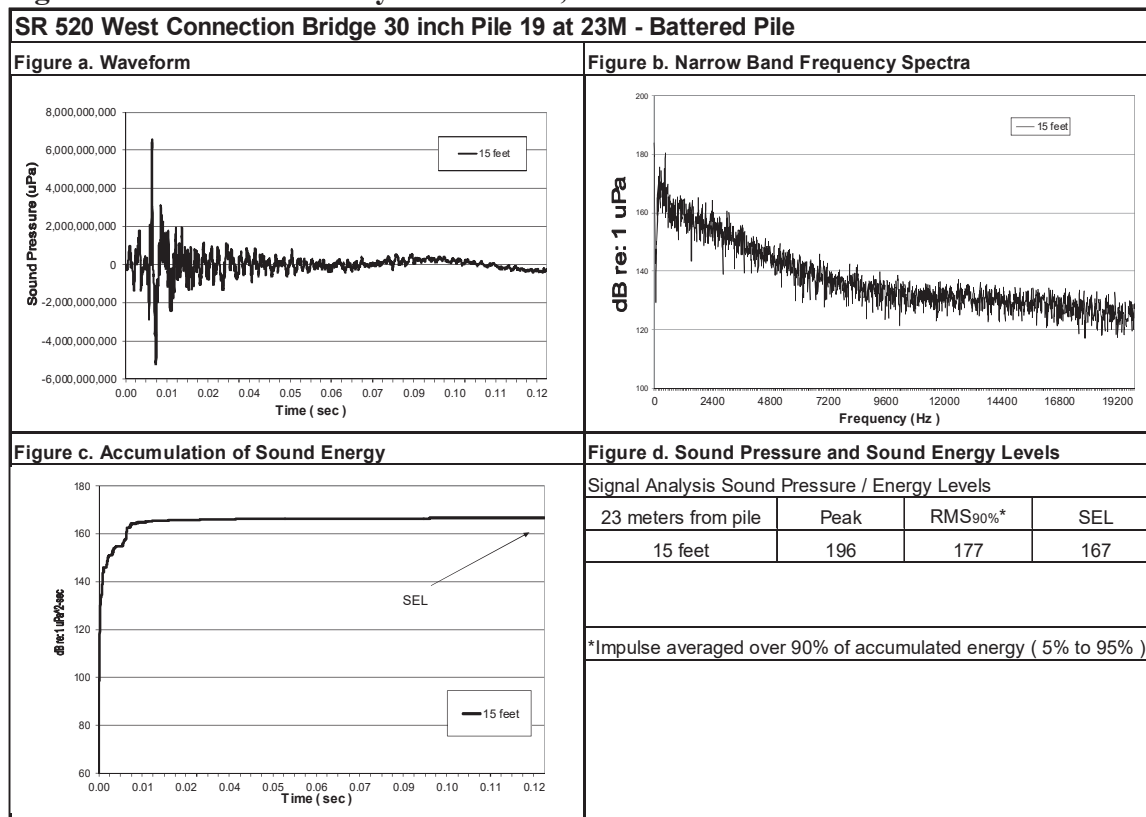
Figure 48: Waveform analysis of Pile 18, 3H



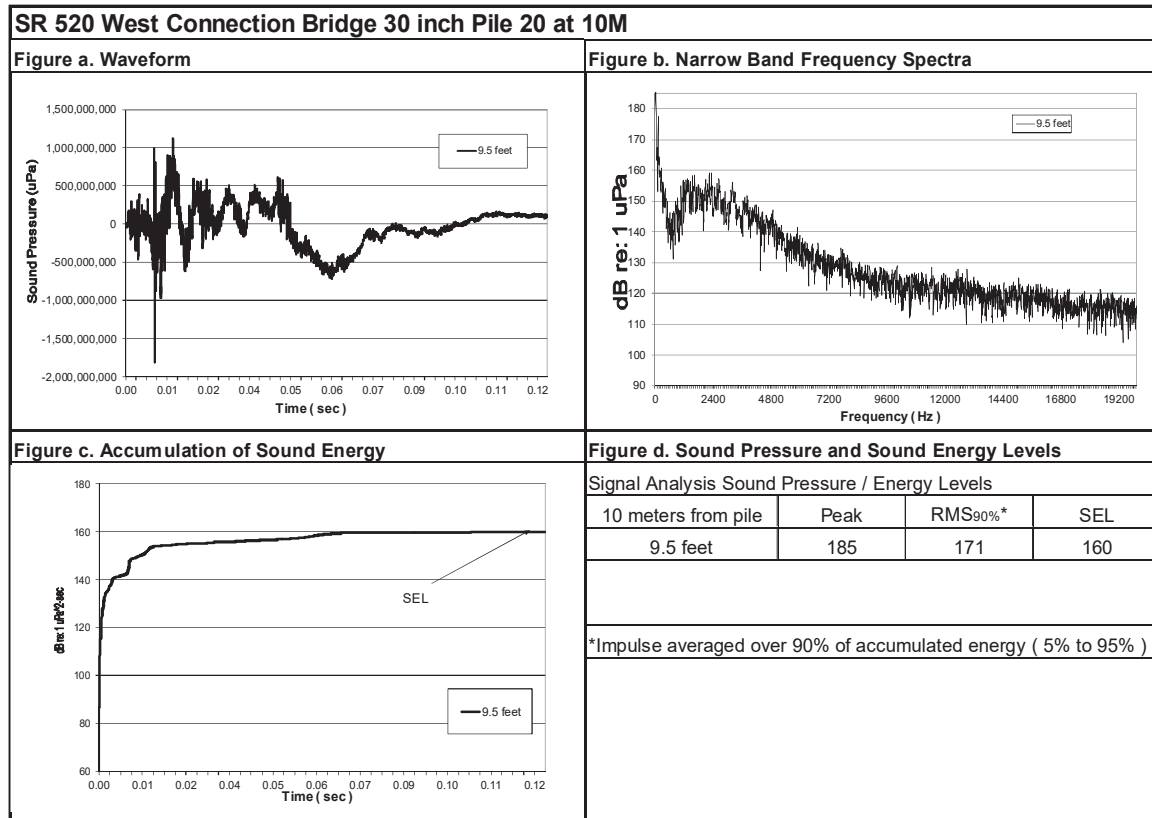
**Figure 49: Waveform analysis of Pile 19, 10M**



