



USAID
FROM THE AMERICAN PEOPLE

LEBANON

ENVIRONMENTAL ASSESSMENT OF THE MUDEIREJ BRIDGE RECONSTRUCTION PROJECT

FINAL REPORT

Prepared by

ECODIT (Lebanon)



AUGUST 2007

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Appendix A

Minutes of meetings

Date: June 13, 2007

Object: Entrance interview with USAID Lebanon

Participants: Mrs. Sana Saliba (USAID), Mr. Rami Wehbeh (USAID), Mr. Karim El-Jisr (ECODIT) and Ms. Soraya Mokarzel, ECODIT Liban

Issues discussed:

- USAID Reconstruction Team
- Format and date for Scoping Session
- Road diversion
- Demolition waste
- Source of construction material
- EA Work Plan

Date: June 15, 2007

Object: Site Visit # 1

Participants: Essam Guirguis (USAID reconstruction team), Mr. Rami Wehbeh (USAID), Mr. Karim El-Jisr and Ms. Soraya Moukarzel of ECODIT Liban

Issues discussed:

- Describing the role of contractors and sub-contractors
- Bridge reconstruction sequence of work
- Scoping Session format and presentation by CII
- Options for demolition/ demolition plan
- Options for the removal / handling of demolition waste
- Source of construction material

Date: June 25, 2007 (Sofar)

Object: Meeting with Ramiz Chaya (mayor of Sofar) to discuss:

- Scoping session
- Sofar steel bridge
- Role of surrounding municipalities

Date: June 26, 2007 (CDR)

Object: Meeting with Elie El Helou (CDR) to discuss:

- Sofar steel Bridge
- Rubble disposal after the war
- Program and list of participants for scoping session
- Considerations for blasting

Date: July 12, 2007

Object: Site Visit #2

Participants: Essam Guirguis (USAID reconstruction team), Mr. Said Tarabay (Contrack international), Mr. Issam Abou Jaoude of ECODIT Liban

Issues discussed:

- Landslide below the bridge near Pier 3
- Location of springs close to the site
- Rubble disposal site near the bridge used at the time of building the bridge (1998)
- Water sources

Date: August 1, 2007

Object: Site Visit # 3

People met: USAID Reconstruction Team: Mr. Essam Guirguis, Contrack International: Mr. Said Torbey, Mr. Mohammed Gouda, Baker: Mr. Ghassan Ziab

Issues discussed:

- Using local resources (workforce and materials/supplies)
- Safety on the bridge
- Emergency response plans
- Life span of the bridge
- Waste disposal
- Topographic survey
- Office premises
- Options related to repairing the North bridge

Date: August 9, 2007

Object: Site Visit # 4

People met: CII: Mr. Said Torbey, Mr. Mohammed Gouda and Mr. Bassem Assaf

Issues discussed:

- Location of approved disposal site
- Blasting protocol
- Lebanese legislation/restrictions on aggregate source
- Source of aggregates used in construction
- Safety while working on the bridge deck
- Truck regulations

Date: August 14, 2007

Object: Site Visit # 5

People met: CII: Mr. Mohammed Gouda, Mr. Imad: MAN

Issues discussed:

- Site visit to the rubble disposal site

Appendix B

Minutes of scoping session

Scoping session
Sofar Municipality
July 6, 2007

ECODIT organized on July 6 a scoping session for the Mudeirej Bridge Reconstruction project. The scoping session was hosted by the municipality of Sofar, one of five municipalities located near the Mudeirej Bridge. In total, 22 participants attended the scoping session (excluding ECODIT) which was followed by a visit to the site.

