STATE OF OREGON
DEPARTMENT OF GEOLOGY AND MINERAL INDUSTRIES
Suite 965
800 NE Oregon Street, #28
Portland, Oregon 97232

OPEN-FILE REPORT O–95-7

Downhole and Seismic Cone Penetrometer Shear-Wave Velocity Measurements for the Portland Metropolitan Area, 1993 and 1994

By
Matthew A. Mabey
and
Ian P. Madin
Oregon Department of Geology and Mineral Industries

1995

NOTICE

The Oregon Department of Geology and Mineral Industries is publishing this paper because the information furthers the mission of the Department. To facilitate timely distribution, this report has not been edited to our usual standards.

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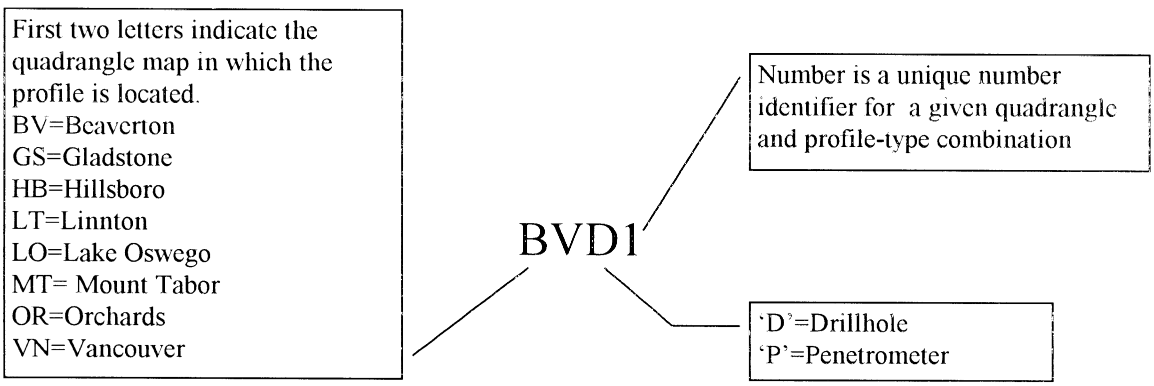
During the years of 1993 and 1994 the Oregon Department of Geology and Mineral Industries (DOGAMI) conducted a major subsurface investigation program as part of the Relative Earthquake Hazards Mapping Project funded through the Federal Emergency Management Agency. This program included the measurement of shear-wave velocities at 65 locations around the Portland Metropolitan Area (PMA). This Open-file report is a printed graphical catalog of these shear-wave velocities as well as the interpretation of the geologic units encountered. Accompanying the shear-wave velocities collected in drillholes are raw Standard Penetration Test (SPT) blow counts and lithologic descriptions. Accompanying the shear-wave velocities collected by seismic cone penetrometer are the tip resistance and friction ratio data with geologic unit interpretations. A simple map showing the locations of the profiles is also included. The map shows the PMA urban growth boundary as a solid bold line and the 7-1/2 minute quadrangle boundaries in dashed lines.

The Drillhole/Penetrometer profile names were constructed using the following system:



For more information on the geologic units and the Relative Earthquake Hazard Mapping Project the reader is referred to the hazard maps and their accompanying texts (DOGAMI publications GMS-79,89,90,91,92).

Depths in feet and velocities in feet-per-second can be obtained by multiplying the meters and meters per second values by 3.28.

Approximate tip resistance in tons-per-square-foot can be obtained by dividing kilo-newtons-per-square-meter by 96.

These data will also be released in digital format.

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First two letters indicate the quadrangle map in which the profile is located.
BV=Beaverton
GS=Gladstone
HB=Hillsboro
LT=Linnton
LO=Lake Oswego
MT= Mount Tabor
OR=Orchards
VN=Vancouver

BVD1

Number is a unique number identifier for a given quadrangle and profile-type combination

'D'=Drillhole
'P'=Penetrometer

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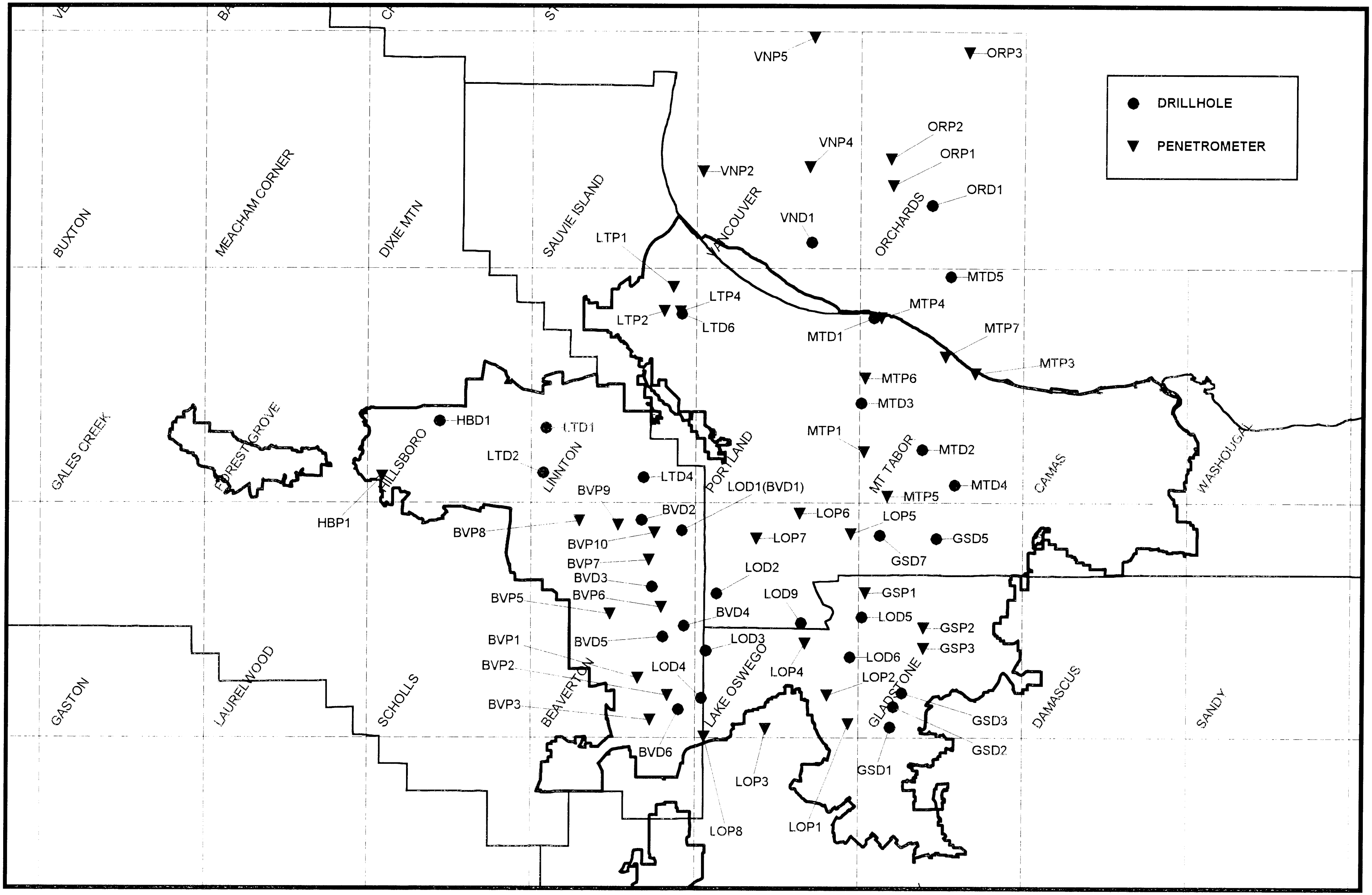
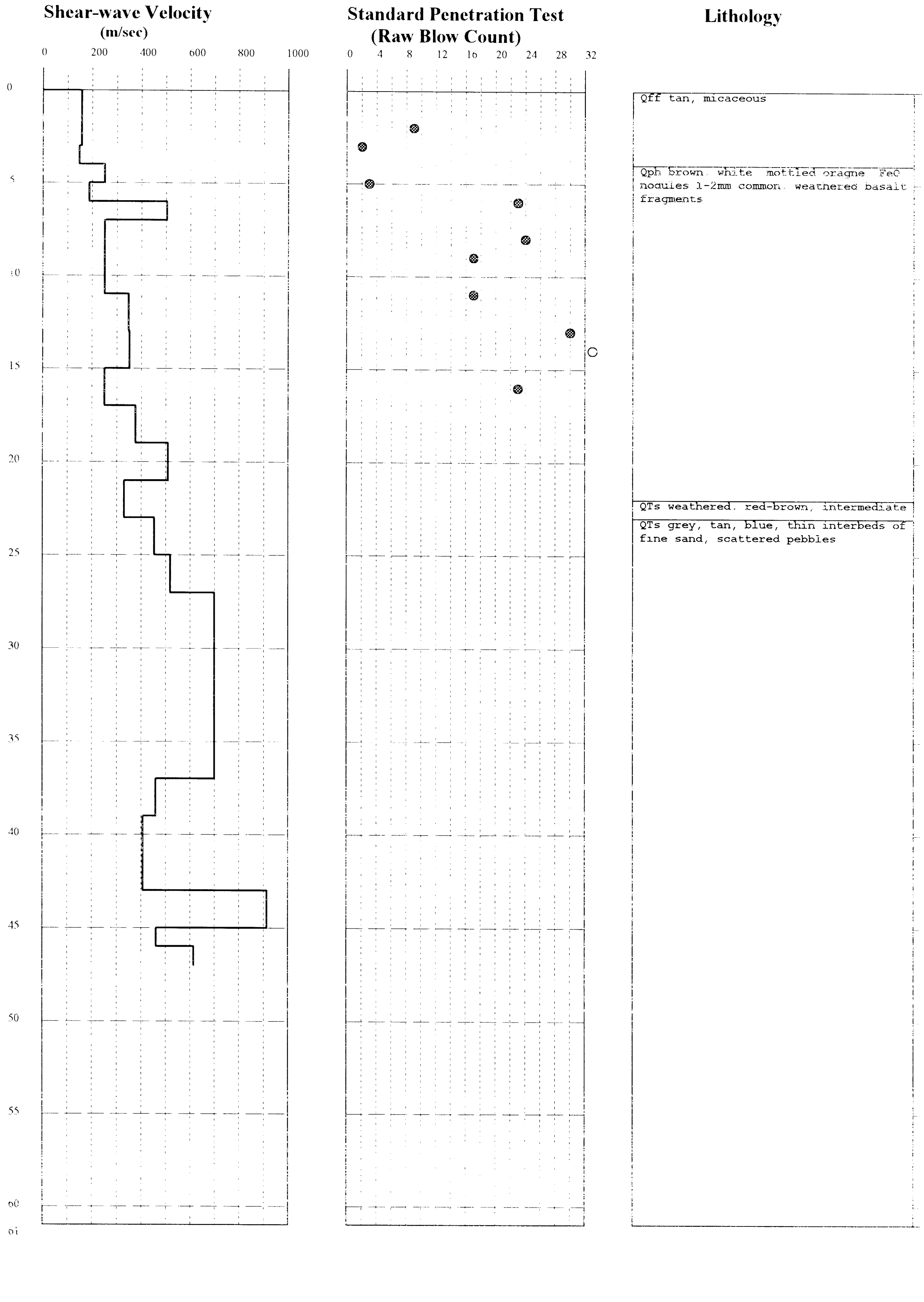

DRILLHOLE
PENETROMETER
BUXTON
MEACHAM CORNER
DIXIE MTN
SAUVIE ISLAND
VANCOUVER
ORCHARDS
GALES CREEK
FOREST GROVE
HILLSBORO
LINNTON
PORTLAND
MT TABOR
CAMAS
WASHOUGAL
GASTON
LAURELWOOD
SCHOLLS
BEAVERTON
LAKE OSWEGO
GLADSTONE
DAMASCUS
SANDY
VNP5
ORP3
ORP2
ORP1
VNP4
VNP2
ORD1
VND1
LTP1
MTD5
LTP4
MTP4
LTP2
LTD6
MTD1
MTP7
MTP3
MTP6
MTD3
HBD1
LTD1
MTP1
MTD2
LTD2
LTD4
MTD4
MTP5
LOD1(BVD1)
BVP9
BVD2
LOP6
LOP5
HBP1
BVP8
BVP10
LOP7
GSD5
GSD7
BVP7
LOD2
BVD3
GSP1
BVP5
BVP6
LOD9
BVD4
LOD5
GSP2
BVP1
BVD5
LOD3
GSP3
LOD6
BVP2
LOD4
LOP4
LOP2
BVP3
GSD3
GSD2
BVD6
GSD1
LOP3
LOP1
LOP8

BVD1(LOD1)

UTM Y = 5036662 UTM X = 518738



BVD2

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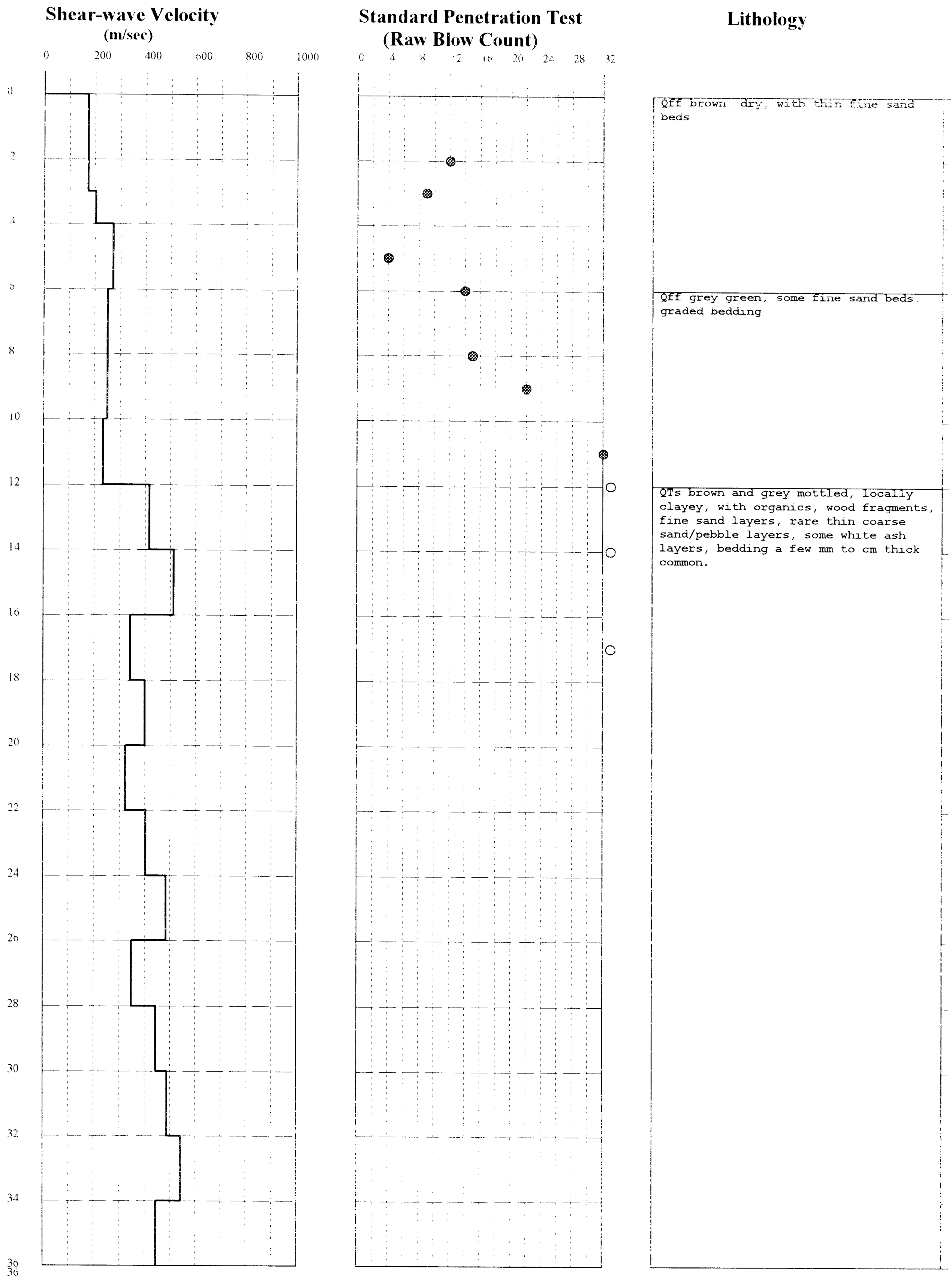

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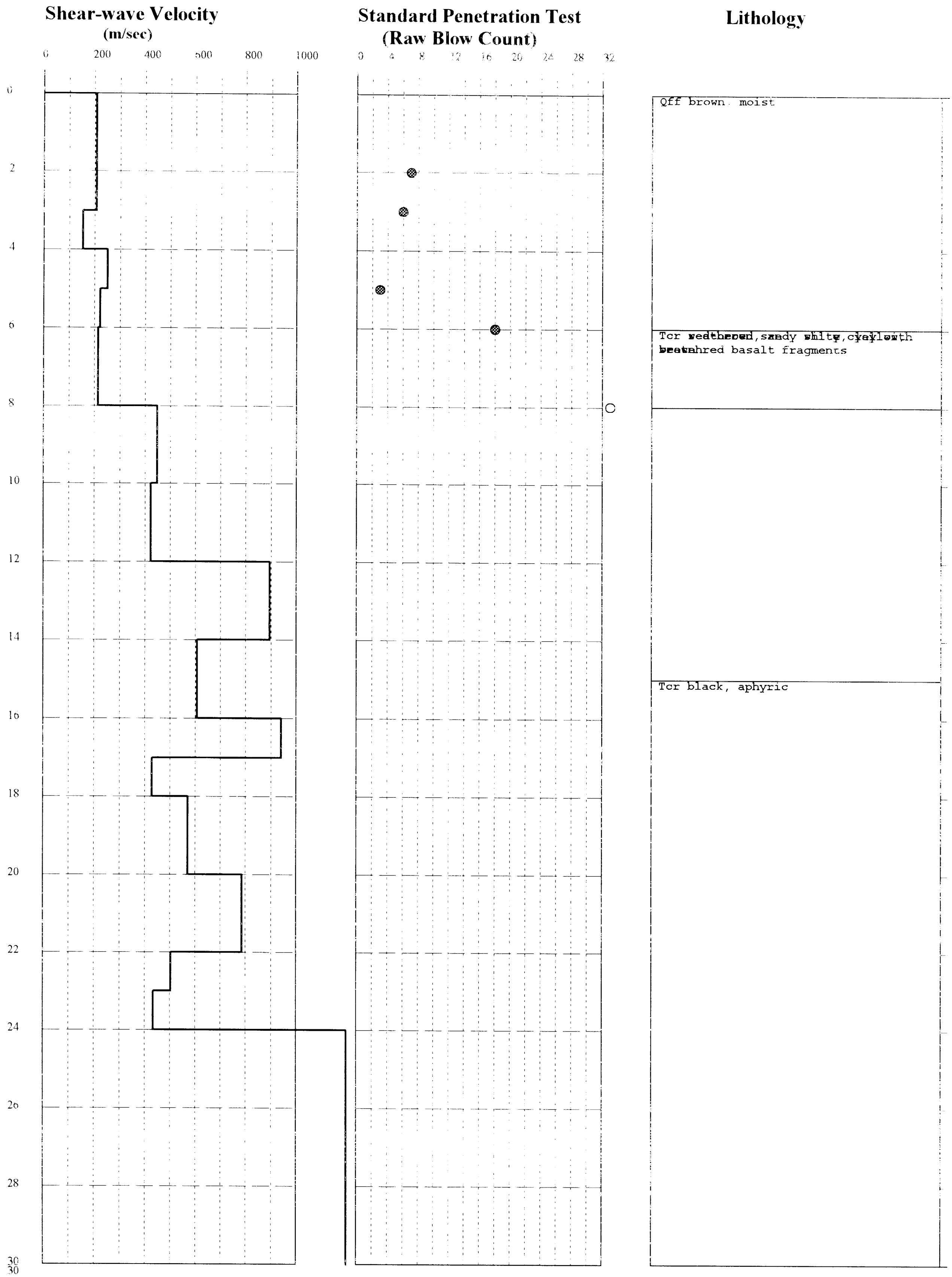

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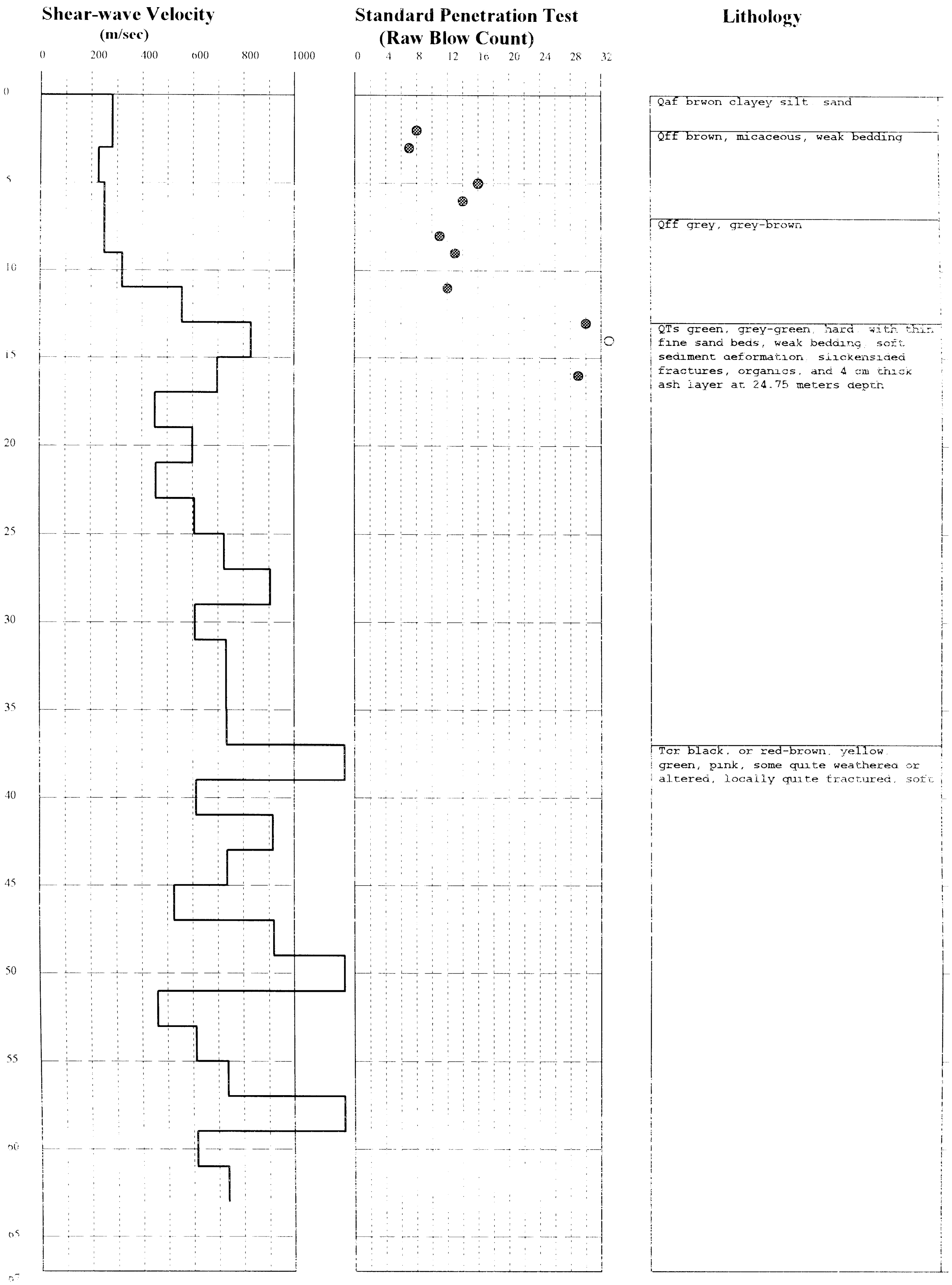

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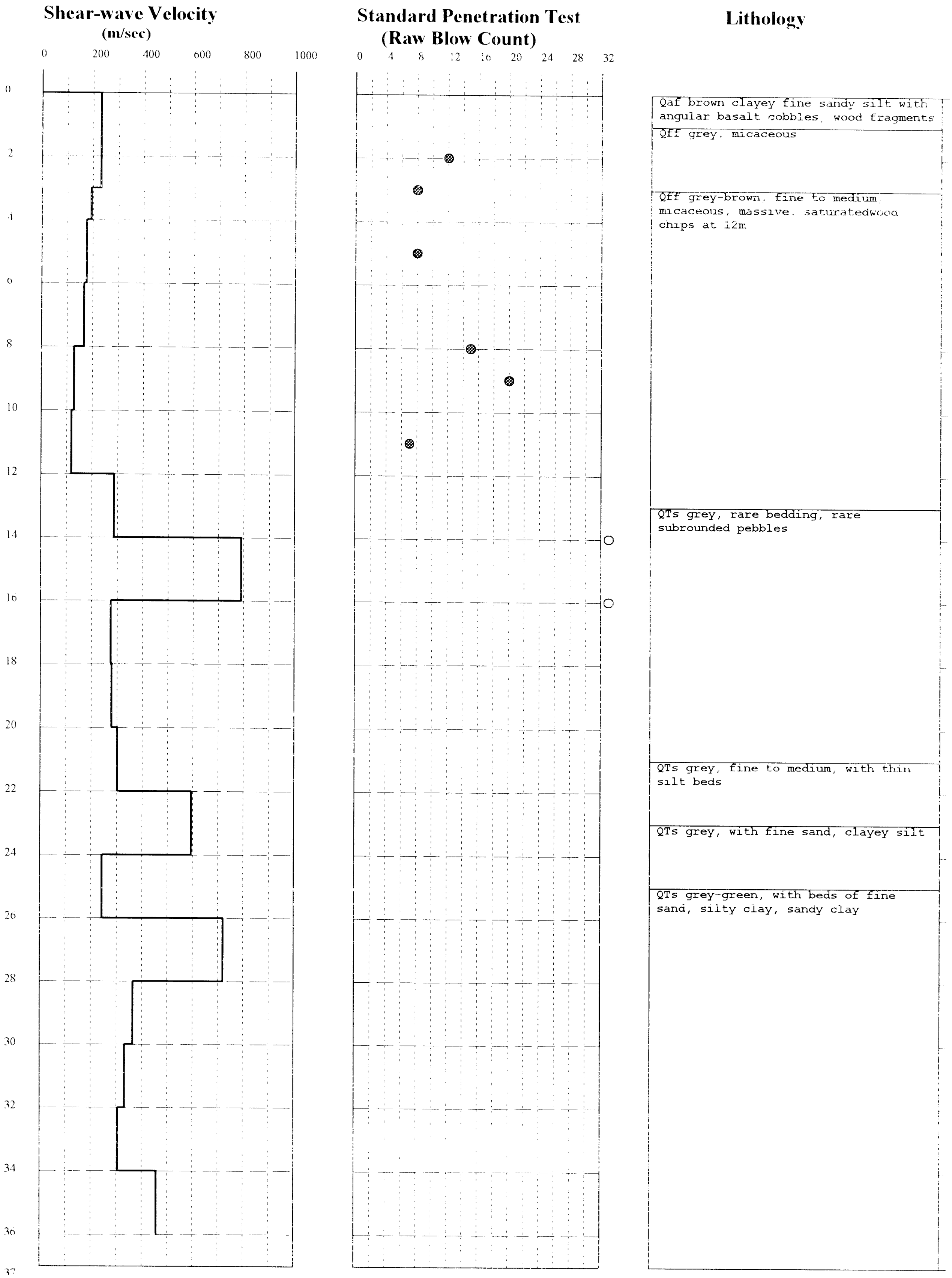

BVD6

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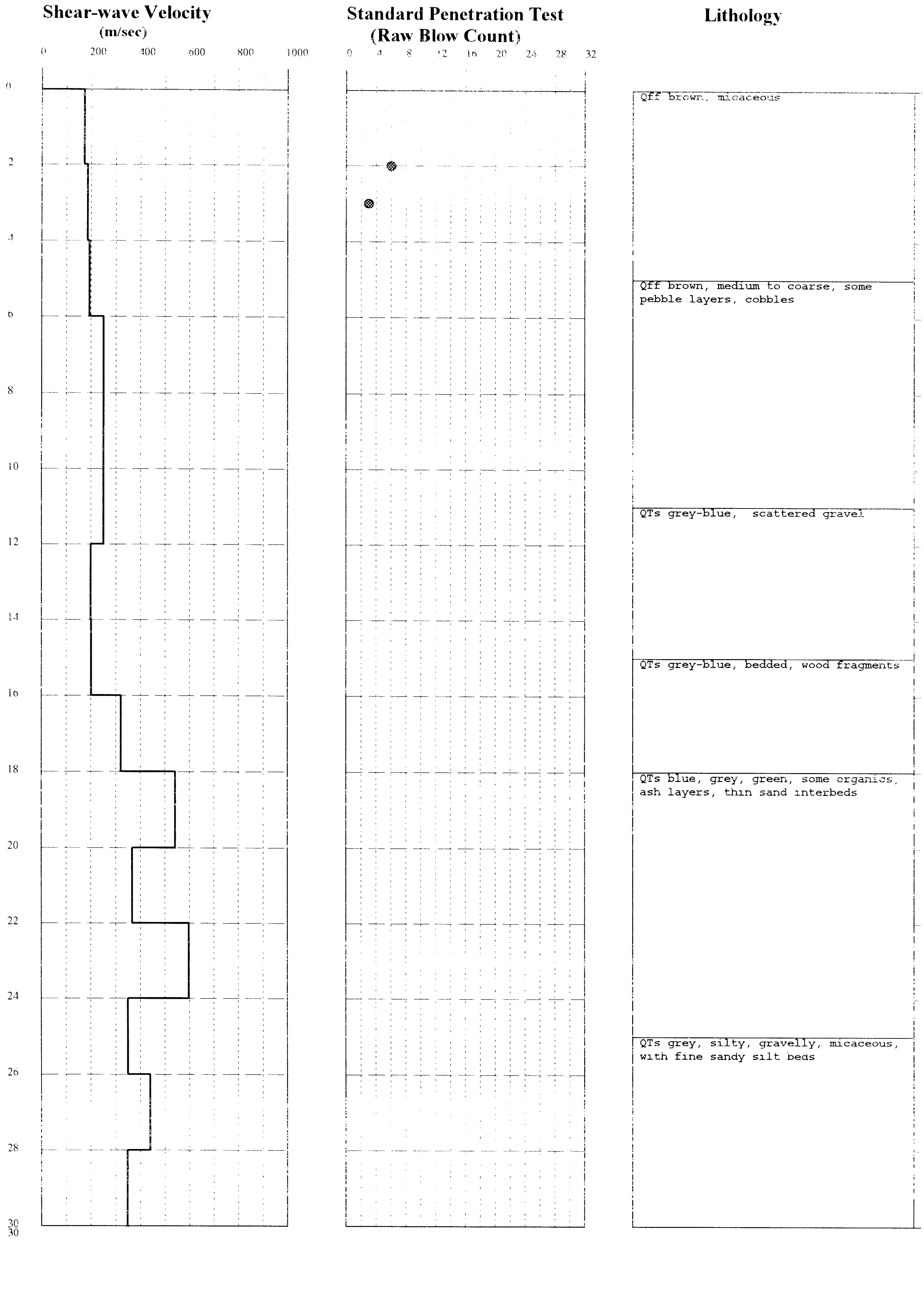

