

# RESULTADOS PRACTICA CURSO DE EXPLORACIÓN Y CARACTERIZACIÓN



INGENIERIA Y GEORIEGOS IGR SAS

**EDGAR E. RODRIGUEZ GRANADOS**

I.C., M.Sc., Profesor Asistente Universidad Nacional de Colombia, Profesor Catedrático de la Escuela Colombiana de Ingeniería y Pontificia Universidad Javeriana.

**Gerente de INGENIERÍA Y GEORIEGOS IGR SAS**

CURSO DE EXPLORACIÓN Y CARACTERIZACIÓN DEL SUBSUELO CON  
TÉCNICAS AVANZADAS

Bogotá 7, 8 y 9 de mayo de 2015

# PRUEBAS DE CAMPO CPTu, SDMT, PMT y GEOFÍSICA



# PRUEBA DE CAMPO - CPT<sub>u</sub>

(Geocing – IGR)



# PRUEBA DE CAMPO – SDMT

(Marchetti – IGR)



# PRUEBA DE CAMPO – PMT (IGR)

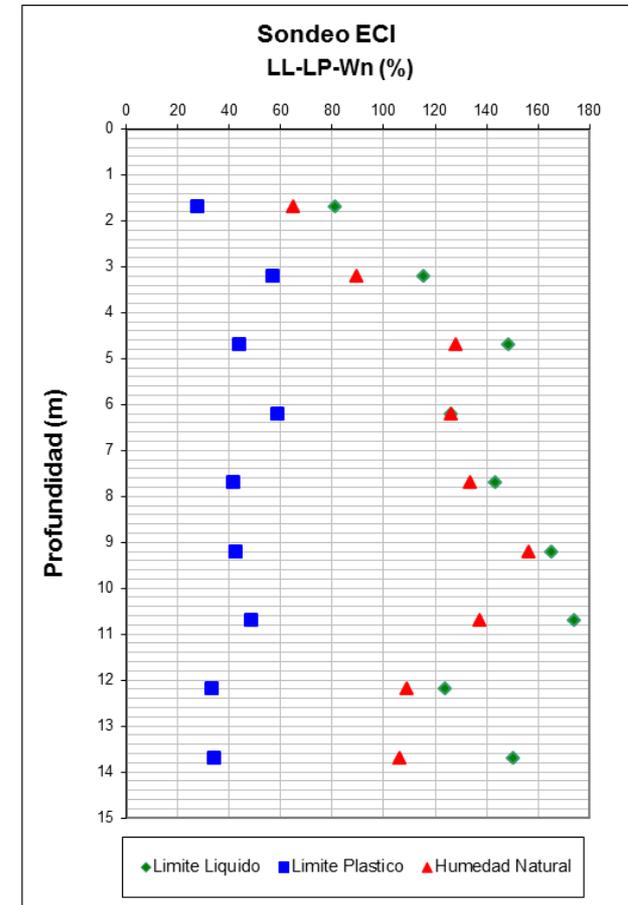
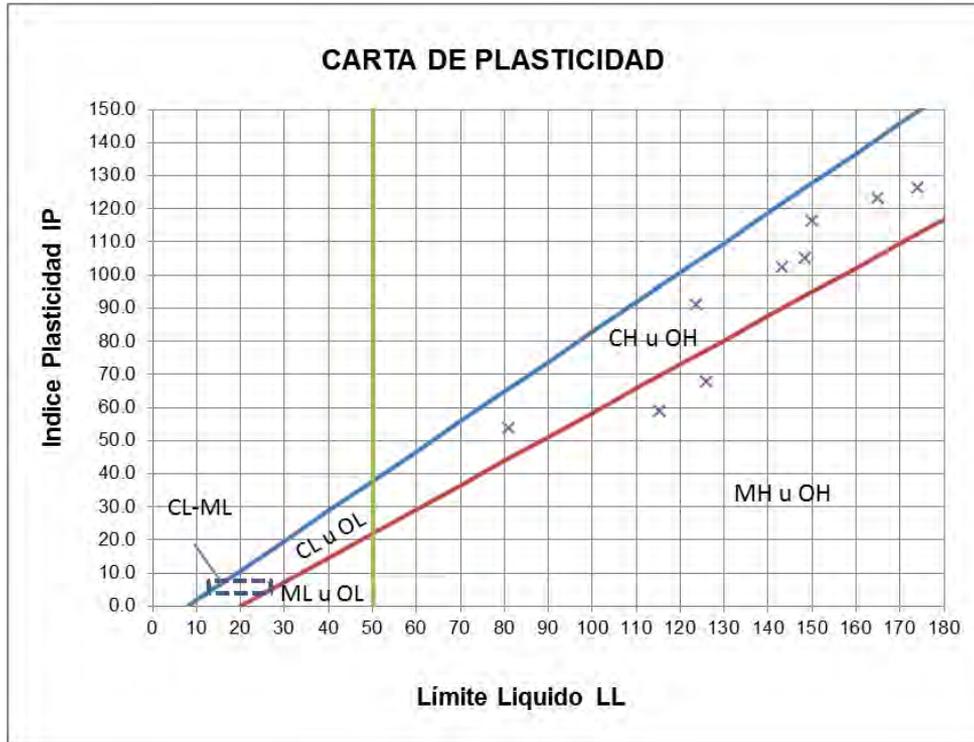


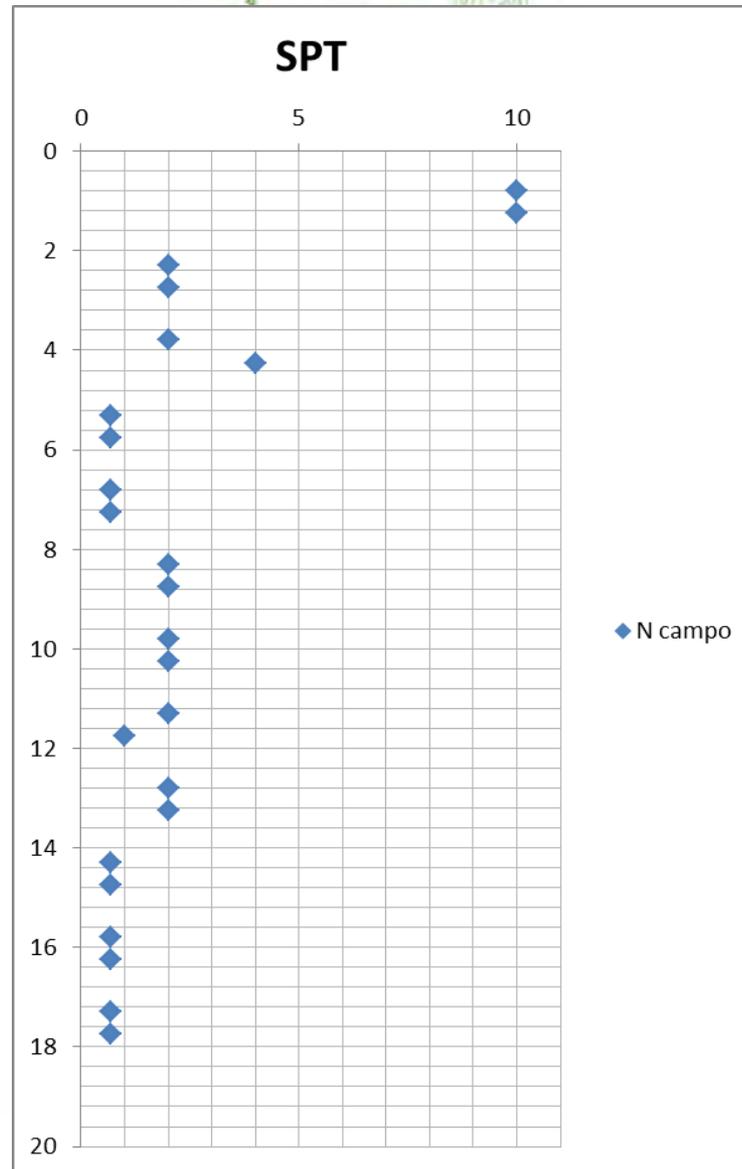
# PRUEBAS DE CAMPO - GEOFÍSICA (Jeoprobe)