The program was as follows:

10:00 Arrival

10:10 – 10:15 Opening remarks (USAID Lebanon)
10:15 – 10:30 Introductions and EA purpose (ECODIT)
10:30 – 10:45 Project Description (USAID Reconstruction Team)
10:45 – 11:00 Questions & Answers regarding the Project

11:00 – 11:15 Coffee Break

11:15 – 11:45 Presentation on key environmental issues (ECODIT)
11:45 – 12:30 Open discussion regarding potential environmental impacts
(facilitated by ECODIT)

12:45 Site Visit (tour provided by Contrack International)

Arrival, welcome and project description:

Mr. Ramez Chayya, the Mayor of Sofar, welcomed the participants and Ms. Sana Saliba, Program Development Specialist at USAID, gave a brief overview of the project background and the reconstruction team. She then explained that USAID was committed to purchasing up to 70% of the material used for reconstruction locally (from Lebanon). The Director of ECODIT, Mr. Karim El-Jisr, then presented the objectives of the scoping session and Mr. Essam Guirguis, Team Leader for the USAID Reconstruction Team, presented the project that will result in the total repair and reconstruction of the bridge by 2009.

Environmental impacts:

After a presentation of the project's potential impacts, the participants raised important questions and made pertinent comments, summarized next:

1. General Comments

- The project could affect groundwater by disrupting natural water infiltration and/or pollute underground water reservoirs. The EA should study the geology (and soil type in the area) and determine the location of nearby springs.

- Several municipalities (incl. Hammana and Chbaniyeh) commented on the impact of the original bridge (and associated highway) on nearby lands on both sides of the highway (the highway from Sofar to Mudeirej across the Mudeirej Bridge has no service roads or exits). Many local residents lost their lands (or were not duly compensated) at the time of building the highway and bridge.
- The municipality of Sofar complained about the temporary steel bridge that was erected after the war on the damaged Sofar Bridge (located about 2 km north of the Mudeirej Bridge). The Sofar Bridge will be repaired using an Italian grant. The temporary bridge is causing severe noise pollution and will, according to Mr. Elie El Helou, be retrofitted with rubber sheets to minimize noise.
- Several municipalities also suggested to plant trees along both sides of the highway to minimize dust and noise. Elie El Helou of CDR invited these municipalities to visit the Council to discuss proposed amendments to the Tender Documents for the Sofar highway (prior to tendering).

While pertinent, the comments related to the Sofar steel bridge and highway fall outside the scope of the Mudeirej Bridge Reconstruction Project and related EA.

2. Anticipated positive impacts

The Mudeirej Bridge Reconstruction Project will:

- Restore the bridge and redeem its title as the *Highest bridge in the Middle East*
- Reduce travel time
- Reduce the number of road accidents
- Create jobs and economic activities during reconstruction

3. Potential adverse impacts

During *demolition*, the Mudeirej Bridge Reconstruction Project may:

- Generate a lot of demolition waste and rubble; reckless disposal would seriously degrade the environment and the landscape. Consider hauling the rubble to inactive quarries and use them to rehabilitate the sites (e.g., Ain Dara)
- Release a lot of dust (and a plume of smoke during blasting)
- Cause additional landslides (especially during blasting)

It was agreed that blasting offered several advantages over jack-hammering (namely speed) and that *implosion* (currently considered by CDR and the design contractors) is less intrusive than *explosion* and probably more effective and safer.

During *reconstruction*, the Mudeirej Bridge Reconstruction Project may:

- Cause noise pollution, traffic jams and air quality deterioration (due to dust)
- Lead to occupational accidents
- Increase pressure on natural resources if the source of aggregates is not controlled
- Affect roadside commerce in/around Sofar
- Require road diversions.

The participants made the following recommendations:

- Hire local workers (skilled and unskilled)
- Communicate the time of blasting in advance
- Make sure that local springs are not affected by the project
- Monitor and regulate the flow of trucks to/from the site (carrying construction materials and demolition waste)
- Verify the source of aggregates to minimize pressure on local resources (for example, by using a ticketing system to certify the origin of the aggregates)

مشروع إعادة بناء جسر المديرع
جلسة لتحديد نطاق تقييم الأثر البيئي
بلدية صوفر في ٦ تموز ٢٠٠٧