BVP1

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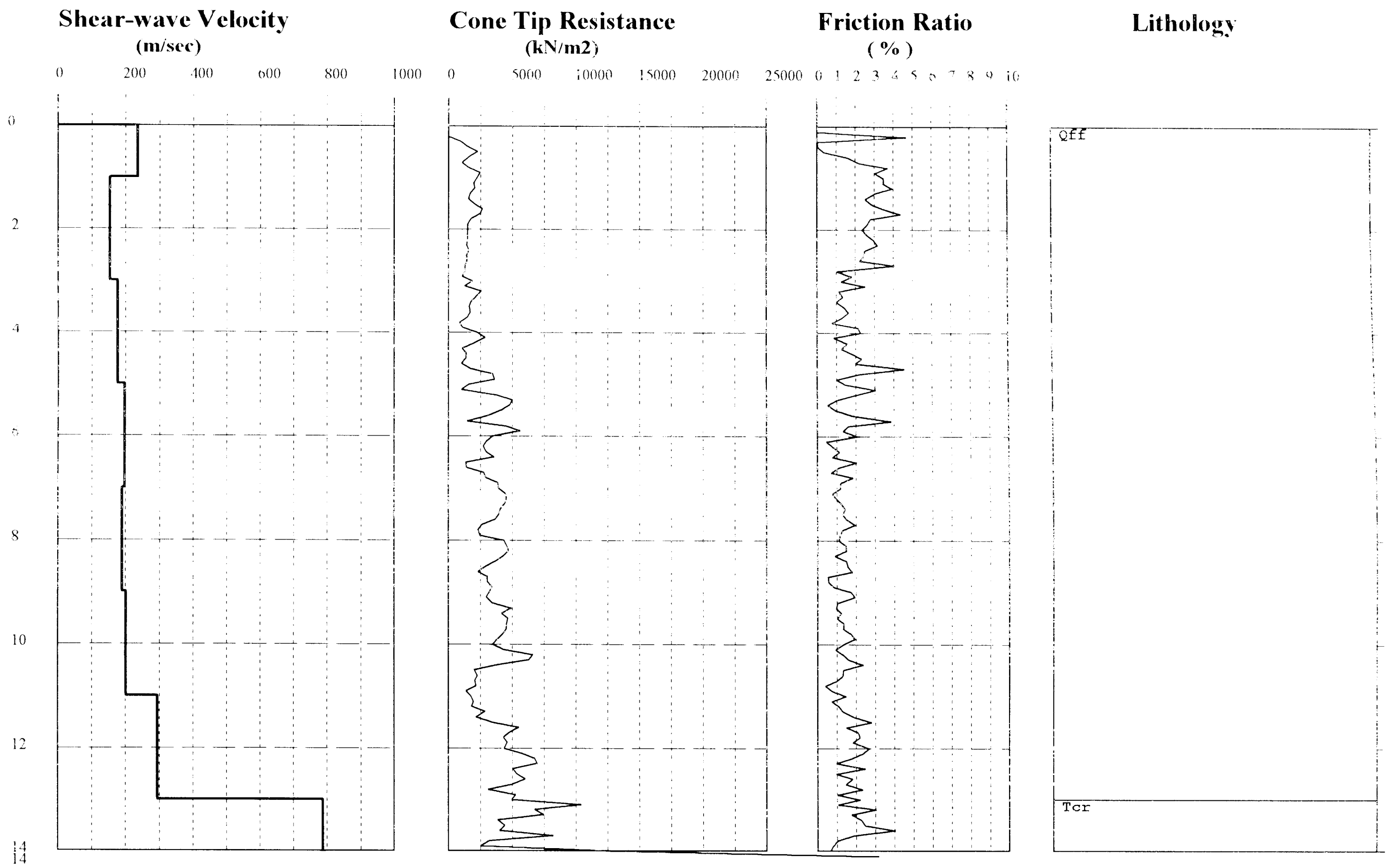

BVP2

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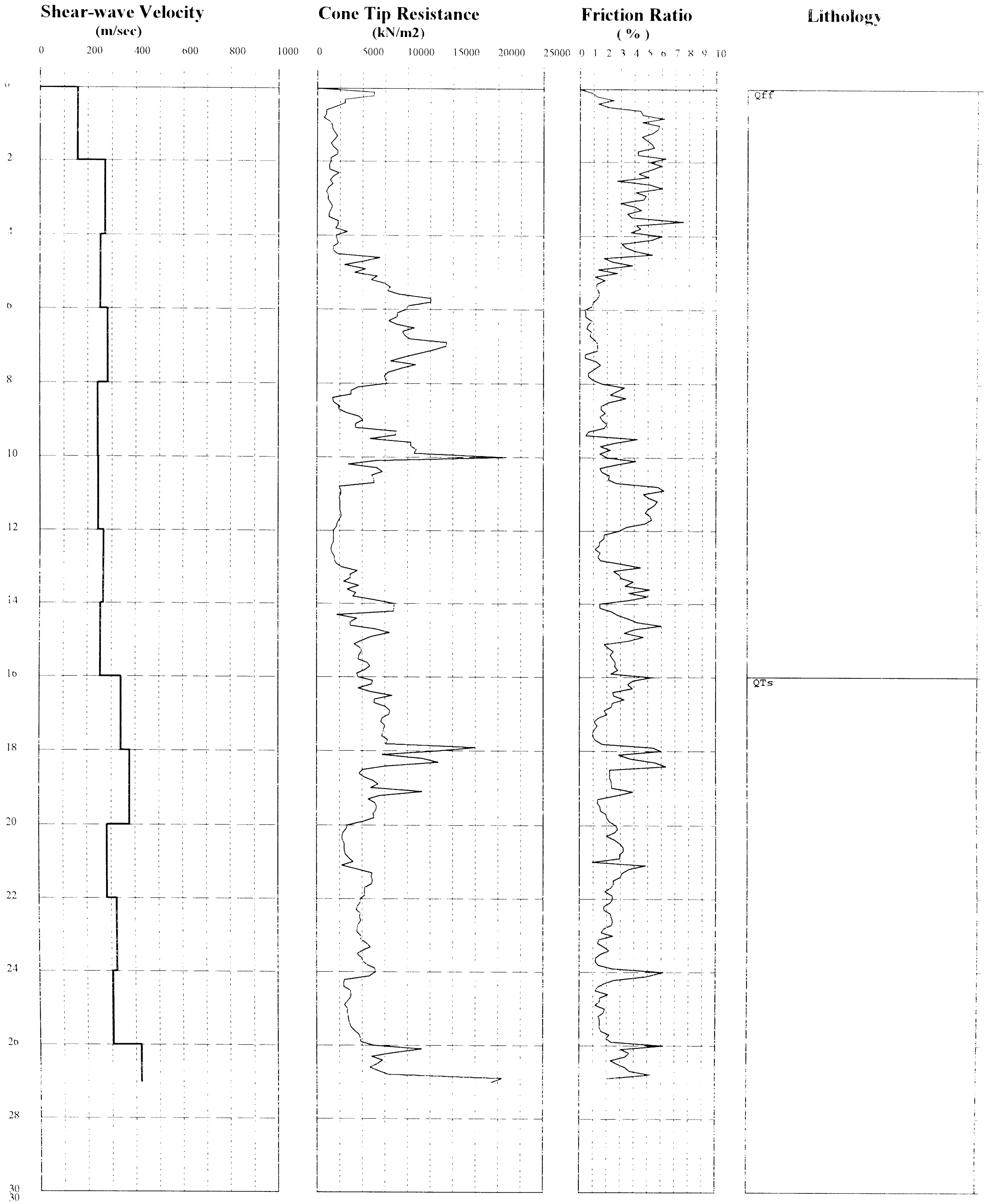

BVP3

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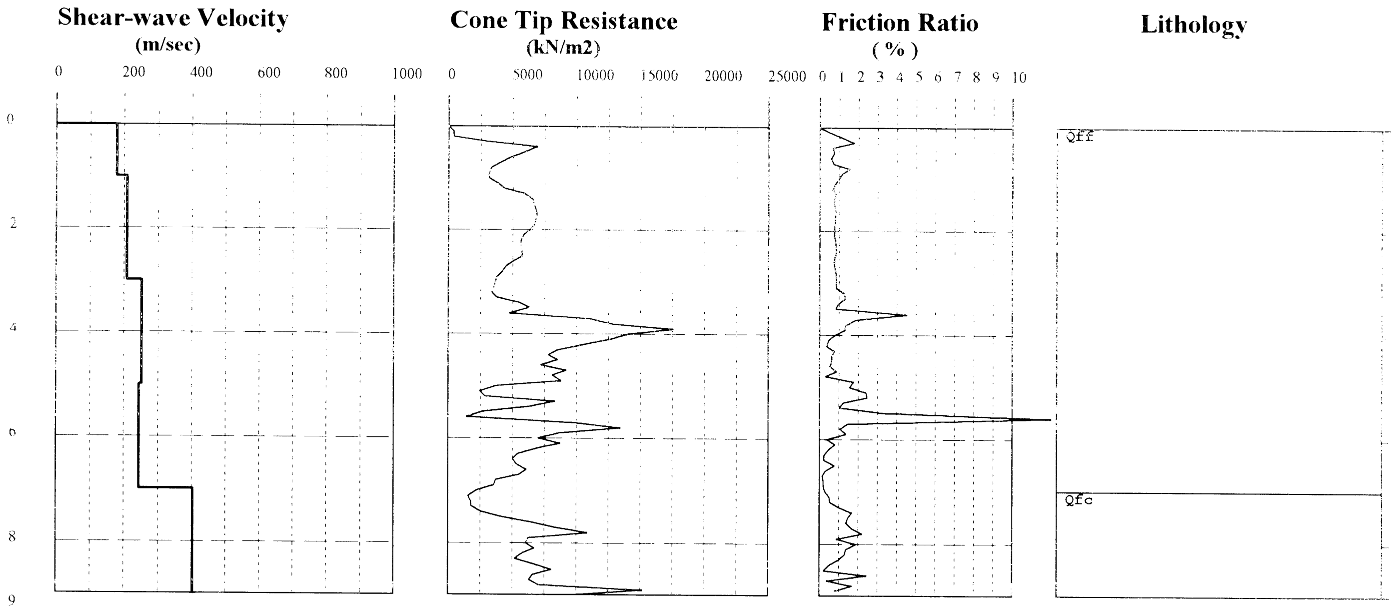

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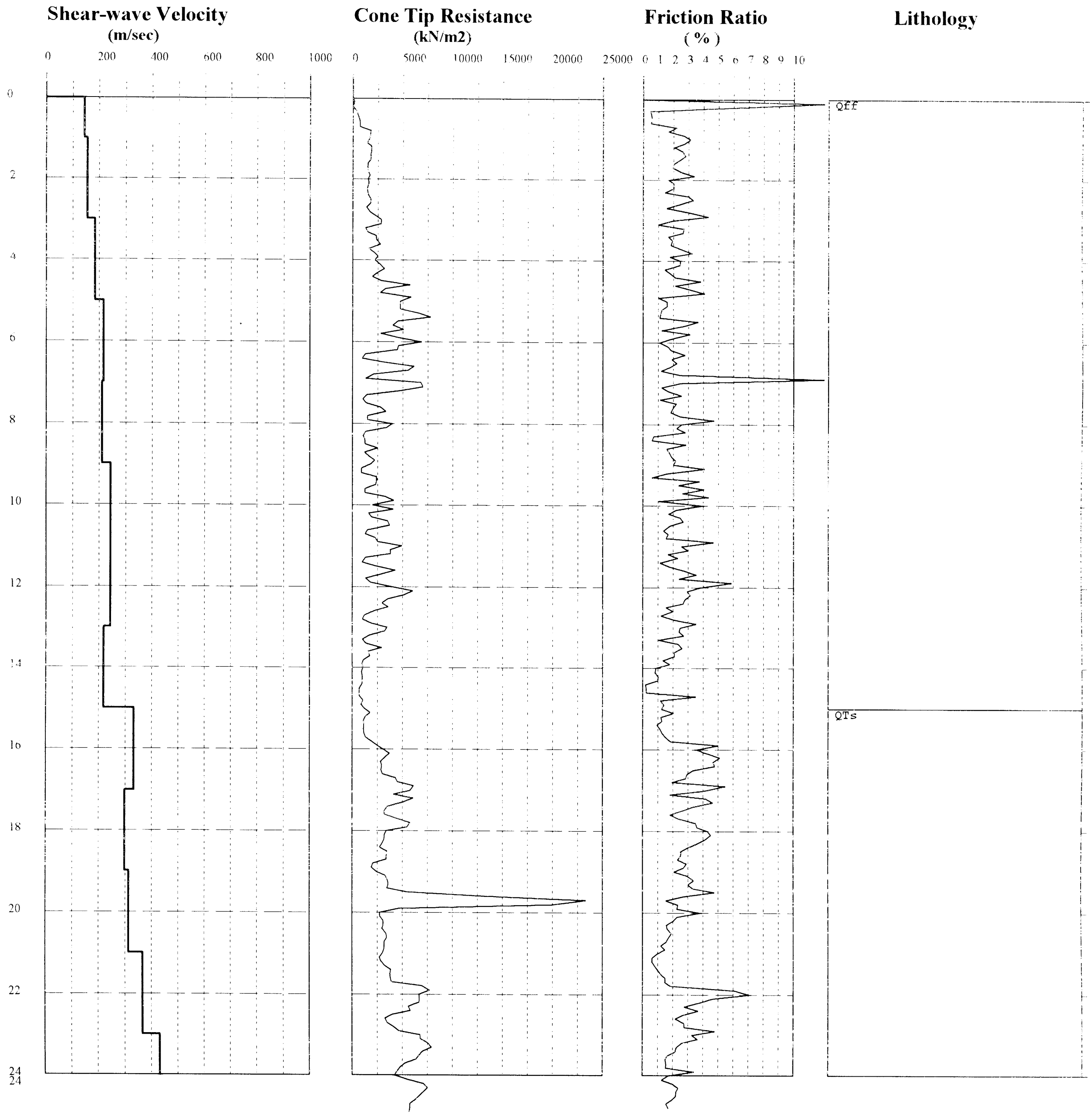

BVP6
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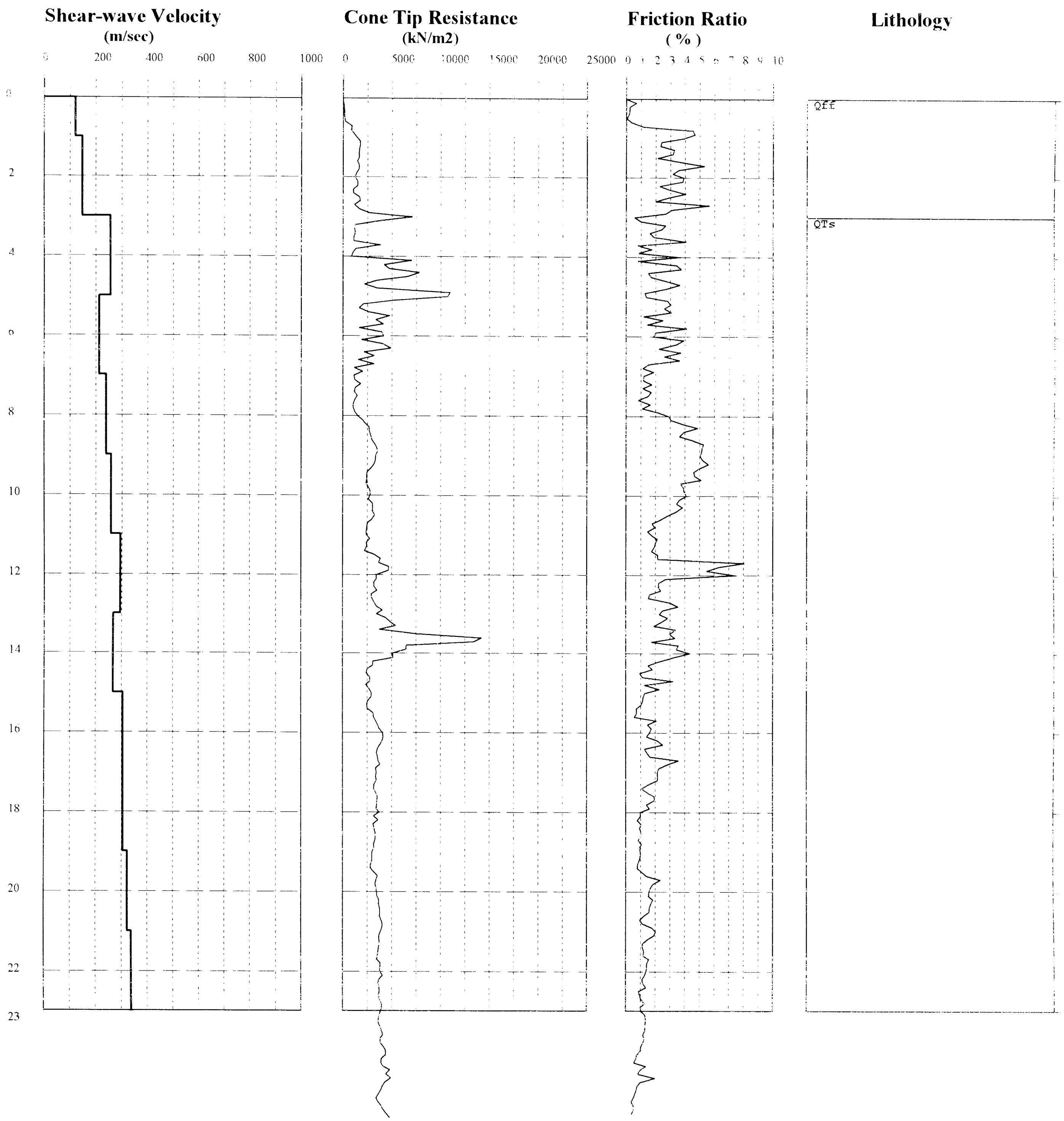

BVP7

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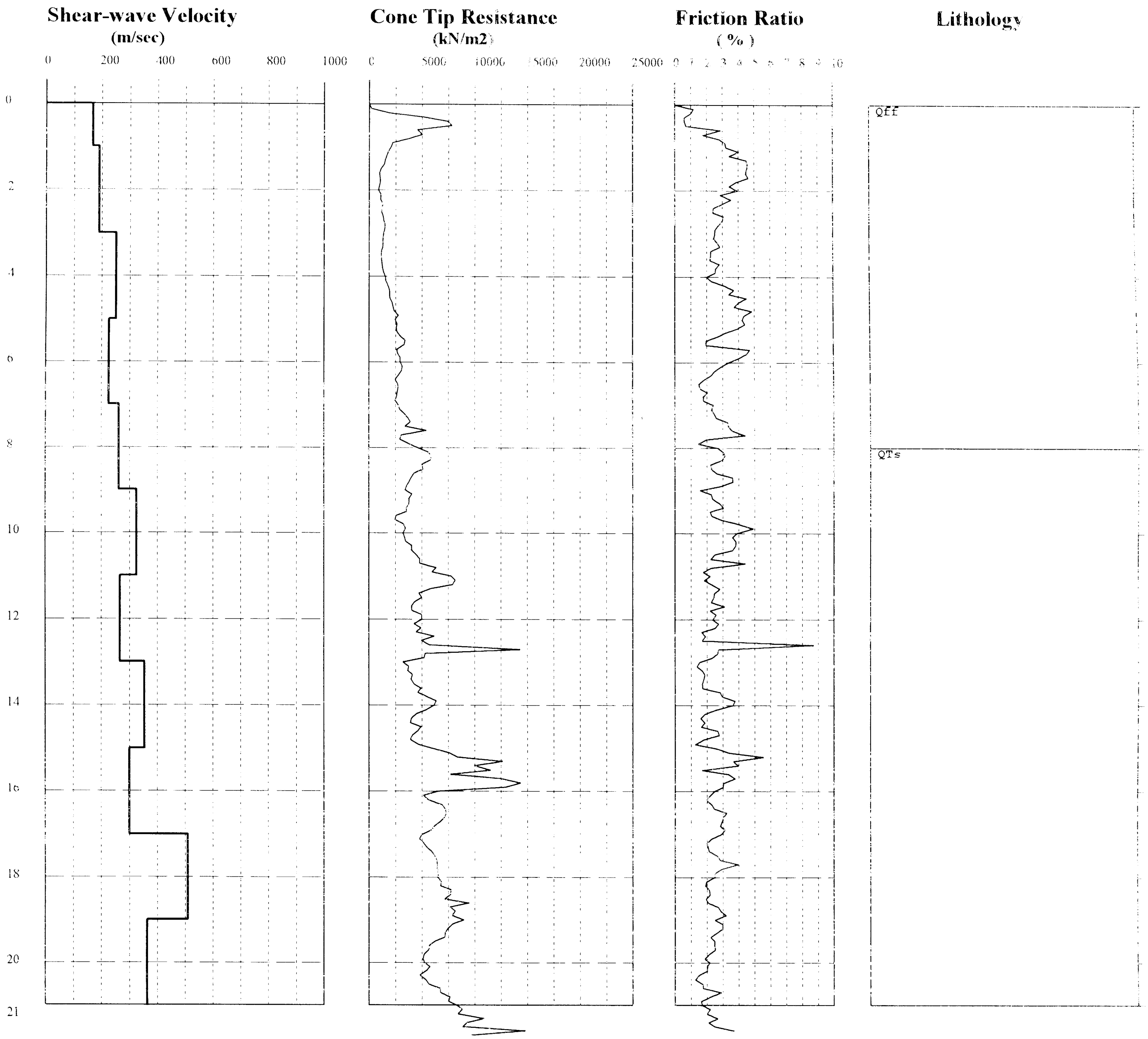
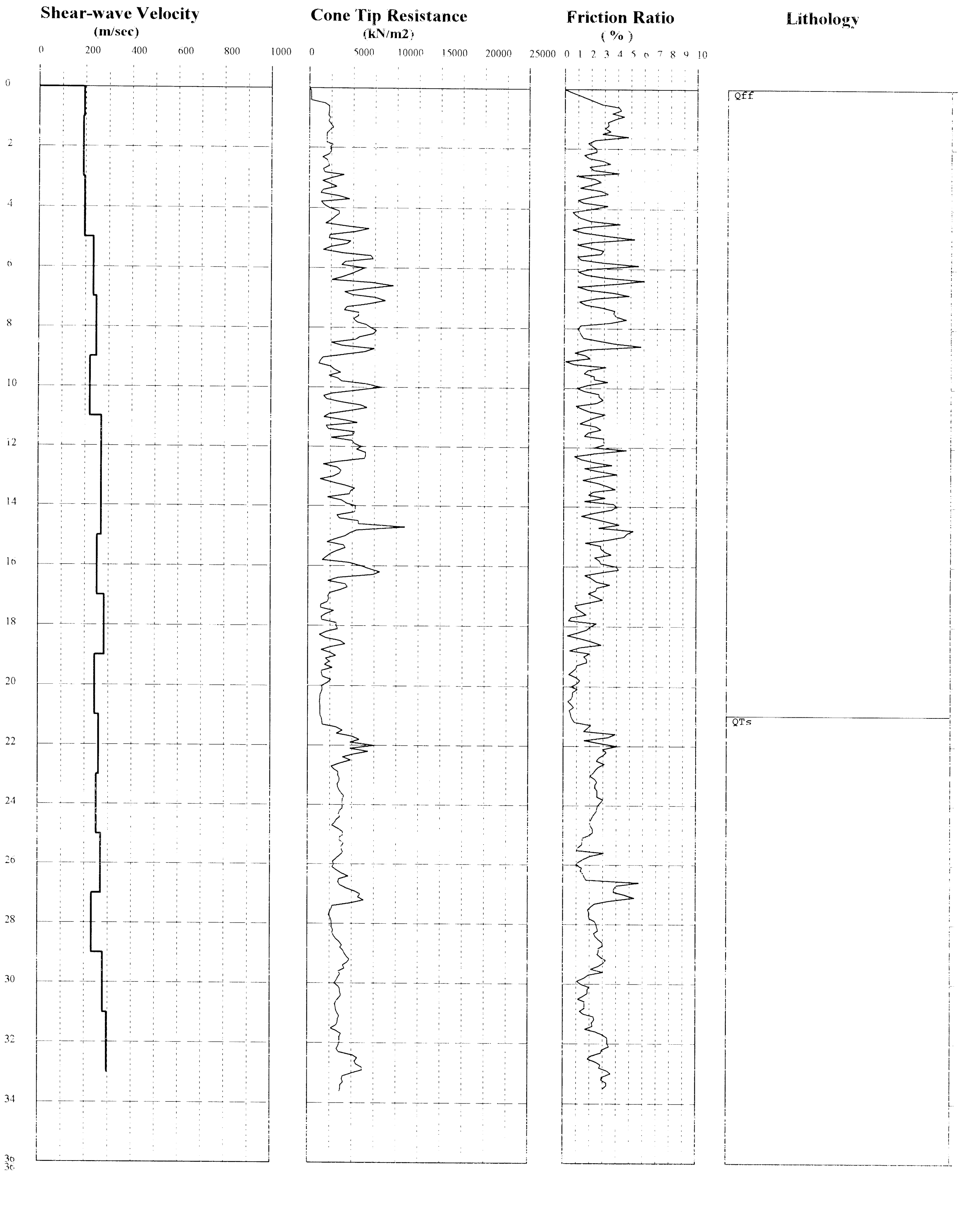


