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Brasil

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# SOLUÇÕES INTEGRADAS EM ENSAIOS NÃO DESTRUTIVOS E MONITORAMENTO ESTRUTURAL





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**INSPEÇÕES EM FUNDAÇÃO DE CONCRETO**

# INSPEÇÕES EM FUNDAÇÃO DE CONCRETO



**Falhas em fundação de concreto são catastróficas.**

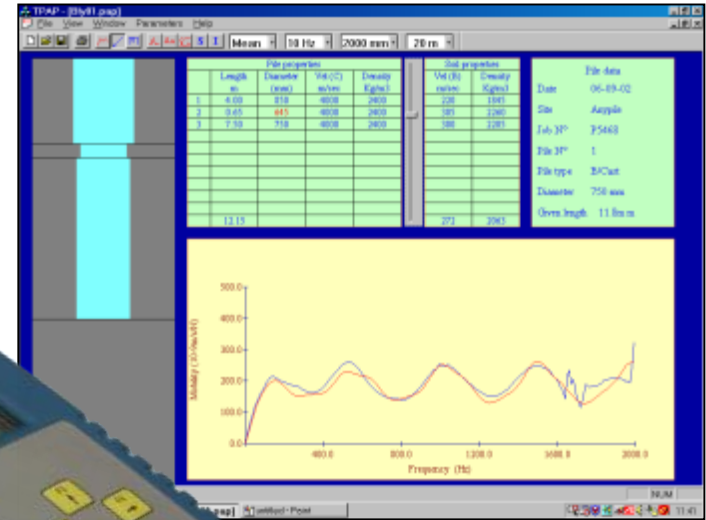
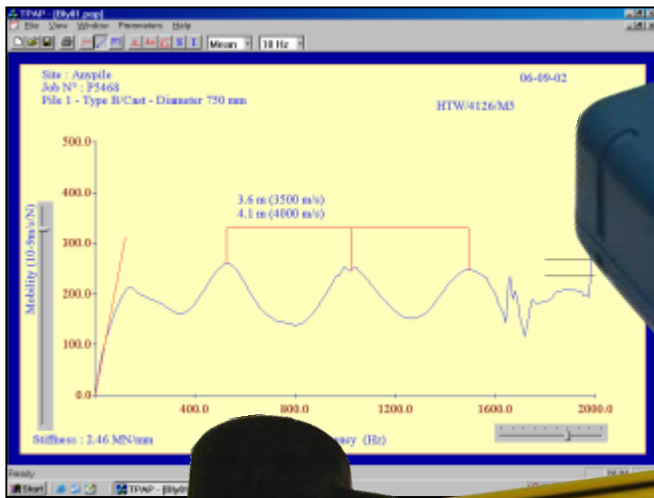