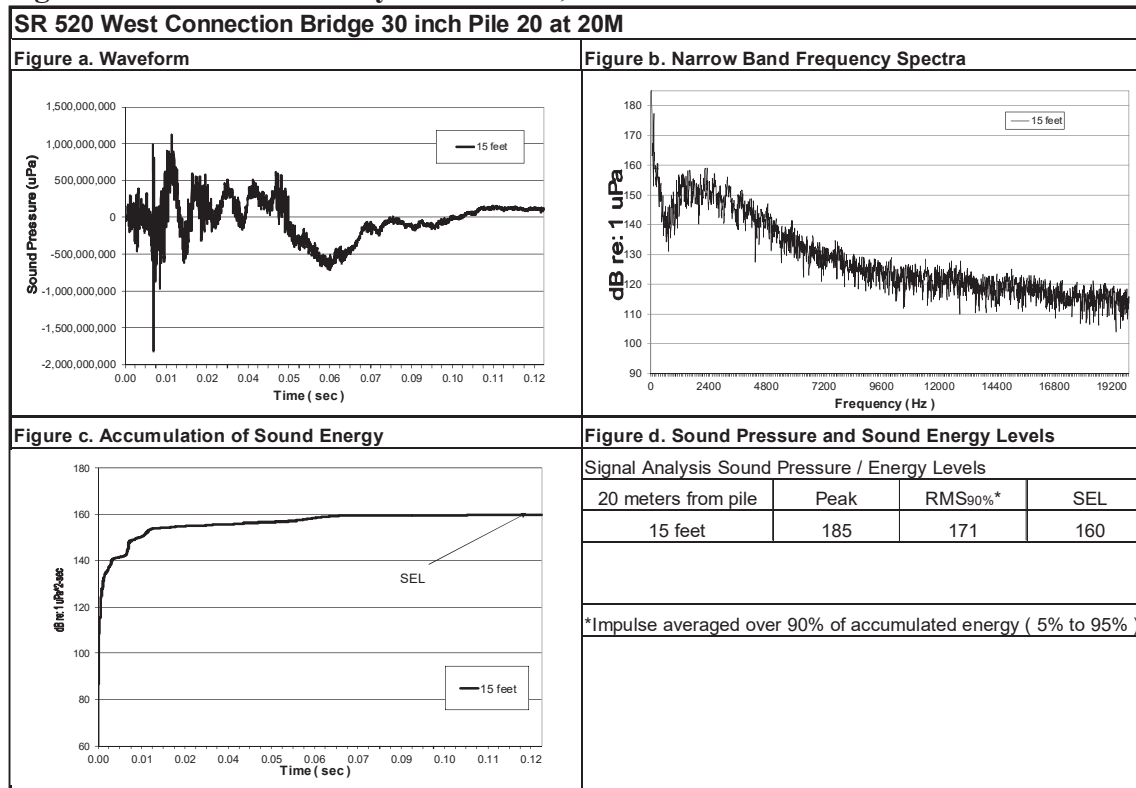
**Figure 50: Waveform analysis of Pile 19, 3H**



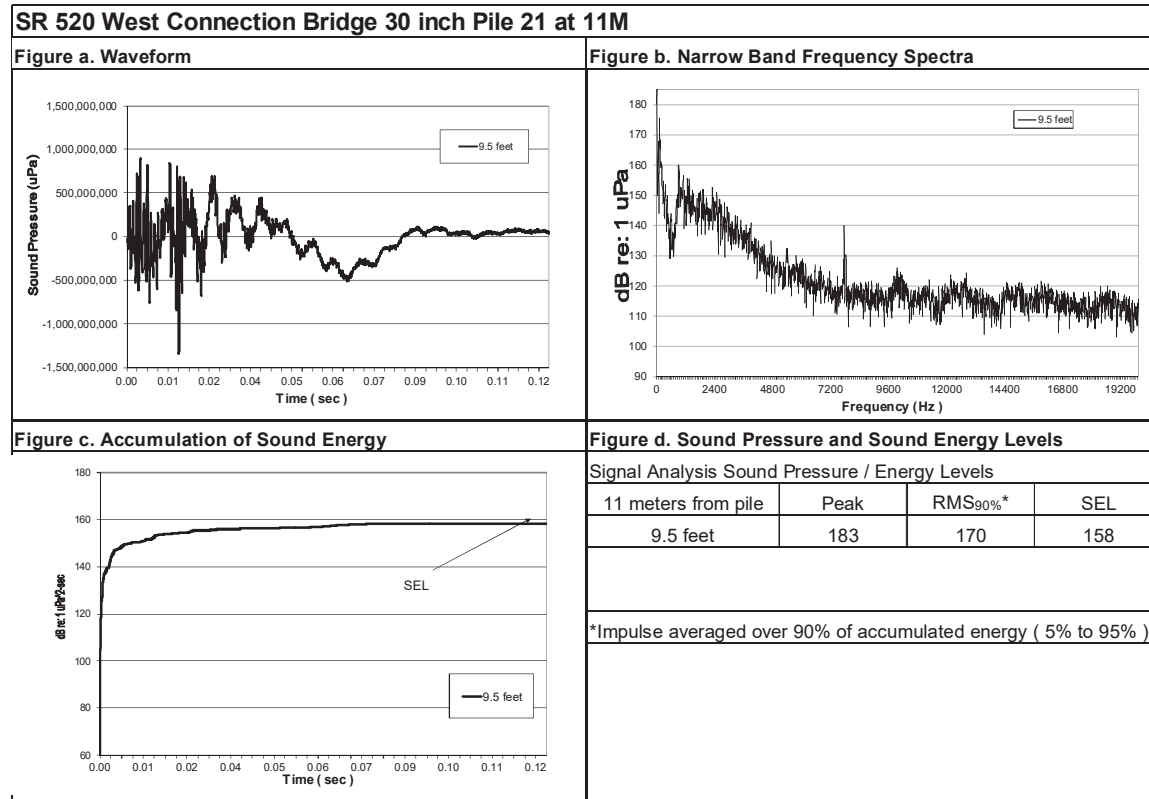
**Figure 51: Waveform analysis of Pile 20, 10M**



