

//

//

//

(Downhole)

()



(SPT)

-

-

-

-

-

-

--

-

--

--

--

--

-

--

--

--

-



(Ks)

- -

- -

- -

-

-

-

-



()

()

:

-
-
-
-
-
-

(SPT)

(Down hole)

...



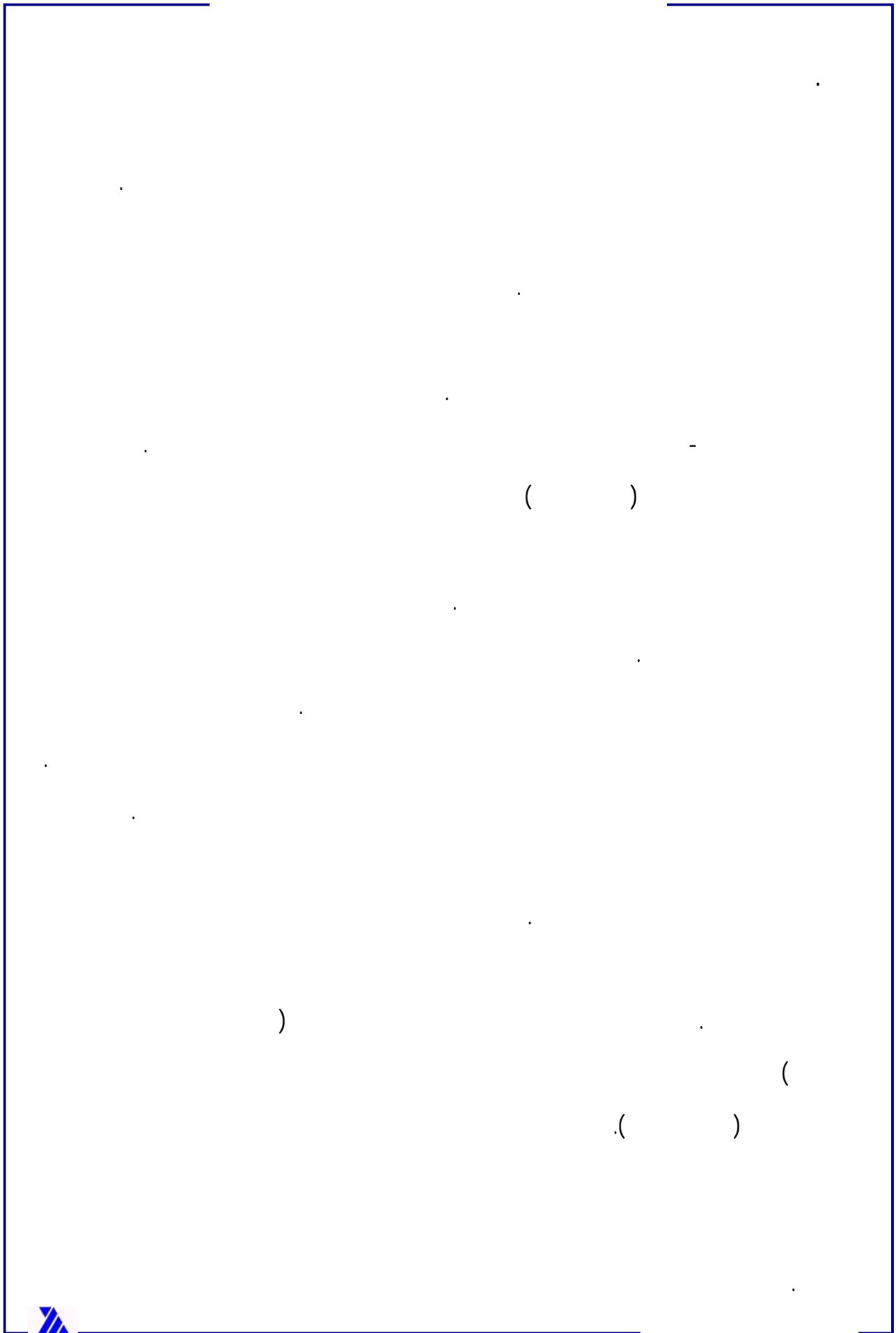


()



()





(Rieben,1955,1966)

D C B A

D

A

()

A

B

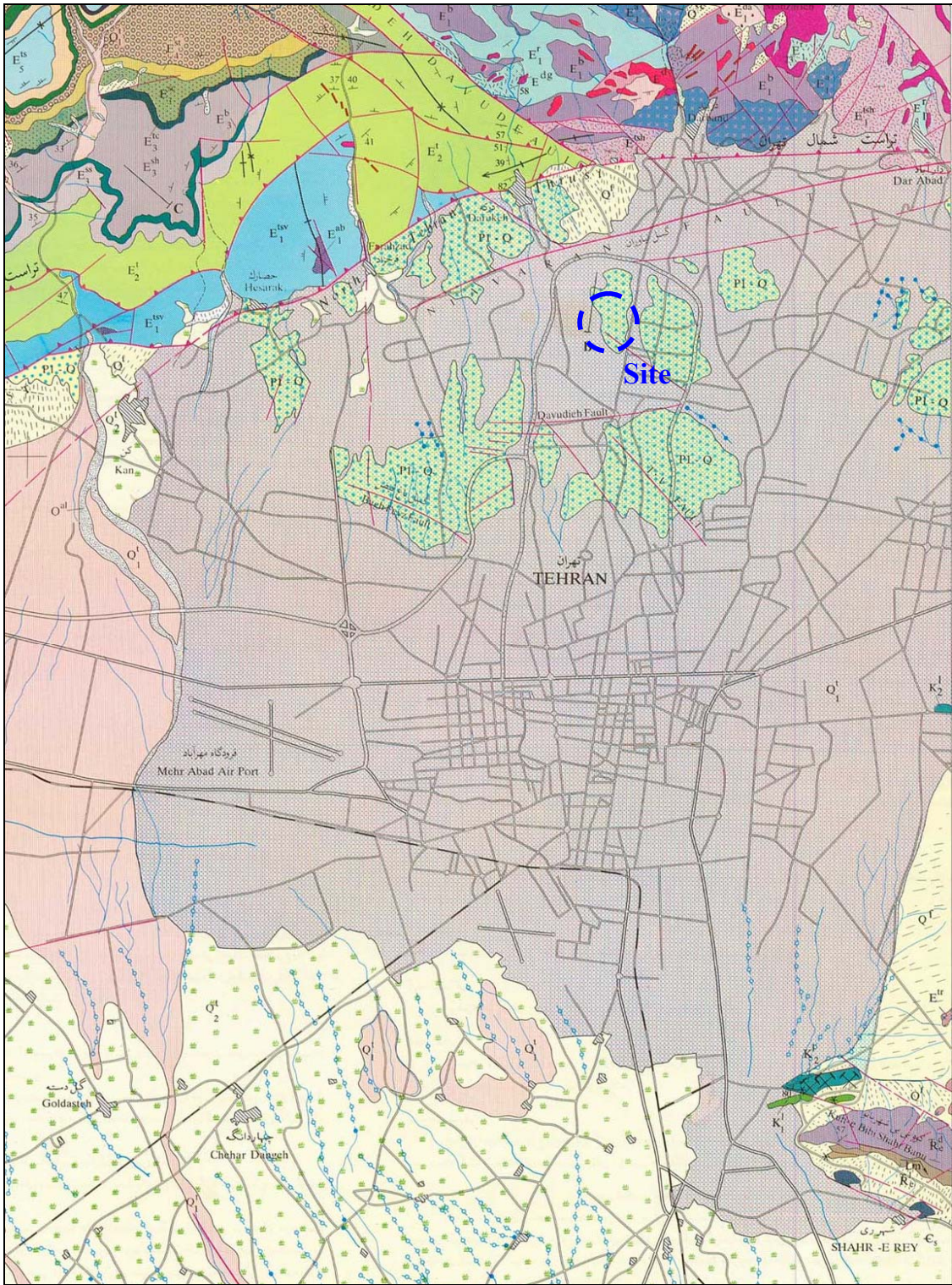
C

A

A

A





() : / ()

(A PI-Q)



()



() : / ()

(



SPT

() () ()

(SPT)

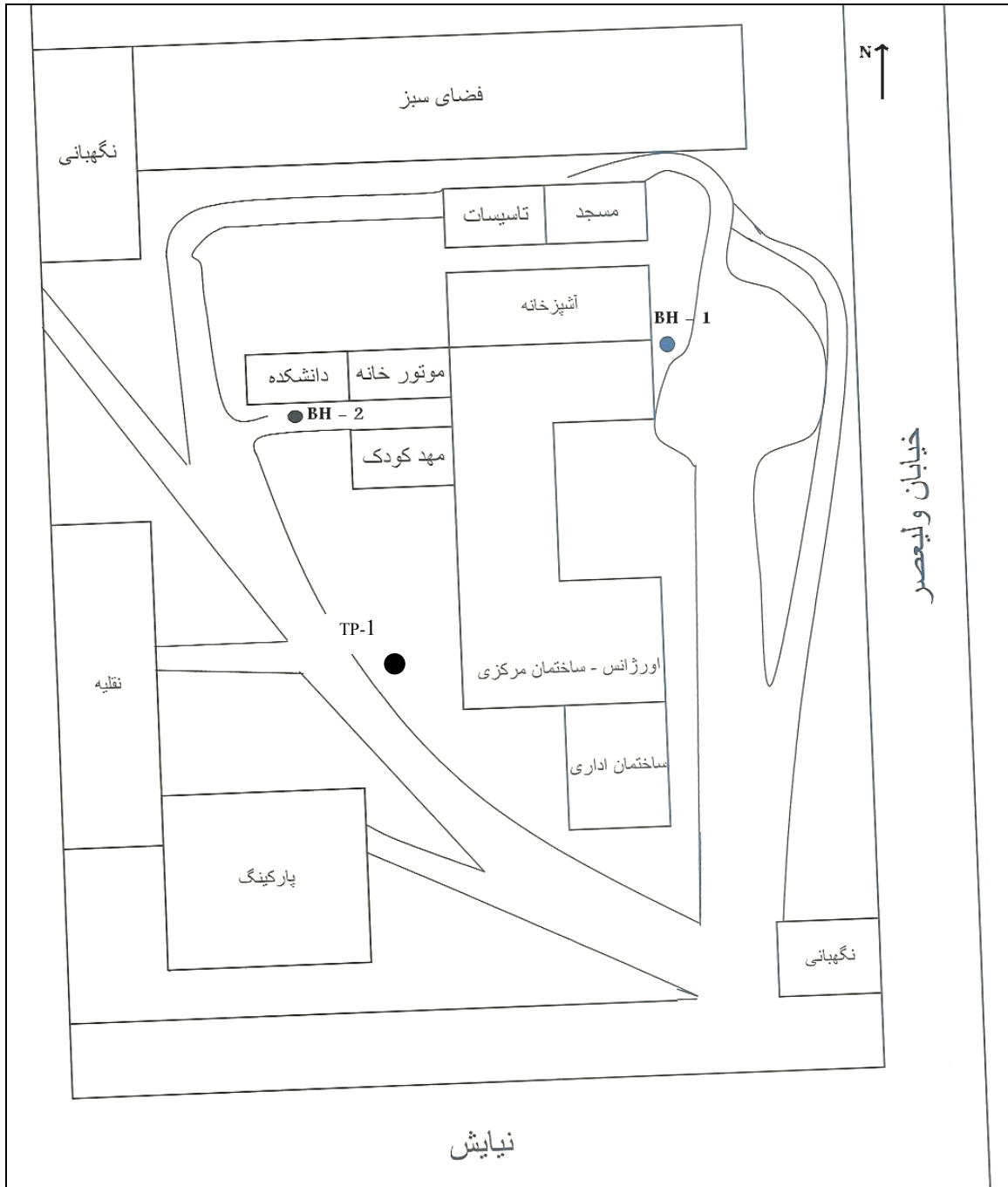
PVC

BH-2 BH-1

()

()		/
		BH-1
		BH-2
		TP-1





()





BH-1 ()



BH-2 ()

(SM)

(GC)

(GM)

()

()

(SC)

(GC)

(SPT)

SPT

SPT

()

SPT

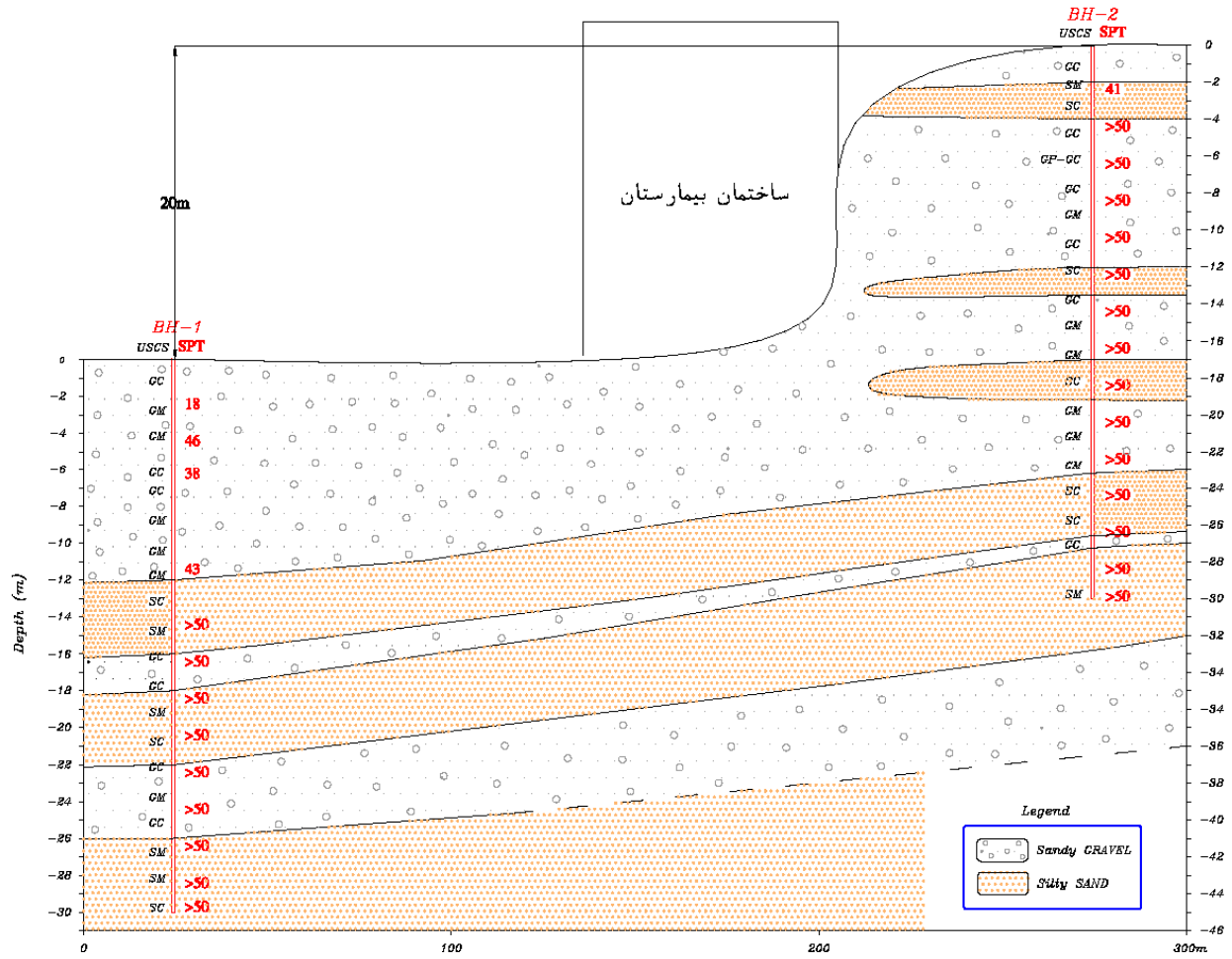
SPT

)

()

.(



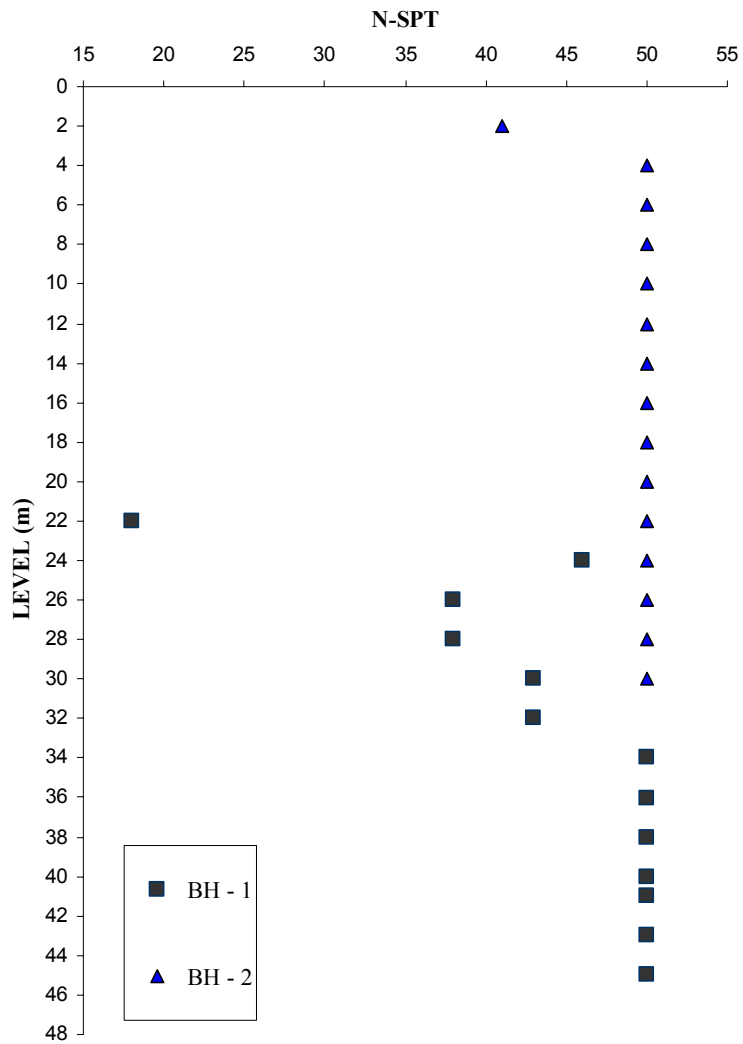


()



() SPT ()

SPT	
4-10	Loose
10-30	Medium dense
30-50	Dense
>50	Very dense



SPT ()



()

TP-1

/ /

/ /

TP-1

()

(m)	(gr/cm ²)		(gr/cm ²)
	/	/	/
	/	/	/
	/	/	/
	/	/	/
	/	/	/
۱۲	۱/۹۰	۶/۷	۱/۷۸
۱۴	۱/۹۳	۹/۹	۱/۷۶

(SM)

(GC)

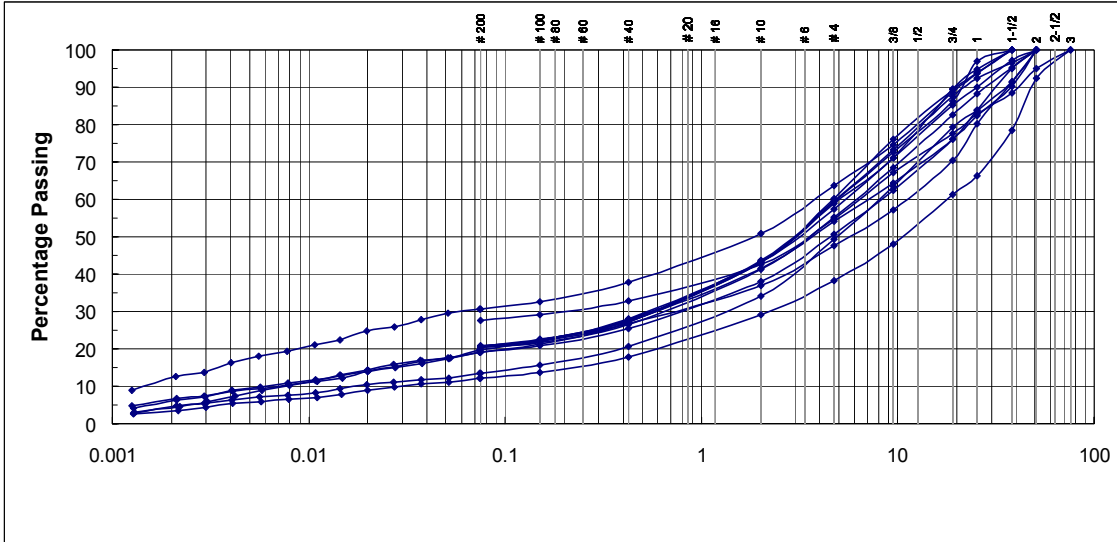
(GM)



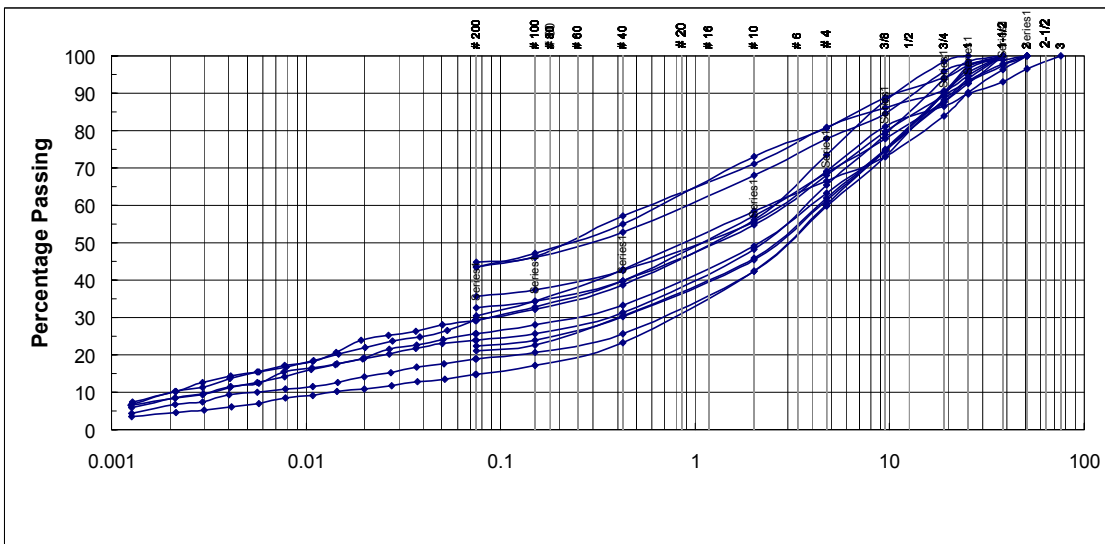
()

(SC)

(GC)



()



()



(Gs)

()

/ /

()

Gs	(m)	
/	/ - /	BH-1
/	/ - /	
/	/ - /	BH-2
/	/ - /	

()

(gr/cm ³)		(gr/cm ³)	(m)	
/	/	/	/ - /	BH-1
/	/	/	/ - /	
/	/	/	/ - /	
/	/	/	/ - /	
/	/	/	/ - /	BH-2
/	/	/	/ - /	
/	/	/	/ - /	
/	/	/	/ - /	
/	/	/	/ - /	
/	/	/	/ - /	



/ /

()

/ /

()

/ /

(c)

/ / (φ)

()

		ϕ (deg)	C (kg/cm ²)	(g/cm ³)	(m)	/
GC		/	/	/	/ - /	BH-1
GM		/	/	/	/ - /	
SC		/	/	/	/ - /	BH-2
GC		/	/	/	/ - /	
GW		/	/	/	/	TP-1

CU UU



CU (c) ()
 / / UU /
 / / CU (φ)

()

		φ (deg)	C (kg/cm ²)	(g/cm ³)	(m)	/
GM	CU	/	/	/	/ - /	BH-1
GC	CU	/	/	/	/ - /	
SC	UU	/	/	/	/ - /	BH-2
SM	UU	/	/	/	/	TP-1

BH-2 BH-1

:

RAS 24



(GPS)

-

-

--

()

()

(Longitudinal)

(Shear)

S

P

:(Down hole)

-

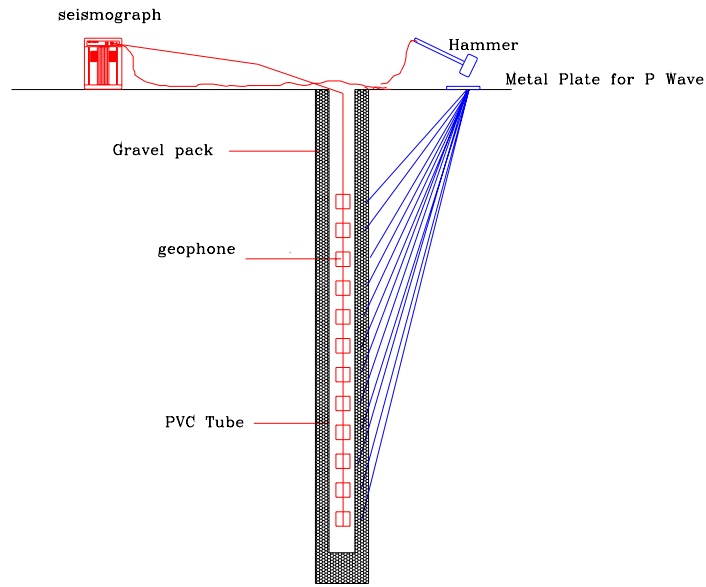
(Noise)



() ()

()

:(Up hole)

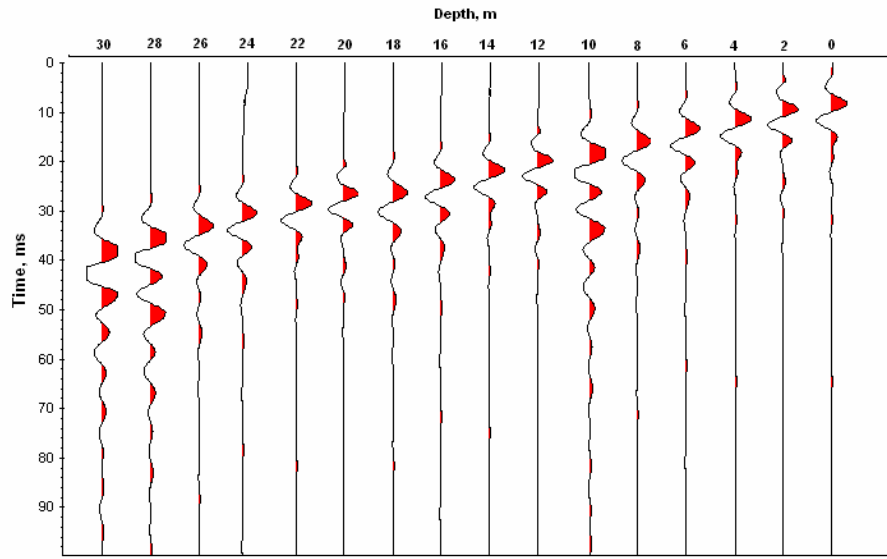


Down-Hole Seismic (P Wave)

(Down hole)

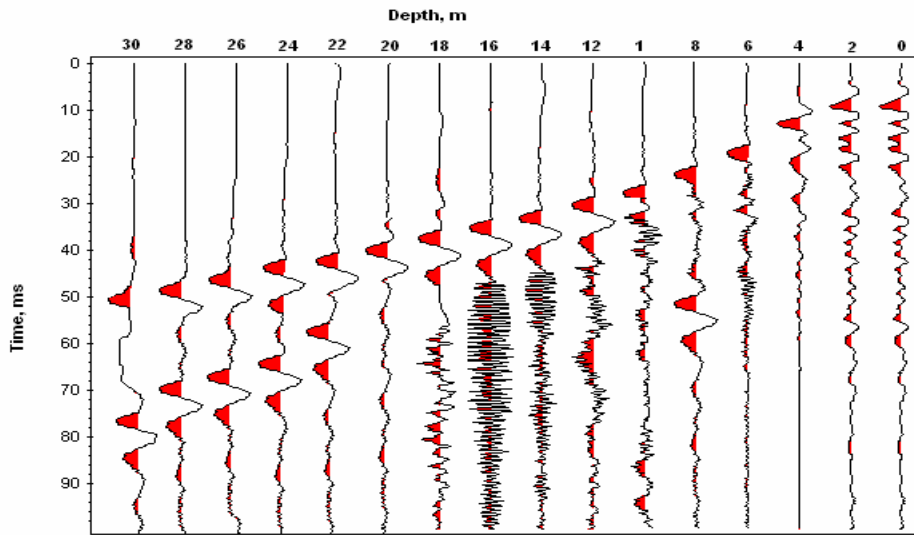
()





BH-1

()



BH-1

()

:(logging)

- 3



(Vertical Seismic Profiling)

(Down hole)

جامدات	پارامترهای دینامیکی
$\nu = \frac{\left(\frac{V_p}{V_s}\right)^2 - 2}{2\left[\left(\frac{V_p}{V_s}\right)^2 - 1\right]}$	نسبت پوواسن
$\left(\frac{V_p}{V_s}\right)^2 = \frac{2 - 2\nu}{1 - 2\nu}$	مجذور نسبت سرعت امواج
$G = d \cdot V_s^2$	مدول برشی
$E = 2G(1 + \nu)$	مدول یانگ
$K = \frac{1}{3} \cdot \frac{E}{1 - 2\nu}$	مدول بالک

BH-2 BH-1 Downhole

/ () P

()

() S

()



BH-1

() ()

BH-1

() ()

(G) (E)

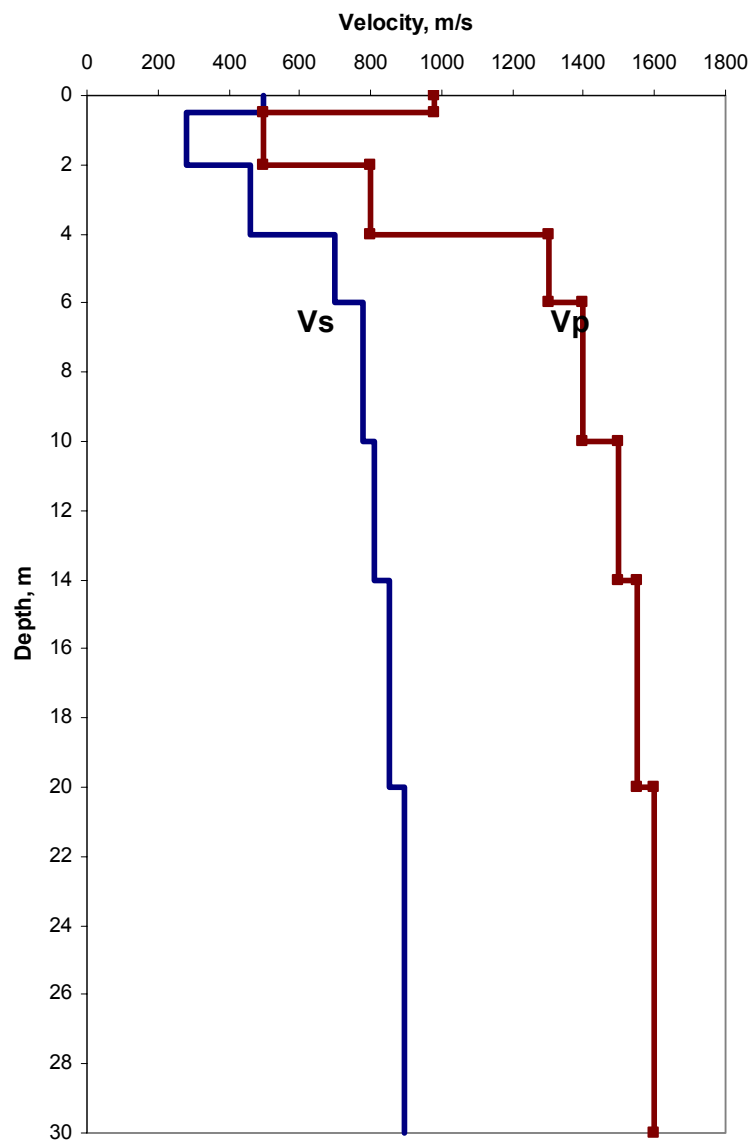
() ()

BH-1

()

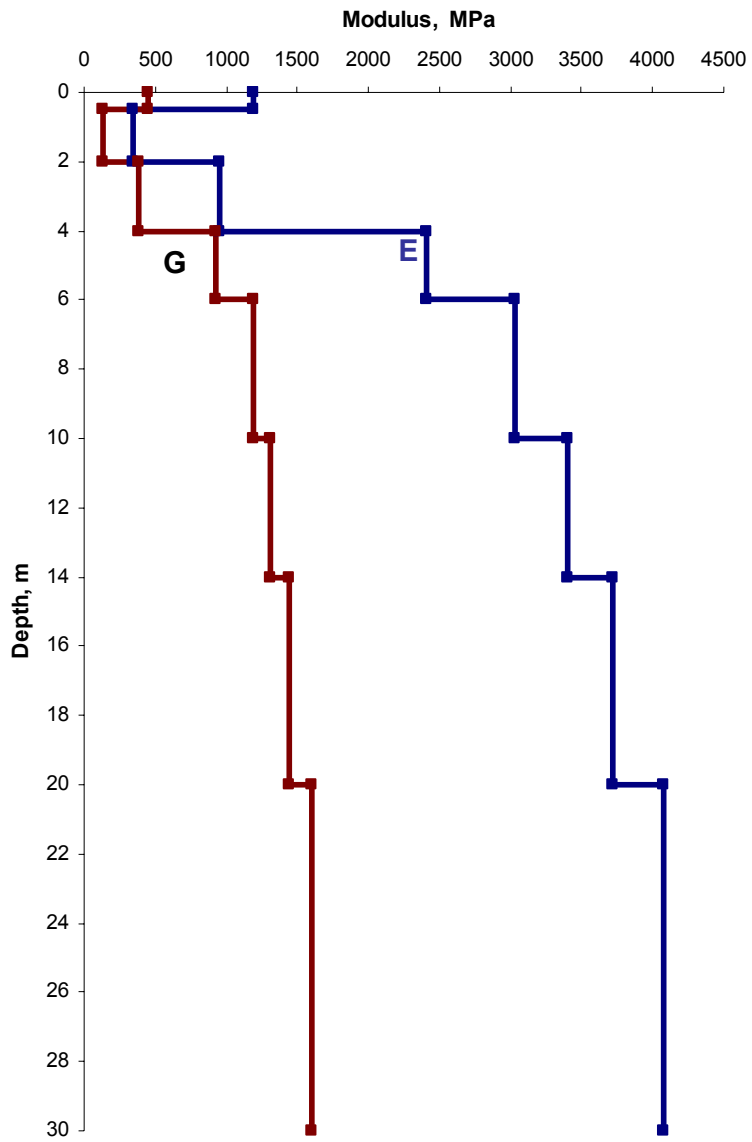
ضریب پواسون	مدول حجمی Mpa	مدول برشی Mpa	مدول یانگ Mpa	سرعت موج S m/sec	سرعت موج P m/sec	چگالی gr/cm ³	عمق m
0.32	1129	450	1192	500	980	1.8	0-5
0.27	247	133	339	280	500	1.7	.5-2
0.25	644	381	955	460	800	1.8	2-4
0.30	1970	931	2413	700	1300	1.9	4-6
0.27	2240	1186	3025	780	1400	1.95	6-10
0.29	2750	1312	3396	810	1500	2	10-14
0.28	2878	1445	3714	850	1550	2	14-20
0.27	2984	1602	4077	895	1600	2	20-30





شکل (۱۵) منحنی تغییرات سرعت امواج تراکمی و برشی با عمق در گمانه BH-1





BH-1

()

BH-2

()

()

BH-2



(Gs)

(E)

()

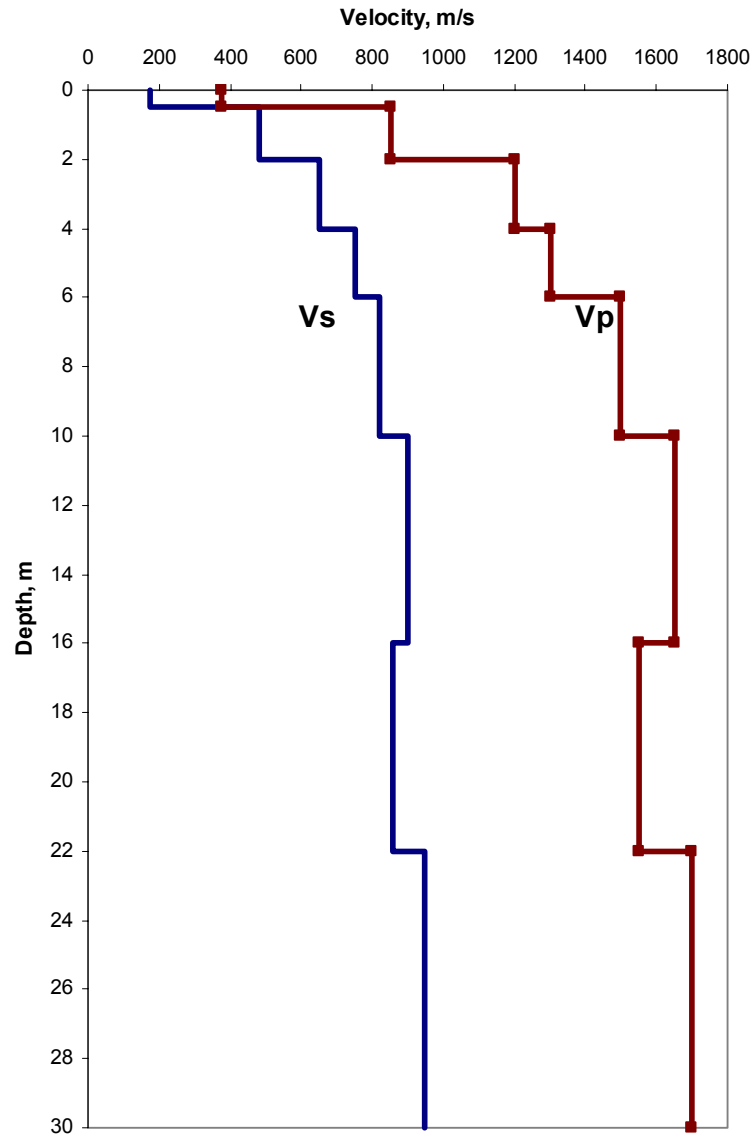
()