المشاركون

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| | ٠١٠٢٧٠٤٠١ | ٠٢/٨٦٢٥٢٢ | شركة التأسيس | طير عمر |
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| | ٠١-٩٨١٤٥٤ | ٠١-٩٨١٤٥٤ | مكتب الاستشارات | إلهي طير |
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| | | | مكتب هندسة الجسور | د.م. زهير الدين |
| | | | مكتب هندسة الجسور | د.م. زهير الدين |
| | | | مكتب هندسة الجسور | د.م. زهير الدين |

Appendix C

Map showing the four (4) designated quarry zones in Lebanon

Source: The Ministry of Environment, Service of Conservation of Nature, Department of Protection of Natural Resources. Ref.: Decree#16456 dated 27/2/2006

الجمهورية اللبنانية
رئاسة مجلس الوزراء

تعميم رقم ١٩ / ٢٠٠٦

٢٠٠٦ / ١٠ / ٤
٢٠٠٦ / ١٠ / ٤

عدد
١٦٥١

الى جميع الادارات العامة والمؤسسات العامة والبلديات التي تقوم بتنفيذ مشاريع انشائية
بضرورة التزام المقاولين والمتعهدين العاملين في المشاريع العائدة للقطاع العام بالتزود بمواد
البحص والرمل والصخور من المصادر المرخصة وفقاً للاسول

بموجب المرسوم رقم ٨٨٠٣ تاريخ ٢٠٠٢/١٠/٤ تم تنظيم المقالع والكسارات ، وقد تم
تعديله بموجب المرسوم رقم ١٦٤٥٦ تاريخ ٢٠٠٦/٢/٢٧ وحدد تاريخ بدء العمل به بتاريخ
٢٠٠٦/٦/٩.

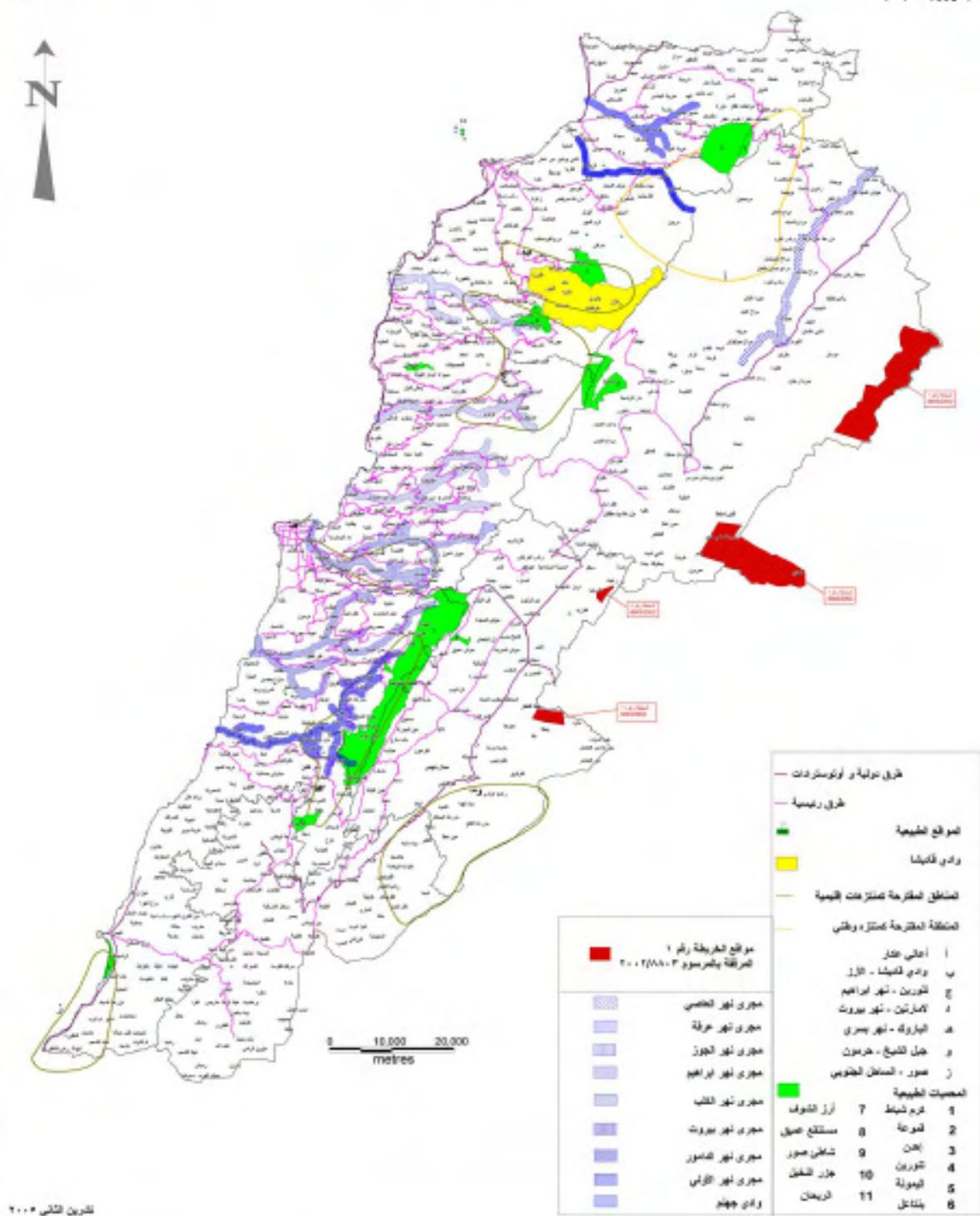
وحيث ان معظم الادارات العامة هي المستهلك الاكبر لمواد البحص والرمل والصخور.