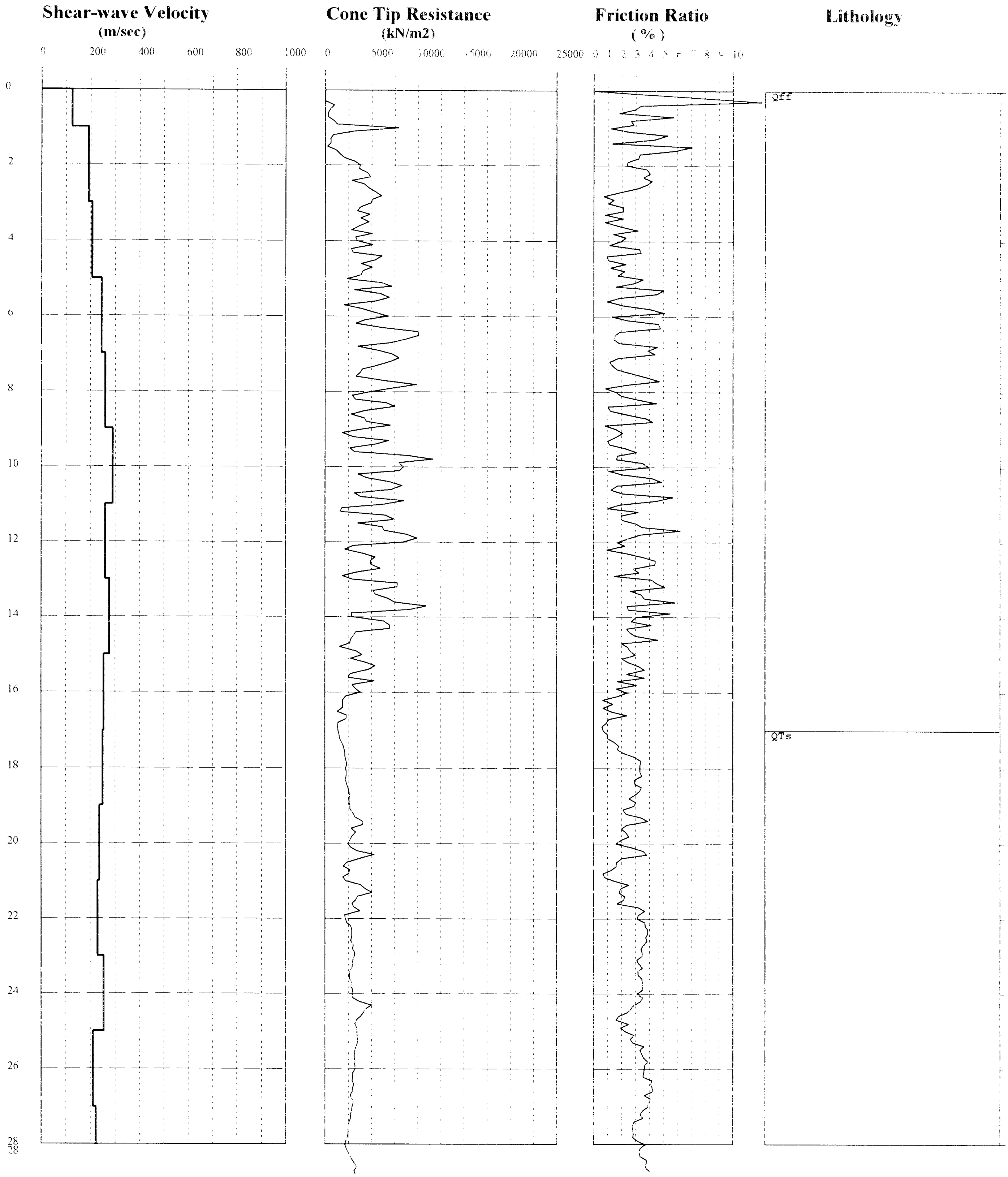
BVP8

UTM Y = 5037219 UTM X = 512605



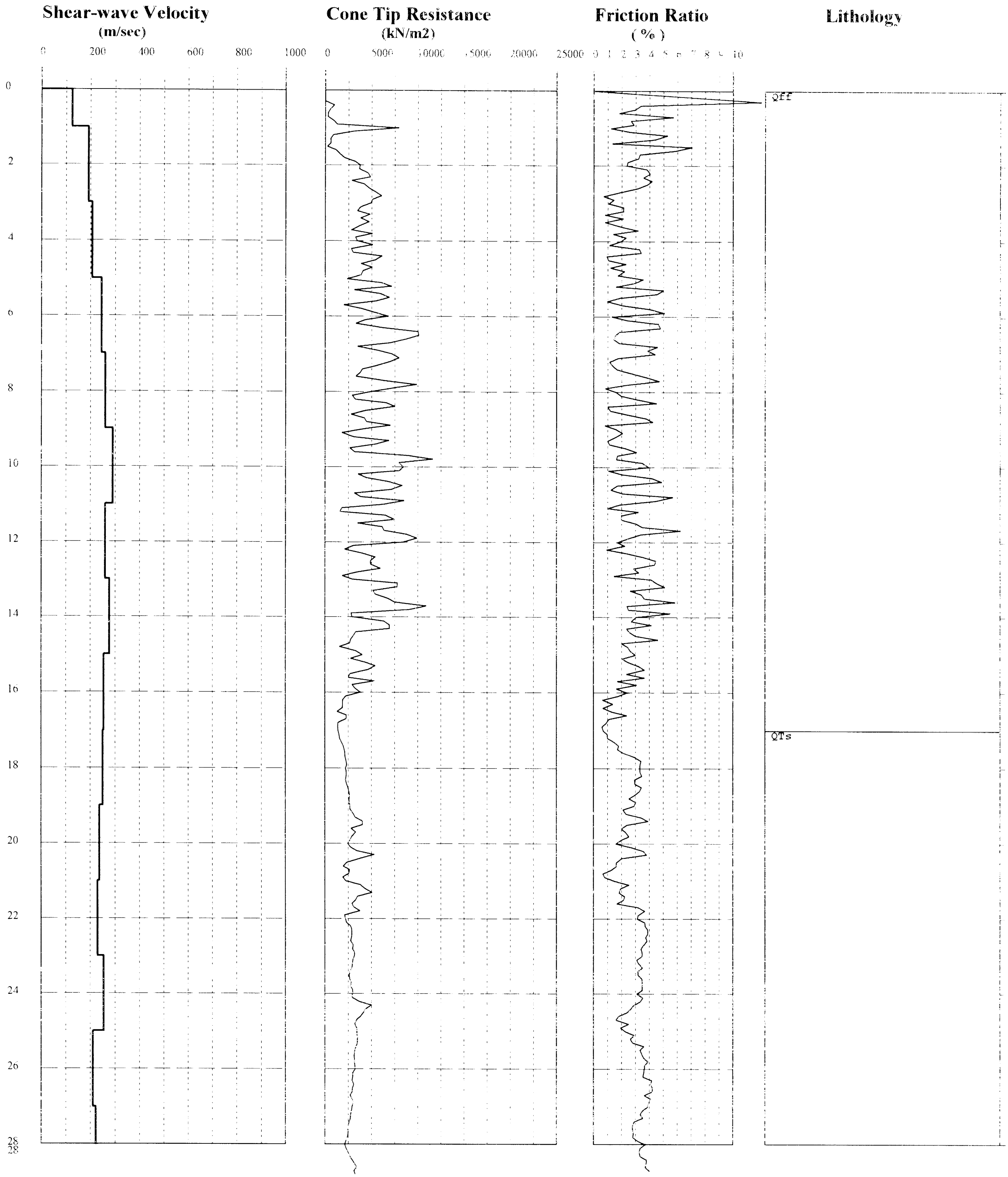
BVP9

UTM Y = 5036992 UTM X = 514934



BVP9

UTM Y = 5036992 UTM X = 514934



BVP10

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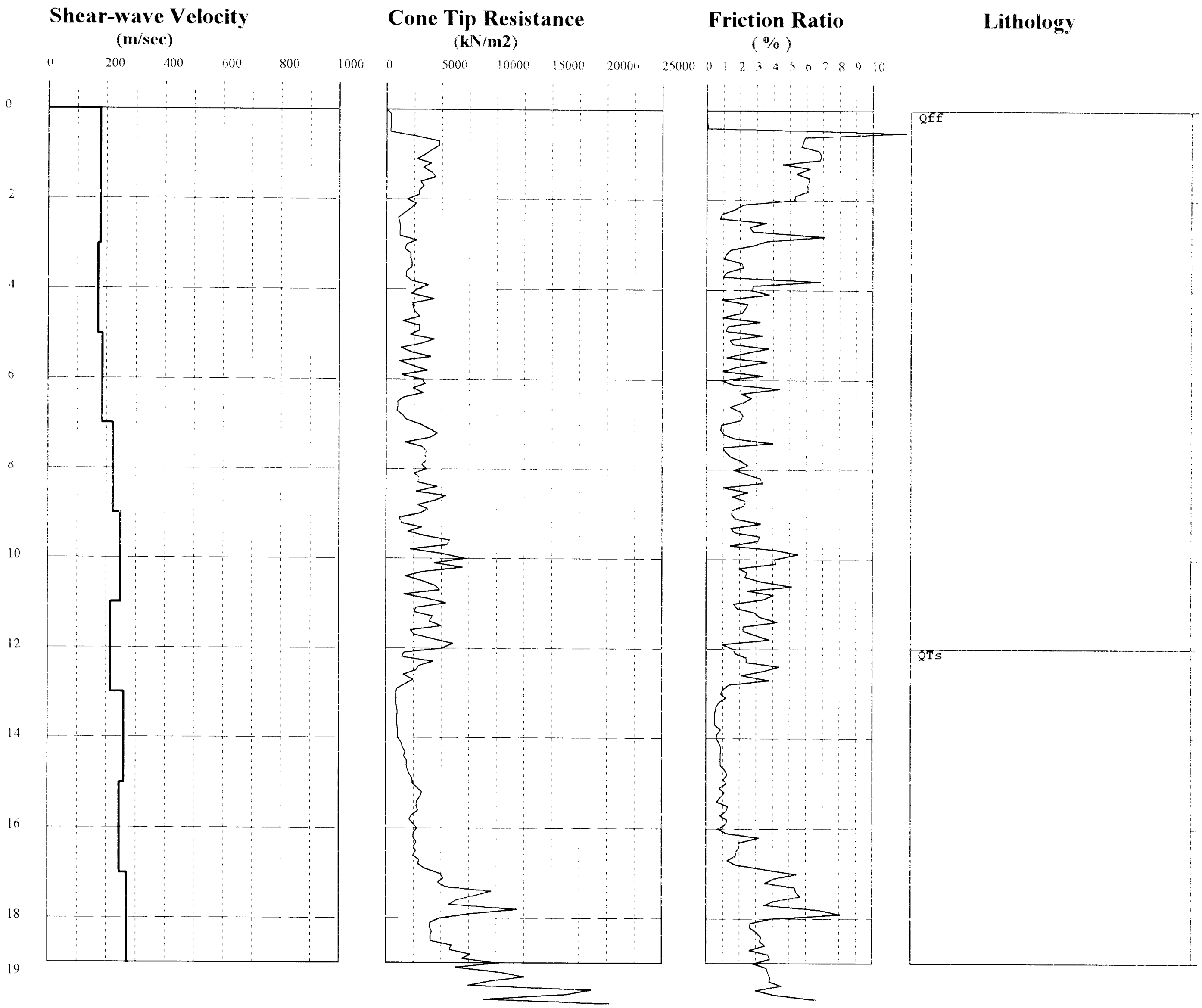
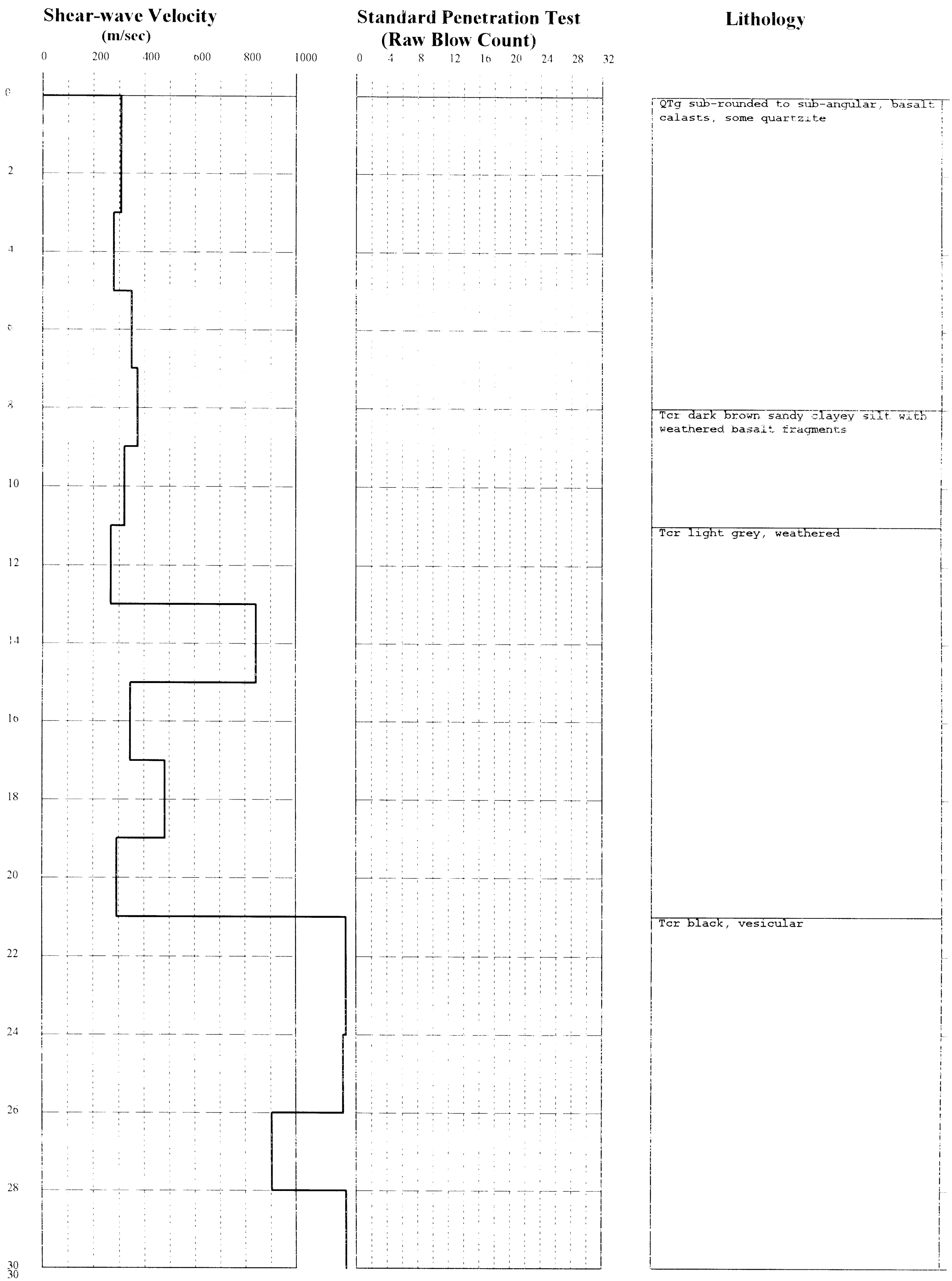


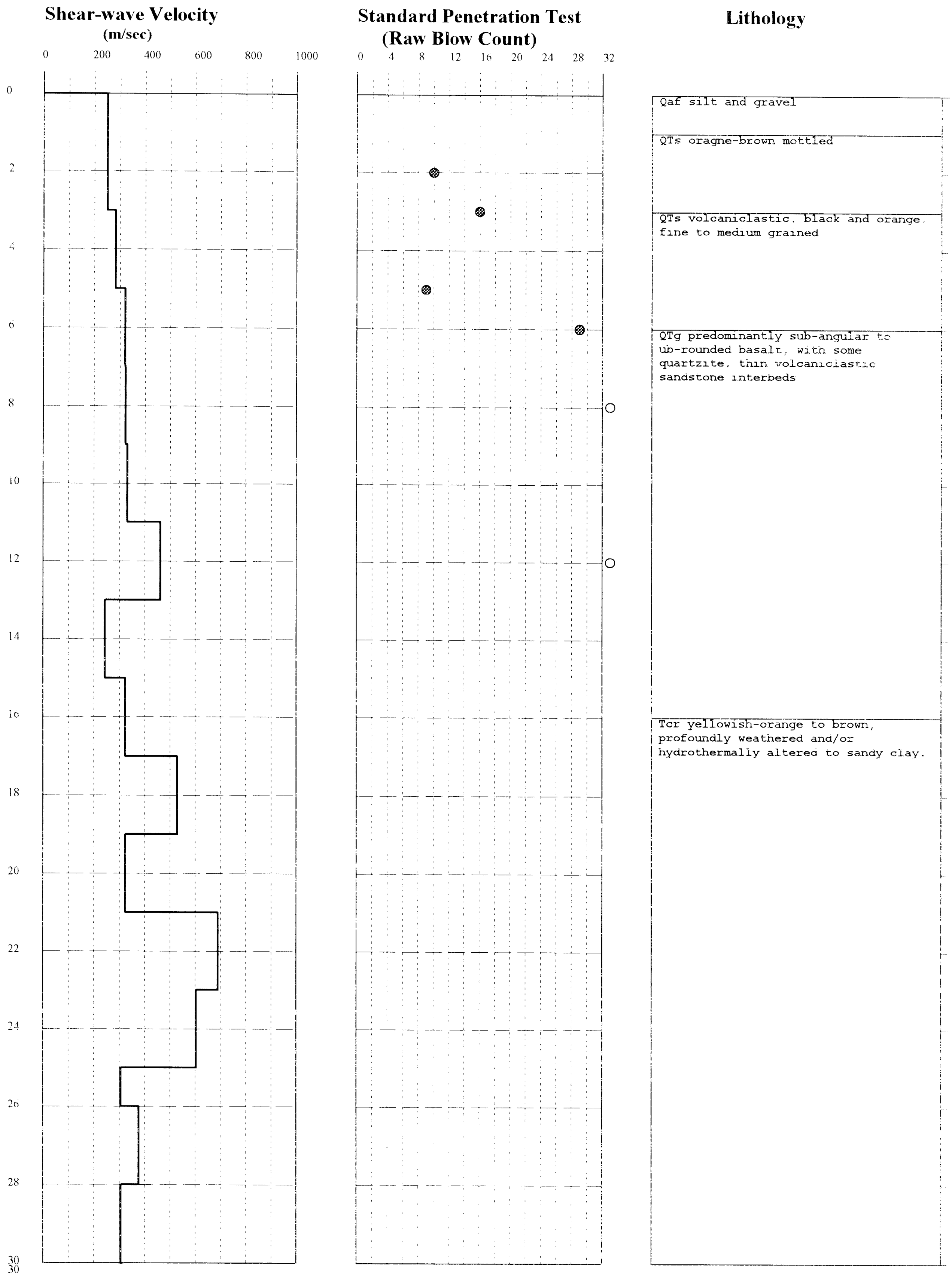
GSD1

UTM Y = 5025106 UTM X = 531248



GSD2

UTM Y = 5026302 UTM X = 531431



GSD3

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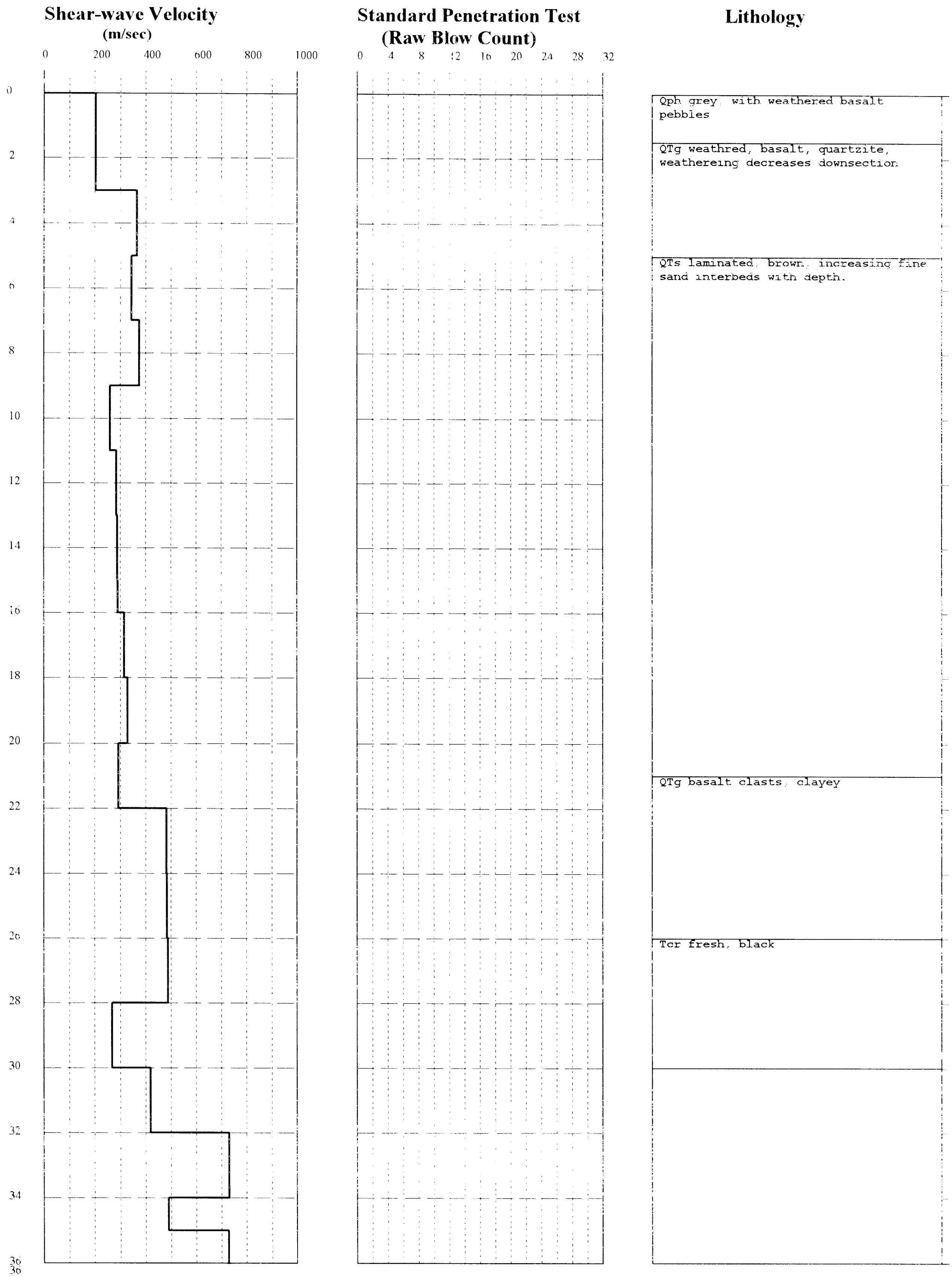
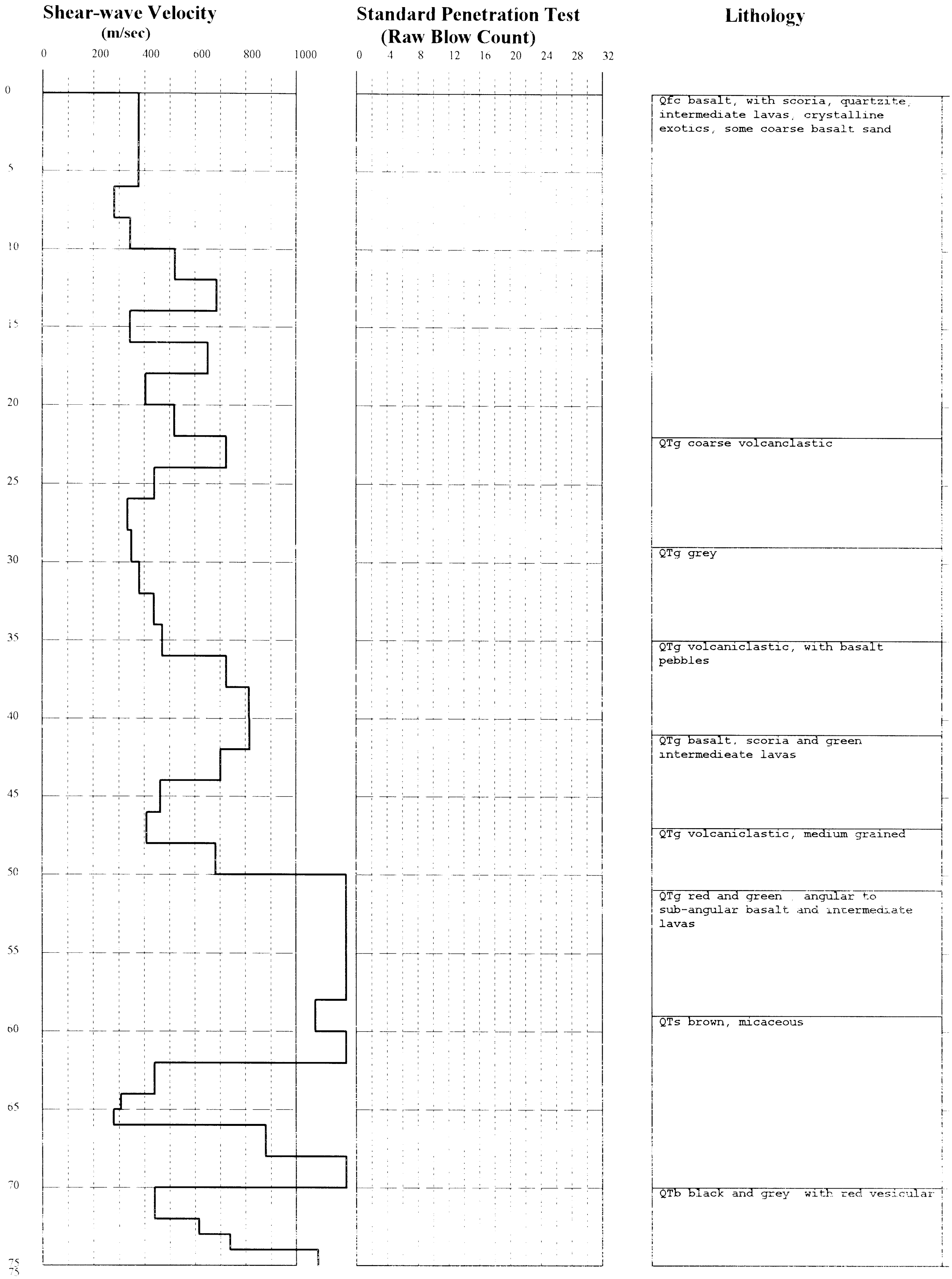


GSD5

UTM Y = 5036263 UTM X = 533913



GSD7

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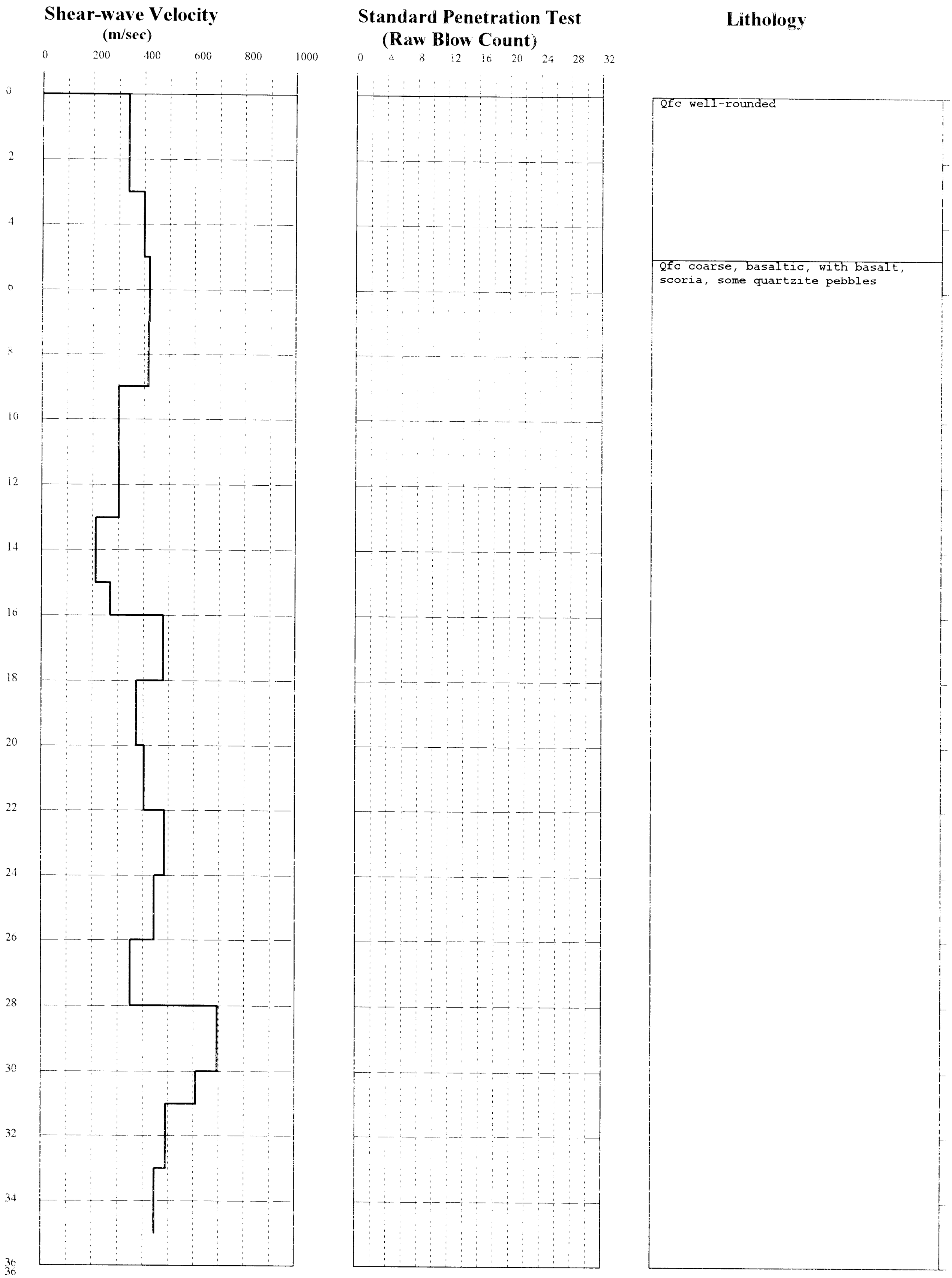
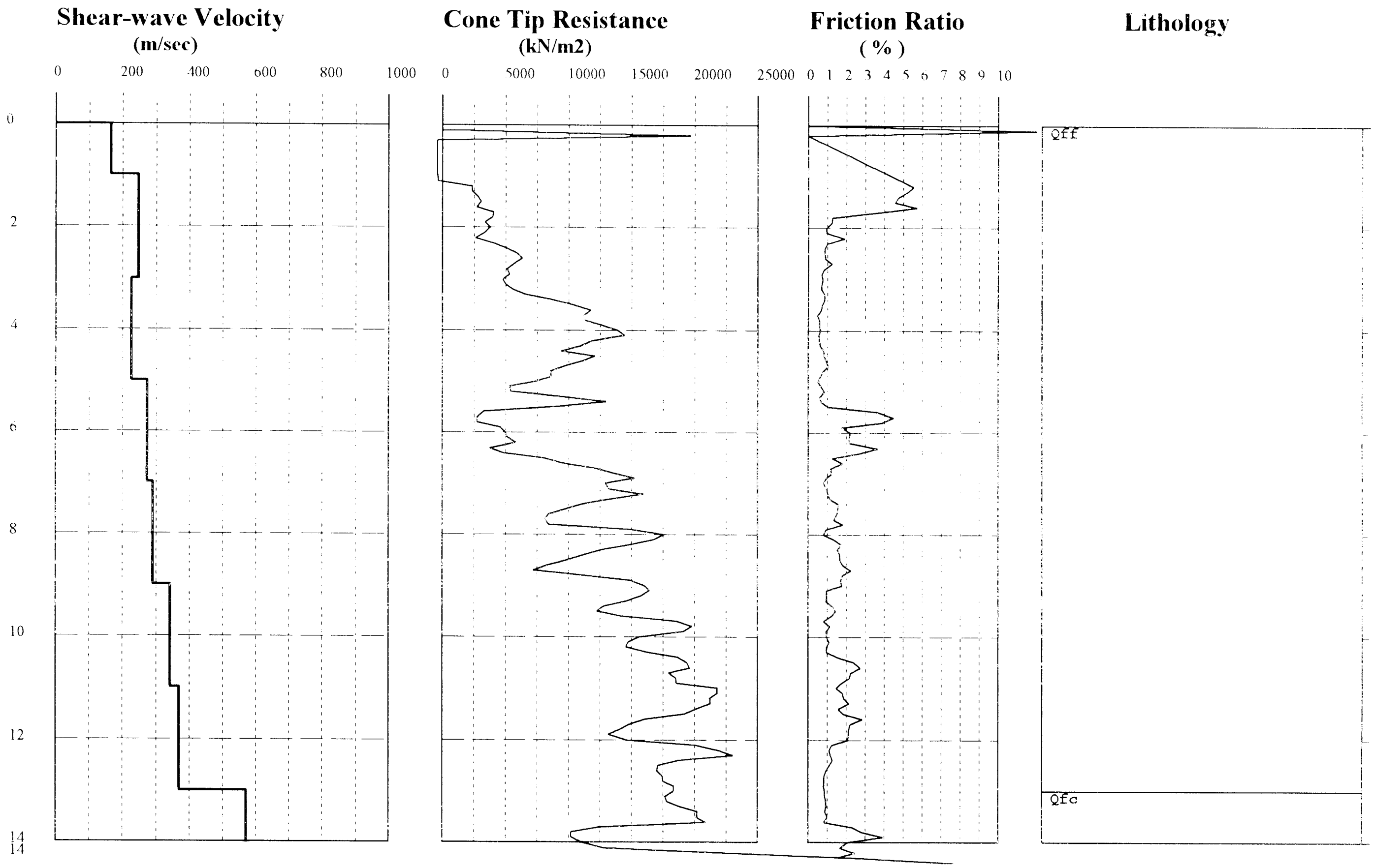


