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MWI Management Information System

Detailed Engineering Design and Final Report

Science Applications International Corporation
An Employee-Owned Company

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Water Quality Improvement and Conservation Project

Management Information Systems Report

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EXECUTIVE SUMMARY

The Ministry of Water and Irrigation is responsible at the national for administering water policy and managing water resources in the Hashemite Kingdom of Jordan. The water resources monitoring and management component of the Water Quality Improvement and Conservation (WQIC) Project focuses on strengthening the Ministry's capabilities in developing and managing the water resources of Jordan. Several tasks of this component are related to the collection, management, storage, and retrieval of high quality data, both for water resources and water quality. Development of a management information system (MIS) is a major task of the WQIC Project. This report presents a detailed engineering design for the Unified MIS that covers most of the resources managed by the Ministry. The design effort required the extensive effort and cooperation of several individuals working in the agencies managed by the Ministry.

To implement a unified MIS for all Ministry functions requires the ability to communicate, transmit, share, and create management information from the data within the Ministry. This task has focused on the physical components; networks, computers, locations, and communications necessary to support a Unified MIS. This report does not focus on the large remaining effort to migrate existing databases to a new physical structure and create the logical (software) framework that will be needed to provide a fully operational Unified MIS to the Ministry. The final Unified MIS will make use of both tabular data in databases such as Oracle 7 and spatial data in a Geographic Information System based on maps, drawings and attribute data.

1. DETAILED ENGINEERING DESIGN

The detailed engineering design is based on the work performed in the User Needs Assessment Task submitted to the Ministry under the title, "Water Quality Improvement and Conservation Project, Management Information Systems Report", dated December 1994. This report provided five potential alternative conceptual designs for the Unified MIS. Alternative 5 of the subject report was selected by the Ministry as the alternative that should be used as the basis for the detailed engineering design.

To develop the detailed engineering design, a four step approach was used.

- Develop baseline information on equipment and locations
- Analyze required intra/inter organizational connectivity requirements
- Present a Preliminary Design Review (PDR) to the Ministry
- Refine the design in accordance with the PDR and submit a final design

The detailed engineering design task required the following items be included in the final report:

- Design packages for each site
- Equipment lists/costs for each site
- Tools required
- Proposed training for managers and network administrators
- Schedules for each site and the total program

Details on each of the above requirements are found in the body of this report with site specific Appendices for each location. Included in the back of this report are electronic copies of the report, a database, spreadsheets, and Autocad drawings that are the basis of the information used in the process of creating the design. Training requirements developed in relation to this task have been submitted separately to Development Alternatives Incorporated (DAI) under separate cover. These same training requirements are reflected in Chapter 5 of this document.

2. MODULAR NATURE OF THE DESIGN

The scope and cost of implementing a project the size of the Unified MIS for the Ministry is significant. To allow for incremental implementation, the geographically separated facilities can be implemented in a modular approach. Most facilities can operate independently, therefore, if the choice is to implement the design in the Zarqa Governorate but delay or not implement the design in the Ajlun Governorate, the system will not fail. In the future, when the logical framework for the Unified MIS is completed and implemented, if a particular site was not implemented, it will impact the quality and how representative the final MIS products will be. The modular nature of the design is also reflected in the priority scheme described in Chapter 5. The priority scheme provides a method to implement the design with sensitivity toward cost and capability. The proposed design will need to be implemented in phases to ensure each facility is correctly installed, tested, and personnel are adequately trained, prior to implementing succeeding sites. The design is not intended to be a turn-key approach to implementing a Unified MIS.

3. THE DESIGN

The recommended detailed engineering design for the Unified MIS emphasizes "open" systems and modularity. The core of the recommended system is a consolidated network within the Ministry Building in Amman. Physically the network is consolidated, however, each agency in the Ministry, the Ministry of Water and Irrigation (MWI), the Water Authority of Jordan (WAJ) and the Jordan Valley Authority (JVA) retain independent networks with the capability of sharing data based on mutual agreements. The recommended core networks use the Novell network operating system, with existing systems such as the WAJ DEC Alpha processor becoming a node on the WAJ Novell network, accessible through the Novell based system. Organizations geographically

separated from the WAJ will operate using independent Novell based networks with the capability to "dial-in" to the host WAJ network in the Ministry Building. Because the Telecommunications Company (TCC) capability to supply high speed data lines is limited (less than 9600 baud), the initial dial in capability will have slow response times. As the TCC capability improves, the recommended solution will accommodate higher speed data communications without modification. In the JVA significant changes will be needed to improve the data processing support for HQ JVA and for the Staging Offices. The recommended solution uses powerful new personal computers to replace old Data General MV 2000 equipment. The new personal computers will use Microsoft's Windows NT Workstation operating system to provide multithreaded, multitasking capabilities at a reasonable price in the Staging Offices. Using Data General Aviion systems for the Staging Offices was considered; however, at three times the price and approximately one-half the processing capability, this solution is not recommended. Regardless of which replacement system is used in the Staging Offices, the JVA must update the Staging Office Oracle 5 based system to an Oracle 7 based system, if new equipment is to be installed. This is necessary because changing the equipment in the Staging Offices (to either personal computers or Aviion hardware) will require updated Oracle software for a Disk Operating System (DOS) or Unix operating system.

