Report No.: 62/S/03/2016

Date: 12/03/2016

Geotechnical Investigation for the Proposed Building Site at Al-Zarqa Lot No. (1). Basin No. (05)

المشروع : مدرسة السخنة

لاستعمال نقابة المهندسين الأردنيين

1- تسوية اولى كاملة بمساحة كامل م^2

ومنسوب بلاط :

2- طوابق فقط بمساحة لا تزيد عن (2400) م^2 للطابق

التاريخ 19/ 4 /2016م التوقيع

Submitted to

السادة خزينة المملكة وزارة التربية و التعليم المحترمين

السادة التصاميم الحضرية للاستشارات الهندسية المحترمين

Amman – Jordan

Report No.: 62/S/03/2016

Date: 12/03/2016

السادة خزينة المملكة وزارة التربية و التعليم المحترمين

السادة التصاميم الحضرية للاستشارات الهندسية المحترمين

Subject: Geotechnical Report on the Proposed Site at **Al- Zarqa .**

Dear Sir,

Kindly find the report on the geotechnical study for your proposed building site in Al- Zarqa , done on 3rd . Mar. . 2016. It includes the results of field and laboratory tests; in addition to, the conclusions and recommendations, to guide the designer for a better and economic method of construction.

Thank you for your confidence ,we look forward to further future cooperation.

Sincerely,

Eng. Anwar Tmaizeh

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1- INTRODUCTION

The following report summarizes the results of the in situ investigation and lab tests conducted at the request of our client for his projected site for the purpose of determining the geotechnical parameters needed for guiding design of a safe and economic foundation.

The investigation consisted of the following sequence stage:

- Obtaining and studying the available maps and information concerning the site and the proposed project.
- Reconnaissance stage which include site visit, survey the geotechnical & geological features (rock out crops existing , present facilities used in the site).
- site accessibility survey of type and conditions of the nearby existing buildings
- Bore holes drilling according to requirements of Jordanian National Building Code and Jordan Engineers Association
- Collecting undisturbed and disturbed samples from different bore holes and at different depths.
- Conducting the required tests on representative samples
- Analyses and evaluation of field & lab tests results
- Conclusions & recommendations for the design and foundation of the proposed project

2- PROJECT CHARACTERISTICS

We have been informed by our client that the proposed project has the characteristic summarized in table 1:

Table (1) : Project Characteristics of Building

Type of the project		Building
Purpose of the project		Educational
Proposed floors	Number of floors	Six
	Area of each Floor	2400.0 m^2
	Ground Tile Level	+97.5
Proposed Basement	Number of Basement	One
	Area of each Floor	1720.0 m^2
	Basement Tile Level	+93.45

3- SITE DESCRIPTION

3-1- Site Location

The investigated site located at Al- Zarqa . Lot No. (1). Basin No. (5)

3-2- Existing Structures

There are an existing structures at the proposed building area , but these structures will be demolished before construct the new building , for more details please see figure (1) the site plan attached to appendix.

3-3- Site Topography

The proposed building has a difference in elevation about 3.5m . for more details please see figure (1) the site plan attached to appendix.

4- GEOLOGY OF THE SITE

4-1- Lithology

Subsurface exploration was carried out by drilling bore holes at the site. The drilling revealed that the subsurface strata consisted of the following :

- **Concrete Pavement .**
- **Fill Material** : Composed of Silty Clay soil mixed with Limestone gravels .
- **Mixture Material** Composed of Limestone and chert gravels and cobbles with some boulders mixed with Silty Clay and Marly Clay soil.

We wish to emphasize that the results obtained from the boreholes are only representing the boreholes . These results are only representing the lithology at the depths indicated on the attached log sheets and Geological Profile Figure(2-6) attached to appendix.

4-2-Geologic Formation

The encountered Mixture Material isonsidered to be recent deposits, See figure (7) the geological map attached to appendix.

4-3-Ground Water and Cavities

Neither ground water nor cavities were encountered under the drilled bore holes.

5- DRILLING AND SAMPLING OF BOREHOLES

5-1 Drilling

Eleven boreholes were drilled at the site, at the locations shown on the site map enclosed within appendix .They were numbered as BH1 thru BH11 inclusive . The depths and elevations of the drilling were fixed on the attached log sheets within appendix and as follows in table 2.

Table 2: Boreholes Depths and Elevations

Borehole No.	Borehole Depth (m)	Elevation (m)	Borehole No.	Borehole Depth (m)	Elevation (m)
BH1	16.0	+95.5	**BH7**	12.0	+95.0
BH2	12.0	+95.0	**BH8**	15.0	+94.85
BH3	12.0	+95.3	**BH9**	11.0	+94.9
BH4	14.0	+93.0	**BH10**	17.0	+96.1
BH5	11.0	+94.9	**BH11**	13.0	+96.2
BH6	11.0	+94.85			

The drilling were carried out with Atlas Copco Rotary drilling rig. The advance of the drilling operation was carried out through rotary air flush drilling method.

5-2 Sampling

Depending on type of material encountered during drilling operation undisturbed & disturbed samples were obtained . The following samplers were used :

- Down the hole hammer for obtaining disturbed samples

All obtained samples are visual inspected and classified in the site by our geologist and then they were marked , placed in proper way in water –proof plastic bags and placed in wooden boxes to transport them to our lab for conducting the requested tests.

6- LABORATORY & FIELD TESTS

6-1 Tests Carried Out

For the purposes of calculating bearing capacity Standard penetration field tests were carried out, please see section 6-2.

6-2 Field Test:

Standard penetration (SPT) tests according to ASTM:D 1586 were conducted at different boreholes and different depths .Results of these tests are shown on table No. 3 below

Table 3: Standard Penetration Test Results

STANDARD PENETRATION TEST				
Boreholes No.	**Depth (m)**	**Penetration (cm)**	**Number of Blows(N)**	**Lithology**
BH1	5.5	15	9	**Mixture Material**
		15	12	
		15	13	
BH2	3.0	15	4	
		15	6	
		15	6	
BH3	1.5	15	10	
		15	14	
		15	11	
BH4	4.5	15	11	
		15	13	
		15	15	
BH5	2.5	15	10	
		15	14	
		15	17	
BH6	3.5	15	12	
		15	16	
		15	13	

STANDARD PENETRATION TEST				
Boreholes No.	Depth (m)	Penetration (cm)	Number of Blows(N)	Lithology
BH7	2.0	15	10	Mixture Material
		15	15	
		15	14	
BH8	8.0	15	13	
		15	16	
		15	19	
BH9	4.0	15	11	
		15	14	
		15	12	
BH10	9.5	15	10	
		15	13	
		15	17	
BH11	5.5	15	12	
		15	13	
		15	18	

7- SIESMIC ACTIVITY

As far as seismic activities are concerned the investigated site lies within zone " 2A " as noticed in the Jordanian Seismic Activities map see figure 8 attached to appendix . The following seismic parameters can be used in designing the proposed project:

Table 6 : Seismic Factors for the Proposed Site

Seismic Zone	2A
Seismic Zone Factor (Z)	0.15
Seismic Soil Type	Mixture Material
Seismic Soil Section Name	S_C
Seismic Factor Related to Acceleration (Ca)	0.18
Seismic Factor Related to speed (Cv)	0.25

8- CLIMATE

The climate in Jordan is predominantly of the Mediterranean type .It is characterized by a hot dry summer and cool wet winter . with two short transitional periods in between .The first starts around end of April and the second starts around med of November .

The climate of Jordan could be divided into 3 main types according to the topography of the country , which has a very well marked longitudinal zones in spite of its small area. At **Hilly regions** (The majority of the population of Jordan live in these regions) highest temperature of (42.8C°) and lowest of (- 7.5C°) were observed. **The Ghor** [the highest observed temperature of (51.2 C°) and lowest of (- 2.2 C°) in Wadi Yabis], and **The desert** [the lowest observed temperature of (- 12.0 C°)]. The proposed site area where the climate is desert climate, that means the site area has a hot and dry weather in summer time and cold wet weather in winter time.

9- ENGINEERING ANALYSIS OF THE RESULTS

9-1- Calculation of Bearing Capacity for mixture layer

To calculate the bearing capacity for cohesion soil using Cone Penetration Test (CPT) Schmertmann created the following equations:

$q_{ult} = 28 - 0.0052\ (300 - q_c)^{1.5}$ For strip footing -----[eq … 1]

$q_{ult} = 48 - 0.009\ (300 - q_c)^{1.5}$ For isolated footing -----[eq … 2]

Where:

q_{ult} : The ultimate bearing capacity (Kg / cm^2).

$q_{all} = q_{ult} / S.F$

S.F = Safety factor.

q_c = Bearing capacity factor depends on obtained SPT "N" value.

$q_c = 4 \times N$ --- N (Number of blows)

Using (eq.---1) and utilizing the obtained **N** values from table no. (5) we calculate the following:

$q_c = 4\ (12.0) = 48$

$q_{ult} = 28 - 0.0052\ (300 - 48)^{1.5} = 7.189$ Kg / cm^2

$q_{all} = 7.189 / 3 = 2.399$ Kg / cm^2 . - - - **Use 2.4 Kg / cm^2 for mixture layer.**

9-2- Calculation of Maximum Settlement Of mixture:

To calculate the final settlement the following relationship proposed by Terzagi & Peck

$$S = \frac{0.8P}{N}\left[\frac{2B}{0.3+B}\right]^2\left[1-0.25\left(\frac{D}{B}\right)\right]$$

Where:

S : the total settlement (mm)

p : the applied allowable bearing capacity (Kpa)

D : depth (m)

B: footing width (m)

N: SPT blows/30 cm

PARAMETERS	VALUES
P	2.4Kg /cm² (240 Kpa)
B	2.0 m
D	1.5 m
Average blows (N)	27.36

And by applying the above obtained value the vertical settlement will be equal to 17.25 mm .