BH-2

()

ضریب پواسون	مدول بالک Mpa	مدول برشی Mpa	مدول یانگ Mpa	سرعت موج S m/sec	سرعت موج P m/sec	چگالی gr/cm ³	عمق m
0.36	180	55	150	175	375	1.8	0-5
0.27	706	392	992	480	850	1.7	.5-2
0.29	1578	761	1966	650	1200	1.8	2-4
0.25	1786	1069	2673	750	1300	1.9	4-6
0.29	2707	1345	3461	820	1500	2	6-10
0.29	3285	1620	4174	900	1650	2	10-16
0.28	2833	1479	3780	860	1550	2	16-22
0.27	3373	1805	4595	950	1700	2	22-30

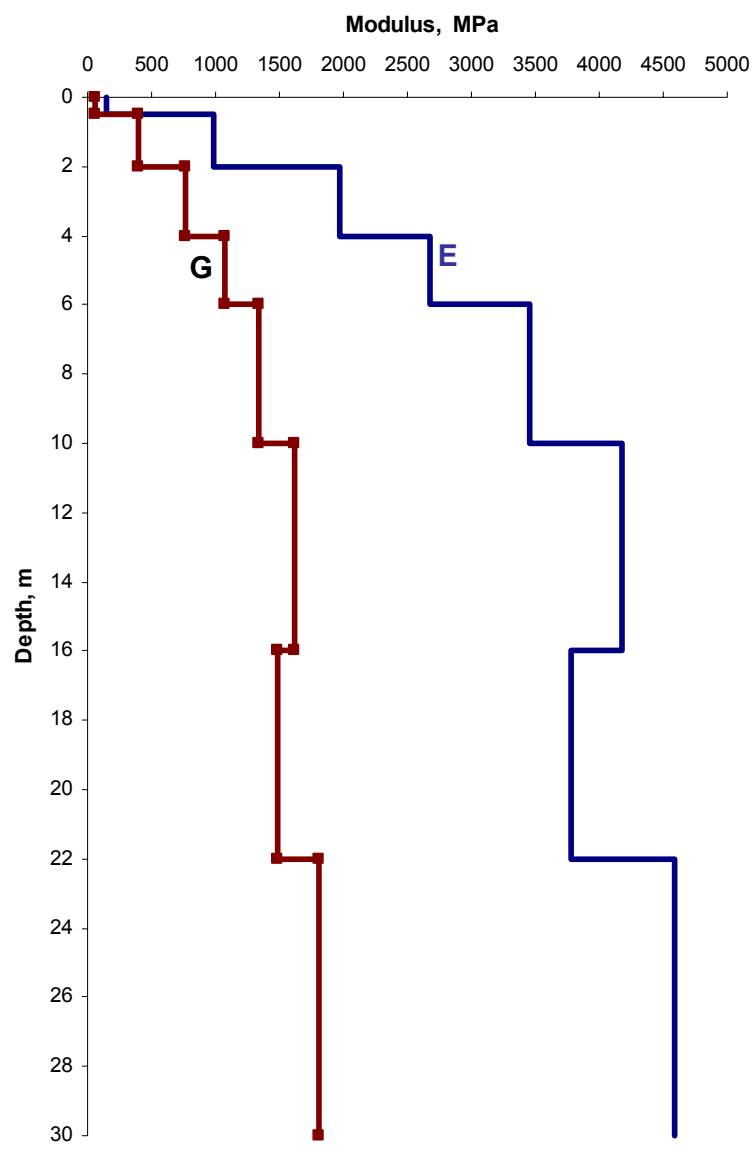




BH-2

()





BH-2

()





RAS 24

()



()

BH-2 BH-1

BH-2 BH-1

\bar{V}_s

/

II

BH-1

SPT

BH-1

Vesic



/

$$c=0.05 \text{ Kg/cm}^2$$

$$\phi=28^\circ$$

$$\gamma = 1.8 \text{ gr/m}^3$$

$$v=0.32$$

SPT

SPT

(q_{ult})

: (q_{ult})

$$q_{ult} = c \cdot N_c \cdot S_c \cdot d_c + q \cdot N_q \cdot S_q \cdot d_q + 0.5 \cdot B \cdot \gamma \cdot N_\gamma \cdot S_\gamma \cdot d_\gamma$$

B

q

c



$N_\gamma \quad N_q \quad N_c$

:

$$N_c = /$$

$$N_q = /$$

$$N_\gamma = /$$

:

$S_\gamma \text{ و } S_q, S_c$

$$S_c = 1 + 0.2 k_p \frac{B}{L}$$

$$S_q = 1 + 0.1 k_p \frac{B}{L}$$

$$S_\gamma = 1 + 0.1 k_p \frac{B}{L}$$

:

$d_\gamma \quad d_q \quad d_c$

$$d_c = 1 + 0.2 \sqrt{k_p} \frac{D}{B}$$

$$d_q = 1 + 0.1 \sqrt{k_p} \frac{D}{B}$$

$$d_\gamma = 1 + 0.1 \sqrt{k_p} \frac{D}{B}$$

:

(

)

: D

: B

: L

$$k_p = \tan^2(45 + \frac{\phi}{2})$$

(q)

:

$Q_{ult(net)}$

$$Q_{ult(net)} = Q_{ult} - Q$$



(Fs)

 $q_{allow(net)}$

$$q_{allow(net)} = \frac{q_{ult(net)}}{F_s}$$

$$\Delta H = q_0 B \frac{1-\mu^2}{E'} \left(F_1 + \frac{1-2\mu}{1-\mu} F_2 \right) I_F$$

I_f : v E B q_0

: ()

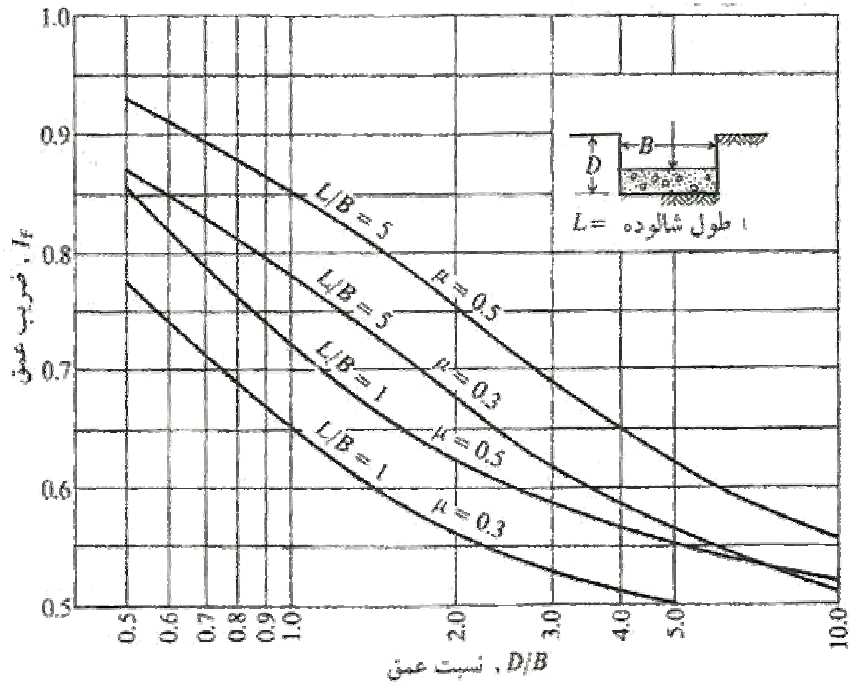
$$F_1 = \frac{1}{\pi} \left[M \ln \frac{(1 + \sqrt{M^2 + 1}) \sqrt{M^2 + N^2}}{M(1 + \sqrt{M^2 + N^2 + 1})} + \ln \frac{(M + \sqrt{M^2 + 1}) \sqrt{1 + N^2}}{M + \sqrt{M^2 + N^2 + 1}} \right]$$

$$F_2 = \frac{N}{2\pi} \tan^{-1} \left(\frac{M}{N \sqrt{M^2 + N^2 + 1}} \right) \quad (\tan^{-1} \text{ in rads})$$

where $M = \frac{L}{B}$ $N = \frac{H}{B}$ $B' = \frac{B}{2}$ for center F_i ; $= B$ for corner F_i

$L = L/2$ for center; $= L$ for corner F_i





(Bowles, 1999) $L^* B$ D (I_F) ()

() ()

$$\left(\frac{L}{B} = 2\right)$$

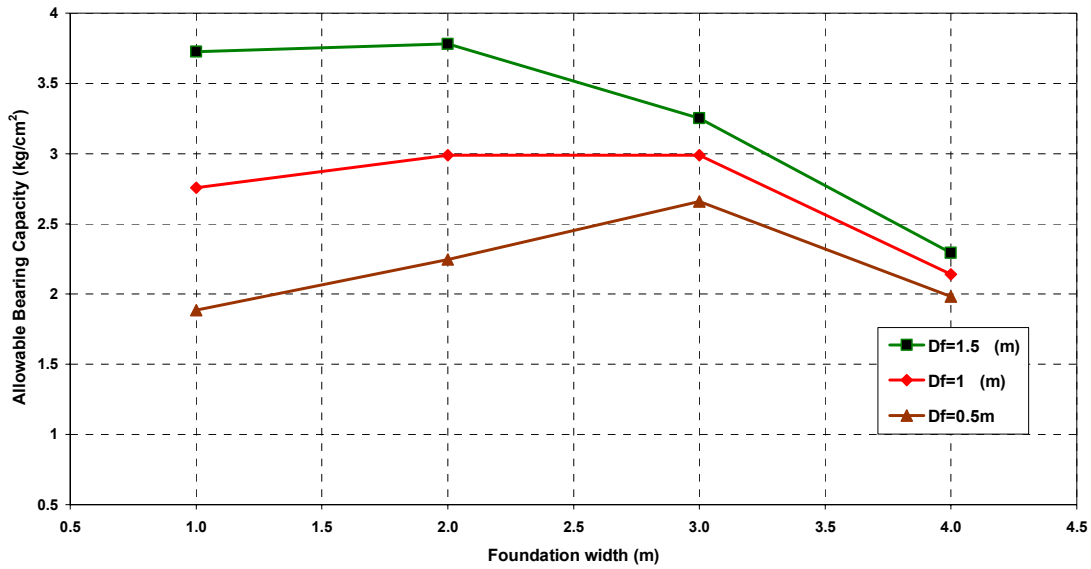
$$\left(\frac{L}{B} = 1\right)$$

$$\left(\frac{L}{B} = 10\right)$$

/

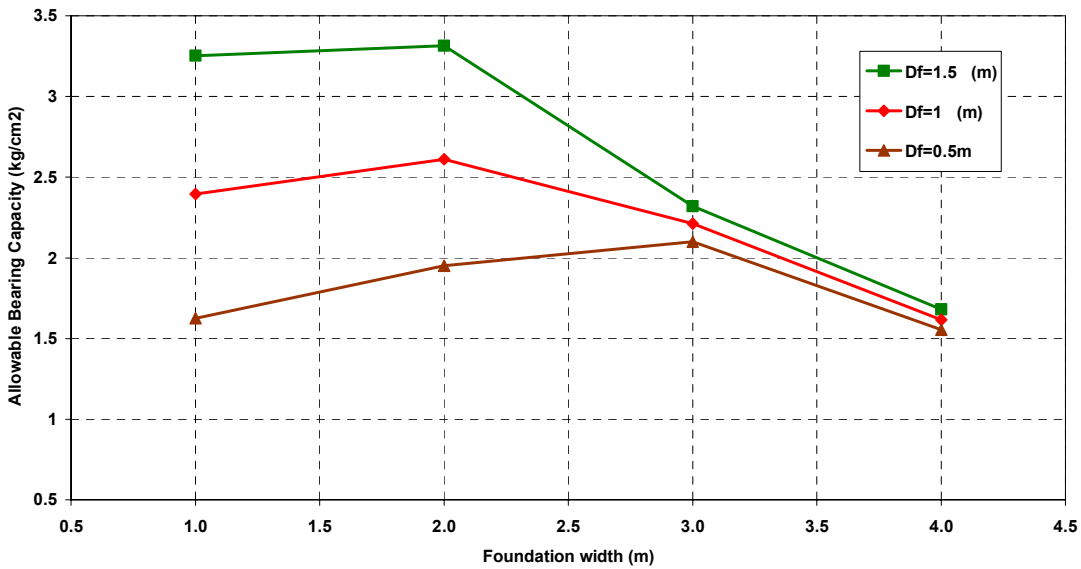


Allowable Bearing Capacity (Square footing)
 L/B=1 , Allowable settlement: 2.54 cm



/ $\left(\frac{L}{B} = 1\right)$ ()

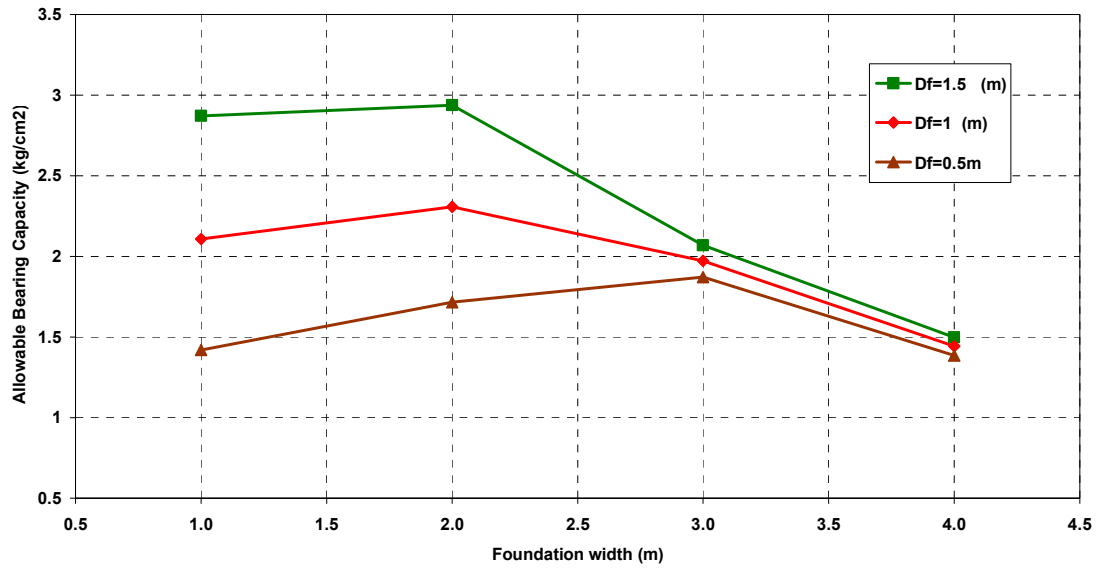
Allowable Bearing Capacity (Rectangular Footing)
 L/B=2 , Allowable settlement: 2.54 cm



/ $\left(\frac{L}{B} = 2\right)$ ()



Allowable Bearing Capacity (Strip footing)
 L/B=10, Allowable settlement: 2.54 cm



/

()

-

-

(

)

(K_a)

(K₀)

:

(K_p)

$$K_0 = 1 - \sin \phi$$

$$K_a = \tan^2 \left(45 - \frac{\phi}{2} \right)$$

$$K_p = \tan^2 \left(45 + \frac{\phi}{2} \right)$$

φ=

:

$$K_0 = 0.5$$

$$K_a = 0.33$$

$$K_p = 3$$



K_0

$K_p \quad K_a$

$K_p \quad K_a$

K_p

()

-

$(a_h = K_h g)$

K_h

g

$$k_{AE} = \frac{\sin^2(\phi + \beta - \theta')}{\cos \theta' \cdot \sin^2 \beta \cdot \sin(\beta - \theta' - \delta) \left[1 + \sqrt{\frac{\sin(\phi + \delta) \sin(\phi - \theta' - \alpha)}{\sin(\beta - \theta' - \delta) \sin(\alpha + \beta)}} \right]^2}$$

$$k_{PE} = \frac{\sin^2(-\phi + \beta + \theta')}{\cos \theta' \cdot \sin^2 \beta \cdot \sin(\beta + \theta' - 90 + \delta) \left[1 - \sqrt{\frac{\sin(\phi + \delta) \sin(\phi - \theta' + \alpha)}{\sin(\beta + \theta' + \delta) \sin(\alpha + \beta)}} \right]^2}$$

$$\theta' = \tan^{-1} \left[\frac{k_h}{1 - k_v} \right]$$

δ

β

α



$$\delta = \phi/2 \quad \alpha=90-\beta=0 \quad K_v=0.0 \quad K_h=0.15$$

:

$$\delta = 0.0$$

$$K_{ac}=0.44$$

$$K_{pe}=2.5$$

$$P_{ac} = 1/2 K_{ac} \gamma H^2 (1 - K_v)$$

$$P_{pe} = 1/2 K_{pe} \gamma H^2 (1 - K_v)$$

$\phi =$

(Ks)

(Ks)

$$K_s = \frac{E}{B(1-\nu^2)}$$

()

: K_s

$$K_s = K_1 \left(\frac{B+B_1}{2B} \right)^2$$



$$K_s = K_1 \left(\frac{\frac{L}{B} + 0.5}{1.5 \frac{L}{B}} \right) \left[\frac{B + B_1}{2B} \right]^2$$

:K₁

:B₁

:B

:L

-

()

BH-2 BH-1

\bar{V}_s

/

II

-

"

-

/

/

()

-

/

:

-



$$K_0 = 0.5 \quad K_a = 0.33 \quad K_p = 3 \quad :$$

$$:(K_h = 0.15 \quad)$$

$$K_{ac} = 0.44$$

$$K_{pe} = 2.5$$

)

-

(

BH-2 BH-1

\bar{V}_s

-

/

II

-

(Liquifaction)

()

-



:

-

-

-

-

-

-

-

-





BOREHOLE LOG

P. O. RAHVAR
Consulting Engrs.Co.

BORING NO. : BH-1	PROJECT: Rajaee Hospital Seismic Retrofitting
TOTAL DEPTH: 30.0 m	CLIENT: Ministry of Health
DRILLING METHOD : Continuous Coring	SITE : Tehran, Valy - e - Asr Street
G.W.D.: -	DATE: 1386/05/10 to 1386/05/15

Depth (m)	CR %	RQD %	Sample	U.S.C.S.	Symbol	Description	PERMEABILITY		S.P.T				Remarks	
							LEF. (cm/sec)	LUG.	1st 15cm	2nd 15cm	3rd 15cm	Nspt		
0	100													
1			▲	GC		Sandy clayey GRAVEL, medium dense, dry, light brown								
2														
3			▲	GM		Silty sandy GRAVEL, medium dense, moist, light brown			7	9	9		18	
4														
5			▲	GM		Silty sandy GRAVEL, dense, moist, light brown			15	17	29		46	
6														
7			▲	GC		Sandy clayey GRAVEL, dense, moist, light brown			18	21	17		38	
8														
9			▲	GM		Silty sandy GRAVEL, dense, moist, light brown								
10														

Legend:	G.W.L.	Core sample	Disturbed	Undisturbed	GRAVEL SAND Sandy GRAVEL	Gravely SAND CLAY SILT	Silty SAND Clayey SILT Sandy CLAY	Page 1 of 3
---------	--------	-------------	-----------	-------------	--------------------------------	------------------------------	---	----------------



BOREHOLE LOG

P. O. RAHVAR
Consulting Engrs.Co.

BORING NO. : BH-1	PROJECT: Rajae Hospital Seismic Retrofitting
TOTAL DEPTH: 30.0 m	CLIENT: Ministry of Health
DRILLING METHOD : Continuous Coring	SITE : Tehran, Valy - e - Asr Street
G.W.D.: -	DATE: 1386/05/10 to 1386/05/15

Depth (m)	CR %	ROD %	Sample	U.S.C.S.	Symbol	Description	PERMEABILITY		S.P.T				Remarks
							LEF. (cm/sec)	LUG.	1st 15cm	2nd 15cm	3rd 15cm	NSPT	
10	100		▲	GM	Silty sandy GRAVEL, dense, moist, light brown							
11					.....							
12	85		▲	GM	.....			16	19	24	43	
13	100				Clayey gravely SAND, very dense, moist, brown							
14	100		▲	SC	.....							
15	100		▲	SM	Silty gravely SAND, very dense, moist, brown			50/10 cm				
16	100				.....							
17	100		▲	GC	Sandy clayey GRAVEL, very dense, moist, light brown			50/9 cm				
18	100		▲	GC	.....							
19	100				Silty gravely SAND, very dense, moist, brown			50/13 cm				
20	100		▲	SM	.....							

Legend:	G.W.L.	Core sample	Undisturbed GRAVEL Gravelly SAND Silty SAND	Page 2 of 3
	Disturbed	Undisturbed	..... SAND	..... CLAY	..... Clayey SILT
			..... Sandy GRAVEL	..... SILT	..... Sandy CLAY



BOREHOLE LOG

P. O. RAHVAR
Consulting Engrs.Co.

BORING NO. : BH-1	PROJECT: Rajae Hospital Seismic Retrofitting
TOTAL DEPTH: 30.0 m	CLIENT: Ministry of Health
DRILLING METHOD : Continuous Coring	SITE : Tehran, Valy - e - Asr Street
G.W.D.: -	DATE: 1386/05/10 to 1386/05/15

Depth (m)	CR %	ROD %	Sample	U.S.C.S.	Symbol	Description	PERMEABILITY		S.P.T				Remarks
							LEF. (cm/sec)	LUG.	1st 15cm	2nd 15cm	3rd 15cm	NSPT	
20	100		▲	SC	.....	Clayey gravely SAND, very dense, moist, light brown			50/6 cm				
21					.....							
22	100				.....	Sandy clayey GRAVEL, very dense, moist, light brown			50/7 cm				
23			▲	GC	.....							
24	100		▲	GM	.....	Silty sandy GRAVEL, very dense, moist, light brown			50/9 cm				
25					.....							
26	100		▲	GC	.....	Sandy clayey GRAVEL, very dense, moist, light brown			50/8 cm				
27					.....							
28	100		▲	SM	.....	Silty gravely SAND, very dense, moist, light brown			50/8 cm				
29					.....							
30	100		▲	SC	.....	Clayey gravely SAND, very dense, moist, light brown			50/8 cm				End of boring

Legend:	G.W.L.	Core sample	Disturbed	Undisturbed	GRAVEL SAND Sandy GRAVEL	Gravely SAND CLAY SILT	Silty SAND Clayey SILT Sandy CLAY	Page 3 of 3
---------	--------	-------------	-----------	-------------	--------------------------------	------------------------------	---	----------------



BOREHOLE LOG

P. O. RAHVAR
Consulting Engrs.Co.

BORING NO. : BH-2	PROJECT: Rajae Hospital Seismic Retrofitting
TOTAL DEPTH: 30.0 m	CLIENT: Ministry of Health
DRILLING METHOD : Continuous Coring	SITE : Tehran, Valy - e - Asr Street
G.W.D.: -	DATE: 1386/05/15 to 1386/05/18

Depth (m)	CR %	RQD %	Sample	U.S.C.S.	Symbol	Description	PERMEABILITY		S.P.T				Remarks	
							LEF. (cm/sec)	LUG.	1st 15cm	2nd 15cm	3rd 15cm	Nspt		
0	100													
1			▲	GC		Sandy clayey GRAVEL, dense, dry, light brown								
2	100													
3			▲	SM		Silty gravelly SAND, dense, moist, light brown			11	19	22	41		
4	100													
5			▲	SC		Clayey gravelly SAND, dense, moist, light brown								
6	100													
7			▲	GC		Sandy clayey GRAVEL, very dense, moist, light brown			18	28	39	67		
8	100													
9			▲	GP - GC		Sandy clayey GRAVEL, very dense, moist, light brown			50/14 cm					
10	100													
11			▲	GC		Sandy clayey GRAVEL, very dense, moist, light brown								
12	100													
13			▲	GM		Silty sandy GRAVEL, very dense, moist, light brown			50/12 cm					

Legend:	G.W.L.	Core sample	Disturbed	Undisturbed	GRAVEL SAND Sandy GRAVEL	Gravely SAND CLAY SILT	Silty SAND Clayey SILT Sandy CLAY
---------	--------	-------------	-----------	-------------	--------------------------------	------------------------------	---



BOREHOLE LOG

P. O. RAHVAR
Consulting Engrs.Co.

BORING NO. : BH-2	PROJECT: Rajaee Hospital Seismic Retrofitting
TOTAL DEPTH: 30.0 m	CLIENT: Ministry of Health
DRILLING METHOD : Continuous Coring	SITE : Tehran, Valy - e - Asr Street
G.W.D.: -	DATE: 1386/05/15 to 1386/05/18

Depth (m)	CR %	RQD %	Sample	U.S.C.S.	Symbol	Description	PERMEABILITY		S.P.T				Remarks
							LEF. (cm/sec)	LUG.	1st 15cm	2nd 15cm	3rd 15cm	NSPT	
10	100		▲	GC	.....	Sandy clayey GRAVEL, very dense, moist, light brown			50/13 cm			
11					.....							
12	85				.....	Clayey gravely SAND, very dense, moist, brown			50/9 cm			
13			▲	SC	.....							
14	100		▲	GC	.....	Sandy clayey GRAVEL, very dense, moist, light brown			50/8 cm			
15					.....							
16	100		▲	GM	.....	Silty sandy GRAVEL, very dense, moist, brown			50/11 cm			
17			▲	GM	.....							
18	100				.....	Clayey gravely SAND, very dense, moist, brown			50/7 cm			
19			▲	SC	.....							
20	100		▲	GM	.....	Silty sandy GRAVEL, very dense, moist, brown						

Legend:	G.W.L.	Core sample	Disturbed	Undisturbed	GRAVEL SAND Sandy GRAVEL	Gravely SAND CLAY SILT	Silty SAND Clayey SILT Sandy CLAY	Page 2 of 3
---------	--------	-------------	-----------	-------------	--------------------------------	------------------------------	---	----------------



BOREHOLE LOG

P. O. RAHVAR
Consulting Engrs.Co.

BORING NO. : BH-2	PROJECT: Rajae Hospital Seismic Retrofitting
TOTAL DEPTH: 30.0 m	CLIENT: Ministry of Health
DRILLING METHOD : Continuous Coring	SITE : Tehran, Valy - e - Asr Street
G.W.D.: -	DATE: 1386/05/15 to 1386/05/18

Depth (m)	CR %	ROD %	Sample	U.S.C.S.	Symbol	Description	PERMEABILITY		S.P.T				Remarks	
							LEF. (cm/sec)	LUG.	1st 15cm	2nd 15cm	3rd 15cm	NSPT		
20	100								50/8 cm					
21														
22	100		▲	GM		Silty sandy GRAVEL, very dense, moist, light brown								
23	100		▲	GM							50/6 cm			
24	100													
25	100		▲	SC		Clayey gravely SAND, very dense, moist, light brown					50/9 cm			
26	100		▲	SC										
27	100		▲	GC		Sandy clayey GRAVEL, very dense, moist, light brown					50/8 cm			
28	100													
29	100					Silty gravely SAND, very dense, moist, light brown					50/9 cm			
30	100		▲	SM							50/7 cm		End of boring	

Legend:	G.W.L.	Core sample	Disturbed	Undisturbed	GRAVEL SAND Sandy GRAVEL	Gravely SAND CLAY SILT	Silty SAND Clayey SILT Sandy CLAY	Page 3 of 3
---------	--------	-------------	-----------	-------------	--------------------------------	------------------------------	---	----------------



TEST PIT LOG

Rahvar Consulting Eng.

PROJECT: Rajaei Hospital Seismic Retrofitting

TEST PIT NO. : TP-1

SITE : Valy-e - Asr. , Tehran

DRILLING METHOD : Hand

TOTAL DEPTH : 15 m

START DATE : 1385/05/27

END DATE : 138/5/05/29

Depth (m)	Sample	U.C.S.C	Symbol	Description	Field Density		Water Content %
					Natural Density (gr/cm ³)	Dry Density (gr/cm ³)	
0				Silty gravely SAND, very dense, dry, light brown			
1							
2	<input type="checkbox"/>	SM		Silty gravely SAND, very dense, moist, light brown	1.80	1.71	5.5
3							
4	<input type="checkbox"/>	GW		Sandy GRAVEL, very dense, moist, light brown	1.86	1.75	6.5
5							
6	<input type="checkbox"/>	SP		SAND, very dense, moist, light brown	1.87	1.76	6.7
7							
8	<input type="checkbox"/>	SM		Silty gravely SAND, very dense, moist, light brown	1.88	1.75	7.1
9							
10	<input type="checkbox"/>	ML		Sandy SILT, very hard, moist, light brown	1.9	1.76	8.0

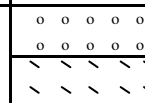
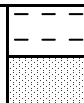
Legend

Disturbed Sample

Undisturbed Sample

Clay

Sand



Gravel

Silt



TEST PIT LOG

Rahvar Consulting Eng.

PROJECT: Rajaei Hospital Seismic Retrofitting

TEST PIT NO. : TP-1

SITE : Valy-e - Asr. , Tehran

DRILLING METHOD : Hand

TOTAL DEPTH : 15 m

START DATE : 1385/05/27

END DATE : 138/5/05/29

Depth (m)	Sample	U.C.S.C	Symbol	Description	Field Density		Water Content %				
					Natural Density (gr/cm ³)	Dry Density (gr/cm ³)					
10				Silty gravely SAND, very dense, moist, light brown	1.90	1.78	6.7				
11											
12											
13											
14											
15								END OF BORING at 15m			
16											
17											
18											
19											
20											

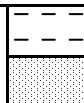
Legend

Disturbed Sample

Undisturbed Sample

Clay

Sand



o o o o o

o o o o o

o o o o o

o o o o o

Gravel

Silt



FIELD DENSITY TEST

Sand-Cone method

ASTM D1556

P. O. Rahvar Consulting Eng.

	PROJECT : Rajaei Hospital Seismic Retrofitting
Test Pit No. : TP-1	LOCATION : Tehran, Valy-e- Asr St.
Depth (m) : 2.0	Client: Ministry of Health
Description of sample :	Date : 1385/05/25

Field Data

Wt. of wet soil	5288	gr
Bulk density of sand , γ_{sand}	1.35	gr/cm ³
Wt. of Jug + Sand before test	9582	gr
Wt. of Jug + Sand after test	5146	gr
Wt. of used Sand (hole + cone)	4436	gr
Wt. of sand in cone (from calibraion)	1180	gr
Wt. of sand in hole , W	3966	gr
Vol. of Hole, $V_h = W / \gamma_{sand}$	2938	cm ³

Wet Density (gr/cm³) : **1.80**

Moisture Content Determination

Can No.	1	
Wt. of wet soil + Can	253.30	gr
Wt. of Can	41.32	gr
Wt. of wet soil, W	211.98	gr
Wt. of dry soil + Can	242.30	gr
Wt. of dry soil	200.98	gr
Wt. of water	11.00	gr
Water content, ω	5.5	%

Dry Density (gr/cm³) : **1.71**

Tested by: S.A.Pasand
Name



FIELD DENSITY TEST

Sand-Cone method

ASTM D1556

P. O. Rahvar Consulting Eng.

	PROJECT : Rajaei Hospital Seismic Retrofitting
Test Pit No. : TP-1	LOCATION : Tehran, Valy-e- Asr St.
Depth (m) : 4.0	Client: Ministry of Health
Description of sample :	Date : 1385/05/26

Field Data

Wt. of wet soil	5492	gr
Bulk density of sand , γ_{sand}	1.35	gr/cm ³
Wt. of Jug + Sand before test	9582	gr
Wt. of Jug + Sand after test	4420	gr
Wt. of used Sand (hole + cone)	5162	gr
Wt. of sand in cone (from calibraion)	1180	gr
Wt. of sand in hole , W	3982	gr
Vol. of Hole, $V_h = W / \gamma_{\text{sand}}$	2950	cm ³

Wet Density (gr/cm³) : **1.86**

Moisture Content Determination

Can No.	2	
Wt. of wet soil + Can	354.30	gr
Wt. of Can	46.50	gr
Wt. of wet soil, W	307.80	gr
Wt. of dry soil + Can	335.60	gr
Wt. of dry soil	289.10	gr
Wt. of water	18.70	gr
Water content, ω	6.5	%

Dry Density (gr/cm³) : **1.75**

Tested by: S.A.Pasand
Name



FIELD DENSITY TEST

Sand-Cone method

ASTM D1556

P. O. Rahvar Consulting Eng.

	PROJECT : Rajaei Hospital Seismic Retrofitting
Test Pit No. : TP-1	LOCATION : Tehran, Valy-e- Asr St.
Depth (m) : 6.0	Client: Ministry of Health
Description of sample :	Date : 1385/05/27

Field Data

Wt. of wet soil	5504	gr
Bulk density of sand , γ_{sand}	1.35	gr/cm ³
Wt. of Jug + Sand before test	9582	gr
Wt. of Jug + Sand after test	4436	gr
Wt. of used Sand (hole + cone)	5146	gr
Wt. of sand in cone (from calibraion)	1180	gr
Wt. of sand in hole , W	3966	gr
Vol. of Hole, $V_h = W / \gamma_{\text{sand}}$	2938	cm ³

Wet Density (gr/cm³) : **1.87**

Moisture Content Determination

Can No.	3	
Wt. of wet soil + Can	255.60	gr
Wt. of Can	41.32	gr
Wt. of wet soil, W	214.28	gr
Wt. of dry soil + Can	242.10	gr
Wt. of dry soil	200.78	gr
Wt. of water	13.50	gr
Water content, ω	6.7	%

Dry Density (gr/cm³) : **1.76**

Tested by: S.A.Pasand
Name



FIELD DENSITY TEST

Sand-Cone method

ASTM D1556

P. O. Rahvar Consulting Eng.

	PROJECT : Rajaei Hospital Seismic Retrofitting
Test Pit No. : TP-1	LOCATION : Tehran, Valy-e- Asr St.
Depth (m) : 8.0	Client: Ministry of Health
Description of sample :	Date : 1385/05/27

Field Data

Wt. of wet soil	4480	gr
Bulk density of sand , γ_{sand}	1.35	gr/cm ³
Wt. of Jug + Sand before test	9590	gr
Wt. of Jug + Sand after test	5190	gr
Wt. of used Sand (hole + cone)	4400	gr
Wt. of sand in cone (from calibraion)	1180	gr
Wt. of sand in hole , W	3220	gr
Vol. of Hole, $V_h = W / \gamma_{\text{sand}}$	2385	cm ³

Wet Density (gr/cm³) : **1.88**

Moisture Content Determination

Can No.	4	
Wt. of wet soil + Can	366.80	gr
Wt. of Can	46.52	gr
Wt. of wet soil, W	320.28	gr
Wt. of dry soil + Can	345.60	gr
Wt. of dry soil	299.08	gr
Wt. of water	21.20	gr
Water content, ω	7.1	%

Dry Density (gr/cm³) : **1.75**

Tested by: S.A.Pasand
Name



FIELD DENSITY TEST

Sand-Cone method

ASTM D1556

P. O. Rahvar Consulting Eng.

	PROJECT : Rajaei Hospital Seismic Retrofitting
Test Pit No. : TP-1	LOCATION : Tehran, Valy-e- Asr St.
Depth (m) : 10.0	Client: Ministry of Health
Description of sample :	Date : 1385/05/28

Field Data

Wt. of wet soil	5854	gr
Bulk density of sand , γ_{sand}	1.35	gr/cm ³
Wt. of Jug + Sand before test	9586	gr
Wt. of Jug + Sand after test	4238	gr
Wt. of used Sand (hole + cone)	5348	gr
Wt. of sand in cone (from calibraion)	1180	gr
Wt. of sand in hole , W	4168	gr
Vol. of Hole, $V_h = W / \gamma_{\text{sand}}$	3087	cm ³

Wet Density (gr/cm³) : **1.90**

Moisture Content Determination

Can No.	5	
Wt. of wet soil + Can	289.30	gr
Wt. of Can	45.30	gr
Wt. of wet soil, W	244.00	gr
Wt. of dry soil + Can	271.30	gr
Wt. of dry soil	226.00	gr
Wt. of water	18.00	gr
Water content, ω	8.0	%

Dry Density (gr/cm³) : **1.76**

Tested by: S.A.Pasand
Name



FIELD DENSITY TEST

Sand-Cone method

ASTM D1556

P. O. Rahvar Consulting Eng.

	PROJECT : Rajaei Hospital Seismic Retrofitting
Test Pit No. : TP-1	LOCATION : Tehran, Valy-e- Asr St.
Depth (m) : 12.0	Client: Ministry of Health
Description of sample :	Date : 1385/05/29

Field Data

Wt. of wet soil	5800	gr
Bulk density of sand , γ_{sand}	1.35	gr/cm ³
Wt. of Jug + Sand before test	9638	gr
Wt. of Jug + Sand after test	4328	gr
Wt. of used Sand (hole + cone)	5310	gr
Wt. of sand in cone (from calibraion)	1180	gr
Wt. of sand in hole , W	4130	gr
Vol. of Hole, $V_h = W / \gamma_{\text{sand}}$	3059	cm ³

Wet Density (gr/cm³) : **1.90**

Moisture Content Determination

Can No.	6	
Wt. of wet soil + Can	286.30	gr
Wt. of Can	47.50	gr
Wt. of wet soil, W	238.80	gr
Wt. of dry soil + Can	271.30	gr
Wt. of dry soil	223.80	gr
Wt. of water	15.00	gr
Water content, ω	6.7	%

Dry Density (gr/cm³) : **1.78**

Tested by: S.A.Pasand
Name



FIELD DENSITY TEST

Sand-Cone method

ASTM D1556

P. O. Rahvar Consulting Eng.

	PROJECT : Rajaei Hospital Seismic Retrofitting
Test Pit No. : TP-1	LOCATION : Tehran, Valy-e- Asr St.
Depth (m) : 14.0	Client: Ministry of Health
Description of sample :	Date : 1385/05/29

