



Empowered lives.
Resilient nations.

Jerusalem, 24 February 2012

Reference: Award-PAL10-00058277

Dear Excellency,

Subject: Submission of Finalized Project Document – JAIP Administration Building Project

This letter comes as a follow up to the consultations UNDP/PAPP conducted with our Japanese colleagues in the Representation Office of Japan to the PA, JICA and the Palestinian Industrial Estates and Free Zones Authority (PIEFZA) regarding the formulation and finalization of the enclosed Project Document for the Stage II of the Jericho Agro-Industrial Park project, covering the Construction of the Administration Building, Excavation and Leveling of 4 dunums and procurement of needed equipment and furniture.

We also take this opportunity to thank our colleagues in Tokyo for reviewing and clearing the document on their end, and are hereby submitting it officially to the Government of Japan for approval, as per procedure.

We appreciate receiving the response of the Government of Japan to our submission so that we proceed accordingly with launching the needed works, in cooperation with our local partners.

Sincerely Yours,

Erode Mairing

Special Representative of the Administrator



Enclosures: Signed Project Document

H.E. Naofumi Hashimoto
Representative,
Japan Representation Office
To the PA
Ramallah

Establishment of Jericho Agro-Industrial Park (JAIP) Administration Building

**United Nation Development Programme
Programme of Assistance to the Palestinian People**

**2012-2013
Project Document**

February 2012

United Nations Development Programme
Country: occupied Palestinian territory (oPt)
Project Document

Project Title: Establishment of Jericho Agro-Industrial Park (JAIP) Administration Building

Expected Outcome(s) / Indicators:	Outcome 1: Enhanced access to effective social, economic and public services and utilities.
Expected Output(s)*:	<ul style="list-style-type: none"> • Access to Administration facility for the Jericho Agro-Industrial Park (JAIP) provided <p><u>Indicator (s):</u> Total area of square meters constructed Number of working days generated</p> <p><u>Base Line:</u> Agro-Industrial Park connected to public road network, excavated and equipped with water sources.</p> <p><u>Target (s):</u> Provide access to Administration facility through the construction of Administration building with approximate total area of 1000 square meters to serve the Agro-Industrial Park in Jericho City.</p> <ul style="list-style-type: none"> • 4 Dunums of the JAIP Stage II excavated and levelled 4. <p><u>Indicator (s):</u> Total area of square meters Excavated and levelled Number of working days generated</p> <p><u>Base Line:</u> Existing reclaimed land, vis-a-vis total needed for operating the Agro-Industrial Park.</p> <p><u>Target (s):</u> Additional 4 dunums in the JAIP Stage II Excavated and levelled as part of the overall Palestinian Industrial Estates and Free Zones Authority – PIEFZA- Land Reclamation Plan.</p>

Executing Entity: UNDP/PAPP

Implementing Agencies: UNDP/PAPP in partnership with the Palestinian Industrial Estates and Free Zones Authority (PIEFZA)

Brief Description

As part of the Government of Japan's (GoJ) assistance to the Palestinian People, and in particular through its "Corridor for Peace and Prosperity" initiative, three phases have already been funded to support the construction of the future Jericho Agro-Industrial Park (JAIP). The first phase of support included the rehabilitation works for 1.8 Km connecting road, completed and handed over. The second phase included excavation and levelling works for 115 dunums, completed, and, finally, the third phase which is currently ongoing and scheduled for completion by June 2012, involves the construction of a 2.15-kilometer transport line, 1.5 kilometre 4" line, and the construction of a 500 cubic meter water tank in order to provide sufficient quality water resources to the stage one of the JAIP site.

In addition to the three mentioned phases, a fourth phase of support targets the construction of the Palestinian Industrial Estate Free Zone Authority –PIEFZA- Administration Building at the Jericho Agro-Industrial Park, with an approximate total space area of 1000m² (one dunum), in addition to the excavation and levelling works for 4 dunums to be used for the administration building and its services. This building will become the home for PIEFZA operations that will serve the Industrial Park stake holders. The planned building will provide a number of services to support the Industrial Park developer, tenants and visitors. Related to the civil works, UNDP/PAPP will also be tasked with the role of procuring needed furniture and equipment, identified jointly and agreed to by the three partners.

Beneficiaries of the project include, the Palestinian National Authority, through the Palestinian Industrial Estates and Free Zones Authority (PIEFZA), the developer team, international and local investors, laborers, young graduates, school students, and tenants of JAIP who will benefit from the training centre, trade shows and other functions to be available at the building.

The proposed project will generate 10,000 direct and indirect working days.

Programme Period:	2012-2013
Key Result Area (Strategic Plan):	Infrastructure
Atlas Award ID:	00058277
Start date:	01 April 2012
End Date:	01 Feb 2013
PAC Meeting Date:	
Management Arrangements:	

Total resources required:	USD 1,487,532.22
Total allocated resources:	USD 1,487,532.22
• Regular:	0
• Other:	
• Donor: Government of Japan (GoJ)	
• Donor:	0
• Government:	0
Programmable amount:	USD 1,317,982.03
UNDP Team and GMS:	USD 169,550.19
Unfunded budget:	0
In-kind Contributions:	0

Agreed by (Government)

Agreed by (Executing Entity):

Agreed by (UNDP):

I. SITUATION ANALYSIS

The continued lack of employment opportunities in the occupied Palestinian territory (oPt) has resulted in an increased the poverty levels for Palestinians, living in the West Bank and Gaza Strip. According to the Palestinian Central Bureau of Statistics (PCBS), and using the International Labour Organization- ILO standards, "the percentage of persons who don't work, but are seeking jobs increased from 25.8% in the 2nd quarter 2008 to 27.5% in the 3rd quarter 2008, and that the unemployment rate in the West Bank increased from 16.3% in the 2nd quarter 2008 to 20.7%." The age group of 20 to 25 years old have the highest levels of unemployment placing them at the 35.1% rate. The town of Jericho and the Jordan Valley have some of the lowest unemployment rates at 13%, when compared to the overall country, due to its agricultural and tourism sectors¹.

While peace talks between the Palestinians and Israelis continue to remain at an impasse, the Government of Japan has launched an initiative to create a "corridor for peace and prosperity". This confidence building measure is meant to support projects that promote regional cooperation between the Israelis, Palestinians, and Jordanians, and to enhance economic development opportunities.

The Jordan Valley region, in particular the ancient Palestinian town of Jericho, has been selected as the target region for the implementation of the concept. The selection of the region is based upon the region's economic and tourism potential, as well as border and transport proximity to the other regional partners. The core project under the initiative is to establish an Agro-Industrial Park in Jericho. To this end, the Government of Japan has been working together with the Palestinian Industrial Estate & Free Zone Authority (PIEFZA) that would service the location of the future Agro-Industrial Park.

The new phase of support aims to provide a PIEFZA Administration Building with total space area of 1000m² at the Jericho Agro Industrial Park (JAIP). The building will be used as the PIEFZA home of operations servicing the Industrial Park stake holders and to provide number of services that will support the Industrial Park developer, tenants and visitors. This will also be contributing to efforts for employment generation and poverty reduction with emphasis on employing female staff and involving them in capacity development, in line with the gender considerations and components of UNDP corporate policies. Related to the civil works, UNDP/PAPP will also be tasked with the role of procuring needed furniture and equipment, identified jointly and agreed to by the three partners. The phase activities will require implementing construction works in addition to providing heavy machinery, where as UNDP will target to employ labour-intensive means in implementing certain activities to increase the number of possible workdays generated.

It is also envisaged that in a parallel effort (to reduce Project oversight costs), but under a related intervention, an additional 4 dunums of the JAIP Stage II land will also be excavated, filled and levelled including the land upon which the bulding is constructed.

During this phase of the project, the following activities will be implemented:

- Production of Engineering Design Services
- Construction Works
- Excavating, filling and levelling works.

¹ UNDP and the Municipality of Jericho Commence Works on the Jericho Agro Industrial Road Project Funded by the Government of Japan, retrieved from <http://unispal.un.org/UNISPAL.NSF/0/1B084E14C005BF5385257631004F2869>

- Procurement of needed furniture and equipment.

As a result of the implementation of this project, the Government of Japan hopes to create an environment that would attract local, regional, and international investors. Moreover, thousands of workdays for unemployed residents, who reside in the West Bank and Jordan valley and Jericho town in particular, will be generated. In addition, to being part of PIEFZA master plan for Industrial Zones, the JAIP project is part of the Jericho Municipality master plan intended to encourage growth to outlying communities and stimulate economic growth.

II. STRATEGY

The United Nations Development Programme/Programme of Assistance to the Palestinian People (UNDP/PAPP) will act as implementing agency for this project. It will engage various local experts and professionals to ensure quality, timely & effective planning, design, and construction of the project. It will work in close cooperation and partnership with its Palestinian counterparts, in particular the Palestinian Industrial Estate & Free Zone Authority (PIEFZA) on all aspects of the project. Moreover, UNDP/PAPP teams will also be involved to provide capacity building interventions to assist the project owners, if and once identified and requested by PIEFZA.

The project will be implemented towards advancing the following objectives, based upon the Corridor for Peace and Prosperity concept:

- To establish a viable state for Palestinians, accompanied with sustainable economic development, through the strengthening of their partnerships with neighbouring countries.
- The role of the private sector, coupled with the development of the public private partnership (PPP), is crucial for achieving sustainable economic development. In the West Bank, agriculture and agro-industry could be a driving force for sustainable economic development.

As such, the “construction of agro-industrial business parks will be a significant component” for Economic and Private Sector Development Section as outlined in the Palestinian Government’s Palestinian National Development Plan for 2011-2013 – Ending the Occupation/ Building the State, and is in line with the Jericho Regional Development Study.