9-3 Calculation To Choose The Foundation Type

If Seven stories building is planned at the site. Assuming a live and dead load per square meter per floor of 1250 kgf.

The total load, (since the biggest built surface area is 2400.0 m^2):

$$7^* 2400.0^* 1250 = 21000000 \text{ Kgf.}$$

- If the allowable bearing capacity has been found to be: 24000 Kg/m^2 :

thus the minimum area of the footing should be : $\frac{21000000}{24000} = 875 \text{ m}^2$

Thus the minimum area for the footing will be around 36.45 % of the total built area.

In our view it would be better to choose continuous strip footing system outside the building and isolated footing system connected with strong tie beams inside the building .

However we should like to stress that the decision for the choice of the type and depth of foundation lies with the Structural Engineer in the light of information supplied by the data of our report.

10-CONCLUSIONS & RECOMMENDATIONS

10-1 Project Conclusions & Recommendations

اسم المالك : السادة خزينة المملكة وزارة التربية و التعليم المحترمين	رقم التقرير: 62/S/03/2016	رقم العقد :
المنطقة : السخنة	رقم القطعة :1	رقم الحوض واسمه : 5/البلد

In the accordance with Jordanian Building Code and in view of the results of the geotechnical investigation we should like to suggest the adoption of the following :

10.1.1 Foundation Layer

We recommend to lay the foundations within the foundation layer that composed of of **Mixture Material** that composed of chert and limestone gravels and cobbles mixed with some silty clay soil , which is found at the following depths from the present ground surface :

- 0.2m in the vicinity of BH9.
- 0.3m in the vicinity of BH1.
- 0.5m in the vicinity of BH3, BH11.
- 0.7m in the vicinity of BH4 , BH6.
- 1.0m in the vicinity of BH2 , BH10.
- 1.3m in the vicinity of BH7.
- 1.8m in the vicinity of BH8.
- 2.3m in the vicinity of BH5.

10.1.2 Allowable Net Bearing Capacity

We recommend to use allowable net bearing capacity of **2.4** Kg/cm^2.

10.1.3 Depth of Foundation

We recommend the followings :

- To remove all the asphaltic pavement and fill material that covered the site .

المالك : السادة خزينة المملكة وزارة التربية و التعليم المحترمين / قطعة رقم(1) / حوض(5/ البلد)

تقرير رقم: 62/S/03/2016

النتائج والتوصيات :

- **عام :**

موقع المبنى مناسب من الناحية الفنية اذا تم الاخذ بالنتائج والتوصيات الواردة في التقرير

- **التصميم :**

يمكن تحميل المبنى على اساسات مستمرة و/او اساسات منفردة ووضع هذه الاساسات على عمق 1.5متر من منسوب الارض النهائي حول المبنى على طبقة الخليط .

- **ضغط التحميل :**

نوصي باستخدام ضغط تحميل يساوي 2.4 كغم/سم2 على العمق الموصى به لطبقة الخليط.

- **الهبوط المتوقع :**

الهبوط المتوقع لطبقة الخليط 17.18مم

- **الضغط الجانبي للتربة :**

يمكن اعتماد زاوية احتكاك داخلي لطبقة الخليط في الموقع بمقدار (25)

معامل الضغط الجانبي الفعال(0.406)

معامل الضغط الجانبي المعاكس (2.463)

المركز الدولي للدراسات الهندسية الجيولوجية

رقم المكتب (861)

- After demolishing the existing building we recommend to remove all the demolished parts and all old structural elements.
- After removing all existing structures and before laying the foundations we recommend to make foundation excavation inspection visit to be sure that the area of basement location (not include boreholes) are reached the required foundation level .
- To lay the foundation at the above described foundation layer .
- The depth of foundation should be not less than 0.5m within the above described foundation layer an at the same time it should be not less than 1.5m from the surrounding ground level.

10.1.4Type of Foundation

We recommend to use continuous strip footing system for the external walls and isolated footing system connected with strong tie beams for the internal foundations.

10.1.5 Expected Settlement of the foundation layer

The expected settlement of the above described foundation layer is 17.25 mm

10.1.6 Drainage System

we recommend to protect the foundation layer and excavations from any running or percolating water by using a proper drainage system.

10.1.7Concrete works

- A layer of blinding concrete 10 cm. thick should be placed under the footings in order to minimize chemical reaction between cement mortar and native rock..
- Ordinary Portland Cement can be used for substructure works.

10.1.8 Stability And Method Of Excavation

- Excavations within the Fill and mixture material can be done by using a loader.
- Excavation within the encountered materials should be done with the side slopes mentioned in table no. (6).
- During excavation, the surrounding building and structures should be protected by using a proper method of excavation .

Table (6) : Side Slopes Excavations for Different Types of Materials

Excavated Material	Height of Material to be excavated	Side Slope of Cut
Fill and Mixture material	Less than 3.0 m	1 Vertical : 1 Horizontal
	More than 3.0 m	1 Vertical : 2 Horizontal

10.1.9 Backfill material

Generally the recommended back fill material which will be used should be granular in general and should not contain the following::

- Should not be classified as A6 or A7 if the material to be back filled from the excavated material.
- Should be classified as A2-5 , A2-4 , A1-a , or A1-b if the material to be back filled from outside of the site.
- Clayey soil which would reach maximum dry density after compaction lower than 1.6gm/cm².
- Clayey soil with a natural moisture content 5% or more in excess of the optimum moisture content .
- Soils with more than 5% of organic impurities .
- Boulders or rock fragments exceeding 2/3 of the thickness of layer to be compacted.
- In case of creating any retaining wall we recommend to use single size material to be as a filter material behind the retaining wall and at the same time to make a web holes in the retaining wall.

10.1.10 Retaining Wall

In case of designing retaining wall, the following parameters can be used:

Table 8 : Designing of Retaining Wall Parameters

Material type	Mixture	Compacted selected fill material
Friction angle (ø)	25	30
Wall friction angle	16.75	13.4
Cohesion, C kg/cm^2	2.0	0.10
Bulk Density (g / cm^3)	2.35	2.000
K_0 (1-sinø)	0.5774	0.5
K_A $\frac{1-\sin\phi}{1+\sin\phi}$	0.406	0.33
K_P $\frac{1+\sin\phi}{1-\sin\phi}$	2.463	3.00

10.1.11 Modules of Sub grade Reaction (Ks):

We recommend to use the following equation recommend by Joseph E.Bowles

$$Ks(Kg/cm^3) = 40 \times (S.F) \times q_{all}$$

$$Ks(Kg/cm^3) = 40 \times (3) \times 2.4 = 288\ Kg/cm^3$$

Where , q_{all} =Recommend allowable net bearing capacity .

SF=Used Safety Factor .

10-2 General Recommendations

- The construction operations should not endanger adjoining existing structures.
- During construction the site should be protected from running or percolating water.
- The Soil Engineer should be informed after the excavation of foundations and prior to any concrete pouring in order to visit the site and reconcile field conditions with the findings of this report.
- The recommendations of this report are based on the assumption that the subsurface conditions do not deviate appreciably from those disclosed in the exploratory borings
- Should any variations or undesirable conditions be encountered during construction the Soil Engineer should be immediately notified. site conditions provided as dictated by the field conditions.
- This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and the recommendations contained here in are brought to the attention of the Architect and the Civil Engineer for the project and are incorporated into the plans and that the necessary steps are taken to see that the contractor carry out such recommendations in the field.
- A layer of blinding concrete 10 cm. thick should be placed under the footings in order to minimize chemical reaction between cement mortar and native soil.

