USAID | LEBANON
FROM THE AMERICAN PEOPLE

ENVIRONMENTAL ASSESSMENT OF THE MUDEIREJ BRIDGE RECONSTRUCTION PROJECT

FINAL REPORT

Prepared by

ECODIT (Lebanon)

ECODIT

AUGUST 2007

List of Appendices

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-contactors
- 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).

<u>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.</u>

2. <u>Anticipated positive impacts</u>

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. <u>Potential adverse impacts</u>

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 المديرج

جلسة لتحديد نطاق تقييم الأثر البيئي

بلدية صوفر في ٦ تموز ٢٠٠٧

المشاركين

الاسم	الجهة	رقم الهاتف	رقم الفاكس	بريد الكتروني
١. هشام شيا	اتحاد بلديات الجرد الاعلى	٠٣/٤٠٤٥٢٢		hishamshayya@hotmail.com
٢. الرائد الهندي وليد أبي خنا	الجيش اللبناني	٠٣/٢٧٢٧٤٤		lebwalid@hotmail.com
٣. عصام جرجس	U.SAID	03/482619		~~guirguise~~ essam.guirguis@lebwa.net
٤. كمال جوده	كونترال انترناشونال	03/499747		mgouda@CONTRACK.com
٥. العقيد الركن [illegible]		01/301687		
٦. سالي براسو	USAID	04-563600		salibrasg@state.gov
٧.				

الاسم	الجهة	رقم الهاتف	رقم الفاكس	بريد الكتروني
٣٠. [illegible]	USAID	03077550		
٣١. [illegible]	CONTRACK	70 16 12 17		
٣٢. [illegible]	CONTRACK	70-16-12-13		
٣٣. [illegible]	Contrack	70 168605		
٣٤. [illegible]	Contrack	03/194127		bassaf@contrack.com
٣٥. [illegible]	SOCOTEC LIBAN	03/732241	01/218310	socotec@cyberia.net.lb.
٣٦. [illegible]	[illegible]	03 830860	05/551080	Ahmadieh@cyberia.net.lb
٣٧. [illegible]	بلدية البترون	٠٣/٦٦٠٢٤٩	٠٥/٢٧٠٧٦٢	
٣٨. [illegible]	بلدية هادا	٠٣/٦٦٢٤٧٧	٠٥/٥٣٠١٠٩	
٣٩. [illegible]	البترونية	٠٣/٥٧٠٠٩٥	—	—
٤٠. [illegible]	البترونية		٠٣٠٨٦٢٥	

الاسم	الجهة	رقم الهاتف	رقم الفاكس	بريد الكتروني
٤١. بطرس عبد	بلدية الشبانة	٠٣/٨٦٢٥٢٢	٠٥/٢٧٠٤٠١	
٤٢. ناهيب الأعمى	ت بلدية صور	٠٣/٨٦١٧٠٦		
٤٣. إيلي حلو	مجلس الإنماء والإعمار	٠١-٩٨١٤٢١	٠١-٩٨١٢٥٢	
٤٤. د.م. زهير زين الدين	رئيس بلدية صيدا	٠٧/٧٢٠٢٨٧		
٤٥. حسام بوجوه	ECODIT - جيولوجي	٠١-٥٦٧٧١٤		issam_boujaoudeh@hotmail.com
٤٦. كريم الحسن	إيكوديت	٠١ ٥٦٦ ٧٨٩	٠١-٥٦٦٧٨٥	kjisr@ecodit.com
٤٧. سرا مكرزل	إيكوديت	٠١.٥٦٦٧٨٤	٠١-٥٦٦٧٨٥	smouhanged@ecodit.com
٤٨.				
٤٩.				
٥٠.				

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

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

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.