Field Data

Wt. of wet soil	5745	gr
Bulk density of sand , γ_{sand}	1.35	gr/cm ³
Wt. of Jug + Sand before test	9350	gr
Wt. of Jug + Sand after test	4155	gr
Wt. of used Sand (hole + cone)	5195	gr
Wt. of sand in cone (from calibraion)	1180	gr
Wt. of sand in hole , W	4015	gr
Vol. of Hole, $V_h = W / \gamma_{\text{sand}}$	2974	cm ³

Wet Density (gr/cm³) : **1.93**

Moisture Content Determination

Can No.	7	
Wt. of wet soil + Can	254.30	gr
Wt. of Can	43.20	gr
Wt. of wet soil, W	211.10	gr
Wt. of dry soil + Can	235.30	gr
Wt. of dry soil	192.10	gr
Wt. of water	19.00	gr
Water content, ω	9.9	%

Dry Density (gr/cm³) : **1.76**

Tested by: S.A.Pasand
Name



DENSITY TEST

P. O. Rahvar Consulting Eng.

Project : Rajaeii Hospital Seismic Retrofitting

Client: Ministry of Health

Location : Valy-e-Asr St. - Tehran

Date : 1386/7/25

Boring No.	BH - 1							
	6.0 - 6.50		10.0 - 10.50		14.50 - 15.0		22.0 - 22.50	
Depth (m)								
Wt. of wet soil + can (g)	142.52	115.33	100.56	112.02	105.45	129.82	150.20	110.03
Wt. of dry soil + can (g)	135.29	109.32	93.86	104.72	98.57	121.70	138.10	100.94
Wt. of can (g)	29.97	23.84	22.77	30.33	22.54	23.90	23.50	23.89
Wt. of water (g)	7.23	6.01	6.70	7.30	6.88	8.12	12.10	9.09
Water content, W (%)	6.9	7.0	9.4	9.8	9.0	8.3	10.6	11.8
Wt. of dry bulk (g)	105.00	85.30	70.88	74.23	75.95	97.26	114.49	76.87
Wt. of bulk+ paraffin in air (g)	110.69	92.01	75.73	79.81	81.03	104.68	123.66	85.06
Wt. of bulk+paraffin in water (g)	45.20	36.25	28.84	31.02	32.74	40.51	48.05	32.02
Wt. of paraffin (g)	5.69	6.71	4.85	5.58	5.08	7.42	9.17	8.19
Vol. of bulk + paraffin (cm ³)	65.49	55.76	46.89	48.79	48.29	64.17	75.61	53.04
Vol. of paraffin (cm ³)	6.32	7.46	5.39	6.20	5.64	8.24	10.19	9.10
Vol. of bulk sample (cm ³)	59.17	48.30	41.50	42.59	42.65	55.93	65.42	43.94
Wet Density (gr/cm ³)	1.90	1.89	1.87	1.91	1.94	1.88	1.93	1.96
Dry Density (gr/cm ³)	1.77	1.77	1.71	1.74	1.78	1.74	1.75	1.75

B.Amini

(Tested by)



DENSITY TEST

P. O. Rahvar Consulting Eng.

Project : Rajaeii Hospital Seismic Retrofitting

Client: Ministry of Health

Location : Valy -e- Asr St. - Tehran

Date : 1386/7/23

Boring No.	BH - 2							
	3.0 - 3.50		7.50 - 8.0		10.50 - 11.0		12.0 - 12.50	
Depth (m)								
Wt. of wet soil + can (g)	135.30	84.01	71.54	68.95	86.02	94.25	94.82	104.25
Wt. of dry soil + can (g)	131.00	81.43	68.95	66.41	81.33	89.05	88.77	97.67
Wt. of can (g)	30.36	22.77	29.99	23.38	23.61	30.76	24.01	31.36
Wt. of water (g)	4.30	2.58	2.59	2.54	4.69	5.20	6.05	6.58
Water content, W (%)	4.3	4.4	6.6	5.9	8.1	8.9	9.3	9.9
Wt. of dry bulk (g)	100.61	58.64	38.92	42.96	57.67	58.27	64.90	66.49
Wt. of bulk+ paraffin in air (g)	107.34	64.37	43.75	48.57	67.02	64.80	71.16	73.50
Wt. of bulk+paraffin in water (g)	43.70	24.46	16.20	18.20	24.10	25.10	27.41	28.73
Wt. of paraffin (g)	6.73	5.73	4.83	5.61	9.35	6.53	6.26	7.01
Vol. of bulk + paraffin (cm ³)	63.64	39.91	27.55	30.37	42.92	39.70	43.75	44.77
Vol. of paraffin (cm ³)	7.48	6.37	5.37	6.23	10.39	7.26	6.96	7.79
Vol. of bulk sample (cm ³)	56.16	33.54	22.18	24.14	32.53	32.44	36.79	36.98
Wet Density (gr/cm ³)	1.87	1.83	1.87	1.88	1.92	1.96	1.93	1.98
Dry Density (gr/cm ³)	1.79	1.75	1.75	1.78	1.77	1.80	1.76	1.80

B.Amini

(Tested by)



DENSITY TEST

P. O. Rahvar Consulting Eng.

Project : Rajaeii Hosptital Seismic Retrofitting					Client: Ministry of Health			
Location : Valy -e- Asr St. - Tehran					Date : 1386/7/23			
Boring No.	BH - 2							
Depth (m)	16.50 - 17.0		21.0 - 21.50					
Wt .of wet soil + can (g)	120.02	121.03	96.02	83.04				
Wt. of dry soil + can (g)	110.30	111.59	88.04	76.08				
Wt. of can (g)	23.38	22.54	25.23	22.77				
Wt. of water (g)	9.72	9.44	7.98	6.96				
Water content, W (%)	11.2	10.6	12.7	13.1				
Wt. of dry bulk (g)	86.89	88.33	62.78	53.06				
Wt. of bulk+ paraffin in air (g)	94.93	95.49	67.69	58.20				
Wt. of bulk+paraffin in water (g)	38.12	37.62	27.30	23.20				
Wt. of paraffin (g)	8.04	7.16	4.91	5.14				
Vol. of bulk + paraffin (cm ³)	56.81	57.87	40.39	35.00				
Vol. of paraffin (cm ³)	8.93	7.96	5.46	5.71				
Vol. of bulk sample (cm ³)	47.88	49.91	34.93	29.29				
Wet Density (gr/cm ³)	2.02	1.96	2.03	2.05				
Dry Density (gr/cm ³)	1.81	1.77	1.80	1.81				
B.Amini								
(Tested by)								
<i>P. O. Rahvar Consulting Engrs. Co., No. 76, Meftah Alley, Sheikh Bahaei St. Tehran Tel.:88060194 Fax:88603195</i>								

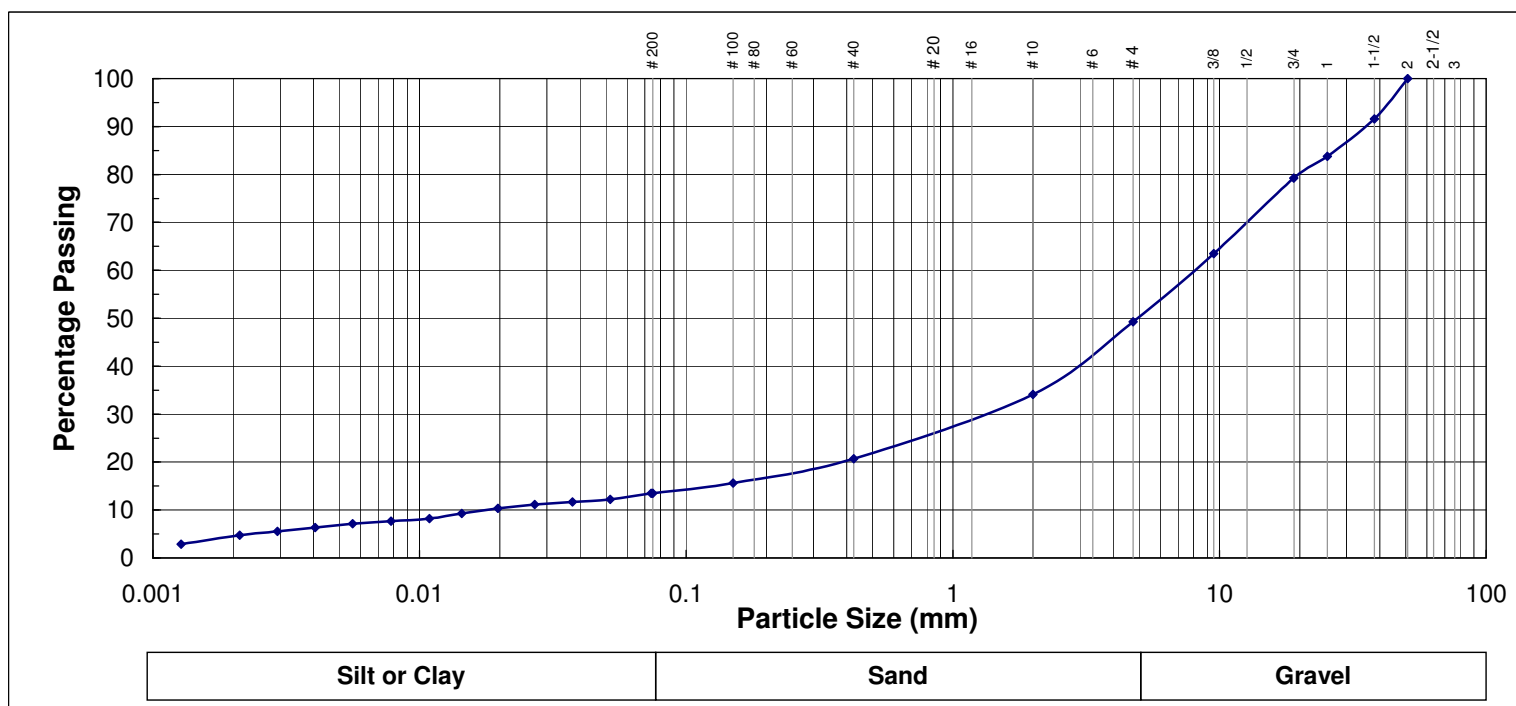


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 1.0-1.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/23	Tested By : M. Daryaei



Unifide Soil Classification : **GC**

Liquid Limit (%) : **26.3**

Passing Sieve # 4 : **49.3**

Description : **Clayey Gravel with sand**

Plasticity Index (%) : **11.0**

Passing Sieve # 40 : **20.7**

Passing Sieve # 200 : **13.5**

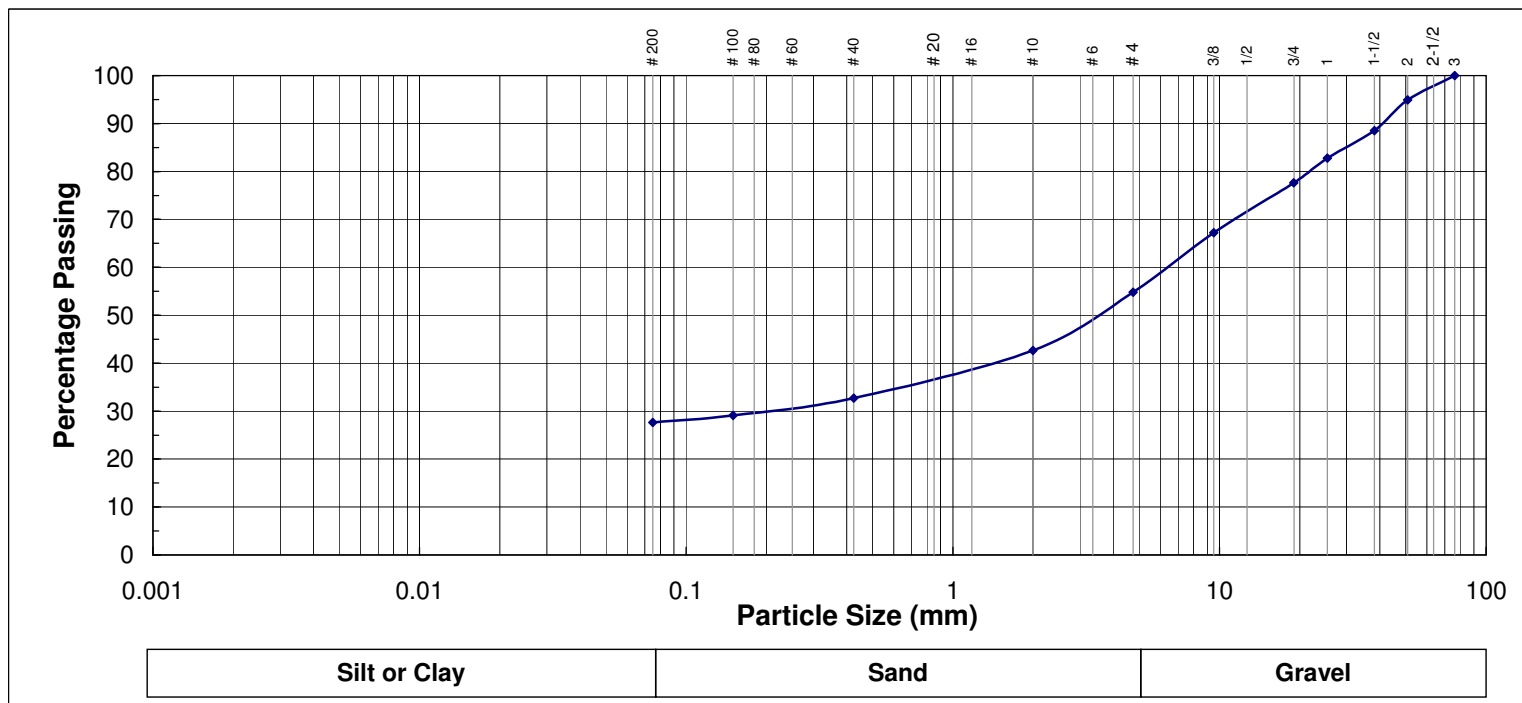


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 2.50-3.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/23	Tested By : M. Daryaei



Unifide Soil Classification : **GM**

Liquid Limit (%) : -

Passing Sieve # 4 : 54.8

Description : *Silty Gravel with sand*

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : 32.7

Passing Sieve # 200 : 27.7

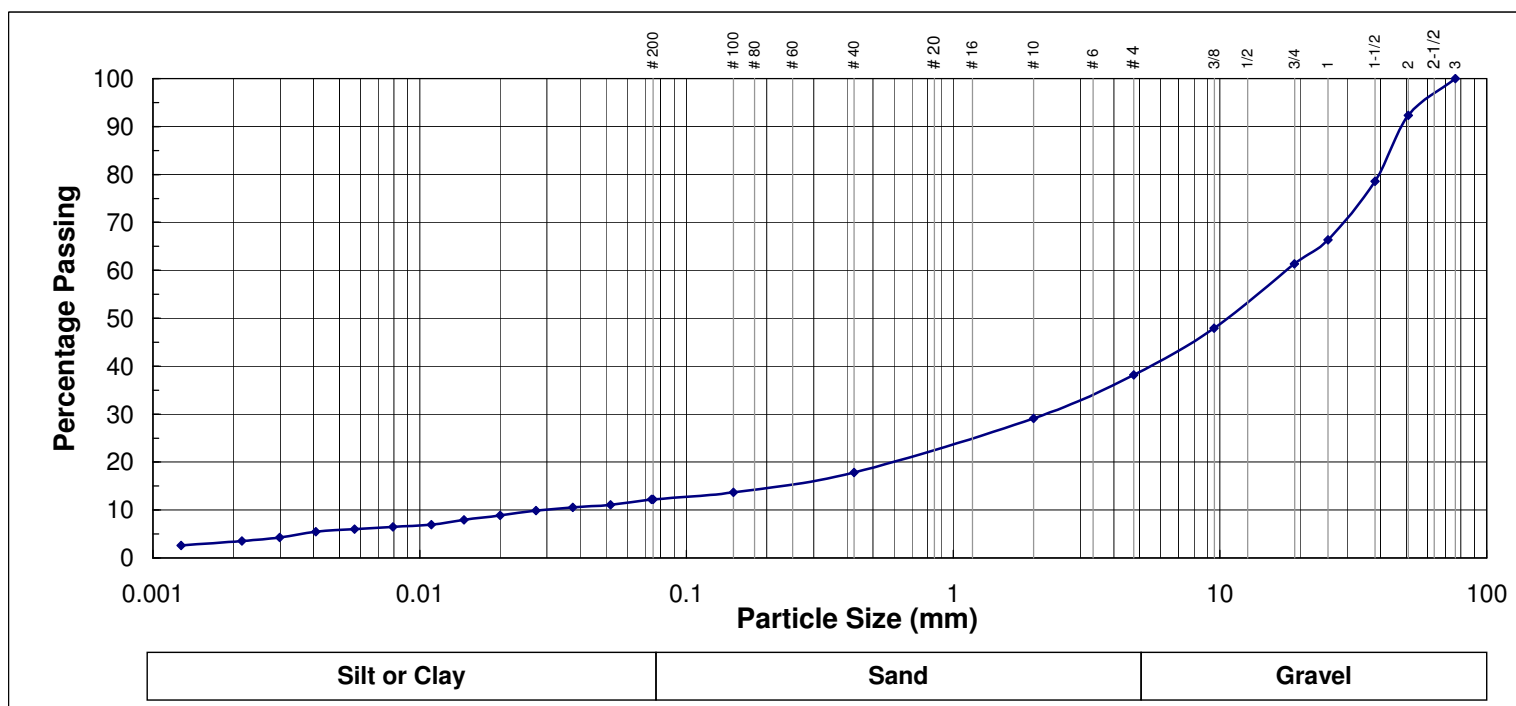


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 4.0-4.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/24	Tested By : M. Daryaei



Unified Soil Classification : **GM**

Liquid Limit (%) : **-**

Passing Sieve # 4 : **38.2**

Description : **Silty Gravel with sand**

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : **17.8**

Passing Sieve # 200 : **12.2**

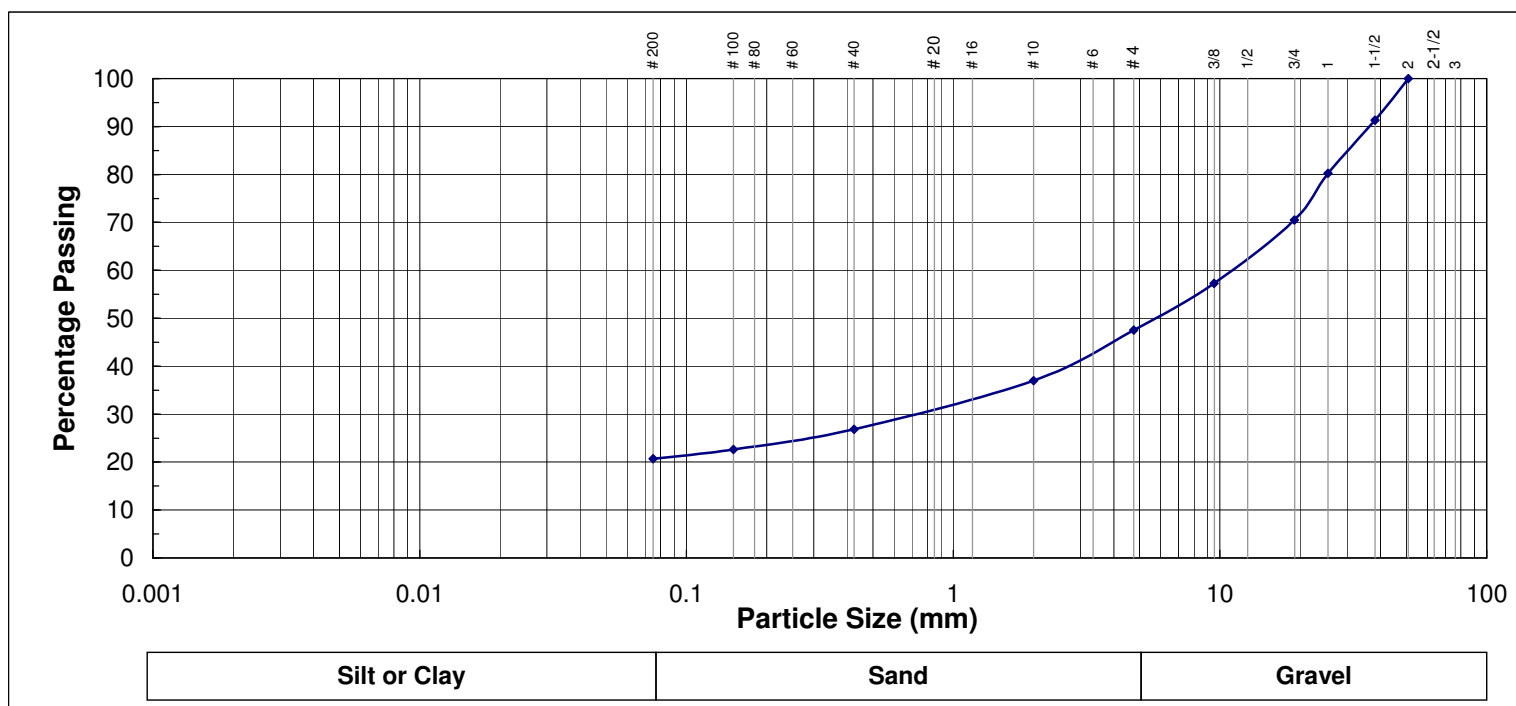


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 6.0-6.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/23	Tested By : M. Daryaei



Unifide Soil Classification : **GC**

Liquid Limit (%) : **39.9**

Passing Sieve # 4 : **47.5**

Description : **Clayey Gravel with sand**

Plasticity Index (%) : **19.3**

Passing Sieve # 40 : **26.8**

Passing Sieve # 200 : **20.7**

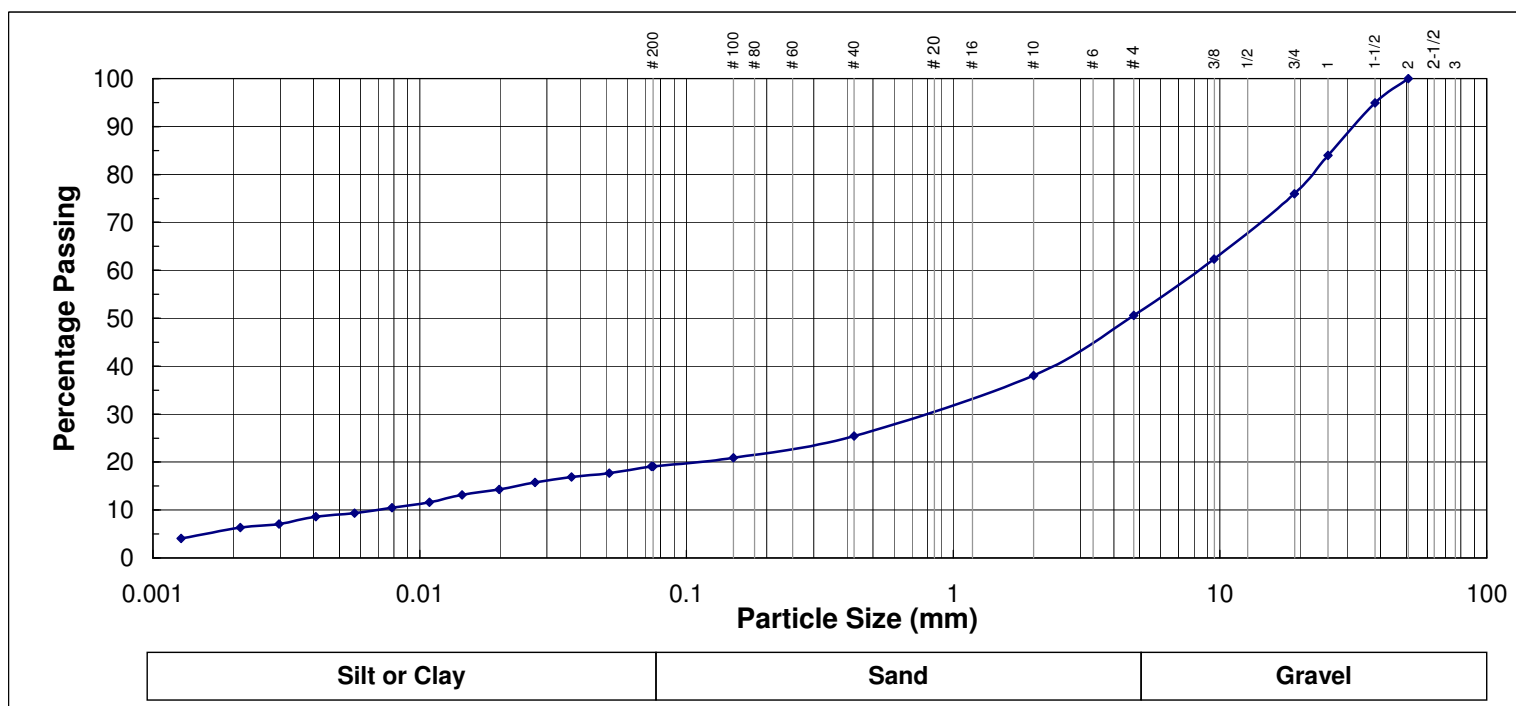


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 7.0-7.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/23	Tested By : M. Daryaei



Unifide Soil Classification : **GC**

Liquid Limit (%) : **35.1**

Passing Sieve # 4 : **50.6**

Description : **Clayey Gravel with sand**

Plasticity Index (%) : **15.9**

Passing Sieve # 40 : **25.5**

Passing Sieve # 200 : **19.1**

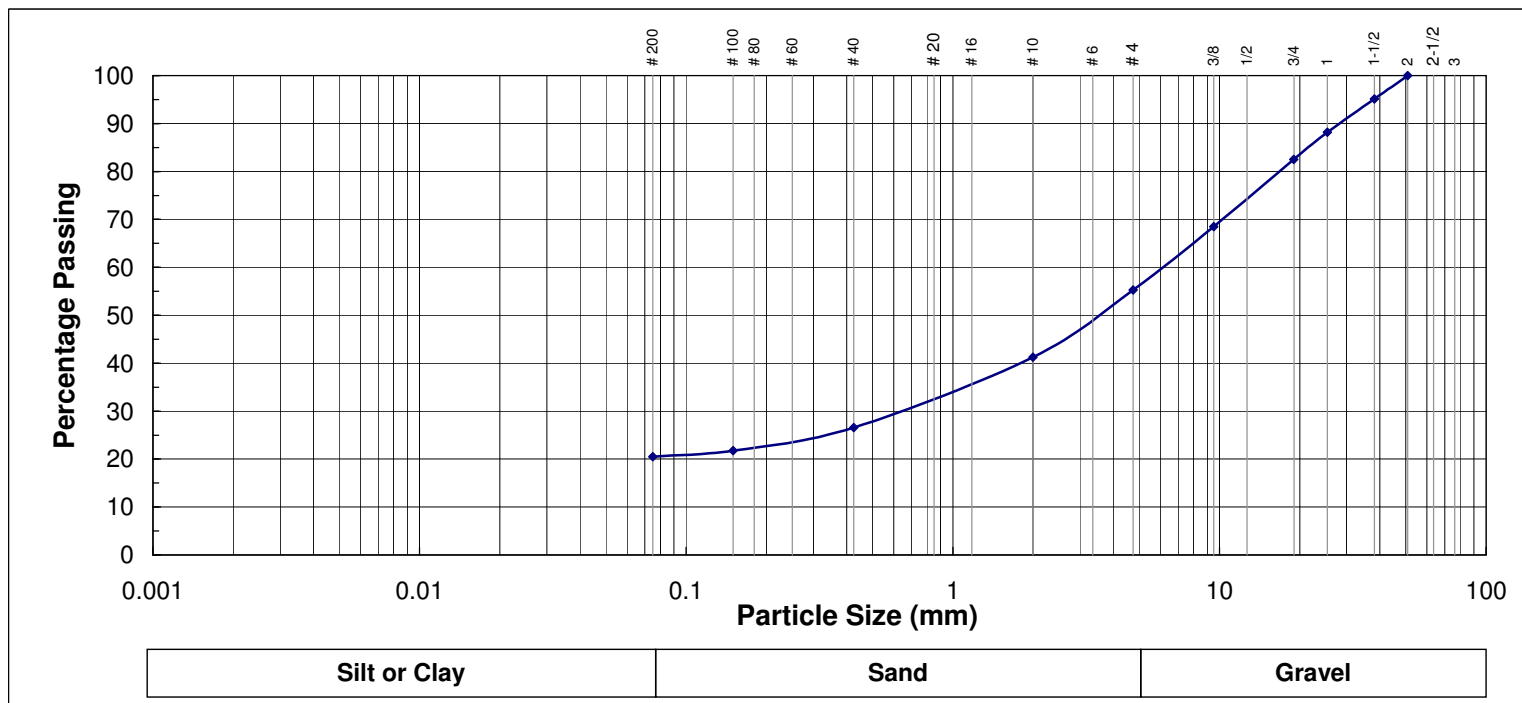


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 8.50-9.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/23	Tested By : M. Daryaei



Unifide Soil Classification : **GM**

Liquid Limit (%) : -

Passing Sieve # 4 : 55.3

Description : *Silty Gravel with sand*

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : 26.5

Passing Sieve # 200 : 20.5

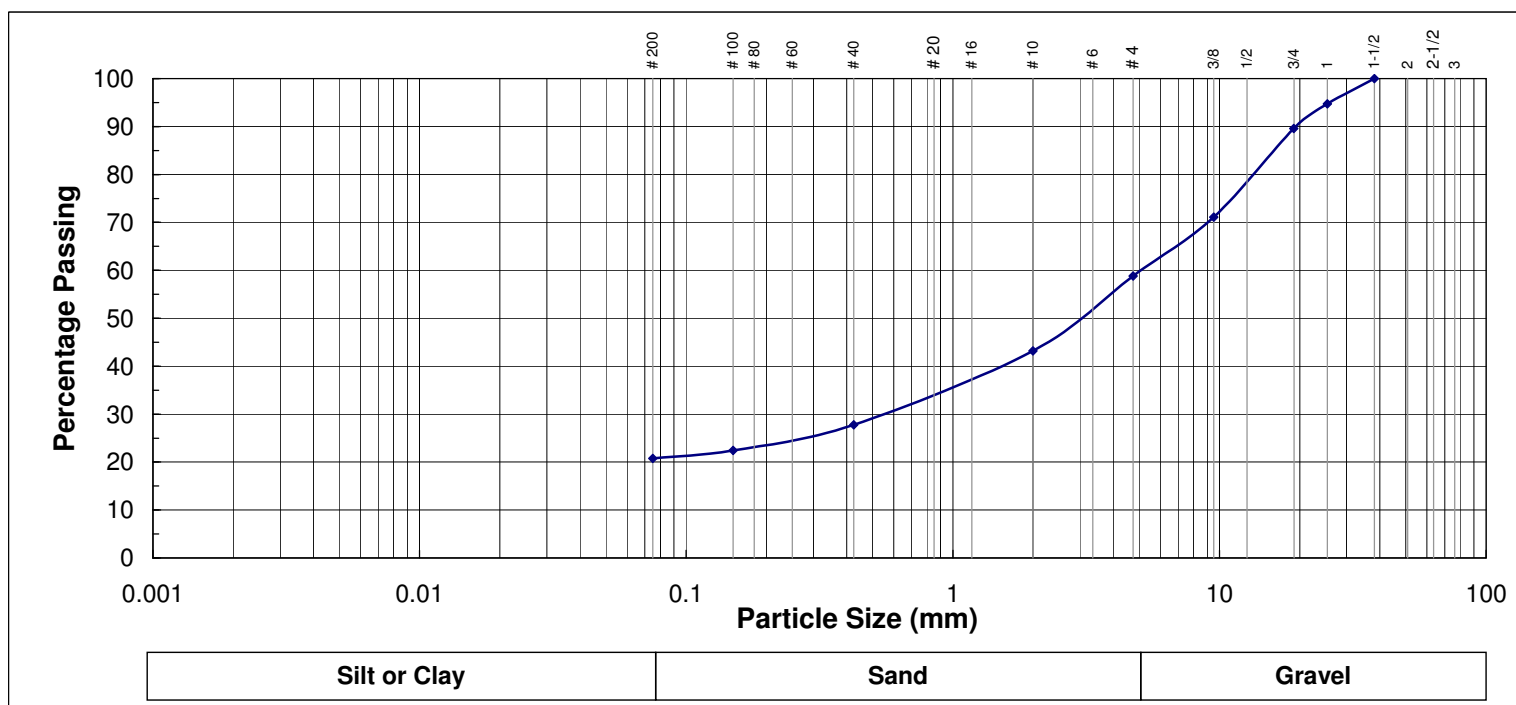


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 10.0-10.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/24	Tested By : M. Daryaei



Unified Soil Classification : **GM**

Liquid Limit (%) : **-**

Passing Sieve # 4 : **58.8**

Description : **Silty Gravel with sand**

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : **27.8**

Passing Sieve # 200 : **20.8**

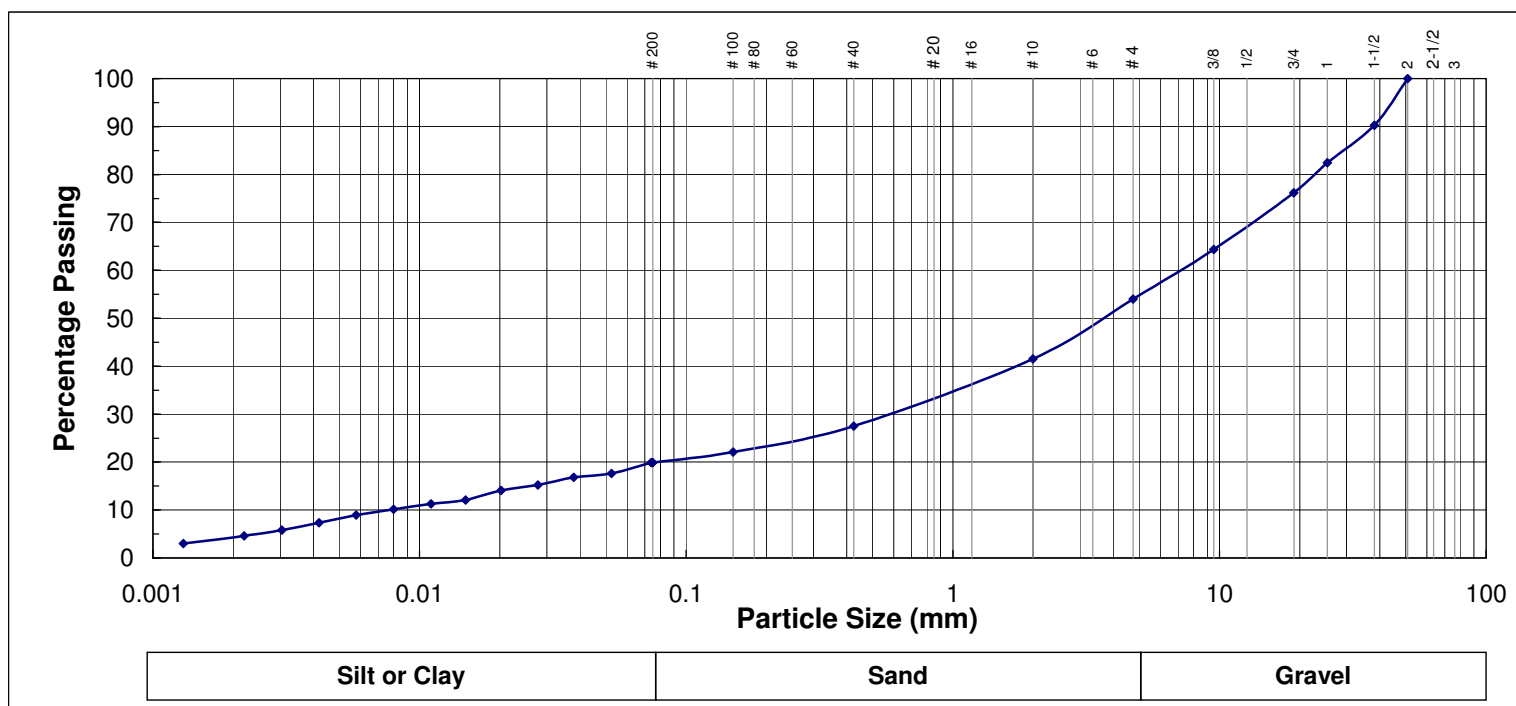


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 11.50-12.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/23	Tested By : M. Daryaei



Unifide Soil Classification :

GM

Liquid Limit (%) :

-

Passing Sieve # 4 :

54.0

Description :

Silty Gravel with sand

Plasticity Index (%) :

NPI

Passing Sieve # 40 :

27.5

Passing Sieve # 200 :