# INSPEÇÕES EM FUNDAÇÃO DE CONCRETO

Equipamento de inspeção em fundações de concreto.  
**Pile Testing System**



**Sistema de avaliação rápida e simples.**

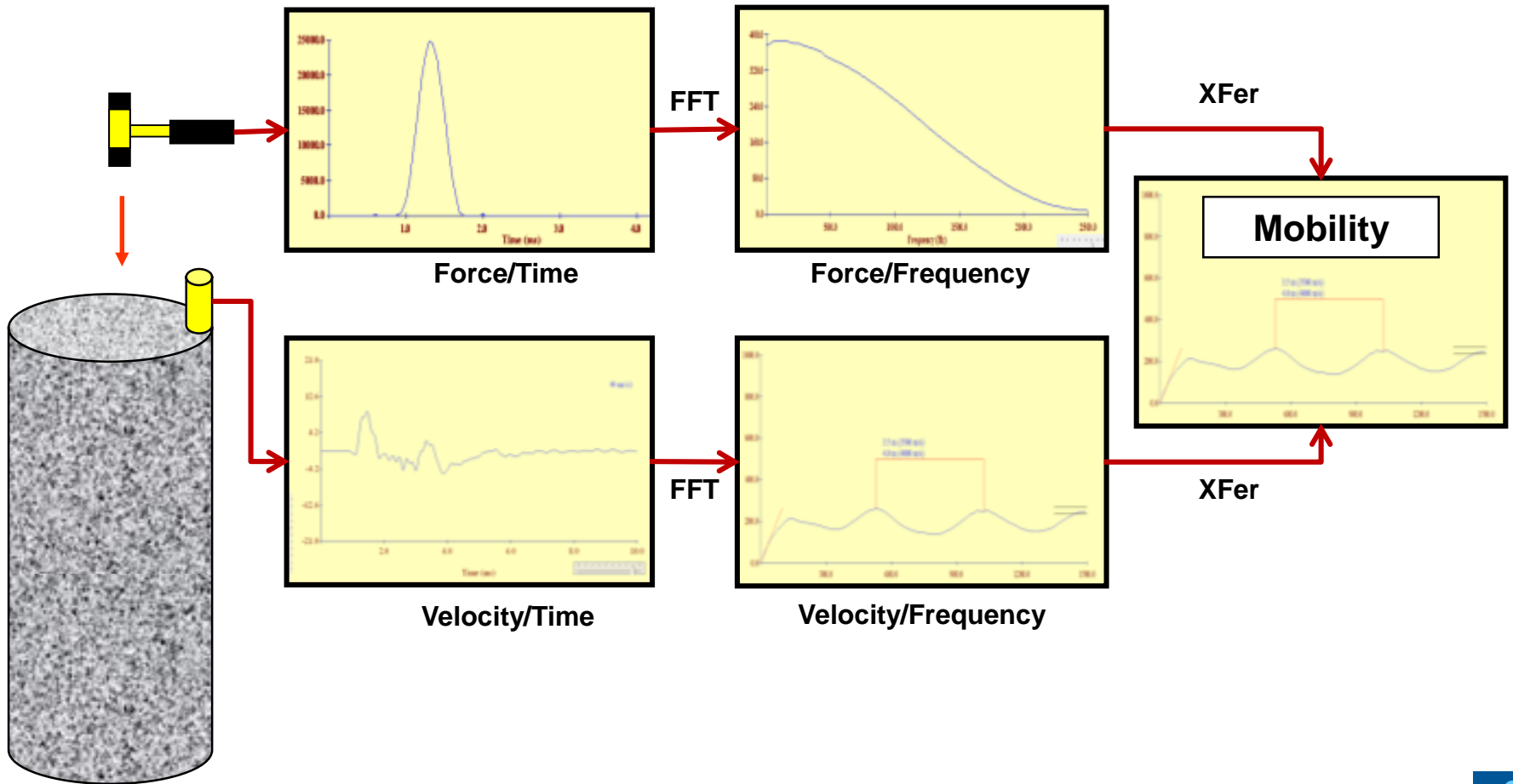




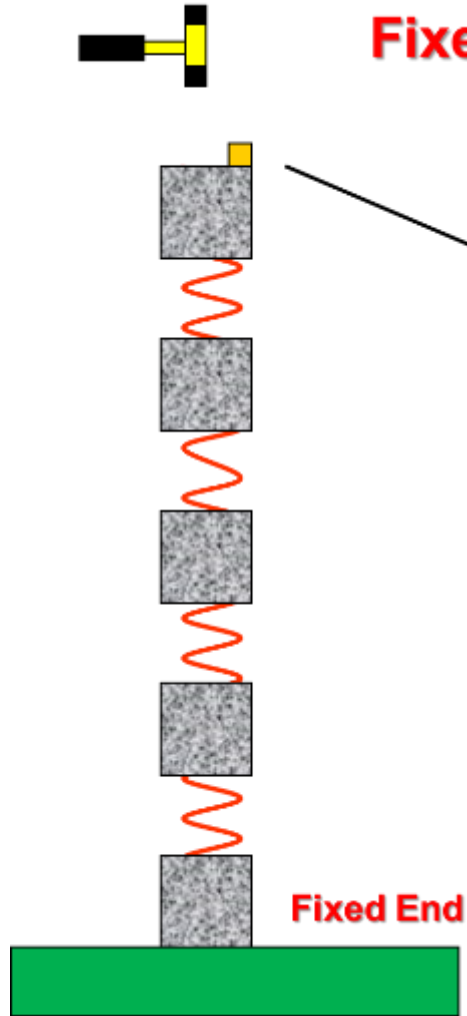
## **Low Strain Test Method**

- **Baseado na resposta da onda sonora gerada pelo impacto do martelo**
- **Medidas no domínio do tempo e no domínio da frequência**
- **Pode medir rigidez dinâmica, comprimento, deslocamento, perda de seção e trinca da fundação;**
- **Localiza o comprimento da falha**