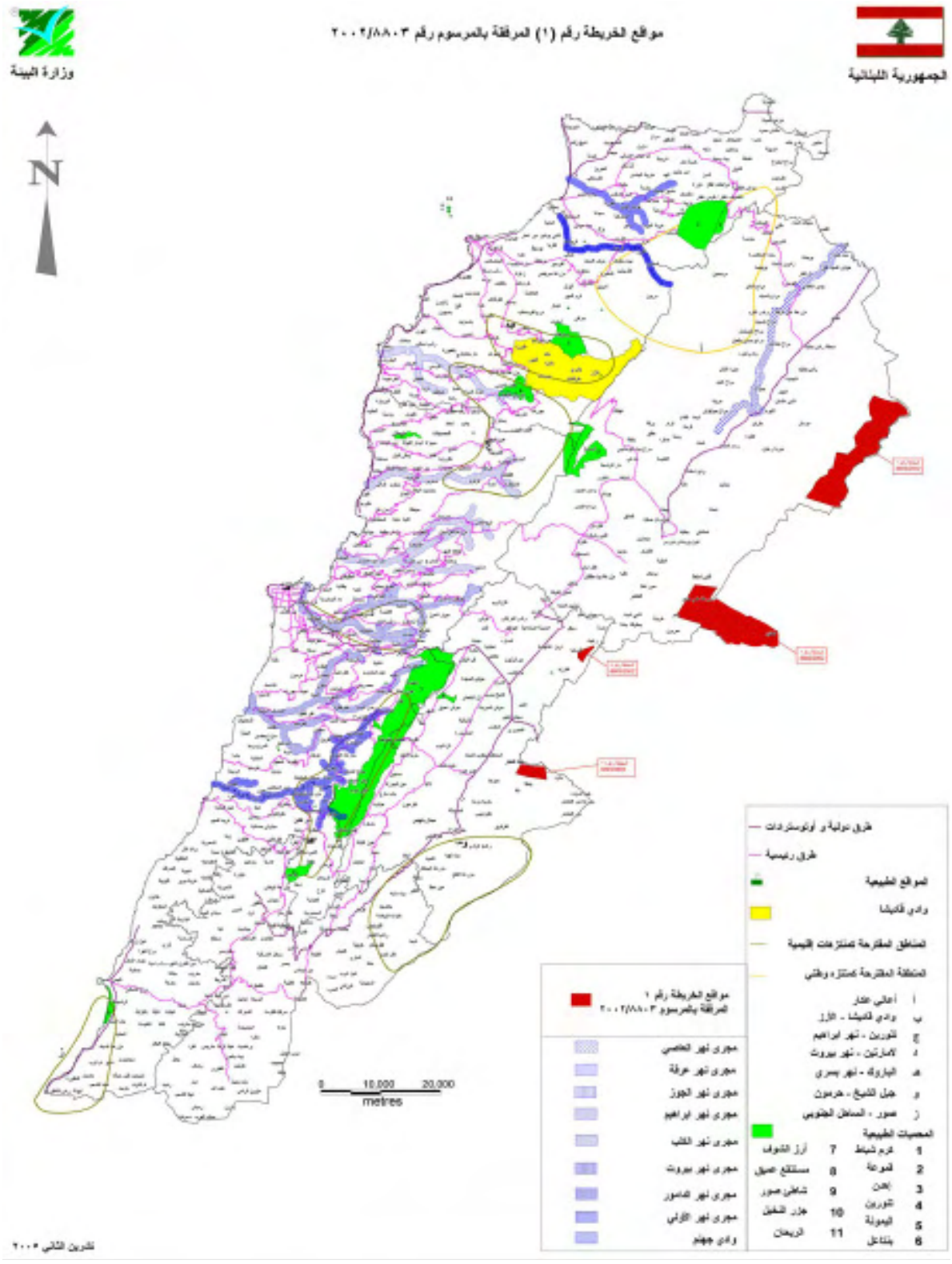
وحيث ان معظم الادارات العامة هي المستهلك الاكبر لمواد البحص والرمل والصخور.

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

لذلك ، يطلب الى جميع الادارات والمؤسسات العامة والبلديات التي تقوم بتلزيم 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.