All geographically separated systems will have the technical capability to communicate with other locations within the Ministry via dial up modems. Recommended operating systems and network operating systems are being proposed that will use common networking protocols between similar networks (e.g. Novell networks to Novell networks in the WAJ and TCP/IP based network to TCP/IP capable networks in the JVA). In the WAJ, each Governorate is established as a independent network, with capability to dial in to the Ministry Building WAJ network, or in the case of the stores function at each Governorate, a dial in capability is provided to contact the Amman Stores ordering computer.

All sites recommended to be included in the detailed design have been addressed. However, many of the sites received a low priority based on the priority scheme developed and presented during the Preliminary Design Review. This does not indicate that these sites are not important. It indicates what an organization's relative position is in the implementation structure based on the priority scheme devised.

Several locations addressed by the design may require procurement of Oracle 7 for use on multiple types of computers, such as the WAJ VAX 3200 systems in some of the Governorates or on personal computers in the JVA Staging Offices. Several copies of Oracle 7 were recently purchased and distributed to the agencies within the Ministry. When the precise allocation of these licensed copies are known, the additional requirements can be included easily in the costing spreadsheets furnished with this report.

4. COST FIGURES

Cost figures are included in the proposal to provide a basis of comparison between priorities and options. The prices also provide an approximation of the cost of implementing the detailed engineering design. The cost figures are in US dollars. During the period of report preparation costs have and will continue to vary significantly because of the volatile nature of the consumer electronics industry. It was found that when comparing prices for like items in Jordan and the US, especially for computers, the Jordanian prices were normally 40 to 60% higher than US based prices. US retail prices were used for hardware components and software. US prices do not include transportation costs. The assumption was made that since all material would be used for the Jordanian Government, no import duties would be required. Cost figures for equipment costs are found in Figure 1 below. Although care was taken to account for all details when developing the cost models, it is not possible to account for every item that would be needed to implement this large of a project. Should the Ministry and USAID decide to implement the design, or a portion of the design, the design as represented by this report could be used as the basis to develop tenders. The team recommends using a cost plus approach for equipment purchases. This provides flexibility in procuring large amounts of hardware needed for the networks and computer upgrades, and allows for modifying the design to adjust for changes in dynamic organizations.

Figure 1. Summary of Costs

COMPONENT	PRIORITY 1	PRRIORITY 2	PRIORITY 3	PRIORITY 4	TOTALS
Ministry Building	235,708.78	16,788.00	8,357.00	0.00	$260,853.78
MWI	0.00	10,596.00	0.00	0.00	$10,596.00
JVA	116,957.36	25,715.25	28,307.96	59,577.48	$230,558.04
WAJ	85,666.64	136,879.46	235,998.84	129,350.98	$587,895.92
TOTALS	$438,332.78	$189.878.70	$272,663.80	$188,928.46	$1,089,903.74

The estimated labor cost to complete the entire project is 6,250 hours at approximately $268,000, using US based labor. If the installation technicians are supplied from local resources, the labor cost could be reduce by approximately 25%.

5. RECOMMENDATION

The recommendation of the team is that the Ministry continue to pursue its goal of implementing a Unified MIS. The recommended next step in that process is to adopt the detailed engineering design and pursue funding for implementation. The initial effort should include all Priority 1 and 2 sites and a significant number of Priority 3 sites. In the later category, WAJ Governorates and the JVA and WAJ Laboratories should receive high consideration for the purposes of implementing the plan. If is further recommended that the installation team be composed of both local Jordanian personnel from commercial installation resources and personnel from SAIC who are experienced in managing projects of this scope. Quality installation personnel are available in Jordan

and should be used to reduce cost to the program. It is recommended that SAIC provide program management, quality assurance engineering, configuration management documentation, testing and provide independent validation and verification of the all installations. This teaming approach ensures a quality installation, and provides in country resources that understand the system and would be available for long term support. The team recommends software development and conversion efforts begin for sites that will be receiving automated support for the first time, or will be experiencing significant equipment changes as a result of the implementation.

6. BASELINE DATA

Baseline data were needed to define where the Ministry was at a specific point in time. This baseline data became the departure point for the detailed design. The baseline data on the equipment (as of July 1995) identified the resources that could be used as is, modified or be recommended for salvage if the design for the Unified MIS is implemented. The facility baseline information provided the environmental specifics for where equipment needed to be installed and the geographic locations for each facility.