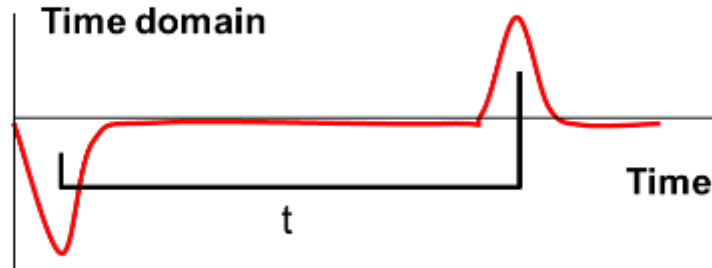
## Frequency Domain



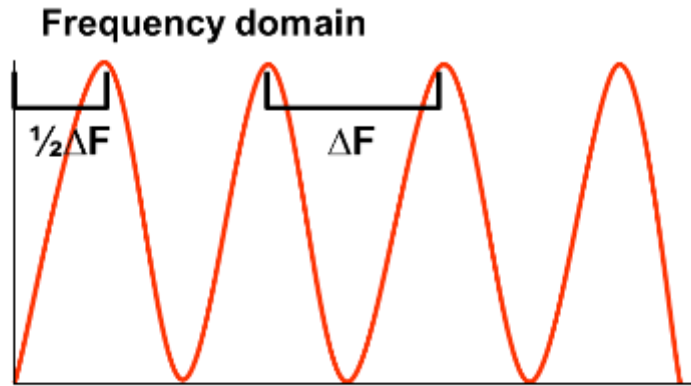
# INSPEÇÕES EM FUNDAÇÃO DE CONCRETO



## Fixed End Condition - Undamped



$Length = velocity \times time / 2$



$Length = velocity / 2 \Delta F$

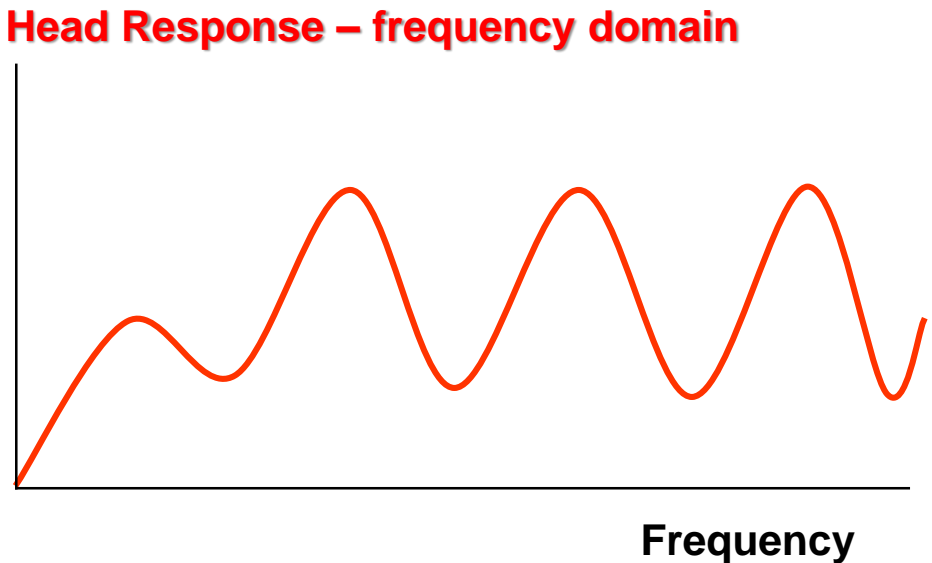
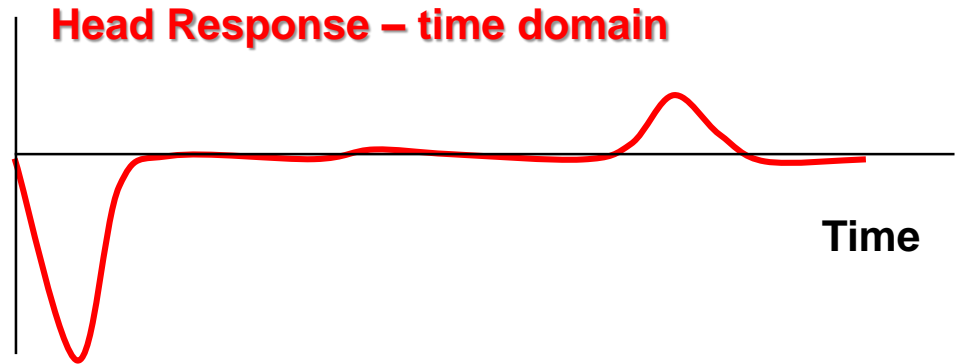