بيروت في ٢٠ أيار ٢٠٠٦

رئيس مجلس الوزراء


وزارة البيئة
الجمهورية اللبنانية
موقع الخريطة رقم (١) المرفقة بالمرسوم رقم ٢٠٠٤/٨٨٠٣
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0 10,000 20,000
metres
تشرين الثاني ٢٠٠٥

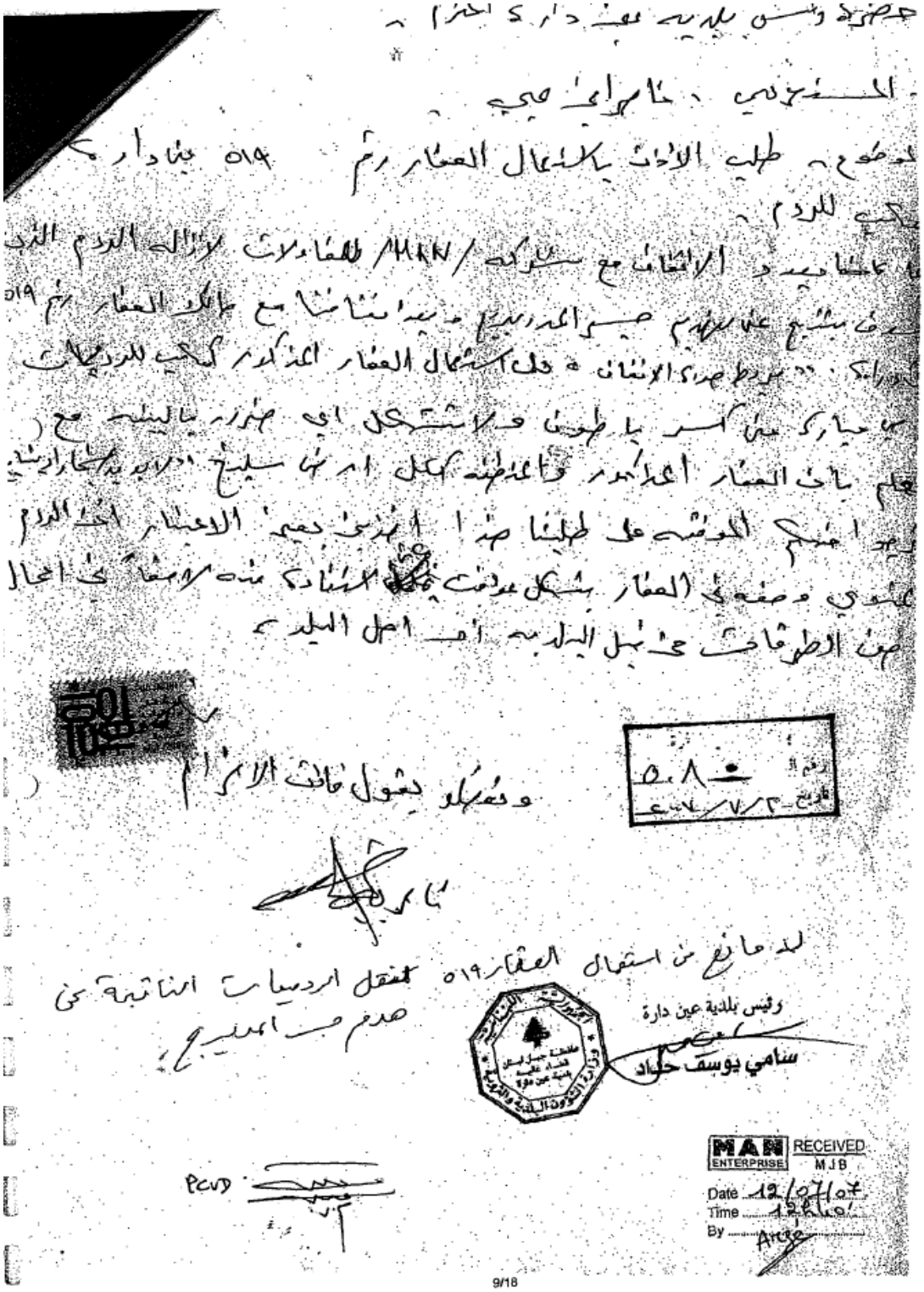
Appendix D
List of supplies needed for reconstruction