Baseline information is a key input to management decisions. Management must know what exists and where it exists, to determine what investments are needed to meet requirements. During the team's investigations complete equipment listings (for computer systems) nor complete facility drawings and information could be found for any location. At times drawings were available, however the current configuration of any facility was not readily available either at the Ministry Building or at the geographically separated units. Because this type of information is important to not only this design effort but also the Ministry, the team has included in this report electronic copies of the equipment database (computer equipment) and AutoCad drawings for each of the facilities visited. In some cases stylized drawings are used because the facility was not visited. In cases where the facility was not visited it was often described as similar to other offices (e.g. other Staging Offices in the JVA). These electronic files can be used and updated on a going forward basis to help with the Ministry with configuration management of its assets. The Ministry is a dynamic organization, and because of this the baseline data have changed since the data were collected in July 1995. To make the data current will require a minimum of effort at this time; however, within a year a significant amount of effort will be needed to accomplish this task.

7. PROJECT GROWTH

The original scope of the project included the Ministry Building, the 12 Governorates of the Water Authority of Jordan and the three District Offices and 10 Staging Offices of the Jordan Valley Authority. As the team began to develop the baseline data, six dams, two laboratories, eleven water treatment facilities, nine pumping stations, two vehicle maintenance facilities, two stores operations and several other unique offices and functions were added to the overall design effort. Although the additional offices and locations did not change the length of time required to perform the design, there have

been some impacts. Early in the data collection phase costing questions were asked on how much the overall implementation would cost. In many cases, the additional offices and functions were not known when the first estimates were provided. The growth in offices and scope has caused a growth in the cost figures. The additional offices and functions included in the design have caused the team to concentrate more on the overall approach than on the details for each location than was originally planned. Enough details have been developed to make this report a suitable guide for the implementation of the overall design.

In addition, the project has grown with respect to changes in facilities. At least four of the WAJ Governorates (Madaba, Aqaba, Karak and Tafelah) are going to be relocated to different or new facilities. The Amman Governorate's vehicle operations and maintenance facility is being relocated. In the JVA the Fannoush computer center was in the process of being moved to Dirar. Three JVA Staging Offices need to be replaced because of their deteriorating physical condition. These changes impact the schedule and planning for implementing the Unified MIS, especially at these locations. The schedule will need to remain flexible to handle changes within the Ministry. The report identifies these changes in facilities in Chapter 4, where they are known. A final implementation schedule will need to be closely coordinated with all Ministry agencies prior to beginning the installation process.

8. MULTIPLE SIMULTANEOUS PROJECTS

The Ministry represents a large divergent organization with many agencies that have current and on going modernization programs. During the period this report was being prepared a tender for the design of a new training building was issued. The new building, adjacent to the current Ministry Building is planned as a training facility and potentially as office space for some or all of the Secretary General of the MWI staff. The detailed engineering design does not include this facility. The proposed Ministry network could be extended to the new facility if required, without significantly affecting the overall design. The new building was not addressed because of the uncertainty in when the proposed building would be built. External to the Ministry Building, the Governorate of Amman issued a tender for a Management Information System for the Governorate, to include a Geographic Information System (GIS). The status of this tender is unknown. The systems proposed may not be compatible with the rest of the detailed engineering design for the Ministry. This is particularly true of the GIS portion of the tinder. In addition, the Water Quality Improvement and Conservation (WQIC) Project has formalized an Automated Data Processing (ADP) Plan. The ADP Plan was prepared considering requirements of the Unified MIS and detailed engineering design. If the plan is approved and acquisition for the equipment and software begins prior to the implementation of the MIS detailed design, some costs and components addressed in the design will not be required. In an another area, the JVA is migrating their primary data processing software from Oracle 5 to Oracle 7 at Dirar. The JVA is also moving the data processing from a Data General MV 2000 temporarily to a Data General 15000 and eventually to an Aviion system. For these reasons, replacement equipment for the old

MV 2000 development system used by programmers at Fannoush (and subsequently at Dirar) was not addressed. Appropriate upgrades to Oracle 7 at the District Offices and Staging Offices will be required.

For the purposes of this design report, the team used the following assumptions:

- The WQIC Project ADP Plan will be accepted and items procured prior to implementing the detailed design, therefore, only limited procurements for the WQIC and UNDP areas will be needed.
- The MIS for the Amman Governorate will not address the entire Governorate, therefore, the detailed design will be costed completely for Amman. (Actual implementation plans can be adjusted)
- The JVA work at Dirar to replace the Data General MV 2000 with an Aviion system running Oracle 7 will be complete prior to implementation of the design. The design incorporates the Aviion system but does not assign costs specifically for it, but does enhance the Dirar facility.