APPENDIX

The followings are enclosed to this report

- 11 Log Sheets
- Figure (1) : Site Plan
- Figure (2-6) : Geological Profiles
- Figure (7) : Geological Map
- Figure (8) : Seismic Map

BOREHOLE LOG SHEET

Client : السادة التصاميم الحضرية للاستشارات الهندسية المحترمين	**Job No.: 62/S/03/2016**
Project : مدرسة السخنة	**Borehole No.: BH1... (1/2)**
Location: Al-Zarqa **Lot No.(1) , Basin No.(5)**	**Elevation: +95.5**
RIG : ATLAS COPCO	**Date:3/03/2016**

depth (m)	Elev.	Samp.	Legend	T.C.R (%)	R.Q.D (%)	SPT (N)	LITHOLOGIC DESCRIPTION
+0.0	95.50						Present ground surface
	95.00						**Concrete Pavement** (0.0-0.3)m
1	94.50						
	94.00						**Mixture** Composed of Limestone and chert gravels and cobbles with some boulders mixed with Silty Clay and Marly Clay soil
2	93.50						
	93.00						
3	92.50						
	92.00						
4	91.50	⊠				25	
	91.00						
5	90.50						
	90.00						
6	89.50						
	89.00						
7	88.50						
	88.00						
8	87.50						
	87.00						
9	86.50						
	86.00						
10	85.50						
	85.00						
11	84.50						End of boring
12							
13							
14							
15							

SPLIT SPOON ⊠ CORE SAMPLE ▯ PERCUSSION ▽ TUBE SAMPLE ■

BOREHOLE LOG SHEET

Client : السادة التصاميم الحضرية للاستشارات الهندسية المحترمين	**Job No.: 62/S/03/2016**
Project : مدرسة السخنة	**Borehole No.: BH1... (2/2)**
Location: Al-Zarqa **Lot No.(1) , Basin No.(5)**	**Elevation: +95.5**
RIG : ATLAS COPCO	**Date:3/03/2016**

depth (m)	Elev.	Samp.	Legend	T.C.R (%)	R.Q.D (%)	SPT (N)	LITHOLOGIC DESCRIPTION
11.0	84.50						Present ground surface
	84.00						**Mixture** Composed of Limestone and chert gravels and cobbles with some boulders mixed with Silty Clay and Marly Clay soil
12	83.50						
	83.00						
13	82.50						
	82.00						
14	81.50						
	81.00						
15	80.50						
	80.00						
16	79.50						End of boring
17							
18							
19							
20							
21							
22							
23							
24							
25							
26							

SPLIT SPOON ☒ CORE SAMPLE ▯ PERCUSSION ▽ TUBE SAMPLE ■

BOREHOLE LOG SHEET

Client : السادة التصاميم الحضرية للاستشارات الهندسية المحترمين	**Job No.: 62/S/03/2016**
Project : مدرسة السخنة	**Borehole No.: BH2... (1/1)**
Location: Al-Zarqa **Lot No.(1) , Basin No.(5)**	**Elevation: +95.0**
RIG : ATLAS COPCO	**Date:3/03/2016**

depth (m)	Elev.	Samp.	Legend	T.C.R (%)	R.Q.D (%)	SPT (N)	LITHOLOGIC DESCRIPTION
+0.0	95.00						Present ground surface
	94.50						**Concrete Pavement** (0.0-0.2)m
1	94.00						**Fill Material**
	93.50						Composed of Silty Clay soil mixed with Limestone gravels (0.2-1.0)m
2	93.00						
	92.50						
3	92.00						**Mixture**
	91.50					12	Composed of high percentage of chert gravels and Limestone and cobbles with some boulders mixed with Silty Clay and Marly Clay soil
4	91.00						
	90.50						
5	90.00						
	89.50						
6	89.00						
	88.50						
7	88.00						
	87.50						
8	87.00						
	86.50						
9	86.00						
	85.50						
10	85.00						
	84.50						
11	84.00						
	83.50						
12	83.00						End of boring
13							
14							
15							

SPLIT SPOON ⊠ CORE SAMPLE ▯ PERCUSSION ▽ TUBE SAMPLE ■

BOREHOLE LOG SHEET

Client : السادة التصاميم الحضرية للاستشارات الهندسية المحترمين	**Job No.: 62/S/03/2016**
Project : مدرسة السخنة	**Borehole No.: BH3... (1/1)**
Location: Al-Zarqa **Lot No.(1) , Basin No.(5)**	**Elevation: +95.3**
RIG : ATLAS COPCO	**Date:3/03/2016**

depth (m)	Elev.	Samp.	Legend	T.C.R (%)	R.Q.D (%)	SPT (N)	LITHOLOGIC DESCRIPTION
+0.0	95.30						Present ground surface
	94.80						**Concrete Pavement** (0.0-0.2)m
1	94.30						**Fill Material** Composed of Silty Clay soil mixed with Limestone gravels (0.2-0.5)m
	93.80						
2	93.30						
	92.80					25	
3	92.30						**Mixture** Composed of Limestone and chert gravels and cobbles with some boulders mixed with Silty Clay and Marly Clay soil
	91.80						
4	91.30						
	90.80						
5	90.30						
	89.80						
6	89.30						
	88.80						
7	88.30						
	87.80						
8	87.30						
	86.80						
9	86.30						End of boring
10							
11							
12							
13							
14							
15							

SPLIT SPOON ☒ CORE SAMPLE ▯ PERCUSSION ▽ TUBE SAMPLE ■

BOREHOLE LOG SHEET

Client : السادة التصاميم الحضرية للاستشارات الهندسية المحترمين	**Job No.: 62/S/03/2016**
Project : مدرسة السخنة	**Borehole No.: BH4... (1/1)**
Location: Al-Zarqa **Lot No.(1) , Basin No.(5)**	**Elevation: +93.0**
RIG : ATLAS COPCO	**Date:3/03/2016**

depth (m)	Elev.	Samp.	Legend	T.C.R (%)	R.Q.D (%)	SPT (N)	LITHOLOGIC DESCRIPTION
+0.0	93.00						Present ground surface
	92.50						**Concrete Pavement** (0.0-0.2)m
1	92.00						**Fill Material**
	91.50						Composed of Silty Clay soil mixed with
2	91.00					28	Limestone gravels (0.2-0.7)m
	90.50						
3	90.00						**Mixture**
	89.50						Composed of Limestone and chert gravels
4	89.00						and cobbles with some boulders mixed
	88.50						with Silty Clay and Marly Clay soil
5	88.00						
	87.50						
6	87.00						
	86.50						
7	86.00						
	85.50						
8	85.00						
	84.50						
9	84.00						
	83.50						
10	83.00						
	82.50						
11	82.00						
	81.50						
12	81.00						End of boring
13							
14							
15							

SPLIT SPOON ⊠ CORE SAMPLE ▮▮▮ PERCUSSION ▽ TUBE SAMPLE ■

BOREHOLE LOG SHEET

Client : السادة التصاميم الحضرية للاستشارات الهندسية المحترمين	**Job No.: 62/S/03/2016**
Project : مدرسة السخنة	**Borehole No.: BH5... (1/1)**
Location: Al-Zarqa **Lot No.(1) , Basin No.(5)**	**Elevation: +94.9**
RIG : ATLAS COPCO	**Date:3/03/2016**

depth (m)	Elev.	Samp.	Legend	T.C.R (%)	R.Q.D (%)	SPT (N)	LITHOLOGIC DESCRIPTION
+0.0	94.90						Present ground surface
	94.40						**Concrete Pavement** (0.0-0.2)m
1	93.90						**Fill Material** Composed of Silty Clay soil mixed with Limestone gravels (0.2-2.3)m
	93.40						
2	92.90						
	92.40						
3	91.90						**Mixture** Composed of Limestone and chert gravels and cobbles with some boulders mixed with Silty Clay and Marly Clay soil
	91.40						
4	90.90						
	90.40					31	
5	89.90						
	89.40						
6	88.90						
	88.40						
7	87.90						
	87.40						
8	86.90						
	86.40						
9	85.90						End of boring
10							
11							
12							
13							
14							
15							

SPLIT SPOON ☒ CORE SAMPLE ▯ PERCUSSION ▽ TUBE SAMPLE ■

BOREHOLE LOG SHEET

Client : السادة التصاميم الحضرية للاستشارات الهندسية المحترمين	**Job No.: 62/S/03/2016**
Project : مدرسة السخنة	**Borehole No.: BH6... (1/1)**
Location: Al-Zarqa **Lot No.(1) , Basin No.(5)**	**Elevation: +94.85**
RIG : ATLAS COPCO	**Date:3/03/2016**

depth (m)	Elev.	Samp.	Legend	T.C.R (%)	R.Q.D (%)	SPT (N)	LITHOLOGIC DESCRIPTION
+0.0	94.85						Present ground surface
	94.35						**Fill Material**
1	93.85						Composed of Silty Clay soil mixed with Limestone gravels (0.0-0.7)m
	93.35						
2	92.85						
	92.35						
3	91.85					29	**Mixture**
	91.35						Composed of Limestone and chert gravels and cobbles with some boulders mixed with Silty Clay and Marly Clay soil
4	90.85						
	90.35						
5	89.85						
	89.35						
6	88.85						
	88.35						
7	87.85						
	87.35						
8	86.85						
	86.35						
9	85.85						
	85.35						
10	84.85						
	84.35						
11	83.85						
	83.35						
12	82.85						
	82.35						
13	81.85						End of boring
14							
15							

SPLIT SPOON ⊠ CORE SAMPLE ▮▮ PERCUSSION ▽ TUBE SAMPLE ■

BOREHOLE LOG SHEET

Client : السادة التصاميم الحضرية للاستشارات الهندسية المحترمين	**Job No.: 62/S/03/2016**
Project : مدرسة السخنة	**Borehole No.: BH7... (1/1)**
Location: Al-Zarqa **Lot No.(1) , Basin No.(5)**	**Elevation: +95.0**
RIG : ATLAS COPCO	**Date:3/03/2016**

depth (m)	Elev.	Samp.	Legend	T.C.R (%)	R.Q.D (%)	SPT (N)	LITHOLOGIC DESCRIPTION
+0.0	95.00						Present ground surface
	94.50						**Concrete Pavement** (0.0-0.2)m
1	94.00						**Fill Material**
	93.50						Composed of Silty Clay soil mixed with Limestone gravels (0.2-1.3)m
2	93.00						
	92.50					29	
3	92.00						**Mixture**
	91.50						Composed of Limestone and chert gravels and cobbles with some boulders mixed with Silty Clay and Marly Clay soil
4	91.00						
	90.50						
5	90.00						
	89.50						
6	89.00						
	88.50						
7	88.00						
	87.50						
8	87.00						
	86.50						
9	86.00						
	85.50						
10	85.00						
	84.50						
11	84.00						
	83.50						
12	83.00						End of boring
13							
14							
15							