Description	Qty.	Unit	Source
STEEL REINFORCEMENT			
Steel reinforcement all diameters.	1,565	Tons	Demco/Yared
Bearings			
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
Propping			
Paint to concrete surfaces (cement colour).	1,500	Galon	CTC,A-Built, Intertectra,Tonaco,TBM
Expansion joints between abutments and deck slab.	33	m	Fressynet
Fences			
External fence to deck.	475	m	Tecman Industries
Internal fence to deck.	475	m	Tecman Industries
Water prrofing			
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
Fiber Wrap (To repair North Piers 5 & 6)			
Sika Wrap 100 G	6,600	m2	Sika
Sikadur 330	9,000	m2	Sika
Rain Water Pipes Including Fittings and Fixing Accessories:			
PVC pipes 150 mm diameter.	12	L.M.	TBD
PVC pipes 200 mm diameter.	600	L.M.	TBD
Grating			
300 x 300 mm steel grating.	12	No.	TBD
Street Lighting			
1 x 100mm diameter PVC ducts.	490	L.M	
4 x 16mm2 + E = 16mm2	790	L.M	
4 x 6mm2	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
BITUMINOUS CONSTRUCTION			
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
Marking			
Marking paint (yellow).	220	m2	GUBELLA-VIA LIBAN
Marking paint (white).	240	m2	GUBELLA-VIA LIBAN
Studs			
Studs (cats eyes) fixed to floors.	166	No.	GUBELLA-VIA LIBAN
CONCRETE COMPONENTS			
Cement		Tons	Sabba/Chekka
Aggregate		Tons	Fattouch/Bekaa
Sand		Tons	Beirut
Water		Tons	Ain Dara
PRESTRESSING CABLES			
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 ruble



رقم ٥٨٠
تاريخ ٢٠٠٧/٧/٣

رئيس بلدية عين دارة
سامي يوسف حداد

MAN ENTERPRISE RECEIVED MJB
Date 12/07/07
Time 12h10
By Ange

9/18

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.

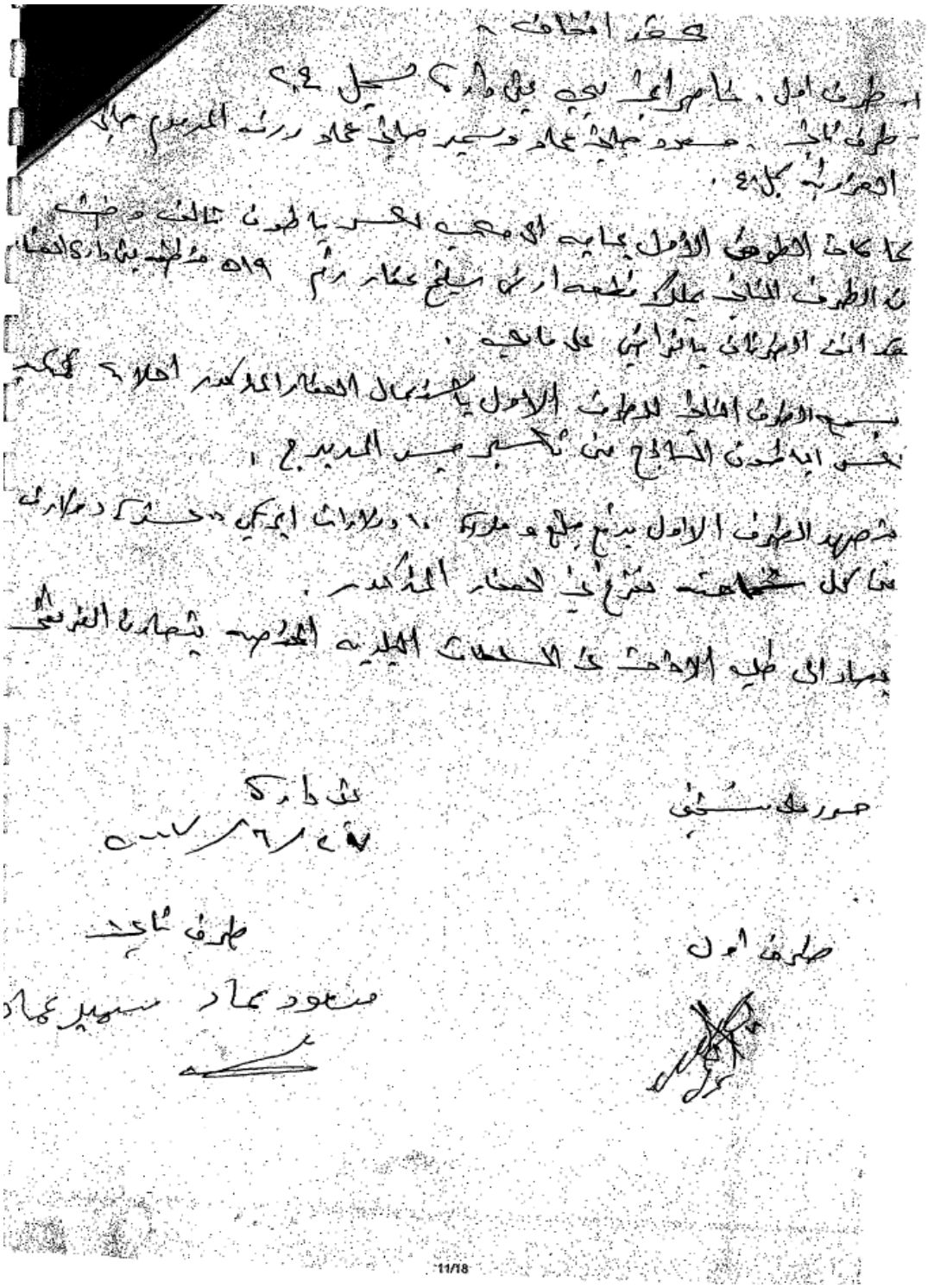
We ask for approval on this request, taking into consideration that the dumped debris above will be on temporary basis to be used later as a sub base in the pavement works executed by the municipality or the community of Ain-Dara.