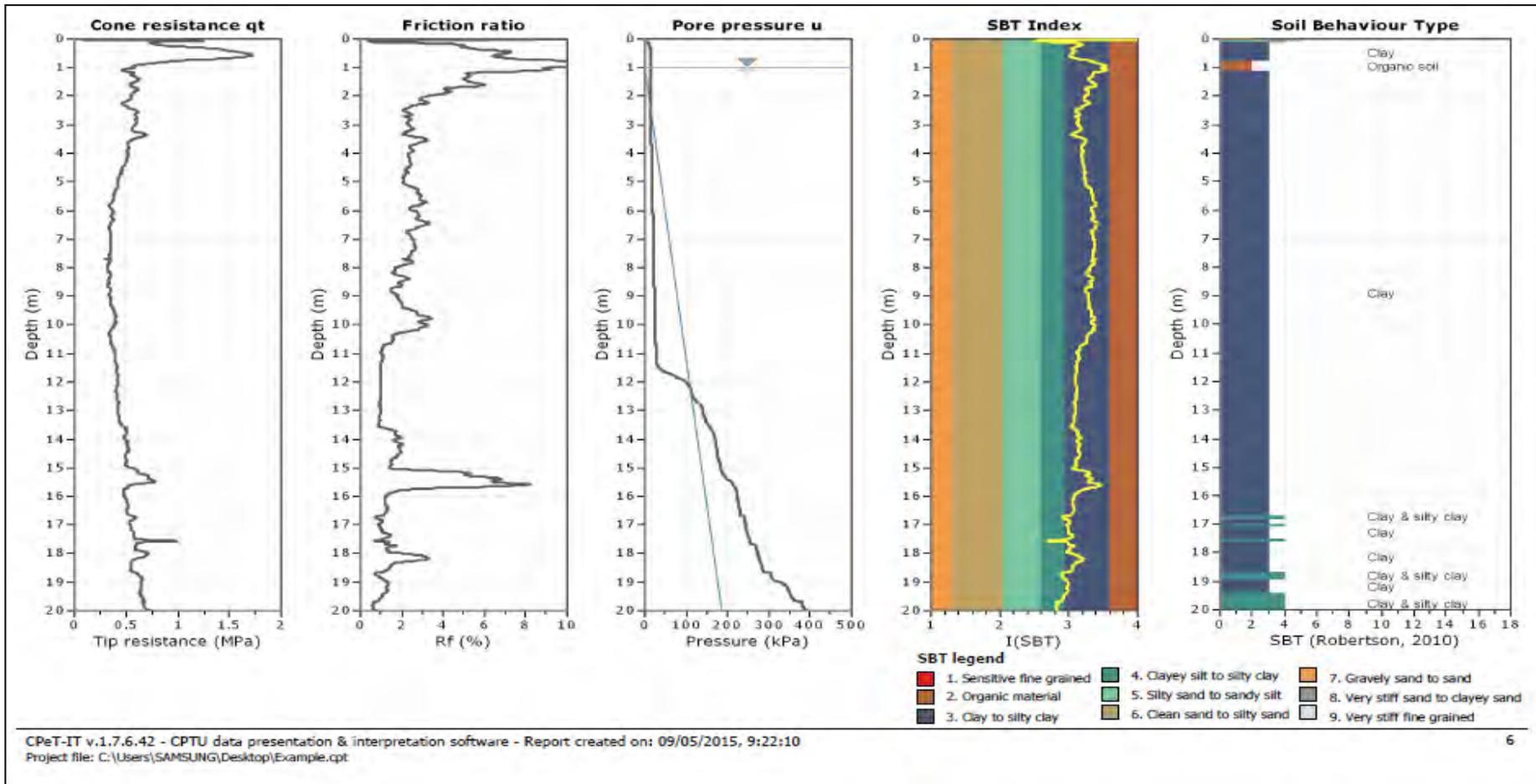
# RESULTADOS

## PROPIEDADES INDICE SONDEO ECI

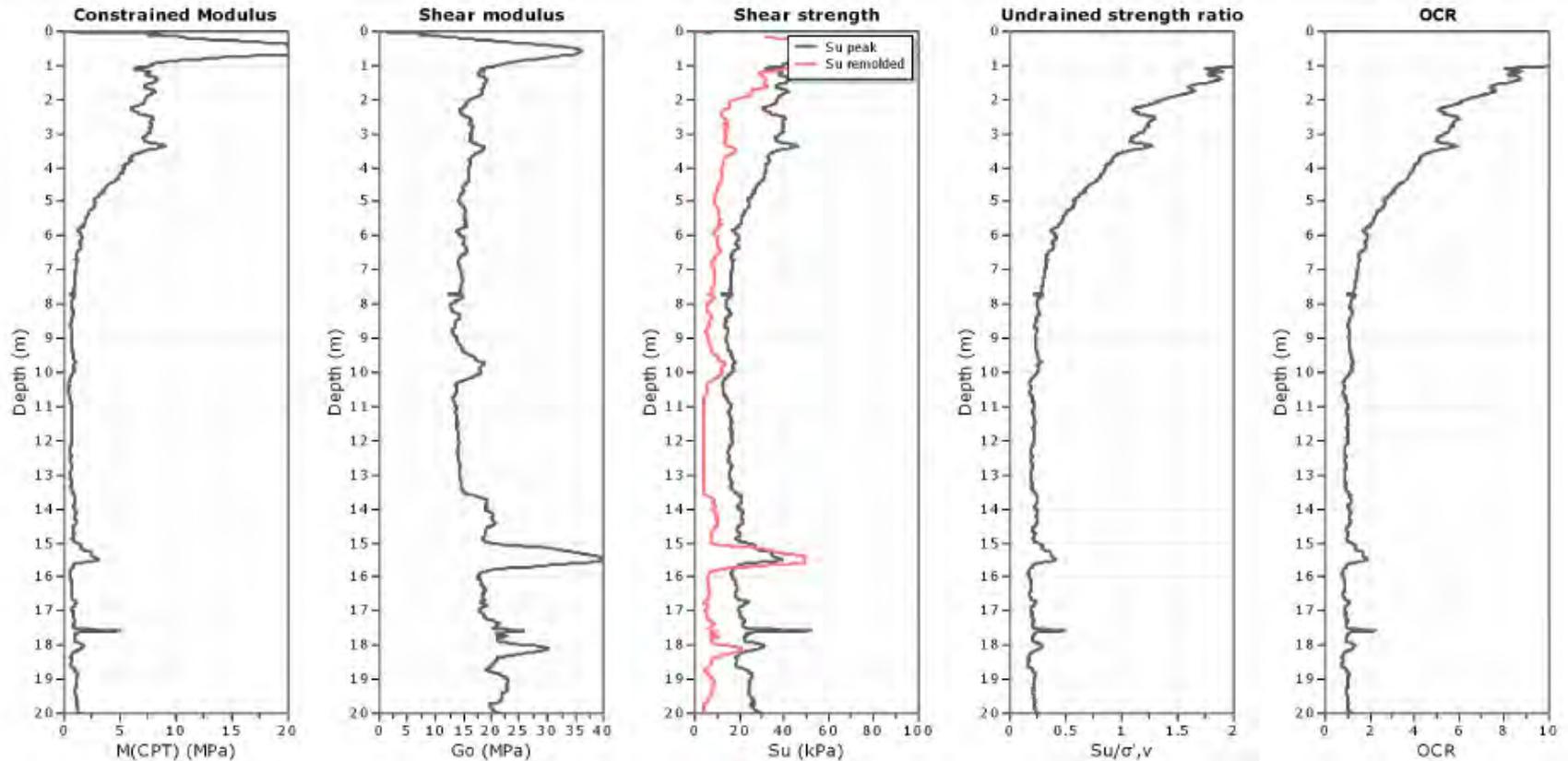




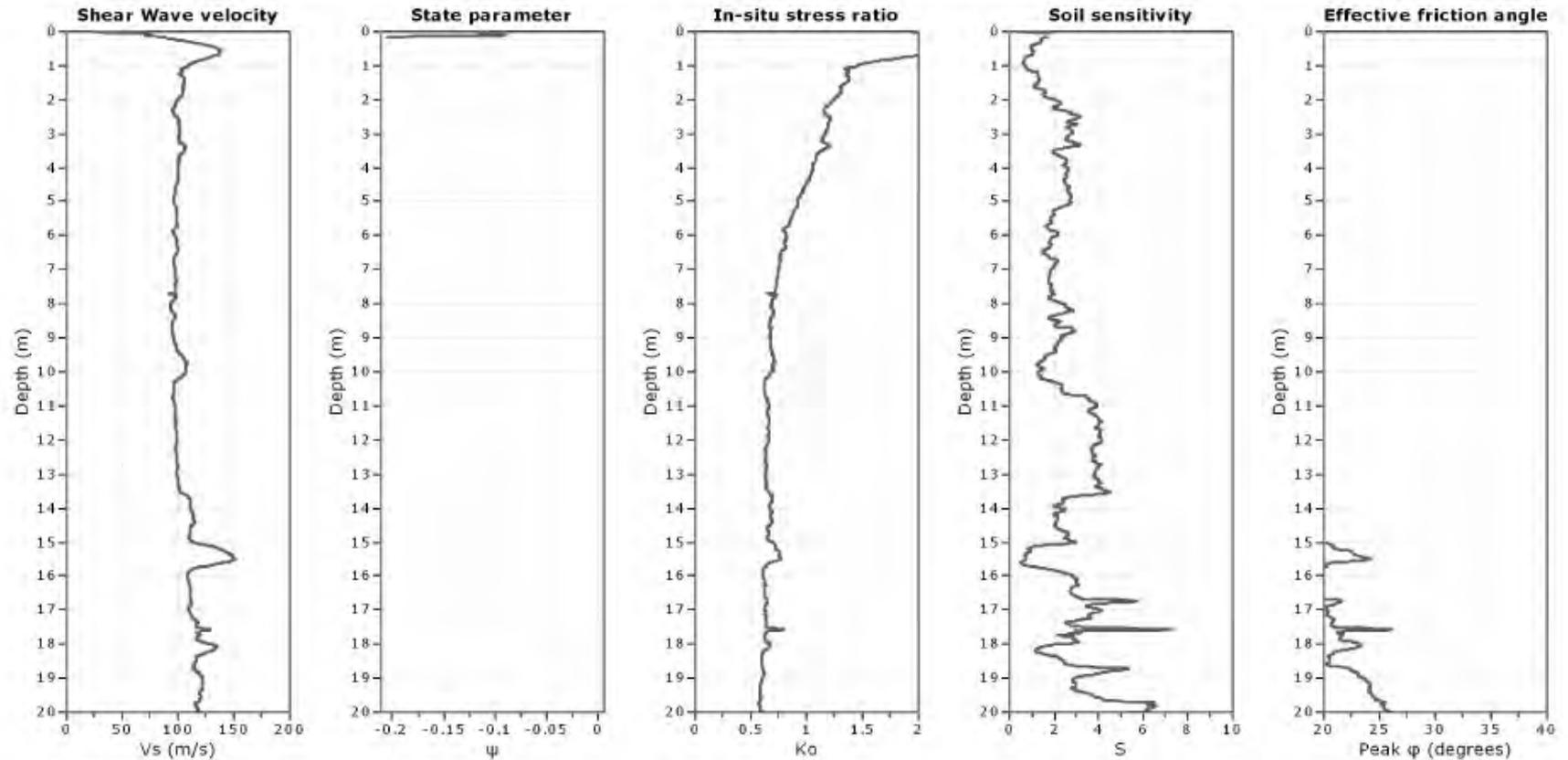
## RESULTADOS DE CPTu – PRÁCTICA ECI



## RESULTADOS DE CPTu – PRÁCTICA ECI



## RESULTADOS DE CPT<sub>u</sub> – PRÁCTICA ECI



**Calculation parameters**

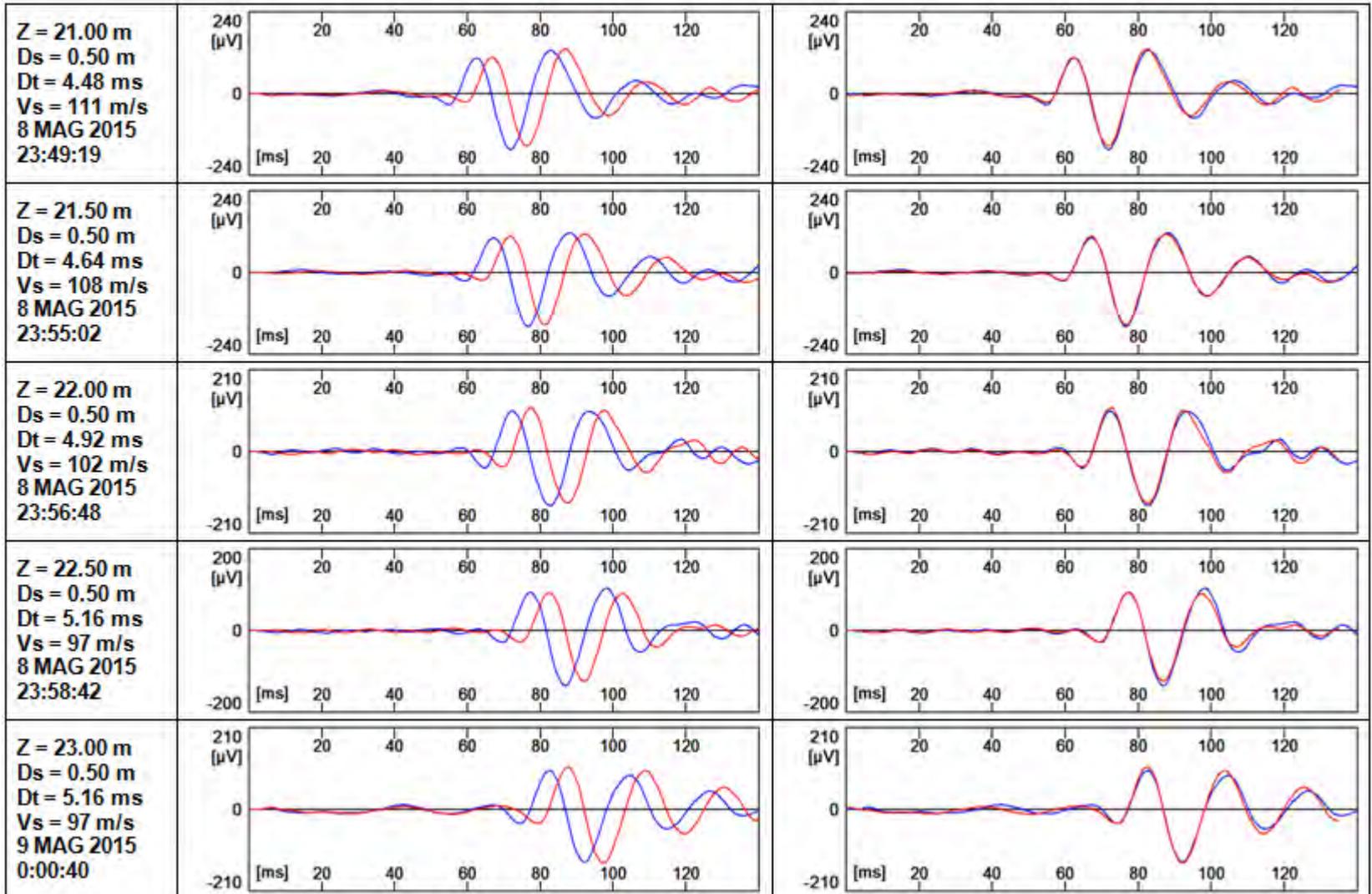
Soil Sensitivity factor,  $N_s$ : 7.00

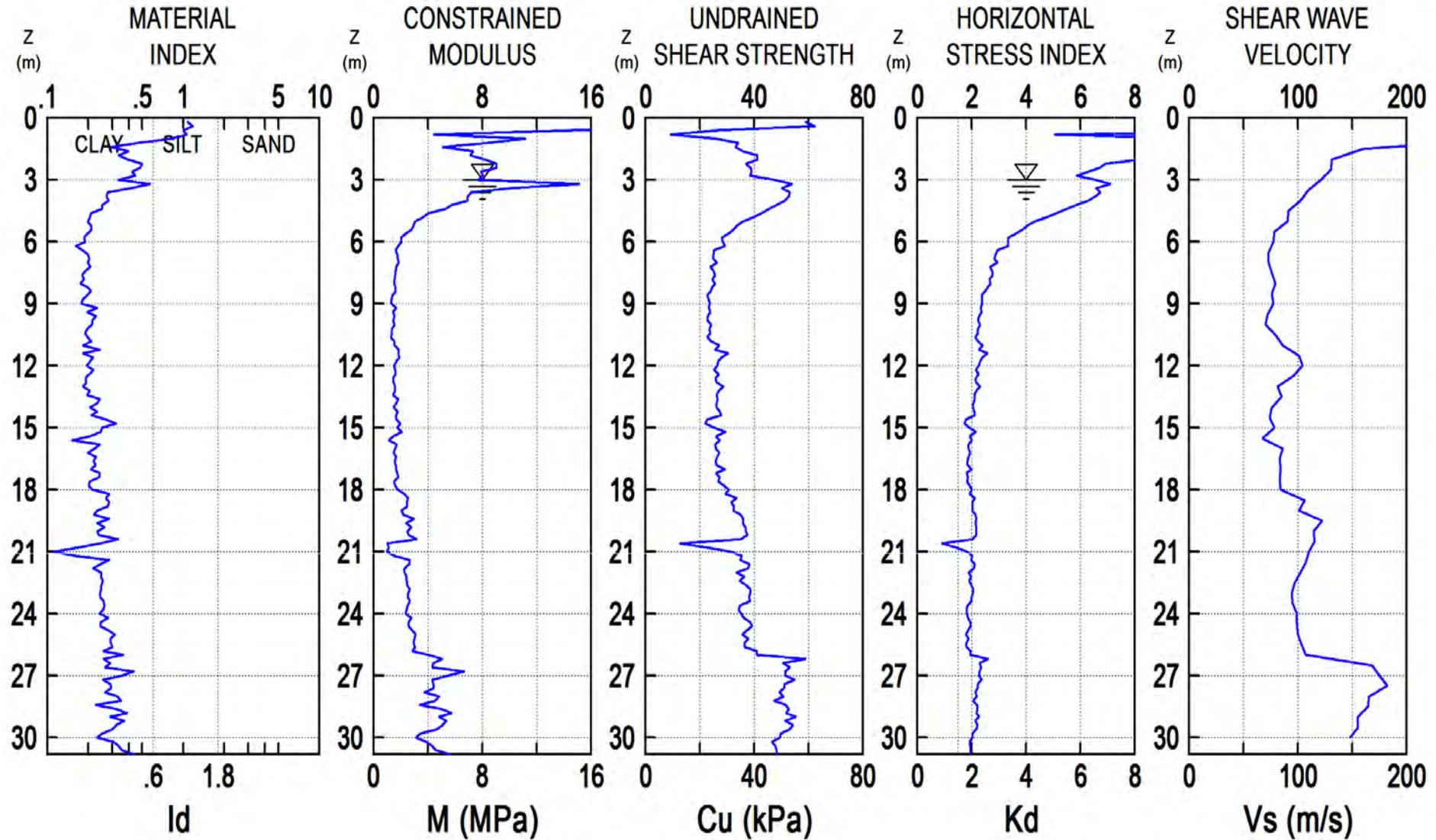
● User defined estimation data

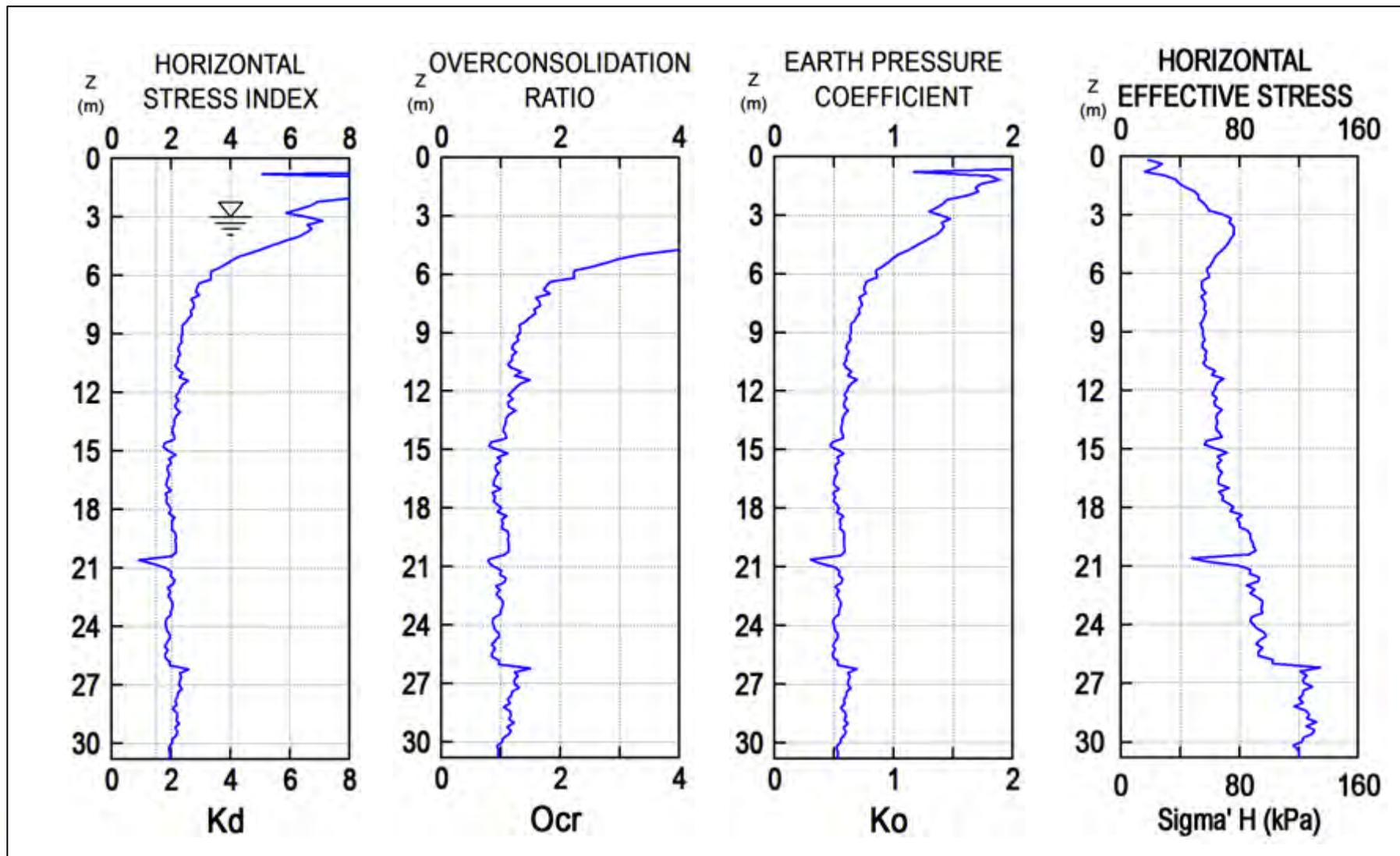
# SDMT 1 - $V_s$

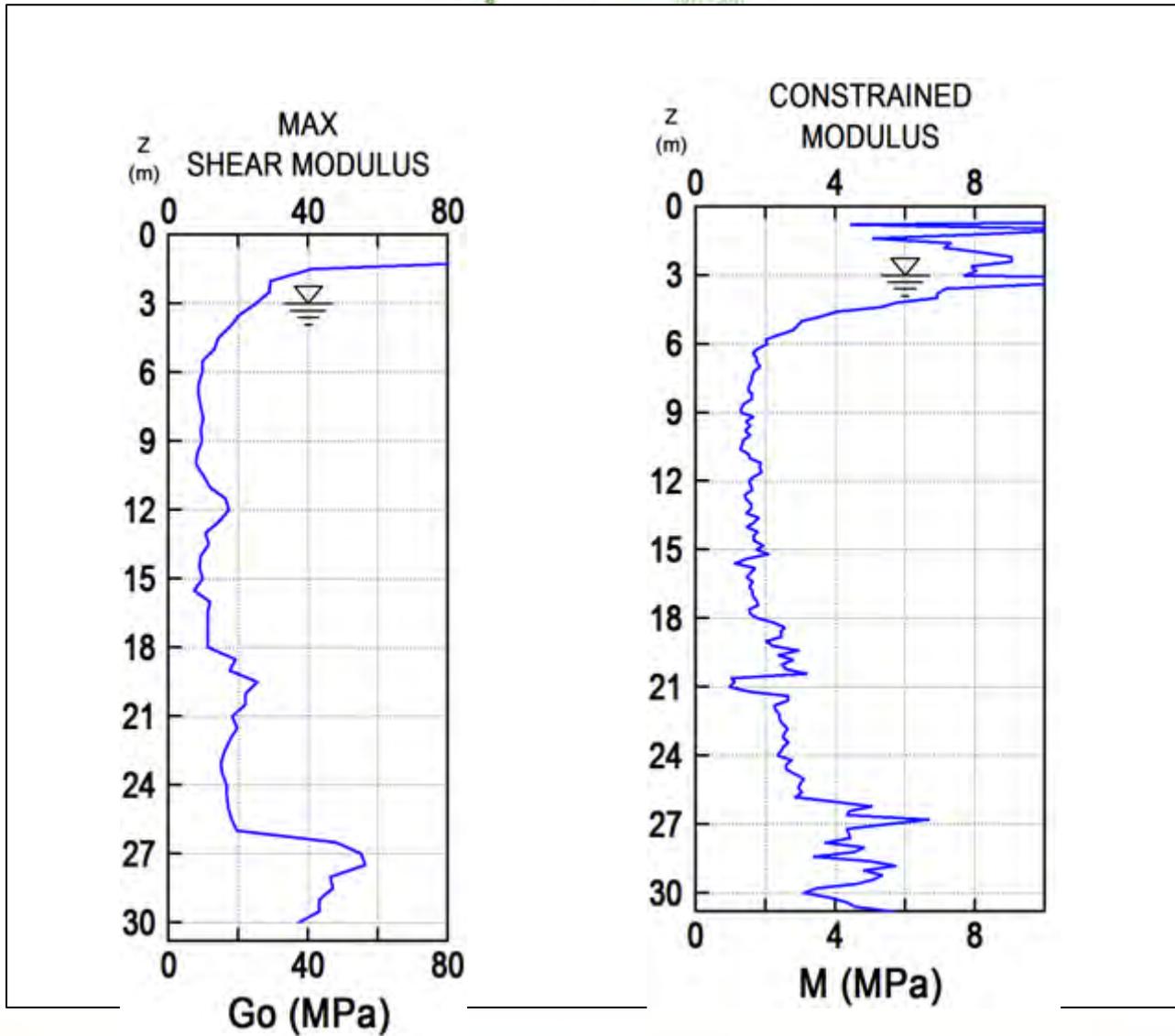
## RECORDED

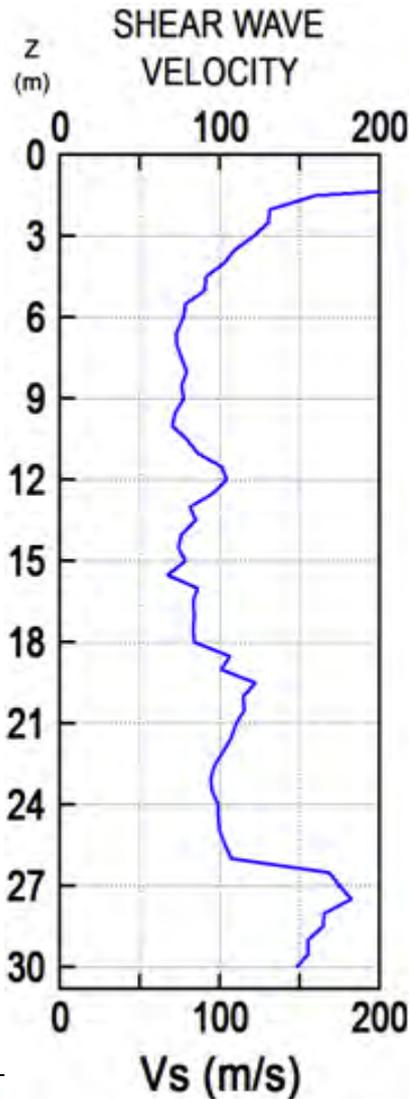
## RE-PHASED









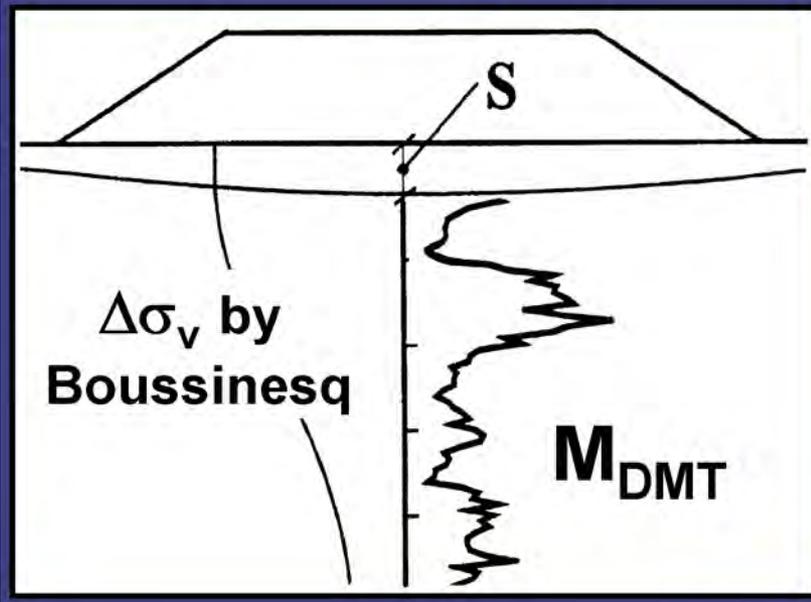


$$V_{S30} = \frac{30}{\sum_{i=1}^N \frac{h_i}{v_i}}$$