وبما ان الطريقة الفضلى لتنظيم هذا السوق هي تطبيق الانظمة التي ترعاها عبر قيام
الادارات العامة التي تقوم بتنفيذ مشاريع انشائية بالزام المقاولين والمتعهدين العاملين في المشاريع
العائدة للقطاع العام بالتزود بمواد البحص والرمل والصخور من المصادر المرخصة وفقاً للقوانين
والانظمة النافذة.

لذلك ، يطلب الى جميع الادارات والمؤسسات العامة والبلديات التي تقوم بتنفيذ مشاريع انشائية
الزام المقاولين والمتعهدين العاملين في المشاريع العائدة للقطاع العام بالتزود بمواد البحص والرمل
والصخور من المصادر المرخصة وفقاً لما نصت عليه القوانين والانظمة النافذة ولا سيما المرسوم
رقم ٨٨٠٣ تاريخ ٢٠٠٢/١٠/٤ وتعديلاته.

يُروى في ٢٠ حزيران ٢٠٠٦

رئيس مجلس الوزراء
شمار البسوط



Appendix D

List of supplies needed for reconstruction

| Description | Qty. | Unit | Source |
|--|-------|-------|--|
| <u>STEEL REINFORCEMENT</u> | | | |
| Steel reinforcement all diameters. | 1,565 | Tons | Demco/Yared |
| <u>Bearings</u> | | | |
| Pot bearing sliding in one direction. | 21 | No. | Fressynet |
| Pot bearing sliding in two directions. | 21 | No. | Fressynet |
| Transverse elastic restraint. | 26 | No. | Fressynet |
| Shock transmission unit. | 4 | No. | Fressynet |
| <u>Propping</u> | | | |
| Paint to concrete surfaces (cement colour). | 1,500 | Galon | CTC,A-Built, Intertectra,Tonaco,T BM |
| Expansion joints between abutments and deck slab. | 33 | m | Fressynet |
| <u>Fences</u> | | | |
| External fence to deck. | 475 | m | Tecman Industries |
| Internal fence to deck. | 475 | m | Tecman Industries |
| <u>Water proofing</u> | | | |
| Two Layers of Waterproofing Membrane, Complete with Protection Layer as Approved by Engineer over bridge deck. | 7,925 | m2 | TBM,Intertectra,A-Built |
| Two coats of bituminous coating to surfaces of concrete below ground. | 350 | m2 | TBM,Intertectra,A-Built |
| Cementitious integral crystalline waterproofing compound to abutment seats and abutments diaphragm. | 500 | m2 | TBM,Intertectra,A-Built |
| | | | |