# Fixed End Condition - Damped

Effectively an  
increase in pile  
impedance

Increase in section  
Stiff Soil Interfaces  
Rock Socket

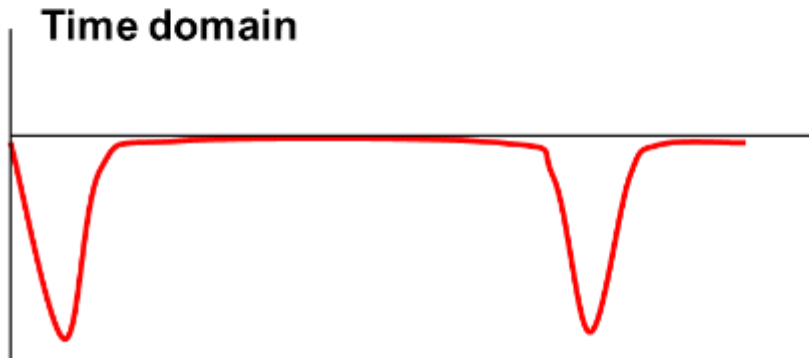




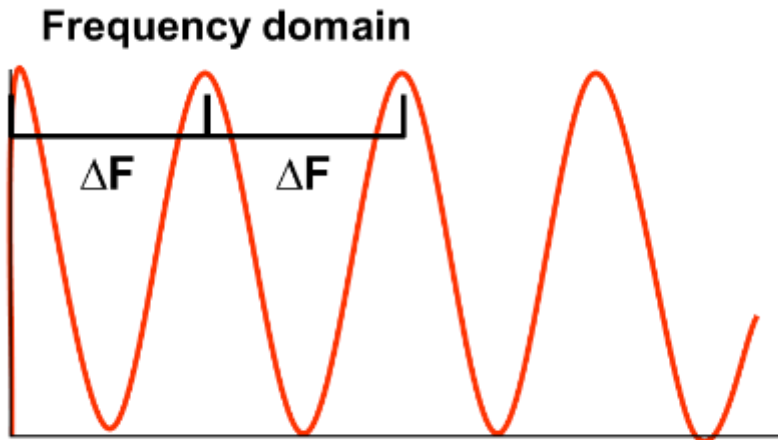