For Palestinians, this project is one of a number of Industrial Parks that are planned in various locations in the West Bank (Jenin, Bethlehem, & Hebron) to stimulate economic growth.

UNDP/PAPP will be working on introducing new implementation modalities as a means to increase the number of direct workdays generated through this project.

The Project Scope

The project is part of a comprehensive plan which aims at providing a fully functional and operational administration building to the Jericho Agro Industrial Park;

The following are the four main elements of the project:

1. Production of designs and tender documents which includes preparation of ToR, tendering, evaluation of tenders, contract awarding, preparation of the design and tender documents for

the land excavation and levelling of the 4 dunums, and production of the design documents for the construction of the administration building.

2. Land excavation and levelling of the 4 dunums which includes gathering information to bid, bidding, and evaluation of bids, contract approval process, contract awarding and civil works for the land excavation and levelling of the 4 dunums.
3. Construction of the PIEFZA administration building with an approximate total space area of 1000m² which includes gathering information to bid, bidding, evaluation of bids, contract approval process, contract awarding and civil works for the PIEFZA administration building for an approximate total space area of 1000m².
4. Procurement of furniture and equipment for the PIEFZA administration building which includes gathering information to bid, bidding, evaluation of bids, contract awarding and the supply of furniture and equipment for the PIEFZA administration building.

All those elements will contribute to providing sustainable utility with tangible impact. Indeed, this phase will play pivotal role in providing the other activities such as the Administration building, excavation and levelling of the 4 dunums and provision of furniture and equipments.

Sustainability can be realized and revealed by those above mentioned factors. For instance, the Administration Building will be supplied by Electricity by the connection to the adjacent Photo Voltaic farm, supplied by water from the elevated tank and water connection pipes and accessed by the connecting road available. PIEFZA will also be delivering as part of its commitments towards the sustainability of this project in the form of drafting a complete Maintenance and Operational plan, to be discussed and agreed to with the concerned partners.

III. RESULTS AND RESOURCES FRAMEWORK

Intended Outcome as stated in the Country Programme Results and Resource Framework:

1. Enhanced access to effective social, economic and public services and utilities.

Outcome indicators as stated in the Country Programme Results and Resources Framework, including baseline and targets:

Indicator (s): Total area of square meters constructed/reclaimed. Number of working days generated

Base Line: Agro-Industrial Park connected to public road network, excavated and equipped with water sources.

Target:

- I. Access provided to Administration facility through the construction of Administration building with approximate total area of 1000 sq.m to serve the Agro-Industrial Park in Jericho City
- II. 4 Dunums of land excavated and leveled.

Applicable Key Result Area: Promote sustainable livelihood and self-reliance; specially enhance access to effective social, economic and public services and utilities.

Partnership Strategy:

Project title and ID (ATLAS Award ID):

INTENDED OUTPUTS	OUTPUT TARGETS FOR (YEAR 2012)	INDICATIVE ACTIVITIES	RESPONSIBLE PARTIES	INPUTS (USD)
Access to Administration facility for the Agro-Industrial Park provided	Construction of Administration building with approximate total area of 1000 sq.m to serve the Agro-Industrial Park in Jericho City.	1. Project Personnel Fees	UNDP/PAPP	72,235.00
		2. Production of Engineering Design Services	UNDP/PAPP	30,000
		3. Tendering Process	UNDP/PAPP	0.00
		4. Civil Works (Administration Building)	UNDP/PAPP	1,015,482.03
		5. Civil Works (Excavation and	UNDP/PAPP	50,000

		leveling for 4 Dunums)		
		6. Procurement of Equipment & Furniture	UNDP/PAPP	200,000.00
4 Dunums of land excavated and levelled		7. Miscellaneous Security, Transportation, communication, etc.	UNDP/PAPP	22,500
Sub-Total				1,390,217.03
GMS 7%				97,315.19
Total				USD 1,487,532.22

IV. Annual Work Plan

Year: 2012

EXPECTED OUTPUTS	PLANNED ACTIVITIES <i>List activity results and associated actions</i>	TIMEFRAME				RESPONSIBLE PARTY
		Q 1	Q 2	Q 3	Q 4	
Access to Administration facility for the Agro-Industrial Park provided	1. Project Personnel Fees		X	X	X	UNDP/PAP P
	2. Production of Engineering Design Services		X			UNDP/PAP P
	3. Tendering Process		X	X	X	UNDP/PAP P
	4. Civil Works (Administration Building)			X	X	UNDP/PAP P
	5. Civil Works (Excavation and leveling for 4 Dunums)		X	X		UNDP/PAP P
4 Dunums excavated and levelled	6. Procurement of Equipment & Furniture			X	X	UNDP/PAP P
	7. Miscellaneous Security, Transportation, communication, etc.	X	X	X	X	UNDP/PAP P

ANNUAL WORK PLAN

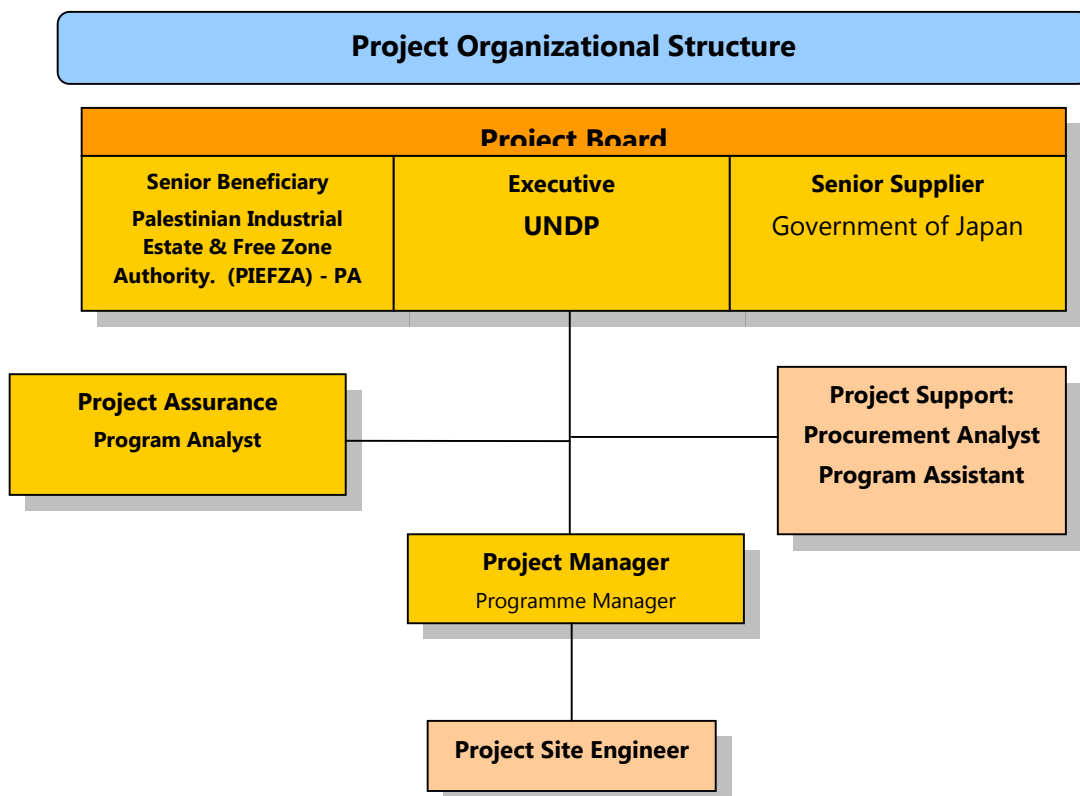
Year: 2013

EXPECTED OUTPUTS	PLANNED ACTIVITIES <i>List activity results and associated actions</i>	TIMEFRAME				RESPONSIBLE PARTY
		Q 1	Q 2	Q 3	Q 4	
Access to Administration facility for the Agro-Industrial Park provided	1. Project Personnel Fees	X				UNDP/PAP P
	2. Production of Engineering Design Services					UNDP/PAP P
	3. Tendering Process					UNDP/PAP P
	4. Civil Works (Administration Building)	X				UNDP/PAP P
	5. Civil Works (Excavation and leveling for 4 Dunums)					UNDP/PAP P
4 Dunums excavated and levelled	6. Procurement of Equipment & Furniture	X				UNDP/PAP P
	7. Miscellaneous Security, Transportation, communication, etc.	X				UNDP/PAP P

V. MANAGEMENT ARRANGEMENTS

UNDP will assign a Program Analyst from its staff to follow up on all managerial, including administrative and financial issues related to the project. In addition, UNDP will assign an Engineering Analyst, who will take on the role of a Technical Quality Assurance, to manage and assess the daily technical monitoring of the project. The UNDP will also assign a Sr. Electrical Engineer and a Sr. Mechanical Engineer who manage and handle all technical electrical and mechanical related issues of the project. The day to day Management (Project Manager) will be handled by the Programme Manager, whereas the UNDP Programme Analyst will be responsible for the overall project assurance.

A project board will be established to follow up the works implemented by UNDP. The members of the board will include the Government of Japan as the donor, a representative of the PIEFZA who will coordinate the project with other PA counterparts, and UNDP/PAPP as the implementing partner. This board will meet every 2 months or exceptionally upon request by Board members, to review priorities and progress towards expected results.



The UNDP will utilize its standard Management, Procurement, Contracting, and Financial procedures in the implementation of the project. The project will be tendered locally and through the UNDP procurement web site portal. A public tender opening will occur in which all relevant parties may be present. UNDP's procurement unit will evaluate the tender and only upon approval from UNDP Contracts, Assests, and Procurement Committee will a contract be awarded to the winning contractor. If the contract value is over US\$1 million, the evaluated tender is forwarded to our Regional Assets, Contracts, & Procurement committee for further review and final approval.