The impact of the these multiple concurrent programs is that depending on which program is implemented and when, the costing of the detailed design for upgrading or replacement of the systems changes drastically. Potential conflicts are introduced if the result of a particular program is not compatible with the Ministry accepted design for the Unified MIS. Although the systems proposed all purport to be "open" systems, "open" systems do not miraculously work together simply by electronically connecting the systems.

If the Ministry is to achieve a Unified MIS, the Ministry must establish and enforce guidelines that all Ministry agencies follow when developing new or upgrading existing systems that are part of the Ministry's water resources management system. The Ministry needs a central management staff that can speak for the Ministry in terms of setting architecture guidelines for data processing equipment, networking and software development. The Ministry needs to develop a Concept of Operations Plan (CONOP) that establishes which organizations are responsible for the ADP functions performed by the Ministry. The CONOP needs to define responsibilities for all agencies under its control. A consolidated planning group for the Ministry and a well supported CONOP are a must if the Ministry is going to achieve a Unified MIS to manage the water resources of Jordan.

9. MINISTRY COOPERATION

The detailed engineering design task required the energetic participation, cooperation and guidance of many personnel in the Ministry. Representatives from the WAJ and JVA provided extensive help in site visits and insight into the Ministry operations. Members of the WQIC Project and DAI staff members were extremely helpful in completing the project. The SAIC team would like extend our appreciation to all the Ministry personnel and WQIC Project staff for their assistance in this task.

ACRONYMS

Acronym	Definition
ADP	Automatic Data Processing [equipment]
AOS	Computer operating system for Data General computers
AUI	Attachment Unit Interface
AWG	American Wire Gauge
CIDA	Canadian International Development Agency
CONOP	Concept of Operation Plan
DAI	Development Alternatives Incorporated
DO	District Office (Administrative office for SO's under JVA)
DOS	Disk Operating System
GB	Gigabyte (1,000 MB)
GIS	Geographical Information System
GTZ	German Agency for Technical Cooperation, Ltd
IBM	International Business Machines
IP	Internet Protocol
IPX	Internet Packet Exchange
ISDN	Integrated Services Digital Network
IV&V	Independent Validation and Verification
JVA	Jordan Valley Authority
KAC	King Abdullah Canal
Kbps	Kilo bits per second
LAN	Local Area Network
MB	One million bytes
MHz	Frequency measure, million cycles per second
MIS	Management Information System
MODEM	Modulation/Demodulation
MWI	Ministry of Water and Irrigation
NIC	National Information Center
NIC*	Network Interface Card
OS/2	Small Computer Operating System
PC	Personal Computer
POTS	Plain Old Telephone Service
RAID	Redundant Array of Inexpensive Disks
RAM	Random Access Memory
SAIC	Science Applications International Corporation
SO	Staging Office (Small JVA office in the Jordan Valley)
SPX	Sequenced Packet Exchange
TCC	Telecommunications Corporation
TCP	Transport Control Protocol
UNDP	United Nations Development Programme
UNIX	Computer operating system

Acronym	Definition
UPS	Uninterruptable Power Supply
USAID	United States Agency for International Development
UTP	Unshielded Twisted Pair
VSAT	Very Small Aperture Terminal
WAJ	Water Authority of Jordan
WAN	Wide Area Network
WQIC	Water Quality Improvement and Conservation

CHAPTER 1.0 OBJECTIVES

The Ministry of Water and Irrigation (hereafter referred to as the Ministry) has determined that a comprehensive Management Information System (MIS) is necessary to manage and control the vital water resources of Jordan. The MIS envisioned by the Ministry will provide access by decision makers to information contained in tabular data bases and/or spatial data bases, and be presented in reports or as geographical displays as appropriate. Currently three organizations under the Ministry are responsible for the majority of water management information that will be a part of the MIS for Jordan. These organizations are the Ministry of Water and Irrigation (hereafter referred to as the MWI), the Jordan Valley Authority (JVA) and the Water Authority of Jordan (WAJ).

The Ministry is working with United States Agency for International Development (USAID), and other international organizations and companies to achieve the objective of a comprehensive MIS. The lead international agency for unifying the MIS is USAID. USAID has contracted with Development Alternatives, Incorporated (DAI) and a team of subcontractors to develop and integrate a unified MIS for the Ministry. Other contributors to the MIS include the German Agency for Technical Cooperation (GTZ), a German firm working on a Geographical Information System (GIS) for the Amman Governorate and on selected United Nations Development Programme (UNDP) databases, the Royal Jordanian Geographical Sociey in conjunction with the US Geographical Survey, and the Canadian International Development Agency (CIDA).