$$V_{S30} = 99 \text{ m/s}$$

Soil category: D

$$S = \sum \frac{\Delta\sigma_v}{M_{DMT}} \Delta z$$



DMT Settlements

File Settings Info

Load Area Soil Parameters Calculation Options Settlements Calculation Tables Graphs Report

**Load Area Type**  Isolated  Multiple Loaded Area

**Shape of Load Area** Square **Rectangle** Circle

**Rectangular Load Area**

Short Side  m

Long Side  m

Uniformly Distributed Load  kPa

Total Vertical Load  kN

Depth of Load Area Base  m

**CROSS SECTION**

**TOP VIEW**

Bogotá 7, 8 y 9 de mayo de 2013

DMT Settlements

File Settings Info

Load Area **Soil Parameters** Calculation Options Settlements Calculation Tables Graphs Report

Soil parameters from DMT Uni file

**Test Name**

**Firm**

**Customer**

**Job**

**Site**

**Remark**

**Date**

Z [m]	M [MPa]	Sigma'v [kPa]
0.20	35.7	3
0.40	41.5	7
0.60	14.5	10
0.80	4.4	13
1.00	11.2	16
1.20	8.4	19
1.40	5.1	23
1.60	7.3	26
1.80	7.1	29
2.00	8.2	32
2.20	9.0	36
2.40	9.0	39
2.60	7.9	42
2.80	8.0	46
3.00	7.7	49

DMT Settlements

File Settings Info

Load Area Soil Parameters Calculation Options **Settlements Calculation** Tables Graphs Report

### Settlements Calculation Results

**Load Area**

Shape of Load Area	Rectangle (15.00 m x 30.00 m)
Depth of Load Area Base	2.00 m
Uniformly Distributed Load	70 kPa
Total Vertical Load	31500 kN

**Soil Parameters**

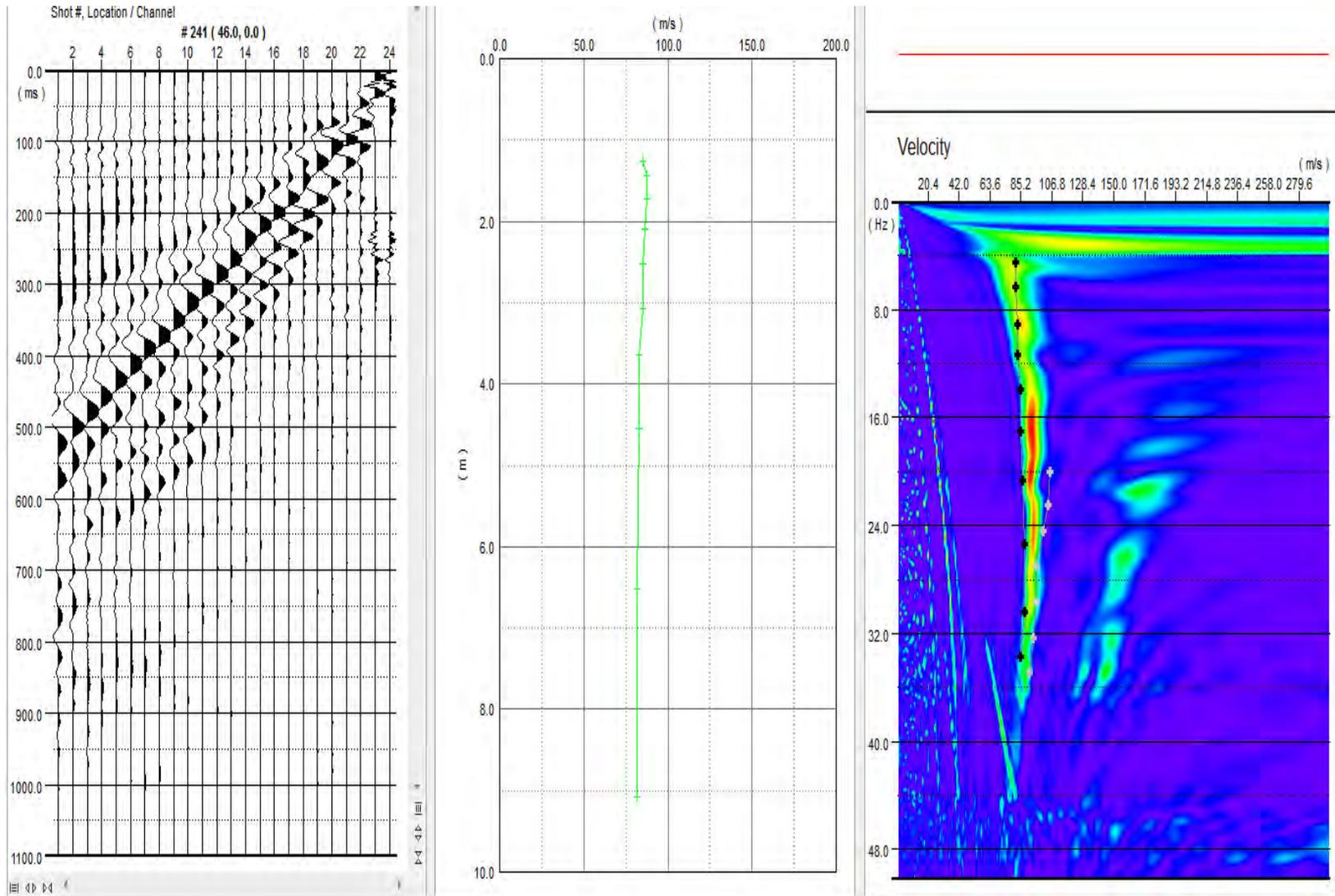
Soil parameters from DMT test	SDMT 1
-------------------------------	--------