**Figure 52: Waveform analysis of Pile 20, 3H**



**Figure 53: Waveform analysis of Pile 21, 11M**



**Figure 54: Waveform analysis of Pile 21, 3H**

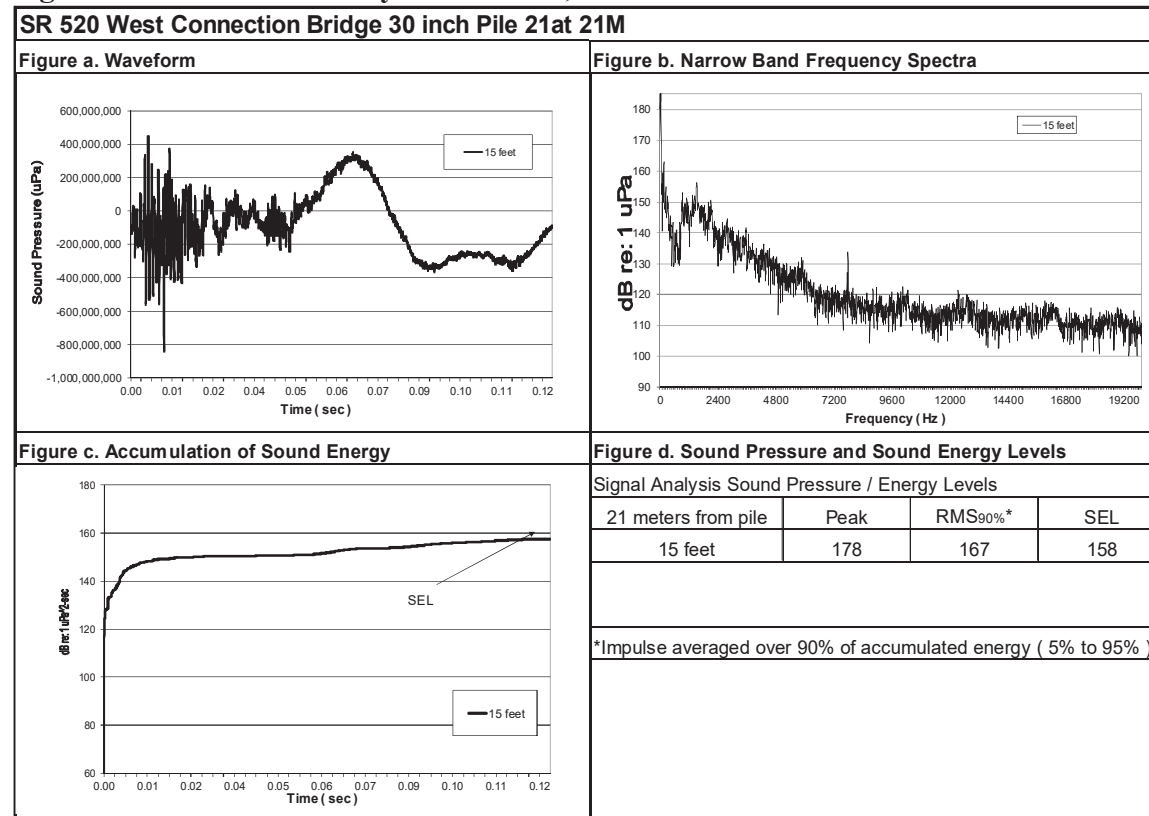


Figure 55: Waveform analysis of Pile 22, 11M

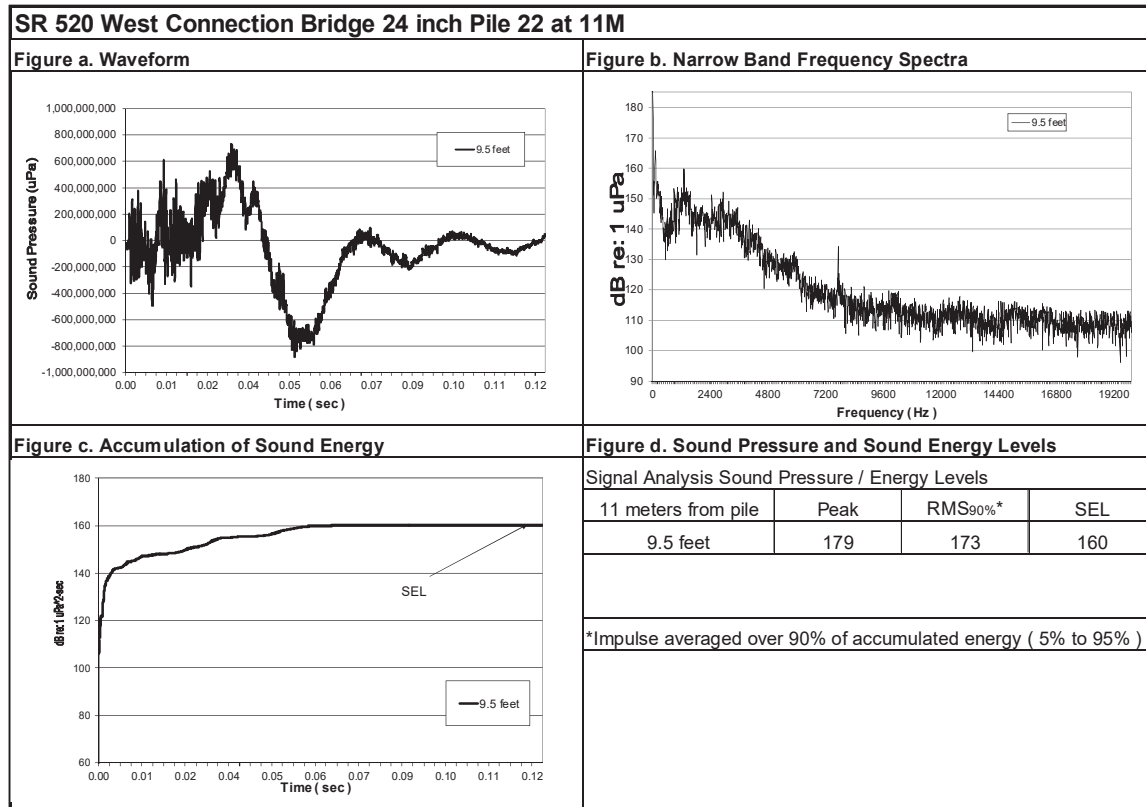