19.9

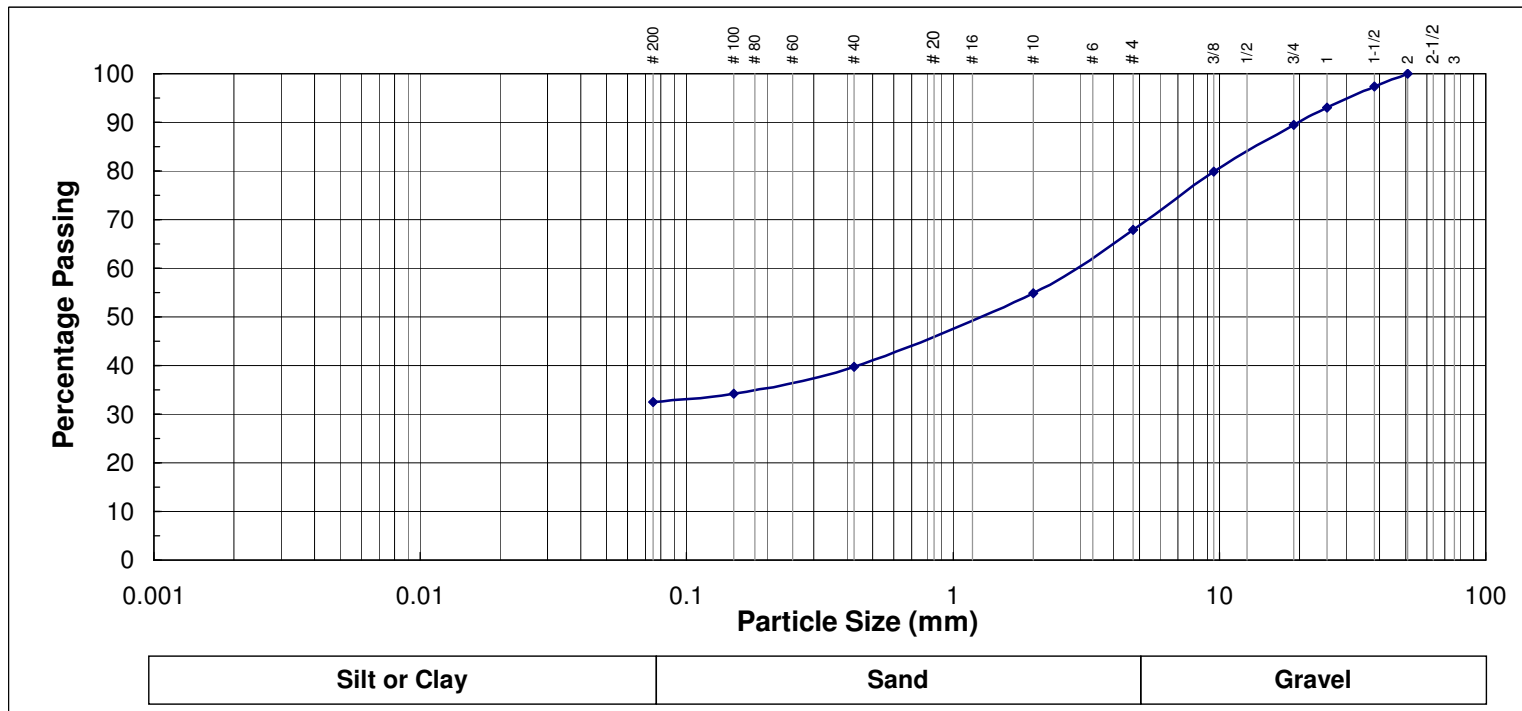


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 13.0-13.50	Location : Tehran,Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/23	Tested By : M. Daryaei



Unifide Soil Classification : **SC**

Liquid Limit (%) : **27.8**

Passing Sieve # 4 : **67.9**

Description : **Clayey Sand with gravel**

Plasticity Index (%) : **11.7**

Passing Sieve # 40 : **39.7**

Passing Sieve # 200 : **32.5**

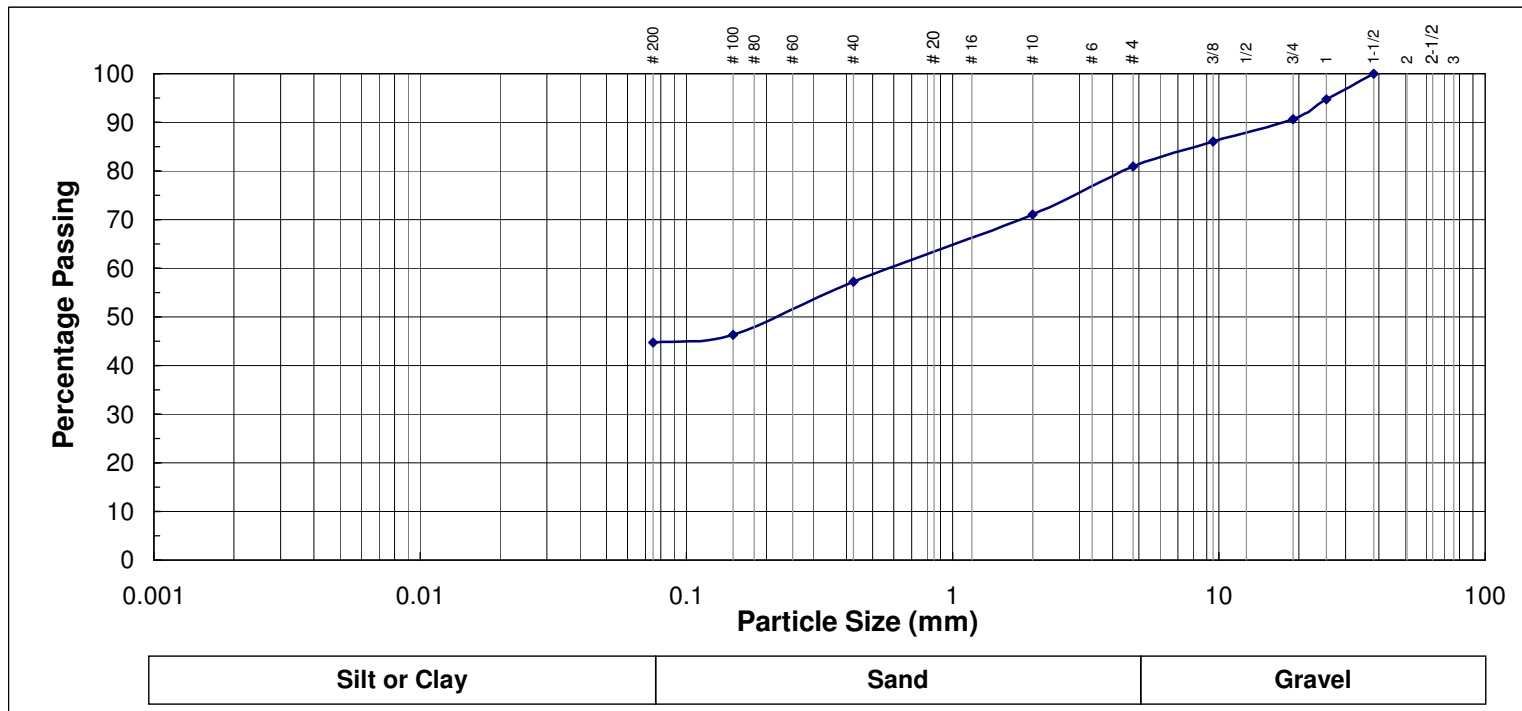


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 14.50-15.0	Location : Tehran,Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/24	Tested By : M. Daryaei



Unifide Soil Classification : **SM**

Liquid Limit (%) : **-**

Passing Sieve # 4 : **80.9**

Description : **Silty Sand with gravel**

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : **57.2**

Passing Sieve # 200 : **44.7**

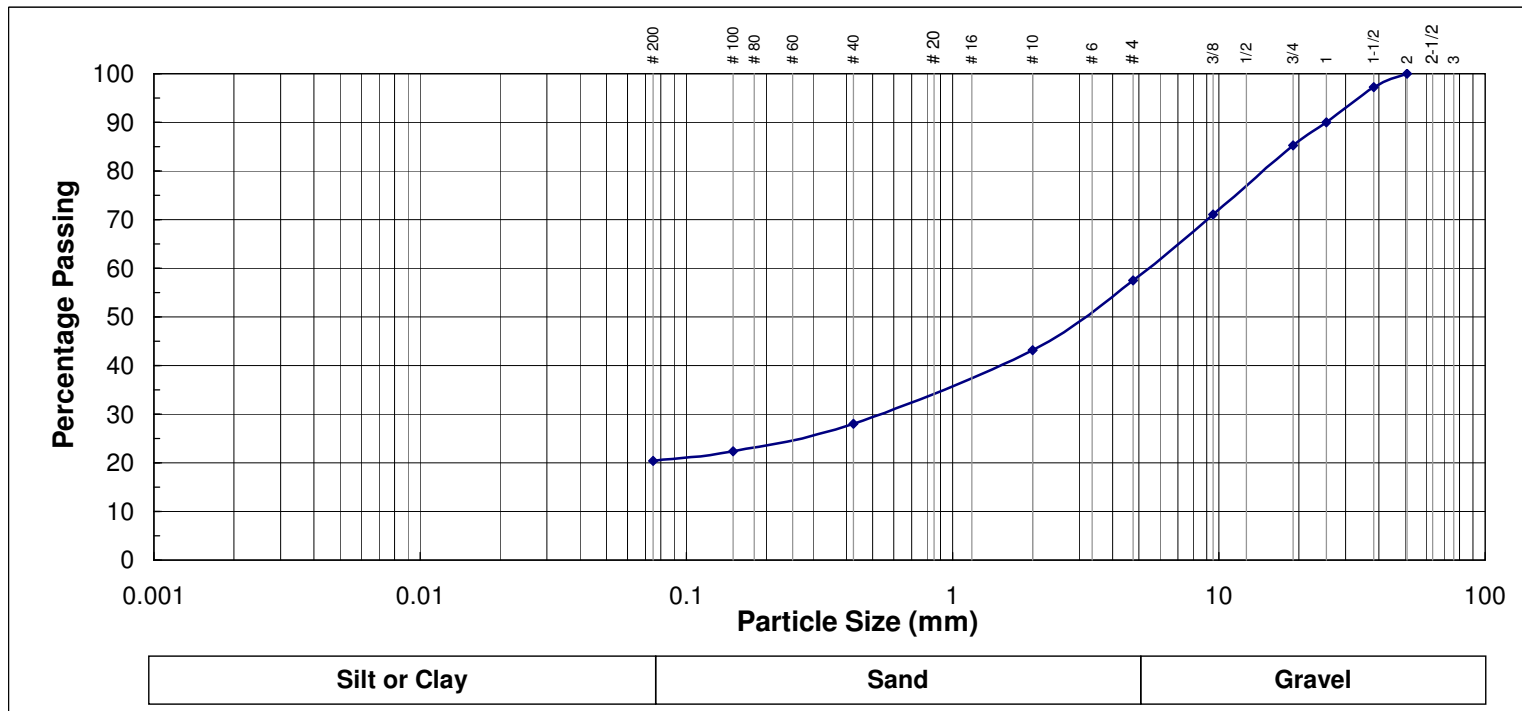


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 16.0-16.50	Location : Tehran,Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/23	Tested By : M. Daryaei



Unifide Soil Classification : **GC**

Liquid Limit (%) : **31.6**

Passing Sieve # 4 : **57.5**

Description : *Clayey Gravel with sand*

Plasticity Index (%) : **12.9**

Passing Sieve # 40 : **28.0**

Passing Sieve # 200 : **20.3**

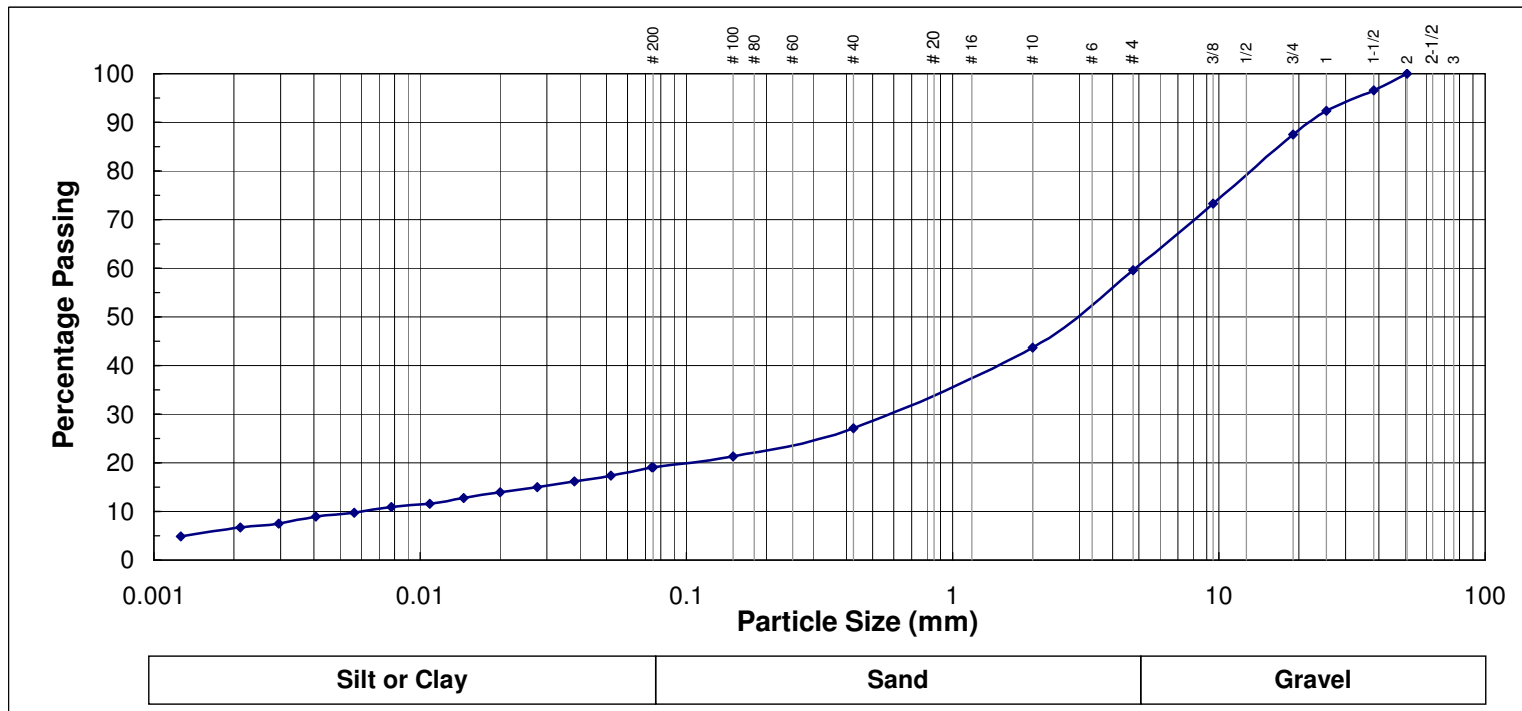


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 17.5 - 18.0	Location : Tehran,Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/23	Tested By : M. Daryaei



Unifide Soil Classification : **GC**

Description : *Clayey Gravel with sand*

Liquid Limit (%) : **30.8**

Plasticity Index (%) : **14.8**

Passing Sieve # 4 : **59.5**

Passing Sieve # 40 : **27.1**

Passing Sieve # 200 : **19.1**

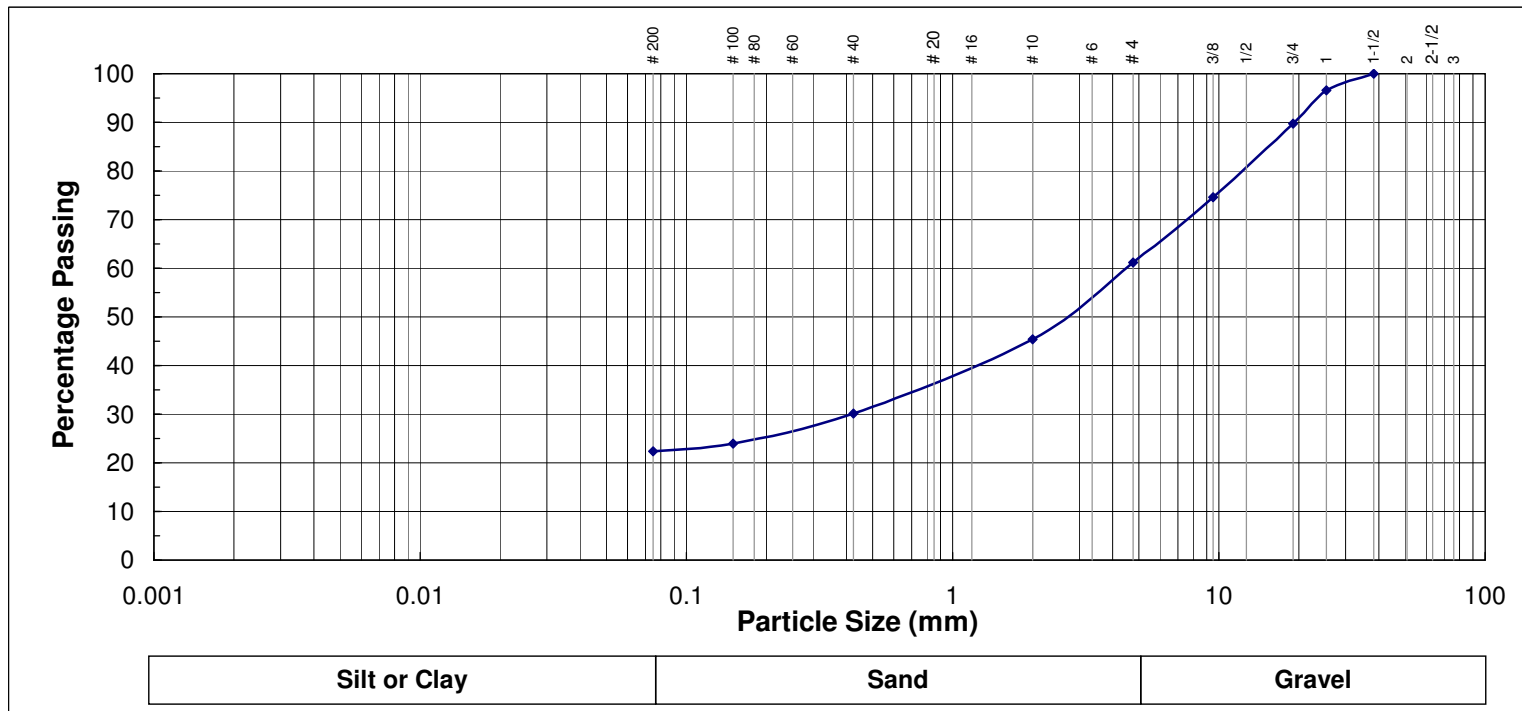


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 19.0-19.50	Location : Tehran,Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/23	Tested By : M. Daryaei



Unifide Soil Classification : **SM**

Liquid Limit (%) : **-**

Passing Sieve # 4 : **61.2**

Description : **Silty Sand with gravel**

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : **30.1**

Passing Sieve # 200 : **22.4**

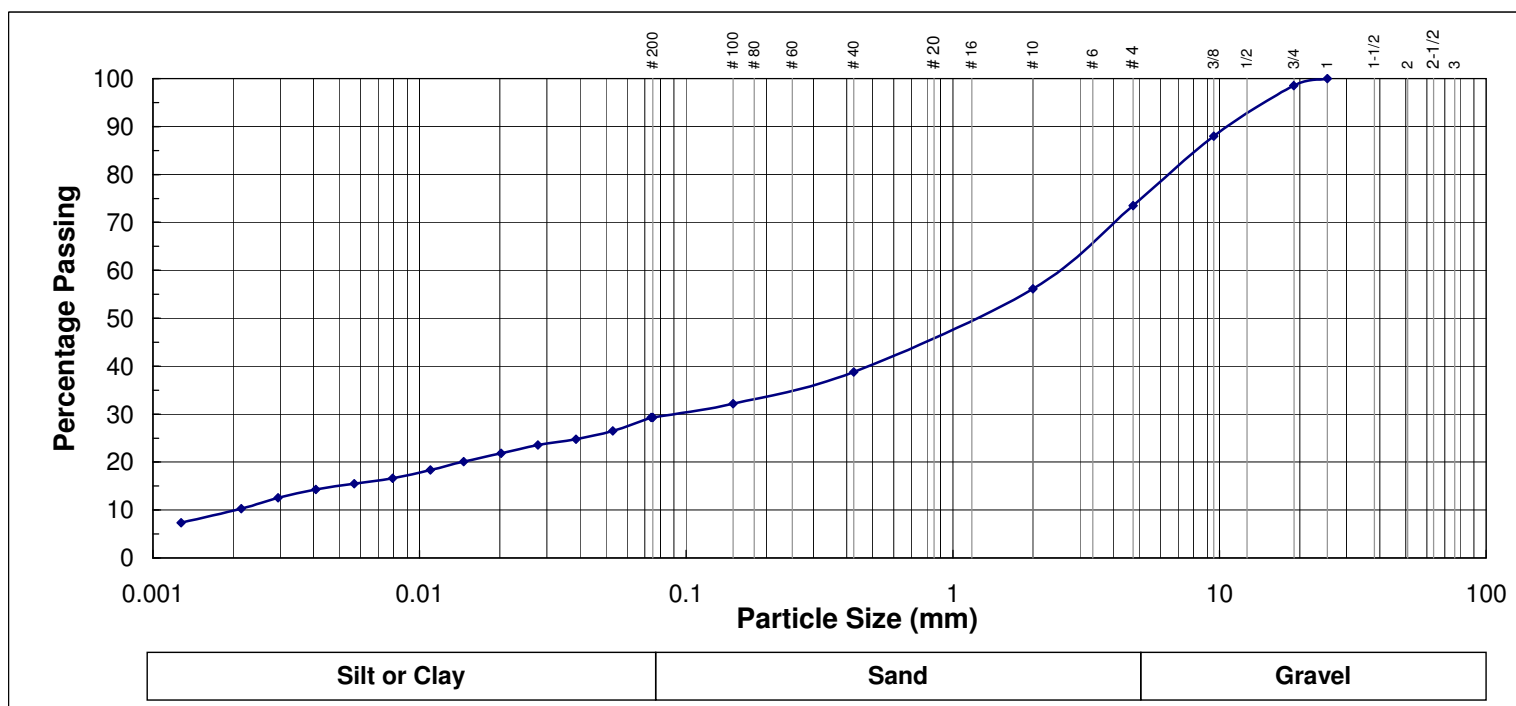


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 20.50-21.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/23	Tested By : M. Daryaei



Unifide Soil Classification : **SC**

Liquid Limit (%) : **29.7**

Passing Sieve # 4 : **73.5**

Description : *Clayey Sand with gravel*

Plasticity Index (%) : **12.8**

Passing Sieve # 40 : **38.8**

Passing Sieve # 200 : **29.3**

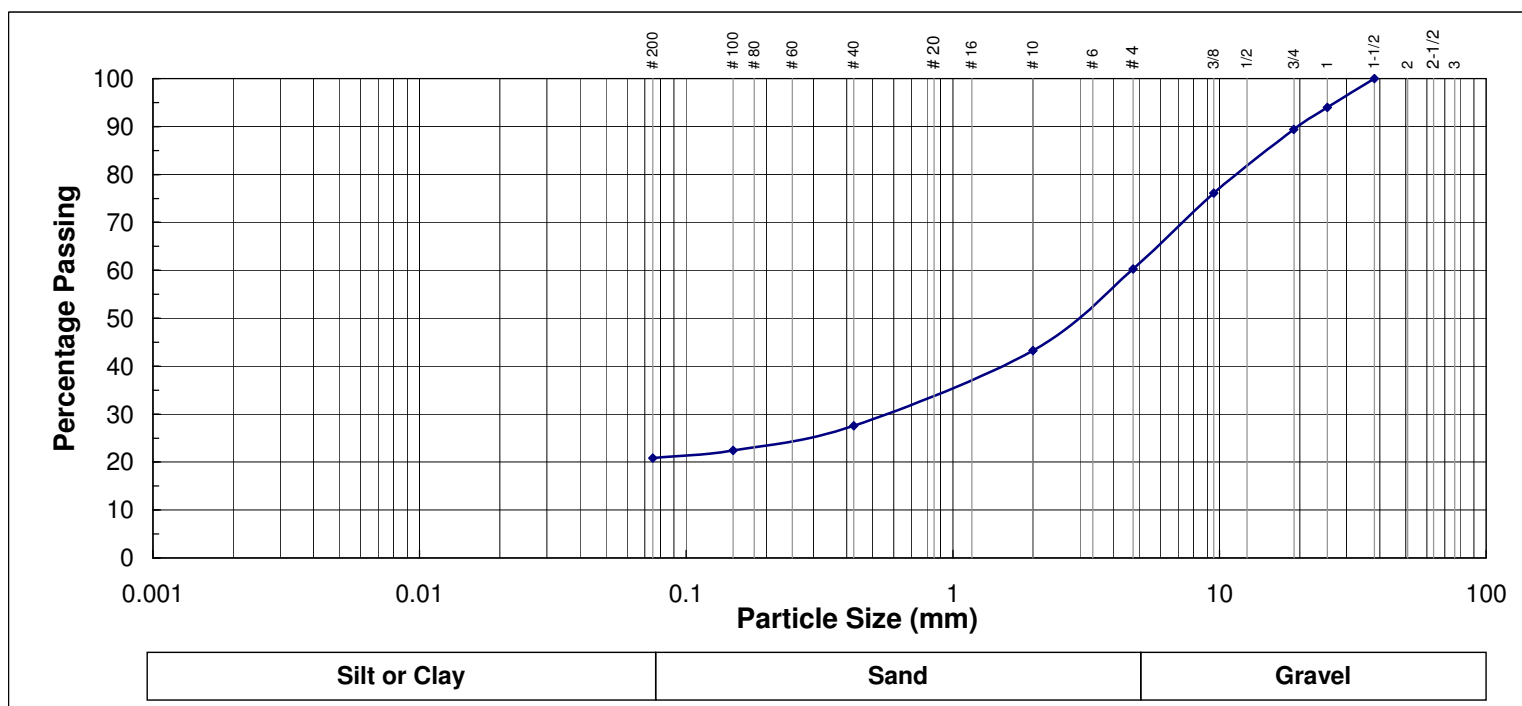


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 22.0-22.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/24	Tested By : M. Daryaei



Unifide Soil Classification : **GC**

Liquid Limit (%) : **29.7**

Passing Sieve # 4 : **60.3**

Description : **Clayey Gravel with sand**

Plasticity Index (%) : **10.6**

Passing Sieve # 40 : **27.6**

Passing Sieve # 200 : **20.8**

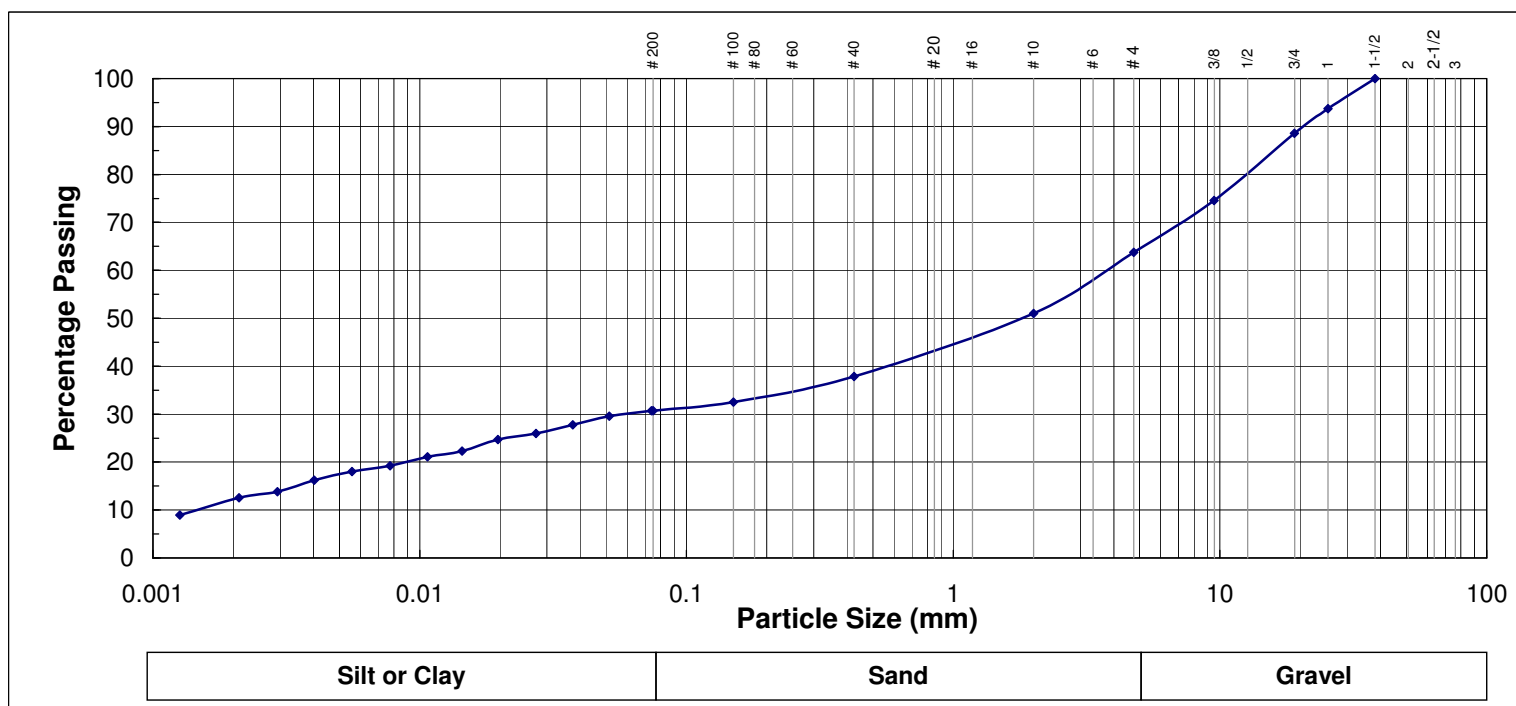


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 23.50-24.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/23	Tested By : M. Daryaei



Unifide Soil Classification : **GM**

Liquid Limit (%) : **-**

Passing Sieve # 4 : **63.8**

Description : **Silty Gravel with sand**

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : **37.8**

Passing Sieve # 200 : **30.7**

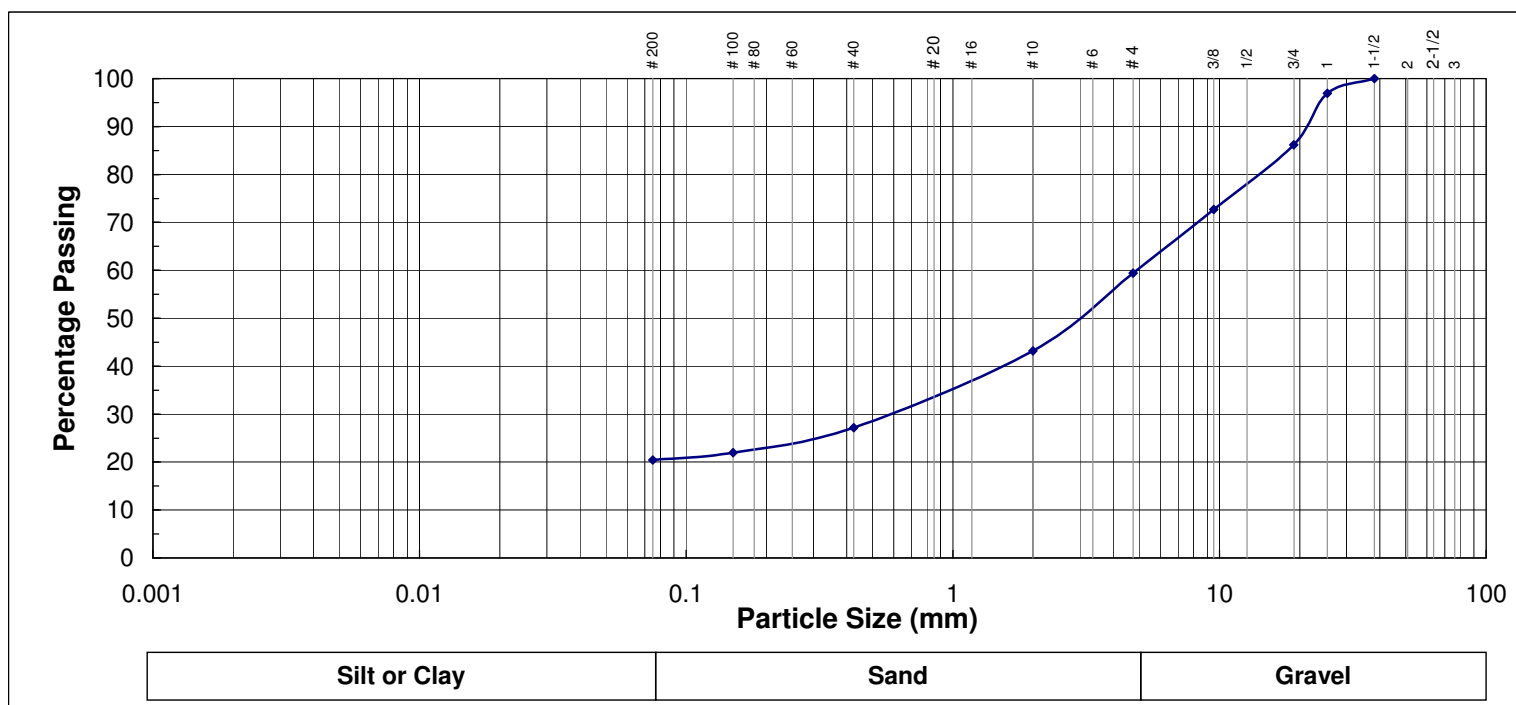


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 25.0-25.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/24	Tested By : M. Daryaei



Unifide Soil Classification : **GC**

Liquid Limit (%) : **28.5**

Passing Sieve # 4 : **59.4**

Description : *Clayey Gravel with sand*

Plasticity Index (%) : **10.8**

Passing Sieve # 40 : **27.1**

Passing Sieve # 200 : **20.4**

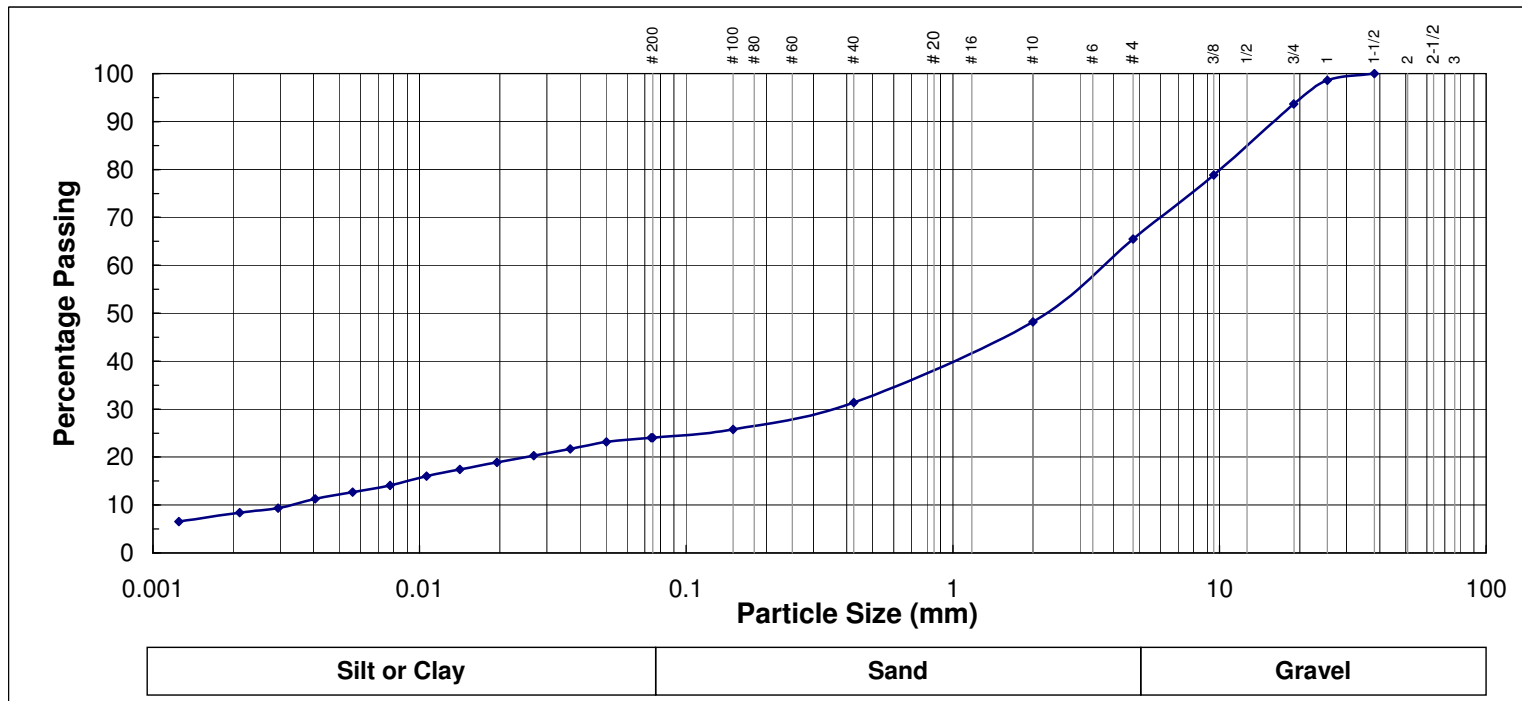


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 26.50-27.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/24	Tested By : M. Daryaei



Unifide Soil Classification : **SM**

Liquid Limit (%) : **-**

Passing Sieve # 4 : **65.5**

Description : **Silty Sand with gravel**

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : **31.4**

Passing Sieve # 200 : **24.0**

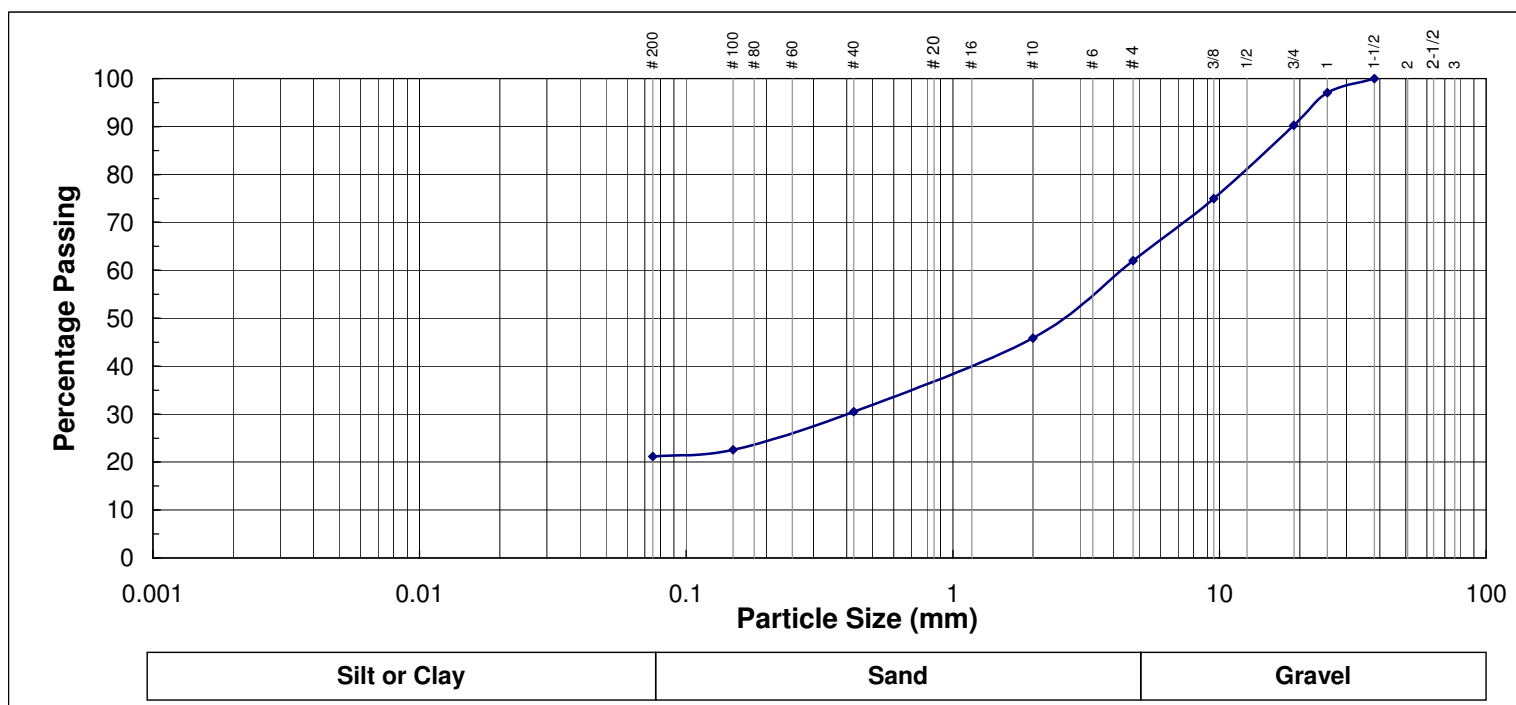


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 28.0-28.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/24	Tested By : M. Daryaei