SPLIT SPOON ☒ CORE SAMPLE ▮ PERCUSSION ▽ TUBE SAMPLE ■

BOREHOLE LOG SHEET

Client : السادة التصاميم الحضرية للاستشارات الهندسية المحترمين	**Job No.: 62/S/03/2016**
Project : مدرسة السخنة	**Borehole No.: BH8... (1/1)**
Location: Al-Zarqa **Lot No.(1) , Basin No.(5)**	**Elevation: +94.85**
RIG : ATLAS COPCO	**Date:3/03/2016**

depth (m)	Elev.	Samp.	Legend	T.C.R (%)	R.Q.D (%)	SPT (N)	LITHOLOGIC DESCRIPTION
+0.0	94.85						Present ground surface
	94.35						**Concrete Pavement** (0.0-0.2)m
1	93.85						**Fill Material**
	93.35						Composed of Silty Clay soil mixed with
2	92.85						Limestone gravels (0.2-1.8)m
	92.35						
3	91.85						**Mixture**
	91.35					35	Composed of Limestone and chert gravels
4	90.85						and cobbles with some boulders mixed
	90.35						with Silty Clay and Marly Clay soil
5	89.85						
	89.35						* more concentration of Silty Clay from 1.8-3.0 m
6	88.85						
	88.35						
7	87.85						
	87.35						
8	86.85						
	86.35						
9	85.85						
10							End of boring
11							
12							
13							
14							
15							

SPLIT SPOON ☒ CORE SAMPLE ▯ PERCUSSION ▽ TUBE SAMPLE ■

BOREHOLE LOG SHEET

Client : السادة التصاميم الحضرية للاستشارات الهندسية المحترمين	**Job No.: 62/S/03/2016**
Project : مدرسة السخنة	**Borehole No.: BH9... (1/1)**
Location: Al-Zarqa **Lot No.(1) , Basin No.(5)**	**Elevation: +94.9**
RIG : ATLAS COPCO	**Date:3/03/2016**

depth (m)	Elev.	Samp.	Legend	T.C.R (%)	R.Q.D (%)	SPT (N)	LITHOLOGIC DESCRIPTION
+0.0	94.90						Present ground surface
	94.40						**Concrete Pavement** (0.0-0.2)m
1	93.90						
	93.40						
2	92.90					26	
	92.40						**Mixture**
3	91.90						Composed of Limestone and chert gravels and cobbles with some boulders mixed with Silty Clay and Marly Clay soil
	91.40						
4	90.90						
	90.40						
5	89.90						
	89.40						
6	88.90						
	88.40						
7	87.90						
	87.40						
8	86.90						
	86.40						
9	85.90						
	85.40						
10	84.90						
	84.40						
11	83.90						
	83.40						
12	82.90						
	82.40						
13	81.90						
							End of boring
14							
15							

SPLIT SPOON ☒ CORE SAMPLE ▮ PERCUSSION ▽ TUBE SAMPLE ■

BOREHOLE LOG SHEET

Client : السادة التصاميم الحضرية للاستشارات الهندسية المحترمين	**Job No.: 62/S/03/2016**
Project : مدرسة السخنة	**Borehole No.: BH10... (1/1)**
Location: Al-Zarqa **Lot No.(1) , Basin No.(5)**	**Elevation: +96.10**
RIG : ATLAS COPCO	**Date:3/03/2016**

depth (m)	Elev.	Samp.	Legend	T.C.R (%)	R.Q.D (%)	SPT (N)	LITHOLOGIC DESCRIPTION
+0.0	96.10						Present ground surface
	95.60						**Fill Material**
1	95.10						Composed of Silty Clay soil mixed with Limestone gravels (0.0-1.0)m
	94.60						
2	94.10						
	93.60						
3	93.10						**Mixture**
	92.60						Composed of Limestone and chert gravels and cobbles with some boulders mixed with Silty Clay and Marly Clay soil
4	92.10					30	
	91.60						
5	91.10						
	90.60						
6	90.10						
	89.60						
7	89.10						
	88.60						
8	88.10						
	87.60						
9	87.10						
	86.60						
10	86.10						End of boring
11							
12							
13							
14							
15							

SPLIT SPOON ⊠ CORE SAMPLE ▯ PERCUSSION ▽ TUBE SAMPLE ■

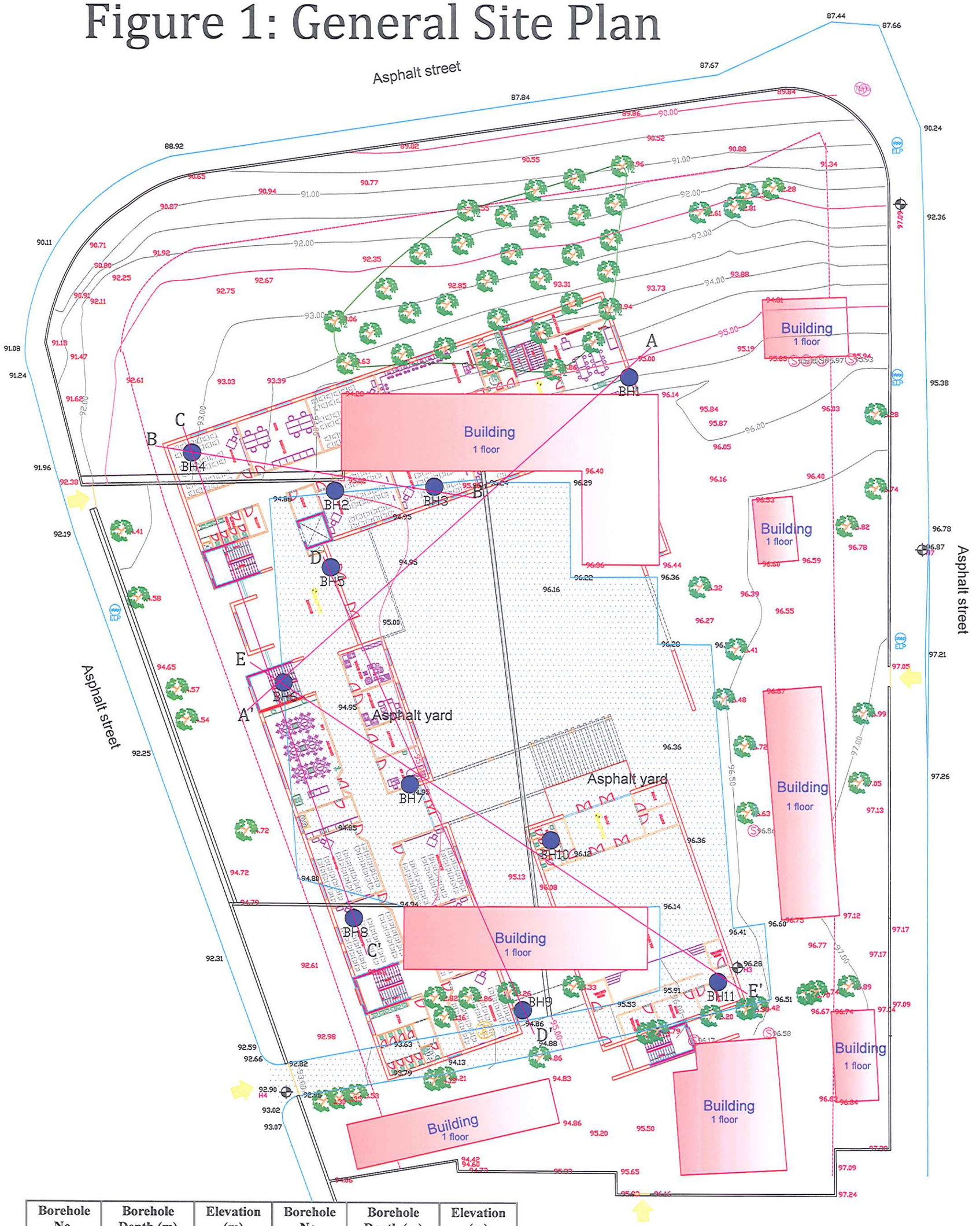
BOREHOLE LOG SHEET

Client : السادة التصاميم الحضرية للاستشارات الهندسية المحترمين	**Job No.: 62/S/03/2016**
Project : مدرسة السخنة	**Borehole No.: BH11... (1/1)**
Location: Al-Zarqa **Lot No.(1) , Basin No.(5)**	**Elevation: +96.20**
RIG : ATLAS COPCO	**Date:3/03/2016**

depth (m)	Elev.	Samp.	Legend	T.C.R (%)	R.Q.D (%)	SPT (N)	LITHOLOGIC DESCRIPTION
+0.0	96.20						Present ground surface
	95.70						**Fill Material**
1	95.20						Composed of Silty Clay soil mixed with Limestone gravels (0.0-0.5)m
	94.70						
2	94.20						
	93.70						
3	93.20					31	**Mixture**
	92.70						Composed of Limestone and chert gravels and cobbles with some boulders mixed with Silty Clay and Marly Clay soil
4	92.20						
	91.70						
5	91.20						
	90.70						
6	90.20						
	89.70						
7	89.20						
	88.70						
8	88.20						
	87.70						
9	87.20						
	86.70						
10	86.20						End of boring
11							
12							
13							
14							
15							