Based upon the Japan International Cooperation Agency (JICA), Agro Industrial Park Feasibility Study, UNDP and PIEFZA will coordinate the technical specifications and works to ensure that the results are in line with the PA Master Plan for industrial zones.

The UNDP will monitor and supervise all construction works on a daily basis and will be responsible for verifying all works and the issuance of payments to contractors based upon actual works performed. PIEFZA in partnership with UNDP will coordinate and review all plans and works pertaining to the project. However, the UNDP will maintain upper supervision on all works implemented.

Through this mechanism UNDP will directly execute all project activities. The project budget would cover the costs of the Project Implementation Unit, all project-based expenses, and UNDP's General Management Services fees shall be a fixed 7%.

The Palestinian Industrial Estates and Free Zones Authority (PIEFZA)

As the owner of the JAIP Administration building, PIEFZA will be responsible for securing that all basic infrastructure utilities including electrical hook up, water supply and the sewage system are available to the new JAIP Administration Building. PIEFZA will also be responsible for securing and coordinating with the municipality of Jericho all permits required to allow the land excavation and levelling of the 4 dunums and the construction of the administration building to proceed smoothly.

VI. MONITORING FRAMEWORK AND EVALUATION

In accordance with the programming policies and procedures outlined in the UNDP User Guide, the project will be monitored through the following:

Within the annual cycle

- An Issue Log shall be activated in Atlas and updated by the Project Manager to facilitate tracking and resolution of potential problems or requests for change.
- Based on the initial risk analysis submitted (see annex 1), a risk log shall be activated in Atlas and regularly updated by reviewing the external environment that may affect the project implementation.
- Based on the above information recorded in Atlas, a Project Progress Reports (PPR) shall be submitted by the Project Manager to the Project Board through Project Assurance, using the standard report format available.
- A project Lesson-learned log shall be activated and regularly updated to ensure on-going learning and adaptation within the organization, and to facilitate the preparation of the Lessons-learned Report at the end of the project.
- A Monitoring Schedule Plan shall be activated in Atlas and updated to track key indicators as mentioned on Page 2 of the project document
- Quarterly
- **Progress Report.** A Bi-Monthly Progress Report shall be prepared by the Project Manager and shared with the Project Board and the Outcome Board.
- **Monthly Summary Report.** A monthly summary report, including pictures, will be provided to the donor with a status update.

VII. VISIBILITY

UNDP/PAPP will work in close coordination with the PIFFEZA and GoJ in promoting the visibility of the project by the following steps and processes:

- Full participation of the initial handover and inauguration of the project
- Produce of press releases to cover project news and events
- Produce of project fact sheet which will be included under UNDP/PAPP official site
- Ensure mentioning the funding source for the project in all announced activities
- Maintain the proper logos and all related materials during project lifecycle that includes tendering, construction plaques, inauguration plaques and etc.

VIII. LEGAL CONTEXT

The administration of this project shall be governed by UNDP rules and regulations.

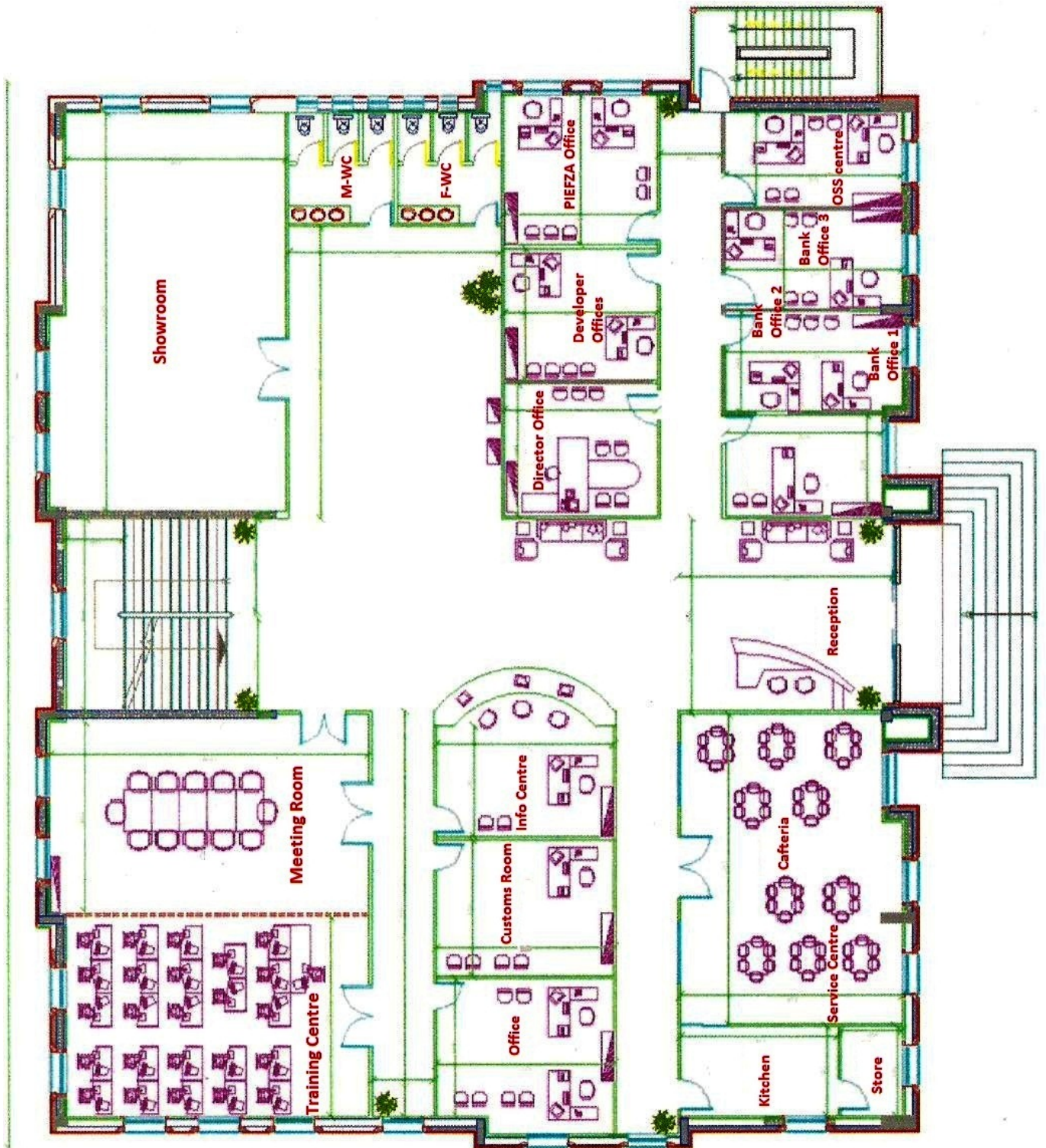
ANNEXES

1. Functional Space Distribution of the JAIP Administration Building
2. Site Map for the JAIP Administration Building
3. Revised Master Plan for Stage I & II & Layouts
4. Detailed Budget – Annex I
5. Proposed Work Plan for Project Implementation – Annex II
6. JAIP Soil Investigation Report published February 2011 – Annex III

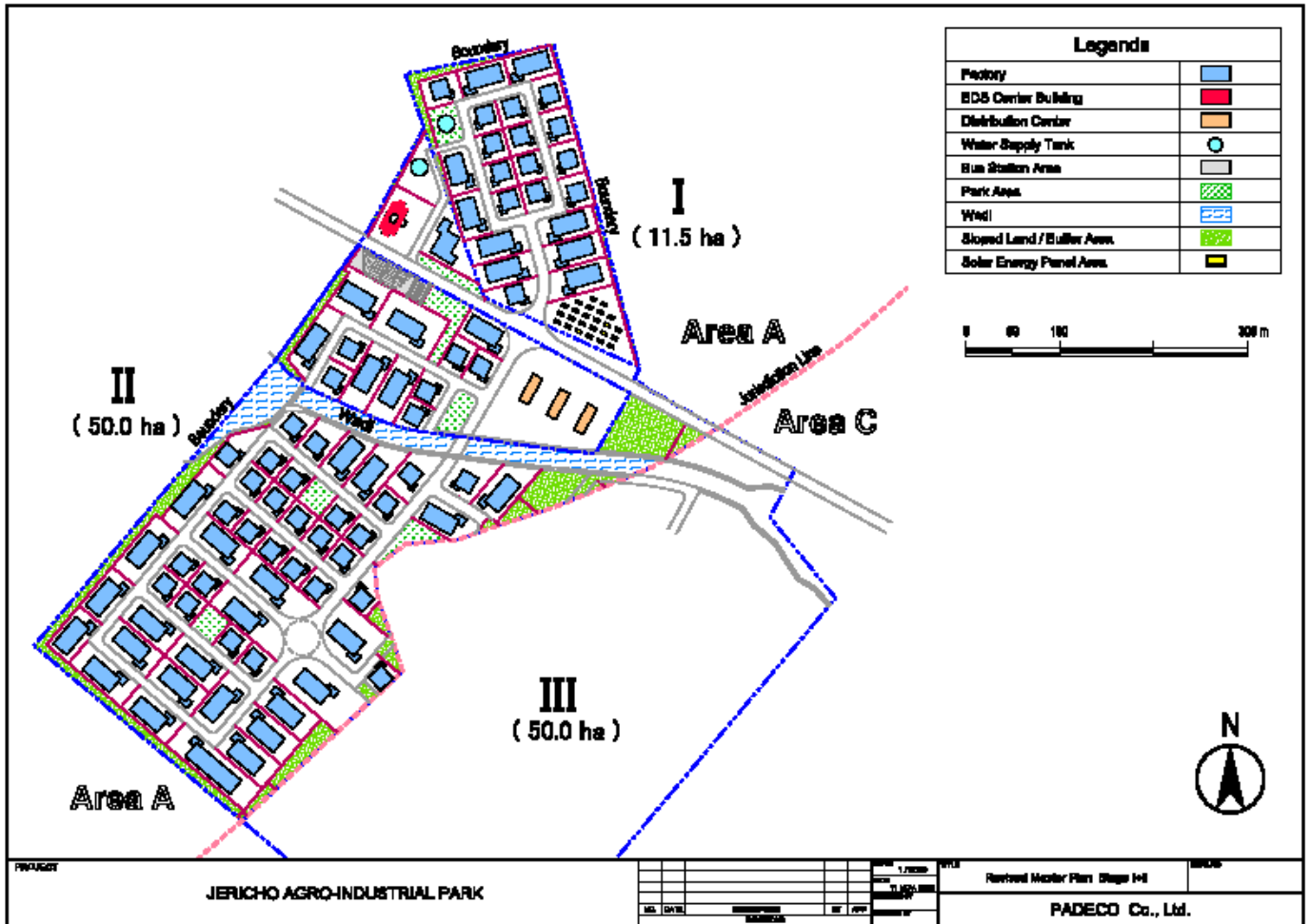
1. Functional Space Distribution of the JAIP Administration Building