Figure 56: Waveform analysis of Pile 22, 3H

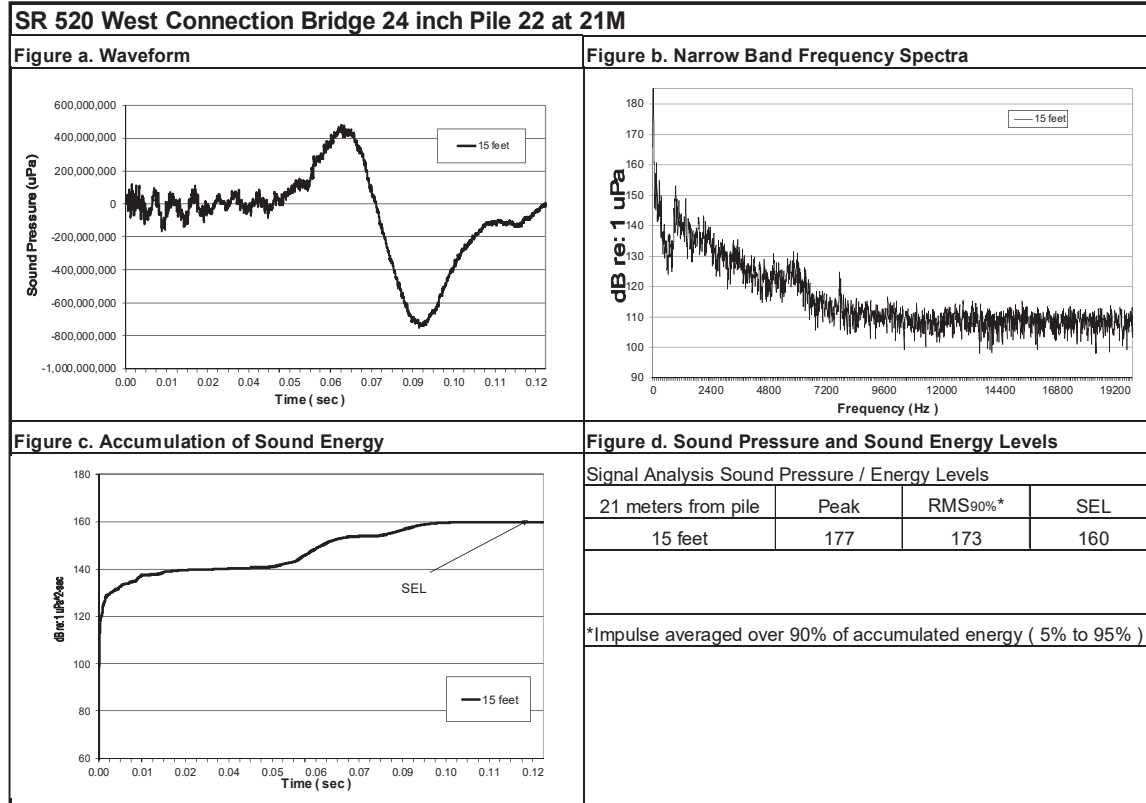


Figure 57: Waveform analysis of Pile 23, 11M

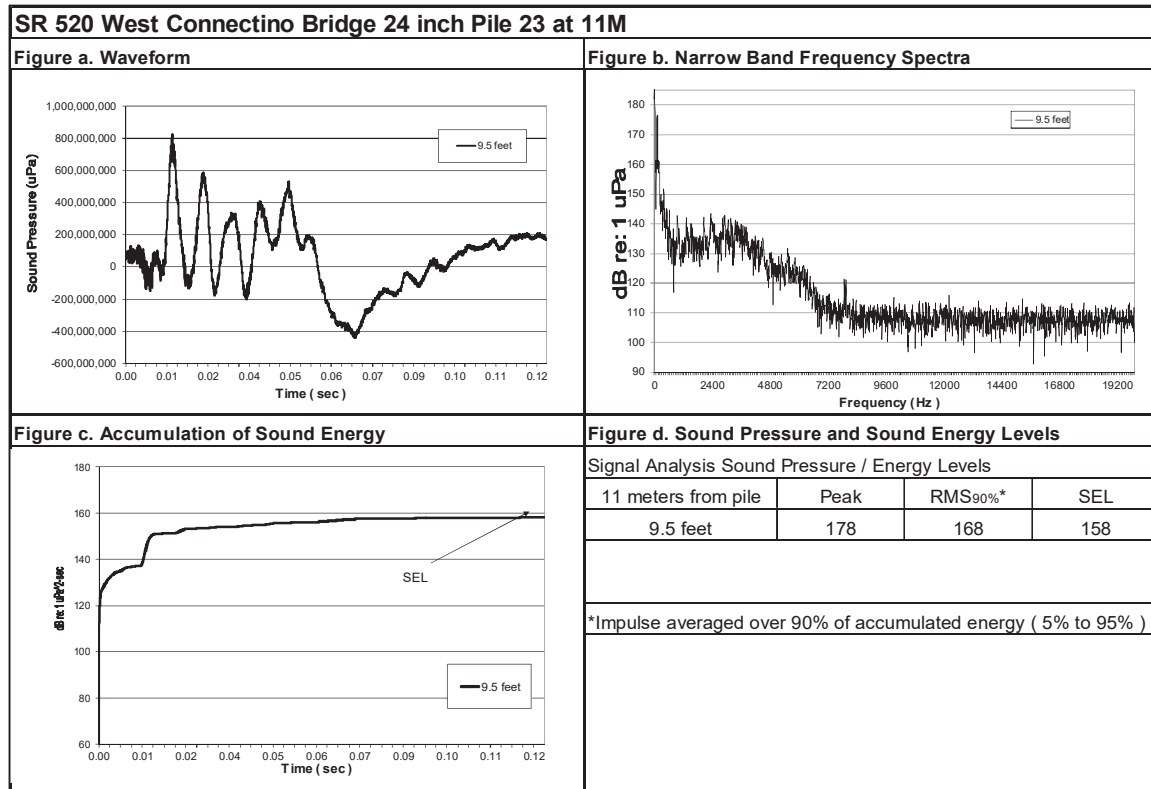
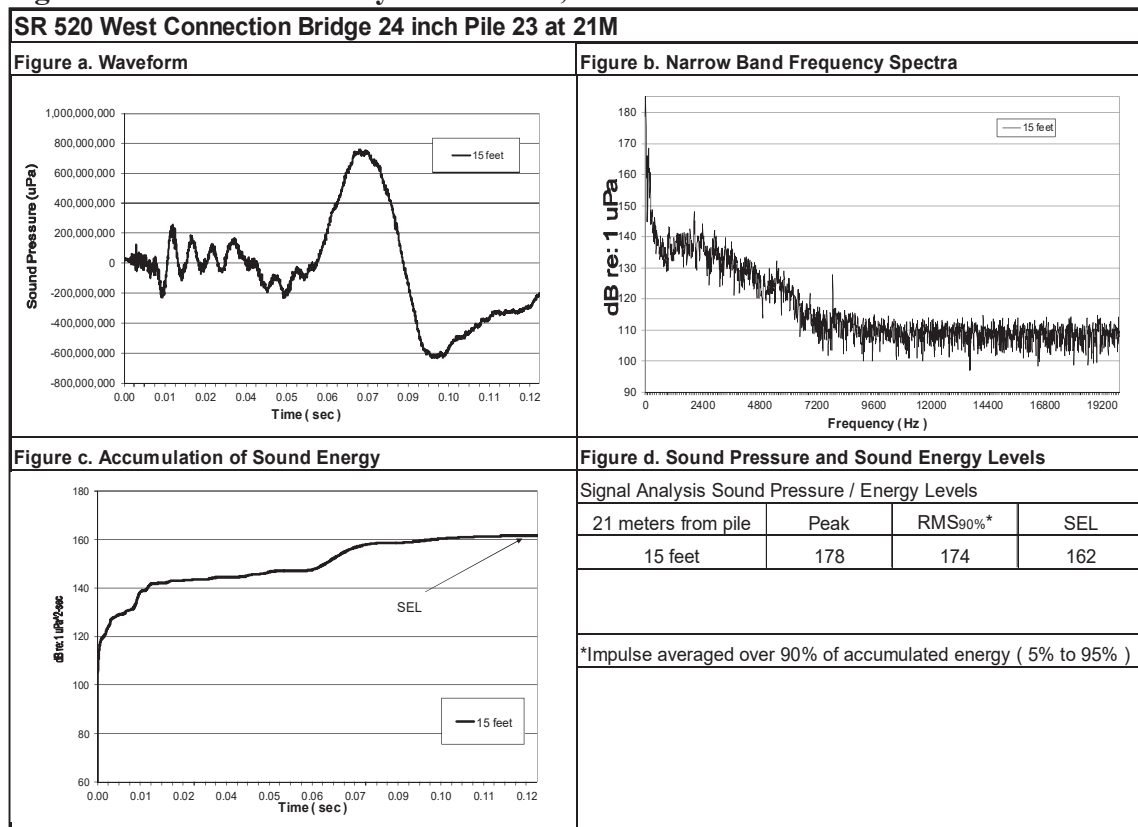
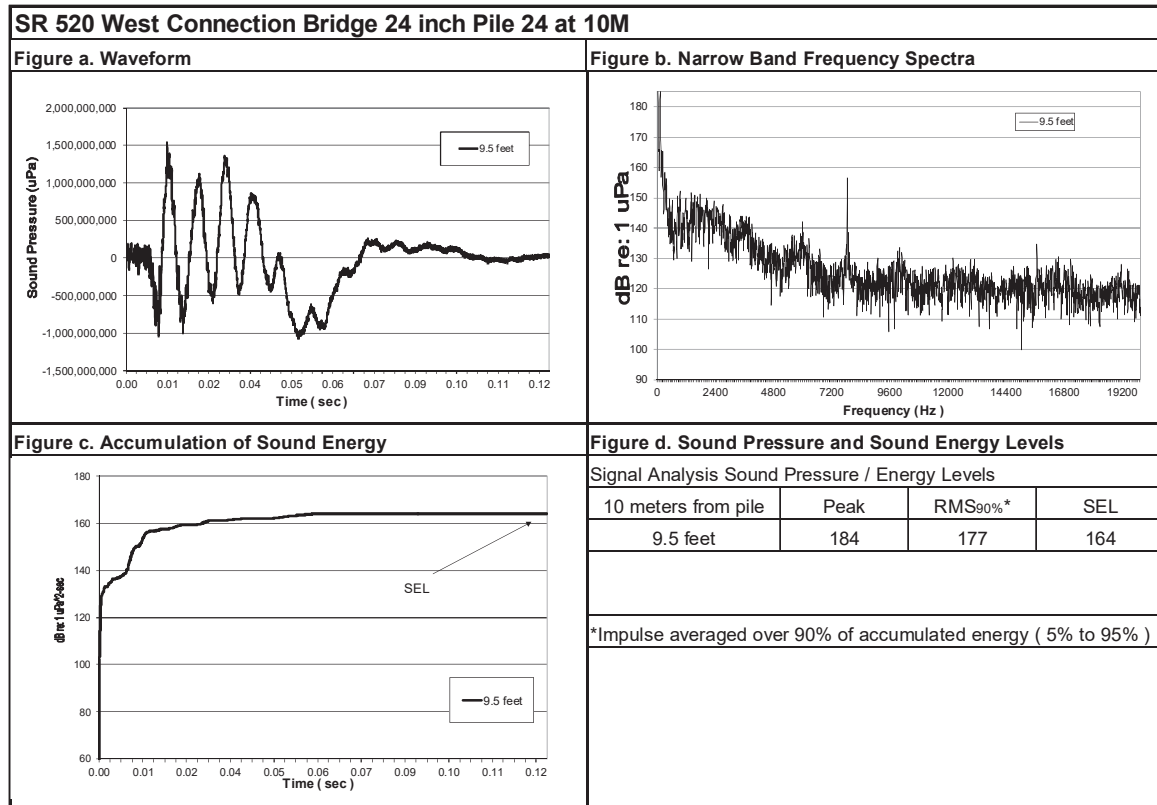