**Un-damped Free End Condition**



**Free End**



**Length = velocity x time / 2**



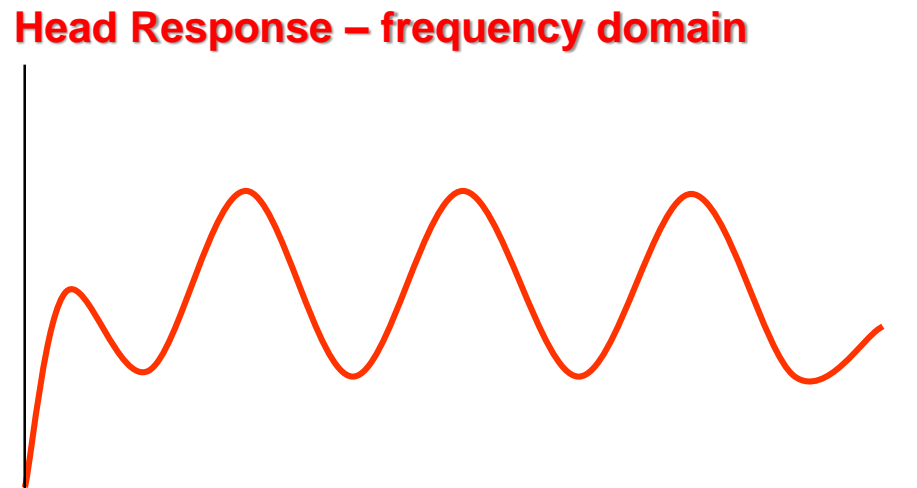
**Length = velocity / 2 ΔF**



## Free End Condition - Damped

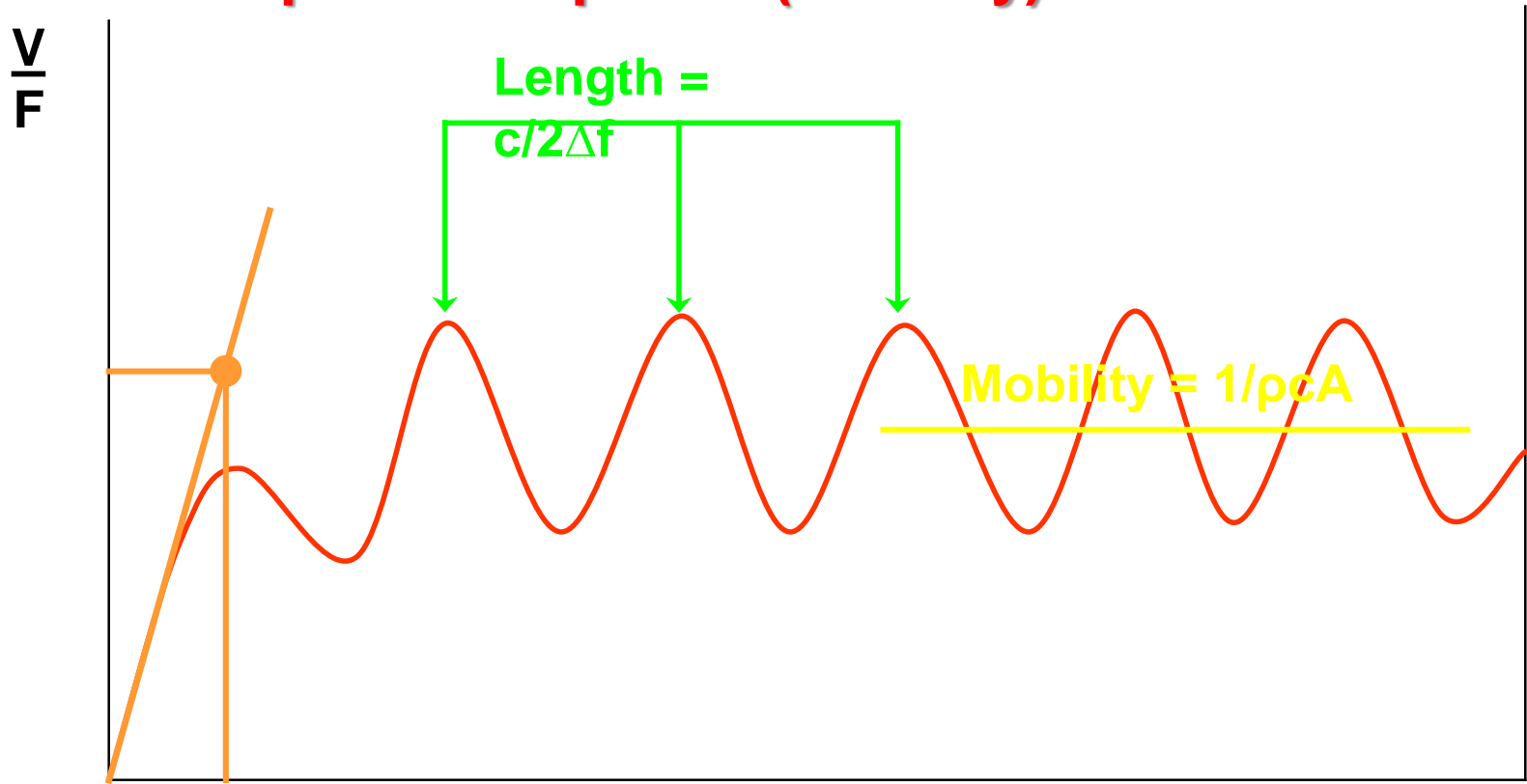
Effectively a decrease in pile impedance:

Pile Toe/Crack  
Decrease in Quality  
Soft Pile Toe





## Impulse Response (Mobility) Curve



$\text{Stiffness} = \frac{2\pi}{f(m)} \frac{V}{F(m)}$

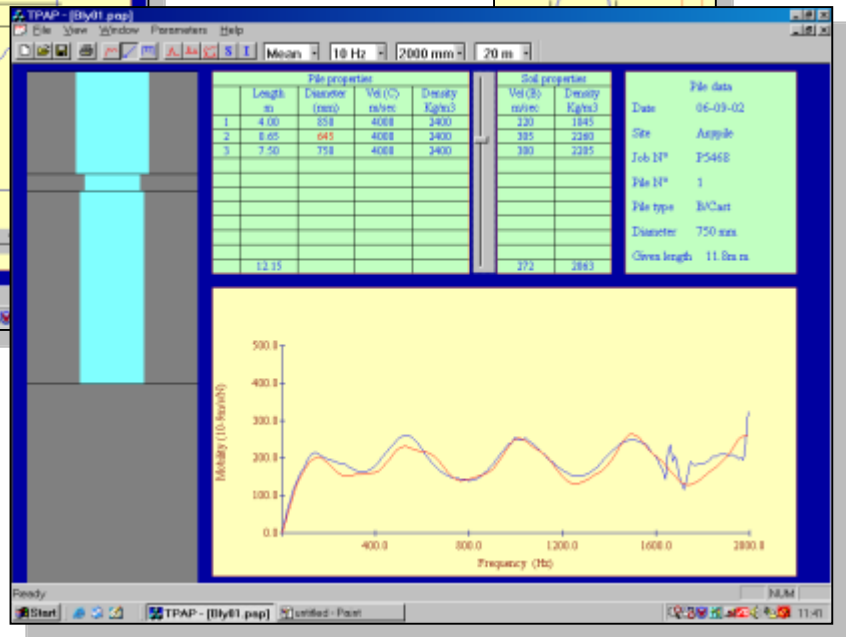
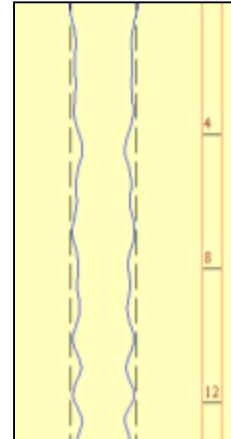
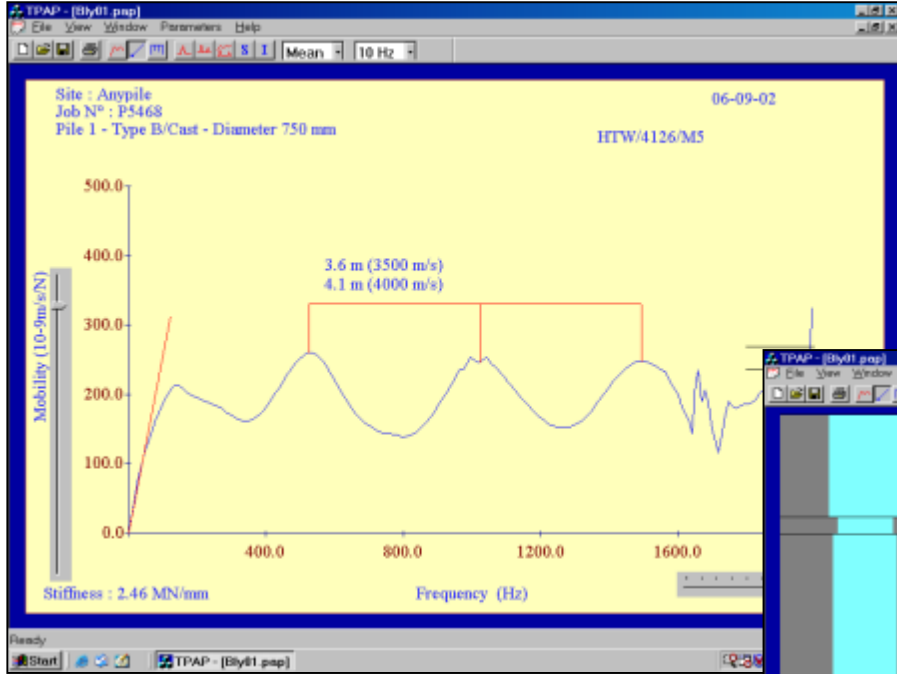
$\frac{V}{F(m)}$

Frequency





# INSPEÇÕES EM FUNDAÇÃO DE CONCRETO



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**Obrigado!**