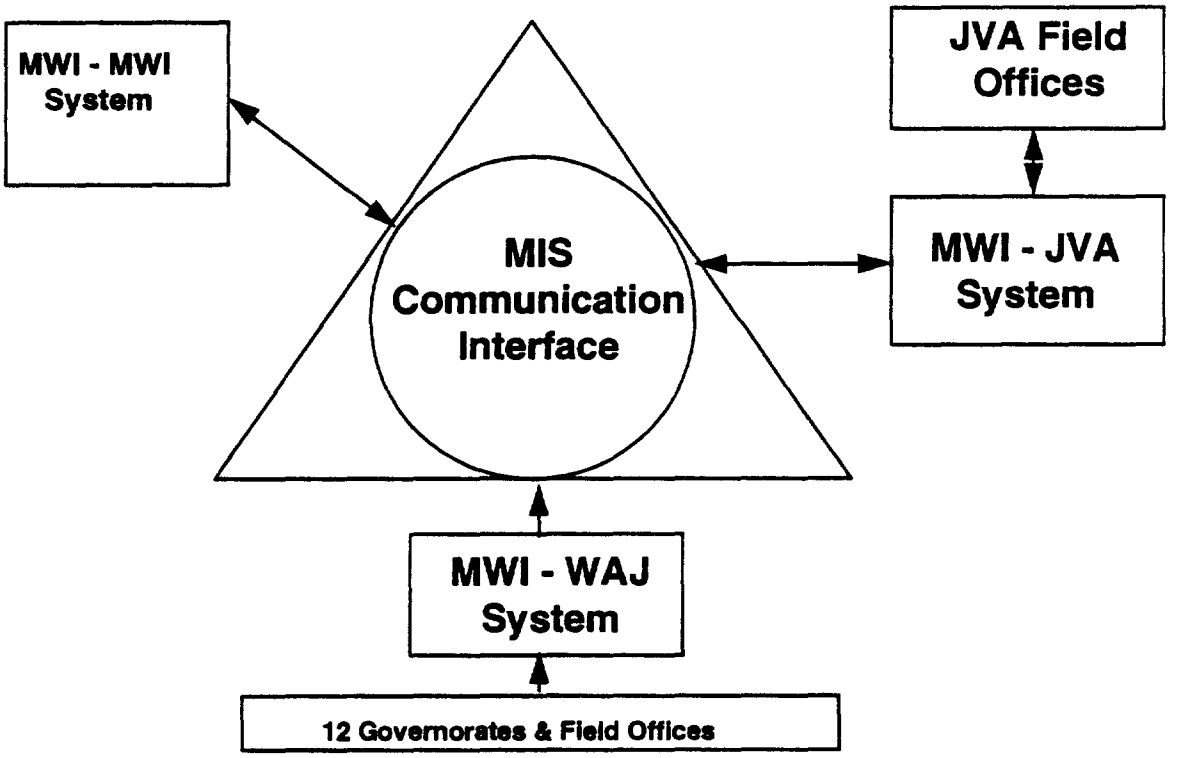
The Unified MIS objective is to provide decision makers information in usable formats, using automated tools, that will assist in managing the water resources of Jordan. The focus of the MIS task is to establish a single central information management system for all aspects of water-related information in the Minstry including water quality, water quantity, administrative, personnel, and management information. The MIS will include the capability to access tabular data stored in databases by GIS. The MIS will be designed to physically support a GIS with LAN communications and workstations. The detailed engineering design of the MIS will coordinate with other projects that are in concurrent development to ensure all required capabilities are addressed and duplication of equipment/software and effort is minimized.

1.1 Water Quality Improvement and Conservation (WQIC) Project Objectives.

DAI is responsible for ensuring its contract team completes the subcomponents identified in its contract with USAID and the Ministry. One of the subcomponents under the Water Resources Monitoring and Management area is the Management Information System (Operations).

To achieve the objective of a unified MIS for the Ministry, the MIS subcomponent has been broken down into several phases for accomplishment. The first phase resulted in a report, "Water Quality Improvement and Conversation Project, Management Information Systems Report", dated December 1994, that described some of the functionality required to implement a unified MIS. This report provided five alternative architectures for the MIS. Architecture Alternative 5 was designated as the accepted target for the follow-on phases. Alternative 5 retains the internal structure of each organization, but provides the capability to exchange information through physical connectivity of the systems. Alternative 5 also has the flexibility to "collapse" into a single, integrated system as the Ministry moves to restructure its organization into a single agency.

Figure 1.1 Localized (by Organization) LANned PCs and Mainframes with WAN Communication Interface Connections and Dial-Ups



The next phase of MIS task required a detailed engineering design of the unified MIS. The engineering design requires a design for each location, a proposed equipment list, cost data and a priority scheme.