Figure 58: Waveform analysis of Pile 23, 3H

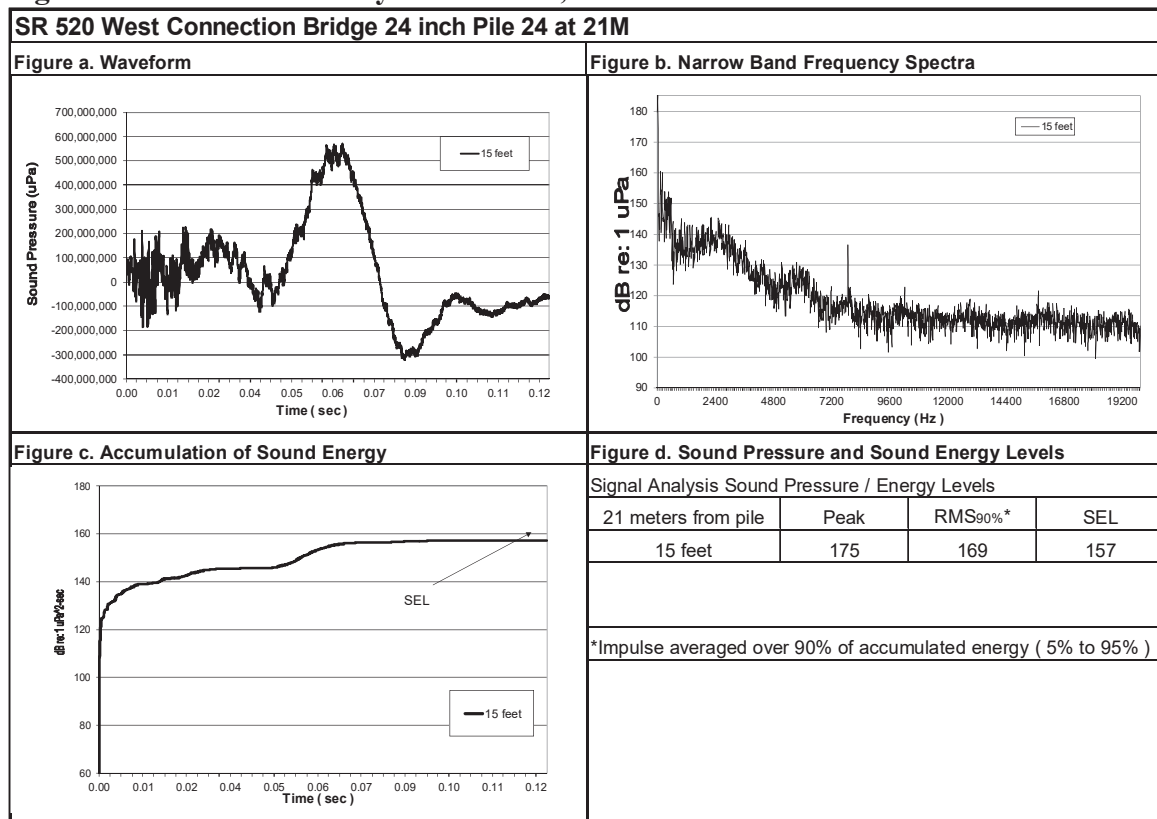




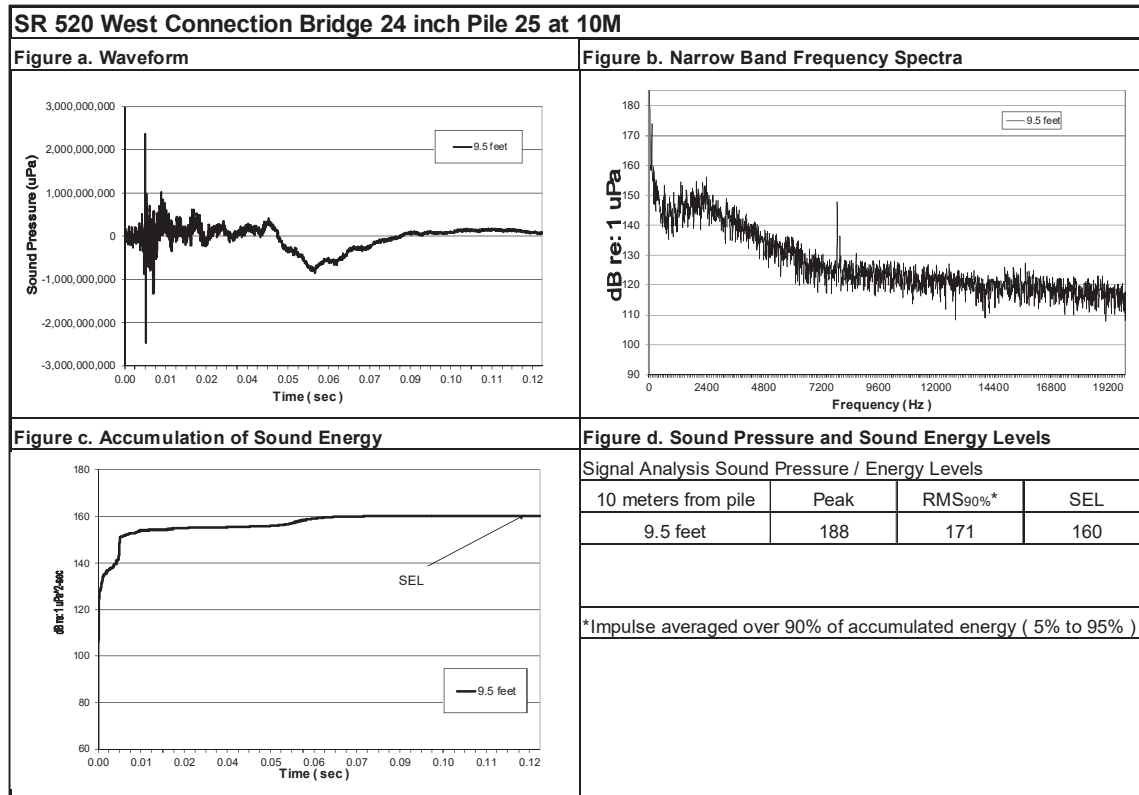
**Figure 59: Waveform analysis of Pile 24, 10M**