SPLIT SPOON ☒ CORE SAMPLE ▯ PERCUSSION ▽ TUBE SAMPLE ■

Figure 1: General Site Plan



Borehole No.	Borehole Depth (m)	Elevation (m)	Borehole No.	Borehole Depth (m)	Elevation (m)
BH1	16.0	+95.5	BH7	12.0	+95.0
BH2	12.0	+95.0	BH8	15.0	+94.85
BH3	12.0	+95.3	BH9	11.0	+94.9
BH4	14.0	+93.0	BH10	17.0	+96.1
BH5	11.0	+94.9	BH11	13.0	+96.2
BH6	11.0	+94.85			

B.T.L= +93.45

G.T.L= +97.50

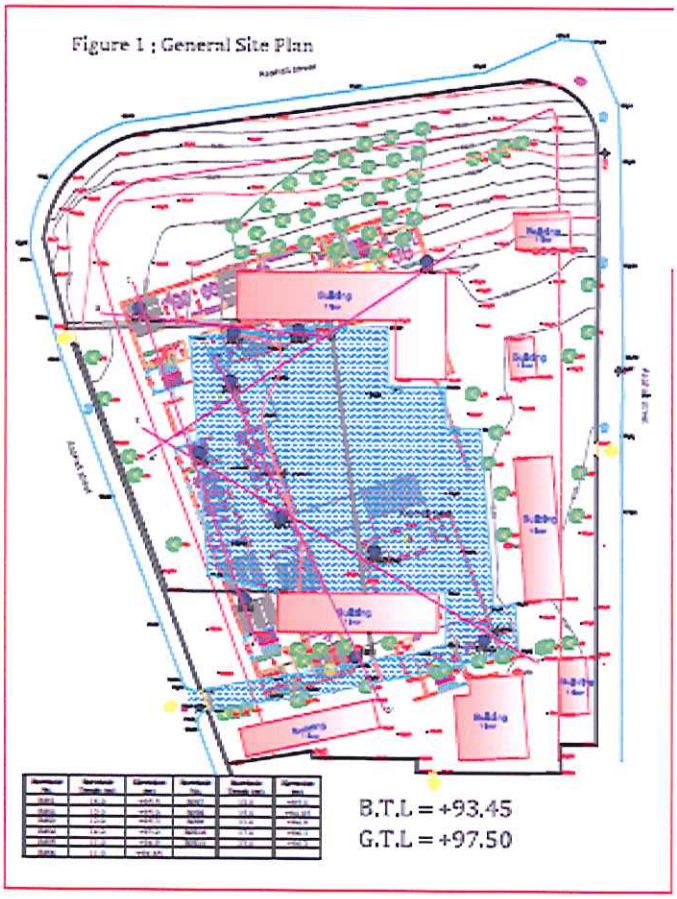
نقابة المهندسين الأردنيين
نموذج يرفق مع المخططات الهندسية مختوم من النقابة

اسم مكتب فحص التربة: المركز الدولي للدراسات الهندسية والجيولوجية رقم المكتب:861 رقم العقد:

التاريخ: / / 2016

اسم المالك: السادة خزينة المملكة وزارة التربية و التعليم رقم القطعة : (1) رقم الحوض واسمه : (5/ النلد) الموقع: السخنة.

الموقع العام مثبت عليه الطبوغرافي والابار السبرية



BH. NO.	Elevation	Depth, m	بيانات تقرير فحص التربة	
1	مرفق جدول 1		+93.45	منسوب بلاط التسوية *
2			+97.5	منسوب بلاط الارضي
3			2.4 kg/cm^2	قوة التحمل المسموح بها
4			1.5 m	عمق التأسيس على الأقل
5			**Mixture Material** that composed of chert and limestone gravels and cobbles mixed with some silty clay soil	مواد التأسيس
6				أي ملاحظات أخرى

* يجب تحديد مكان التسوية وترقيمها.

*جدول 1: اعماق الابار السبرية و ارتفاعاتها :

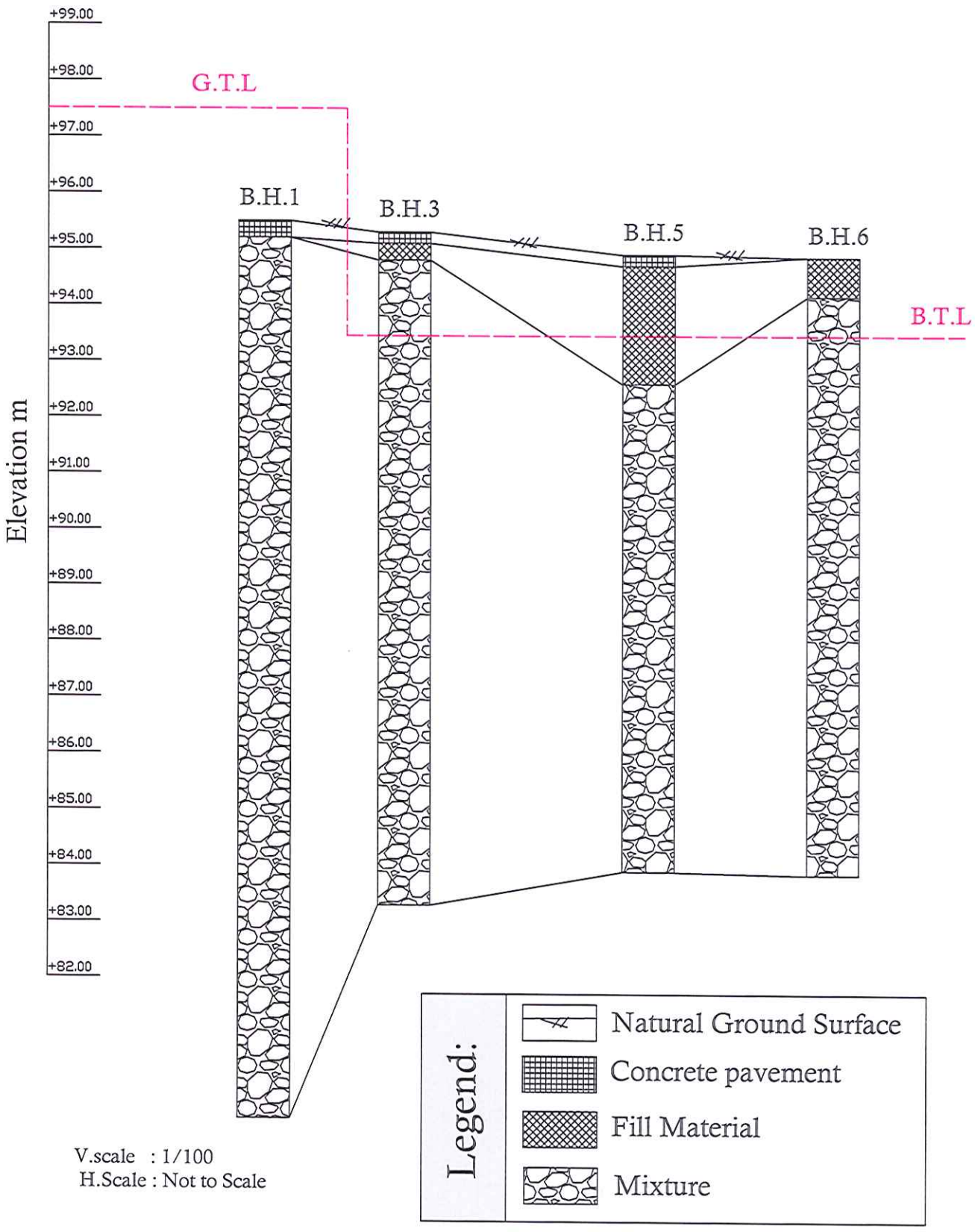
Borehole No.	Borehole Depth (m)	Elevation (m)	Borehole No.	Borehole Depth (m)	Elevation (m)
BH1	16.0	+95.5	**BH7**	12.0	+95.0
BH2	12.0	+95.0	**BH8**	15.0	+94.85
BH3	12.0	+95.3	**BH9**	11.0	+94.9
BH4	14.0	+93.0	**BH10**	17.0	+96.1
BH5	11.0	+94.9	**BH11**	13.0	+96.2
BH6	11.0	+94.85			

ختم المكتب وتوقيع رئيس الإختصاص

خاص لإستعمال نقابة المهندسين الأردنيين.