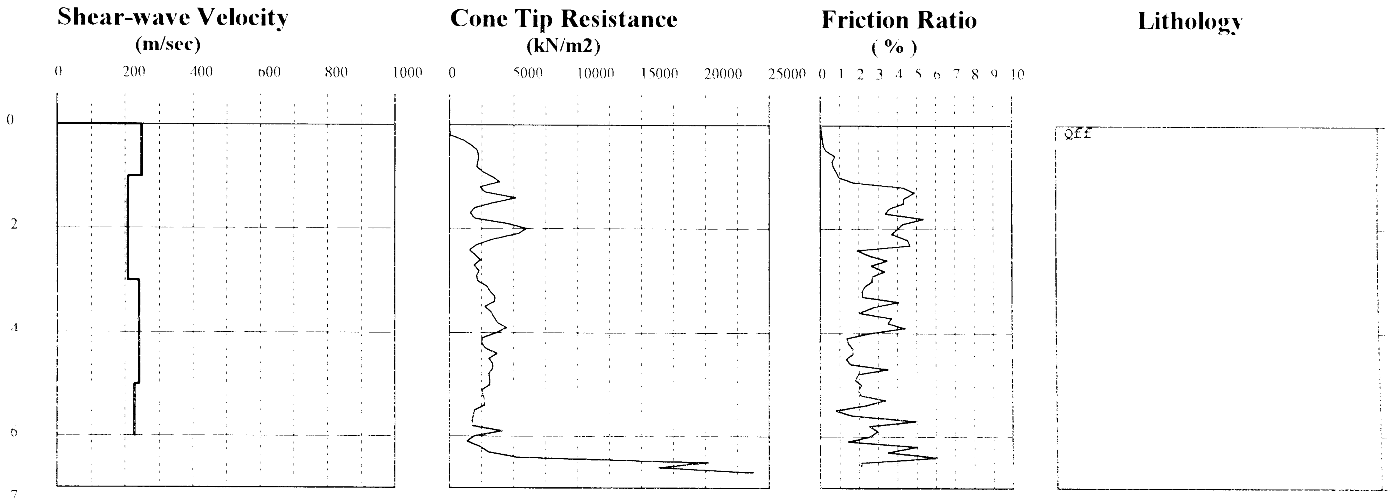
GSP1

UTM Y = 5033019 UTM X = 529710



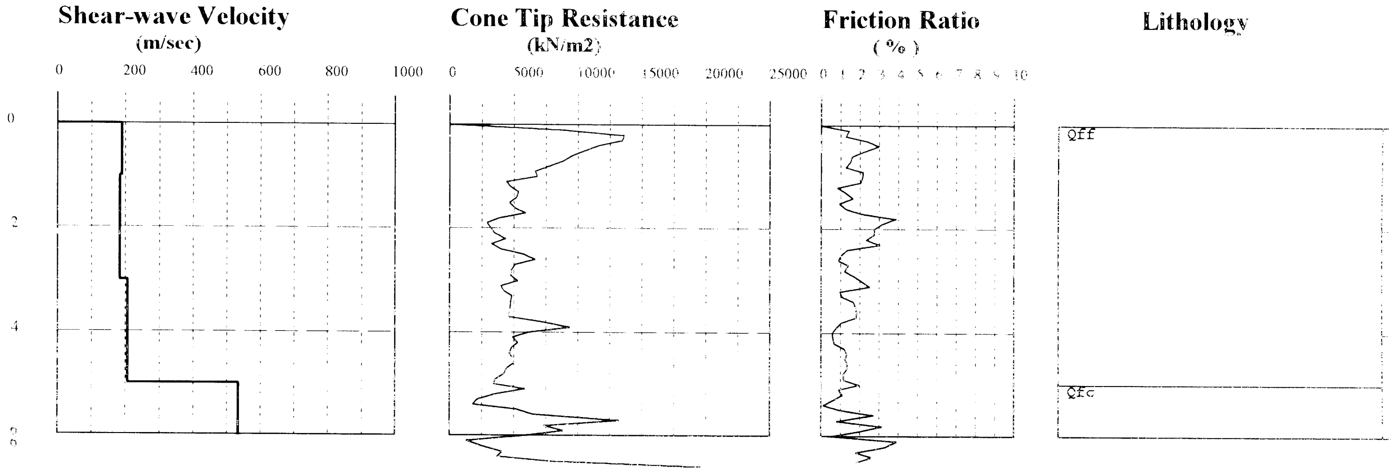
GSP2

UTM Y = 5030956 UTM X = 533200



GSP3

UTM Y = 5029759 UTM X = 533203

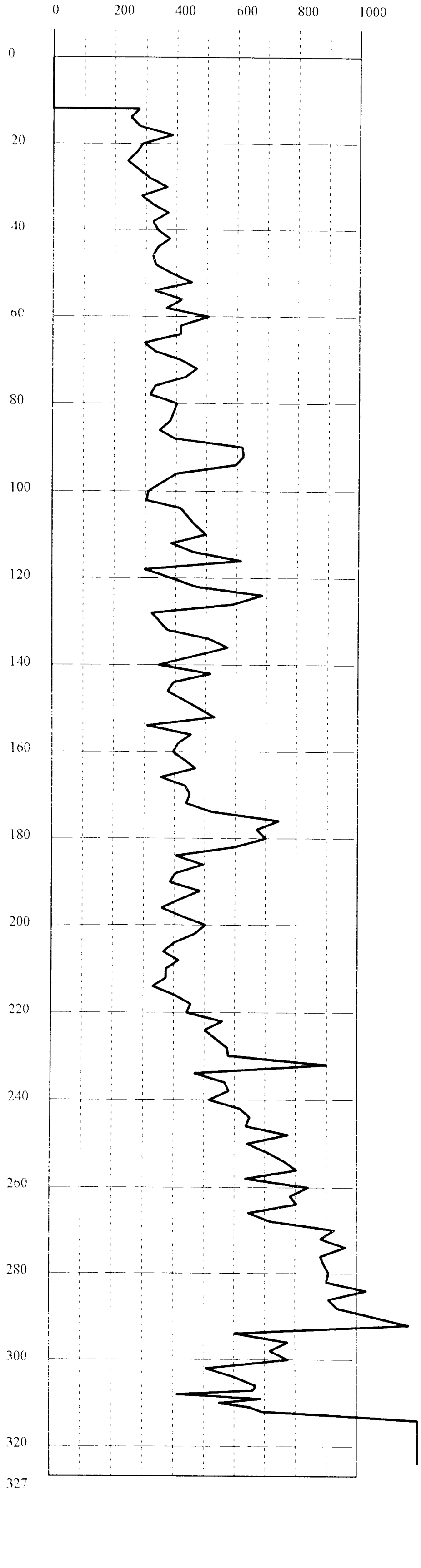


HBD1

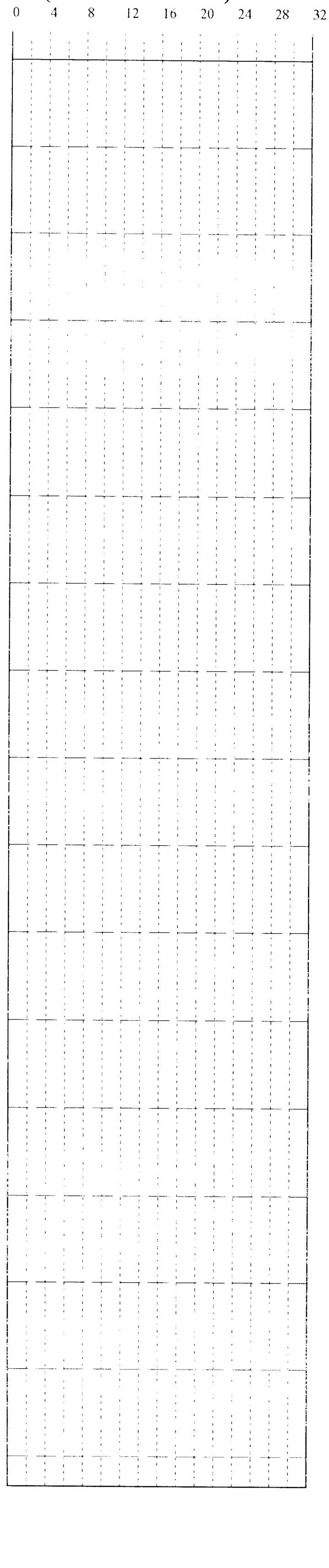
UTM Y = 5043108 UTM X = 504273

Hillsboro Airport

Shear-wave Velocity
(m/sec)



Standard Penetration Test
(Raw Blow Count)



Lithology

Qff brown, micaceous

Qff blue, grey, micaceous, with thin very fine sand beds

QTs blue, grey, micaceous, trace organics, rare basalt pebbles, thin ash beds

QTs blue, grey, red-brown, olive brown or mottled, micaceous, with variable sand, silt, clay content, abundent interbeds of fine to coarse sand, silt, clay, ash, pebbles, wood fragments and organics locally abundant, localy laminated, cross-laminated

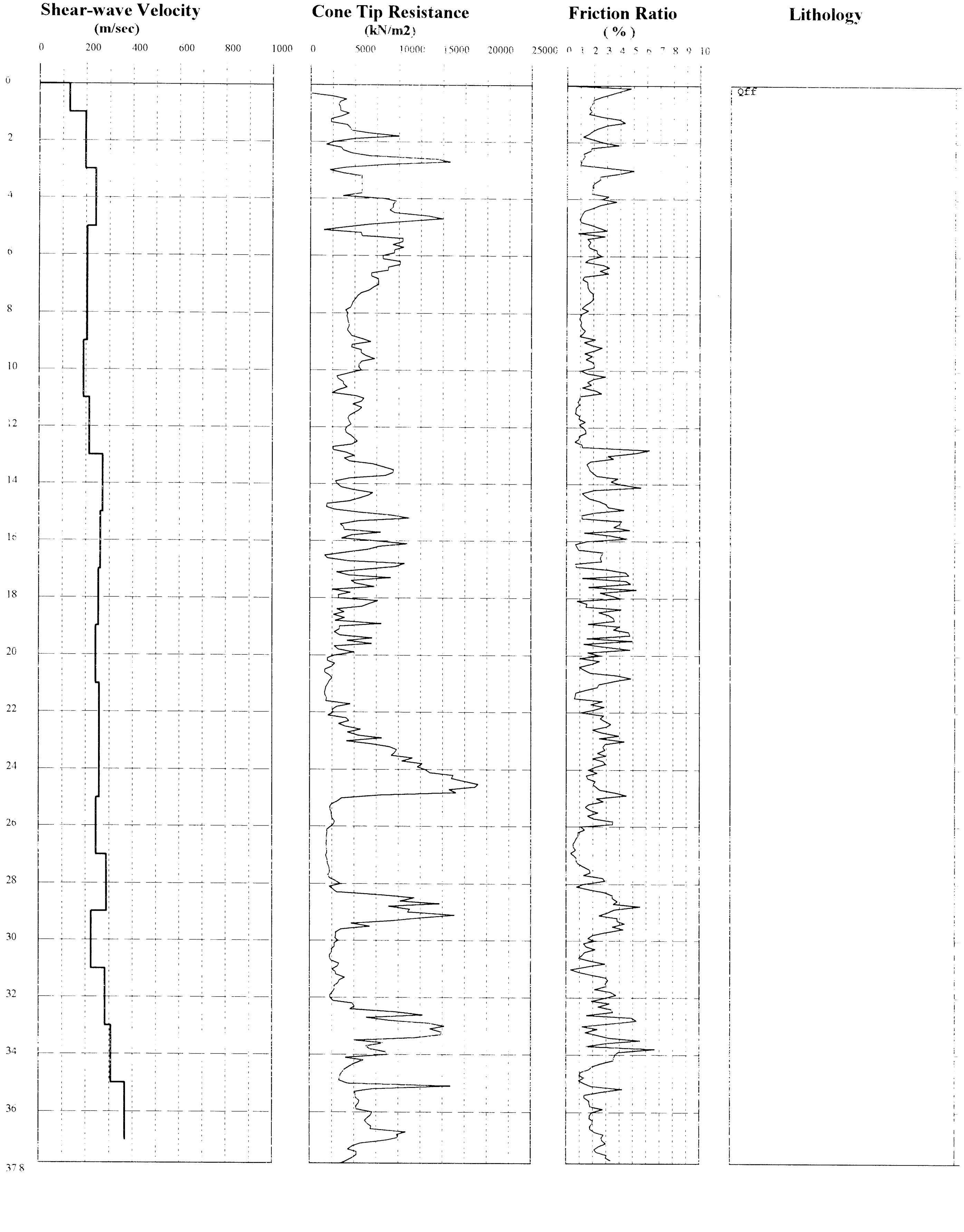
Tcr red-brown sandy silty clay with

Tcr highly weathered or altered, yellow, red, pink, white clay with relict plagioclase crystals

Tcr fresh, black

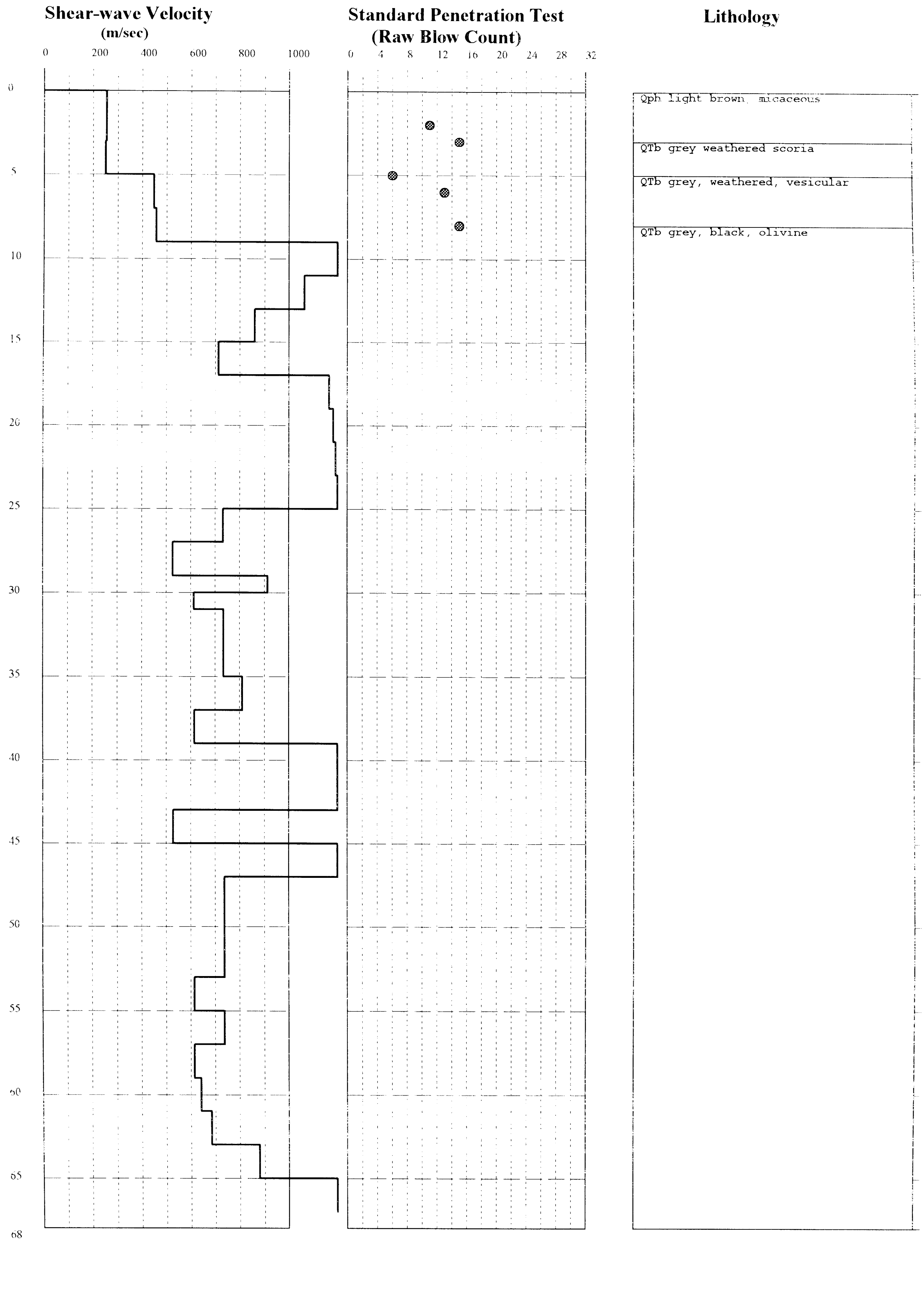
HBP1

UTM Y = 5039851 UTM X = 500868



LOD2

UTM Y = 5032942 UTM X = 520836



LOD3

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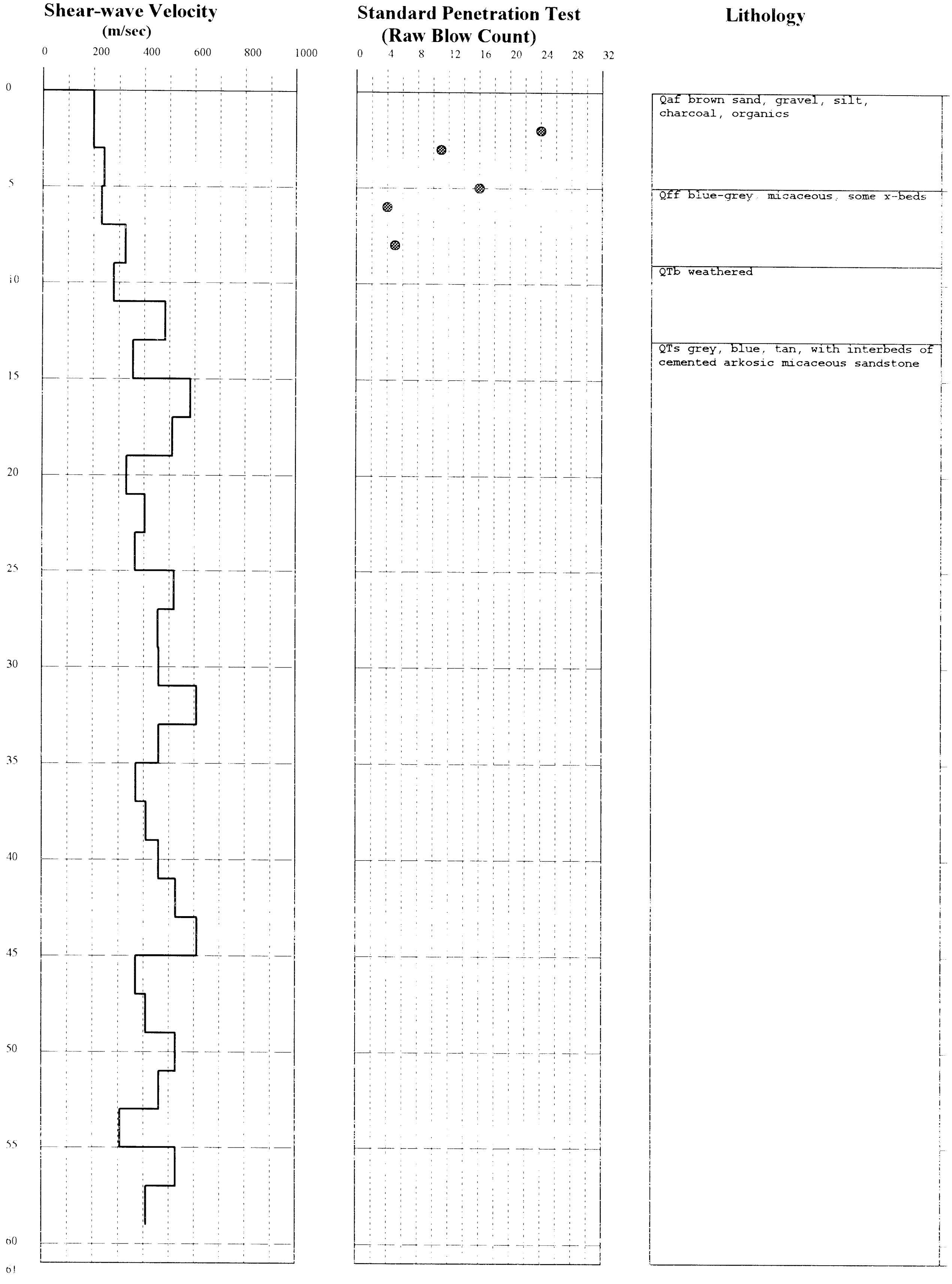
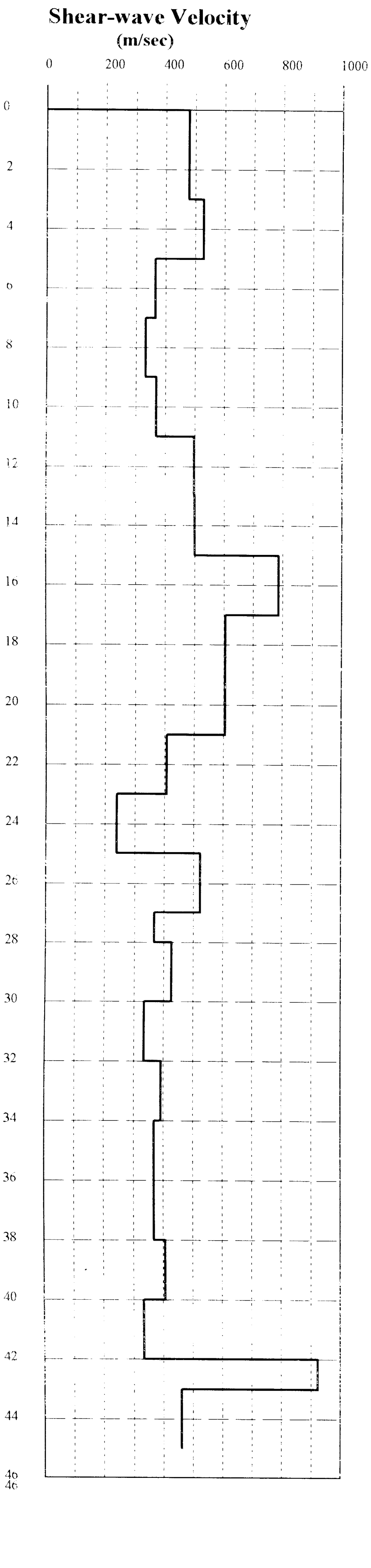
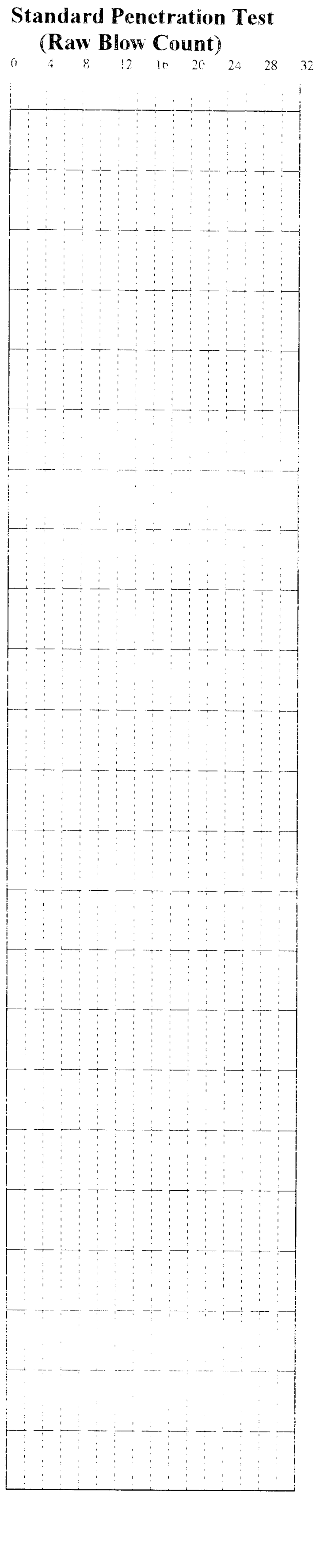


LOD4

UTM Y = 5026763   UTM X = 519948





Lithology

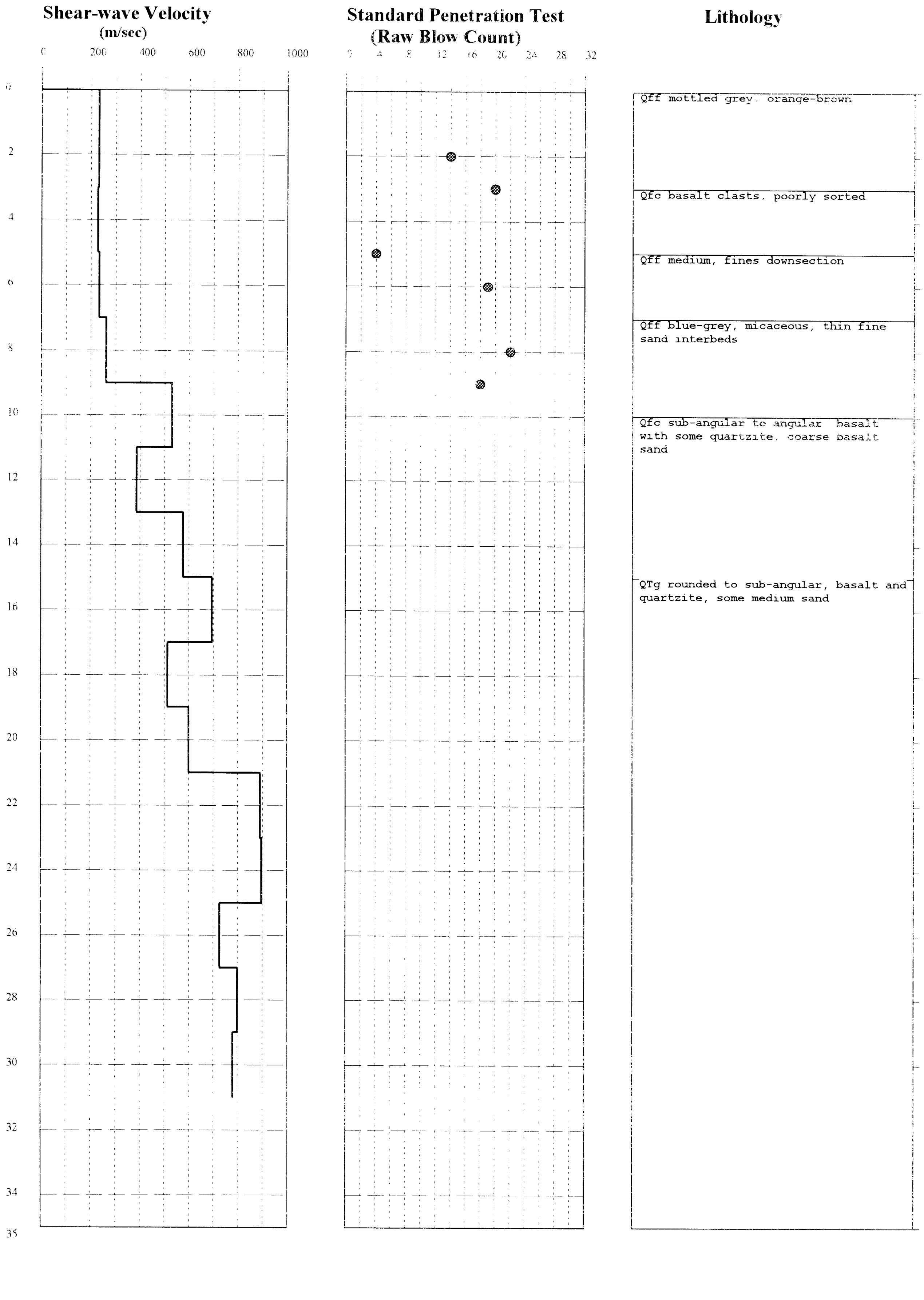
Qfc basalt, intermediate lavas

QTs gray, blue and green, with weathered pebbles of volcanic rocks, wood fragments, some thin sand interbeds.