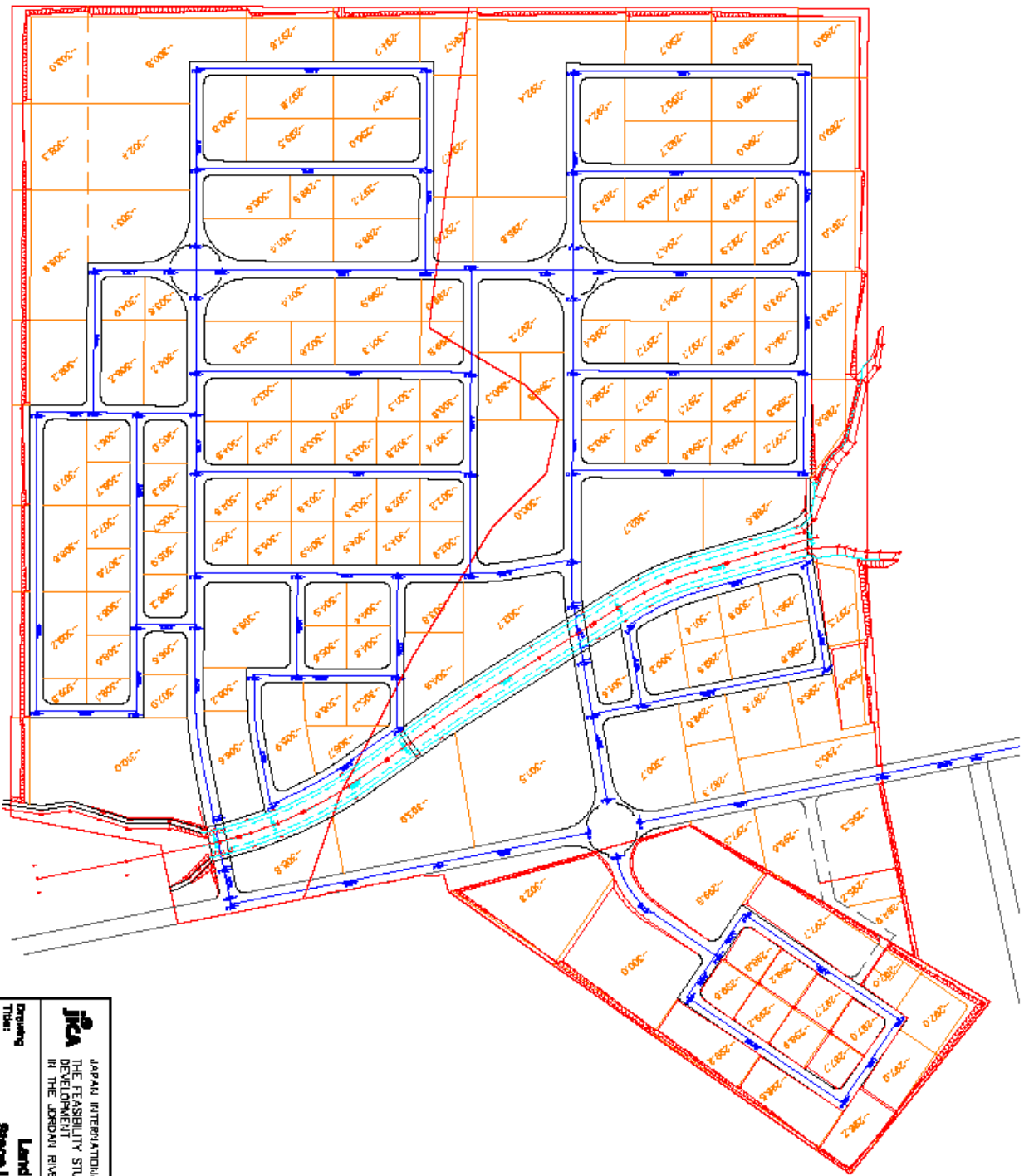
Beneficiary	Space Required	Purpose	Comments
PIEFZA	50 Meters square	Office supervision	//
Custom Authority	52 Meters square	For Monitoring goods in and out	//
OSS	18 Meters square	Facilitate, registration, and other related export-import goods	//
Banks	54 Meters square	Banking services	We have provided for four banks
Information Centre	50 Meters square	For data distribution within the Park and other information for investors or visitors	//
Training Centre	70 Meters square	Technical lecturing and Admin lecturing	//
Meeting room	70 Meters square	Facility for meetings	
Developer	50 Meters square	Admin office for developer	//
Trade Show Hall	170 Meters square	Displaying goods, products that presents industrial park producers	//
Cafeteria and public utilities	416 Meters square	Public use and tenants	


2. Site Map for the JAIP Administration Building



3. Revised Master Plan for Stage I & II & Layouts






JICA
 JAPAN INTERNATIONAL COOPERATION AGENCY
 DEVELOPMENT
 IN THE JORDAN RIVER RIFT VALLEY

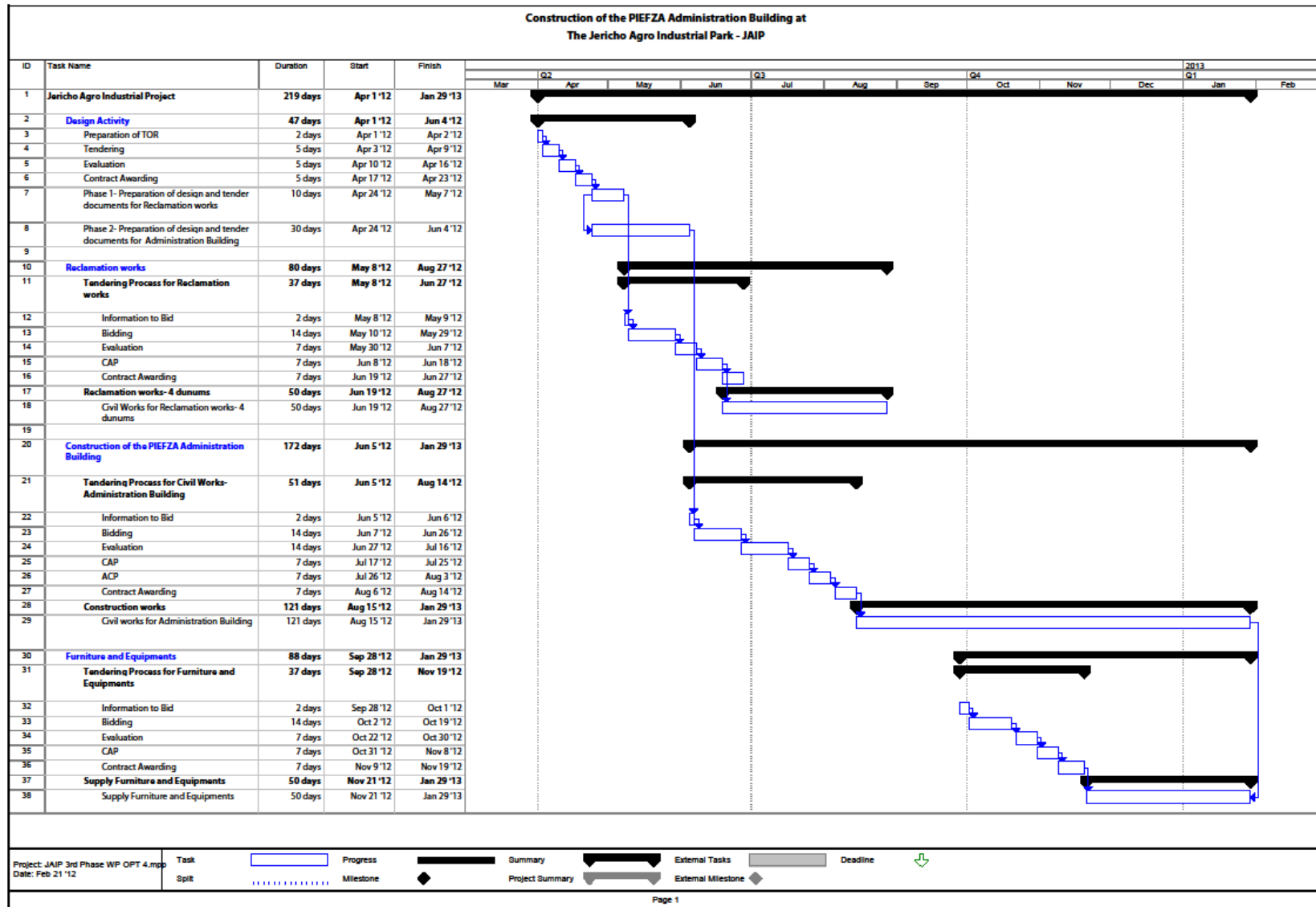
Land Reclamation
Stage I, II and III, Plan