Figure (2): GEOLOGICAL PROFILE (1)

section A-A'



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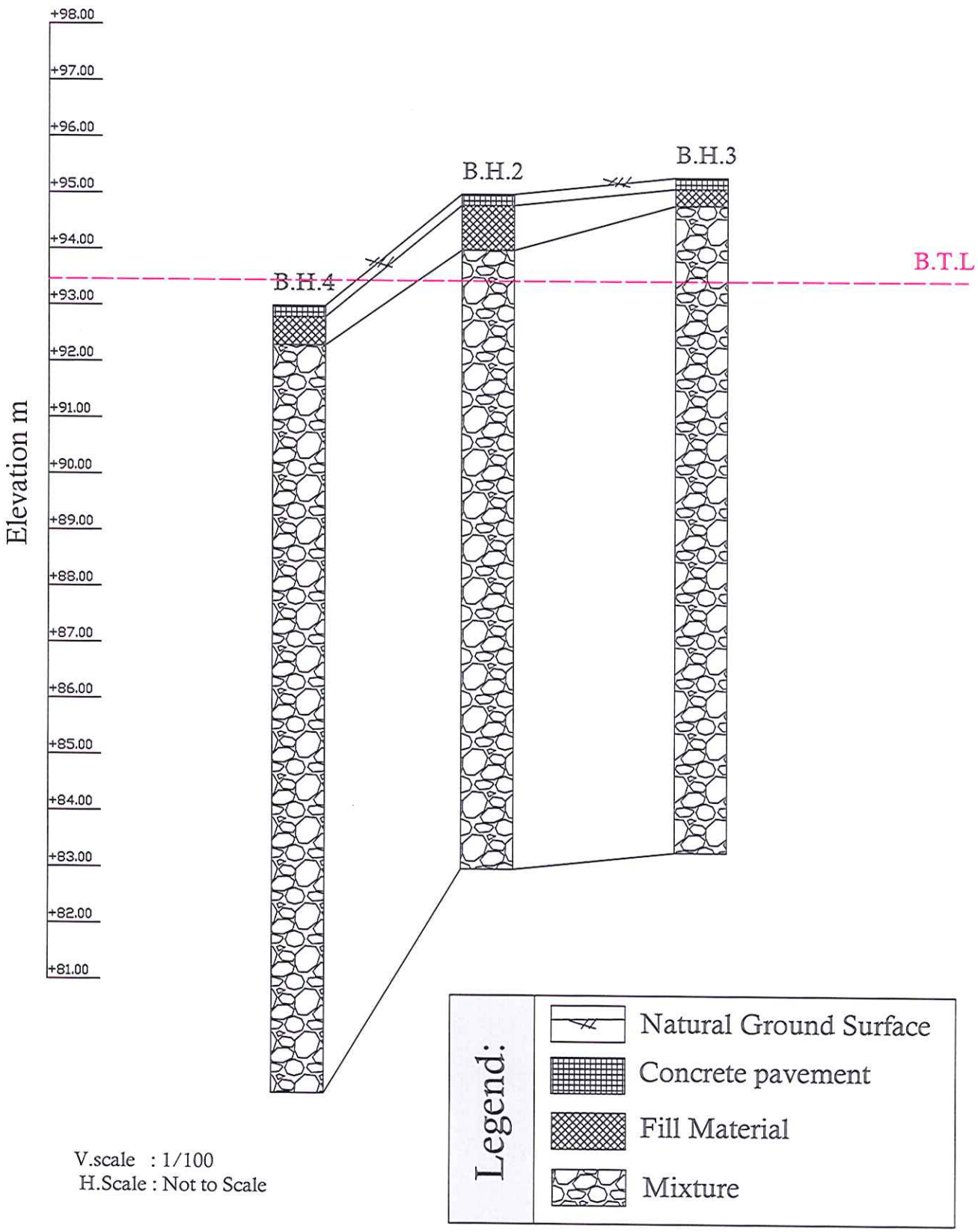
Report No.:62/S/03/2016

Figure (3): GEOLOGICAL PROFILE (2)

section B-B'



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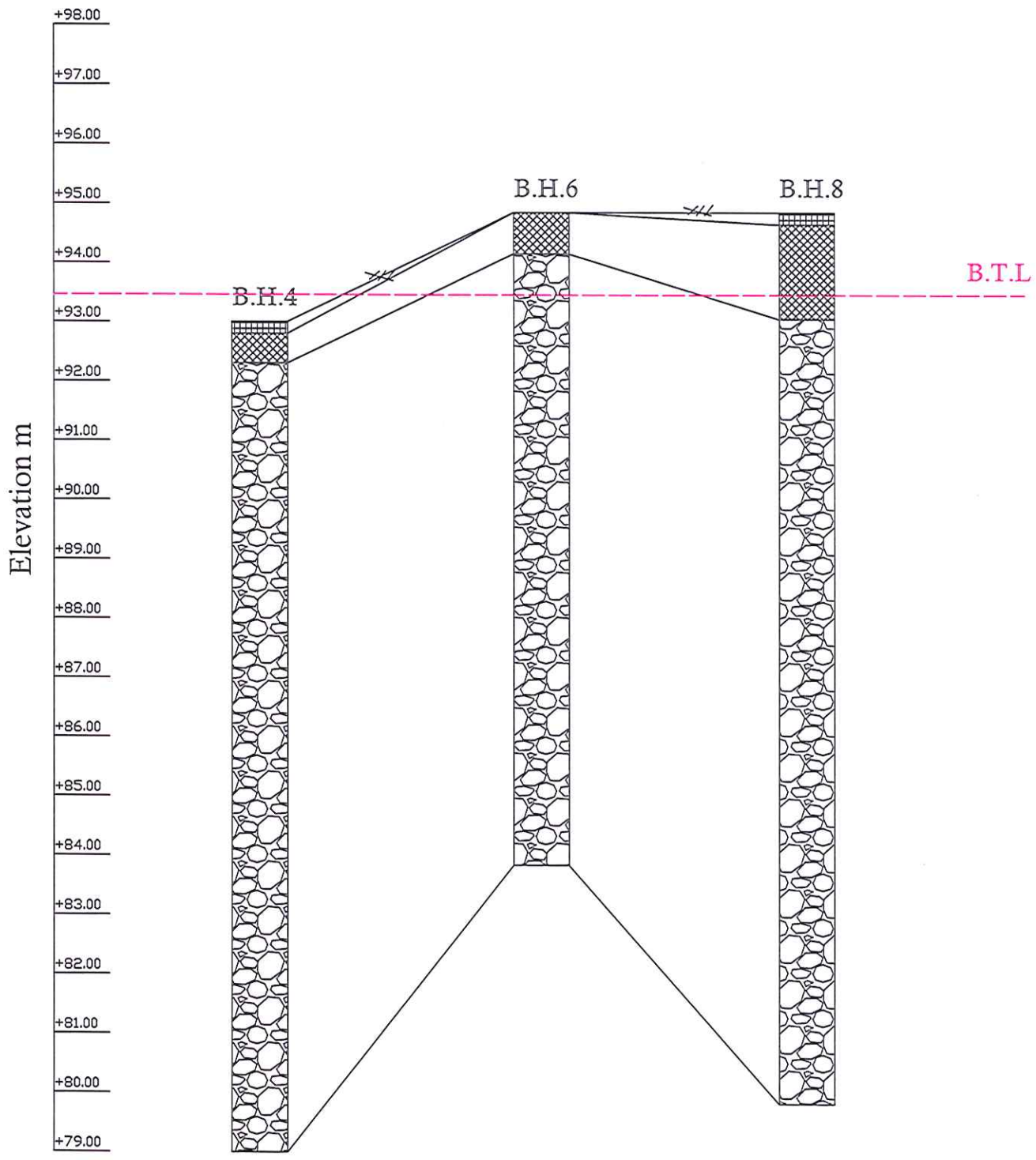
Report No.:62/S/03/2016

Figure (4): GEOLOGICAL PROFILE (3)

section C-C'