**Figure 60: Waveform analysis of Pile 24, 3H**



**Figure 61: Waveform analysis of Pile 25, 10M**



**Figure 62: Waveform analysis of Pile 25, 3H**

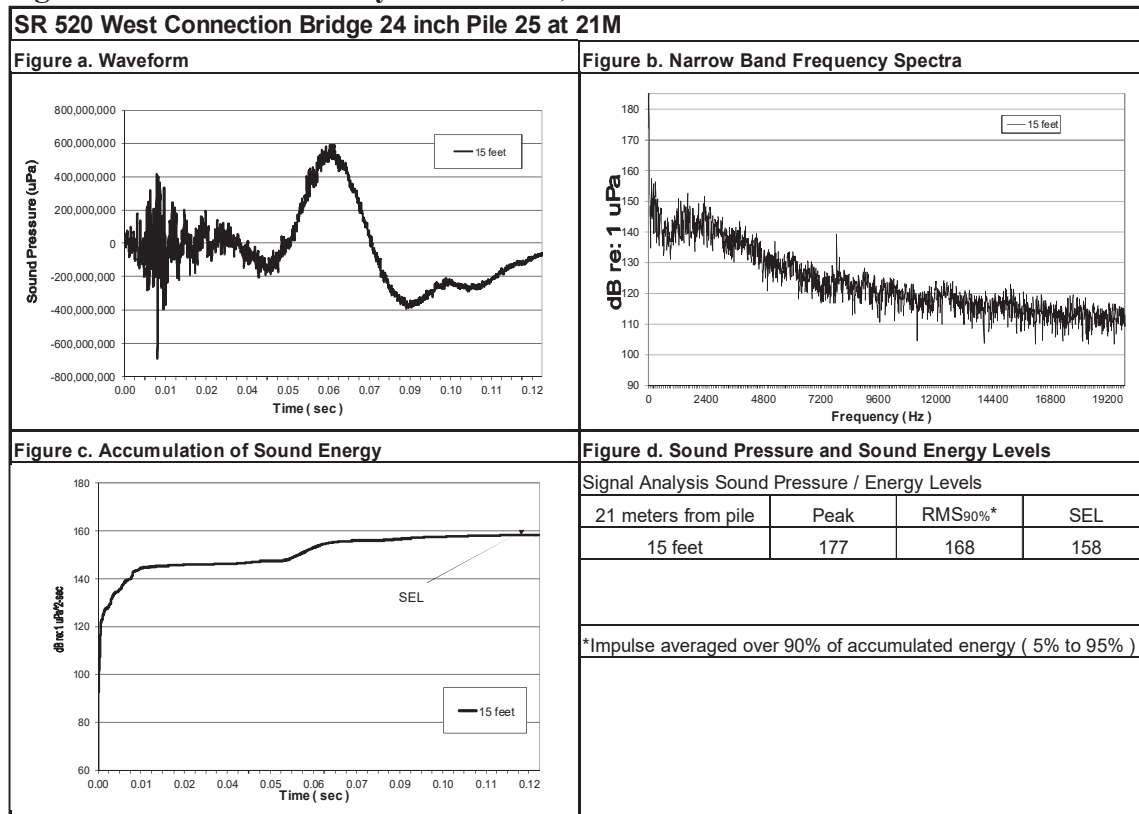


Figure 63: Waveform analysis of Pile 26, 10M