Unified Soil Classification : **SM**

Liquid Limit (%) : **-**

Passing Sieve # 4 : **62.0**

Description : **Silty Sand with gravel**

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : **30.5**

Passing Sieve # 200 : **21.2**

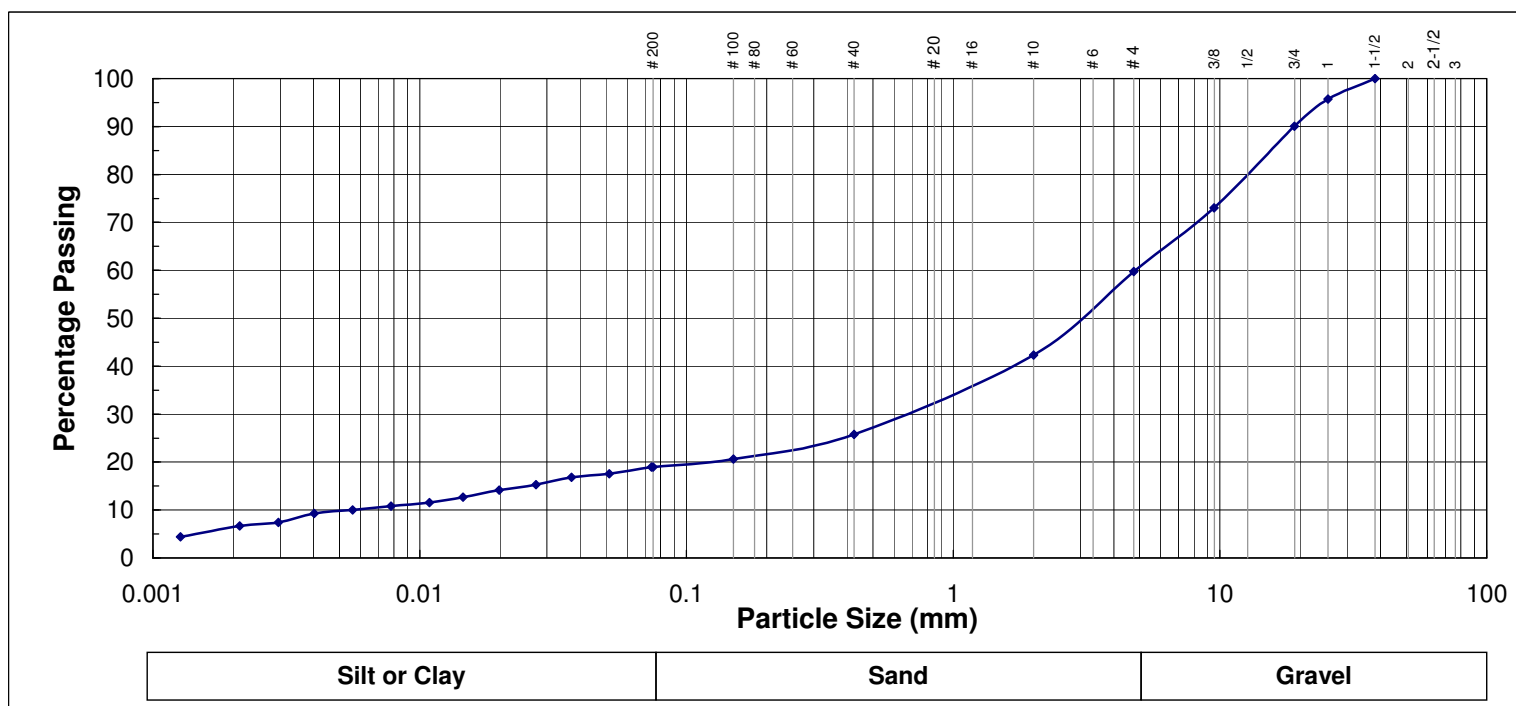


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 29.50-30.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/24	Tested By : M. Daryaei



Unifide Soil Classification : **SC**

Liquid Limit (%) : **28.9**

Passing Sieve # 4 : **59.7**

Description : **Clayey Sand with gravel**

Plasticity Index (%) : **11.9**

Passing Sieve # 40 : **25.8**

Passing Sieve # 200 : **19.0**

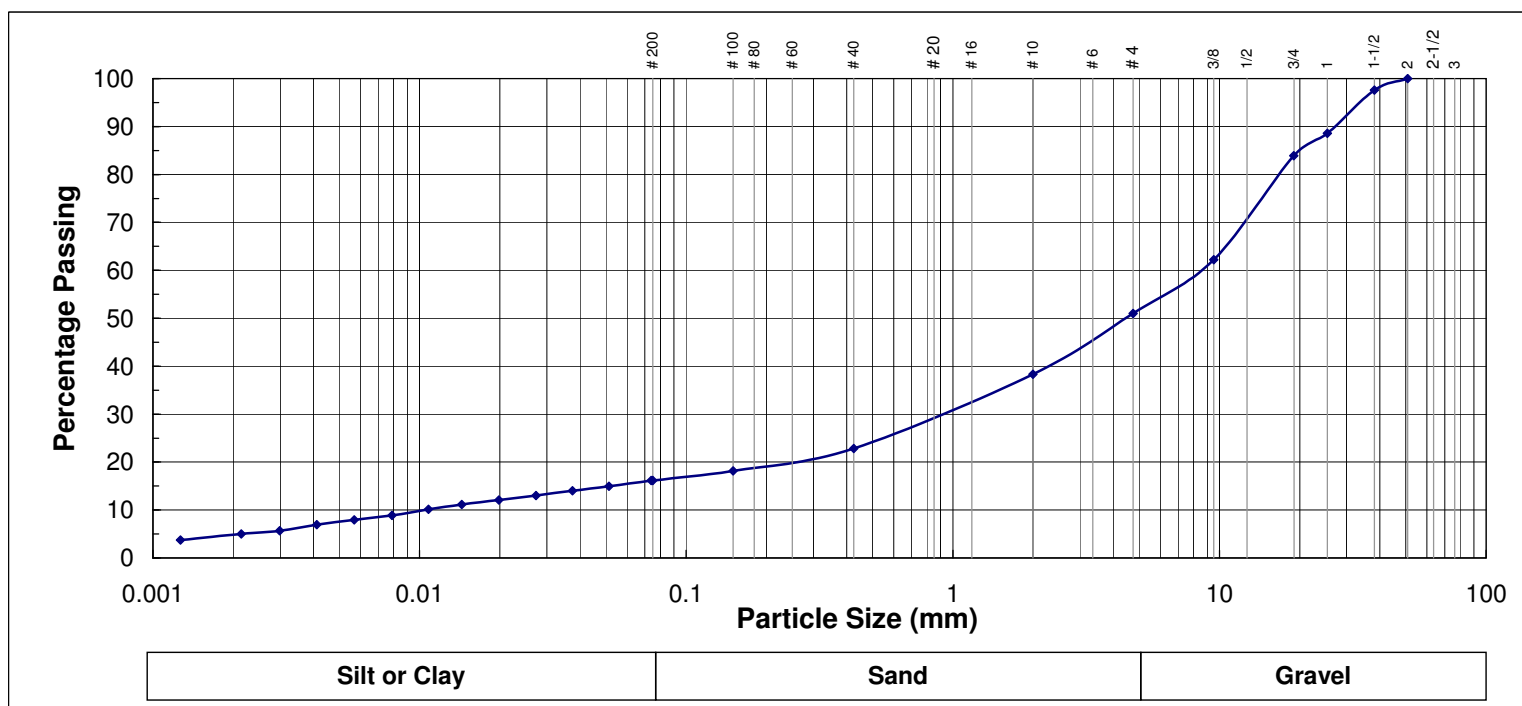


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 1.0-1.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/25	Tested By : M. Daryaei



Unifide Soil Classification : **GC**

Liquid Limit (%) : **24.4**

Passing Sieve # 4 : **51.0**

Description : **Clayey Gravel with sand**

Plasticity Index (%) : **9.2**

Passing Sieve # 40 : **22.8**

Passing Sieve # 200 : **16.2**

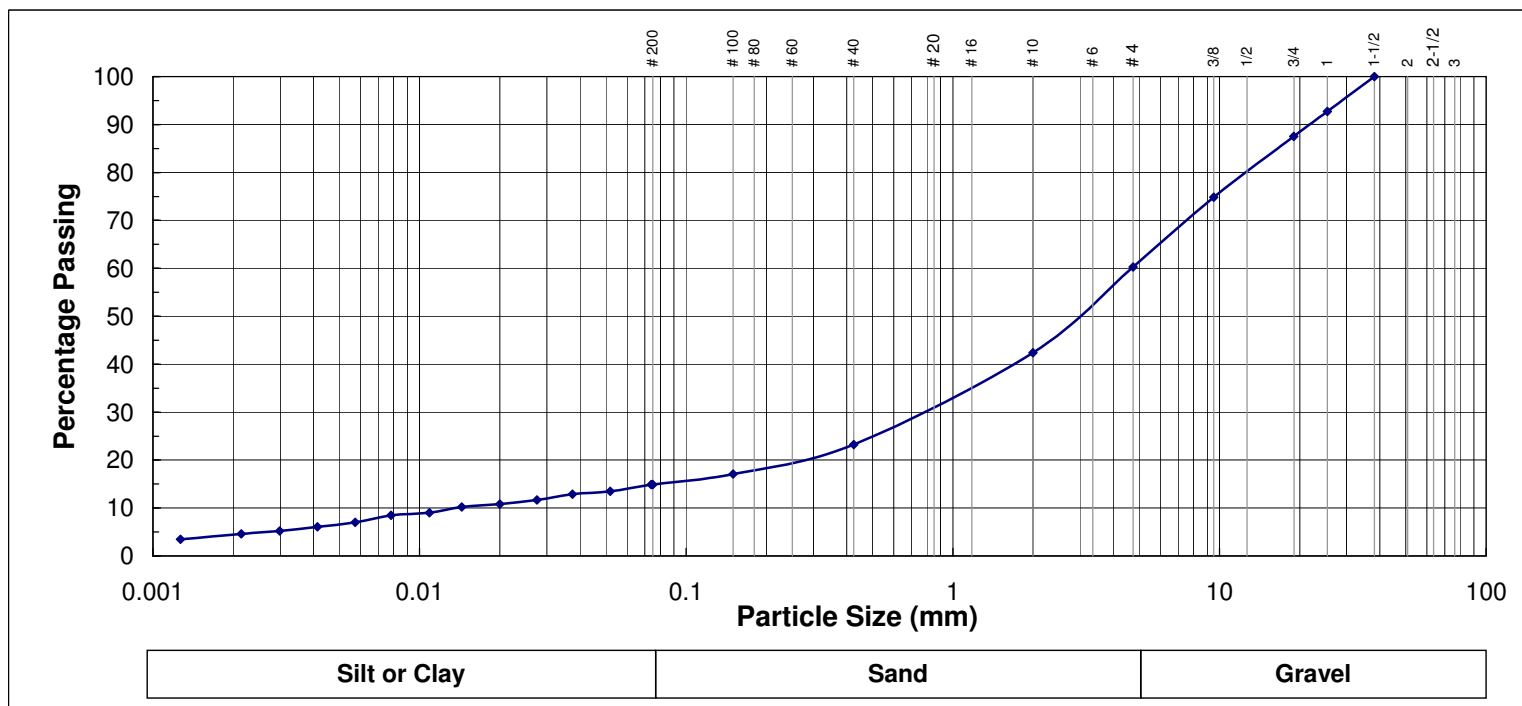


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 2.0-2.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/26	Tested By : M. Daryaei



Unified Soil Classification : **SM**

Liquid Limit (%) : -

Passing Sieve # 4 : 60.3

Description : *Silty Sand with gravel*

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : 23.2

Passing Sieve # 200 : 14.9

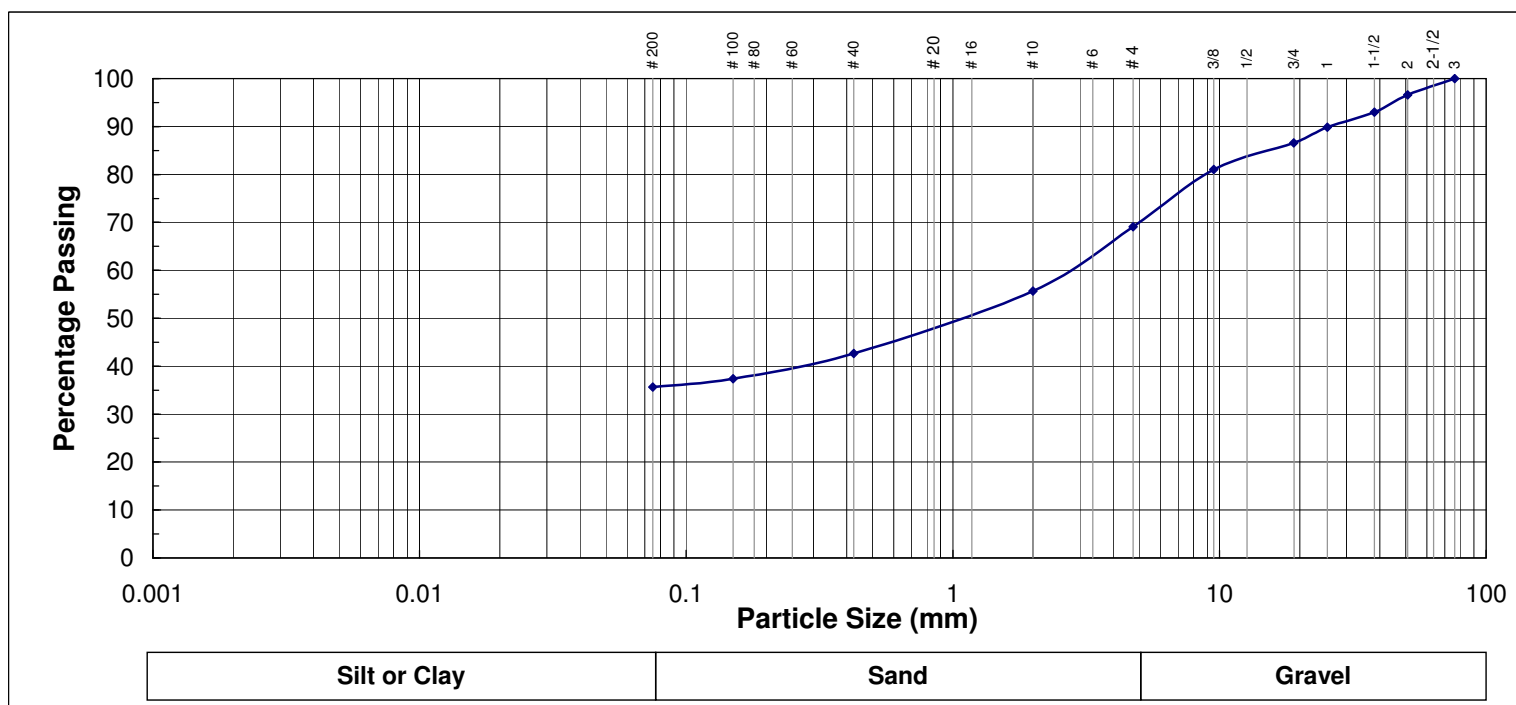


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 3.0-3.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/29	Tested By : M. Daryaei



Unified Soil Classification : **SC**

Liquid Limit (%) : **29.4**

Passing Sieve # 4 : **69.1**

Description : **Clayey Sand with gravel**

Plasticity Index (%) : **9.8**

Passing Sieve # 40 : **42.7**

Passing Sieve # 200 : **35.6**

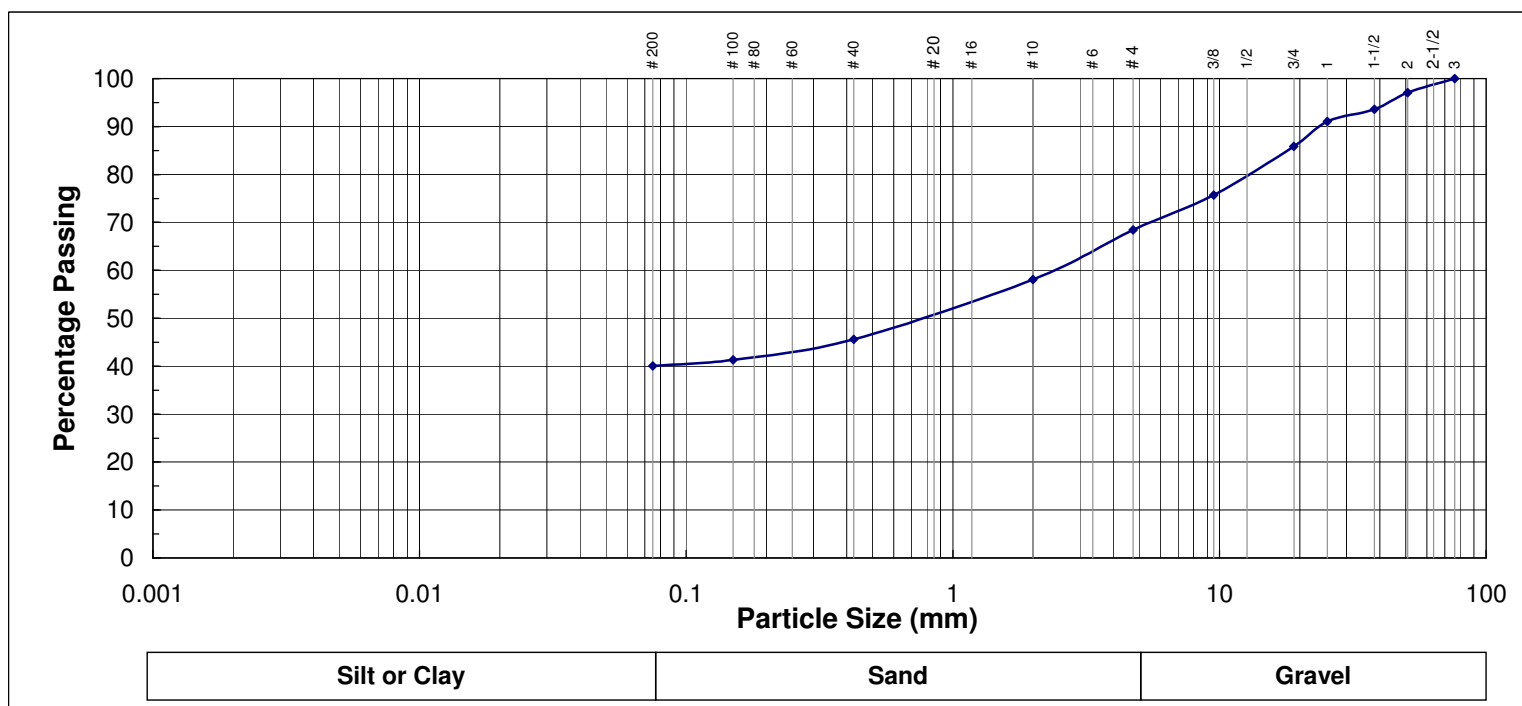


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 4.50-5.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/29	Tested By : M. Daryaei



Unified Soil Classification : **GC**

Liquid Limit (%) : **4.5**

Passing Sieve # 4 : **68.4**

Description : **Clayey Gravel with sand**

Plasticity Index (%) : **5.0**

Passing Sieve # 40 : **45.6**

Passing Sieve # 200 : **40.1**

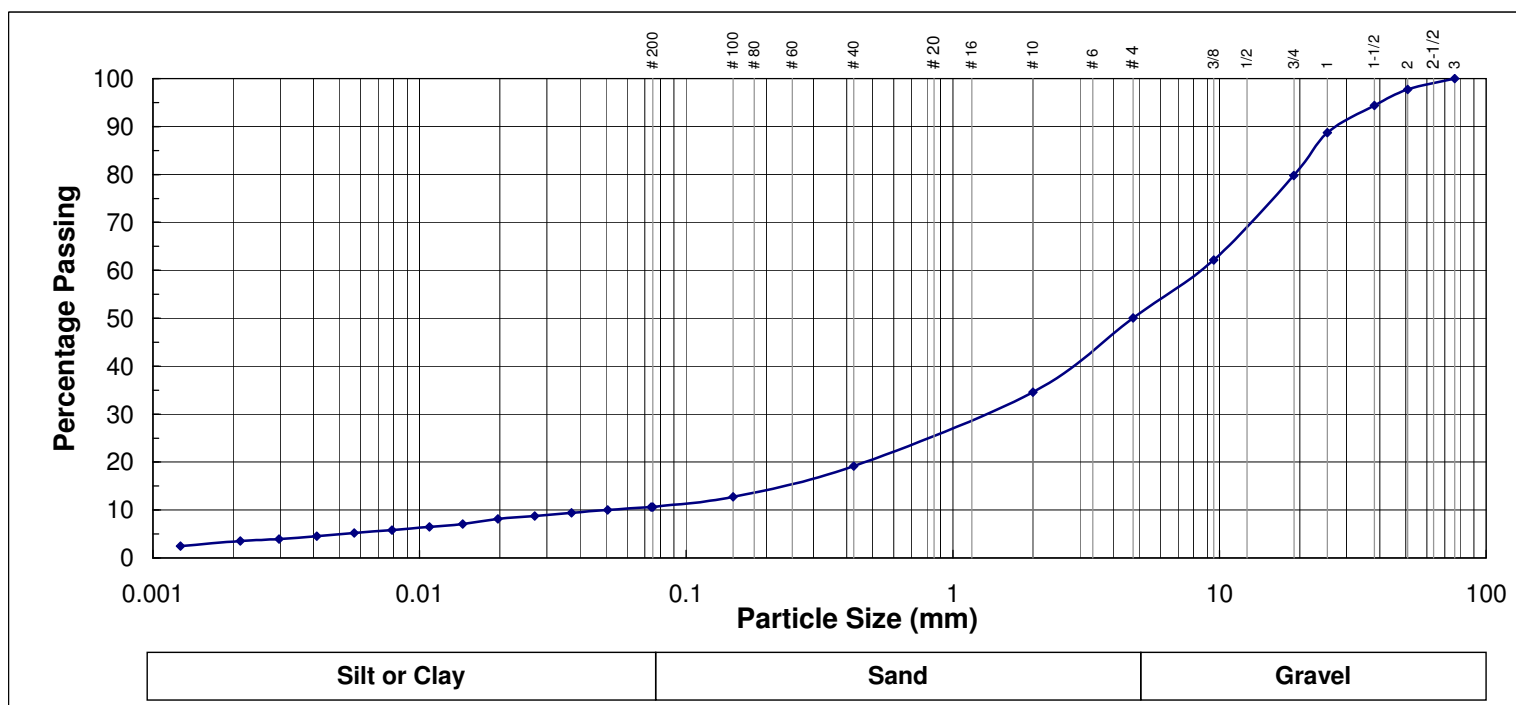


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 6.0-6.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/27	Tested By : M. Daryaei



Unified Soil Classification : **GP-GC**

Liquid Limit (%) : **25.5**

Passing Sieve # 4 : **50.1**

Description : *Poorly graded Gravel with clay and sand*

Plasticity Index (%) : **6.8**

Passing Sieve # 40 : **19.2**

Passing Sieve # 200 : **10.6**

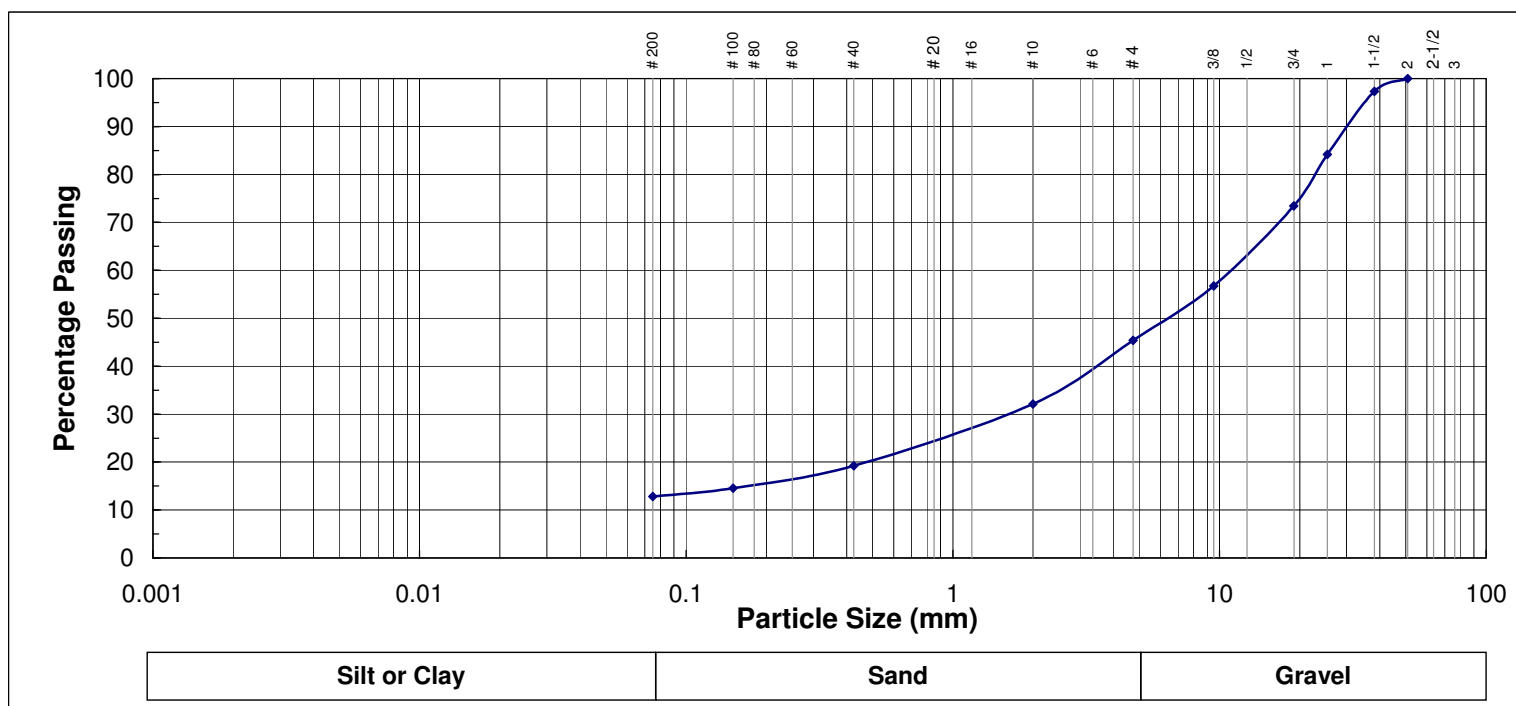


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 7.50-8.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/29	Tested By : M. Daryaei



Unifide Soil Classification : **GC**

Liquid Limit (%) : **23.5**

Passing Sieve # 4 : **45.4**

Description : **Clayey Gravel with sand**

Plasticity Index (%) : **8.2**

Passing Sieve # 40 : **19.2**

Passing Sieve # 200 : **12.8**

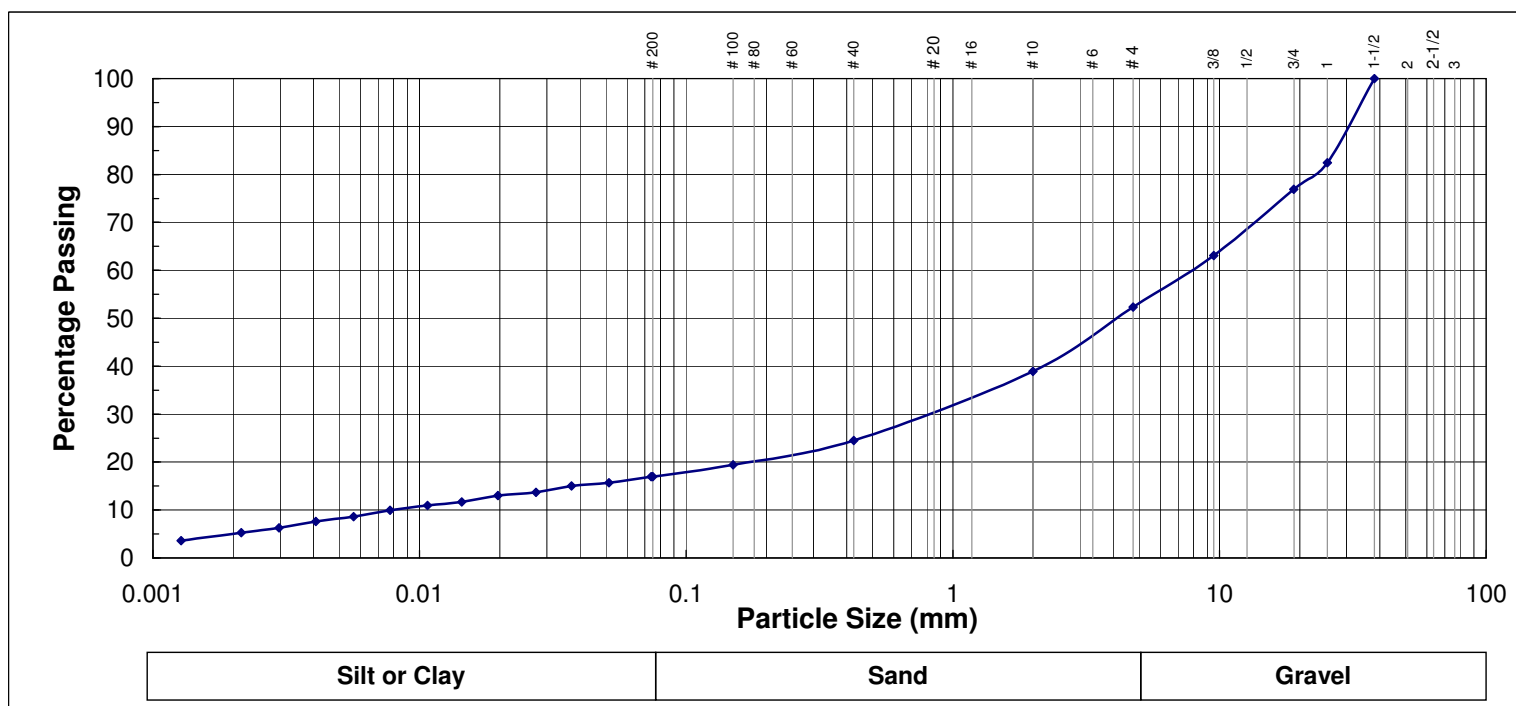


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 9.0-9.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/25	Tested By : M. Daryaei



Unifide Soil Classification : **GM**

Liquid Limit (%) : -

Passing Sieve # 4 : 52.3

Description : *Silty Gravel with sand*

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : 24.5

Passing Sieve # 200 : 17.0

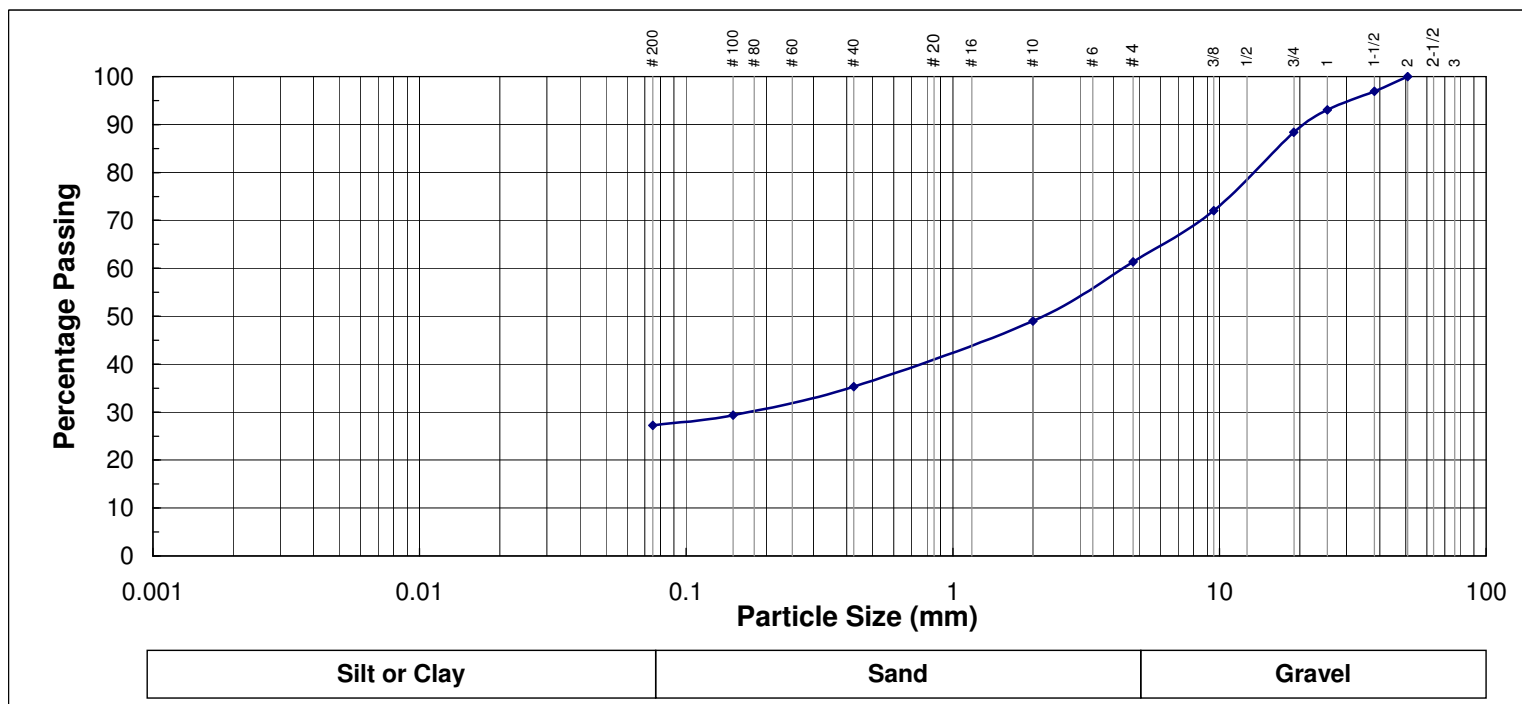


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 10.50-11.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/28	Tested By : M. Daryaei



Unifide Soil Classification : **GC**

Liquid Limit (%) : **25.6**

Passing Sieve # 4 : **61.4**

Description : *Clayey Gravel with sand*

Plasticity Index (%) : **9.3**

Passing Sieve # 40 : **35.3**

Passing Sieve # 200 : **27.2**

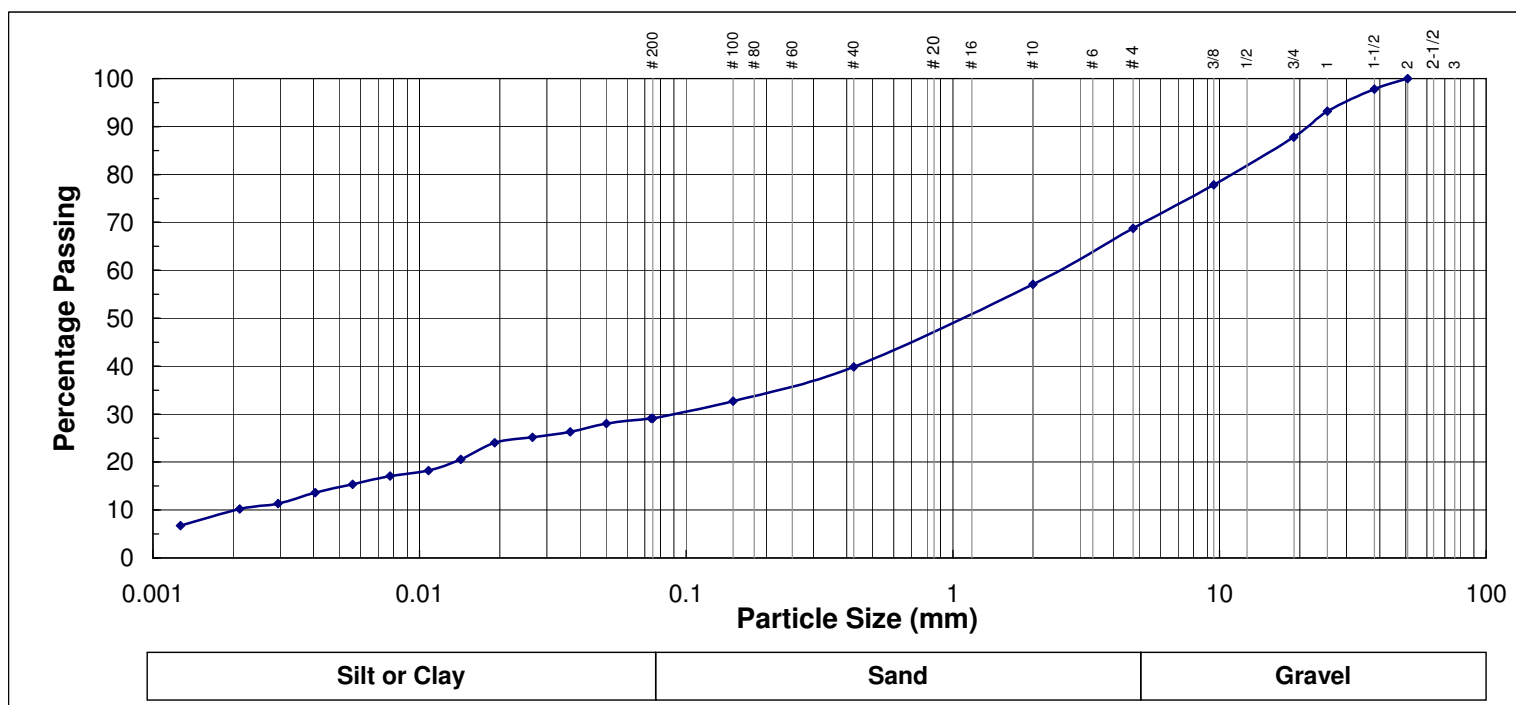


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 12.0-12.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/26	Tested By : M. Daryaei