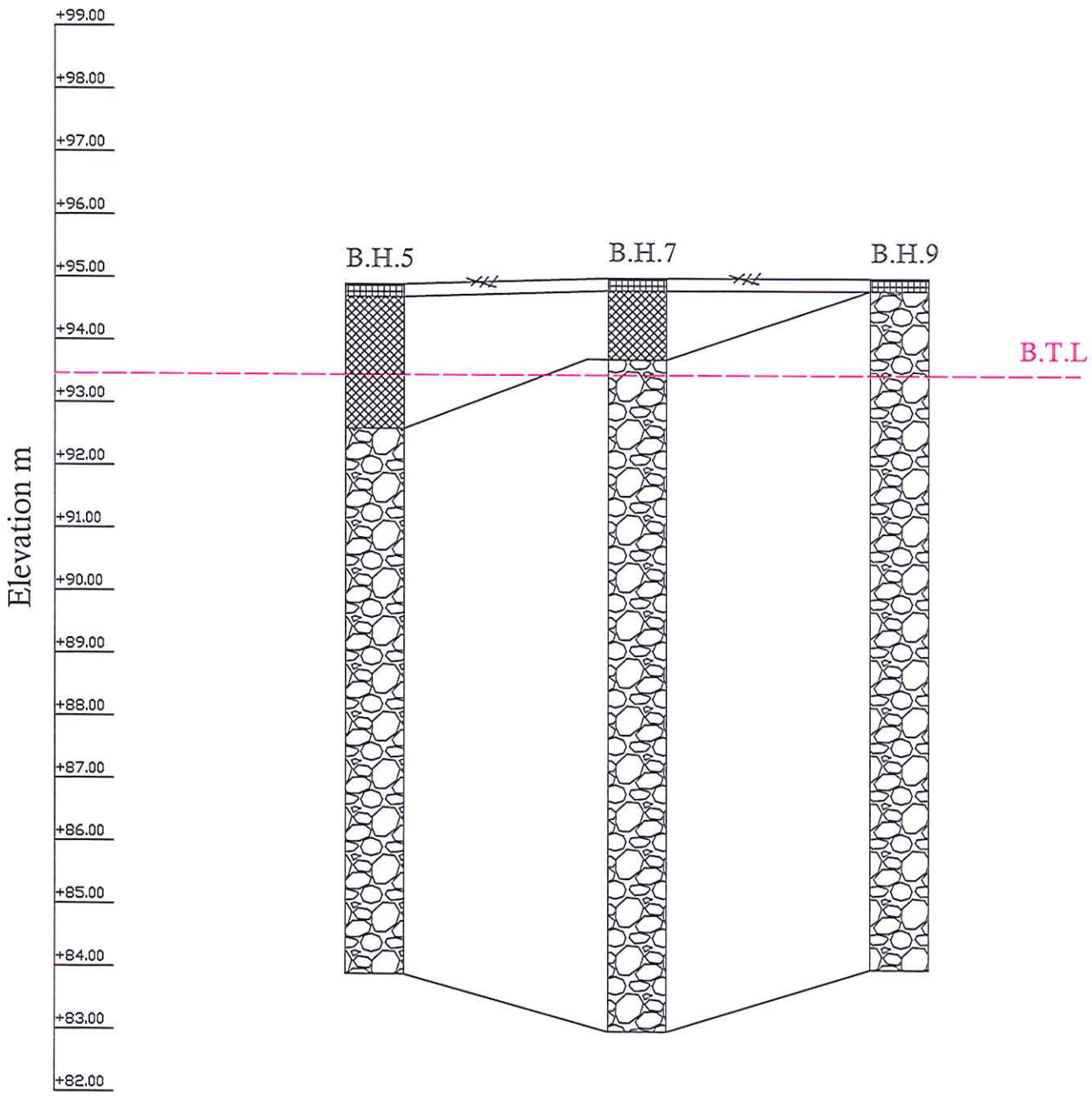
V.scale : 1/100
H.Scale : Not to Scale

Legend:

- Natural Ground Surface
- Concrete pavement
- Fill Material
- Mixture

Figure (5): GEOLOGICAL PROFILE (4)

section D-D'



Legend:

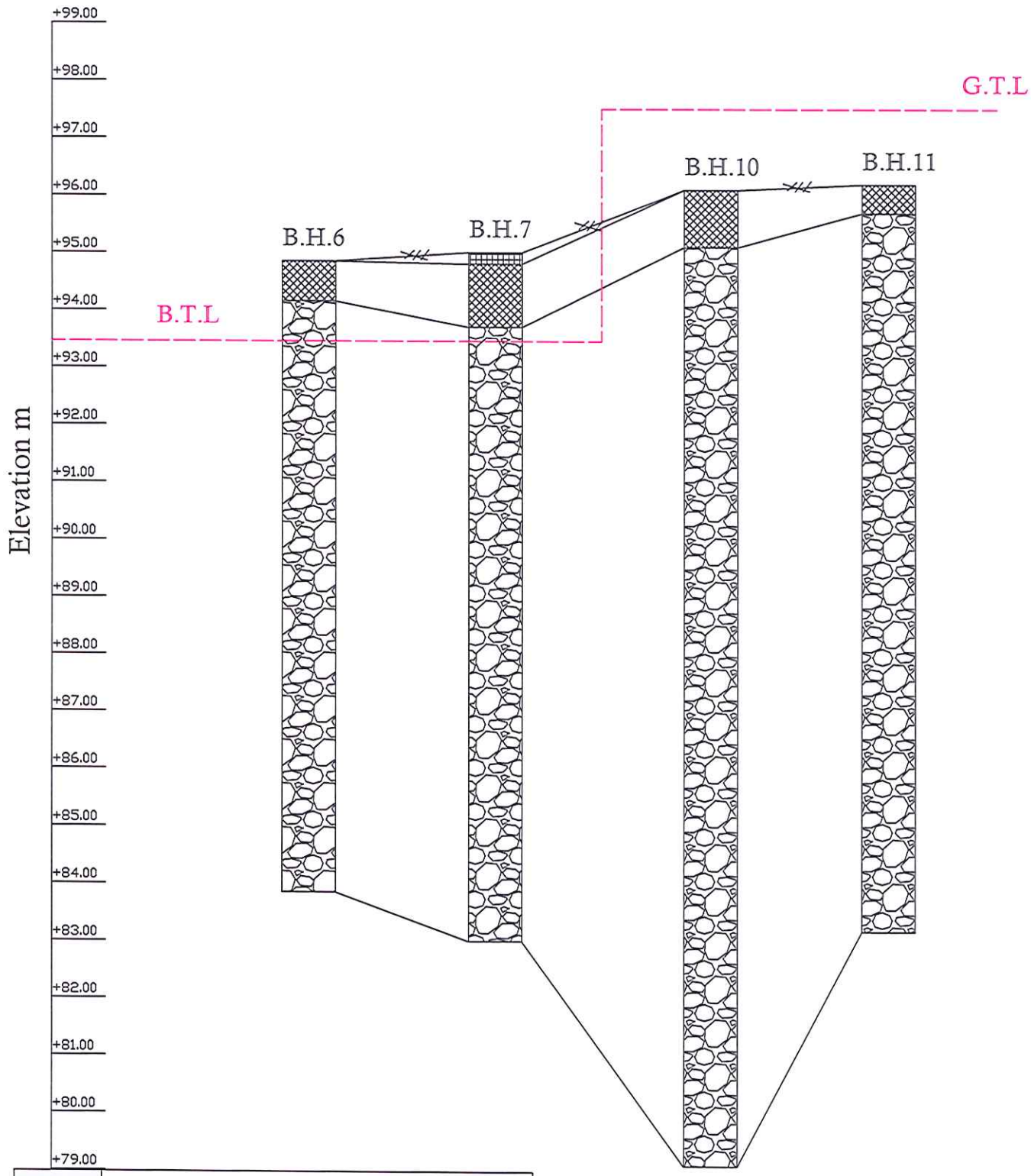
- Natural Ground Surface
- Concrete pavement
- Fill Material
- Mixture

V.scale : 1/100
H.Scale : Not to Scale

International Centre For Geotechnical Studies (GEOTEST)
Report No.:62/S/03/2016

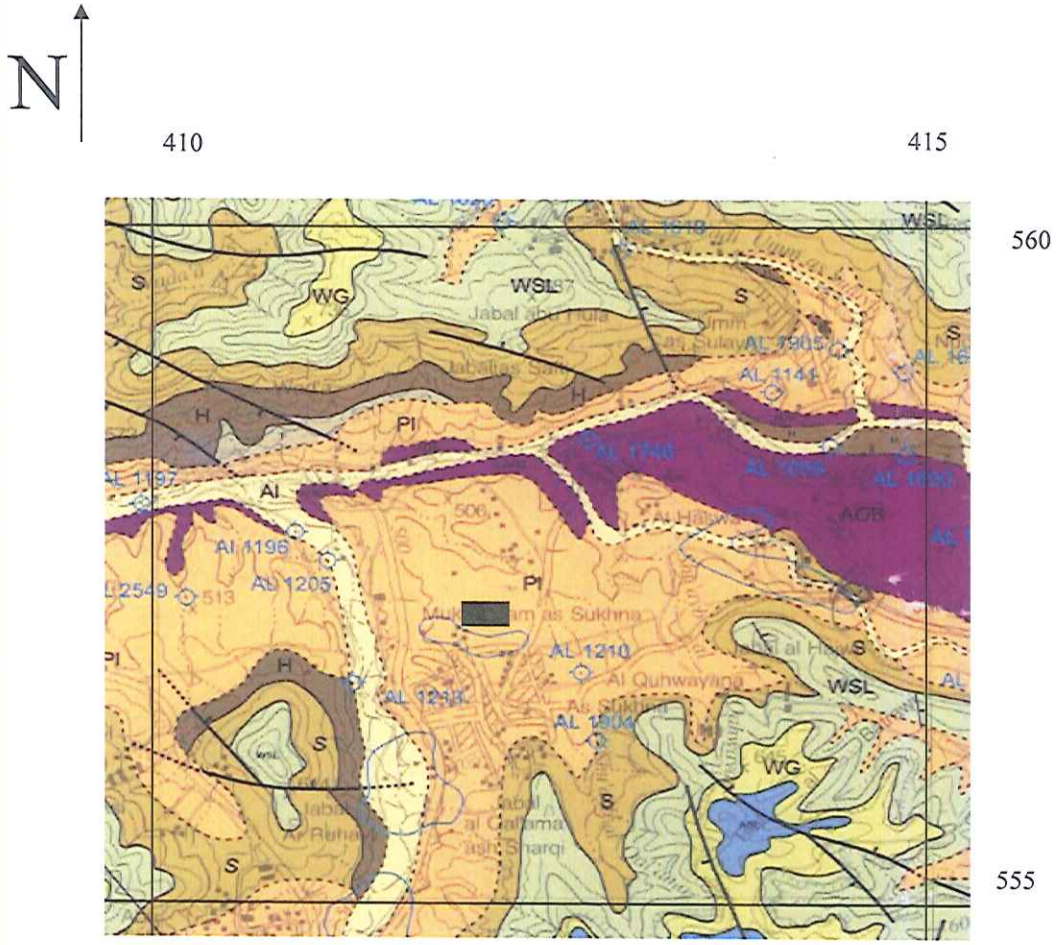
Figure (6): GEOLOGICAL PROFILE (5)

section E-E'