LOD5

UTM Y = 5031587 UTM X = 529509

State 224 and 37th



LOD6

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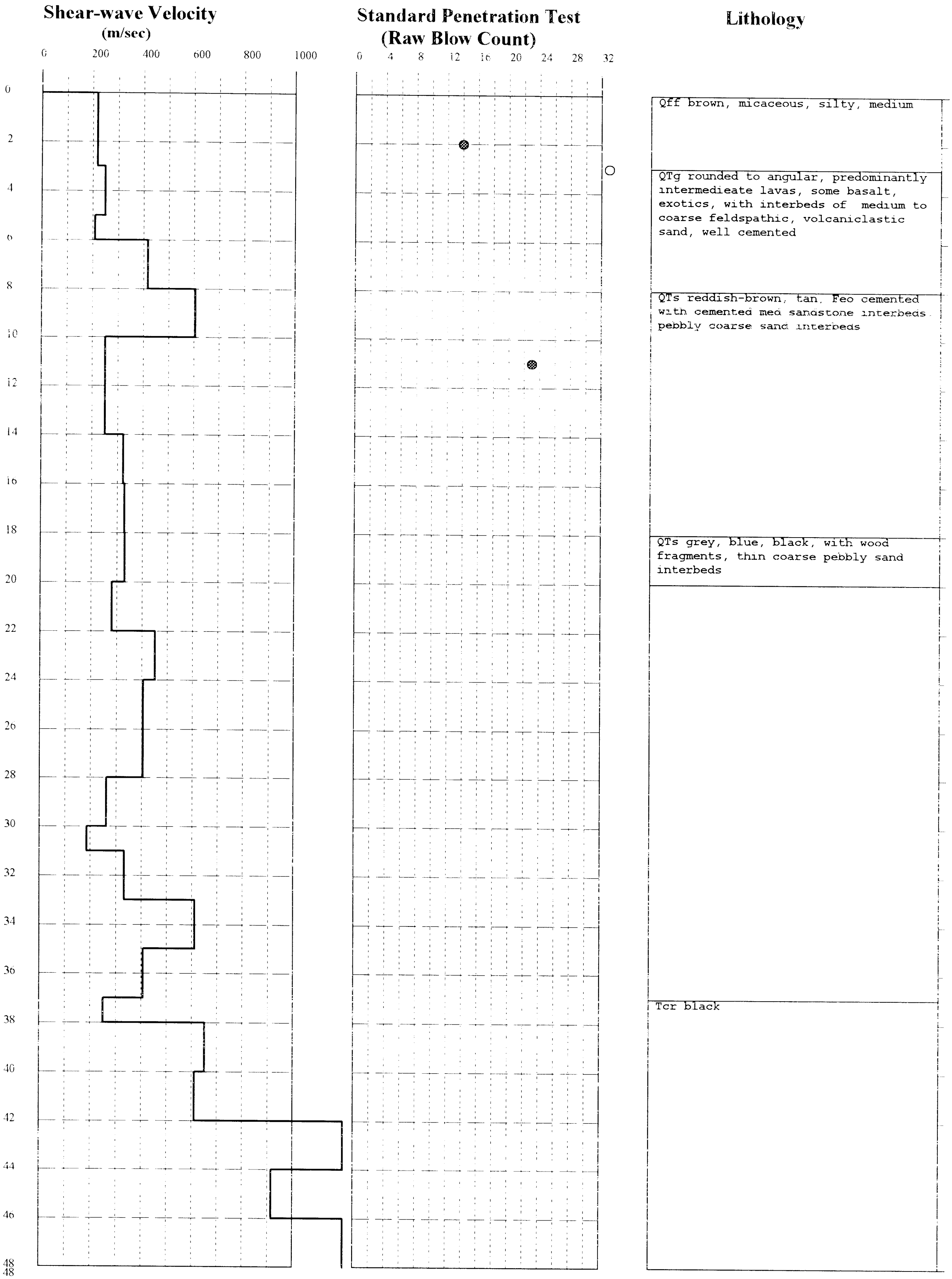

LOD9

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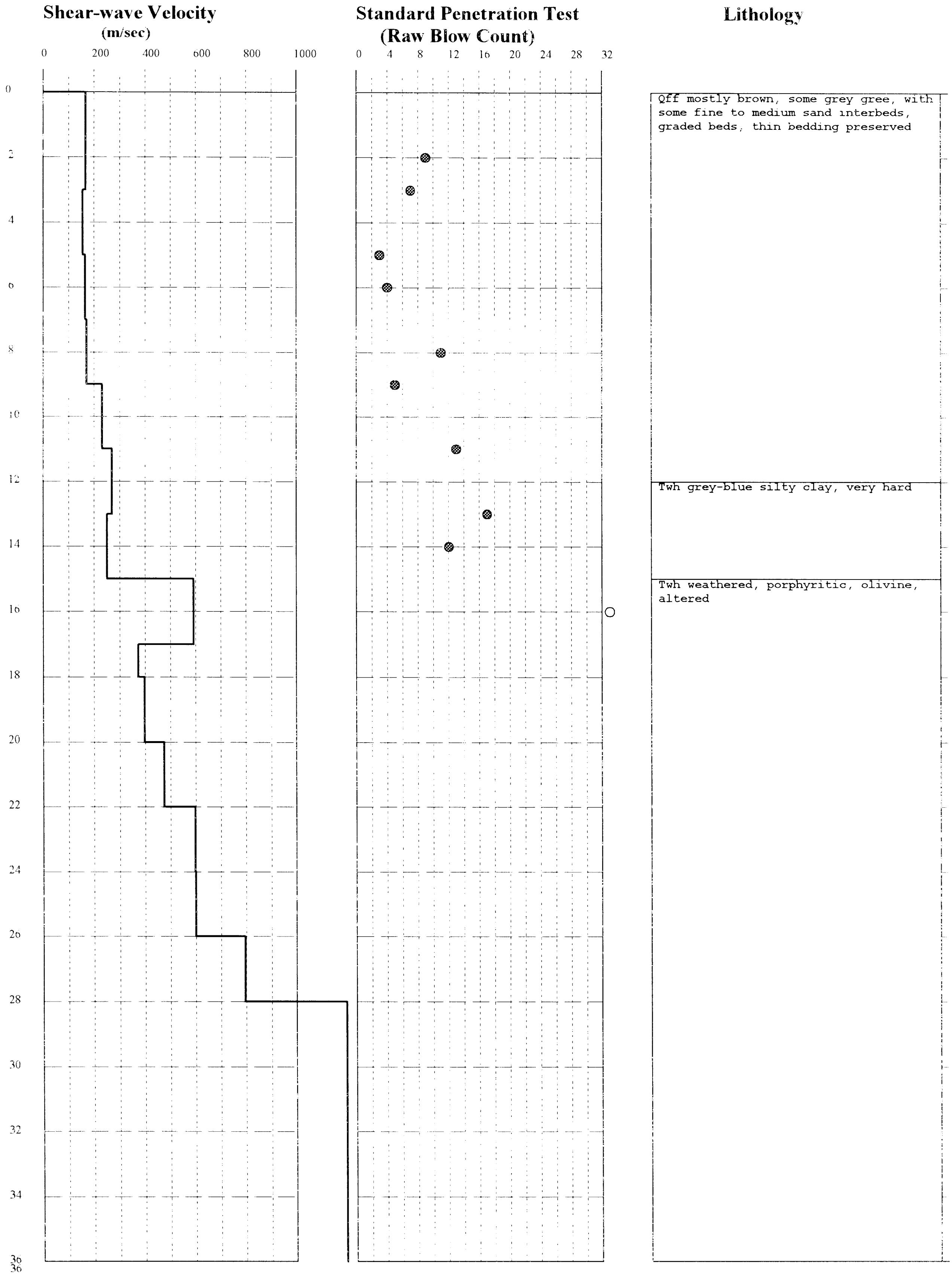
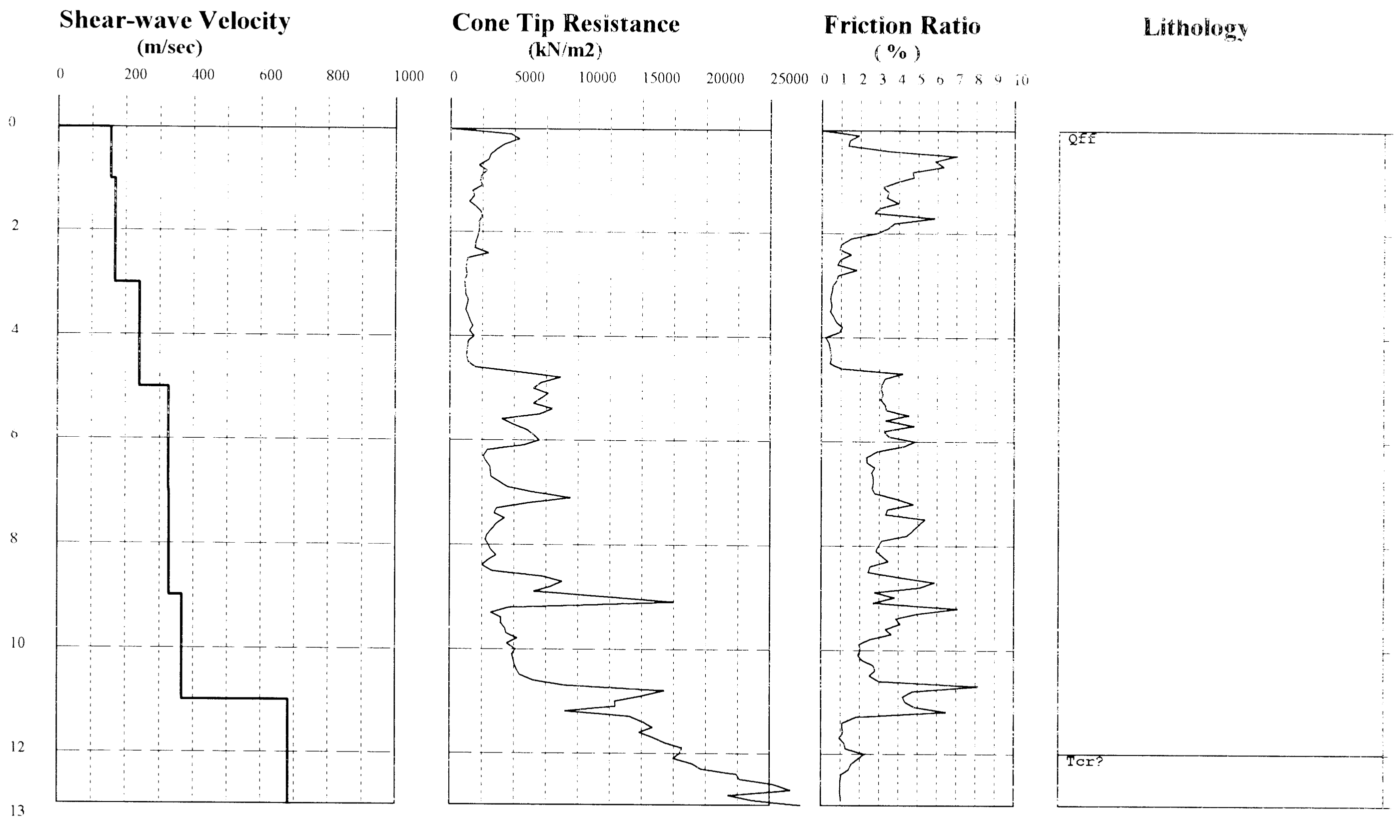


LOP1

UTM Y = 5025274 UTM X = 528732



LOP2

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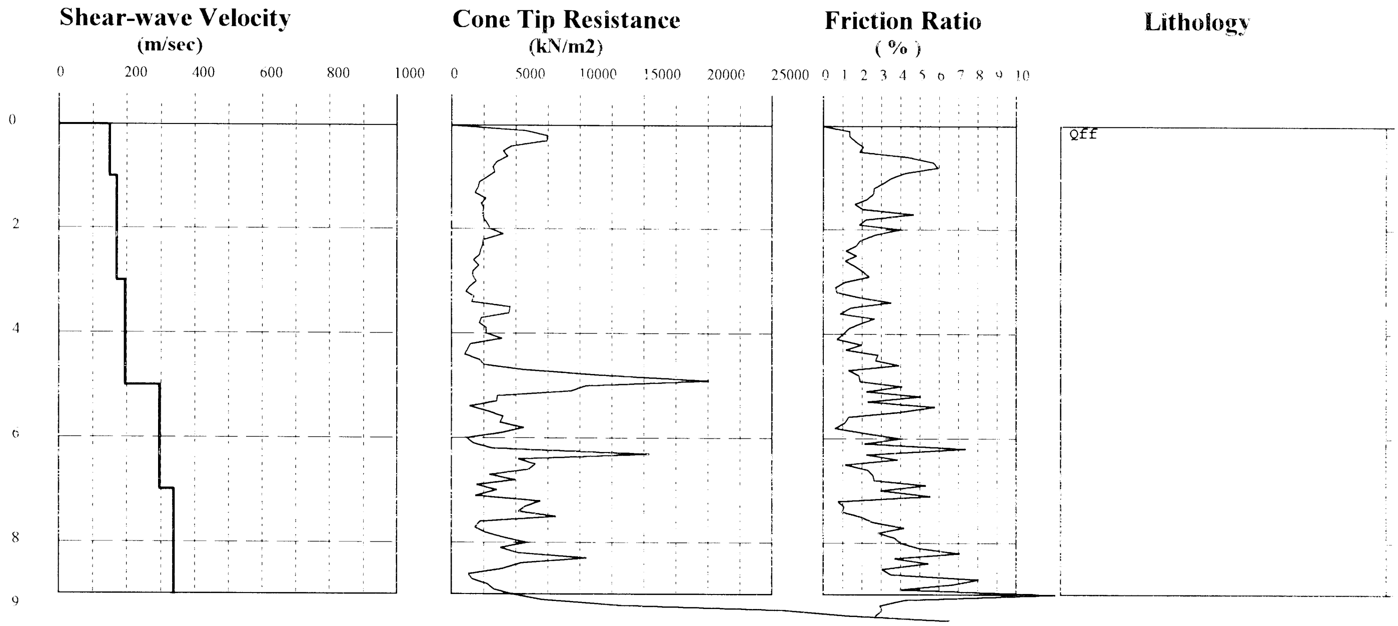

LOP3

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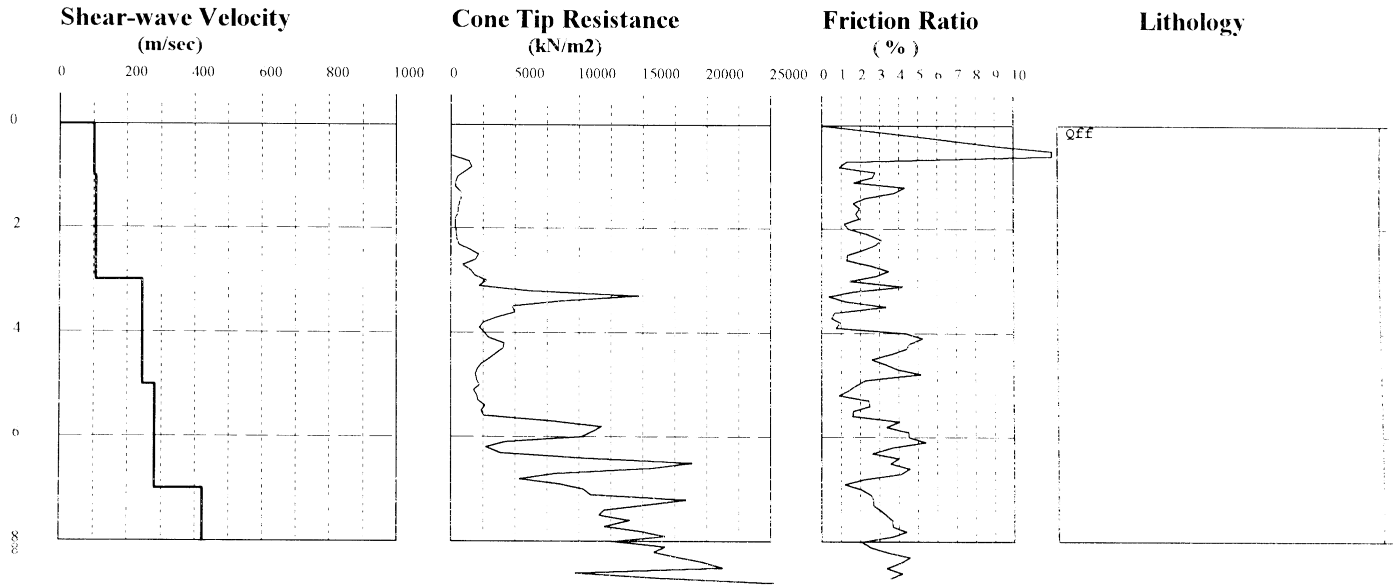

LOP4

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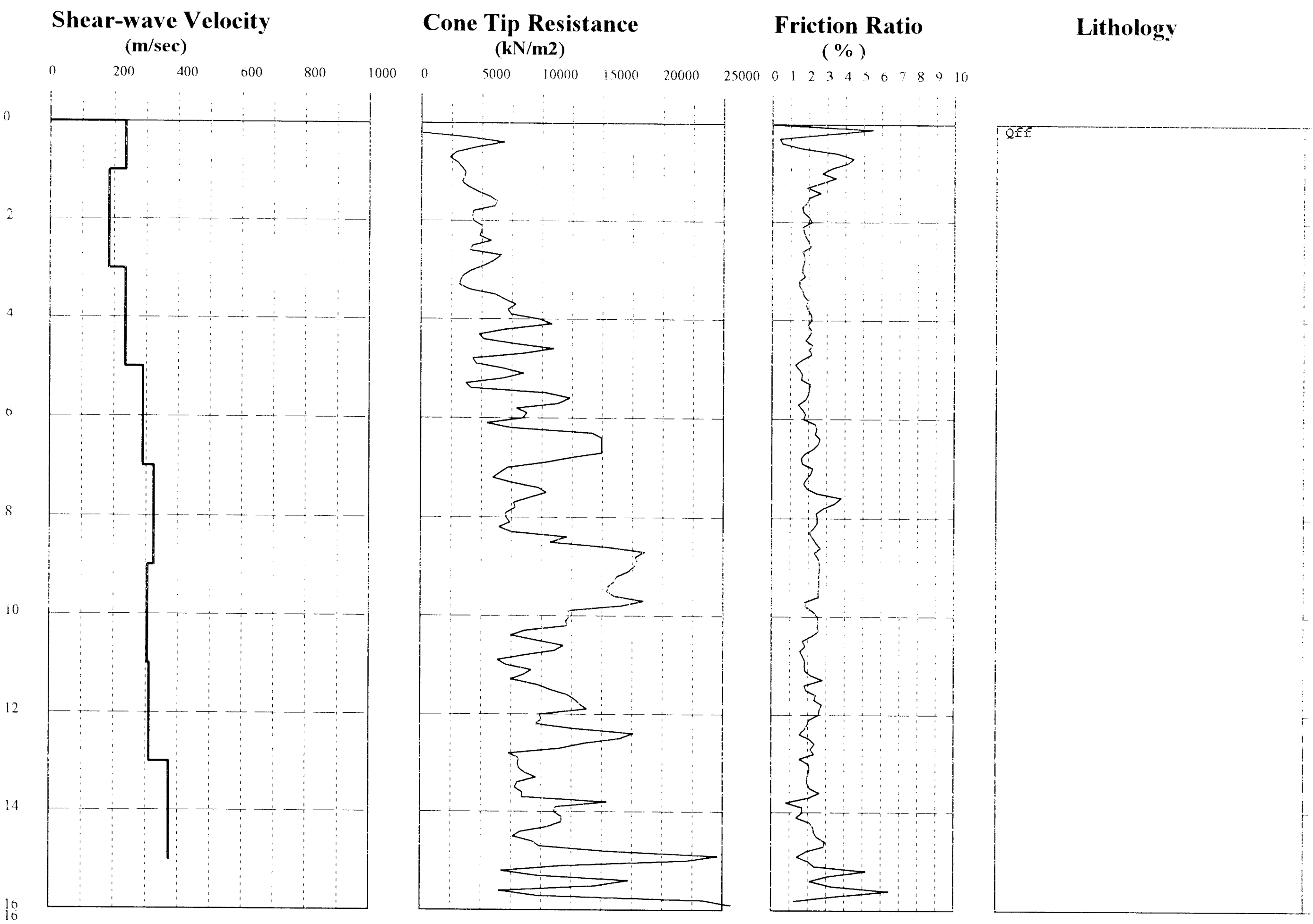

LOP5

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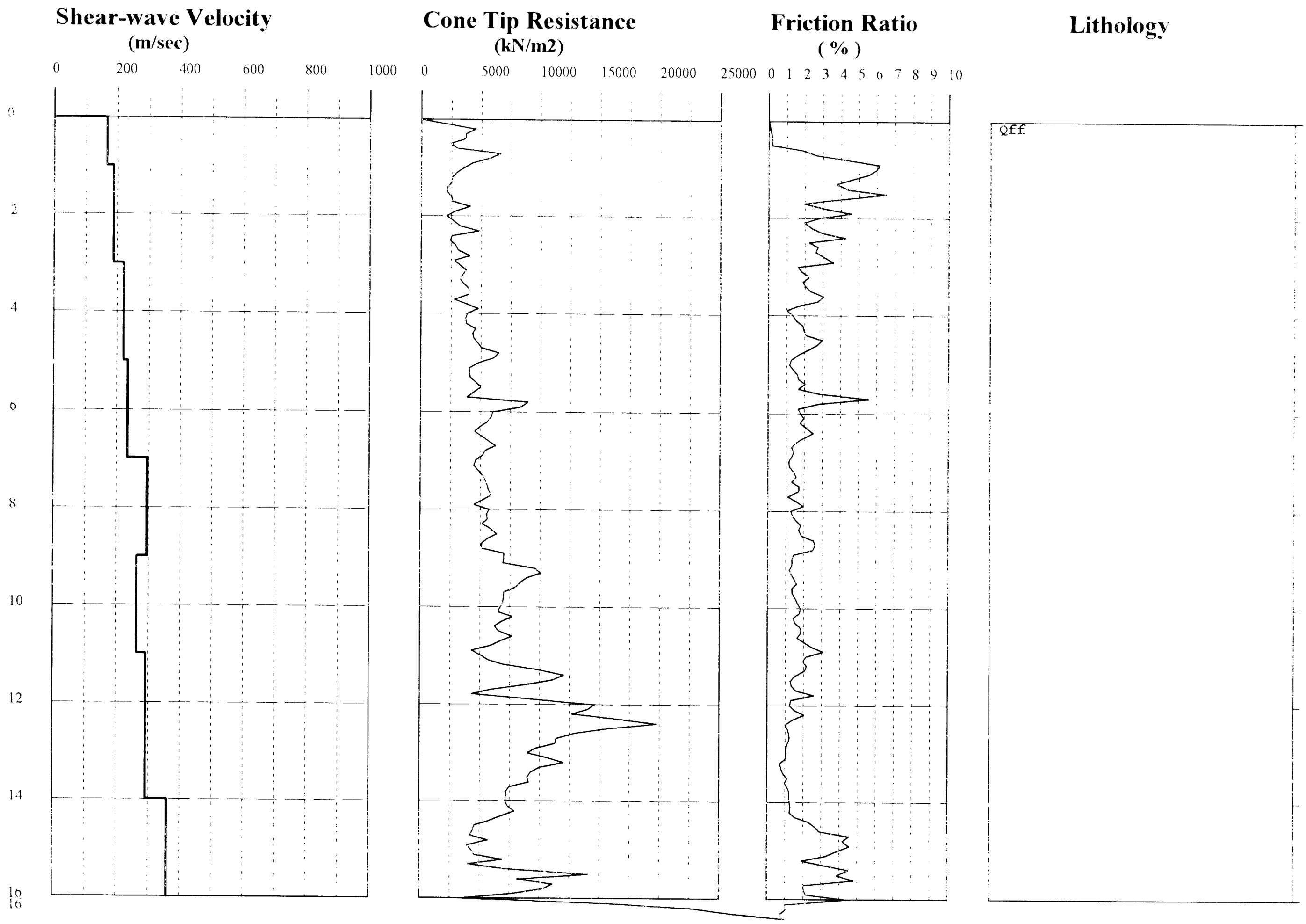

LOP6

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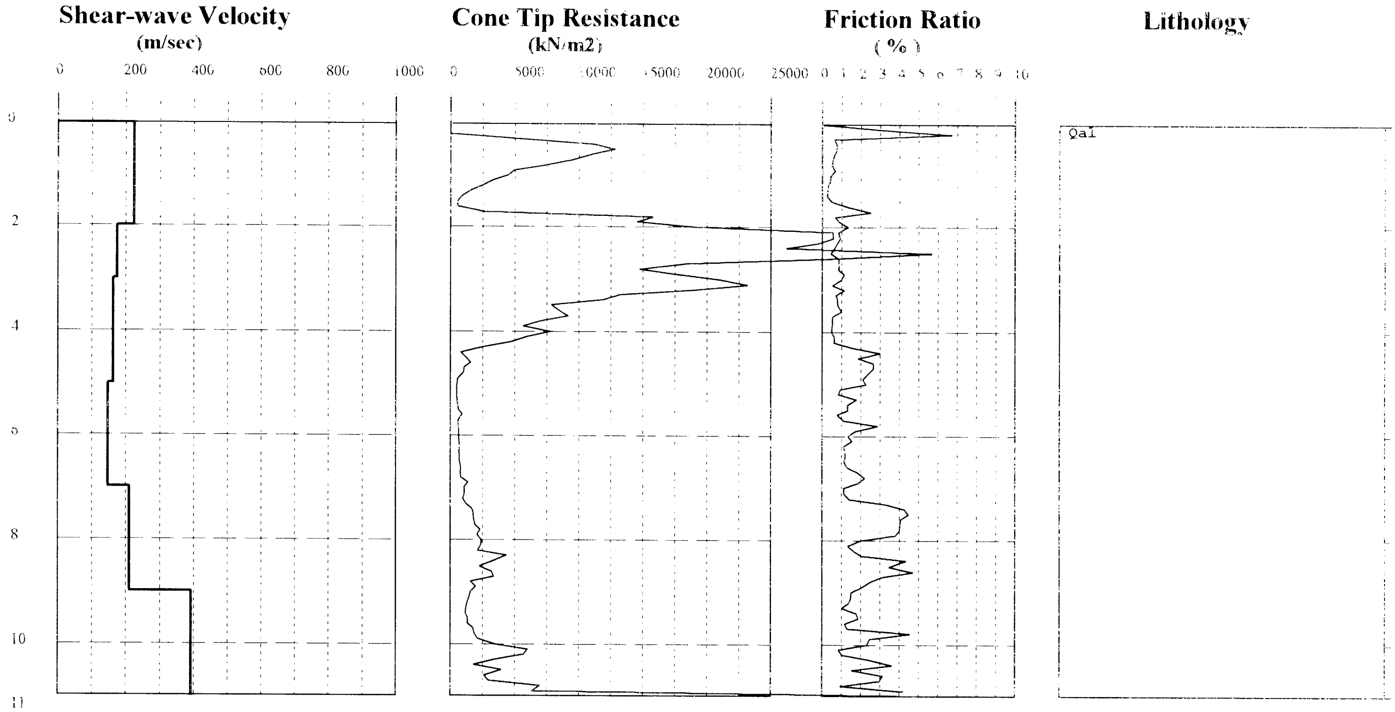

LOP7

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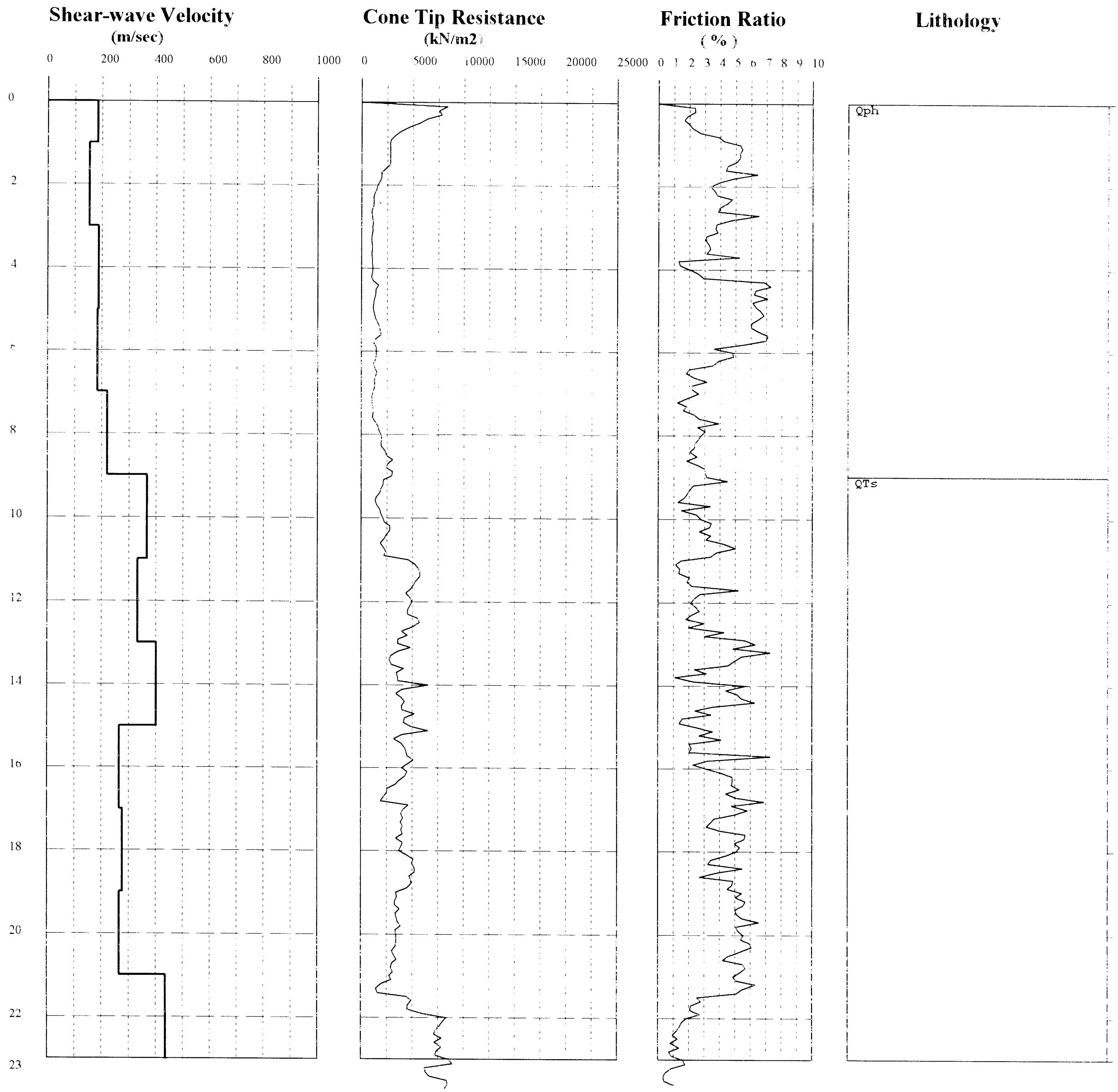

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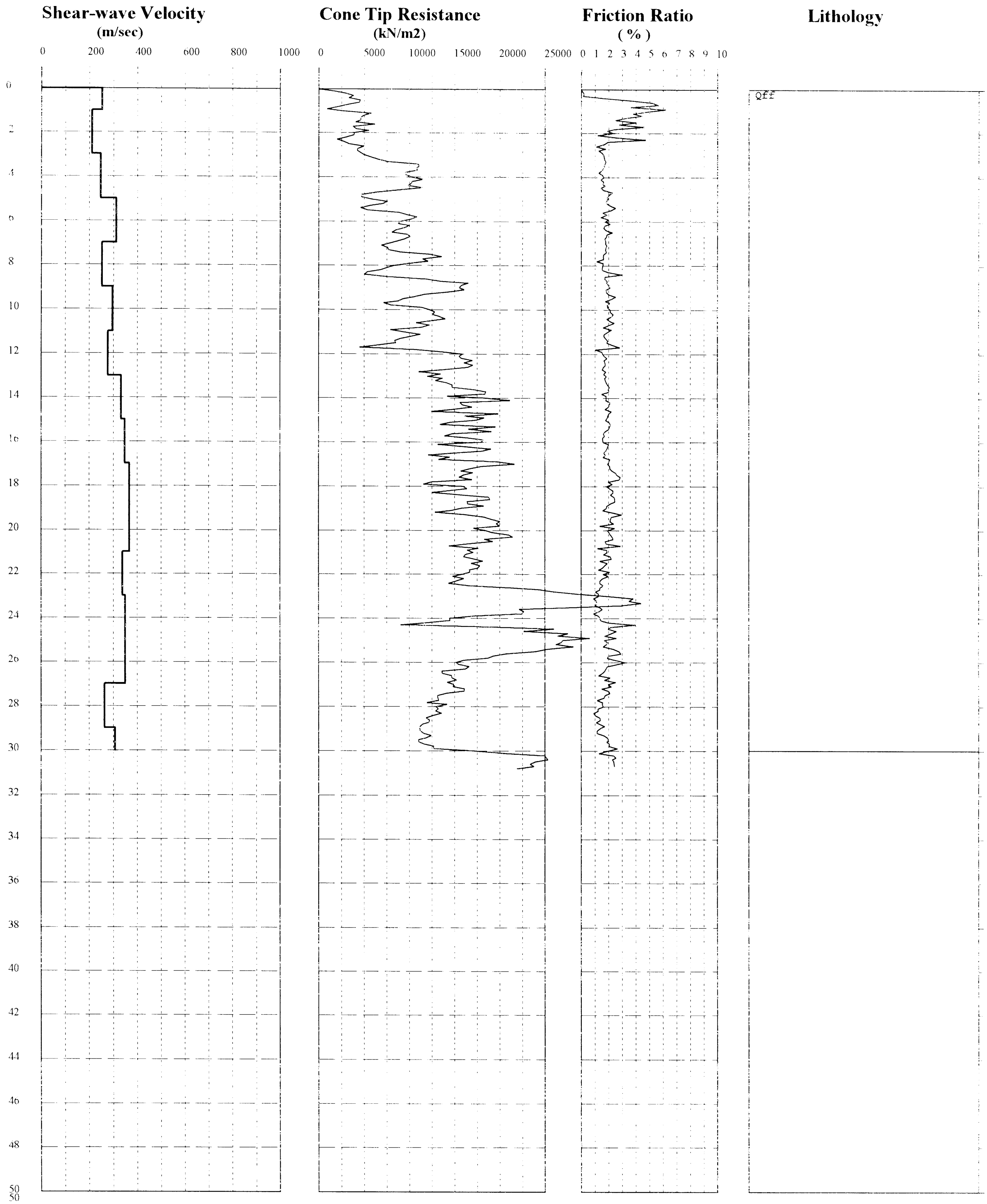
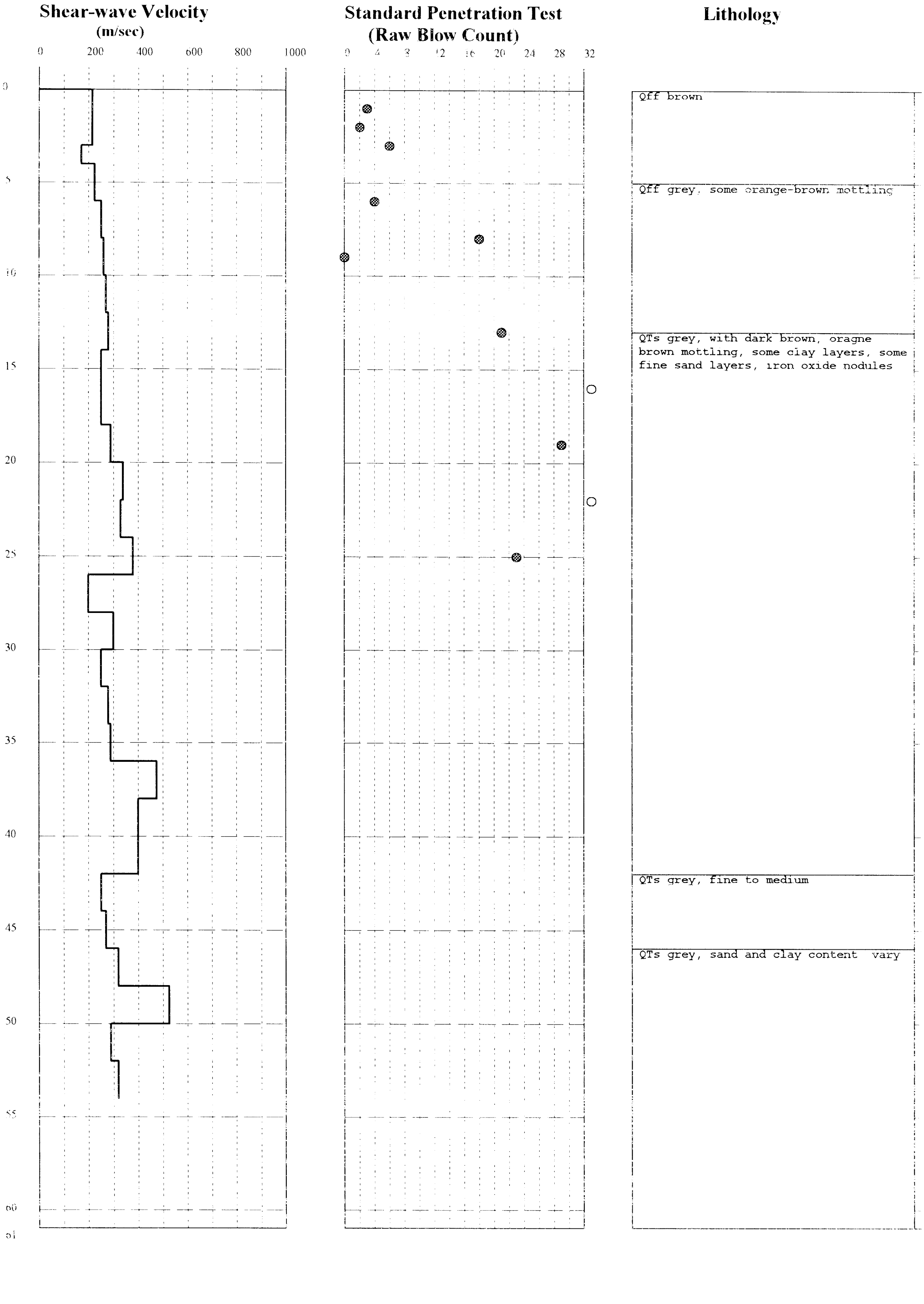