| Description | Qty. | Unit | Source |
|---|-------|------|--------------------------|
| <u>Fiber Wrap (To repair North Piers 5 & 6)</u> | | | |
| Sika Wrap 100 G | 6,600 | m2 | Sika |
| Sikadur 330 | 9,000 | m2 | Sika |
| | | | |
| <u>Rain Water Pipes Including Fittings and Fixing Accessories:</u> | | | |
| PVC pipes 150 mm diameter. | 12 | L.M. | TBD |
| PVC pipes 200 mm diameter. | 600 | L.M. | TBD |
| <u>Grating</u> | | | |
| 300 x 300 mm steel grating. | 12 | No. | TBD |
| <u>Street Lighting</u> | | | |
| 1 x 100mm diameter PVC ducts. | 490 | L.M | |
| 4 x 16mm ² + E = 16mm ² | 790 | L.M | |
| 4 x 6mm ² | 840 | L.M | |
| Street Lighting luminaire, housing 250W HPS lamp type A. | 16 | No. | Shreder,Slomia,GM TCC |
| Supply and install and connect a complete beacon lighting luminaire type B with 2 lamps 2x50W 12V | 16 | No. | Shreder,Slomia,GM TCC |
| 12m column for single bracket luminaires. | 16 | No. | Shreder,Slomia,GM TCC |

| Description | Qty. | Unit | Source |
|---|-------|------|--------------------|
| <u>BITUMINOUS CONSTRUCTION</u> | | | |
| Bituminous prime coat. | 6,700 | m2 | EMSB-JALKH ET FILS |
| Bituminous tack coat. | 6,700 | m2 | EMSB-JALKH ET FILS |
| Hot mix asphalt concrete surface course. | 670 | m3 | EMSB-JALKH ET FILS |
| <u>Marking</u> | | | |
| Marking paint (yellow). | 220 | m2 | GUBELLA-VIA LIBAN |
| Marking paint (white). | 240 | m2 | GUBELLA-VIA LIBAN |
| <u>Studs</u> | | | |
| Studs (cats eyes) fixed to floors. | 166 | No. | GUBELLA-VIA LIBAN |
| <u>CONCRETE COMPONENTS</u> | | | |
| Cement | | Tons | Sabba/Chekka |
| Aggregate | | Tons | Fattouch/Bekaa |
| Sand | | Tons | Beirut |
| Water | | Tons | Ain Dara |
| <u>PRESTRESSING CABLES</u> | | | |
| Cable tendons (1860 Mpa) guts low relaxation 13S7 wires strand. | 218 | Tons | TBD |
| Internal tendons anchorage. | 444 | No. | TBD |
| Continuity tendons anchorage. | 274 | No. | TBD |
| Prestressing bars. | 0.25 | Ton | TBD |
| | | | |
| | | | |

Appendix E
Agreement between MAN Enterprises and landowner of the rubble

Att: Mr Municipality Chairman of Ain-Dara.

Party Name : Nasser Abi Yehya.

Subject: Permission to dump debris in Lot. 519 Ain-Dara.

Since we are in the process of an agreement with MAN Enterprise for the removal of debris resulting from the demolition of Mudeirej Bridge and after our agreement with the landlord of Lot. 519 Ain-Dara, copy attached of the agreement, to use the land above as a dump yard for the concrete debris. The above will have no environmental impact, knowing that the land and the area as a whole is a barren land with no trees or surrounding structures.

We ask for approval on this request, taking into consideration that the dumped debris above will be on temporary basis to be used later as a sub base in the pavement works executed by the municipality or the community of Ain-Dara.

Respectfully
Naser Abi yehya.

Document file number in municipality (registration number)

No: 509

Date: 2-07-2007

Stamp of the Municipality with the Chairman of the municipality signature.