**Calculation Options**

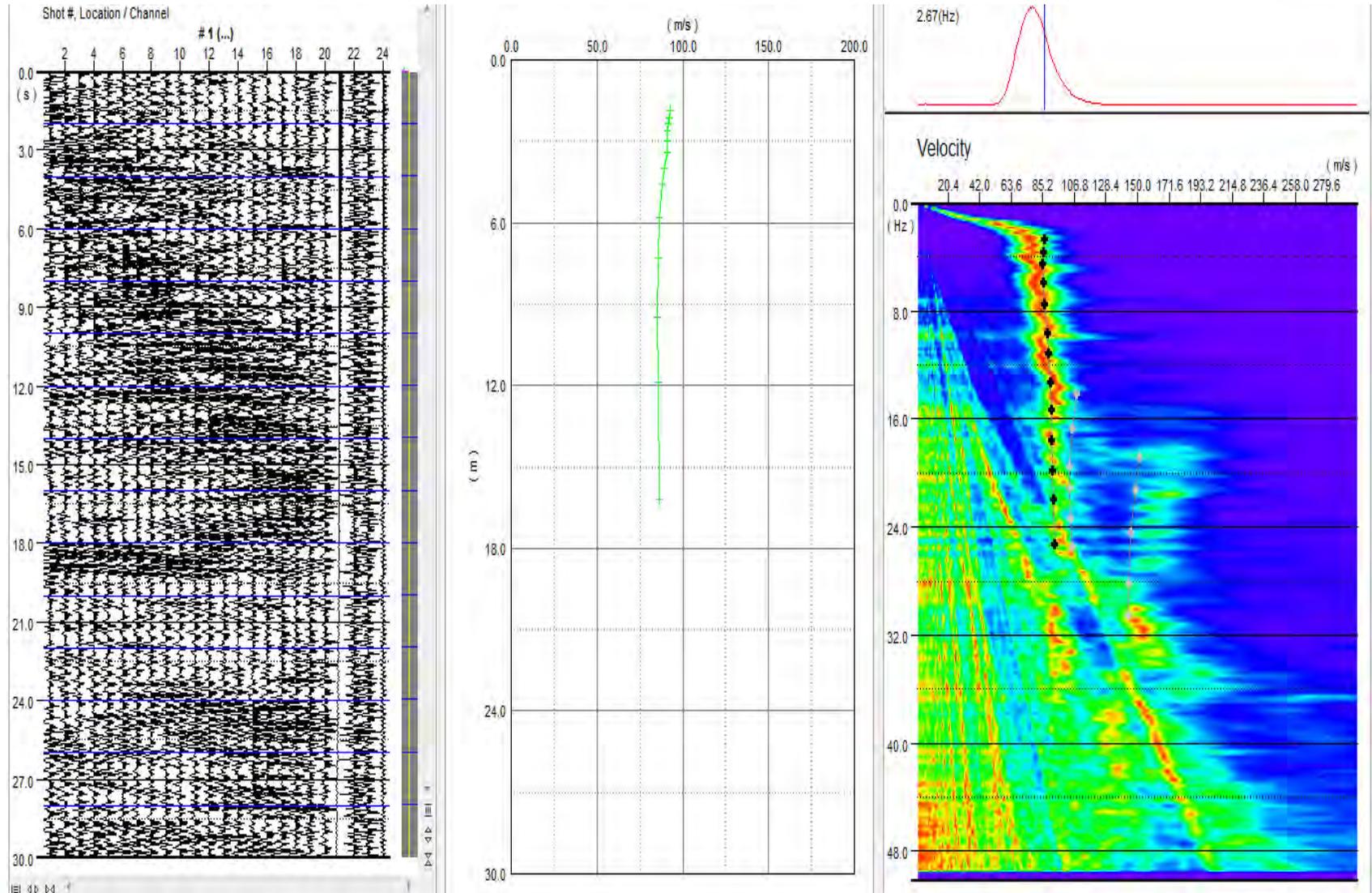
Thickness of calculation layer	0.20 m
Lower limit assigned to M	0.70 MPa
End of Calculation	at end of assigned profile

Settlements Calculation Point	Settlements [mm]	Z Stop [m]	$\Delta\sigma/\sigma'v$
▶ below the center	526.1	30.80	0.063
below the corner	186.1	30.80	0.039
below the median point of short side	283.5	30.80	0.044
below the median point of long side	337.5	30.80	0.055

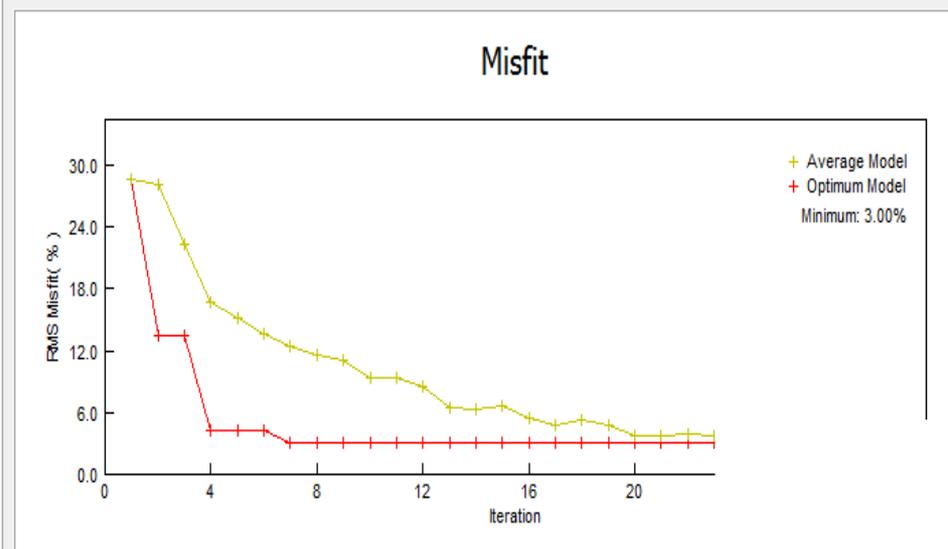
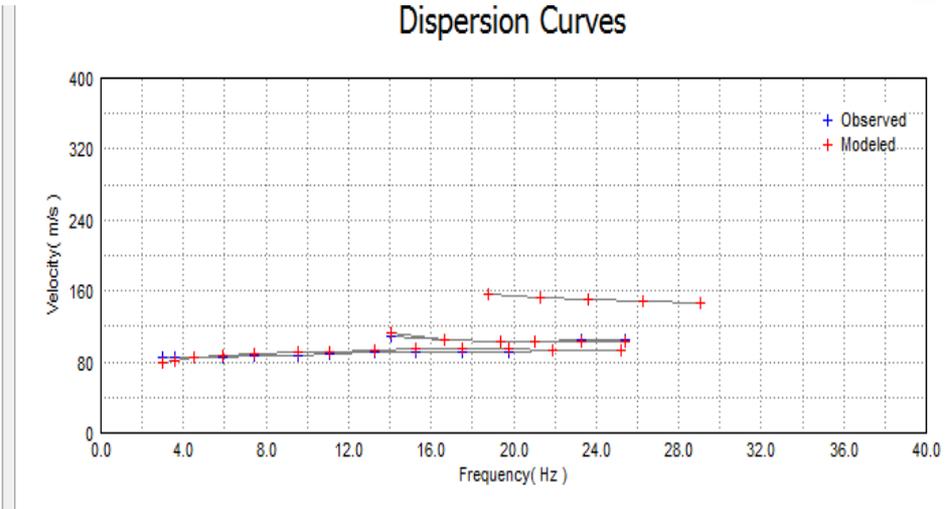
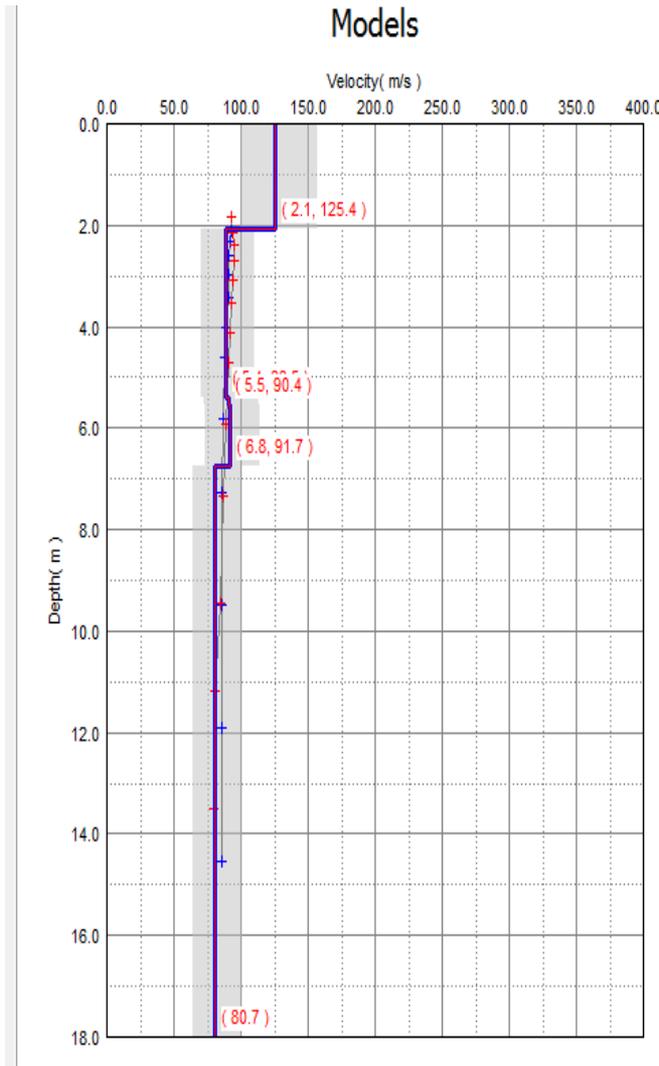
## RESULTADOS ENSAYO MASW: MEDICIONES ACTIVAS