LTD1

UTM Y = 5042713 UTM X = 510606

Tanasborne (RZA Coop)



LTD2

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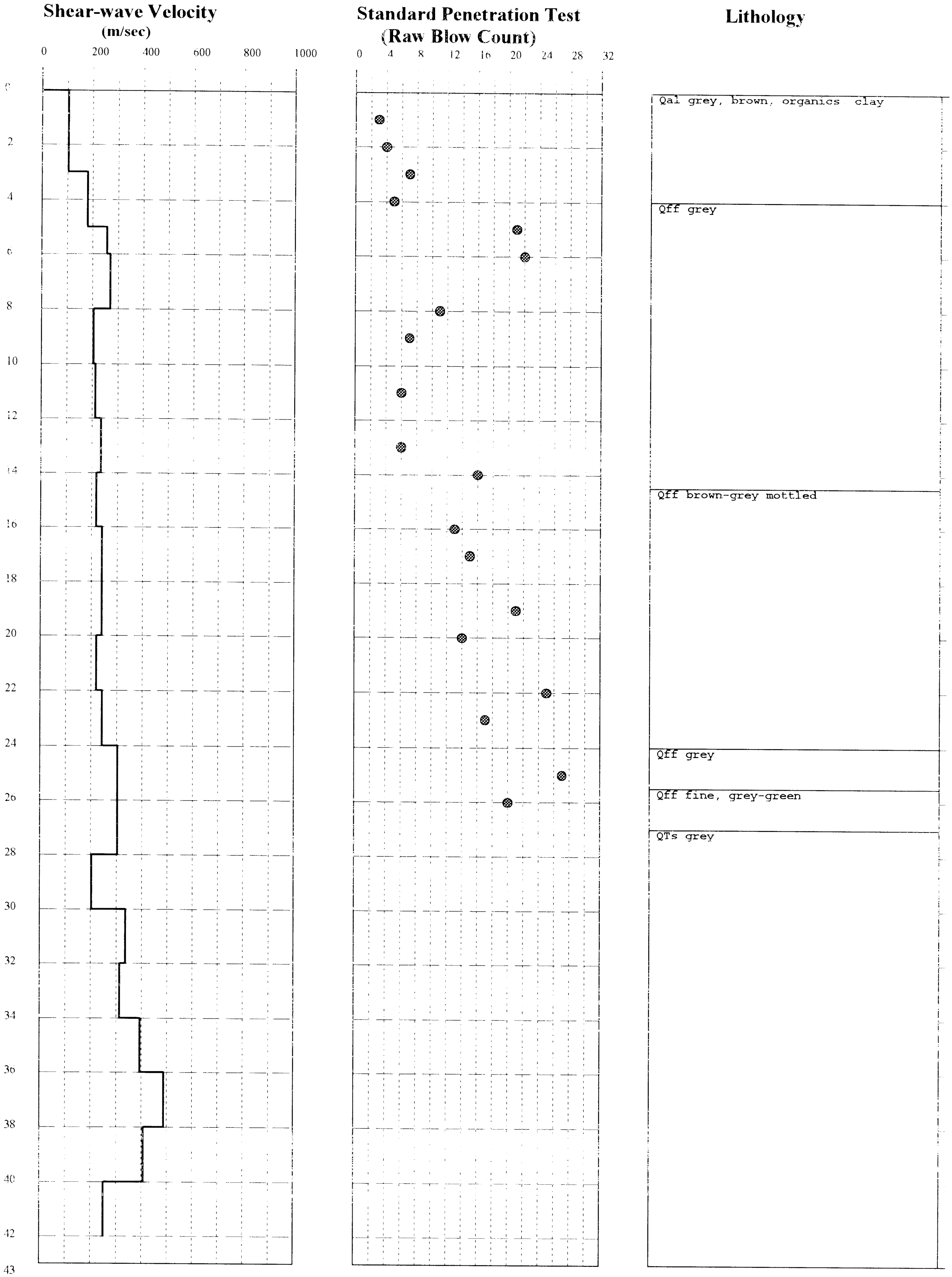

LTD4

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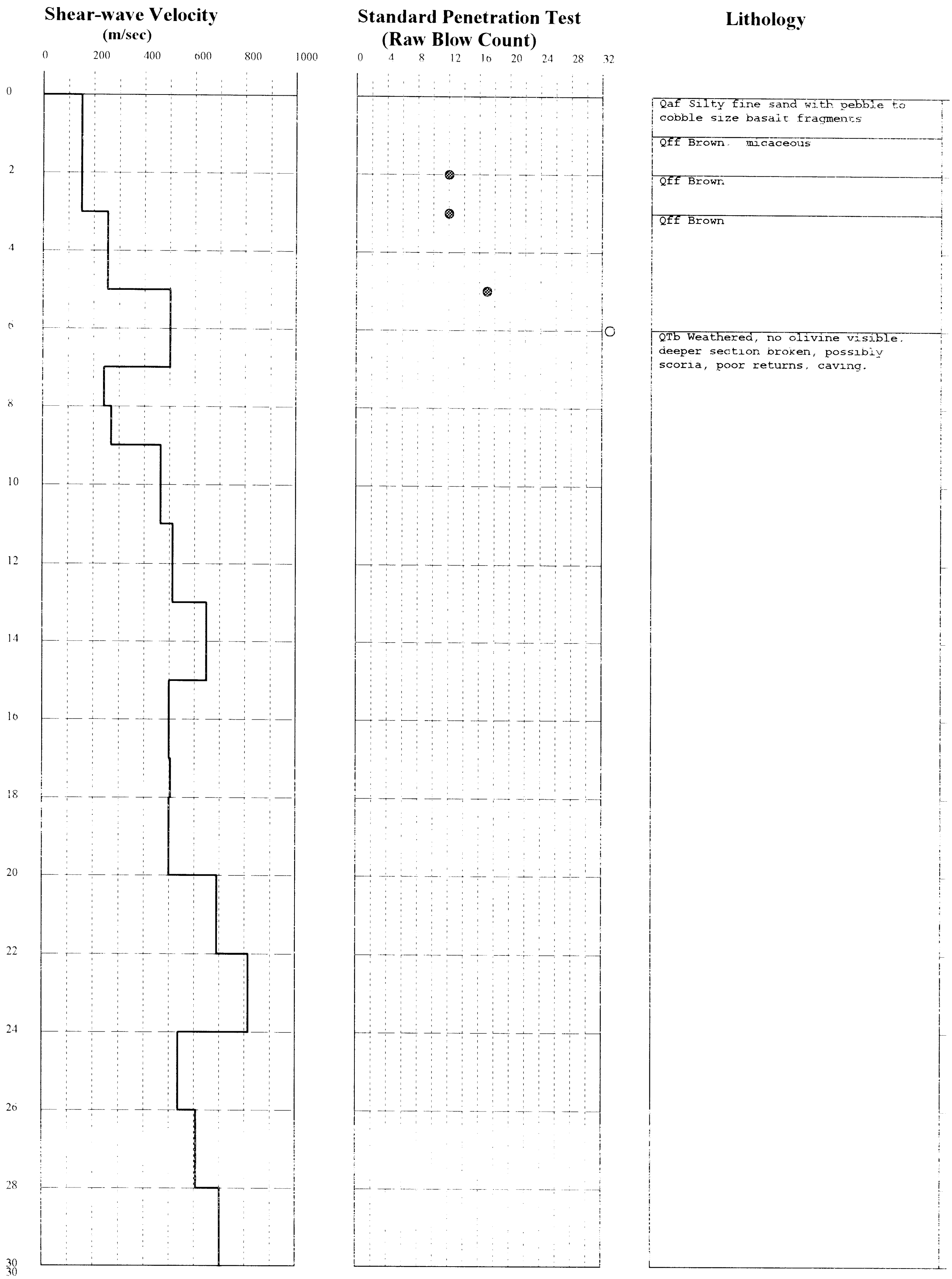

LTD6

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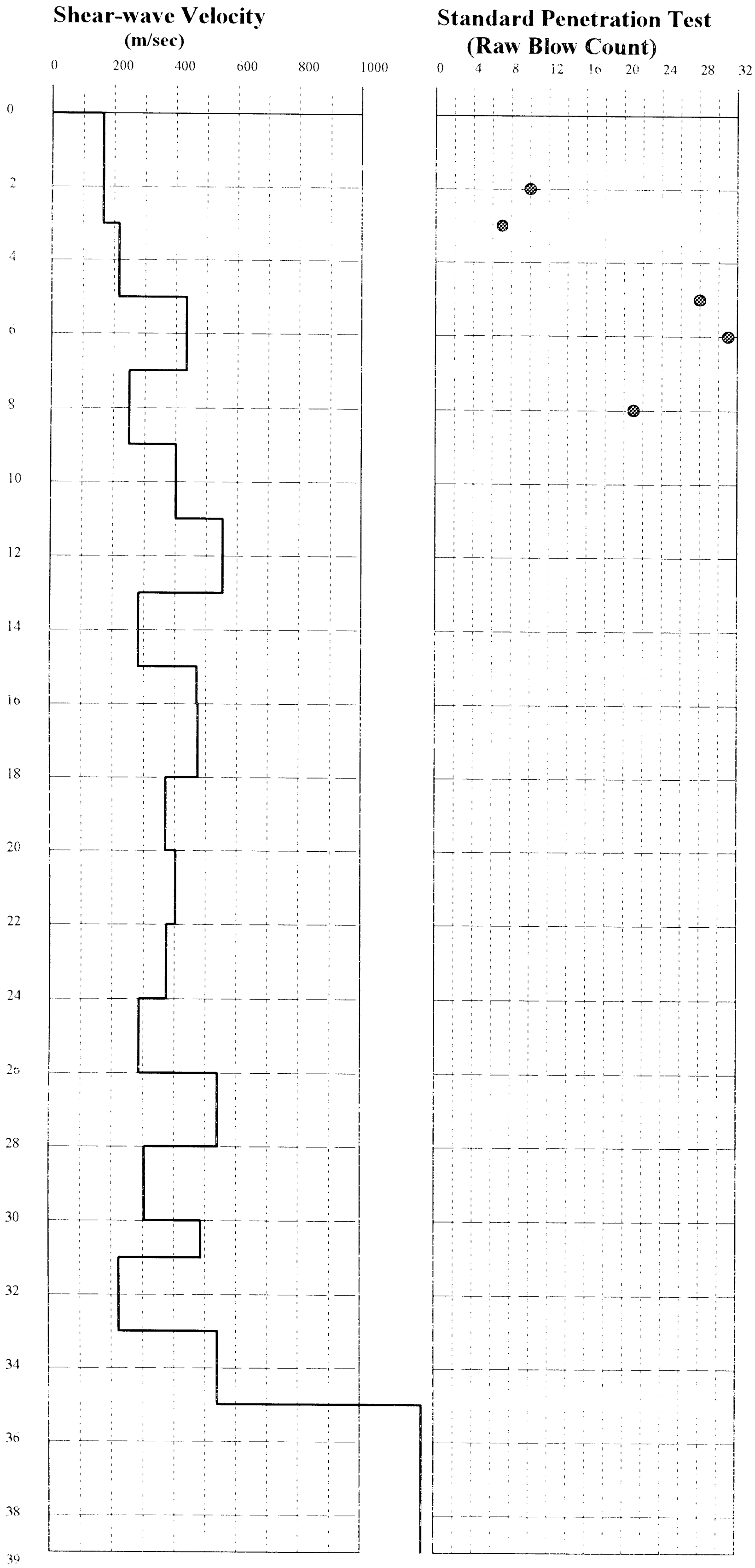


Lithology

Qff Basalt gravel and micaceous clay

Qff saturated, some bedding

Qfs quartz and volcanic lithics, mica

Qff moist, micaceous

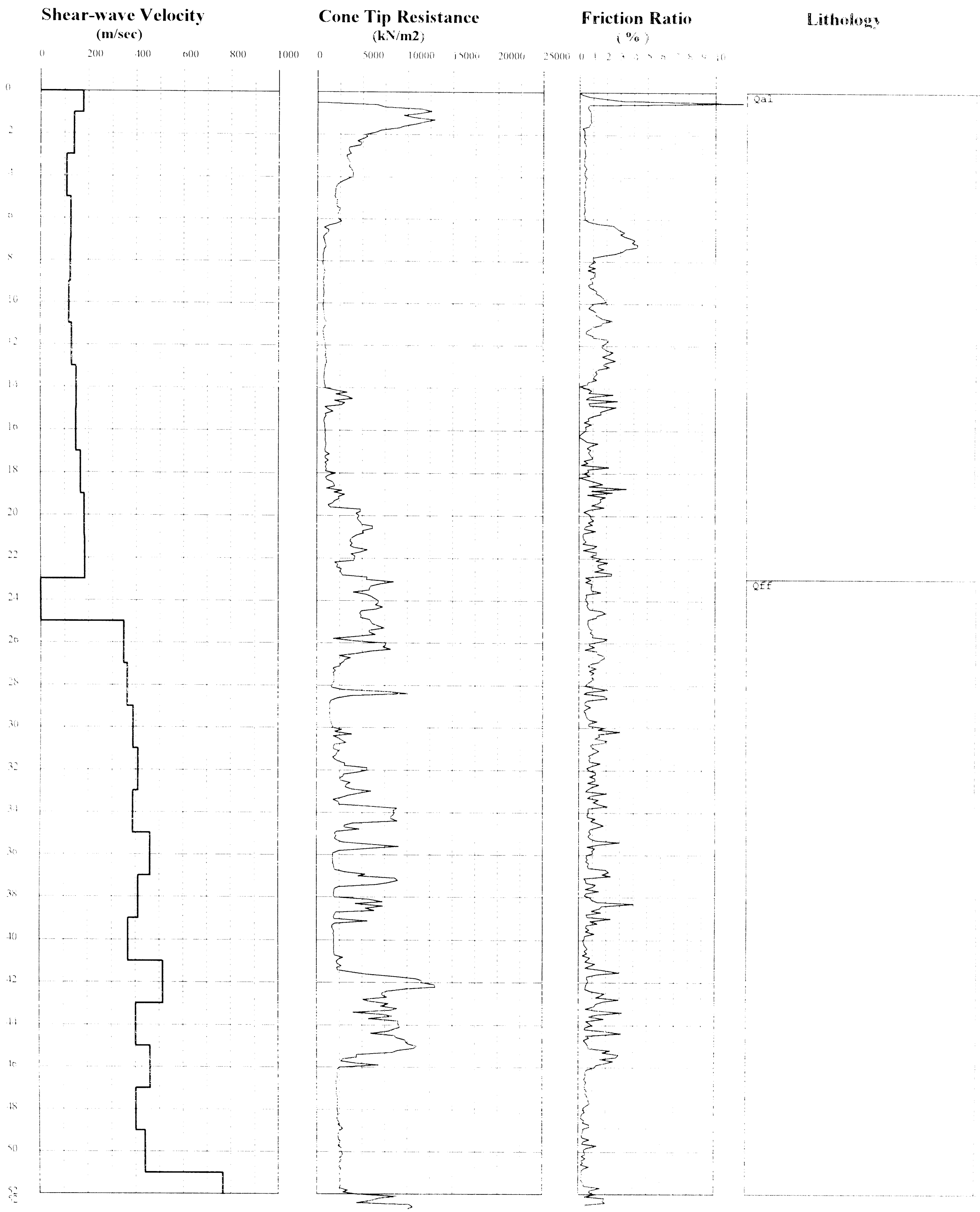
Qfs micaceous, thin silt layers

Qfc well sorted, sub-rounded, basalt, some quartzite

Qfs coarser downsection

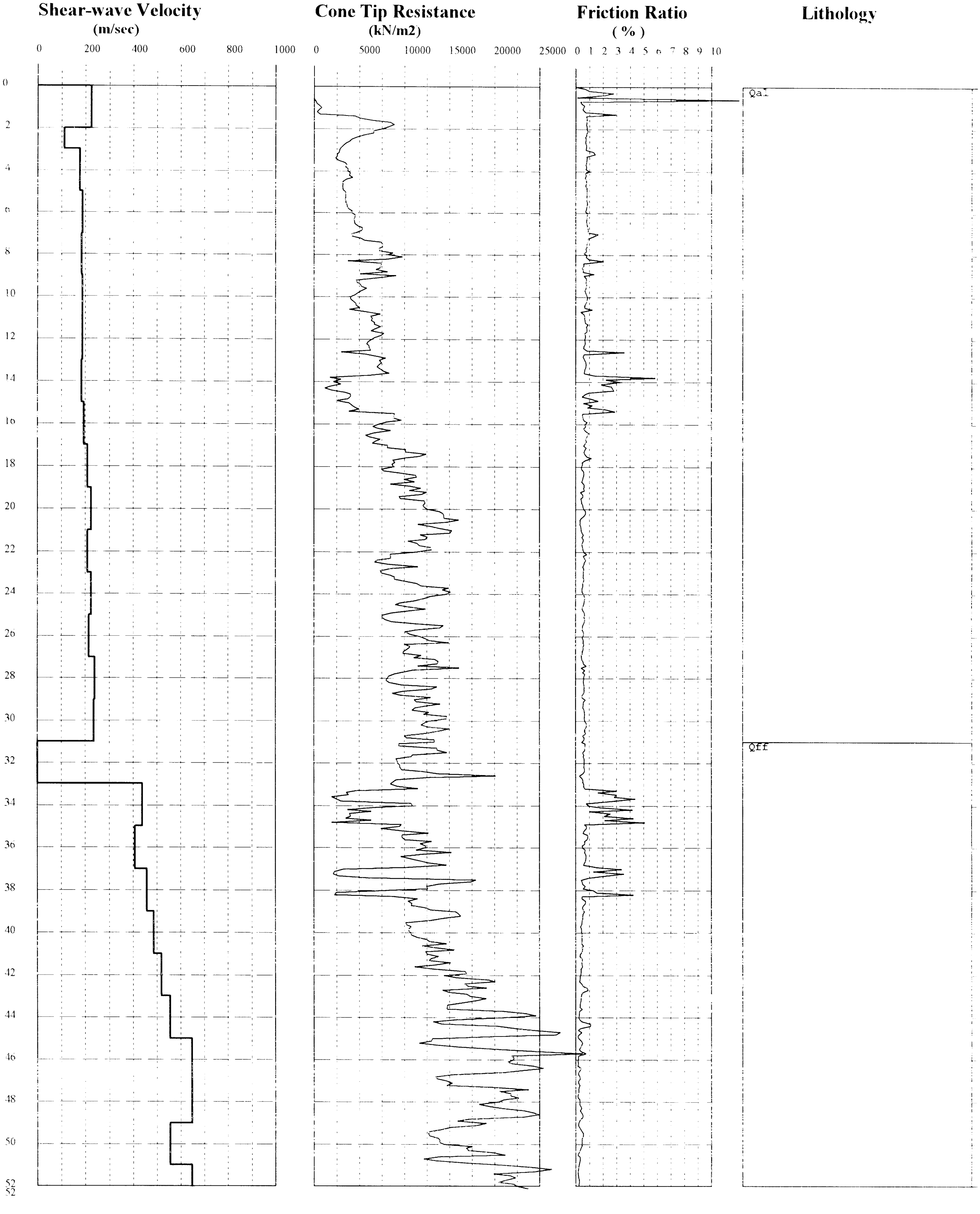
QTg coarse sandy, basalt clasts, some quartzite, other exotics, hard drilling

LTP1
UTM Y = 5051090   UTM X = 518133



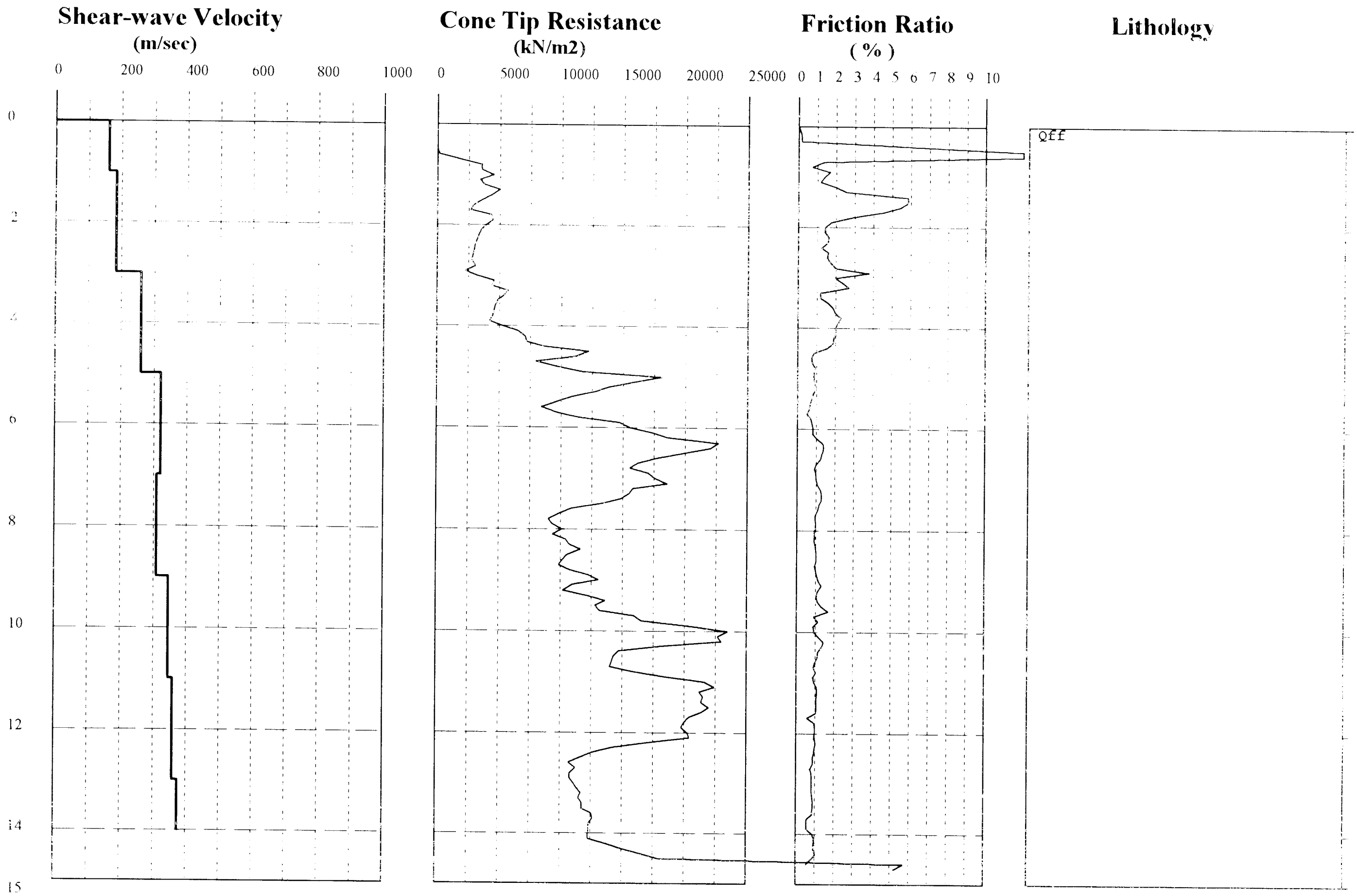
LTP2

UTM Y = 5049669 UTM X = 517596



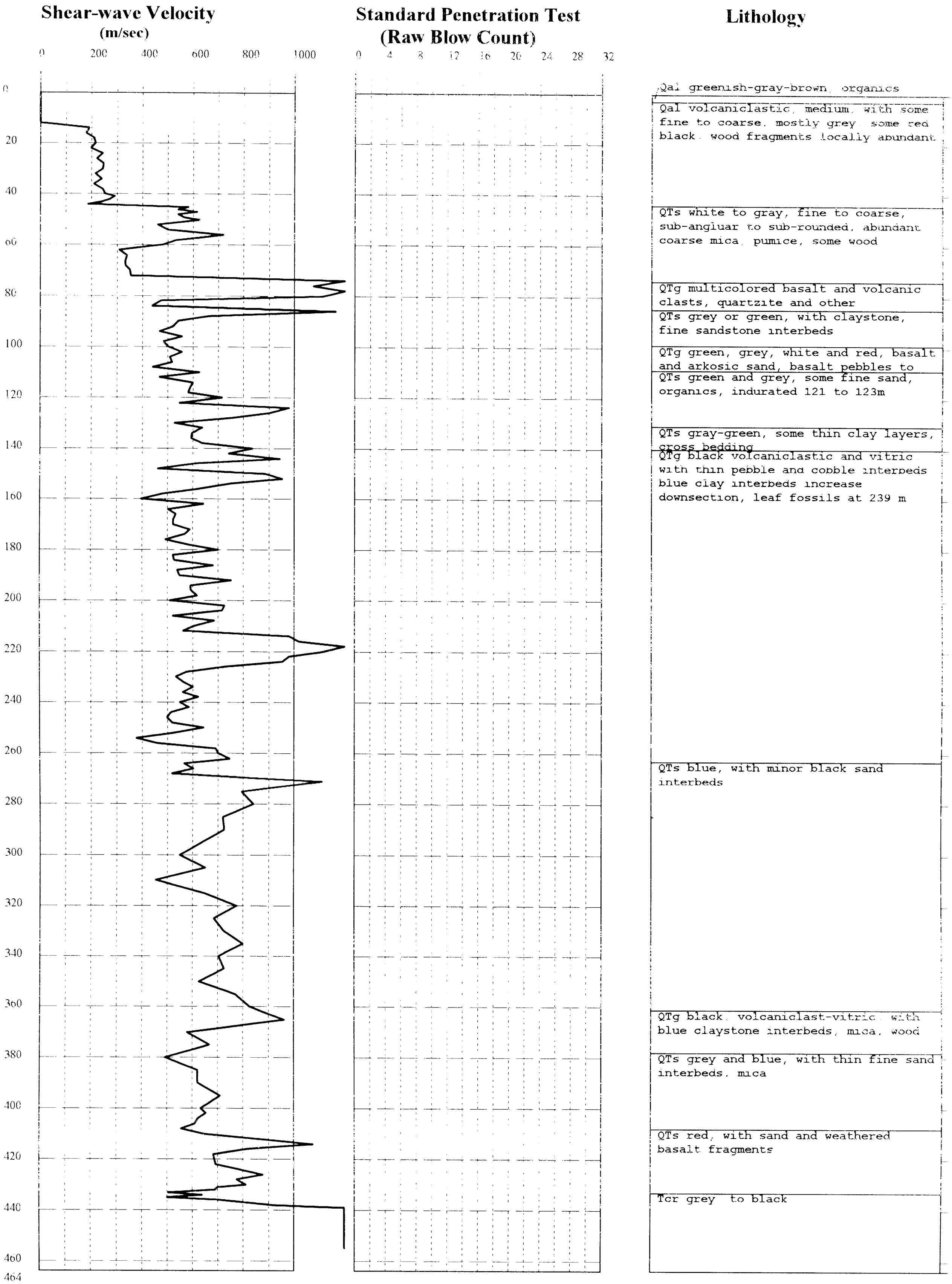
LTP4

UTM Y = 5049646   UTM X = 518556



MTD1

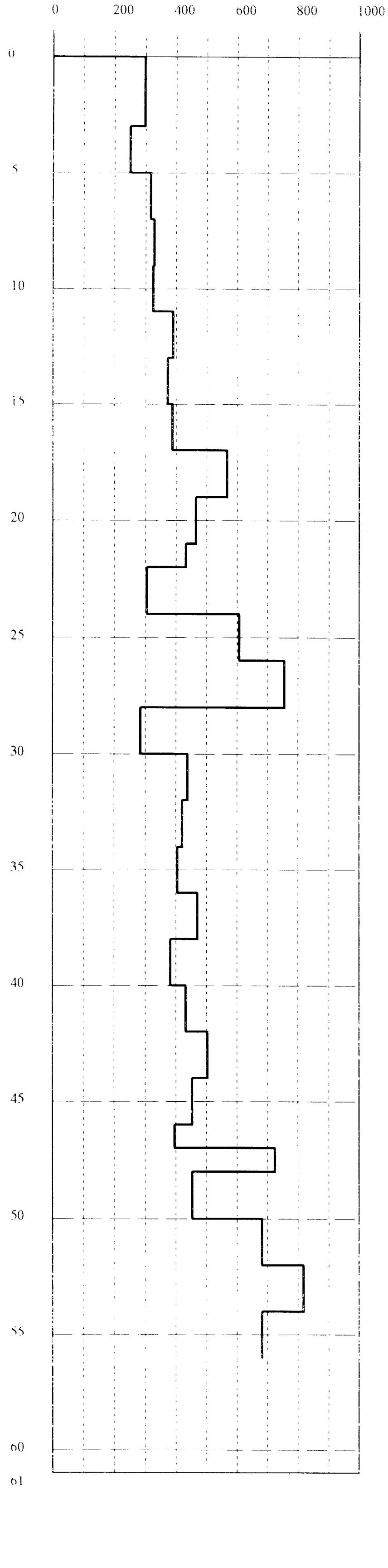
UTM Y = 5049323 UTM X = 530077



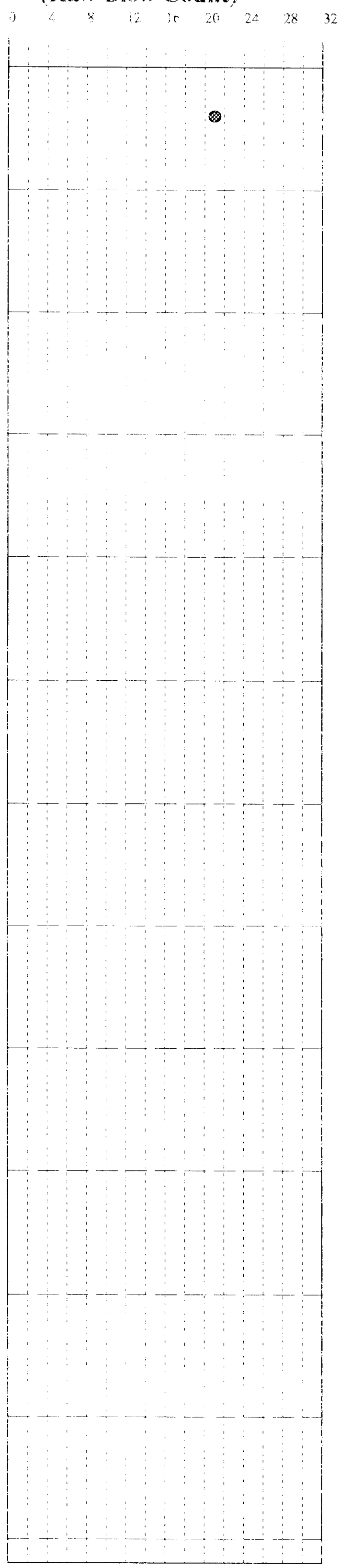
MTD2

UTM Y = 5041511 UTM X = 533033

Shear-wave Velocity
(m/sec)