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.

10/18



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.

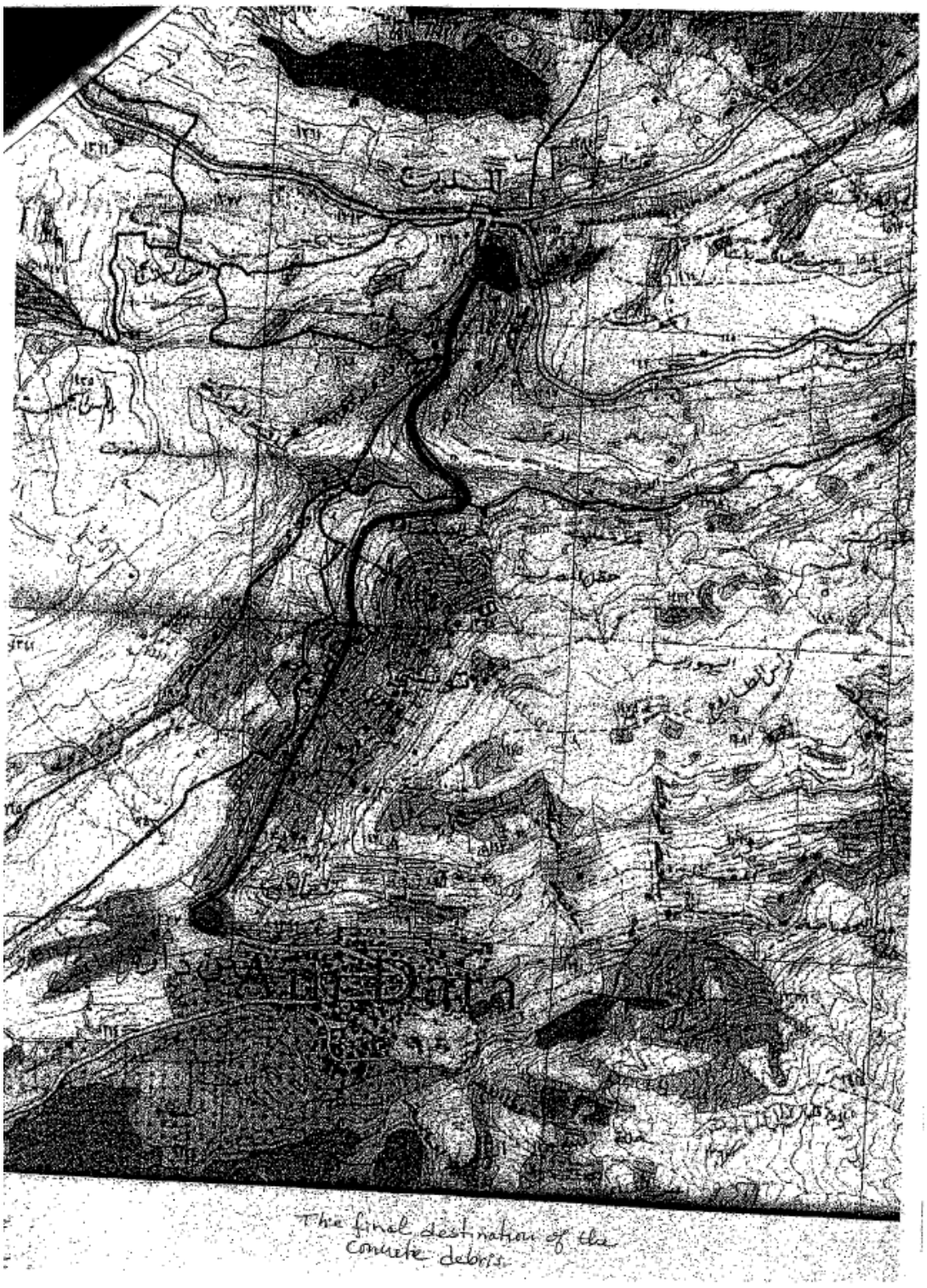
Permissions to be granted from the municipality in the collaboration of both parties.