1.2 Objectives of this report within the context of the WQIC Project.

This report provides the detailed engineering design for the Unified MIS. This report partially fulfills the requirements of the subcomponent task, Management Information System (Operations) to be accomplished by the DAI contract team. The detailed engineerng design is based on the MIS archtitecture proposed as Alternative 5 in the "Water Quality Improvement and Conversation Project, Management Information Systems Report", dated December 1994.

The "Localized (by Organization) LANed PCs and Mainframes (minicomputers) with WAN Communication Interface Connections and Dial-Ups" is based on retaining the independence of each of the primary organizations within the Ministry. Three separate data management systems will exist and be independently operated in parallel with the current organizational structure of the Ministry. The WAJ management information system would be integrated for the Ministry Building offices, the associated organizations within the 12 Governates, and critical field offices. The JVA management information system would be integrated for the Ministry Building offices, the three District Offices, the 10 staging offices in the Jordan Valley, Dirar, Fanoush, the Dams and Irrigation Directorate, Stores, and the Laboratory. The MWI will be networked to include the WQIC Project staff and the UNDP Project staff. The hardware for the current data management systems of WAJ, JVA, and the MWI will be upgraded. Initially the systems will be linked only through a communications interface. As the Ministry "collapses" into a single organization, the management information systems of each of the organizations will need to "collapse" into a single, integrated MIS.

The Wide Area Network (WAN) gateway linking each of the three independent data management systems with their subordinate organizations and the ability to communicate between the LANs installed in the Ministry Building in Amman supports the design requirement. In general, the three principal components that contribute to the unification of the MIS for this alternative are a unifying language (e.g., ORACLE), open operating systems (Novell, DOS, Unix), and a shared communication system.

Data and software for all nine water process activities described in the "Water Quality Improvement and Conversation Project, Management Information Systems Report", December 1994, are intermixed on the new replacement JVA server and JVA PCs, on the WAJ DEC ALPHA computer and PCs, the Governorate's VAXs and PCs, and on the Ministry servers and PCs. Communications within and between the water process activities is possible by implementing Alternative 5, but communications are not as fully developed as for Alternatives 3 and 4 described in the Water Quality Improvement and Conversation Project, Management Information Systems Report, December 1994. Many interface control decisions such as who will have access to data across the communications interfaces, and the amount of information to be exchanged, will be made based on organizational issues, engineering, performance and cost factors. The Concept of Operations Plan, when developed will further refine this critical area.

CHAPTER 2.0 METHODOLOGY

The approach used to accomplish the task was to establish a baseline of existing equipment, needed connectivity and communications capabilities. This was done by concentrating first on the organizations and the facilities contained in the Ministry Building in Amman. Each of the organizations within the building was visited. Equipment, networks, and computers were documented to establish a hardware baseline. The Ministry Building was examined in terms of construction, availability of power, physical layout and special facilities such as existing specially constructed computer rooms. After the Ministry Building was documented, Ministry locations in the immediate Amman area were visited. Baseline data was developed for the physical facilities and existing computer/communications capabilities. Constructing a sound baseline of existing equipment established what equipment would be available for later use and provided insight on the level of training of assigned personnel. These components are a central building block for a Unified MIS for an operational organization.

After the facilities in Amman were documented, the team concentrated on the JVA sites. For each location visited, baseline data on existing facilities, computers and communications were developed. The last area of concentration focused on the WAJ and the individual Governorates and their reporting offices. The baseline data was collected between April 6 and May 5, 1995. Supplemental data was collected between June 16 and July 7, 1995. The supplemental data encompassed additional sites, plus added information for previously visited sites as required. Data was collected at most of the physical locations which will be connected to the network and that will contribute directly to the Unified MIS.

2.1 Collecting Data on Current Equipment Configuration.

To collect data on existing systems, data forms were built using Microsoft's Excel 5.0. The data forms were tailored to collected data on personal computers, computers used as servers, and mini-computers (VAX, Sun Work Stations and Data General products). The data collected included operating systems, available computer memory, disk space and software applications in use. This provided a baseline profile of existing systems. The baseline equipment was then used as part of the final configuration if appropriate, upgraded as needed, or replaced if it no longer adequately supported the mission. The data collected was entered into a Microsoft Access 2.0 database (here after referred to as the Jordan.MDB) which was used in the development of this report. The Jordan.MDB database is included in electronic copy, on 3.5 inch diskette, in the plastic binder at the back of this report. It can be used for future reference or as a means to maintain configuration records for the Ministry. Information was collected on printers and how they were connected to the networks or computers. This information was included on the equipment forms.