Standard Penetration Test
(Raw Blow Count)



Lithology

Qfc basalt, quartzite and red, purple and green volcanic clasts coarse sand matrix

Qfs medium to coarse, volcniclastic

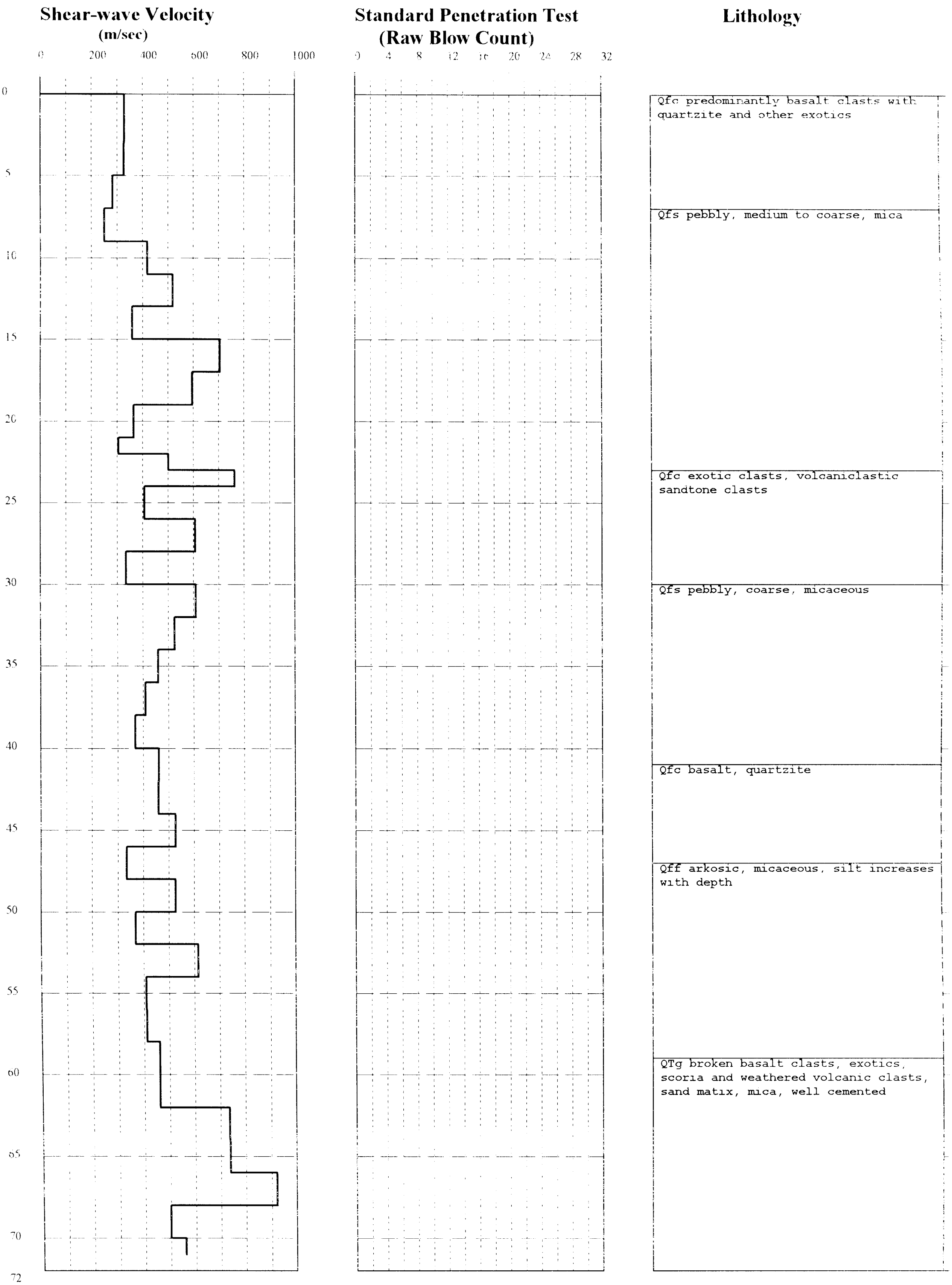
Qfc sub-angular to sub-rounded, basalt, scoria, porphyritic lavas, intermediate lavas, tuff, quartzite, exotics, some medium micaceous sand interbeds

Qfs very fine

QTg broken basalt, quartzite, intermediate volcanics, slow drilling

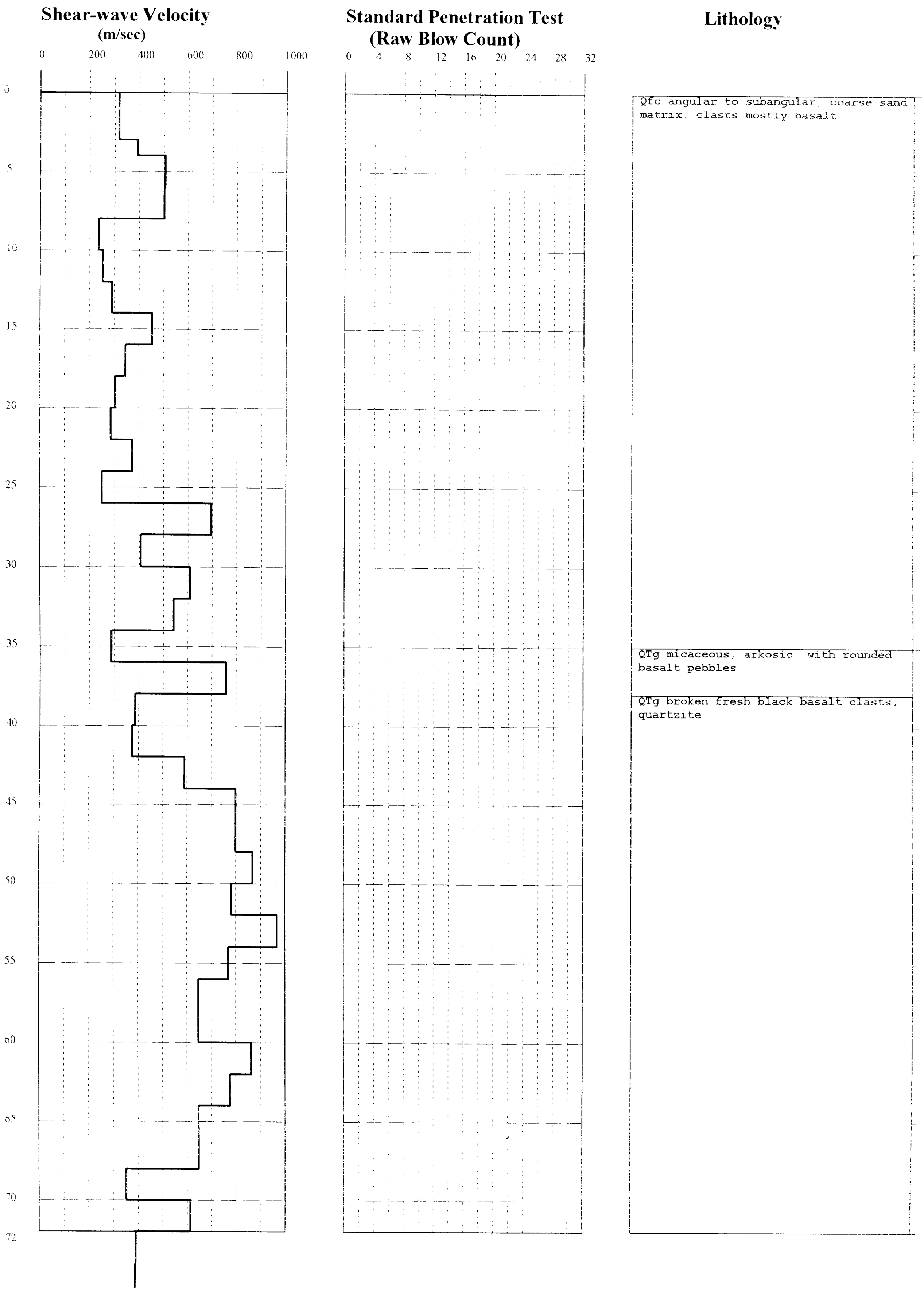
MTD3

UTM Y = 5044250 UTM X = 529377



MTD4

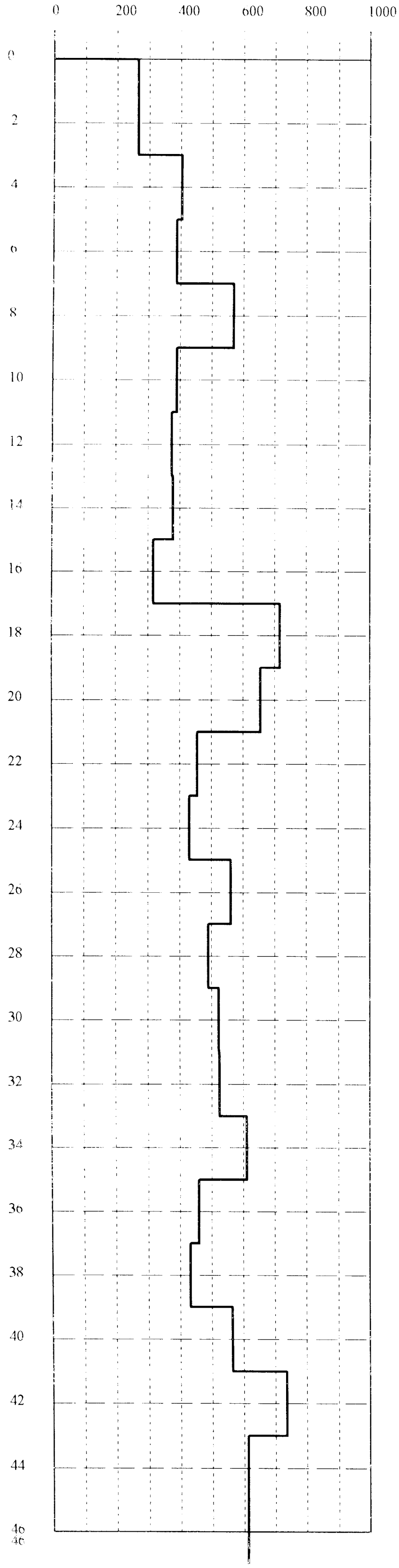
UTM Y = 5039425 UTM X = 534995



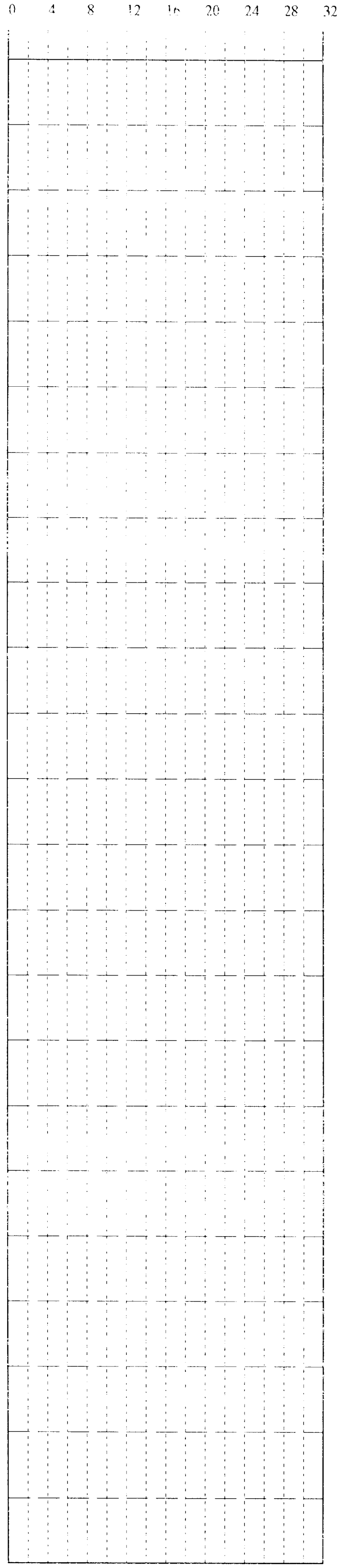
MTD5

UTM Y = 5051775   UTM X = 534604

Shear-wave Velocity
(m/sec)



Standard Penetration Test
(Raw Blow Count)



Lithology

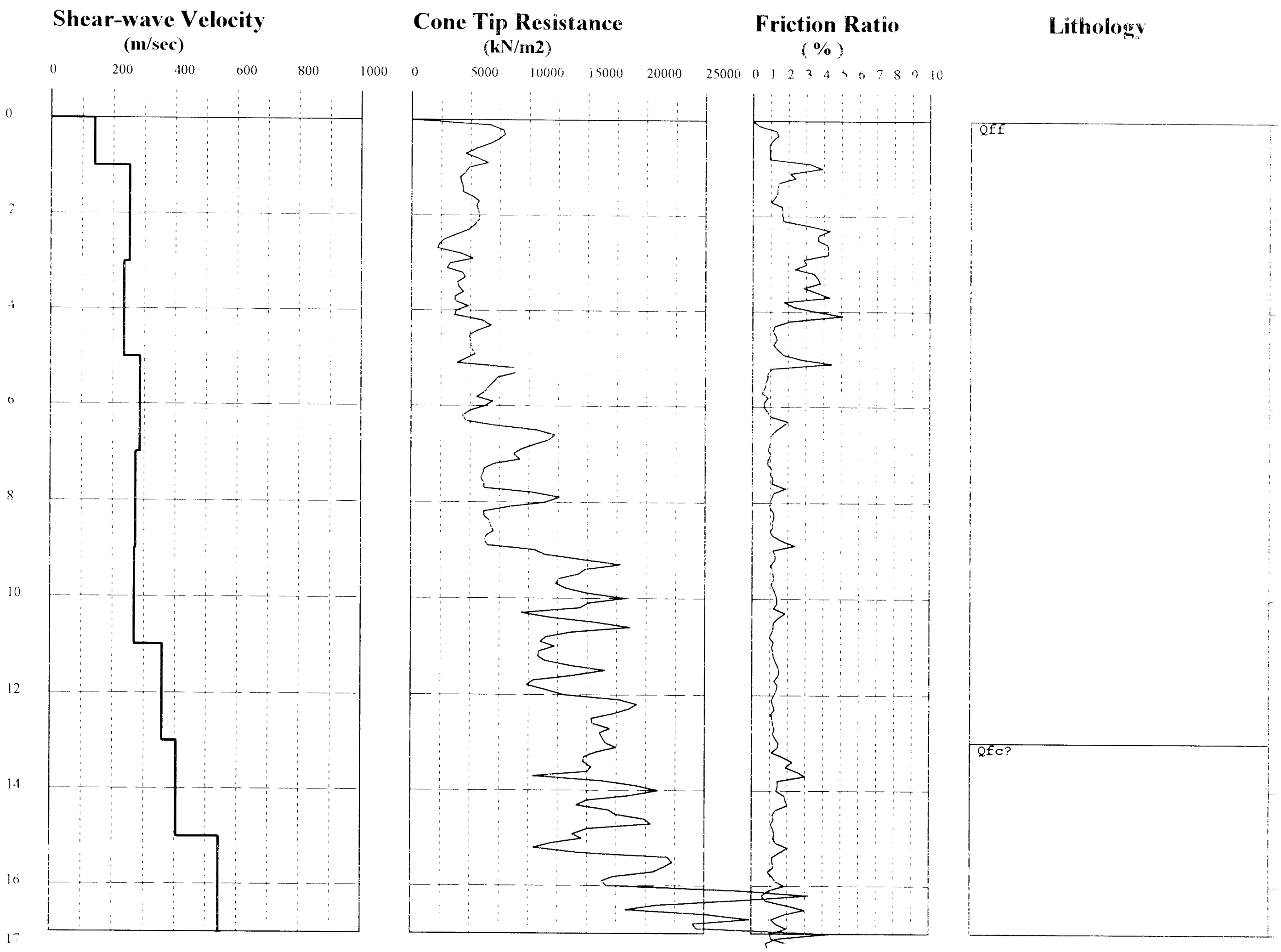
Qfc poorly sorted angular to sub-rounded, predominantly basalt with some quartzite, scoria, some coarse sand

QTg fine silty clay

QTg basalt and other volcanic clasts, quartzite, top 5 m deeply weathered.