Drawing Title:
 Prepared by: **KRI INTERNATIONAL CORP.**
 Drawn by: **HIPOON KOEI CO., LTD.**
 Drawing No: **Z06**
 Date: **NOVEMBER 2008**

4. Annex I: Detailed Budget

Project Budget Sheet					
Item	Activity	Unit	Cost	QTY	Total Cost (USD)
1	Project Personnel				
1.1	On-site project Support	Month	\$3,611.00	10	\$36,110.00
1.2	Engineer Analyst (15%)	Month	\$7,500.00	12	\$13,500.00
1.3	Senior Electrical Engineer (10%)	Month	\$6,250.00	11	\$6,875.00
1.4	Senior Mechanical Engineer (10%)	Month	\$7,500.00	11	\$8,250.00
1.5	Area Engineer (15%)	Month	\$6,250.00	8	\$7,500.00
	Total Activity 1				\$72,235.00
2	Project Design	Overall	\$30,000.00	1	\$30,000.00
	Total Activity 2				\$30,000.00
3	Construction Works				
3.1	Civil Works Including 15% increase for the proposed second shift	LS	\$1,015,482.03	1	\$1,015,482.03
	Total Activity 3				\$1,015,482.03
4	4 Dunums Land Excavation & Leveling				
4.1	Civil Works	LS	\$50,000.00	1	\$50,000.00
	Total Activity 4				\$50,000.00
5	Furniture & Equipment				
5.1	Furniture & Equipment	LS	\$200,000.00	1	\$200,000.00
	Total Activity 5				\$200,000.00
6	Miscellaneous				
6.1	Miscellaneous	LS	\$22,500.00	1	\$22,500.00
	Total Activity 6				\$22,500.00
7	Total Cost of Project Activities (1+2+3+4+5+6)				\$1,390,217.03
8	UNDP General Management Cost (7%)				\$97,315.19
9	Total Project Cost				\$1,487,532.22

Annex II: Workplan



Annex III: JAIP Soil Investigation Report published February 2011



مركز القدس لدراسات الهندسة المدنية والبيئية

Alquds Center for Civil and Environmental Engineering Studies

SITE INVESTIGATION REPORT

FOR PROPOSED
“Jericho Industrial Zone”

LOCATED IN
Jericho / Palestine

SUBMITTED TO
Al- Amjad Company
on behalf of UNDP

REPORT NO. SI-11-011

SUBMITTED BY
ALQUDS CENTER FOR CIVIL & ENVIRONMENTAL
ENGINEERING STUDIES (ACCEES)

February,1 2011





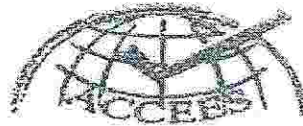
Date: 01/02/2011

Jericho Industrial Zone

Jericho - Palestine

البييرة 7019 شارع الميدان - مقابل ابراج الوطنية - تلفون: 02 2971011 - 02 2971011 - فاكس: 02 2971012

	Title, Company	Name	Signature	Date
Originator	General Manager, Ziad Adi	Ziad Adi		05/12/2011
Approved	General Manager, Ziad Adi	Ziad Adi		05/12/2011



مركز القدس لدراسات الهندسة المدنية والبيئية
Alquds Center for Civil and Environmental Engineering Studies

Document Revision History:

Revision	Date	By	Section Amended	Details of Amendments
01	01/02/2011	Z. Adi	-	-

Messrs.: Jericho Industrial Zone
Atten. : Al-Amjad Company

**Subject: Site Investigation Report for the Proposed Jericho Industrial
Zone Jericho/Palestine.**

Dear Sir,

It is of our pleasure to submit you this geotechnical report for the site mentioned above.
This investigation was carried out according to your request.

This report includes the results of field investigation, laboratory results, and the required
conclusions recommendations needed for design & construction of the most safe and
economical foundation.

For any further information or clarifications, please don't hesitate to contact us.

Yours Sincerely,
General Manager
Eng. Ziad Adi



EXECUTIVE SUMMARY

Alquds Center for Civil and Environmental Engineering Studies (ACCEES) was appointed by Al-Amjad Company on behalf of the UNDP to undertake a ground investigation at the location of the proposed Industrial Zone in Jericho.

The purpose of the investigation was to provide geotechnical information on the subsoil to aid in the design of new foundations to support the proposed structures.

Ten boreholes were sunk to a maximum depth of 15 meters below ground level (mbgl). Selected soil samples were submitted to our geotechnical laboratory for both geotechnical and contamination analysis.

Stratigraphic records from the boreholes indicate that in the area of the proposed industrial zone clayey soil exist underlined by sand stone material. Laboratory tests show that the bearing capacity of this soil is minimal requiring the usage of piled foundation for structures. For pipeline, the subgrade shall be compacted and an additional topping material added onto it. For road construction, the subgrade shall be stabilized, and an additional topping shall be added onto it. For manholes and electrical towers and poles, the subgrade shall be stabilized and a layer of topping shall be added onto it. For structures, piled foundation is recommended for the site.

Groundwater was not encountered within any of the exploratory boreholes.

Qualitative seismic analysis was undertaken using previous information about the site and using UBC code and the site was found not to inhibit any serious risk of seismic activity. The estimated ground peak acceleration that should be used is 0.20g.

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1.0 INTRODUCTION

This report includes the final results of the geotechnical investigation, laboratory tests, the conclusions and recommendations for the proposed Jericho Industrial Zone.

2.0 PURPOSE OF STUDY

The aim of this study is to determine the physical and mechanical properties of the subsurface soil to provide the structural engineer with information needed for safe and economical foundation design and construction. This report provides information relating to the allowable bearing capacity of the soil recommended as foundation ground, recommended foundation depth and type, expected elastic settlement of soil under foundations, safe side slope excavation, suitable backfill material, geotechnical consideration for earthquake design and other recommendations that would result in safe structure.

3.0 SCOPE OF WORK

The work undertaken consisted of the following:

1. Collecting general information such as site plan, geological maps, topographic maps and other information related to the site.
2. Undertaking site visits in order to collect information about site nature, topography of the site, geological features and other properties concerning the project site.
3. Drilling ten boreholes and sampling of disturbed and undisturbed samples.
4. Carrying out necessary field and laboratory tests.
5. Performing classification and description of the sampled soil.
6. Analysis of field and laboratory tests results.
7. Developing comprehensive conclusions and recommendations for design and construction of the most safe and economical foundation system.

4.0 PROJECT & SITE DESCRIPTION

The proposed industrial zone is part of the Palestinian Government Plan to improve the economic situation for the Palestinian people and create much needed jobs for residents of Jericho. The work is sponsored by the Japanese Government and the UNDP.

5.0 GEOTECHNICAL EXPLORATION & FIELD TESTING

5.1 Borehole Schedule

Table 1 shows the finished drilling program of boreholes within the plot:

Table 1: Finished Drilling Program of Boreholes

Borehole No.	Depth (m)	Date of drilling	Location	Relative Elevation*
BH 1	20.0	07/01/2011	See Figure No.1	0.0
BH 2	20.0	07/01/2011		0.0
BH 3	20.0	07/01/2011		0.0
BH 4	20.0	07/01/2011		0.0
BH 5	20.0	07/01/2011		0.0
BH 6	20.0	07/01/2011		0.0
BH 7	20.0	07/01/2011		0.0
BH 8	20.0	07/01/2011		0.0
BH 9	20.0	07/01/2011		0.0
BH 10	20.0	07/01/2011		0.0

Notes:

- (1) All the depths are below the existing ground level.
- (2) Number of boreholes in accordance with standards.
- (3) Number and Depths of boreholes were specified according to Jordanian Code for Site Investigation taking into consideration plan area and number of floors.
- (4) The borehole locations as agreed with client.
- (5) The elevation of ground surface at the boreholes was reported relative to each other.

* This level is at the level of the existing excavation.

5.2 Methods of Sampling

Samples were obtained continuously from the boreholes every half meter or when change in the sampled soil was detected. Down the hole hammer was used at layers of hard bands of rock or highly cemented soil were encountered.

The collected samples were placed in waterproof plastic bags to keep their moisture content, and then they were placed in proper sequence in wooden boxes. These samples were taken to our laboratory to be classified and described by our geological and geotechnical engineers.