2.2 Collecting Data on Current Installed Networks.

Data on networks was collected in a similar fashion. Each installed network was identified to include the network server, network operating system and number of nodes that comprised the network. A system was considered networked if two or more access nodes, terminals or personal computers, accessed a common file system. Where possible, network application software was also documented. Five networks were found in the Ministry Building. The Governorates of Amman, Irbid and Zarqa each contained small DECNet networks. The Amman Stores office contained a small DECNet based network. Each JVA Staging Office (a total of 9) had a small network based on the Data General MV 2000. The Fannoush maintenance facility had two small networks based on the Data General MV 7800 and a SunSparc 20 workstation, the SunSparc workstation has subsequently been moved to Dirar.

2.3 Collecting Information on Data Flow Between Organizations.

Collecting quantitative data flow information between organizations and individual sites was not a primary objective of this task. The primary paths for information flow were documented, and where possible quantitative data was collected. Very little data (electronic or hard copy) appears to flow between the WAJ and the JVA. Data flow between the WAJ, JVA, MWI, and the Ministry is generally accomplished by hard copy. The sharing of data files or electronic connectivity between the Ministry, MWI, WAJ and JVA does not exist at this time.

Data flow internal to each organization combines electronic formats, hard copy out put and hand written data. Within the JVA, the primary producers of electronically transmitted data are the Staging Offices, Remote Transmission Units and the Computer Center at Dirar. Within the WAJ, there is some electronically transmitted data between the WAJ computer facilities in the Ministry Building and the Governorates of Amman, Irbid and Zarqa, which have organic data processing capabilities. Much of the data (billing and customer information) handled by the WAJ computer facilities in the Ministry Building are received as hand written forms, and then entered into the data processing system. This is done for Governorates that do not have organic data processing capabilities. The exception is the Governorate of Ajlun which receives it data processing support from Zarqa.

The Telecommunications Company (TCC), a Jordanian Government company, provides telephone service to Jordan. The service is limited to voice grade lines, with a wide range in the quality of the lines between locations. Leased lines are available. However, the improvement in quality is not appreciable, and if a dedicated leased line fails, responsive repair service is not always available. The TCC, and experienced personnel, recommend that leased lines not be used in most cases. The normal data transmission speeds experienced over Jordan's voice grade circuits is 1200 baud. In some cases, speeds of 9600 baud can be achieved on leased lines. The Government is pursuing two actions that could significantly affect the capability to transmit data. The TCC is planning to upgrade

their network to the Integrated Services Digital Network (ISDN) level, at least between points-of-presence (TCC switches in major cities). As part of this program a new digital switch has just been installed in Amman. The TCC estimates that it will take 4 to 5 years to complete the program (approximately the year 2000). In addition, the TCC may become privatized. Privatization could encourage a wider range of services to meet commercial, government and educational requirements for better/faster communications capabilities between geographically separated locations within Jordan. Both of these actions could provide needed data tranmission capability to the Ministry Unified MIS.

In Jordan, privatization has already begun in two technologies:

- A private consortium was attempting to install a fibe optic backbone to serve the greater Amman area in the late 1995 time period. This would be the first large scale introduction of fiber optic technology in Jordan.

- A private company will begin offering cellular phone service in Amman in late 1995. Wireless telephone transmission may provide an alternative to the low quality levels of service experienced in remote areas.

CHAPTER 3.0 FINDINGS

3.1 Current Equipment Configuration.

3.1.1 MWI Current Equipment Configuration.

The MWI, which includes the WQIC Project Staff, the UNDP Project Staff and a small additional number of Ministry officials, have the most extensive level of automated support in terms of available equipment for the number of personnel of the three independent agencies.. The WQIC Project at the time of data collection for the baseline data, had 28 IBM compatible PCs, with 80386/80486 or Pentium based processors. In addition, there were 4 Apple MacIntosh systems. External to the Ministry Building are 5 Apple MacIntosh systems at the Jordan Environmental Society. The WQIC Project has four additional Apple MacIntosh systems at the Jordan Environmental Society. The systems are networked using Novell 3.11. There are a variety of printers installed. There are two network printers designated, a Mannesmann Tally laser printer and a Hewlett Packard color inkjet printer. Specific equipment configurations can be reviewed using the equipment database developed for this task and included on disk at the back of this report. The database was developed using Microsoft Access 2.0. The UNDP Project Staff has 10 IBM compatible PC systems. GTZ has two IBM compatible PCs, that can be connected to the UNDP network. The UNDP systems are networked using a Novell 3.11 based LAN. Printers under UNDP control are connected directly to host computers and are not network shared.

3.1.2 HQ Jordan Valley Authority (JVA) Current Equipment Configuration.

The HQ JVA at the time when the baseline data was collected had three stand alone IBM compatible PCs and two Data General MV 2000 systems with 15 terminals connected serially. The IBM compatible computers were 80386/80486 devices (see database for additional details). One MV 2000 on the third floor, used as the land acquisition system, had a Multitec 1200 - 9600 Baud Modem attached. Printing provided by dot matrix printers directly attached to the MV 2000 terminals via serial cables or by two laser printers directly attached to two PCs. Printing from the third PC was accomplished by copying a file to a diskette and walking the diskette to a PC with a printer attached, and using the PC with the attached printer for the output.