حرف امخاف

طرف اول : الحاصري بعد يلى دارك سجل ٢٤
 طرف ثانياً : حدود جبلية عماد وسيد صلي عماد ررته المبرمج مالى
 او صرته بلاء
 كما كانت الطروف الاول بماليه الى محبة الحرس بالهون ثالثه وخط
 من الطروف الثاني ملك طعنه ارشى مبلغ عمارة رقم ١٩٩ مظهر به طارده الصفا
 بعد اننى اوامر لاني ياتوا بين على ماله
 بسبع الطروف الثالث للطروف الاول يسهل الصغار المذكر احلا
 بقدر ابناء لحنى السراج من تكبير سيد المديرج
 مظهر الطروف الاول يدع مظهر مذكر ١٩٩ مذكر ايركي حذر دماره
 على كل شخصه فترغ الى الصغار المذكر
 يمداد الى طيه الاضاف الى الصغار المذكر المذكر يمداد المذكر

صوره سنج

شماره ٢٤ / ٦ / ١٩٩

طرف اول

طرف ثانياً

صعود ممدار سيد عماد

شماره ٢٤ / ٦ / ١٩٩

شماره ٢٤ / ٦ / ١٩٩

Agreement Proposal

- 1- First party: Nasir Abi Yehya , Ain-Dara, Registration No. 204
- 2- Second Party: Massoud Hani Imad And Samir Hani Imad, heirs of deceased Hani Imad. Al-ozoba registration 40.

Since the first party is looking for a dump place for collection of concrete and wood debris, and the second party owns a land on Lot. 519 Ain-Dara. Both parties agreed on the following:

- The second party allows the first party to use the Lot. Noted above as a disposal area for the concrete debris resulting from the demolition of the Mudeirej Bridge.
- The first party agrees to pay an amount of Ten US Dollars for every truck trip to the above Lot.

Permissions to be granted from the municipality in the collaboration of both parties.

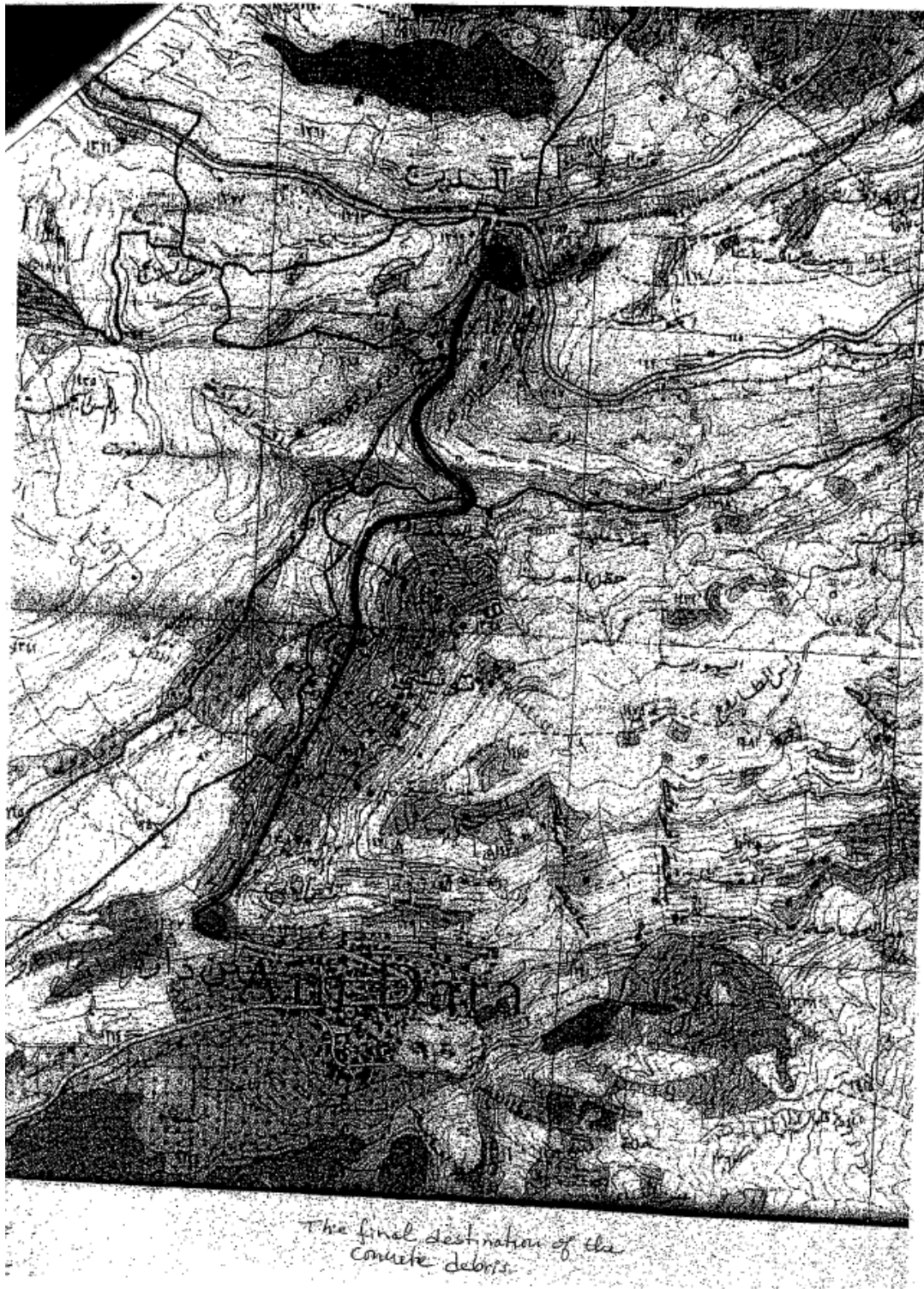
- Two Copies are made available.