6.0 RESULTS OF LABORATORY TESTING

6.1 Laboratory Testing

After carrying out the geological description on the obtained samples, a laboratory tests program was issued. The program included all required tests on selected samples in order to determine the physical and mechanical properties of the encountered materials. The following tests were performed in accordance with **American Society for Testing and Materials (ASTM)** Standards listed below:

1. **ASTM D 2488-93**, "Description and Identification of Soils (Visual-Manual Procedure).
2. **ASTM D 2216-92**, "Laboratory Determination of Water (Moisture) Content of Soil, Rock and Soil Aggregate Mixtures"
3. **AASHTO T233-86**, "Unit Weight".
4. **AASHTO T 89-96, T 90-96**, "Atterberg Limits"
5. **AASHTO T206-87**, SPT
6. **AASHTO T236-92**, Direct Shear
7. **AASHTO T193-98**, CBR

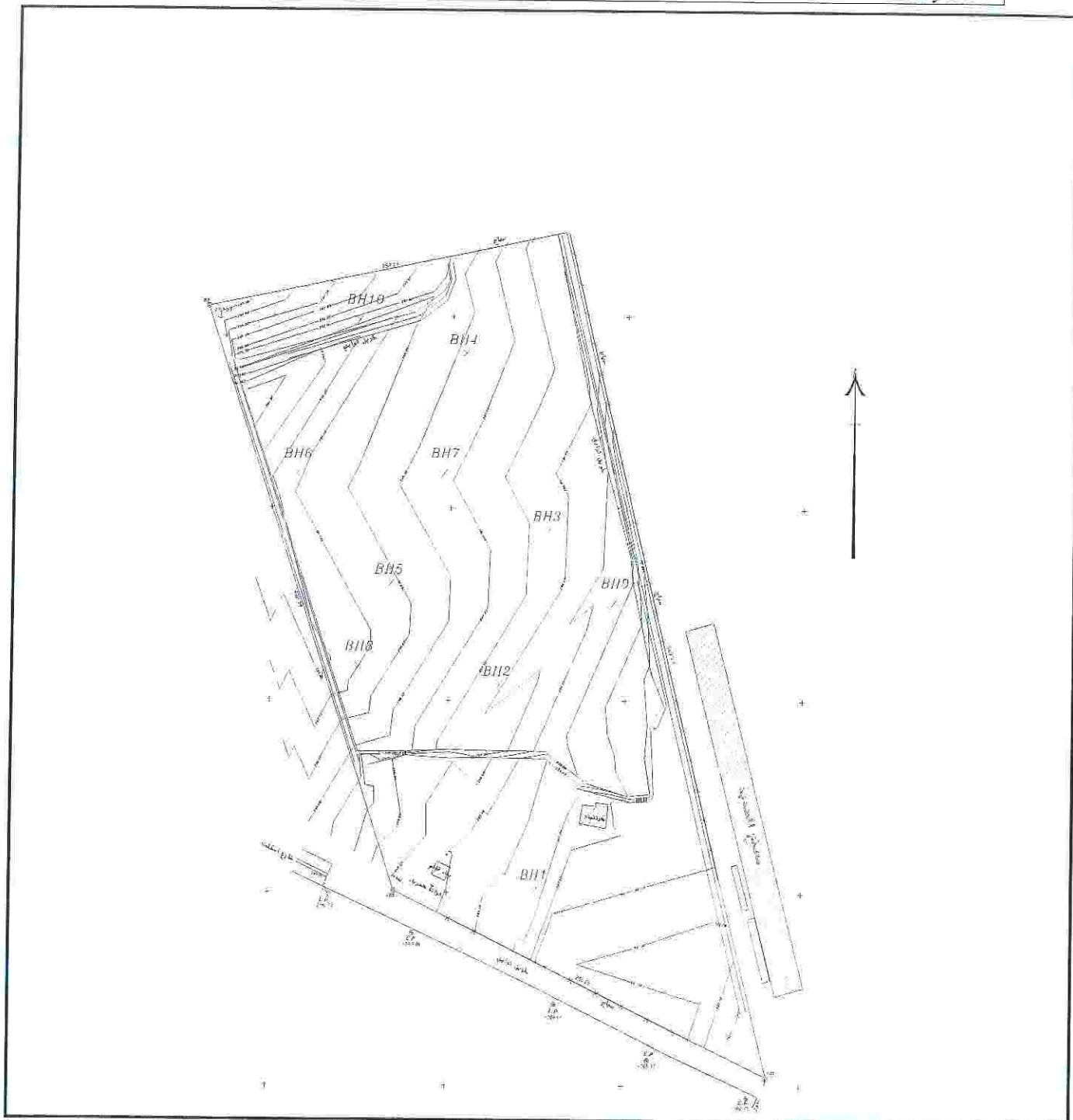


Figure 1: Site Plan and Location of Boreholes

6.2 Laboratory Tests Results:

Table 2: Laboratory Tests Results.

BN	Depth (m)		Sample Type	W (%)	W.D (KN/m ³)	D.D (KN/m ³)	Atterberg Limits			Soil Classification
	From	To					LL (%)	PL (%)	PI (%)	
1										
	Top	9.5	Dist	10.5		18.5	42	32	10	A7
	9.5	20.0	Dist	5.6		22.5	NA	NA	NA	
2										
	Top	8.5	Dist	11.5		17.4	46	35	11	A7
	8.5	20.0	Dist	4.3		23.5	NA	NA	NA	
3										
	Top	8.9	Dist	11.6		17.8	41	31	10	A6
	8.9	15.2	Dist	5.7		22.6	NA	NA	NA	
	15.2	16.5	Dist	12.2		16.5	47	32	15	A7
	16.5	20.0	Dist	5.8		22.1	NA	NA	NA	
4										
	Top	5.1	Dist	10.5		18.4	45	34.6	10.4	A6
	5.1	20.0	Dist	5.9		22.2	NA	NA	NA	
5										
	Top	8.1	Dist	9.2		19.5	44	33.2	10.8	A6
	8.1	14.2	Dist	4.2		23.4	NA	NA	NA	
	14.2	16.5	Dist	12.3		16.5	47	30	17	A7
	16.5	20.0	Dist	6.1		21.9	NA	NA	NA	
6										
	Top	9.4	Dist	11.4		17.3	41	30	11	A7
	9.4	20.0	Dist	4.2		23.4	NA	NA	NA	
7										
	Top	6.1	Dist	12.3		16.6	43	32.8	10.2	A6
	6.1	20.0	Dist	5.4		22.6	NA	NA	NA	
8										
	Top	5.9	Dist	9.3		19.1	45	34.5	10.5	A6
	5.9	20.0	Dist	5.9		22.0	NA	NA	NA	
9										
	Top	4.8	Dist	12.1		16.9	47	36.9	10.1	A6
	4.8	20.0	Dist	4.1		23.5	NA	NA	NA	
10										
	Top	7.5	Dist	11.2		17.4	44	33.5	10.5	A6
	7.5	13.5	Dist			23.1	NA	NA	NA	
	13.5	15.6	Dist	12.1		16.3	41	30.2	10.2	A6
	15.6	20.0	Dist	4.2		22.9	NA	NA	NA	

Symbols:

BN : Boring No

W (%): Moisture Content (%)

W.D: Wet Density

D.D: Dry Density

q_u : Unconfined Compressive Strength

Dist.: Disturbed Sample

LL: Liquid Limit

PL: Plastic Limit

PI: Plasticity Index

F.S: Failure Strain

S.S: Split Spoon Sample

7.0 SUBSURFACE CONDITIONS

7.1 Properties of Ground Materials

According to the findings of the exploration to the geological description for the obtained samples, there are similarities and continuities of the subsurface.

A generalized soil profile that links the ten boreholes was constructed to give view of the encountered layers. This profile is shown in Figure No.2.

Table No.3 shows summary of the physical and mechanical properties for the encountered materials in the three drilled boreholes.

7.2 Ground Water and Cavities

Ground water was not observed. No cavities were observed along the drilled boreholes.

Table 3: Summary of Material Types Encountered in the boreholes.

Approximate Depth (m)			Geologic Description
BH No.	From	To	
1	Top	9.50	Light grayish clayey soil
	9.50	20.0	Grayish sandy stone materials
2	Top	8.5	Light grayish clayey soil
	8.5	20.0	Grayish sandy stone materials
3	Top	8.9	Light grayish clayey soil
	8.9	15.2	Grayish sandy stone materials
	15.2	16.5	Grayish clayey soil
	16.5	20.0	Grayish sandy stone materials
4	Top	5.1	Light grayish clayey soil
	5.1	20.0	Grayish sandy stone materials
5	Top	8.1	Light grayish clayey soil
	8.1	14.2	Grayish sandy stone materials
	14.2	16.5	Grayish clayey soil
	16.5	20.0	Grayish sandy stone materials
6	Top	9.4	Light grayish clayey soil
	9.4	20.0	Grayish sandy stone materials

7	Top	6.1	Light grayish clayey soil
	6.1	20.0	Grayish sandy stone materials
8	Top	5.9	Light grayish clayey soil
	5.9	20.0	Grayish sandy stone materials
9	Top	4.8	Light grayish clayey soil
	4.8	20.0	Grayish sandy stone materials
10	Top	7.5	Light grayish clayey soil
	7.5	13.5	Grayish sandy stone materials
	13.5	15.6	Grayish clayey soil
	15.6	20.0	Grayish sandy stone materials