Unifide Soil Classification : **SC**

Liquid Limit (%) : **22.0**

Passing Sieve # 4 : **68.7**

Description : *Clayey Sand with gravel*

Plasticity Index (%) : **10.7**

Passing Sieve # 40 : **39.8**

Passing Sieve # 200 : **29.1**

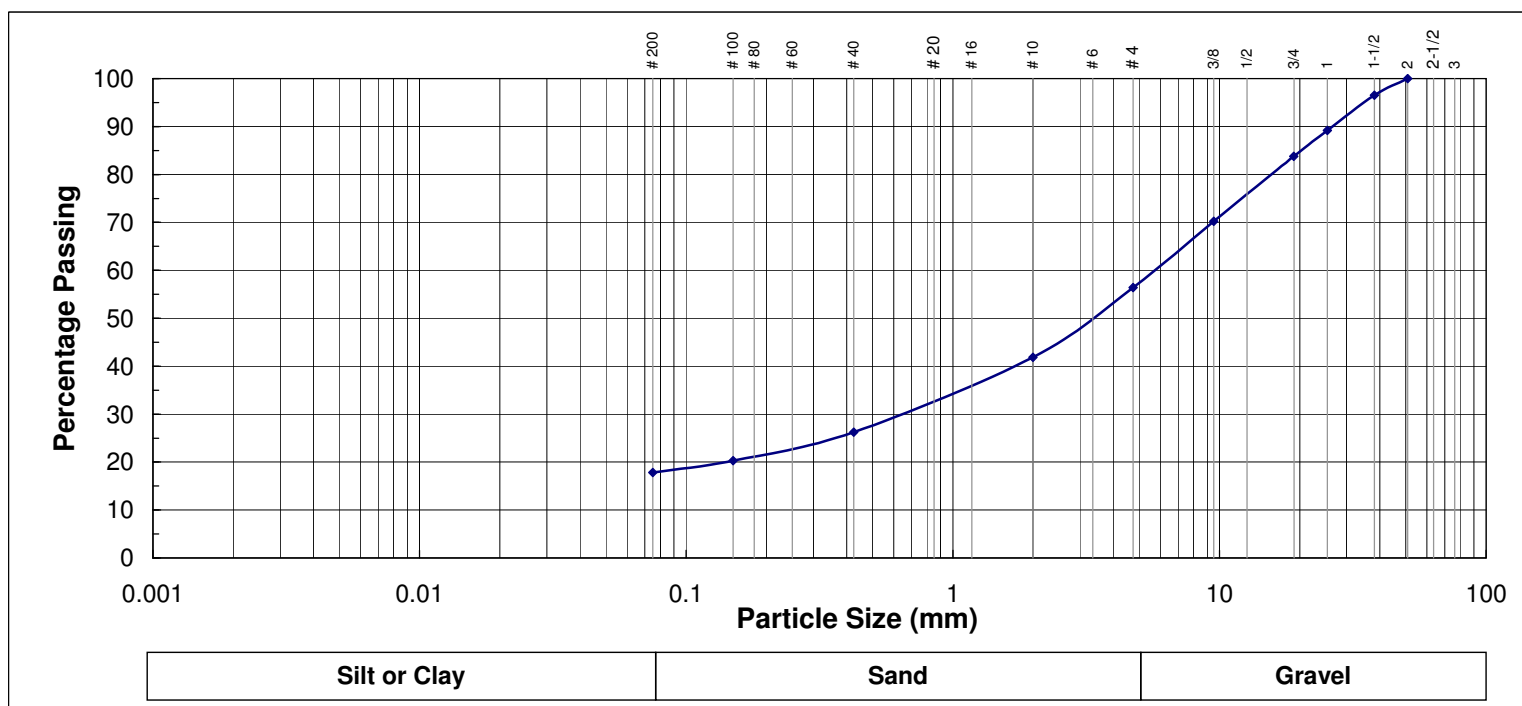


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 13.50-14.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/28	Tested By : M. Daryaei



Unifide Soil Classification : **GC**

Liquid Limit (%) : **24.8**

Passing Sieve # 4 : **56.4**

Description : **Clayey Gravel with sand**

Plasticity Index (%) : **6.1**

Passing Sieve # 40 : **26.3**

Passing Sieve # 200 : **17.8**

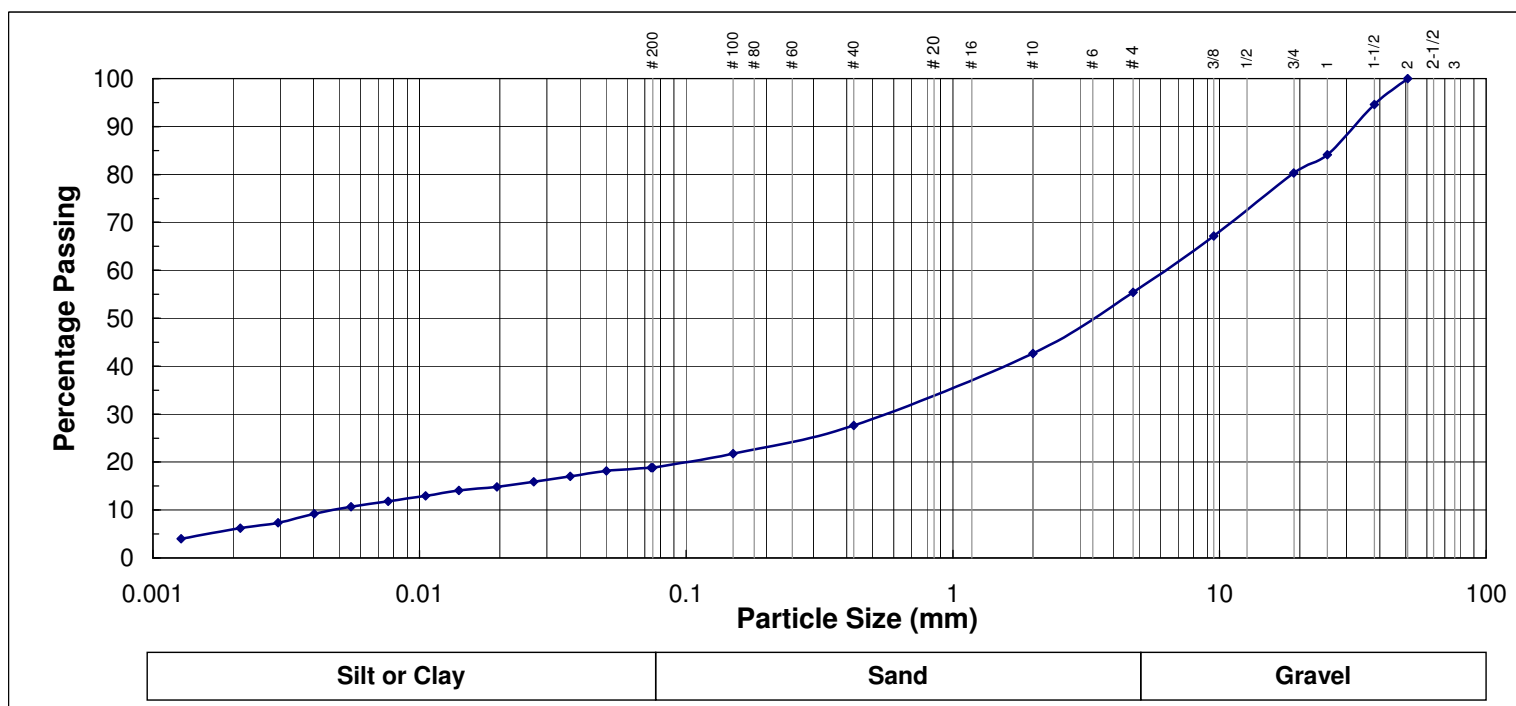


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 15.0-15.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/26	Tested By : M. Daryaei



Unified Soil Classification : **GM**

Liquid Limit (%) : **-**

Passing Sieve # 4 : **55.4**

Description : **Silty Gravel with sand**

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : **27.7**

Passing Sieve # 200 : **18.8**

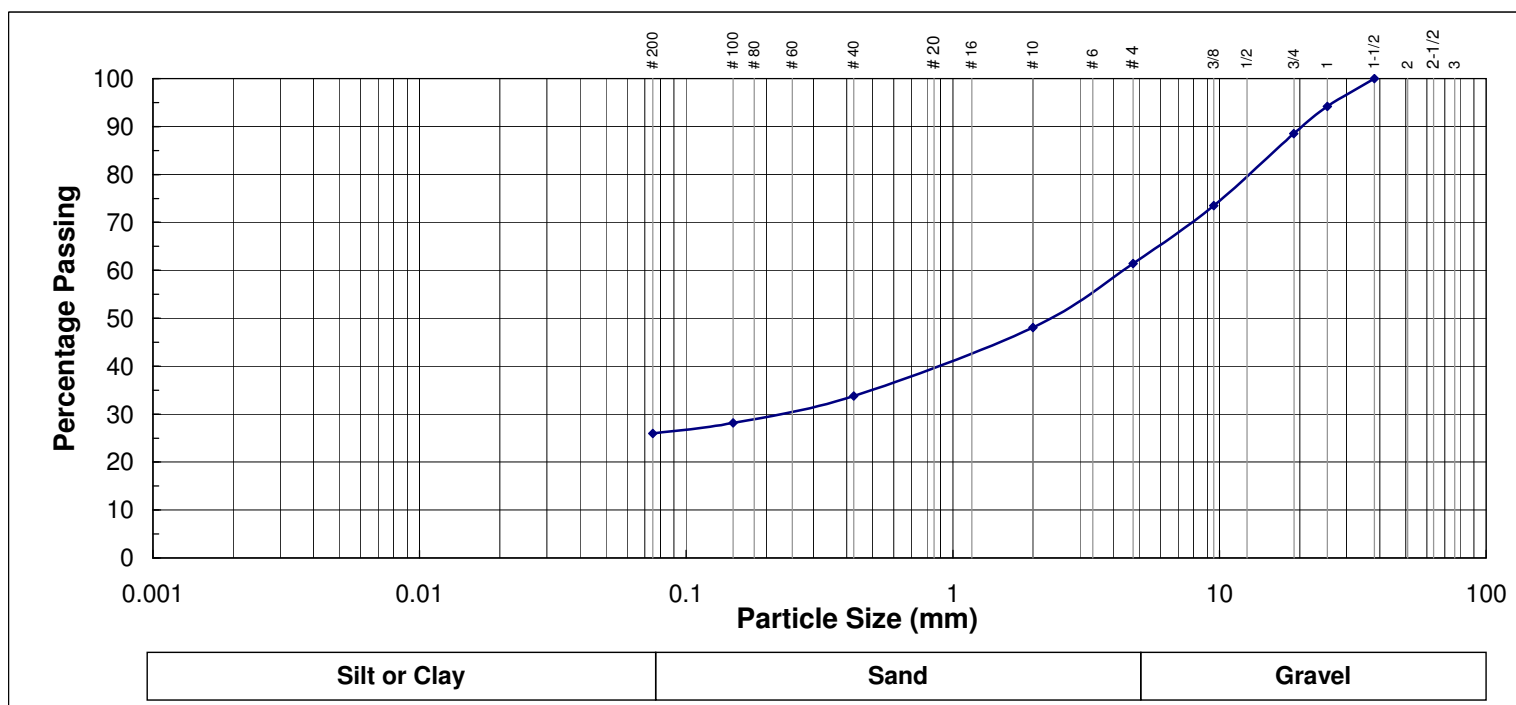


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 16.50-17.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/27	Tested By : M. Daryaei



Unified Soil Classification : **GM**

Liquid Limit (%) : **-**

Passing Sieve # 4 : **61.4**

Description : **Silty Gravel with sand**

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : **33.8**

Passing Sieve # 200 : **25.9**

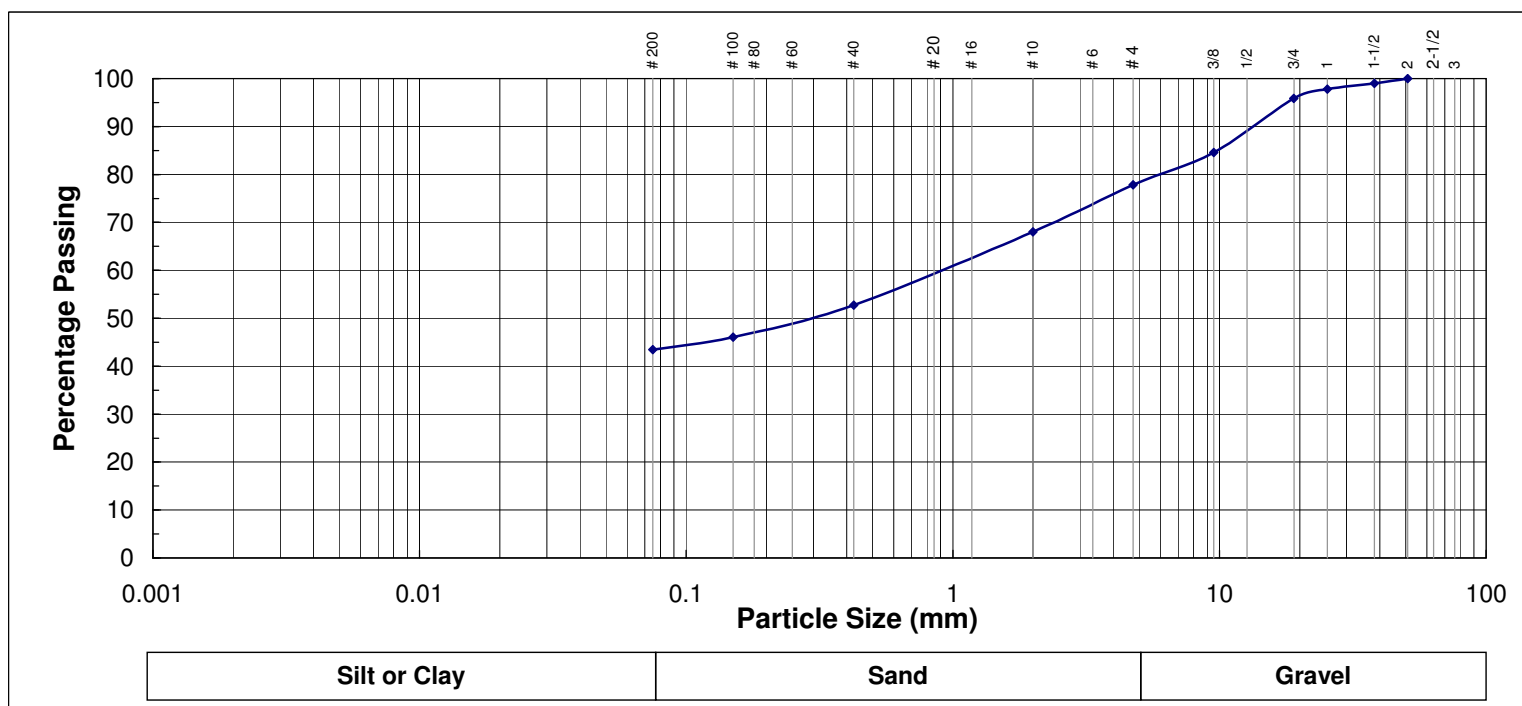


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 18.0-18.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/27	Tested By : M. Daryaei



Unified Soil Classification : **SC**

Liquid Limit (%) : **21.4**

Passing Sieve # 4 : **77.8**

Description : *Clayey Sand with gravel*

Plasticity Index (%) : **9.4**

Passing Sieve # 40 : **52.7**

Passing Sieve # 200 : **43.5**

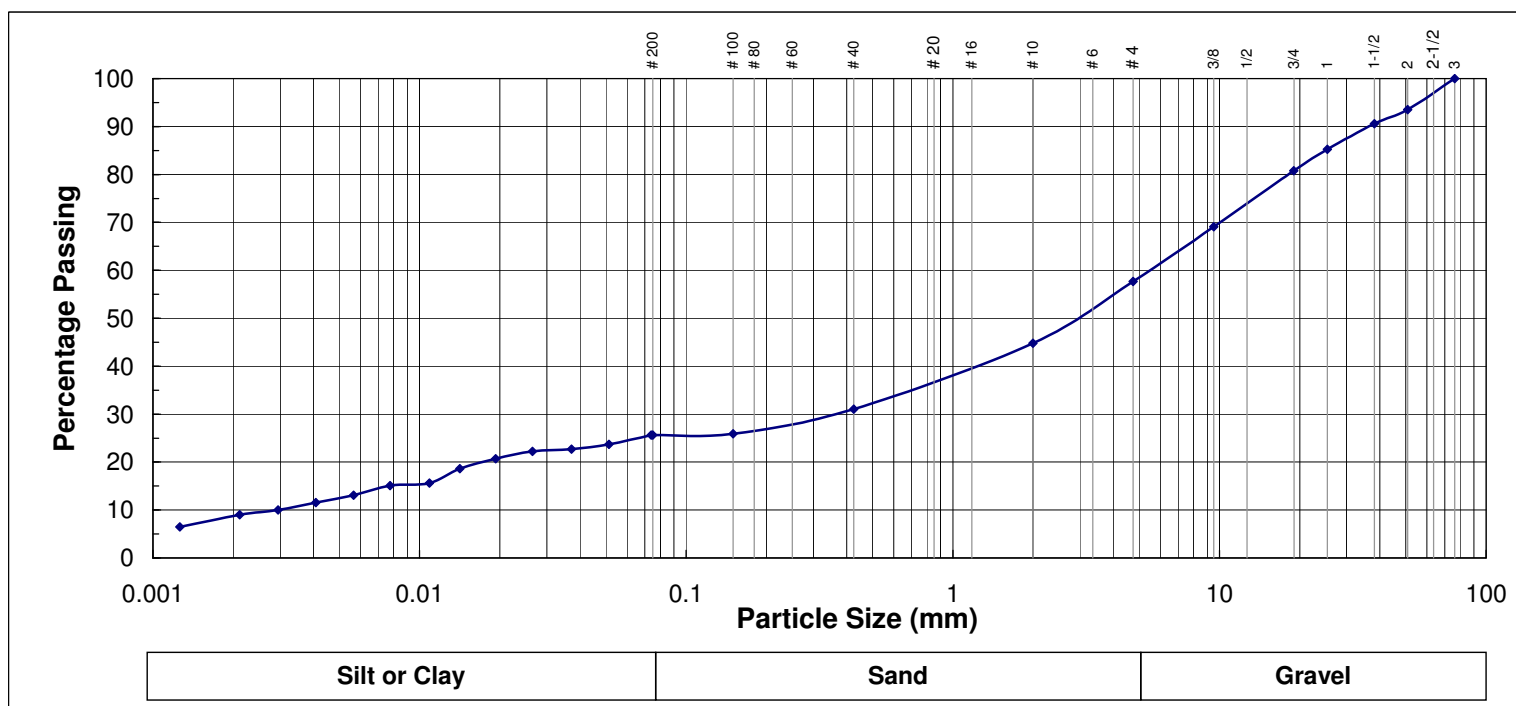


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 19.50-20.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/25	Tested By : M. Daryaei



Unified Soil Classification : **GC**

Liquid Limit (%) : **2.3**

Passing Sieve # 4 : **57.6**

Description : **Clayey Gravel with sand**

Plasticity Index (%) : **6.8**

Passing Sieve # 40 : **31.0**

Passing Sieve # 200 : **25.7**

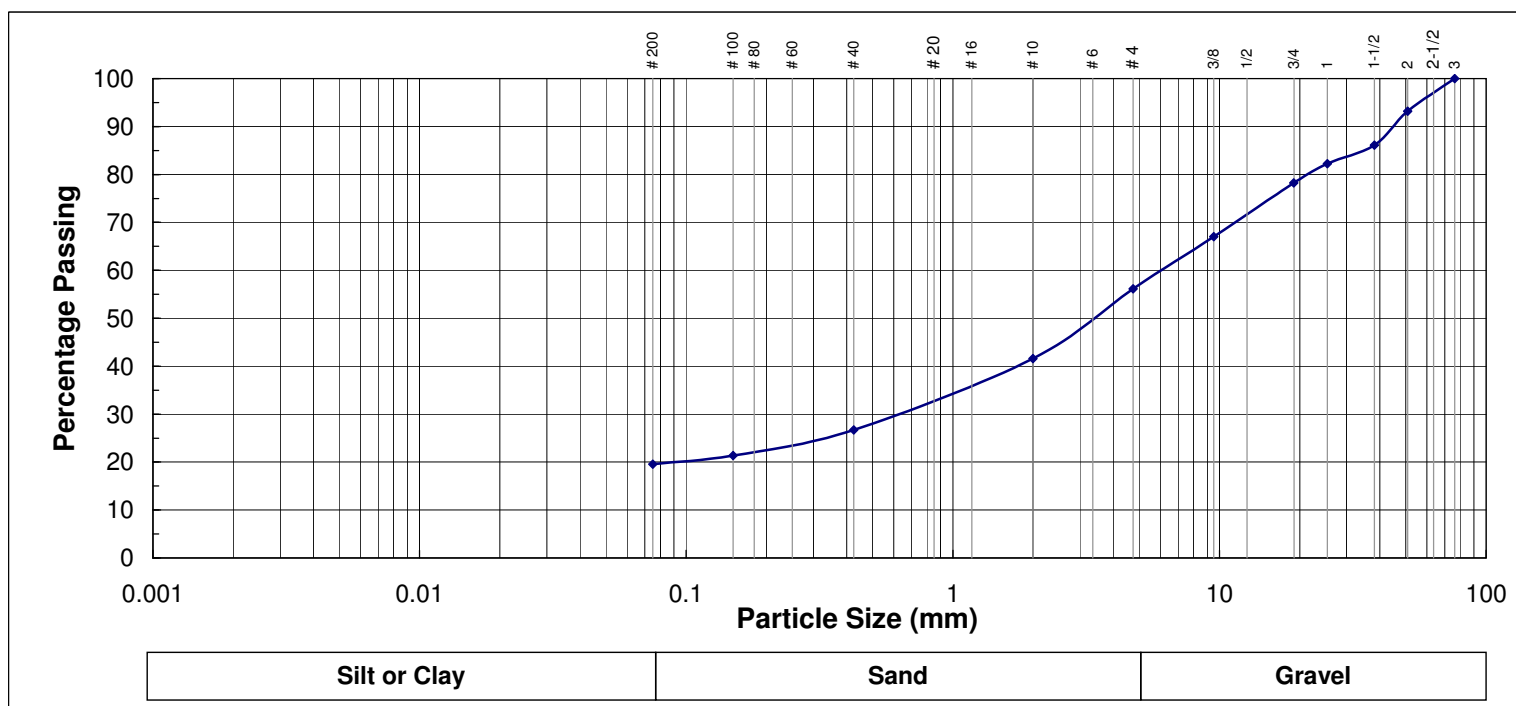


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 21.0-21.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/27	Tested By : M. Daryaei



Unified Soil Classification : **GM**

Liquid Limit (%) : -

Passing Sieve # 4 : **56.1**

Description : *Silty Gravel with sand*

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : **26.7**

Passing Sieve # 200 : **19.6**

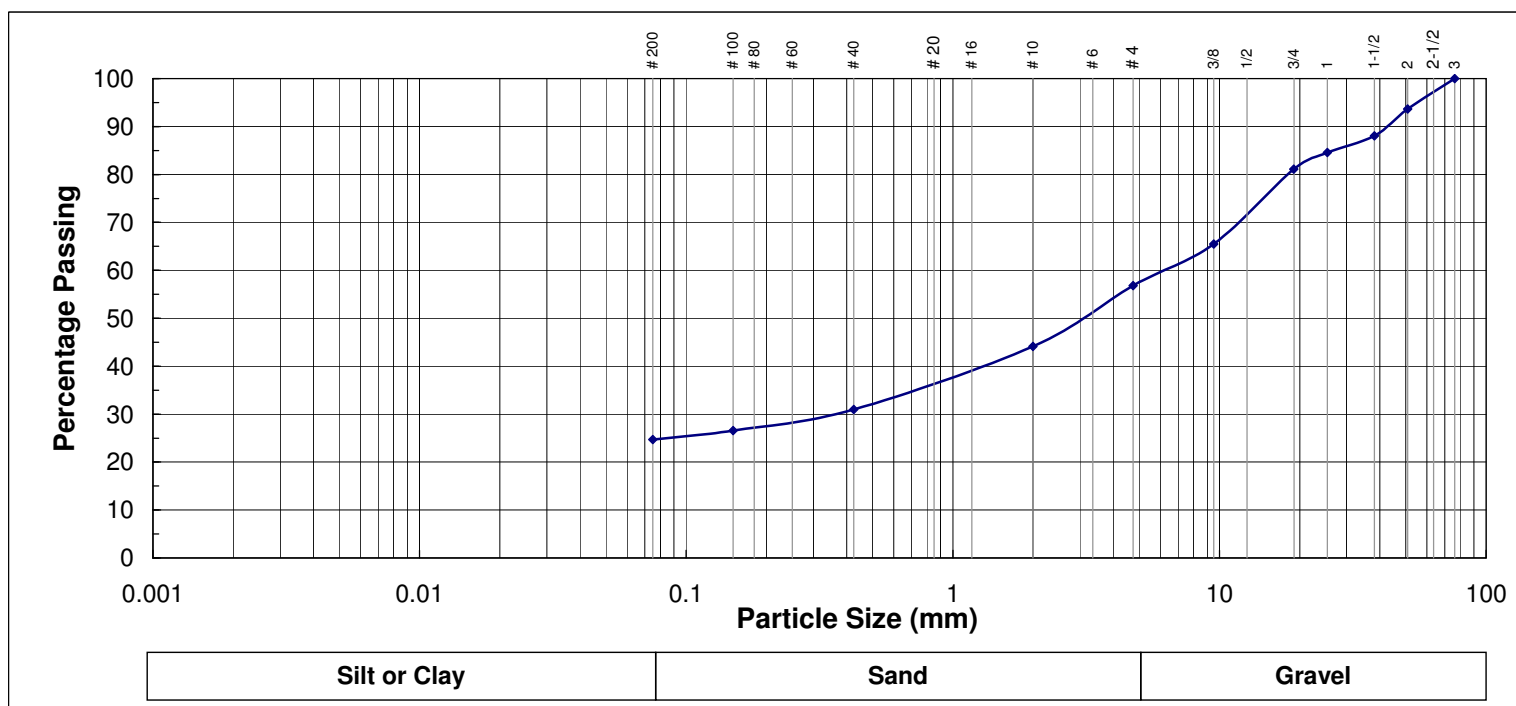


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 22.50-23.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/29	Tested By : M. Daryaei



Unifide Soil Classification : **GM**

Liquid Limit (%) : **-**

Passing Sieve # 4 : **56.8**

Description : **Silty Gravel with sand**

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : **31.0**

Passing Sieve # 200 : **24.7**

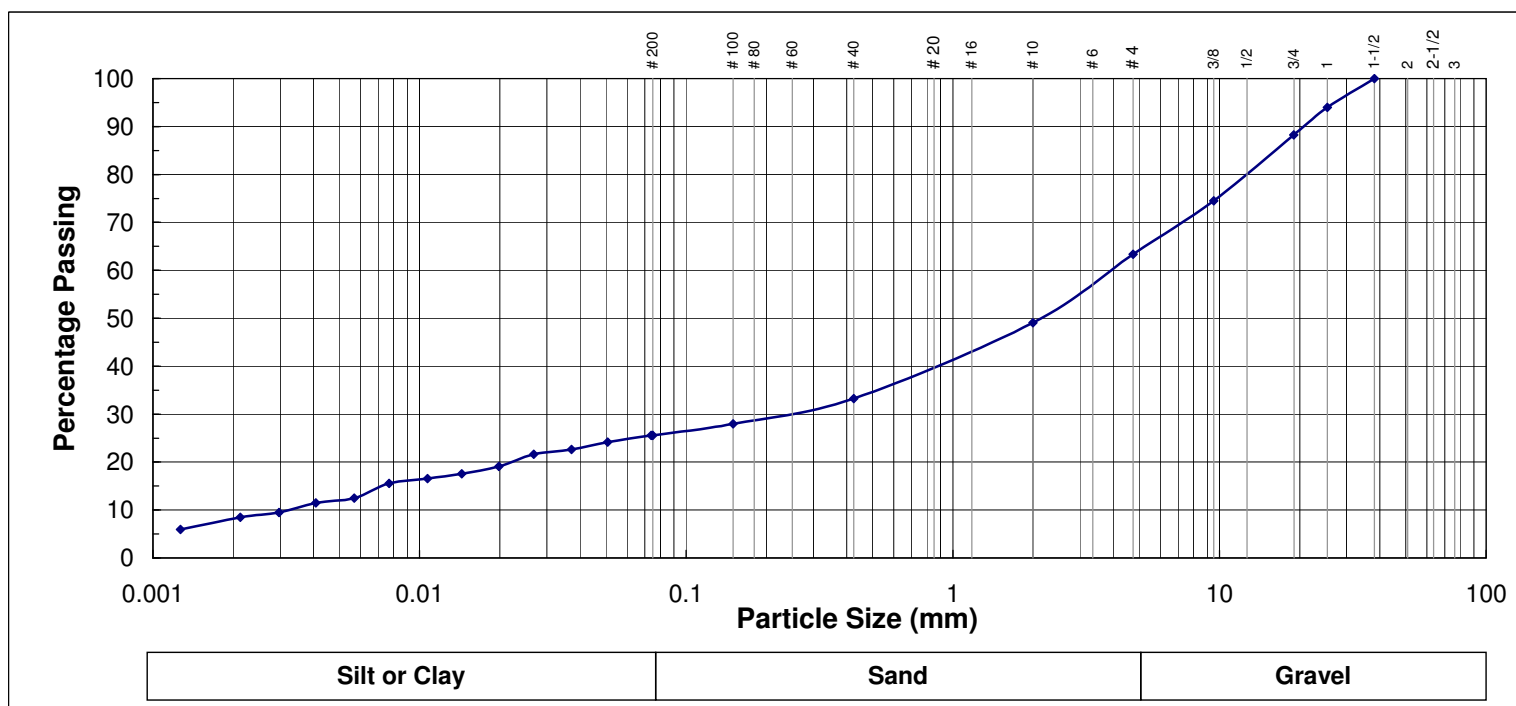


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 24.0-24.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/26	Tested By : M. Daryaei



Unifide Soil Classification : **SC**

Liquid Limit (%) : **23.6**

Passing Sieve # 4 : **63.4**

Description : *Clayey Sand with gravel*

Plasticity Index (%) : **6.3**

Passing Sieve # 40 : **33.2**

Passing Sieve # 200 : **25.6**

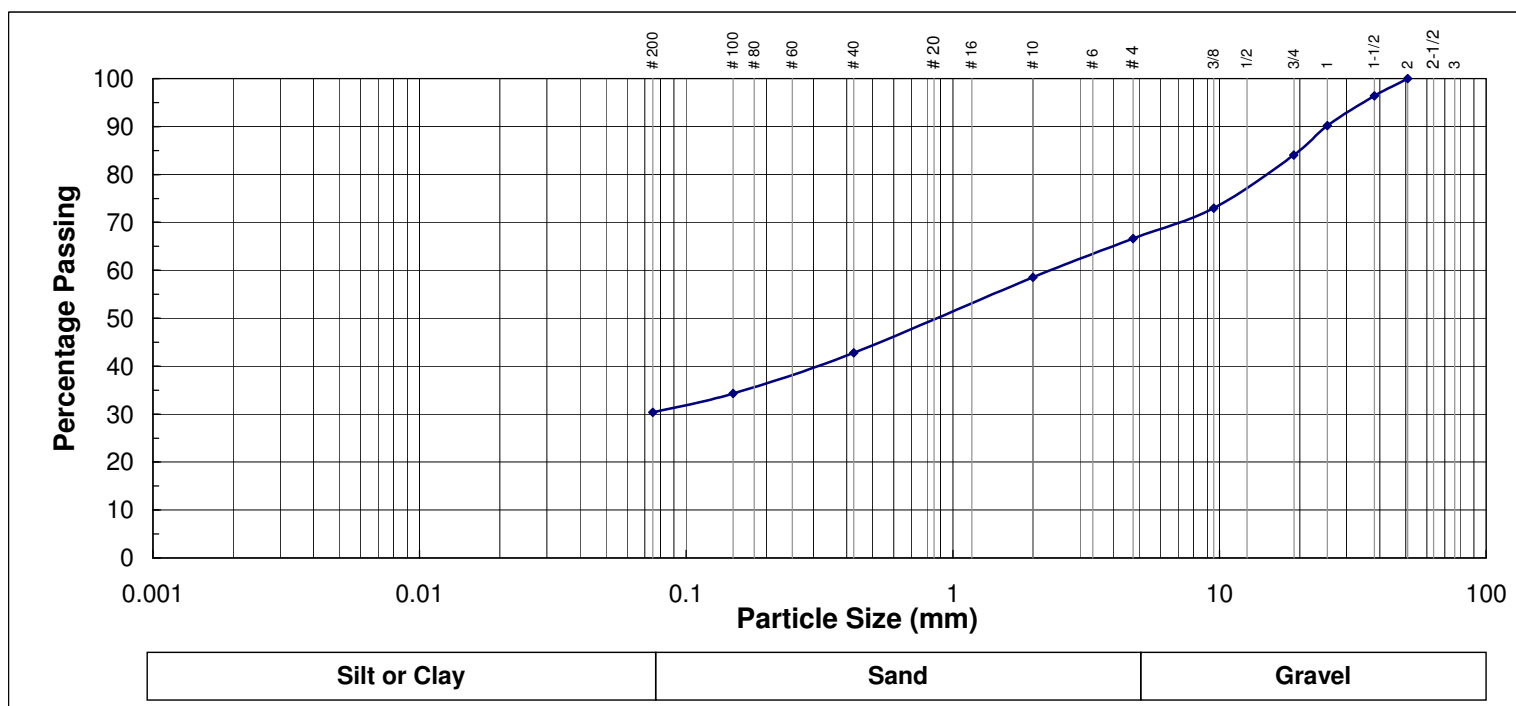


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 25.50-26.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/28	Tested By : M. Daryaei



Unifide Soil Classification : **SC**

Liquid Limit (%) : **23.3**

Passing Sieve # 4 : **66.6**

Description : *Clayey Sand with gravel*

Plasticity Index (%) : **8.8**

Passing Sieve # 40 : **42.8**

Passing Sieve # 200 : **30.3**

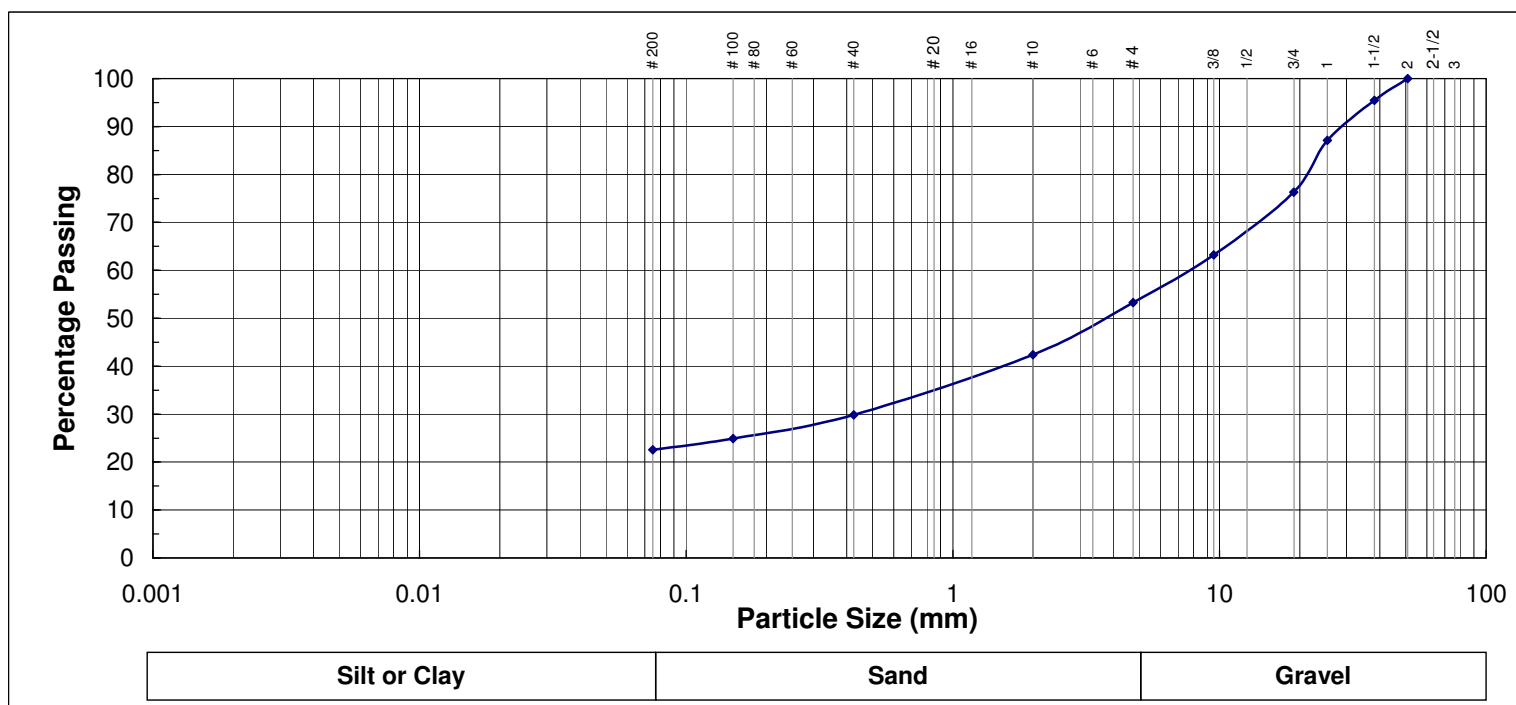


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 27.0-27.50	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/28	Tested By : M. Daryaei