- Ain-Dara
- 27-06-2007

- Second party
- Massoud Imad
- Samir Imad
Signature

-First party
Nasir Abi Yehya

signature



Appendix F

Safety Manuals: Table of contents for OSHA and EM 385-1-1

F-1: Content of OSHA Safety Manual (Construction Chapter)

| <i>Chapter</i> | <i>Content</i> |
|--|--|
| Chapter 1: Demolition | <ul style="list-style-type: none">• Preparatory operations• Special structures demolition• Safe blasting procedures• Bibliography |
| Chapter 2: Hazard Recognition in Trenching and Shoring | <ul style="list-style-type: none">• Introduction• Definitions• Overview• Determination of soil type• Test equipment• Shoring types• Shielding types• Sloping and benching• Spoil• Special Health and safety considerations• Bibliography |
| Chapter 3: Controlling Lead Exposures in the Construction Industry: Engineering and Work Practice Controls | <ul style="list-style-type: none">• Introduction• Engineering and work practice controls• Operations |

F-2: Table of contents for the EM 385-1-1 safety manual

EM 385-1-1
3 Nov 03

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Appendix G

Agreement between Contrack and Hemlin Hospital



Hamlin Hospital
Established in 1995

التاريخ: 2007/04/25

السادة ادارة كونتراك انترناشيونال في ن س المحترمين

بعد التحية...

سررنا جدا" برسالتكم التي تدل على اعادة اعمار لبنان.

فلكم كامل التوفيق في مشروعكم و نحن على أمل أن لا تواجهوا أية حوادث أو اصابات.

نحن كمستشفى هملين، مستعدون لتقديم أرقى الخدمات الطبية بدءاً من نقل المريض بناءً على طلب منكم، من موقع الحادث وحتى المستشفى وذلك بسيارة اسعاف مجهزة يرافقها طبيب و ممرض مختصين يمثل هذه الحوادث.

لكن نحن الآن في فترة توقف مؤقت لصيانة المستشفى و سنعاود الافتتاح في القريب القريب و باذن الله سنعلمكم به خلال الأيام القليلة المقبلة.

لكم منا كل التعاون و كما عاوننا الجميع على تقديم أرقى الخدمات الطبية

أملين النجاح دوماً"



دوفاء الأصيل

Appendix H

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