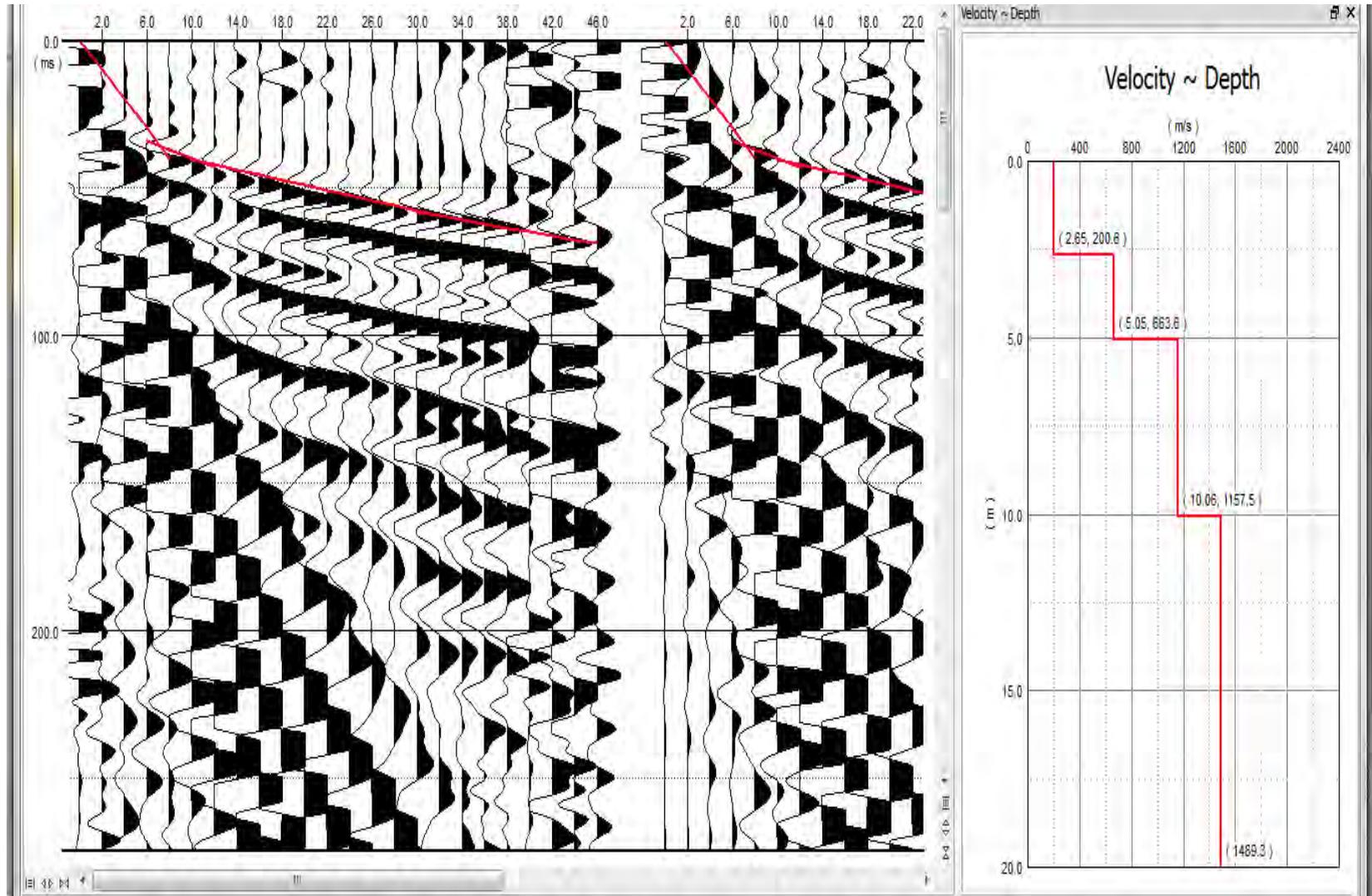
## RESULTADOS ENSAYO MASW: MEDICIONES PASIVAS



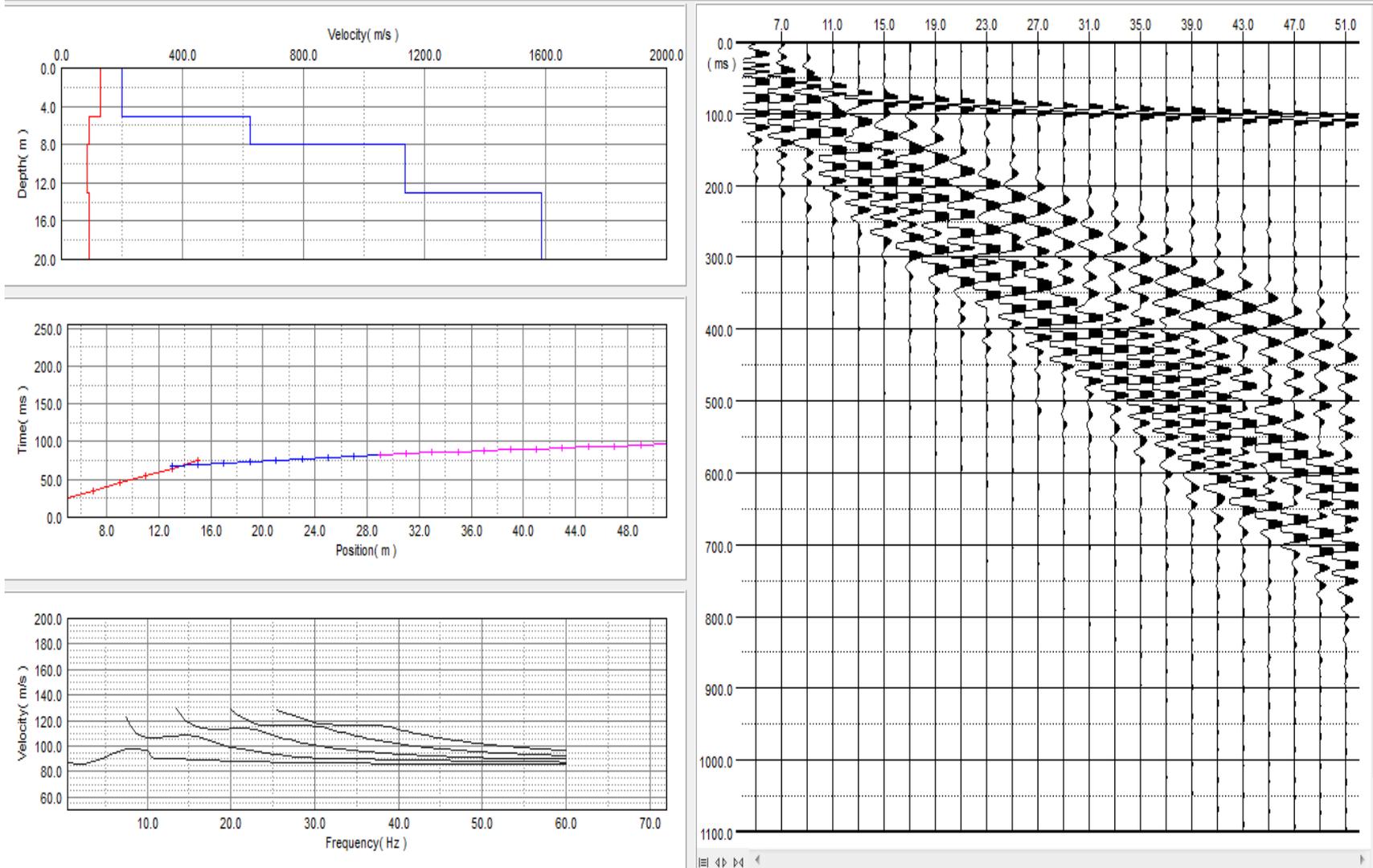
# RESULTADOS ENSAYO MASW: MODELADO DE LA VELOCIDAD DE ONDA DE CORTE (VS)