- Two Copies are made available.

- Ain-Dara
- 27-06-2007

- Second party	-First party
- Massoud Imad	Nasir Abi Yehya
- Samir Imad	
Signature	signature

12/18


Al Dalia
The final destination of the
concrete debris

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

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

Chapter	*Content*
Chapter 1: Demolition	• Preparatory operations • Special structures demolition • Safe blasting procedures • Bibliography
Chapter 2: Hazard Recognition in Trenching and Shoring	• 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	• Introduction • Engineering and work practice controls • Operations

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

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Appendices

Figures

Tables

Appendix G
Agreement between Contrack and Hemlin Hospital

Hamlin Hospital
Established in the year 1905
GHAMAH

التاريخ:2007/04/25

السادة ادارة كونتراك انترناشيونال ي ن س المحترمين

بعد التحية...

سرّرنا جدا" برسالتكم التي تدل على اعادة اعمار لبنان.

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

نحن كمستشفى هملين، مستعدون لتقديم أرقى الخدمات الطبية بدءا" من نقل المريض بناء" على طلب منكم، من موقع الحادث و حتى المستشفى و ذلك بسيارة اسعاف مجهّزة يرافقها طبيب و ممرض مختصّين بمثل 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 عوّدنا الجميع على تقديم أرقى الخدمات الطبية

آملين النجاح دوما"

GHAMAH

دوفاء الأصيل

Hamana - Lebanon - Tel.: 05/530004 - Mobile: 03/753725 - Fax: 05/531939 - E-mail: ghamah@hamlinhospital.com - Website: www.hamlinhospital.com

Appendix H
List of References

Dubertret, L. 1955. Carte Geologique du Liban au 1/200 000, avec notice explicative. Ministére des Travaus Publics, Beirut.

Harajli, M., Tabet, C., Sadek, S., Mabsout, M., Moukaddam, S., and Abdo, M., *Seismic Hazard Assessment of Lebanon: Zonation Maps and Structural Seismic Design, Design Regulations*. Technical Report submitted to the Directorate of Urbanism, Ministry of Public Works, Beirut, Lebanon, 1994.

Khair, K., Karakaisis, G., and Papadimitriou, E., Seismic Zonation of the Dead Sea Transform Fault Area. *Anali di Geofisica*, Vol. 43 (1), pp. 61- 79, 2000.

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

Geo Projects (2002), Librairie des Cartes du Monde, Liban, 1 : 200 000

http://www.osha.gov/dts/osta/otm/otm_toc.html

http://www.usace.army.mil/publications/eng-manuals/em385-1-1/toc.htm