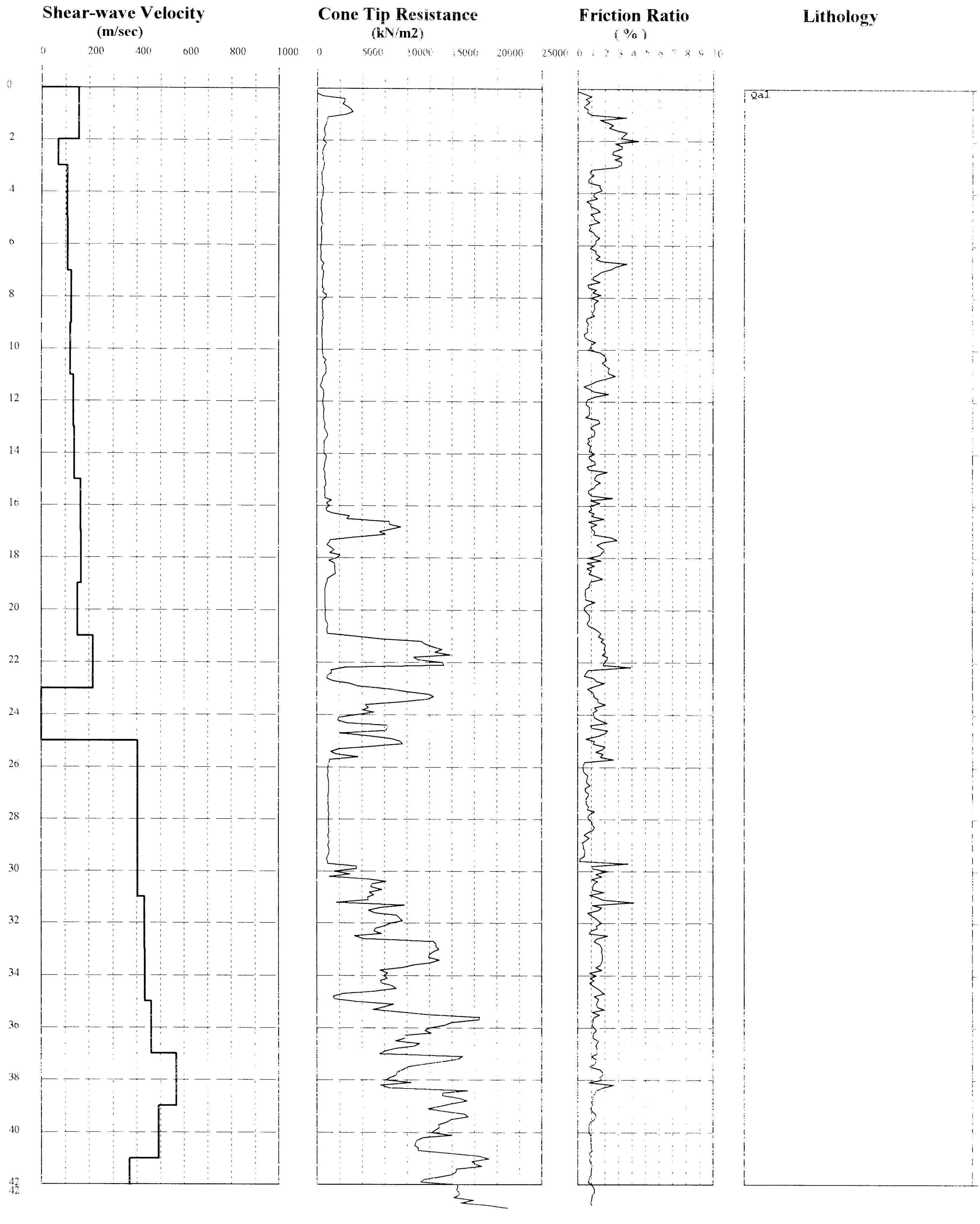
MTP1

UTM Y = 5041371 UTM X = 529550



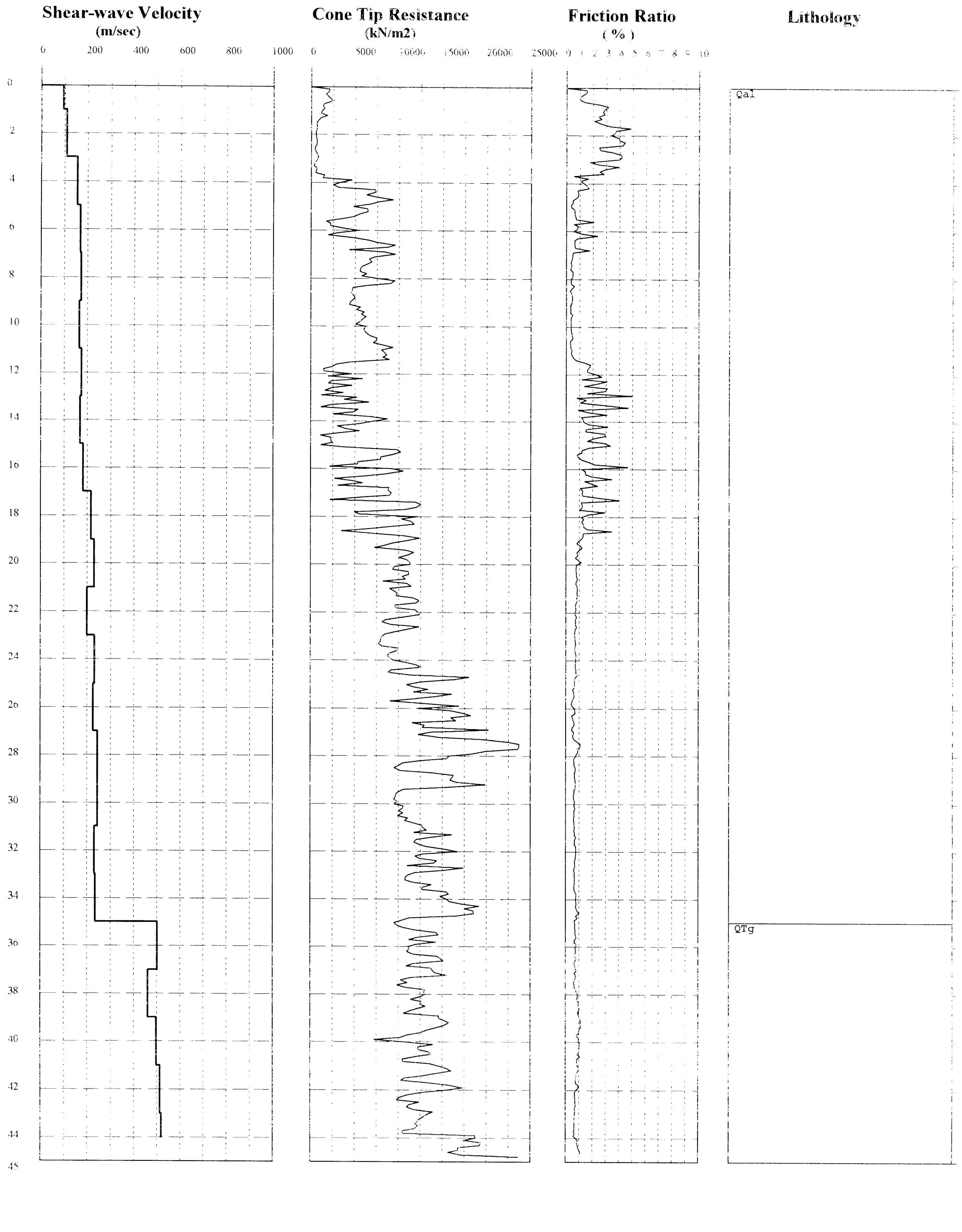
MTP3

UTM Y = 5046041   UTM X = 536136

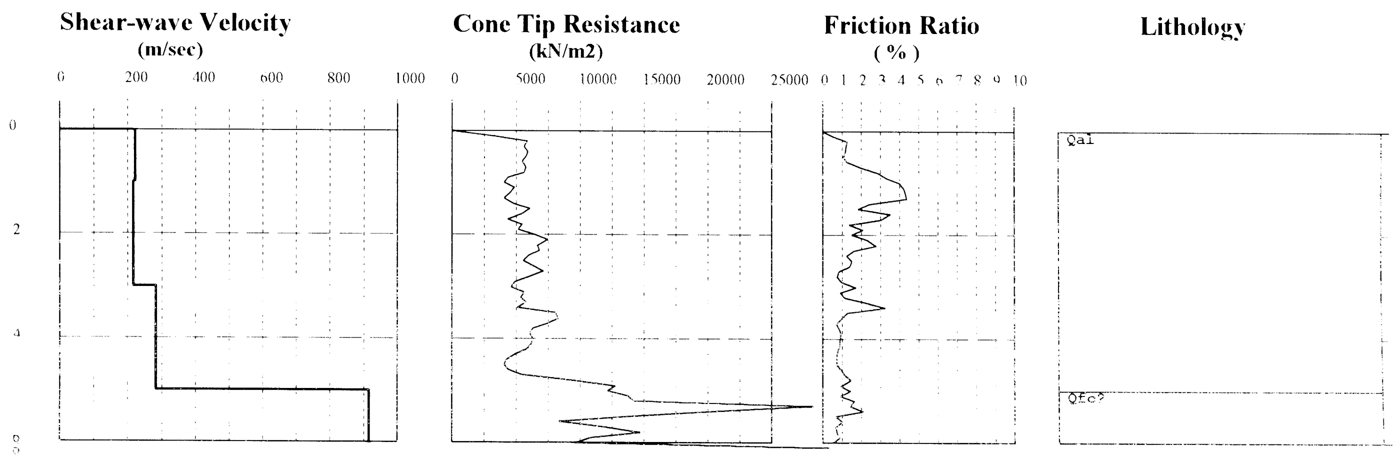


MTP4

UTM Y = 5049309 UTM X = 530501

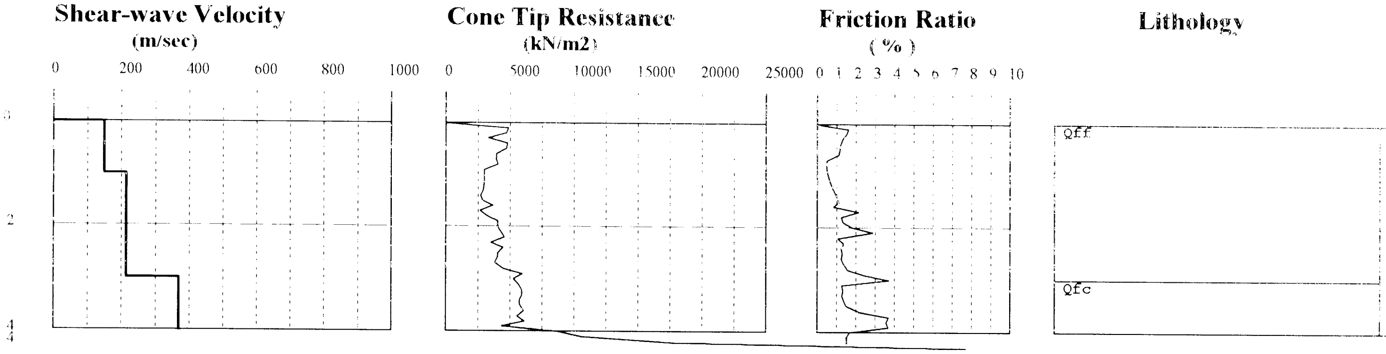


MTP5
UTM Y = 5038726 UTM X = 530976



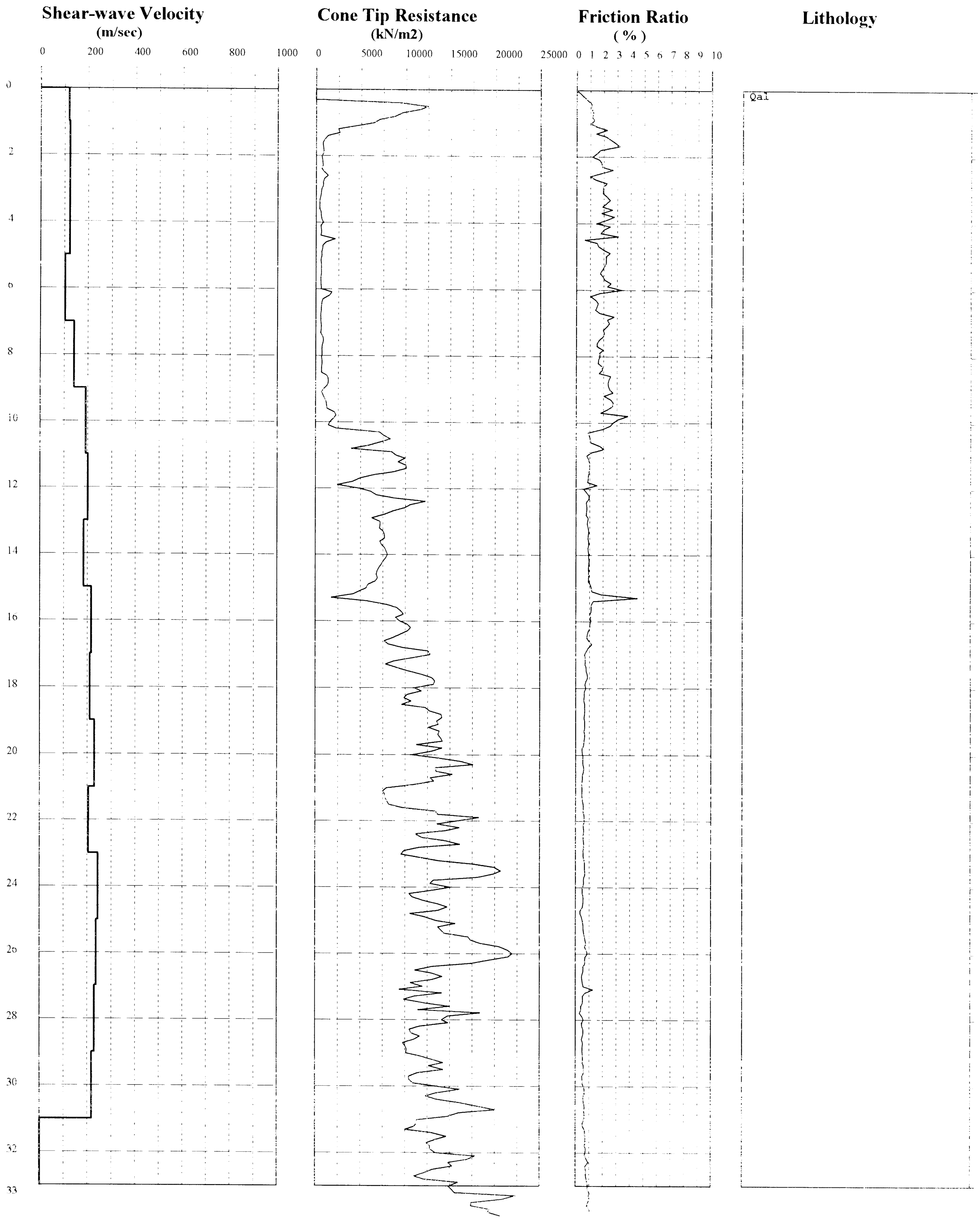
MTP6

UTM Y = 5045729   UTM X = 529576



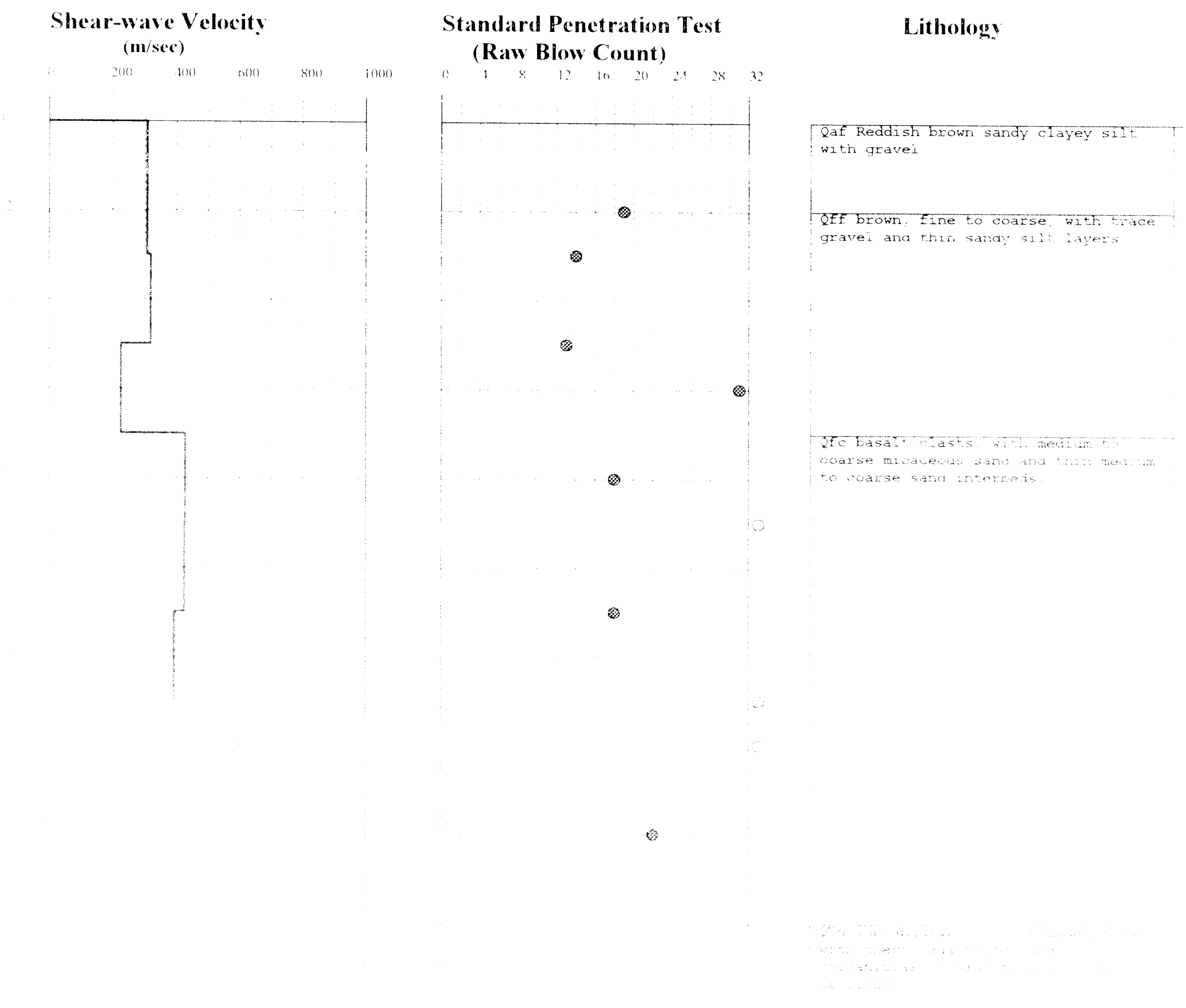
MTP7

UTM Y = 5047037   UTM X = 534347



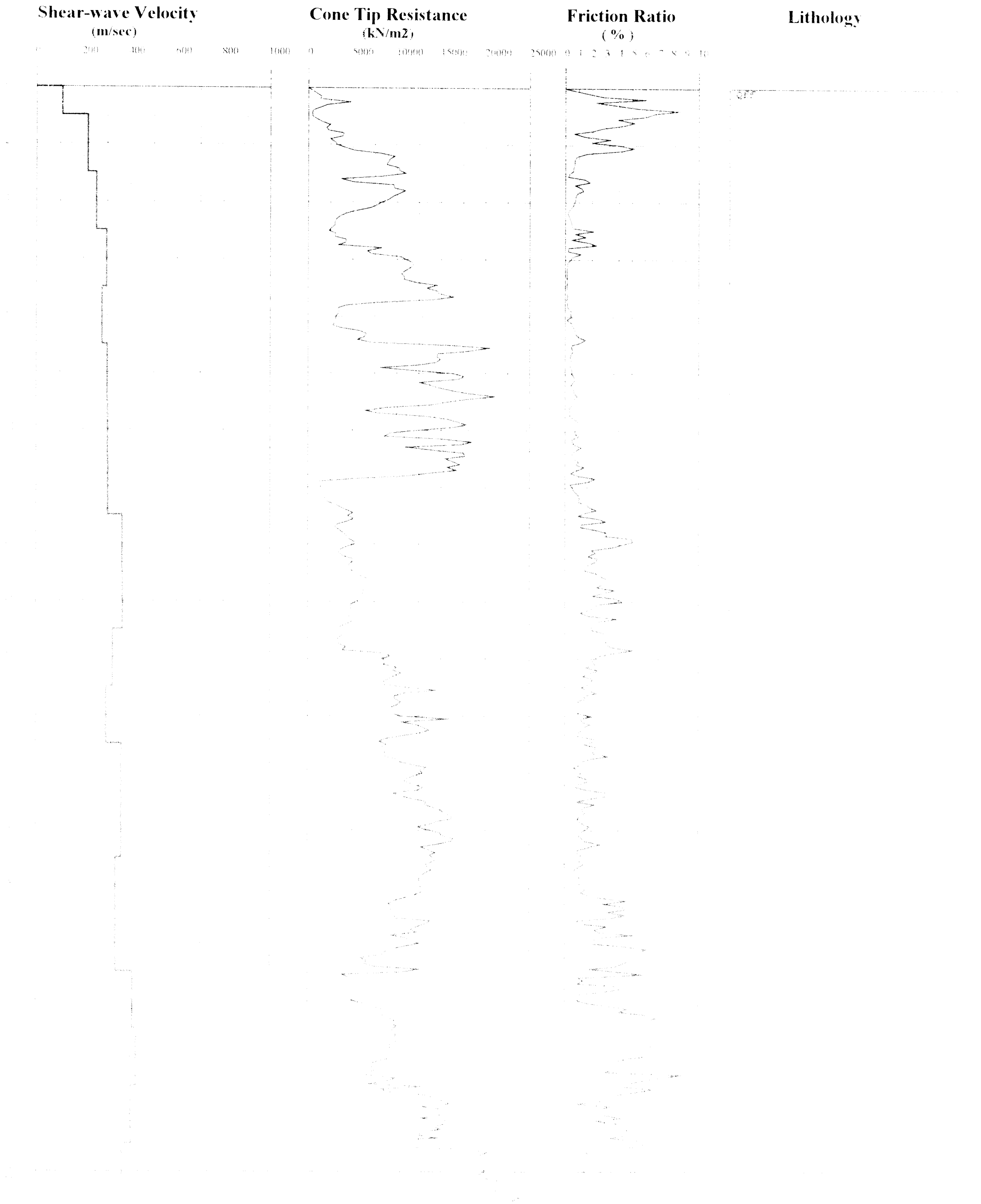
ORD1

UTM Y = 5055965   UTM X = 533457



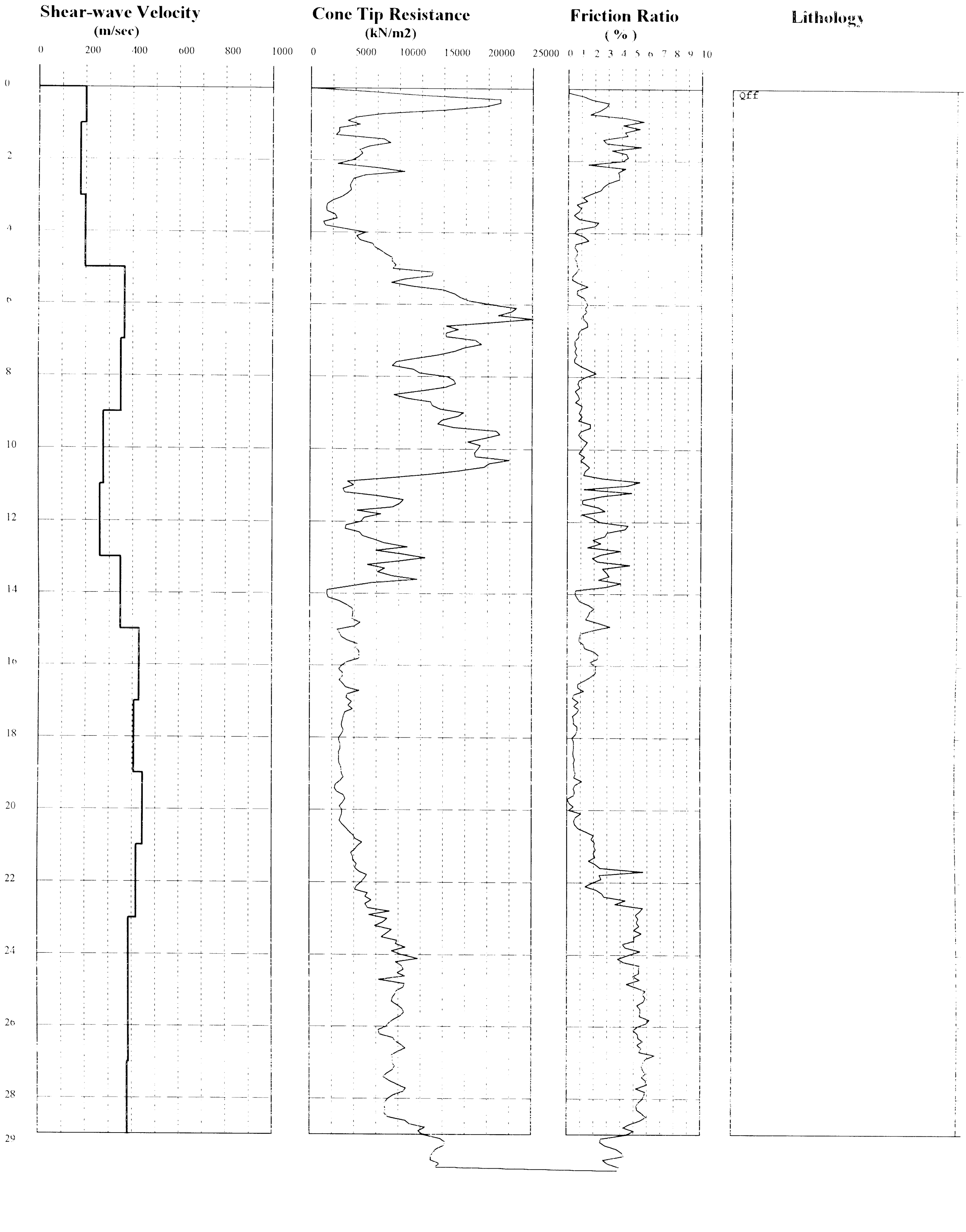
ORP1

UTM Y = 5057095   UTM X = 531155



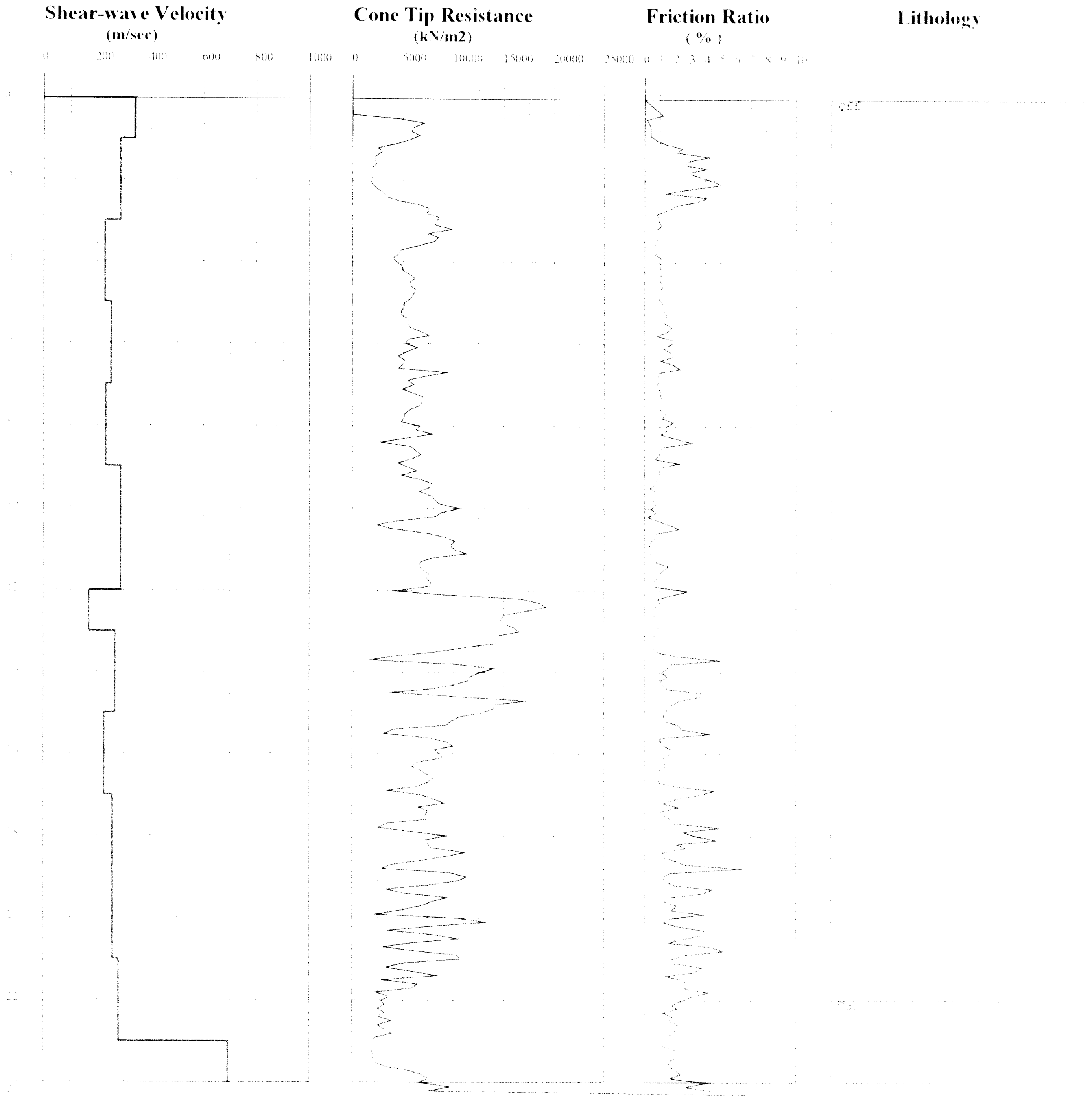
ORP2

UTM Y = 5058673 UTM X = 531013

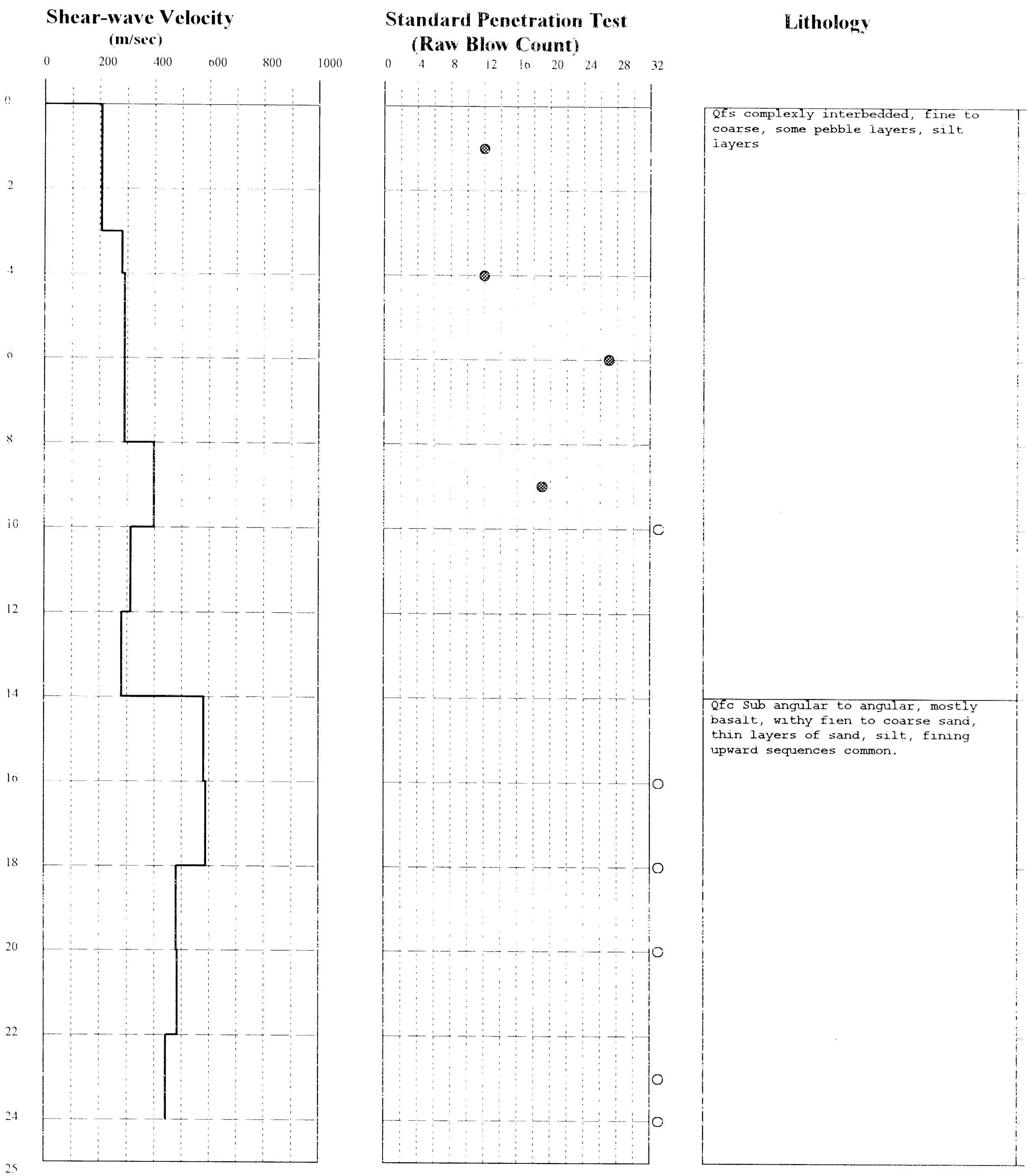


ORP3

UTM Y = 5064925 UTM X = 535563

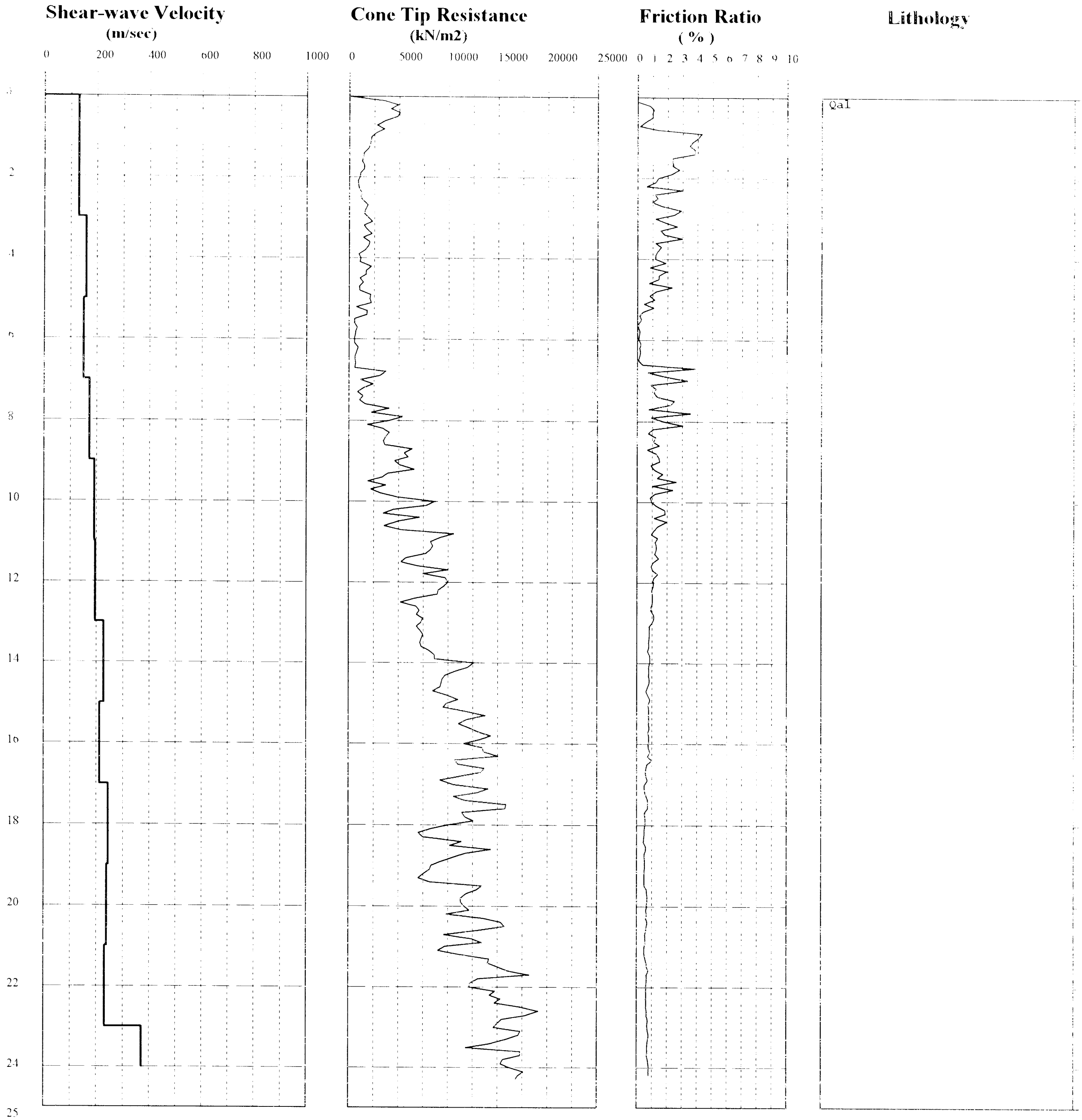


VND1
UTM Y = 5053767 UTM X = 526359



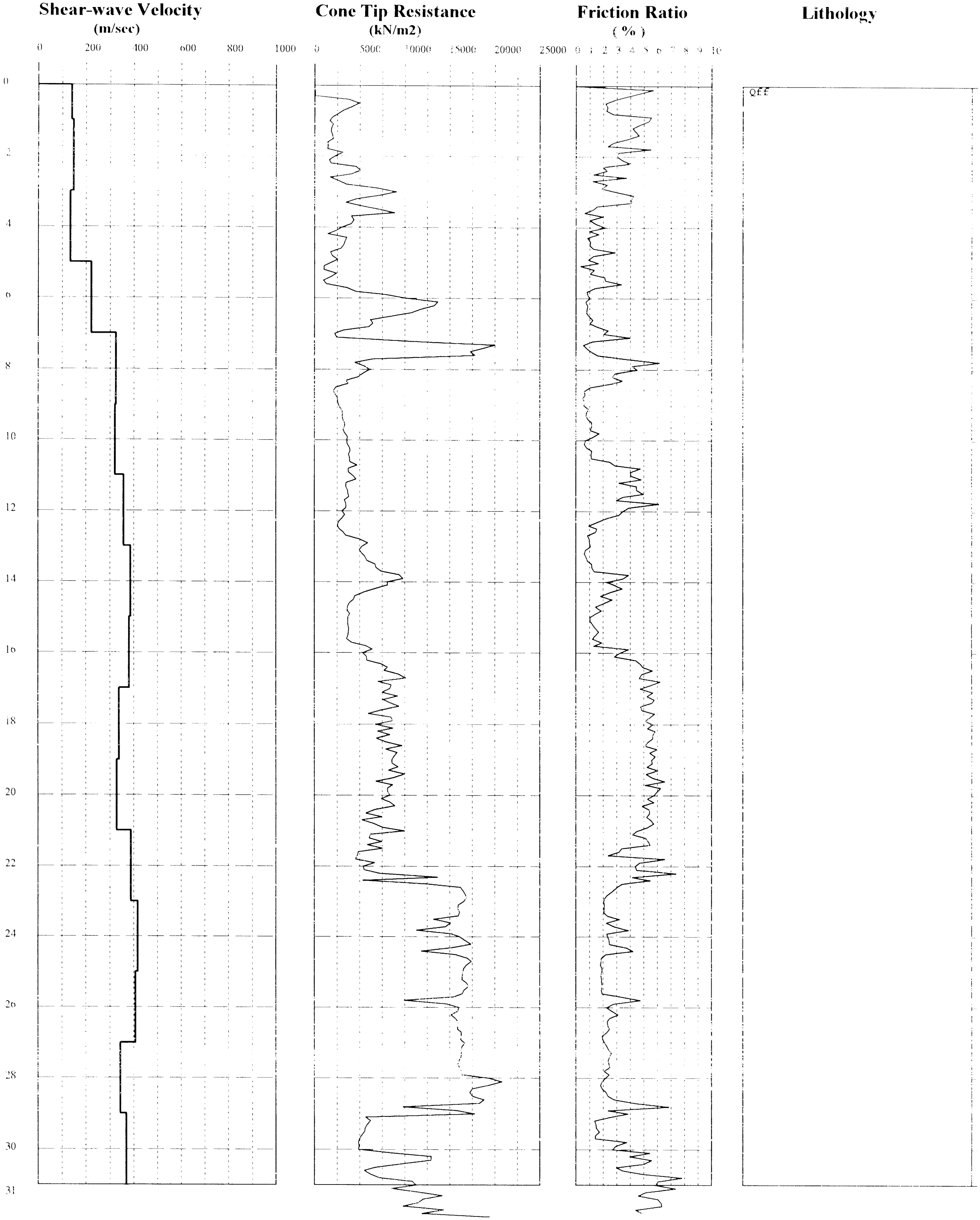
VNP2

UTM Y = 5057900   UTM X = 519846



VNP4

UTM Y = 5058178   UTM X = 526201



VNP5

UTM Y = 5065761 UTM X = 526419