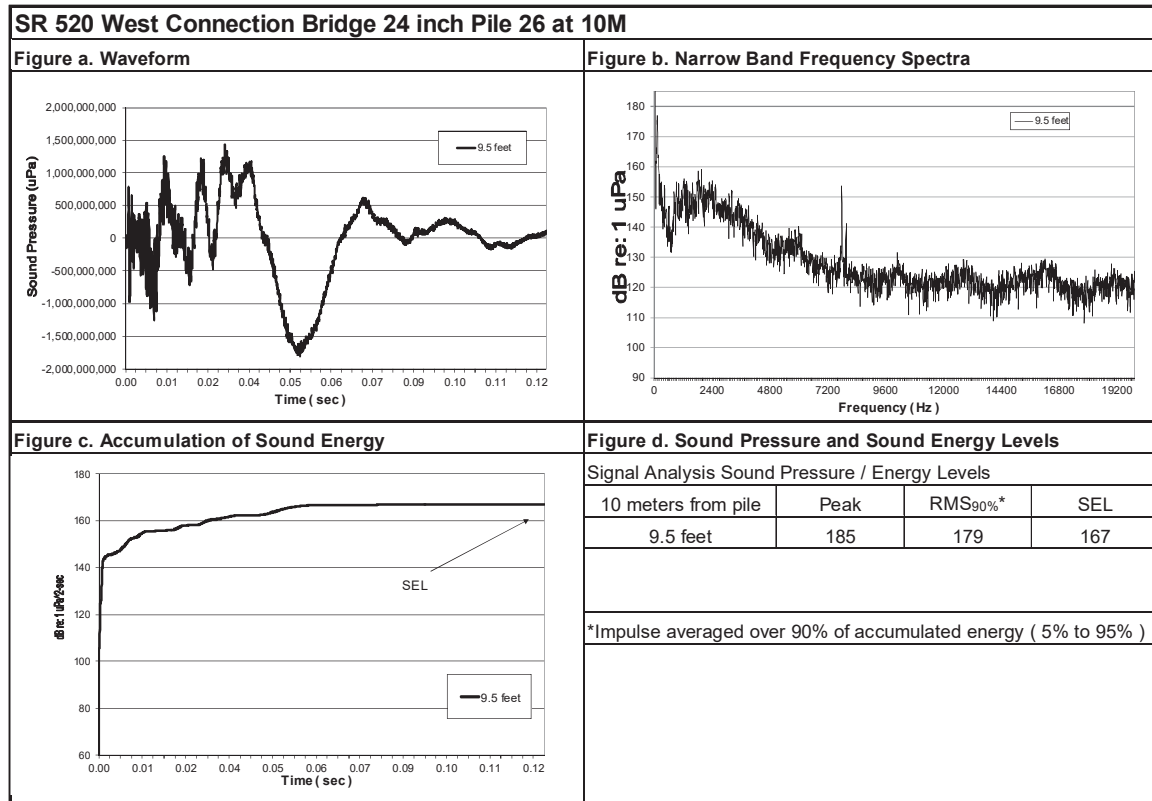


Figure 64: Waveform analysis of Pile 26, 3H

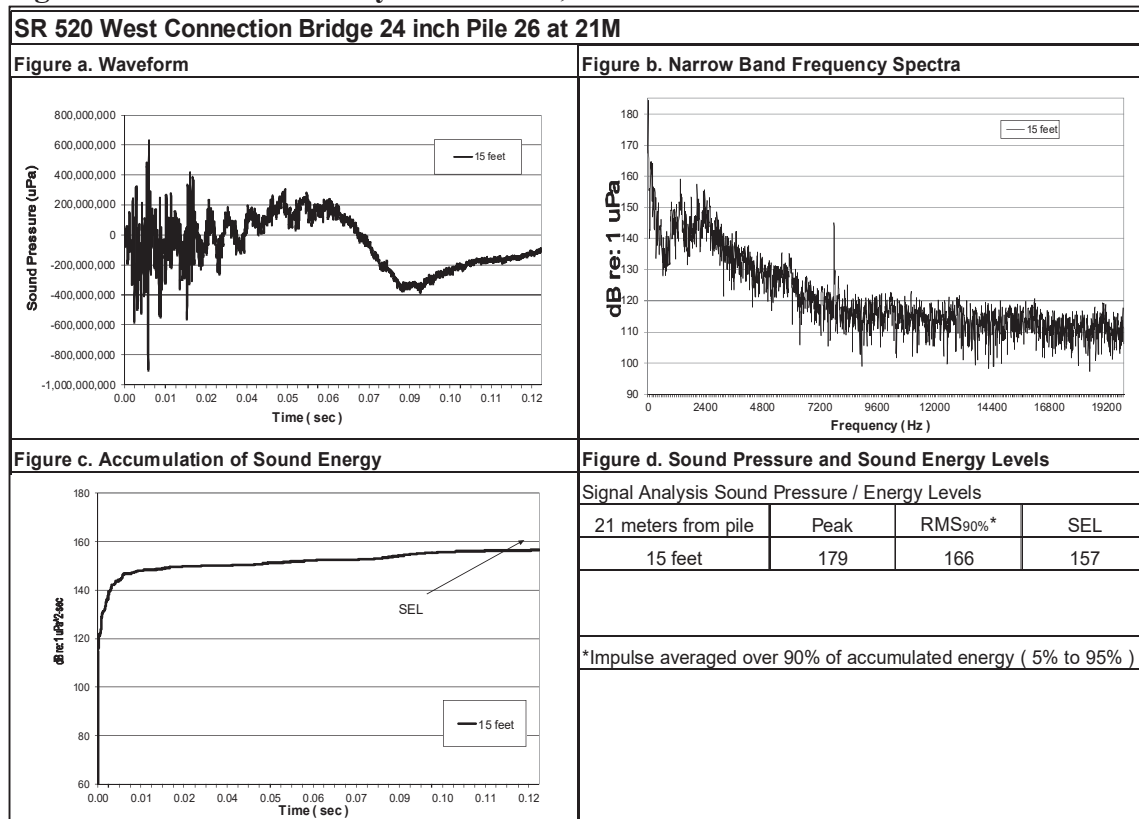


Figure 65: Waveform analysis of Pile 27, 15M

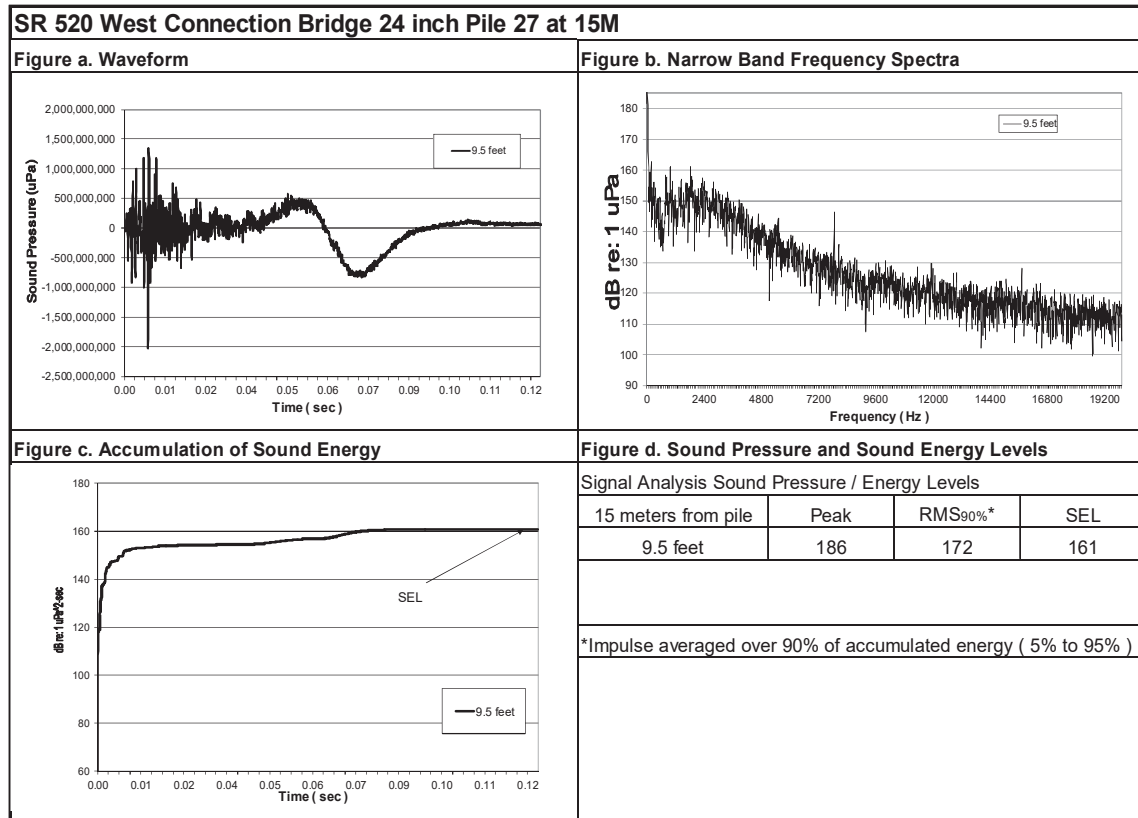