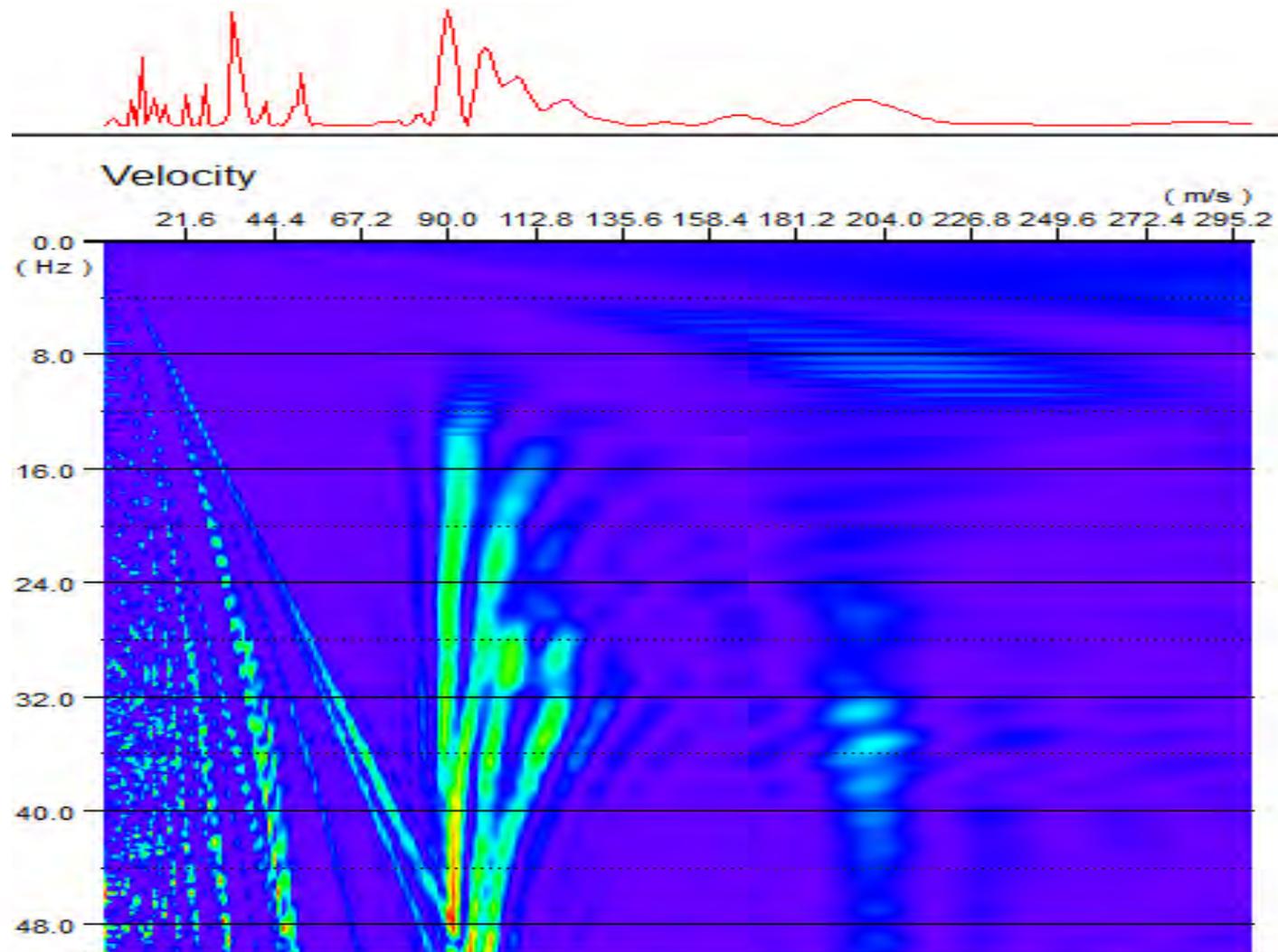
## RESULTADOS ENSAYO REFRACCION: MODELO UNIDIMENSIONAL



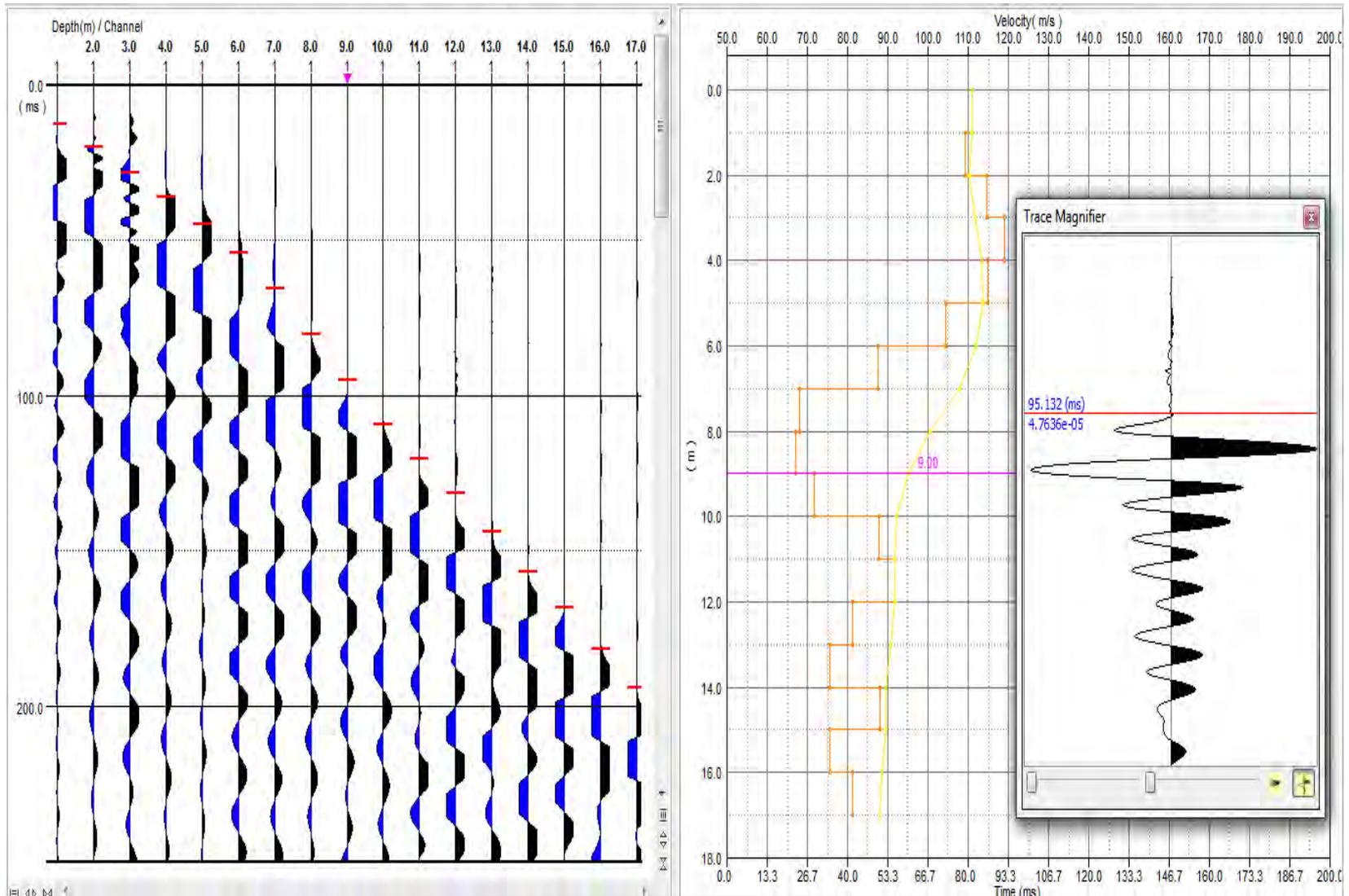
## VALIDACION DE LOS MODELOS OBTENIDOS EN LOS ENSAYOS (RETROANALISIS)



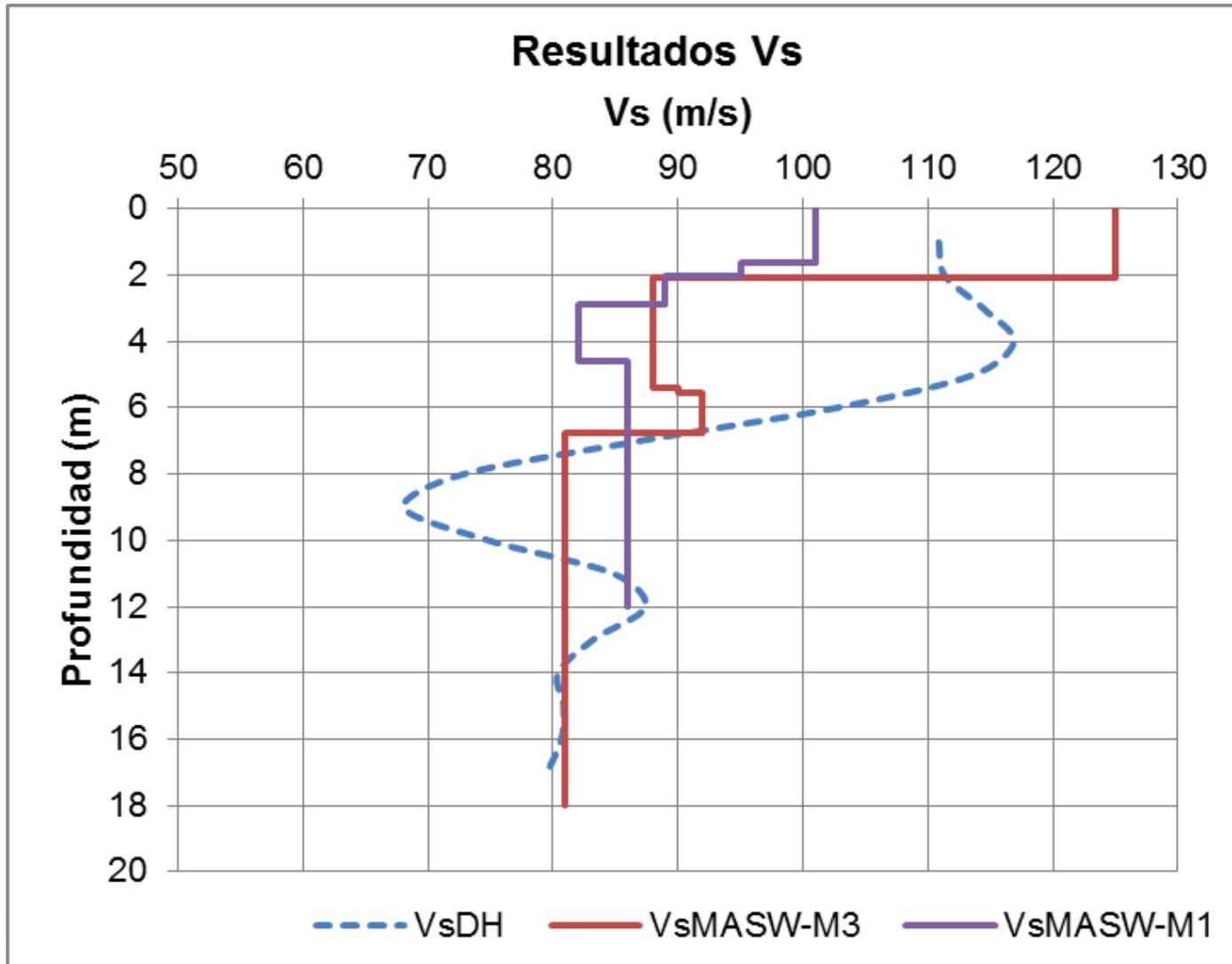
## ESPECTRO CON LAS CURVAS DE DISPERSION DEL MODELO TEORICO



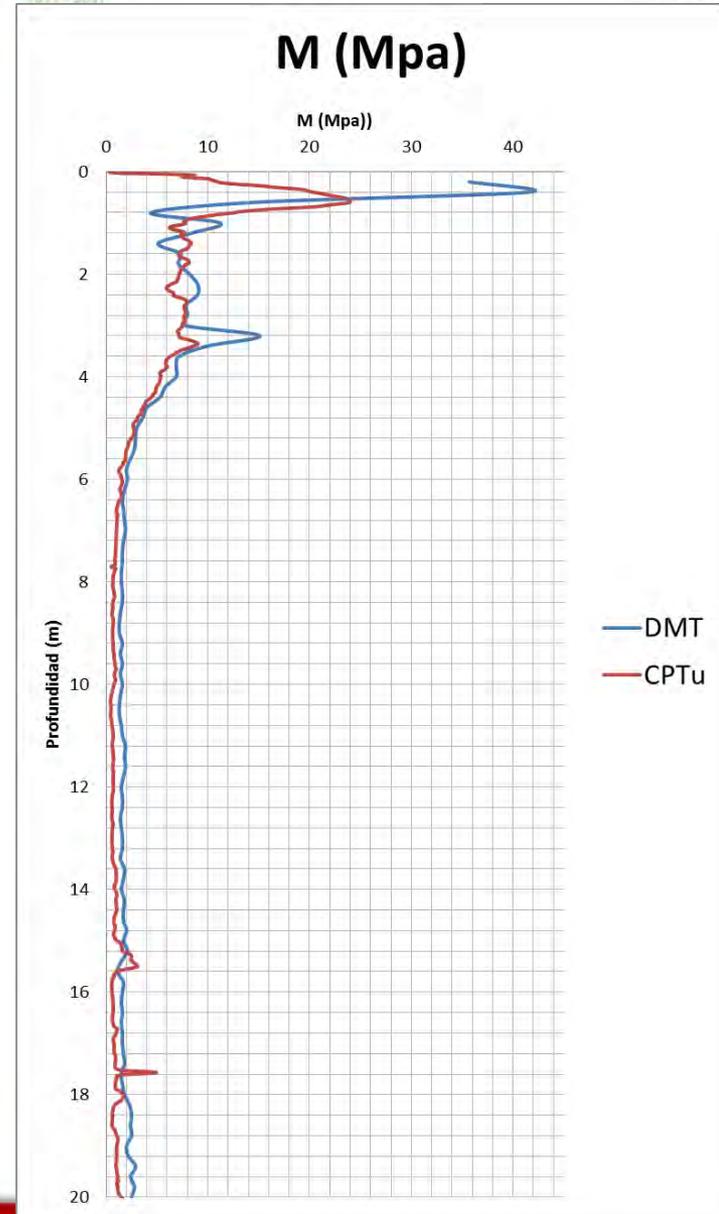
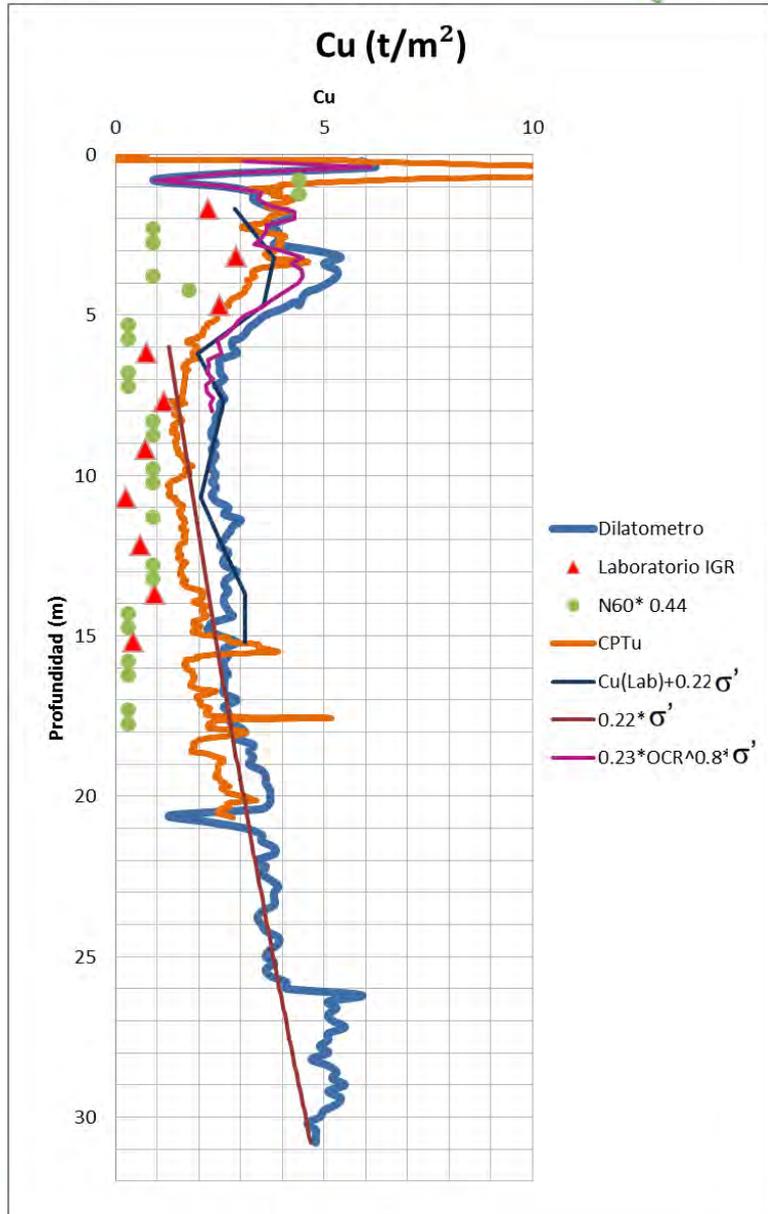
## RESULTADOS DEL ENSAYO DOWN-HOLE