Unified Soil Classification : **GC**

Liquid Limit (%) : **23.1**

Passing Sieve # 4 : **53.3**

Description : **Clayey Gravel with sand**

Plasticity Index (%) : **7.4**

Passing Sieve # 40 : **29.8**

Passing Sieve # 200 : **22.5**

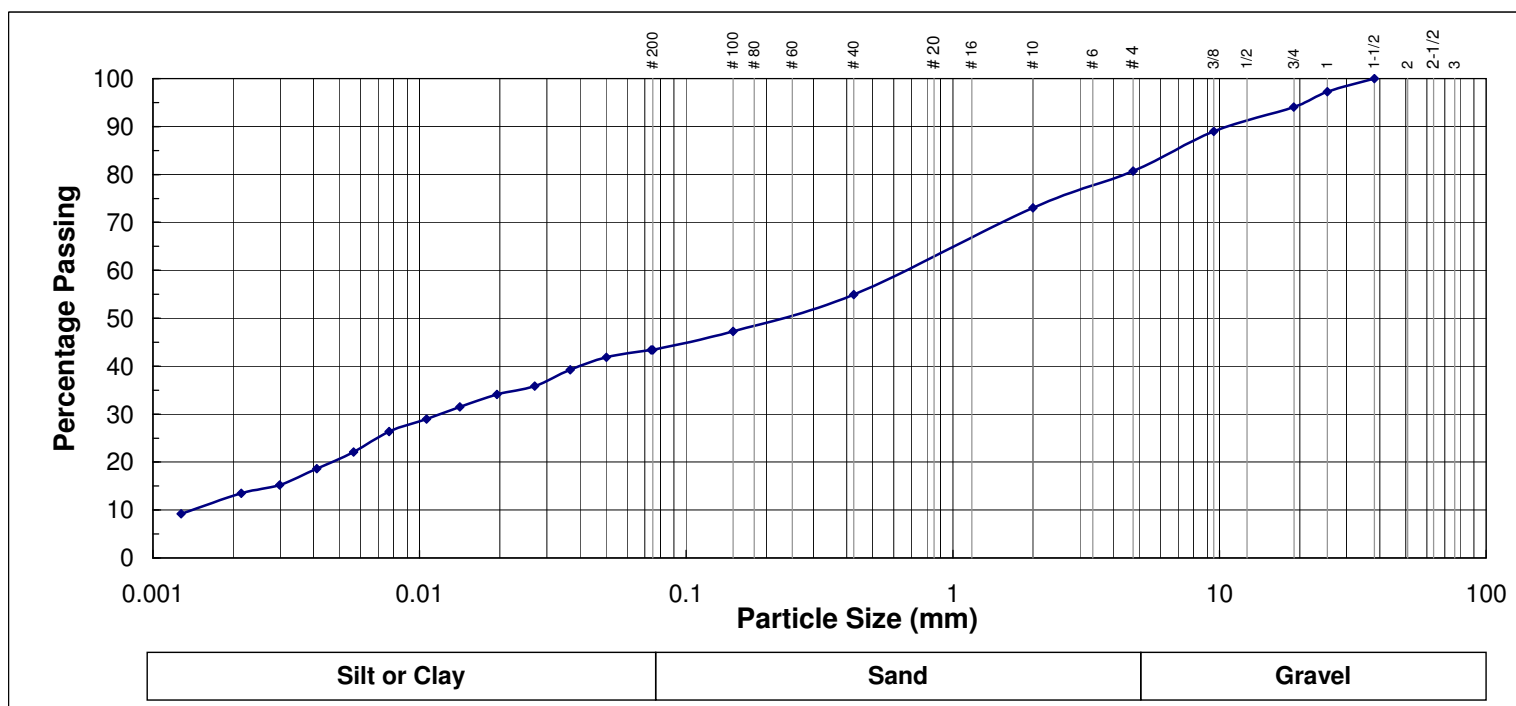


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 29.50-30.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/05/25	Tested By : M. Daryaei



Unifide Soil Classification : **SM**

Liquid Limit (%) : **-**

Passing Sieve # 4 : **80.7**

Description : **Silty Sand with gravel**

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : **54.9**

Passing Sieve # 200 : **43.4**

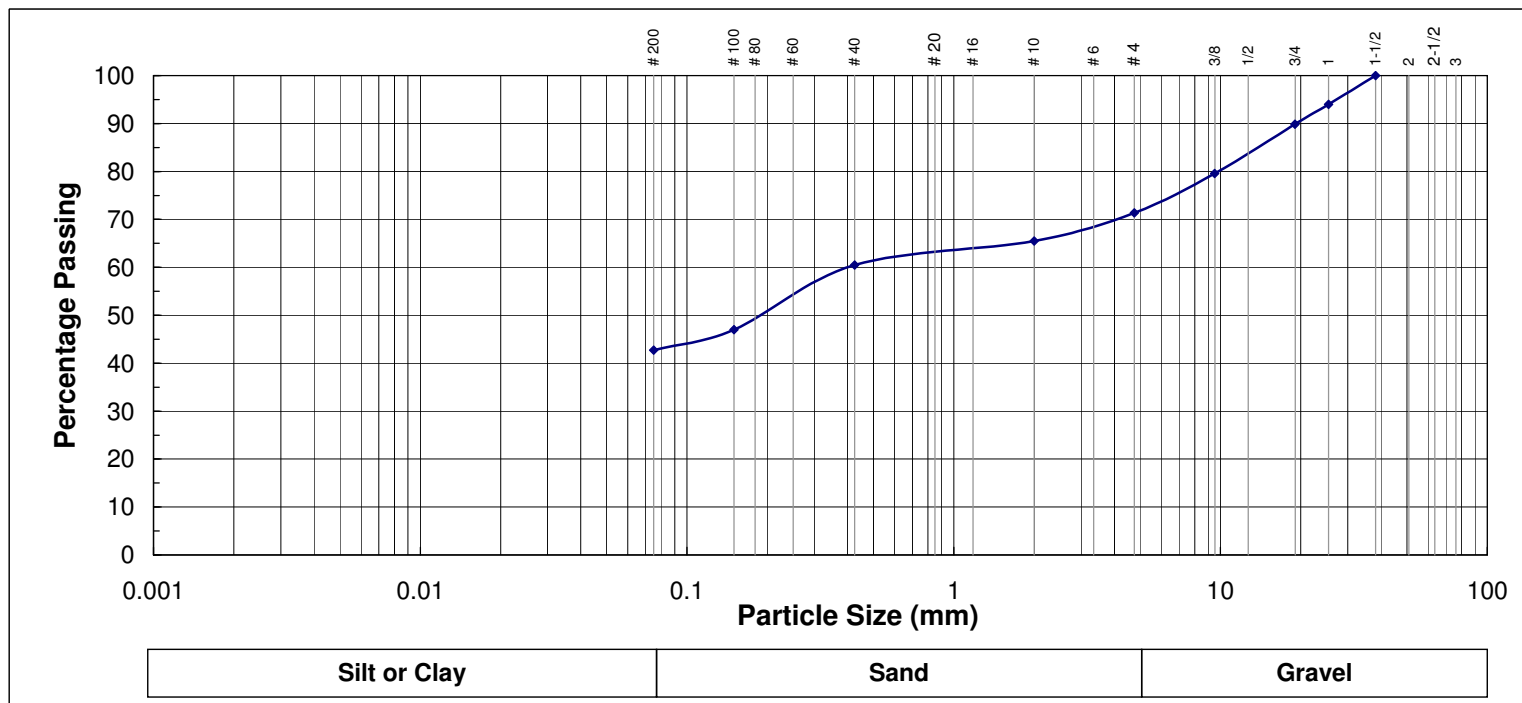


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : TP - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 2.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/06/03	Tested By : M. Daryaei



Unified Soil Classification : **SM**

Liquid Limit (%) : -

Passing Sieve # 4 : 71.4

Description : *Silty Sand with gravel*

Plasticity Index (%) : **NPI**

Passing Sieve # 40 : 60.5

Passing Sieve # 200 : 42.7

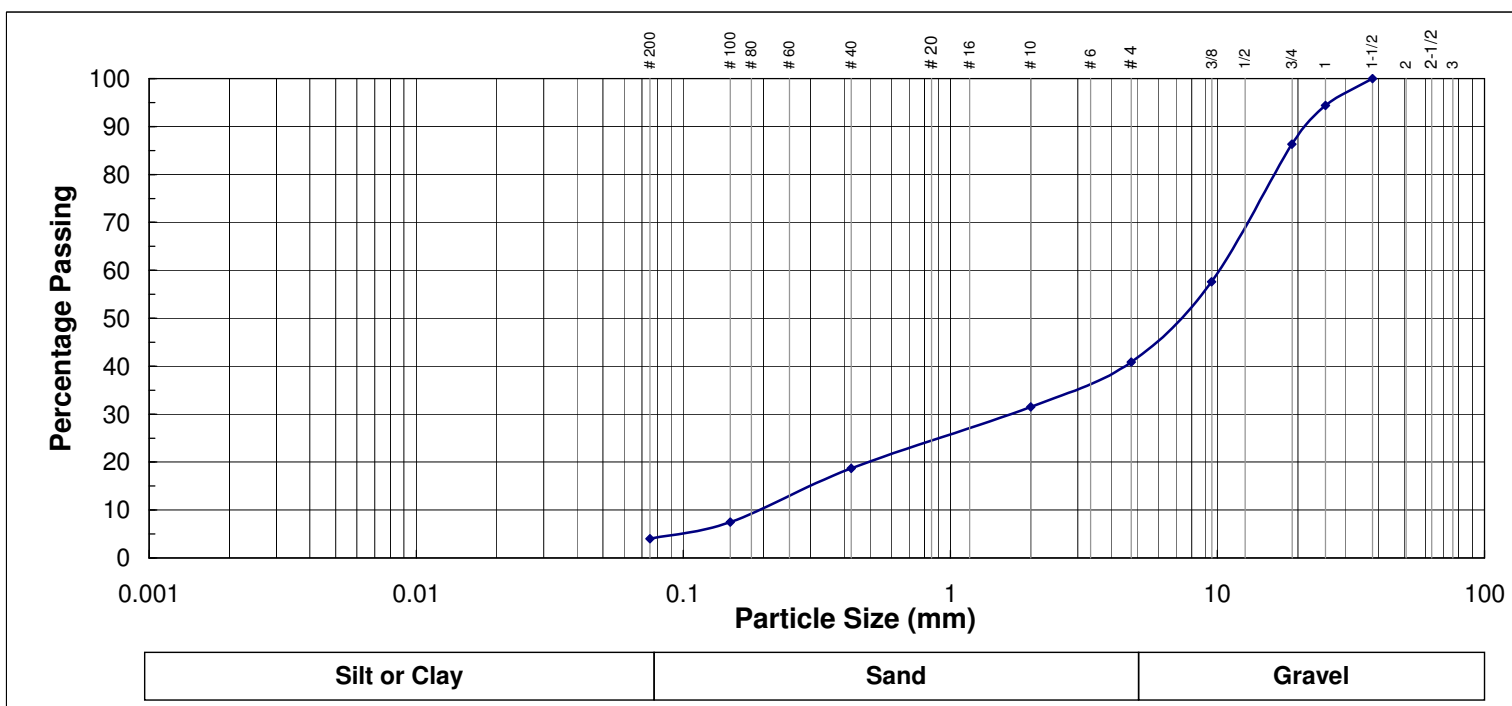


Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

Boring /Test Pit No. : TP - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m) : 4.0	Location : Tehran, Valy-e-Asr Street
Sample No. :	Client: Ministry Of Health
Date : 1386/06/03	Tested By : M. Daryaei



Unified Soil Classification : **GW** Liquid Limit (%) :

Description : *Well graded Gravel with sand* Plasticity Index (%) :

Passing Sieve # 4 : **40.9**

Passing Sieve # 40 : **18.7**

Passing Sieve # 200 : **4.0**



Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

BH / TP No. **TP - 1**

Project : Rajaei Hospital Seismic Retrofitting

Depth (m) : **6.0**

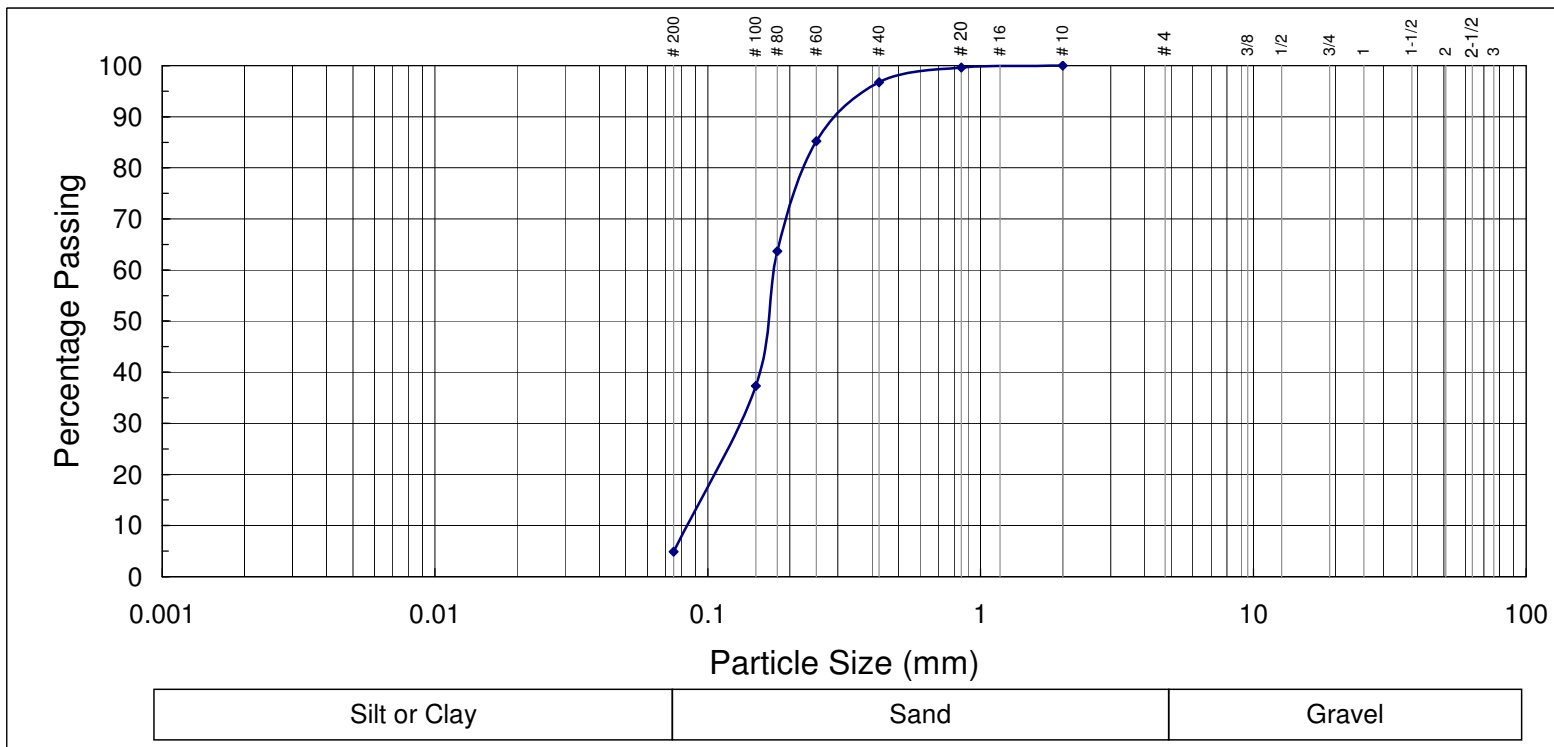
Location : Tehran, Valy-e-Asr Street

Sample No. :

Client: Ministry Of Health

Date : 1386/06/03

Tested By : M. Daryaei



Unifide Soil Classification :

SP

Liquid Limit (%) :

Passing Sieve # 4 :

100.0

Description :

Poorly graded Sand

Plasticity Index (%) :

Passing Sieve # 40 :

96.8

Passing Sieve # 200 :

4.9

Tested by : M. Daryaei



Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

BH / TP No. **TP - 1**

Project : Rajaei Hospital Seismic Retrofitting

Depth (m) : **8.0**

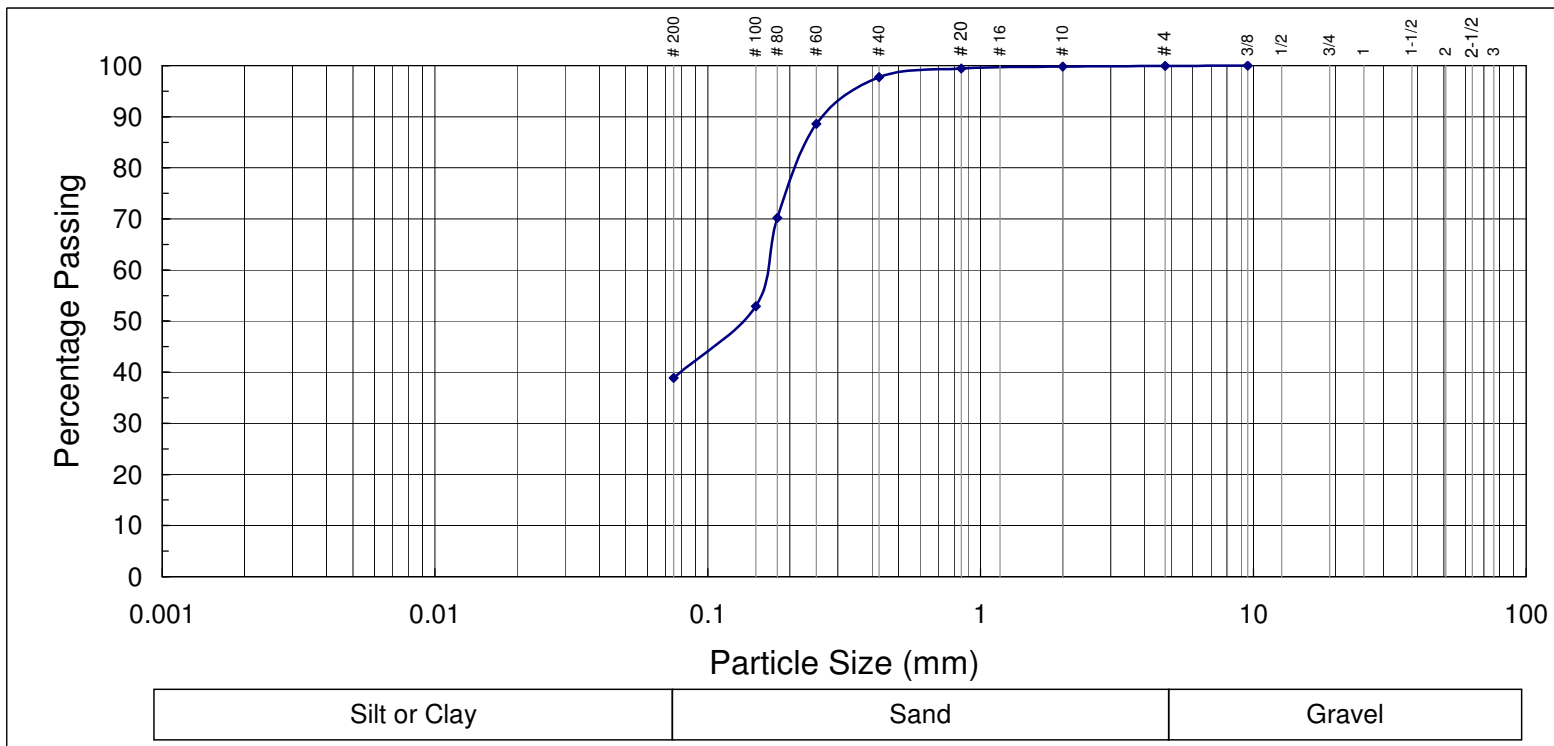
Location : Tehran, Valy-e-Asr Street

Sample No. :

Client: Ministry Of Health

Date : 1386/06/03

Tested By : M. Daryaei



Unifide Soil Classification :

SM

Liquid Limit (%) :

-

Passing Sieve # 4 :

99.9

Description :

Silty Sand

Plasticity Index (%) :

NPI

Passing Sieve # 40 :

97.7

Passing Sieve # 200 :

38.9

Tested by : M. Daryaei



Particle-Size Analysis of Soil

ASTM D 422

P. O. Rahvar Consulting Eng.

BH / TP No. **TP - 1**

Project : Rajaei Hospital Seismic Retrofitting

Depth (m) : **10.0**

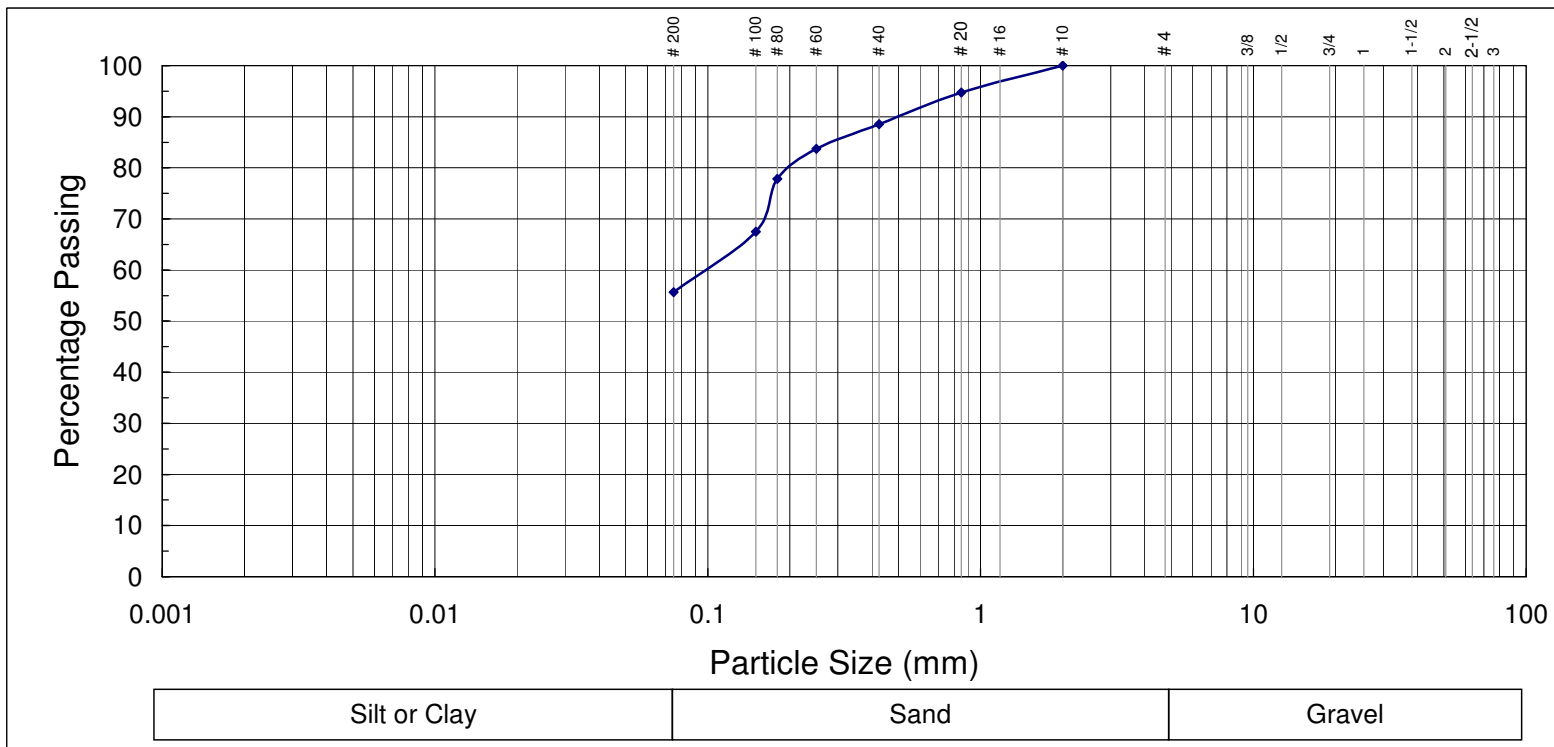
Location : Tehran, Valy-e-Asr Street

Sample No. :

Client: Ministry Of Health

Date : 1386/06/03

Tested By : M. Daryaei



Unifide Soil Classification :

ML

Liquid Limit (%) :

-

Passing Sieve # 4 :

100.0

Description :

Sandy Silt

Plasticity Index (%) :

NPI

Passing Sieve # 40 :

88.5

Passing Sieve # 200 :

55.6

Tested by : M. Daryaei



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

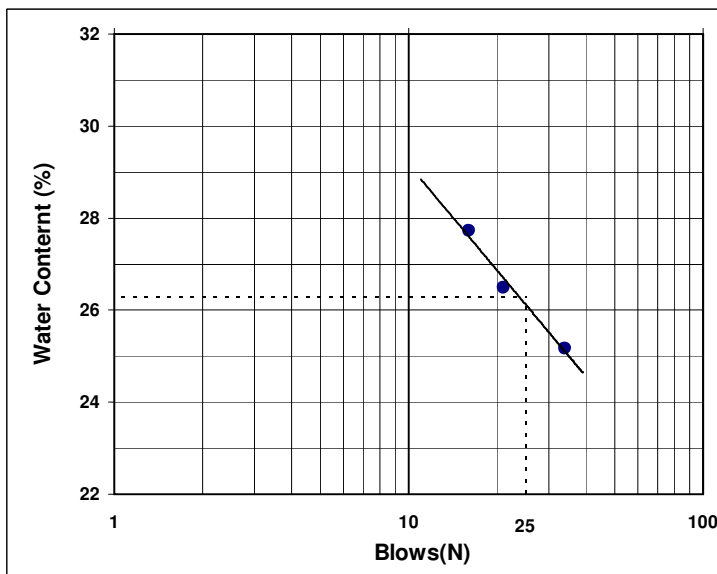
Boring / Test Pit No.: BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 1.0-1.50	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/24

Liquid Limit Determination

Can No.	1	2	3			
Wt. of wet soil + can (gr)	34.98	41	36.54			
Wt. of dry soil + can (gr)	31.02	36.2	32.46			
Wt. of can (gr)	16.74	18.08	16.25			
Wt. of dry soil (gr)	14.28	18.12	16.21			
Wt. of moisture (gr)	3.96	4.8	4.08			
Water content (%)	27.73	26.49	25.17			
No. of blows N	16	21	34			

Plastic Limit Determination

Can No.	1	2				
Wt. of wet soil + can (gr)	11.27	11.2				
Wt. of dry soil + can (gr)	11.05	10.95				
Wt. of can (gr)	9.62	9.3				
Wt. of dry soil (gr)	1.43	1.65				
Wt. of moisture (gr)	0.22	0.25				
Water content (%)	15.38	15.15				



Liquid Limit (%) = 26.3

Plastic Limit (%) = 15.3

Plasticity Index (%) = 11.0

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

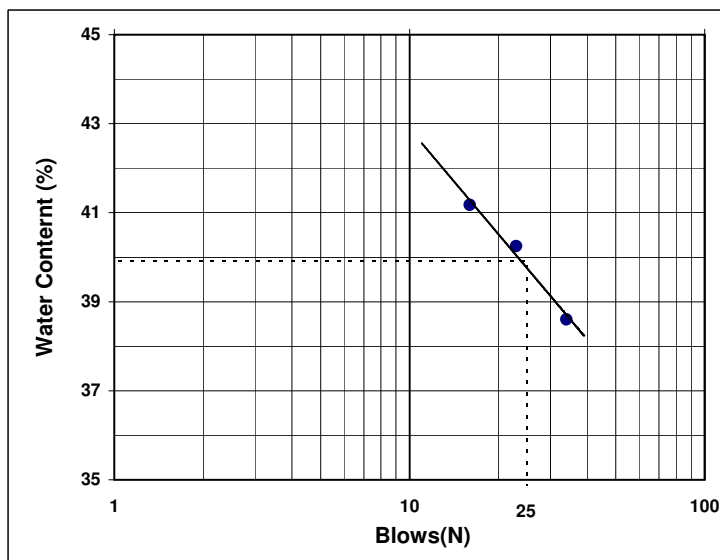
Boring / Test Pit No.: BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 6.0-6.50	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/23

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	43.7	38.29	37.97				
Wt. of dry soil + can (gr)	36.89	32.49	32.94				
Wt. of can (gr)	20.35	18.08	19.91				
Wt. of dry soil (gr)	16.54	14.41	13.03				
Wt. of moisture (gr)	6.81	5.8	5.03				
Water content (%)	41.17	40.25	38.60				
No. of blows N	16	23	34				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	10.59	12.03					
Wt. of dry soil + can (gr)	10.36	11.79					
Wt. of can (gr)	9.24	10.63					
Wt. of dry soil (gr)	1.12	1.16					
Wt. of moisture (gr)	0.23	0.24					
Water content (%)	20.54	20.69					



Liquid Limit (%) = 39.9

Plastic Limit (%) = 20.6

Plasticity Index (%) = 19.3

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)
ASTM D 4318

P. O. Rahvar Consulting Eng.

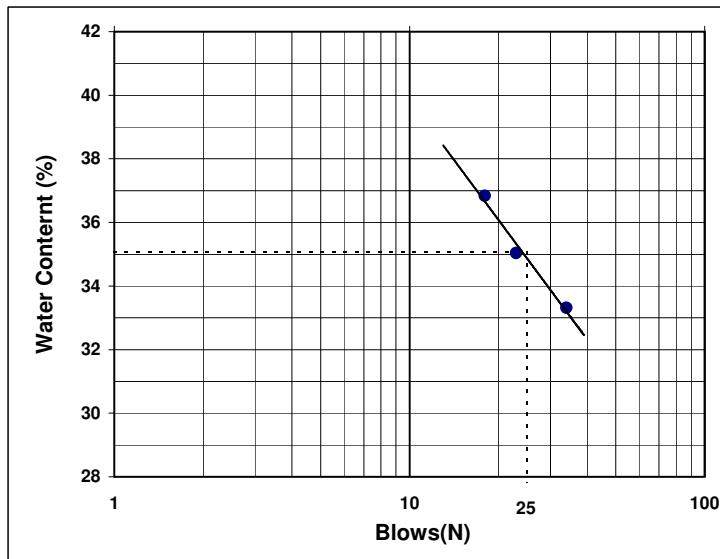
Boring / Test Pit No.: BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 7.0-7.50	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/23

Liquid Limit Determination

Can No.	1	2	3			
Wt. of wet soil + can (gr)	38.79	40.27	36.71			
Wt. of dry soil + can (gr)	32.86	34.38	32.04			
Wt. of can (gr)	16.76	17.57	18.02			
Wt. of dry soil (gr)	16.1	16.81	14.02			
Wt. of moisture (gr)	5.93	5.89	4.67			
Water content (%)	36.83	35.04	33.31			
No. of blows N	18	23	34			

Plastic Limit Determination

Can No.	1	2				
Wt. of wet soil + can (gr)	10.72	11.43				
Wt. of dry soil + can (gr)	10.54	11.25				
Wt. of can (gr)	9.61	10.3				
Wt. of dry soil (gr)	0.93	0.95				
Wt. of moisture (gr)	0.18	0.18				
Water content (%)	19.35	18.95				



Liquid Limit (%) = 35.1

Plastic Limit (%) = 19.2

Plasticity Index (%) = 15.9

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)
ASTM D 4318

P. O. Rahvar Consulting Eng.

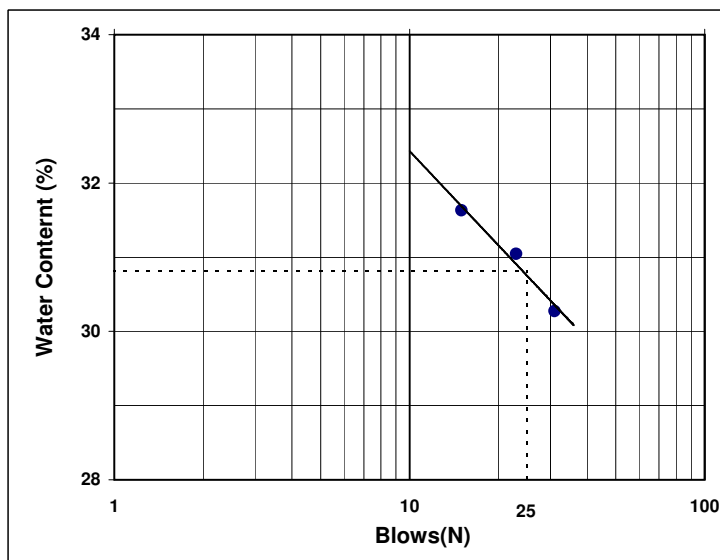
Boring / Test Pit No.: BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 11.5-12.0	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/23

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	41.06	39.7	40.95				
Wt. of dry soil + can (gr)	35.24	34.77	35.21				
Wt. of can (gr)	16.84	18.89	16.25				
Wt. of dry soil (gr)	18.4	15.88	18.96				
Wt. of moisture (gr)	5.82	4.93	5.74				
Water content (%)	31.63	31.05	30.27				
No. of blows N	15	23	31				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	12	10.9					
Wt. of dry soil + can (gr)	11.8	10.68					
Wt. of can (gr)	10.54	9.31					
Wt. of dry soil (gr)	1.26	1.37					
Wt. of moisture (gr)	0.2	0.22					
Water content (%)	15.87	16.06					



Liquid Limit (%) = 30.8

Plastic Limit (%) = 16.0

Plasticity Index (%) = 14.8

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

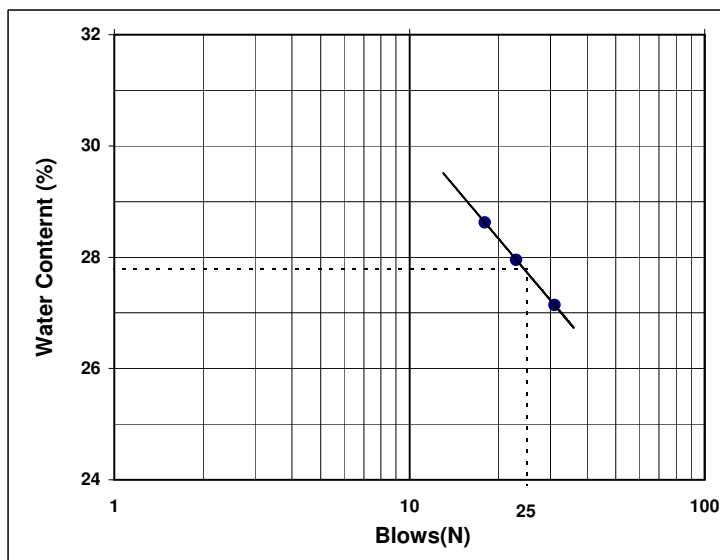
Boring / Test Pit No.: BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 13.0-13.5	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/23

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	42.74	37.84	38.87				
Wt. of dry soil + can (gr)	37.47	33.27	34.78				
Wt. of can (gr)	19.06	16.92	19.71				
Wt. of dry soil (gr)	18.41	16.35	15.07				
Wt. of moisture (gr)	5.27	4.57	4.09				
Water content (%)	28.63	27.95	27.14				
No. of blows N	18	23	31				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	10.99	11.96					
Wt. of dry soil + can (gr)	10.79	11.76					
Wt. of can (gr)	9.56	10.51					
Wt. of dry soil (gr)	1.23	1.25					
Wt. of moisture (gr)	0.2	0.2					
Water content (%)	16.26	16.00					



Liquid Limit (%) = 27.8

Plastic Limit (%) = 16.1

Plasticity Index (%) = 11.7

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

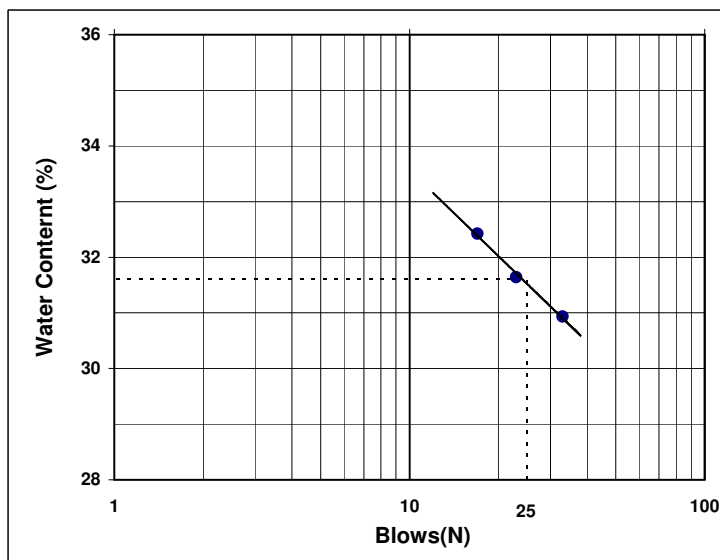
Boring / Test Pit No.: BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 16.0-16.5	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/23