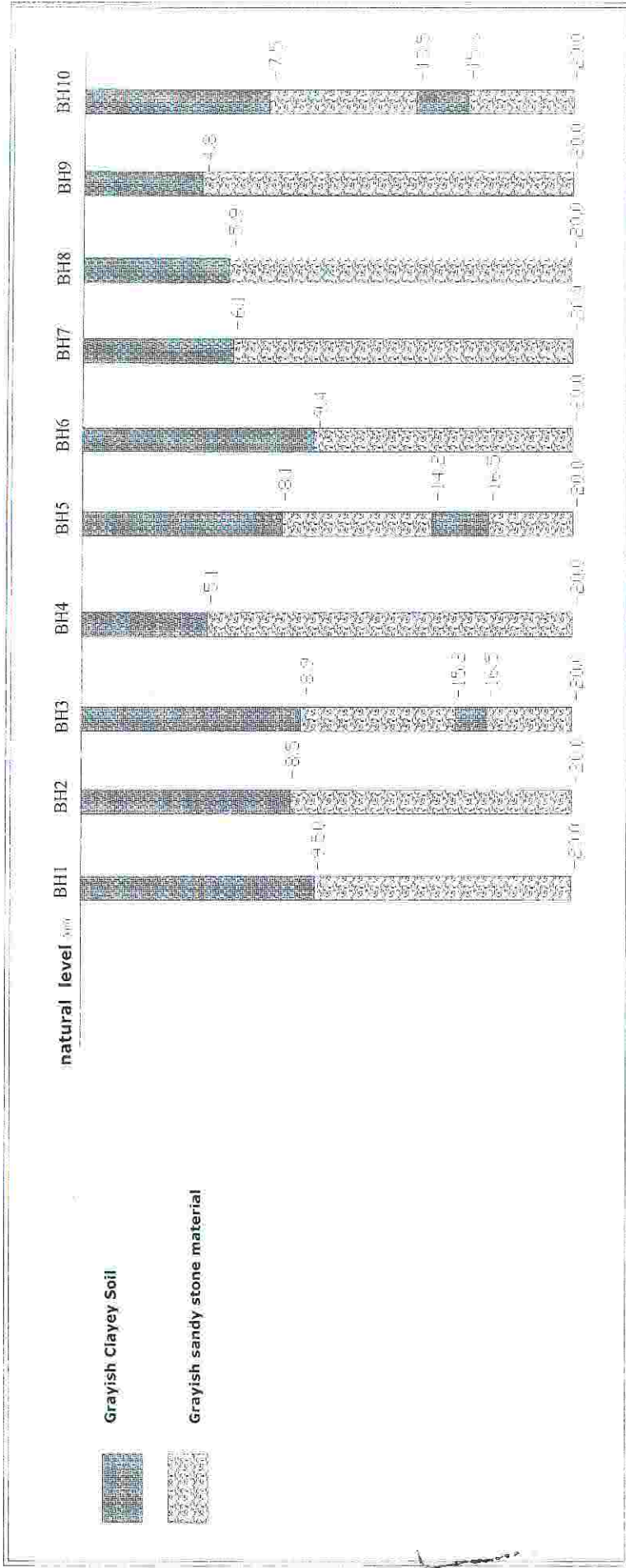


Figure 2: Soil Profile.

8.0 CONCLUSIONS AND RECOMMENDATIONS FOR FOUNDATION SYSTEM.

According to field exploration, laboratory testing, subsurface conditions, and engineering analysis, it can be concluded that the existing ground at the site can support the expected building loads, provided that the following recommendations are strictly followed.

8.1 Road Construction Considerations

The CBR value for the existing soil is 5%. This soil shall be stabilized by cement. The stabilized soil-cement mix shall have a 7days compressive strength of 40Kg/cm². The mix shall be designed in accordance with the Jordanian Specifications for Highway and Bridge Construction Volume II. Cement Type I is appropriate for the mix. A topping material shall be added in accordance with the Jordanian Specification. Surface drainage shall be designed to prevent water from ponding on the road or around it and penetrating down to the subgrade.

8.2 Pipeline Design Consideration for Main and Secondary Pipes

Trench Shoring

No shoring shall be necessary since the required depths are relatively small.

Temporary Excavation Slopes:

The temporary excavation slopes shall be 1H: 2V.

Pipe Bedding and Pipe Zone Backfill; Materials and Compaction:

The subgrade shall be compacted top 100% of the dry unit weight. A topping material shall be added as specified in the Jordanian Specifications for Highway and Bridges Construction Volume II. On top of this topping, the pipe bedding shall consist of sand or crushed rock and shall be placed 150mm below the invert level up to 200mm over the crown of the pipe and for the full width of the trench. The crushed rock shall be to the following grading free from organic and other deleterious matter:

Sieve Size	Percentage passing by weight
1/2 in	100
3/8 in	60-90
No 4	15-45
No 8	0-5

The bedding should be compacted to a density not less than that of the natural soil in the sides and bottom of the trench. The bedding directly beneath or above the pipeline must not be over compacted.

Trench Backfill, Materials and Compaction:

Backfilling above pipe bedding shall be suitable excavated material, natural or processed mineral soils or graded crushed stones or gravel. The material shall be free from all organic material, trash, or other objectionable material which can not be properly compacted. Soft, wet, plastic soils, clay soils having natural in-place water content in excess of 30 percent, and soil containing more than 5 percent fibrous organic material shall be considered unsuitable for use as backfill and fill material.

Common backfill may be for the sections through cross-country and shall not contain granite blocks, broken concrete, masonry rubble, asphalt pavement, or any material larger than 150mm in any dimension.

The trench shall be filled to the level of the natural adjacent ground level in layers not exceeding 300mm, wetted and compacted by rolling, tamping to 90 percent of maximum dry density.

For sections in or adjacent to streets, selected backfill shall be used and shall conform to the requirements of the common backfill except that the material shall not contain any material larger than 50mm in its largest dimension. The backfill shall be up evenly on all sides, in layers not exceeding 250mm measured before compaction, thoroughly wetted and compacted by rolling, tamping, or vibrating to 95 percent of maximum dry density. The top 250mm sub-base for pavement replacement shall consist of one layer of approved basecourse material, wetted and compacted to 95 percent dry density.

Pipeline Coating:

Standard coatings shall be used for the pipes. The external coating of the pipes shall consist of metallic zinc and bituminous paint while the pipe fittings shall be coated with bituminous paint. The internal coating of the pipes shall consist of blast furnace cement mortar and the fittings shall be coated with bituminous paint.

8.3 Design Consideration for Structures

Piled foundation with pile caps are recommended for the structures. Shallow foundations are not recommended because of the potential of differential settlements that will occur in the case of seepage of water into the soil in one side of the structure, see Table 3.3

Appendix B. Preliminary results show that a 60cm diameter piles at 20m depth will give an allowable bearing capacity of 48 tons. Please note that if other diameters or loads are to be used then we can make the necessary calculations again. Cement Type I may be used, with the cement not exceeding 310Kg/m^3 and water cement ratio of no more than 0.55.

The piles shall be designs with regards to the following:

At least 0.5meter of upper loose soil must be removed to stiff layers to prevent collapse of loose soil material inside the pile neither on drilling nor on cast.

- 1-The pile will be reinforced as short column with spiral stirrups.
- 2-Single row of piles for shall be designed and constructed for shear walls.
- 3-The spacing of piles shall be 2.5 to 3.5 Diameter from center to center
- 4-Pile caps shall extend at least 15 cm beyond the exterior face of outside pile.
- 5-The pile shall extend at least 30 cm into pile cap.
- 6-Pile caps must be reinforced for both positive and negative bending moment at a minimum cover of 7.5 cm and shear at critical sections must be checked.
- 7- The load is applied at the center of the pile caps.
- 8- Ultrasonic test (Integrity Test) must be done for each pile for homogeneity of concrete.
- 9- Pile load test shall be undertaken.

8.4 Design Recommendations for Towers and Manholes for Pipelines

Isolated footings may be used for electrical towers. The CBR value for the existing soil is 5%. This soil shall be stabilized by cement. The stabilized soil-cement mix shall have a 7days compressive strength of 40Kg/cm^2 . The mix shall be designed in accordance with the Jordanian Specifications for Highway and Bridge Construction Volume II. Cement Type I is appropriate for the mix. A 20cm topping material shall be added in accordance with the Jordanian Specification. Cement Type I may be used, with the cement not exceeding 310Kg/m^3 and water cement ratio of no more than 0.55. Minimum cover for reinforcement shall be 7.5cm.

8.5 Design Recommendations for Parkways and Driveways

The CBR value for the existing soil is 5%. This soil shall be stabilized by cement. The stabilized soil-cement mix shall have a 7days compressive strength of 40Kg/cm^2 . The mix shall be designed in accordance with the Jordanian Specifications for Highway and Bridge Construction Volume II. Cement Type I is appropriate for the mix. A topping material shall be added in accordance with the Jordanian Specification. Surface drainage shall be designed to prevent water from ponding on the surface road or around it and penetrating down to the subgrade.

8.6 Excavation Methods:

Excavation will be through clayey soil for road undertaken using excavator mounted bucket for roads and foundations for electrical towers. For piles, the excavation shall be done using drill auger. In no case shall the earth be ploughed, scraped, or dug with machinery so near to the finished subgrade as to result in excavation of, or disturbance of material below grade, the last of the excavated material being removed with pick and shovel. Excavation shall be made to the grades shown on the drawings and to such widths as will give suitable workspace for construction of the structures, for bracing and supporting, pumping and draining. The bottom of the excavations shall be rendered firm and dry. Excavation shall be accomplished by methods which preserve the undisturbed state of the subgrade soils.

The entire project site shall be cleared, grubbed and stripped. Stumps, brush, shrubs, roots, grass, weeds, rubbish and any other objectionable material resting on or protruding through the surface of the ground shall be cut and removed to a depth of 450mm below original grade or 450mm beneath bottom of foundations, whichever is greater. All grubbing holes and depressions excavated below the original ground surface shall be refilled with suitable materials and compacted to a density conforming to the surrounding ground surface.

8.7 Excavation Side Slope

The excavation side slope during construction is recommended to be 1H: 2V.

8.8 Surface & Subsurface Drainage:

It is recommended to protect the foundation ground and excavation from surface water both during and after construction by providing proper drainage and protection system. Surface water, if existed, should be diverted away from the edges of the excavations. The side walk should be extended beyond the building line for a distance of at least 2.5 meters in every direction. A slope of 1.5 cm in 100 cm is suggested to allow proper drainage.

However, the slab on grade and the foundation system shall be isolated using a proper isolation material. This material shall be selected by the supervisor engineer according to the required specifications.

8.9 Material for Backfilling Purposes:

Backfill and fill material shall be suitable excavated materials, natural or processed mineral soils obtained from off-site sources, or graded crushed stone or gravel. Backfill and fill materials shall be free of all organic material, trash, or other objectionable materials which may be compressible or which cannot be properly compacted. Soft, wet, plastic soils which may be expansive, clay soils having a natural ion-place water content in excess of 30%, soils containing more than 5 percent (by weight) fibrous organic materials, and soils having a plasticity index greater than 10 shall be considered unsuitable for use as backfill and fill. Backfill and fill materials shall have a maximum of 1% expansion when testing is

performed on a sample remolded to 95% of maximum dry density (per ASTM D698) at 2% below optimum moisture content under a 490Kg/m² surcharge.