V.scale : 1/100
H.Scale : Not to Scale

Figure (7) GEOLOGICAL MAP



Scale 1/25000

LEGENDS

- Aprox. site location
- Formation boundary
- PI
- AOB
- Al

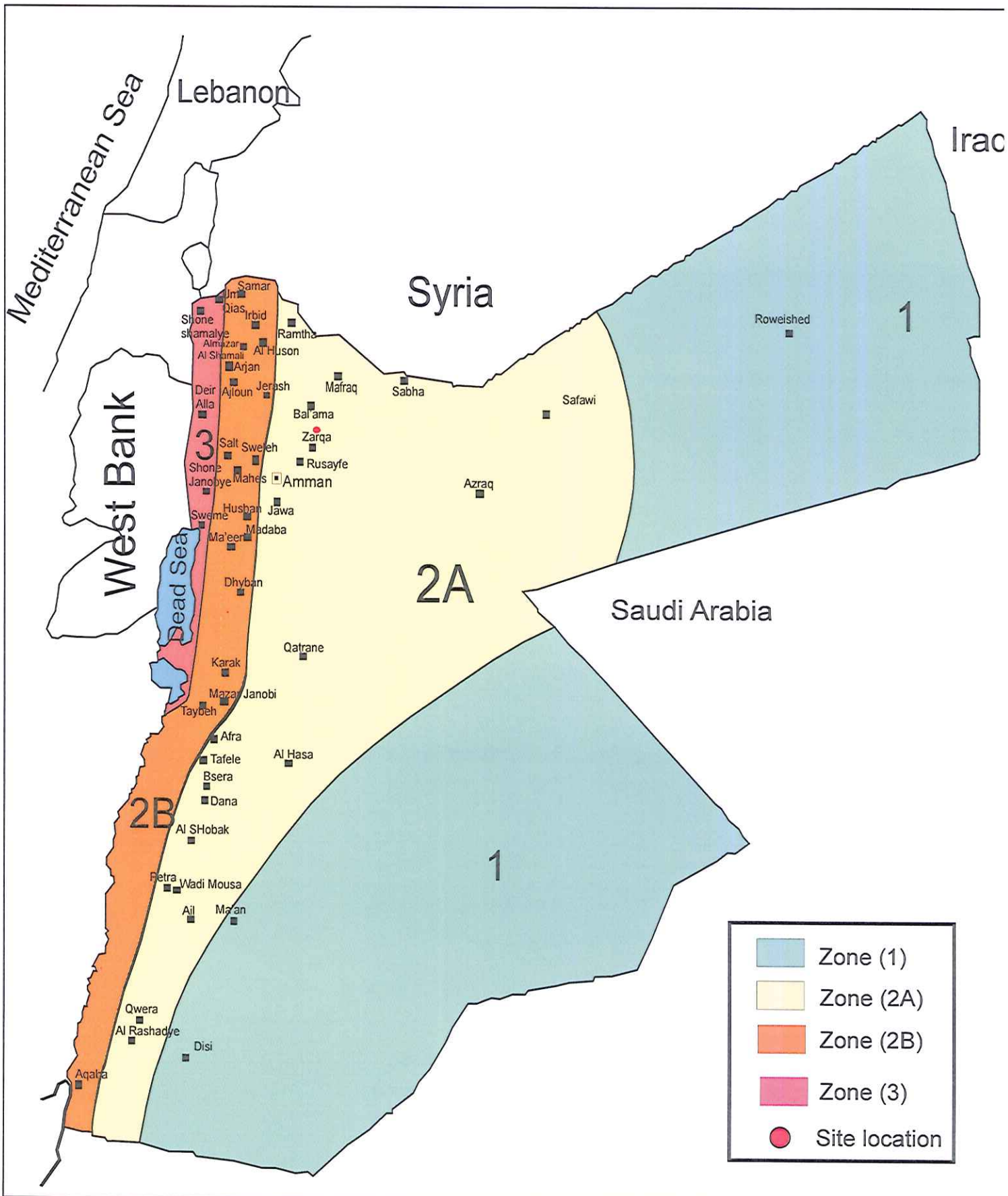


Figure No. (8) : Jordan Seismic Map

DLS-R-0584775/A

صورة قيد تسجيل الأموال غير المنقولة

المديرية : اراضي محافظة الزرقاء
القرية : السخنه
اسم الحي : مدرسة الذكور

رقم القيد : 2015-ZA-17392
اسم الحوض : السلط
نوع الأرض : ملك

يحتوي هذا القيد على 1 (صفحة)

رقم القطعة : 1
رقم الحوض: 5
رقم الشقة: 000
القيمة التسجيلية : 15333.600
رقم بيان التنبير: --

المقترحات
ارض بناء ضمنها مدرسه السخنه الاعداديه

رقم الحي: 6
رقم اللوحة : 14
مجموع الحصص:1
مقياس الرسم : 1/2500

	متر مربع	دونم
المساحة رقما :	404.000	12

المساحة كتابة : اثنى عشرة دونم وأربعمائة و أربعة أمتار فقط

يوجد وقوعات

الرقم الوطني	اسم المالك	الجنسية	الحصص
	خزينة المملكة الاردنيه وزارة التربية والتعليم	الاردنية	كامله

إن الأموال غير المنقولة المبينة اعلاه مسجلة بأسماء المالكين المذكورين و قد اعطي هذا السند عادة بثمن بتاريخ 2015/04/06 والتوفيت الرسوم بموجب كتاب وزارة التربية والتعليم رقم 2317 تاريخ 2015/04/06

رئيس دائرة : محافظة الزرقاء

الرمز المميز: 17392-WYIDDF
منظم سند التسجيل: حسن محمد عواد المشاقبه
DLS3794-11:29:11-06/04/2015

المملكة الاردنية الهاشمية
دائرة الاراضي و المساحة
مخطط أراضي

ظة: محافظة الزرقاء	الحوض: البلد(5)	رقم الوصل: للعمل الرسمي
ديرية: اراضي محافظة الزرقاء	الحي: مدرسة الذكور(6)	تاريخ الاصدار: 6-4-2015
القرية: السخنه(358)	رقم القطعة: 1	تاريخ الوصل: 6-4-2015

مخطط الاراضي صالح لمدة سنة ما لم يتم عليه أي تعديل

DLS KEY: 0358 | 005 | 006 | 00001

مقياس الرسم 1 : 2500

form # QP 09-104-2 rev .b

GIS1ZA

بلدية
الهاشمية الجديدة

مخطط موقع وترسيم
(دائرة التنظيم)

الرقم المتسلسل ت/ ١٥/ ٢٠١٠

رقم الوصول

التاريخ

منطقة السخنة

اسم المالك خزينة المملكة الأردنية / وزارة ...

الموقع ... رقم اللوحة ١٤ رقم الحي ٦ ... رقم التسجيل

رقم الحوض ٥/ ... رقم القطعة ١ مساحة القطعة ... تاريخ سند التسجيل

منطقة التنظيم مباني عامة

النسبة المئوية ٥٣٪

الحد الأعلى لارتفاع البناء ٥٢ م

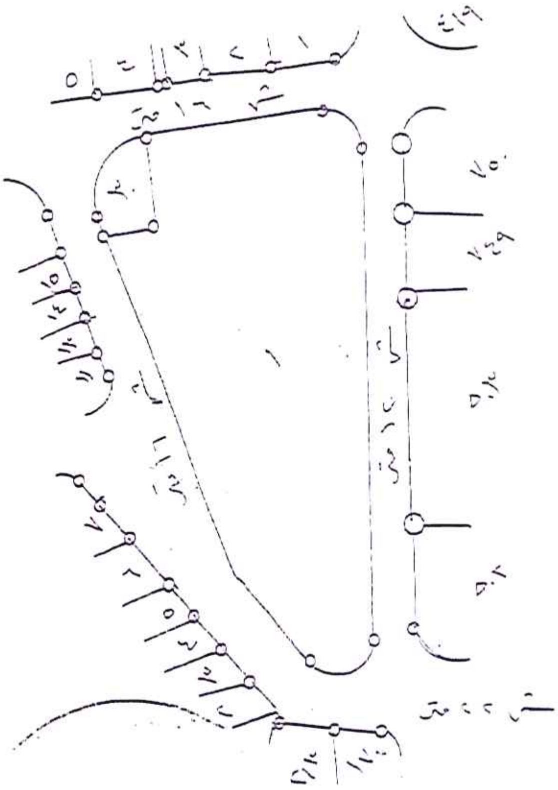
الحد الأدنى لمساحة الافراز

الحد الأدنى لعرض الواجهة على الشارع

ملاحظات المخطط موقع ترسيم

الشمال

امامي	جانبي	خلفي
١٥م	١٠م	١٠م
/	/	/



مقياس الرسم ١/ ٢٥٠٠

رسم / فدوى الحوش التوقيع ... التاريخ ١/ ٤/ ٢٠١٥

تدقيق / فدوى الحوش التوقيع ... التاريخ ١/ ٤/ ٢٠١٥

تدقيق ... التوقيع ... التاريخ ٧/ ٤/ ٢٠١٥

ملاحظة : ١ - هذا المخطط صالح لمدة سنة واحدة من تاريخ اصداره

- أي معلومات او ملاحظات او ترسيم او احكام تنظيم سجلت ضمن هذا المخطط خطأ وتخالف المخطط الهيكلي التنظيمي المصدق او سقطت سهوا