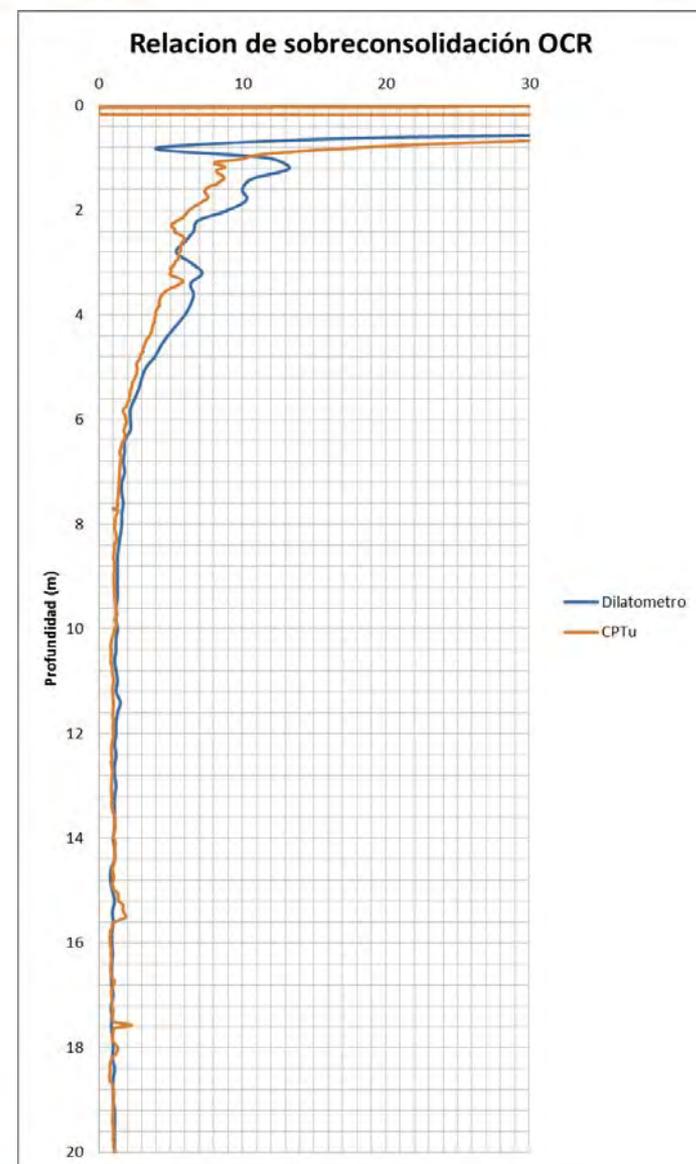
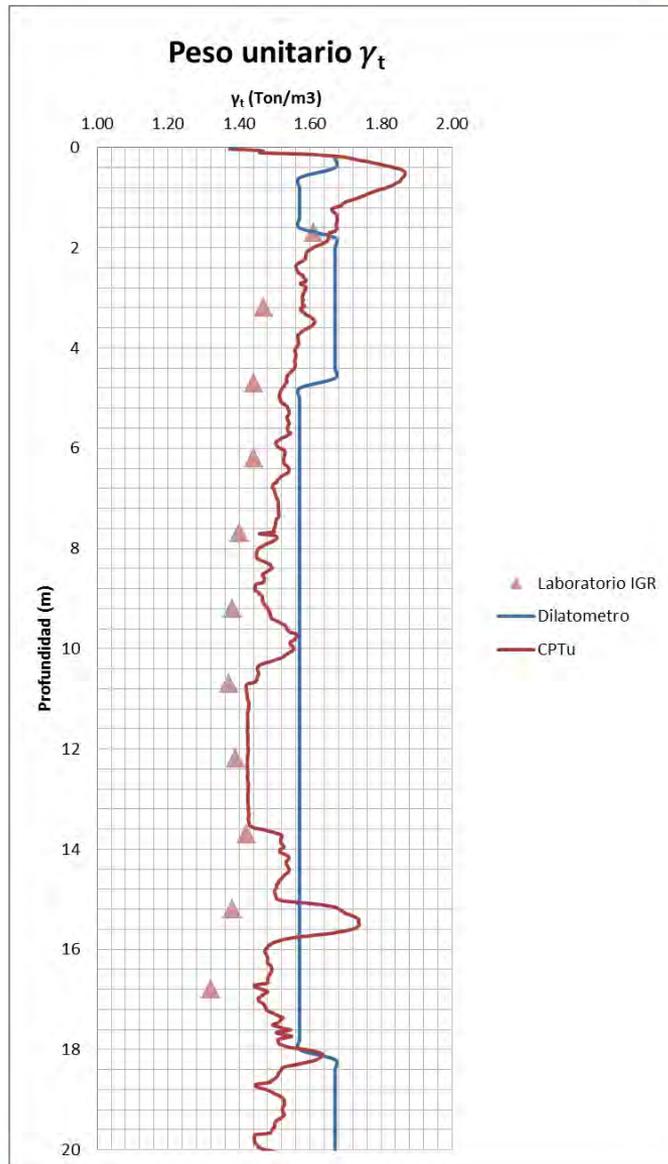


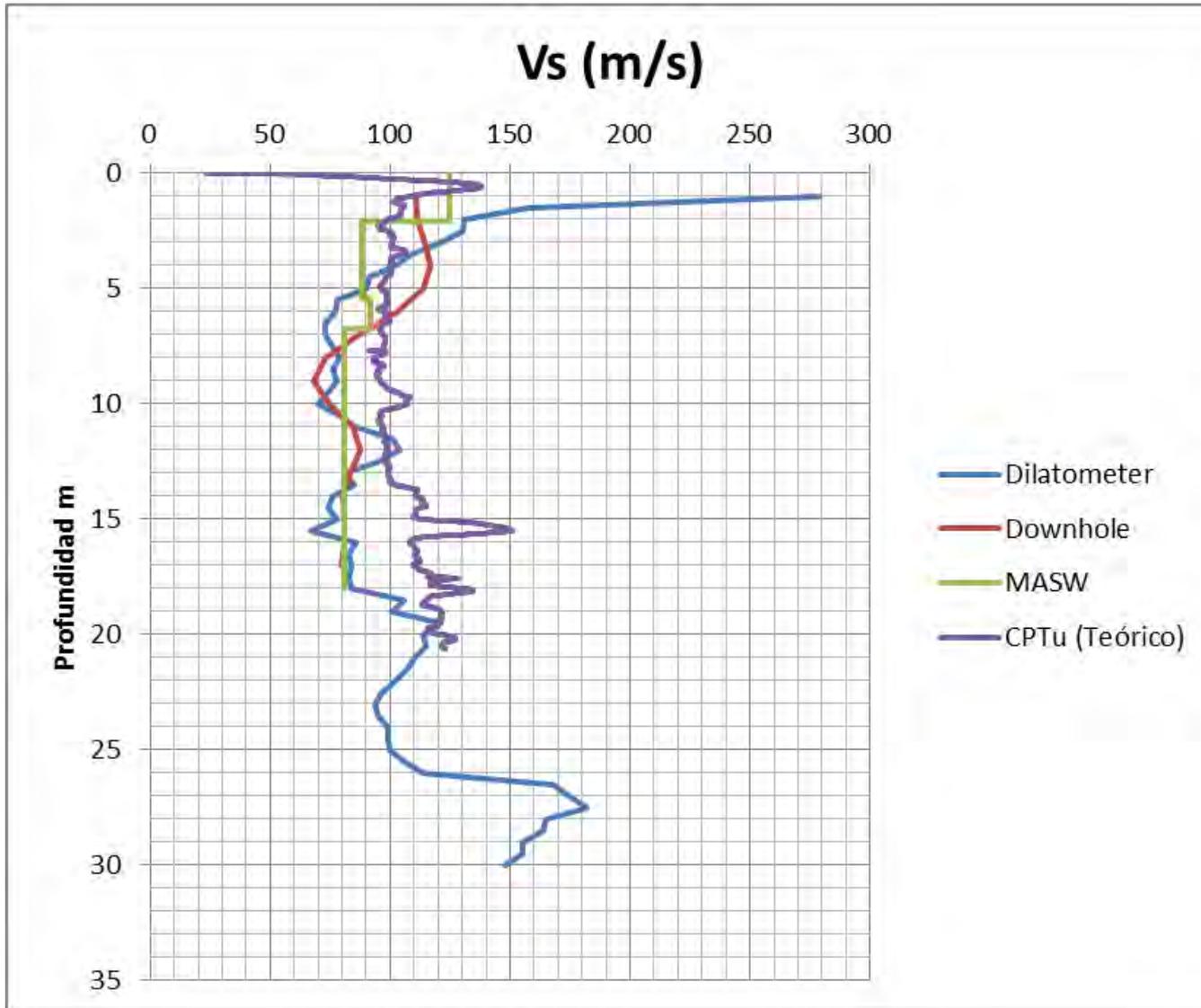
## COMPARACIÓN DE LOS RESULTADOS DE VS OBTENIDOS DE LAS TÉCNICAS GEOFÍSICAS



# COMPARACIÓN DE RESULTADOS







# AGRADECIMIENTOS ESPECIALES

## GRACIAS AL EQUIPO MARCHETTI - KIPARA



## GRACIAS AL EQUIPO DE IGR





# GRACIAS AL EQUIPO DE LA ECI



# GRACIAS AL EQUIPO DE LA UNAL



CURSO DE EXPLORACIÓN Y CARACTERIZACIÓN DEL SUBSUELO CON TÉCNICAS AVANZADAS  
Bogotá 7, 8 y 9 de mayo de 2015



**MIL GRACIAS A TODOS LOS CONFERENCISTAS,  
PATROCINADORES, ORGANIZADORES Y ASISTENTES**