Common fill may be used as fill against exterior walls of structures. Material conforming to the requirements of common fill shall be placed in layers having a maximum thickness of 300mm loose thickness. Common fill shall not contain granite blocks, broken concrete, masonry rubble, asphalt pavement, or any material larger than 150mm in any dimension. Common Fill shall have physical properties, as approved by the Engineer, such that it can be readily spread and compacted.

Structural fill shall be gravel, sandy gravel, or gravelly sand. Material shall have a plasticity index of less than 15 and shall conform to the following gradation limits. It shall be placed in layers having a maximum thickness of 200mm in open areas and 150mm in confined areas including points where conduit and piping join structures, measured before compaction. Each layer of fill shall be compacted to at least 95% of maximum dry density determined by the ASTM D1557, Method D. Compaction of structural fill in open areas shall consist of fully loaded ten-wheel trucks, a tractor dozer weighing at least 13,500 Kg and operated at full speed, a heavy vibratory roller. Compaction of structural fill in confined areas shall be accomplished by hand operated vibratory equipment or mechanical tampers.

Table (6.2.2): Gradation limits

Sieve Size	Percent Finer by Weight
150mm	100
No. 4	20-70
No. 40	5-35
No. 200	0-7

Select fill shall conform to the requirements of common fill except that the material shall not contain any materials larger than 50mm in the largest dimension.

Back fill and fill materials shall be placed in layers not more than 200mm compacted thickness. Before compaction, moisten or aerate each layer to the required percentage of maximum dry density or relative dry density for each area classification. Do not place backfill of fill material on surfaces that contain excessive moisture, preventing specified

degree of compaction. Compact top 200mm and each layer of backfill and fill to not less than 97% of maximum dry density as per ASTM D698 Method D. Common fill shall be compacted to at least 90% of maximum density determine by ASTM Compaction Test, D1557, Method D.

Material placed in fill areas shall be deposited to the lines and grades shown on the Drawings making allowance for settlement of the material. The surface of filled areas shall be graded to smooth true lines, strictly conforming to grades indicated on the plan with no soft or no compacted areas. No compacting shall be done when the material is too wet either from rain or from excess application of water.

8.10 Earth Pressure

The underground basement walls of the building, if any, shall be designed for an equivalent fluid pressure of 0.8 gm/cm^3 (800 kg/m^3) plus a uniform lateral pressure which corresponds to the maximum expected surface loads.

8.11 Site Seismicity:

According to Earth Sciences & Seismic Engineering Center/ An-Najah National University, the site may be classified as 3. The Soil Profile Type is classified as S_E . The estimated peak ground acceleration for the site is 0.30g.

Seismic Zone Factor, Z

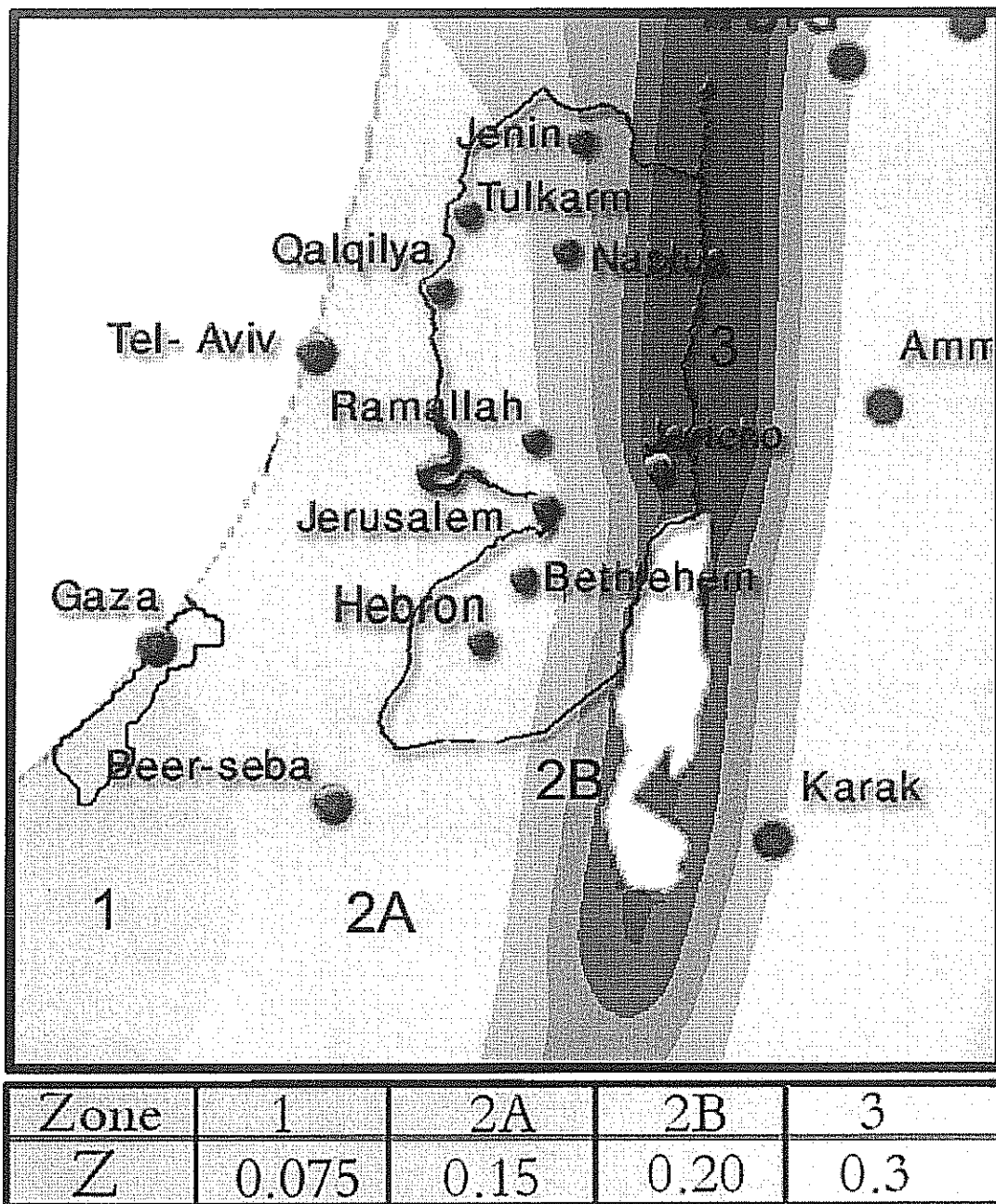


Figure 3: Seismic Map

8.12 Inspection of the foundation grounds:

After the foundation excavation and before the construction, we should be notified in order to inspect the foundation ground. This inspection is very important to confirm that the required ground and other recommendations given in Section 8.1 are satisfied. Such inspection should be paid in separate fees.

Appendices

Appendix 1 - SPT Results

BH #	SPT DEPTH (m)	Nf (N70) (# of blows)	Penetration (cm)	unit wight of the soil (KN/m3)	Qv' (soil stress) (KN/m2)	(N70') N70 corrected (# of blows)
1	1.5	8	30	18.5	27.75	14
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
	(N70') average	14	q allowable (Kg\cm2)			
	(N55) average (# of blows)	18				
	Kd (unitless)	1.33				
	F.S (factor of safety)	10				

BH #	SPT DEPTH (m)	Nf (N70) (# of blows)	Penetration (cm)	unit wight of the soil (KN/m3)	Qv' (soil stress) (KN/m2)	(N70') N70 corrected (# of blows)
2	3	10	30	17	51	13
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
	(N70') average	13	q allowable (Kg\cm2)	1.569		
	(N55) average (# of blows)	16				
	Kd (unitless)	1.33				
	F.S (factor of safety)	4				

BH #	SPT DEPTH (m)	Nf (N70) (# of blows)	Penetration (cm)	unit wight of the soil (KN/m3)	Qv' (soil stress) (KN/m2)	(N70') N70 corrected (# of blows)
7	10.5	16	30	22.6	237.3	10
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
	(N70') average	10	q allowable (Kg\cm2)			
	(N55) average (# of blows)	12				
	Kd (unitless)	1.33				
	F.S (factor of safety)	4				

BH #	SPT DEPTH (m)	Nf (N70) (# of blows)	Penetration (cm)	unit wight of the soil (KN/m3)	Qv' (soil stress) (KN/m2)	(N70') N70 corrected (# of blows)
8	12	22	30	22	264	13
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
	(N70') average	13	q allowable (Kg\cm2)			
	(N55) average (# of blows)	16				
	Kd (unitless)	1.33				
	F.S (factor of safety)	4				

BH #	SPT DEPTH (m)	Nf (N70) (# of blows)	Penetration (cm)	unit wight of the soil (KN/m3)	Qv' (soil stress) (KN/m2)	(N70') N70 corrected (# of blows)
9	13.5	16	30	22	264	9
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
	(N70') average	9	q allowable (Kg\cm2)	20.7		
	(N55) average (# of blows)	11				
	Kd (unitless)	1.33				
	F.S (factor of safety)	4				

BH #	SPT DEPTH (m)	Nf (N70) (# of blows)	Penetration (cm)	unit wight of the soil (KN/m3)	Qv' (soil stress) (KN/m2)	(N70') N70 corrected (# of blows)
10	15	24	30	16.3	244.5	15
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
		no soil	no soil		0	no soil
	(N70') average	15	q allowable (Kg\cm2)	17.35		
	(N55) average (# of blows)	18				
	Kd (unitless)	1.33				
	F.S (factor of safety)	4				