Figure 66: Waveform analysis of Pile 27, 3H

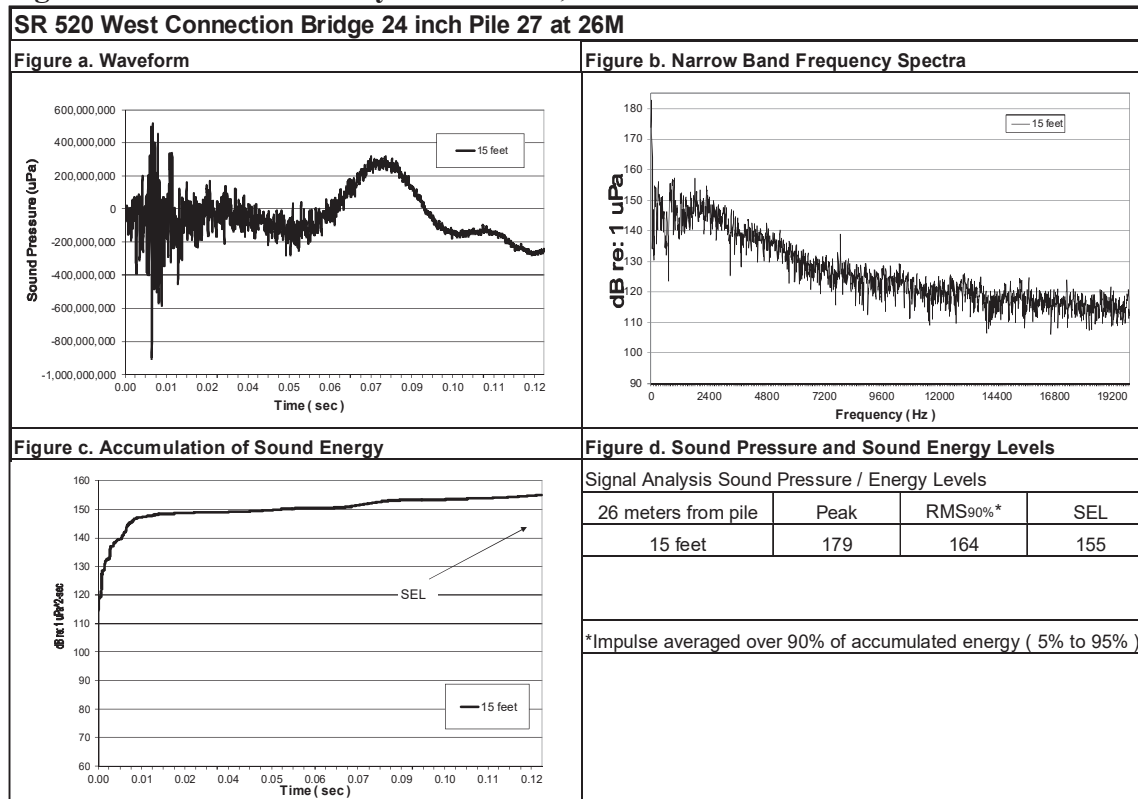


Figure 67: Waveform analysis of Pile 28, 10M

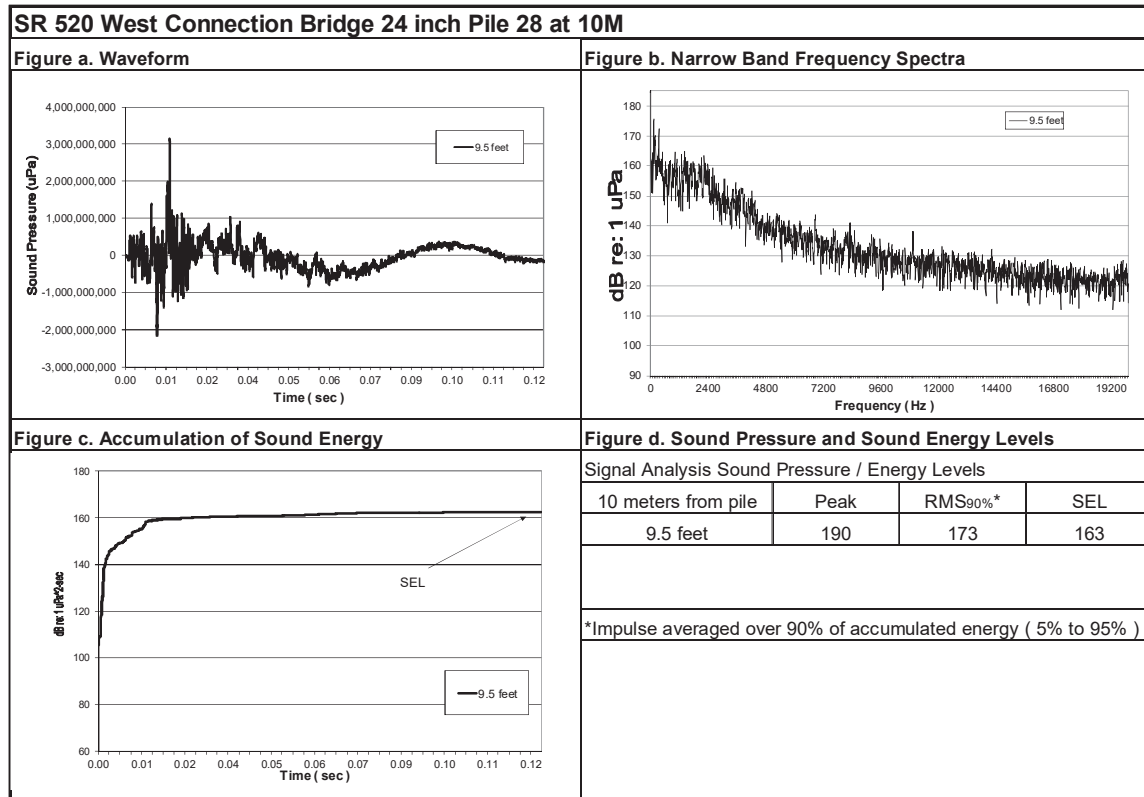


Figure 68: Waveform analysis of Pile 28, 3H