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	37.68	38.39	35.17				
Wt. of dry soil + can (gr)	32.71	33.03	30.7				
Wt. of can (gr)	17.38	16.09	16.25				
Wt. of dry soil (gr)	15.33	16.94	14.45				
Wt. of moisture (gr)	4.97	5.36	4.47				
Water content (%)	32.42	31.64	30.93				
No. of blows N	17	23	33				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	10.97	12.05					
Wt. of dry soil + can (gr)	10.74	11.87					
Wt. of can (gr)	9.52	10.9					
Wt. of dry soil (gr)	1.22	0.97					
Wt. of moisture (gr)	0.23	0.18					
Water content (%)	18.85	18.56					



Liquid Limit (%) = 31.6

Plastic Limit (%) = 18.7

Plasticity Index (%) = 12.9

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)
ASTM D 4318

P. O. Rahvar Consulting Eng.

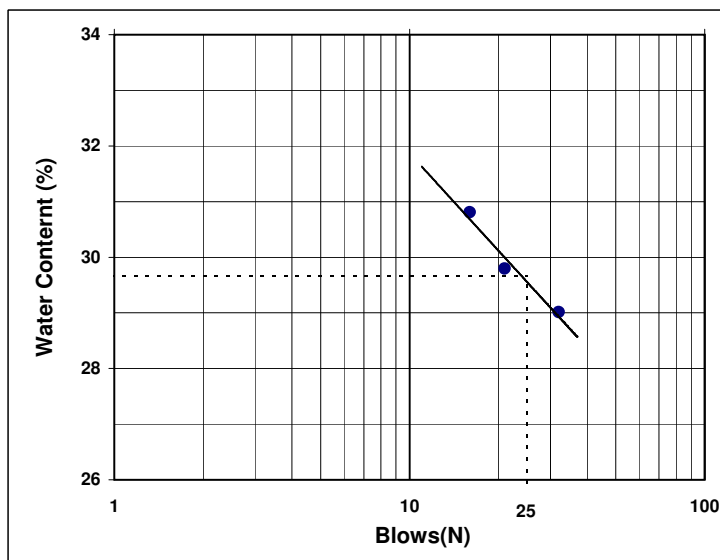
Boring / Test Pit No.: BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 20.5-21.0	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/24

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	35.64	39.35	40.82				
Wt. of dry soil + can (gr)	31.74	34.3	36.12				
Wt. of can (gr)	19.08	17.35	19.92				
Wt. of dry soil (gr)	12.66	16.95	16.2				
Wt. of moisture (gr)	3.9	5.05	4.7				
Water content (%)	30.81	29.79	29.01				
No. of blows N	16	21	32				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	10.68	12.37					
Wt. of dry soil + can (gr)	10.51	12.16					
Wt. of can (gr)	9.51	10.91					
Wt. of dry soil (gr)	1	1.25					
Wt. of moisture (gr)	0.17	0.21					
Water content (%)	17.00	16.80					



Liquid Limit (%) = 29.7

Plastic Limit (%) = 16.9

Plasticity Index (%) = 12.8

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

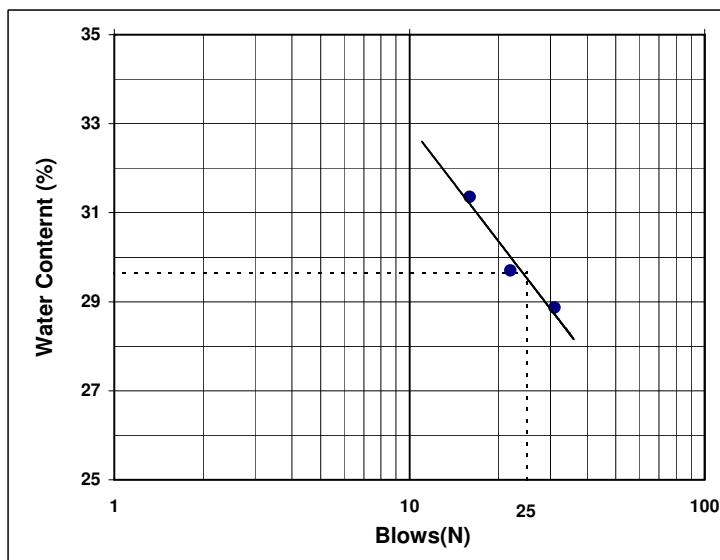
Boring / Test Pit No.: BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 22.0-22.5	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/26

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	32.69	30.89	33.39				
Wt. of dry soil + can (gr)	29.2	27.84	30.18				
Wt. of can (gr)	18.07	17.57	19.06				
Wt. of dry soil (gr)	11.13	10.27	11.12				
Wt. of moisture (gr)	3.49	3.05	3.21				
Water content (%)	31.36	29.70	28.87				
No. of blows N	16	22	31				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	10.61	10.5					
Wt. of dry soil + can (gr)	10.45	10.28					
Wt. of can (gr)	9.61	9.12					
Wt. of dry soil (gr)	0.84	1.16					
Wt. of moisture (gr)	0.16	0.22					
Water content (%)	19.05	18.97					



Liquid Limit (%) = 29.7

Plastic Limit (%) = 19.0

Plasticity Index (%) = 10.6

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

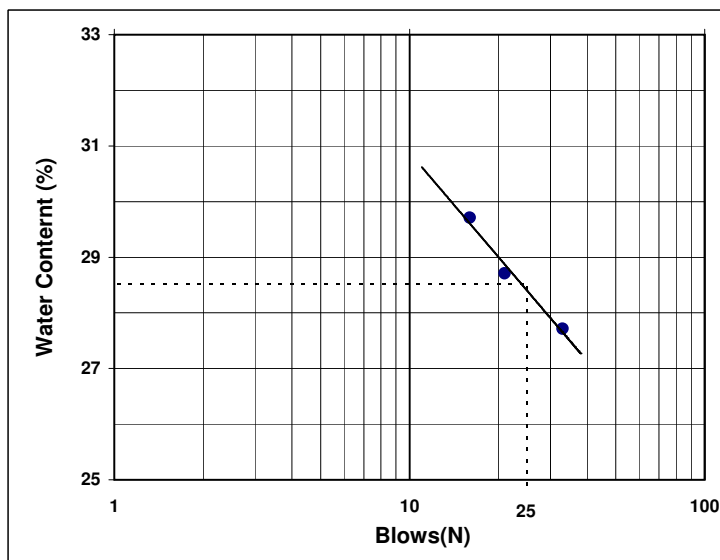
Boring / Test Pit No.: BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 25.0-25.5	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/25

Liquid Limit Determination

Can No.	1	2	3			
Wt. of wet soil + can (gr)	34.18	28.99	34.96			
Wt. of dry soil + can (gr)	31.01	26.05	31.69			
Wt. of can (gr)	20.34	15.81	19.89			
Wt. of dry soil (gr)	10.67	10.24	11.8			
Wt. of moisture (gr)	3.17	2.94	3.27			
Water content (%)	29.71	28.71	27.71			
No. of blows N	16	21	33			

Plastic Limit Determination

Can No.	1	2				
Wt. of wet soil + can (gr)	11.99	12.38				
Wt. of dry soil + can (gr)	11.77	12.16				
Wt. of can (gr)	10.54	10.91				
Wt. of dry soil (gr)	1.23	1.25				
Wt. of moisture (gr)	0.22	0.22				
Water content (%)	17.89	17.60				



Liquid Limit (%) = 28.5

Plastic Limit (%) = 17.7

Plasticity Index (%) = 10.8

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

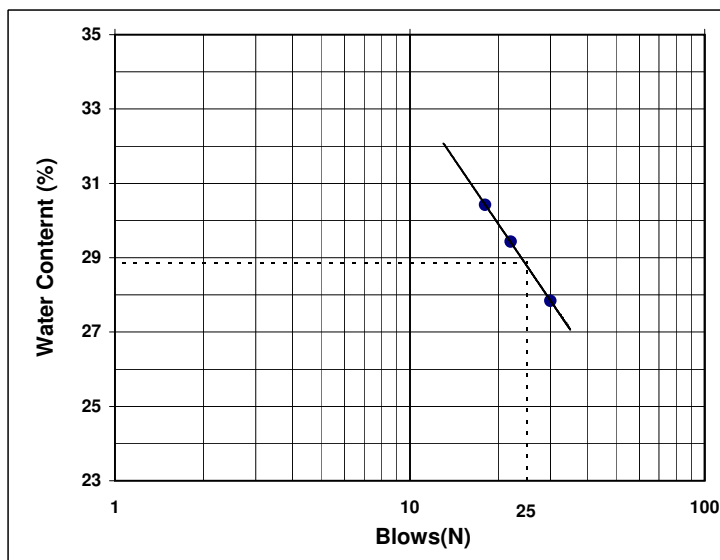
Boring / Test Pit No.: BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 29.5-30.0	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/23

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	42.77	40.18	39.38				
Wt. of dry soil + can (gr)	37.65	34.98	34.11				
Wt. of can (gr)	20.82	17.31	15.18				
Wt. of dry soil (gr)	16.83	17.67	18.93				
Wt. of moisture (gr)	5.12	5.2	5.27				
Water content (%)	30.42	29.43	27.84				
No. of blows N	18	22	30				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	12.16	12.34					
Wt. of dry soil + can (gr)	11.89	12.14					
Wt. of can (gr)	10.31	10.96					
Wt. of dry soil (gr)	1.58	1.18					
Wt. of moisture (gr)	0.27	0.2					
Water content (%)	17.09	16.95					



Liquid Limit (%) = 28.9

Plastic Limit (%) = 17.0

Plasticity Index (%) = 11.9

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

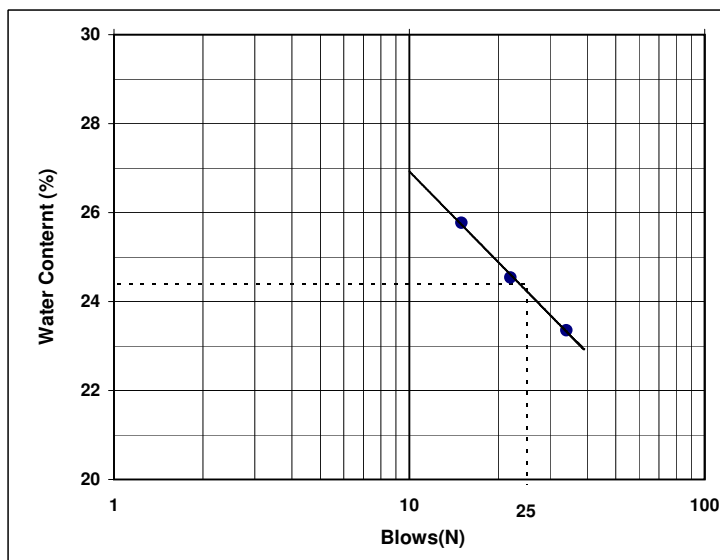
Boring / Test Pit No.: BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 1.0-1.5	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/26

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	42.42	39.19	38.01				
Wt. of dry soil + can (gr)	38.22	34.78	33.89				
Wt. of can (gr)	21.92	16.81	16.25				
Wt. of dry soil (gr)	16.3	17.97	17.64				
Wt. of moisture (gr)	4.2	4.41	4.12				
Water content (%)	25.77	24.54	23.36				
No. of blows N	15	22	34				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	12.21	10.68					
Wt. of dry soil + can (gr)	12	10.51					
Wt. of can (gr)	10.61	9.4					
Wt. of dry soil (gr)	1.39	1.11					
Wt. of moisture (gr)	0.21	0.17					
Water content (%)	15.11	15.32					



Liquid Limit (%) = 24.4

Plastic Limit (%) = 15.2

Plasticity Index (%) = 9.2

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)
ASTM D 4318

P. O. Rahvar Consulting Eng.

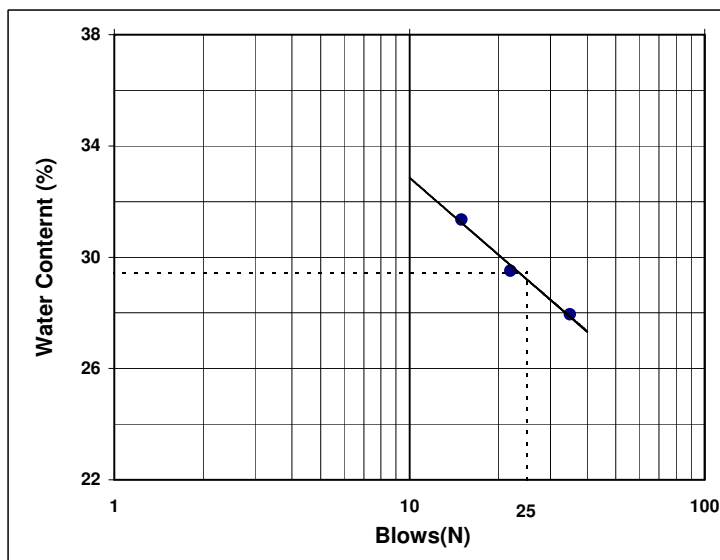
Boring / Test Pit No.: BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 3.0-3.5	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/29

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	39.04	42.5	42.81				
Wt. of dry soil + can (gr)	33.83	37.56	37.9				
Wt. of can (gr)	17.21	20.82	20.33				
Wt. of dry soil (gr)	16.62	16.74	17.57				
Wt. of moisture (gr)	5.21	4.94	4.91				
Water content (%)	31.35	29.51	27.95				
No. of blows N	15	22	35				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	12.54	12.25					
Wt. of dry soil + can (gr)	12.27	11.97					
Wt. of can (gr)	10.9	10.54					
Wt. of dry soil (gr)	1.37	1.43					
Wt. of moisture (gr)	0.27	0.28					
Water content (%)	19.71	19.58					



Liquid Limit (%) = 29.4

Plastic Limit (%) = 19.6

Plasticity Index (%) = 9.8

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)
ASTM D 4318

P. O. Rahvar Consulting Eng.

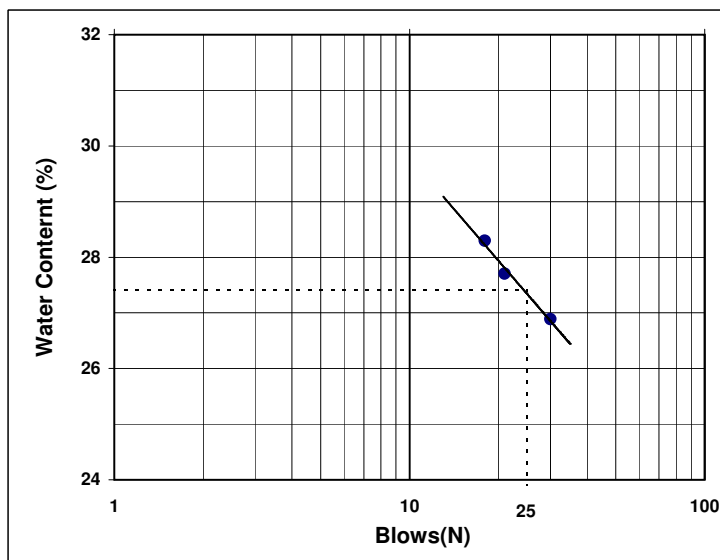
Boring / Test Pit No.: BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 4.5-5.0	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/29

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	35.77	34.56	37.46				
Wt. of dry soil + can (gr)	32.27	30.59	33.54				
Wt. of can (gr)	19.9	16.26	18.96				
Wt. of dry soil (gr)	12.37	14.33	14.58				
Wt. of moisture (gr)	3.5	3.97	3.92				
Water content (%)	28.29	27.70	26.89				
No. of blows N	18	21	30				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	10.77	11.9					
Wt. of dry soil + can (gr)	10.54	11.68					
Wt. of can (gr)	9.3	10.51					
Wt. of dry soil (gr)	1.24	1.17					
Wt. of moisture (gr)	0.23	0.22					
Water content (%)	18.55	18.80					



Liquid Limit (%) = 27.4

Plastic Limit (%) = 18.7

Plasticity Index (%) = 8.7

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

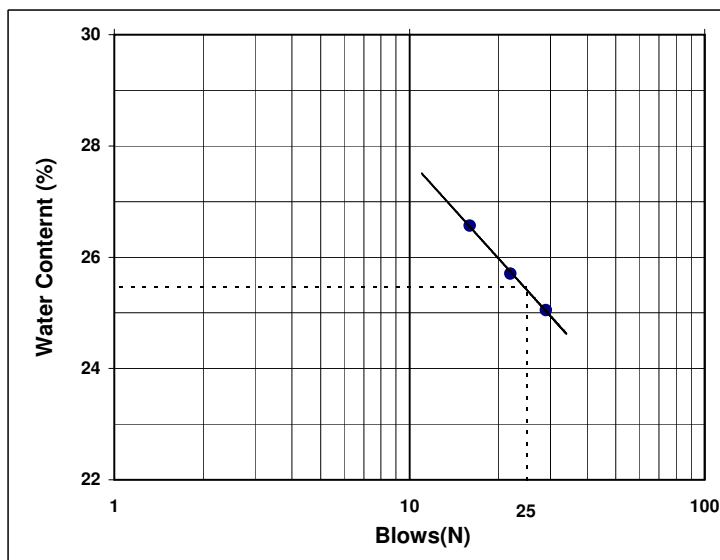
Boring / Test Pit No.: BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 6.0-6.5	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/28

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	31.27	31.74	33.86				
Wt. of dry soil + can (gr)	28.34	29.28	31.15				
Wt. of can (gr)	17.31	19.71	20.33				
Wt. of dry soil (gr)	11.03	9.57	10.82				
Wt. of moisture (gr)	2.93	2.46	2.71				
Water content (%)	26.56	25.71	25.05				
No. of blows N	16	22	29				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	10.71	11.92					
Wt. of dry soil + can (gr)	10.53	11.7					
Wt. of can (gr)	9.56	10.53					
Wt. of dry soil (gr)	0.97	1.17					
Wt. of moisture (gr)	0.18	0.22					
Water content (%)	18.56	18.80					



Liquid Limit (%) = 25.5

Plastic Limit (%) = 18.7

Plasticity Index (%) = 6.8

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

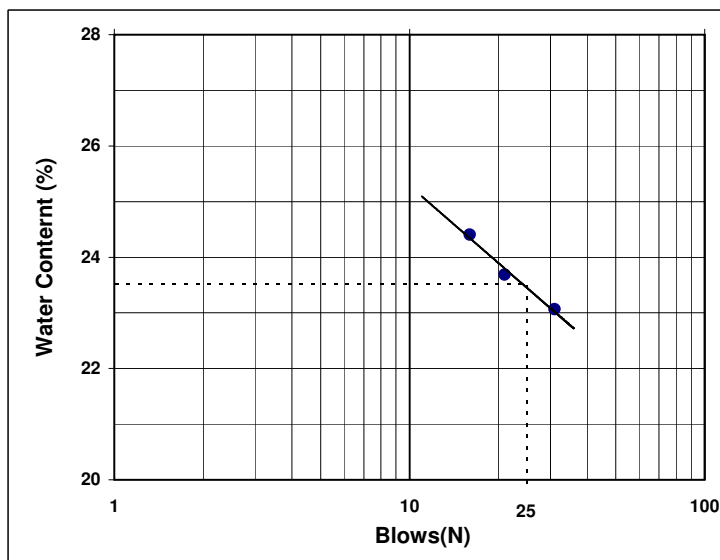
Boring / Test Pit No.: BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 7.5-8.0	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/25

Liquid Limit Determination

Can No.	1	2	3			
Wt. of wet soil + can (gr)	34.65	29.98	31.18			
Wt. of dry soil + can (gr)	31.25	27.36	28.59			
Wt. of can (gr)	17.32	16.3	17.36			
Wt. of dry soil (gr)	13.93	11.06	11.23			
Wt. of moisture (gr)	3.4	2.62	2.59			
Water content (%)	24.41	23.69	23.06			
No. of blows N	16	21	31			

Plastic Limit Determination

Can No.	1	2				
Wt. of wet soil + can (gr)	11.74	10.15				
Wt. of dry soil + can (gr)	11.57	10.04				
Wt. of can (gr)	10.46	9.32				
Wt. of dry soil (gr)	1.11	0.72				
Wt. of moisture (gr)	0.17	0.11				
Water content (%)	15.32	15.28				



Liquid Limit (%) = 23.5

Plastic Limit (%) = 15.3

Plasticity Index (%) = 8.2

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

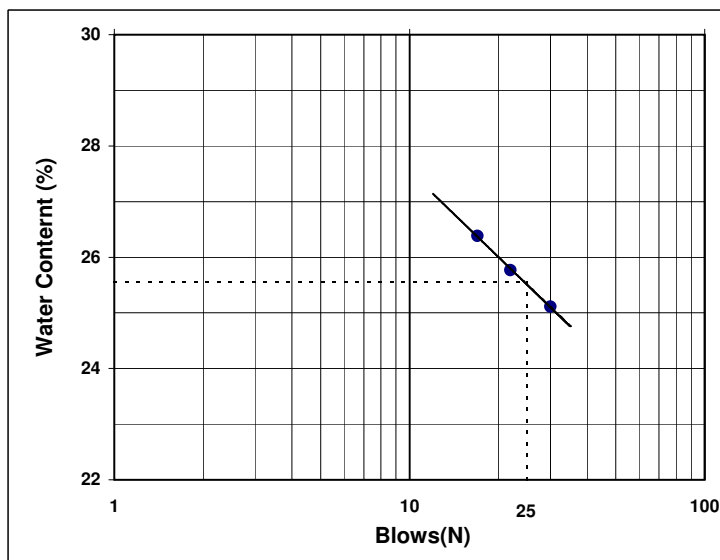
Boring / Test Pit No.: BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 10.5-11.0	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/27

Liquid Limit Determination

Can No.	1	2	3			
Wt. of wet soil + can (gr)	39.53	40.1	36.44			
Wt. of dry soil + can (gr)	35.47	35.39	32.56			
Wt. of can (gr)	20.08	17.11	17.11			
Wt. of dry soil (gr)	15.39	18.28	15.45			
Wt. of moisture (gr)	4.06	4.71	3.88			
Water content (%)	26.38	25.77	25.11			
No. of blows N	17	22	30			

Plastic Limit Determination

Can No.	1	2				
Wt. of wet soil + can (gr)	10.95	12.02				
Wt. of dry soil + can (gr)	10.75	11.87				
Wt. of can (gr)	9.52	10.95				
Wt. of dry soil (gr)	1.23	0.92				
Wt. of moisture (gr)	0.2	0.15				
Water content (%)	16.26	16.30				



Liquid Limit (%) = 25.6

Plastic Limit (%) = 16.3

Plasticity Index (%) = 9.3

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

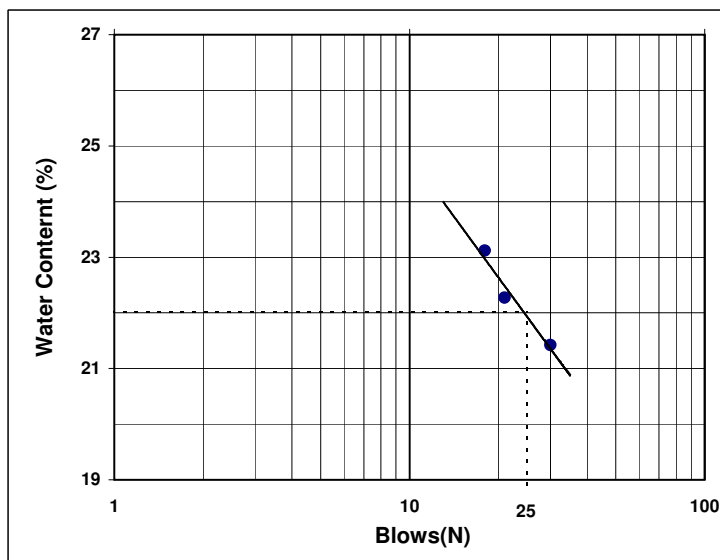
Boring / Test Pit No.: BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 12.0-12.5	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/26

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	32.92	30.14	31.27				
Wt. of dry soil + can (gr)	30	27.53	28.62				
Wt. of can (gr)	17.37	15.81	16.25				
Wt. of dry soil (gr)	12.63	11.72	12.37				
Wt. of moisture (gr)	2.92	2.61	2.65				
Water content (%)	23.12	22.27	21.42				
No. of blows N	18	21	30				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	11.5	10.7					
Wt. of dry soil + can (gr)	11.4	10.59					
Wt. of can (gr)	10.52	9.61					
Wt. of dry soil (gr)	0.88	0.98					
Wt. of moisture (gr)	0.1	0.11					
Water content (%)	11.36	11.22					



Liquid Limit (%) = 22.0

Plastic Limit (%) = 11.3

Plasticity Index (%) = 10.7

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

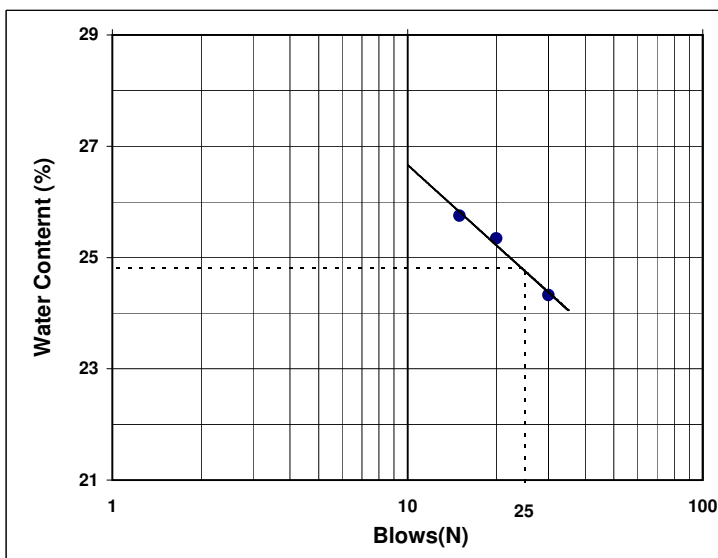
Boring / Test Pit No.: BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 13.5-14.0	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/29

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	38.58	41.36	37.42				
Wt. of dry soil + can (gr)	34.28	36.51	33.19				
Wt. of can (gr)	17.58	17.37	15.8				
Wt. of dry soil (gr)	16.7	19.14	17.39				
Wt. of moisture (gr)	4.3	4.85	4.23				
Water content (%)	25.75	25.34	24.32				
No. of blows N	15	20	30				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	12.04	12.72					
Wt. of dry soil + can (gr)	11.77	12.39					
Wt. of can (gr)	10.31	10.64					
Wt. of dry soil (gr)	1.46	1.75					
Wt. of moisture (gr)	0.27	0.33					
Water content (%)	18.49	18.86					



Liquid Limit (%) = 24.8

Plastic Limit (%) = 18.7

Plasticity Index (%) = 6.1

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)
ASTM D 4318

P. O. Rahvar Consulting Eng.

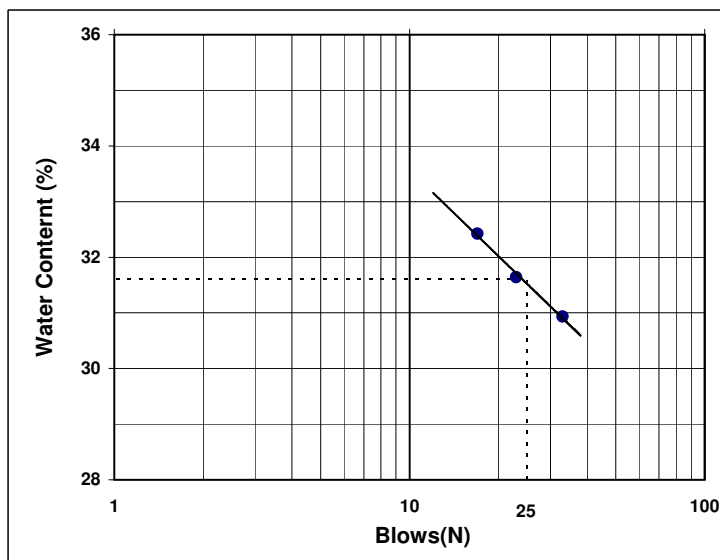
Boring / Test Pit No.: BH - 1	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 16.0-16.5	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/23

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	37.68	38.39	35.17				
Wt. of dry soil + can (gr)	32.71	33.03	30.7				
Wt. of can (gr)	17.38	16.09	16.25				
Wt. of dry soil (gr)	15.33	16.94	14.45				
Wt. of moisture (gr)	4.97	5.36	4.47				
Water content (%)	32.42	31.64	30.93				
No. of blows N	17	23	33				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	10.97	12.05					
Wt. of dry soil + can (gr)	10.74	11.87					
Wt. of can (gr)	9.52	10.9					
Wt. of dry soil (gr)	1.22	0.97					
Wt. of moisture (gr)	0.23	0.18					
Water content (%)	18.85	18.56					



Liquid Limit (%) = 31.6

Plastic Limit (%) = 18.7

Plasticity Index (%) = 12.9

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

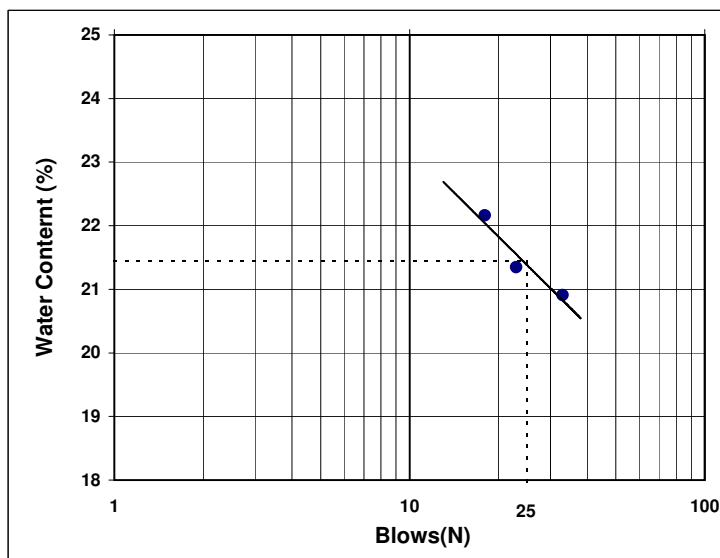
Boring / Test Pit No.: BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 18.0-18.5	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/25

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	35.2	30.11	29.31				
Wt. of dry soil + can (gr)	32.39	27.76	27.05				
Wt. of can (gr)	19.71	16.75	16.24				
Wt. of dry soil (gr)	12.68	11.01	10.81				
Wt. of moisture (gr)	2.81	2.35	2.26				
Water content (%)	22.16	21.34	20.91				
No. of blows N	18	23	33				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	10.68	10.25					
Wt. of dry soil + can (gr)	10.56	10.14					
Wt. of can (gr)	9.56	9.23					
Wt. of dry soil (gr)	1	0.91					
Wt. of moisture (gr)	0.12	0.11					
Water content (%)	12.00	12.09					



Liquid Limit (%) = 21.4

Plastic Limit (%) = 12.0

Plasticity Index (%) = 9.4

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)

ASTM D 4318

P. O. Rahvar Consulting Eng.

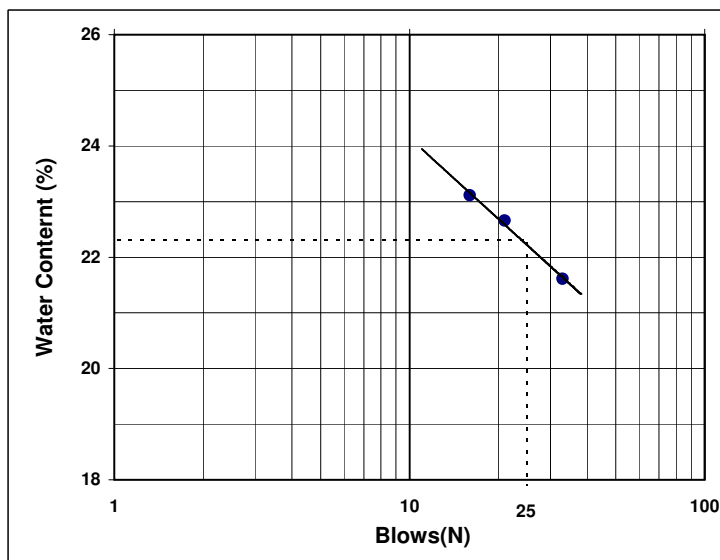
Boring / Test Pit No.: BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 19.5-20.0	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/25

Liquid Limit Determination

Can No.	1	2	3			
Wt. of wet soil + can (gr)	29.02	27.51	29.6			
Wt. of dry soil + can (gr)	26.54	25.43	27.64			
Wt. of can (gr)	15.81	16.25	18.57			
Wt. of dry soil (gr)	10.73	9.18	9.07			
Wt. of moisture (gr)	2.48	2.08	1.96			
Water content (%)	23.11	22.66	21.61			
No. of blows N	16	21	33			

Plastic Limit Determination

Can No.	1	2				
Wt. of wet soil + can (gr)	10.81	12.19				
Wt. of dry soil + can (gr)	10.6	11.98				
Wt. of can (gr)	9.25	10.62				
Wt. of dry soil (gr)	1.35	1.36				
Wt. of moisture (gr)	0.21	0.21				
Water content (%)	15.56	15.44				



Liquid Limit (%) = 22.3

Plastic Limit (%) = 15.5

Plasticity Index (%) = 6.8

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)
ASTM D 4318

P. O. Rahvar Consulting Eng.

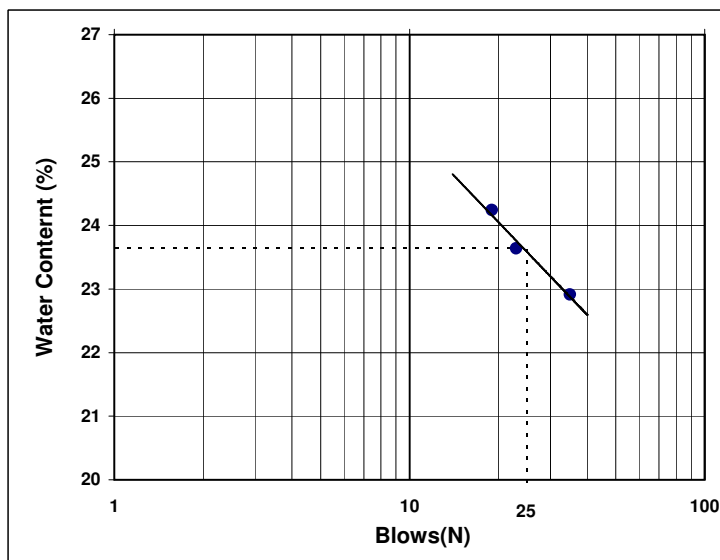
Boring / Test Pit No.: BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 24.0-24.5	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/29

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	39.03	37.4	43.45				
Wt. of dry soil + can (gr)	34.94	33.28	38.87				
Wt. of can (gr)	18.07	15.85	18.88				
Wt. of dry soil (gr)	16.87	17.43	19.99				
Wt. of moisture (gr)	4.09	4.12	4.58				
Water content (%)	24.24	23.64	22.91				
No. of blows N	19	23	35				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	11.1	11.11					
Wt. of dry soil + can (gr)	10.87	10.83					
Wt. of can (gr)	9.55	9.2					
Wt. of dry soil (gr)	1.32	1.63					
Wt. of moisture (gr)	0.23	0.28					
Water content (%)	17.42	17.18					



Liquid Limit (%) = 23.6

Plastic Limit (%) = 17.3

Plasticity Index (%) = 6.3

Tested by: M. Daryaei
Name

Signed



ATTERBERG LIMITS

(Liquid Limit, Plastic Limit, and Plasticity Index of Soils)
ASTM D 4318

P. O. Rahvar Consulting Eng.

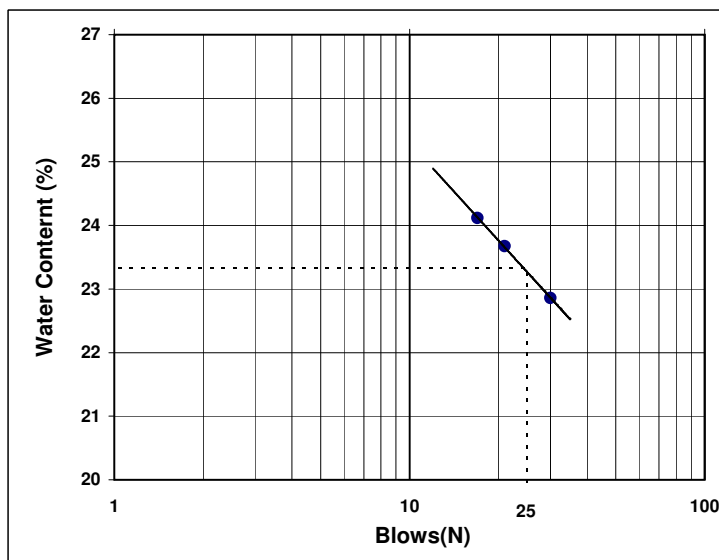
Boring / Test Pit No.: BH - 2	Project : Rajaei Hospital Seismic Retrofitting
Depth (m): 25.5-26.0	Location: Tehran, Valy-e-Asr Street
Sample No.:	Client: Ministry Of Health
Description of Sample:	Date: 1386/05/26

Liquid Limit Determination

Can No.	1	2	3				
Wt. of wet soil + can (gr)	31.34	33.61	31.67				
Wt. of dry soil + can (gr)	28.41	31.07	29				
Wt. of can (gr)	16.26	20.34	17.32				
Wt. of dry soil (gr)	12.15	10.73	11.68				
Wt. of moisture (gr)	2.93	2.54	2.67				
Water content (%)	24.12	23.67	22.86				
No. of blows N	17	21	30				

Plastic Limit Determination

Can No.	1	2					
Wt. of wet soil + can (gr)	10.57	10.58					
Wt. of dry soil + can (gr)	10.44	10.45					
Wt. of can (gr)	9.54	9.56					
Wt. of dry soil (gr)	0.9	0.89					
Wt. of moisture (gr)	0.13	0.13					
Water content (%)	14.44	14.61					



Liquid Limit (%) = 23.3

Plastic Limit (%) = 14.5

Plasticity Index (%) = 8.8

Tested by: M. Daryaei
Name

Signed