3.1.3 Directorate of Dams and Irrigation (JVA) Current Equipment Configuration.

The Directorate of Dams and Irrigation at the time when baseline data was collected had five IBM compatible PCs that were standalone machines. There were two laser printers available and directly connected to two host computers. The computers were used for administrative purposes, typing letters and keeping records, or in the engineering and planning section to perform studies and design activities. No network was available and

all output was in hard copy format and forwarded in hard copy to meet mission requirements.

3.1.4 Computer Center Dirar (JVA) Current Equipment Configuration.

The Computer Center at Dirar at the time when baseline data was collected had a variety of systems. Two Pentium 60 PCs were configured to automatically monitor the King Abdullah Canal (KAC) and its gates' status (open, closed or partially open) and the associated flow of water (measured by water flow meters immersed in the KAC and transmitted back to the center by the Remote Transmission Units (RTUs)). One system Pentium system was designated as a backup. However, it was primarily used as a software/modification development system for the canal monitoring function. A Data General 15000 was recently installed at Dirar as an interim processor to run the water balance model and water allocation program. The Data General 15000 communicates with the Data General MV 2000s at the nine Staging Offices using a Multitec 9600 baud modem. A Data General MV 2000 with two terminals attached was being used as a software development/modification platform to enhance and troubleshoot software used in the Staging Offices. A SunSparc 20 workstation was transferred from Fannoush in May 95, and is being used in conjunction with an IBM compatible PC to transfer Oracle 5 databases to Oracle 7 databases. The SunSparc workstation uses UNIX Version 5 for its operating system. The transitioned software will subsequently reside on a new Data General processor (from the Aviion product line) that will run the water balance model and water allocation program. The SunSparc 20 workstation will be transferred to HQ JVA when the software transition effort is complete. The SunSparc will replace one, and potentially both MV 2000 systems in the Ministry Building. The Data General 15000 system was not documented, because of its temporary nature. The other systems can be found in the Jordan.MDB database accompanying this report.

3.1.5 Fannoush (JVA) Current Equipment Configuration.

The Fannoush Operations and Maintenance center at the time when baseline data was collected had a Data General 7800 with three terminals attached. Fannoush had been the computer center for the JVA until May of 1995, when the center, with its programmers were transferred to Dirar. The Data General 7800 system was originally used for the water balance model, the water allocation program and the JVA vehicle maintenance tracking program. The Data General MV 7800 uses AOS, a proprietary operating system. The MV 7800 is connected to a UPS. The Data General MV 7800 is now dedicated to running the vehicle maintenance tracking database. The tracking database is written in Oracle 5, and contains data on equipment, maintenance actions and life-cycle costs for vehicles used to support JVA operations. There are no current plans to upgrade the database software to Oracle 7, or the customized application developed for tracking vehicle maintenance.

3.1.6 Typical Staging Office (SO) Current Equipment Configuration.

The Staging Offices at the time when baseline data was collected were typically configured with one Data General MV 2000 with two terminals. The Data General MV 2000s use AOS, a proprietary operating system. The terminals were attached using a serial connections. Each site had one Multitec 9600 baud Modem attached to the MV 2000 using a serial cable (RS-232C). Staging Office (SO) 7 was collocated with a District Office 1 (DO). The DO 1/SO 7 location had five terminals attached to the MV 2000. Each SO had a single 9-pin dot matrix printer attached serially to either a terminal or the MV 2000. The configuration of equipment in the District Offices and Staging Offices is standardized to ensure that software and day-to-day operational support is not interrupted. Three Staging Offices (SO 1, SO 3 and SO 5) are in very old buildings. Placing data processing equipment in these buildings is very risky due to poor power, lack any air conditioning and high levels of dust.

3.1.7 Typical District Office Current Equipment Configuration.

The District Office 1, at the time when baseline data was collected was configured with one terminal connected to Staging Office 7's MV 2000. DO 1 had access to the Multitec 9600 Modem attached to the MV 2000 for connection to Staging Offices 1 or 2, to the computer center, or to HQ JVA. District Office 2 had a single terminal attached to Multitec 1200 - 9600 baud Modem. District Office 2 used this terminal to dial-out to subordinate Staging Offices, the computer center or if necessary, HQ JVA in the Ministry Building. DO 2 also had one standalone IBM compatible PC for administrative purposes. DO 2 had one dot matrix printer that could be used with either the terminal or the IBM compatible PC. District Office 3 was not active at the time of the baseline data collection.

3.1.8 HQ WAJ Current Equipment Configuration.

The HQ WAJ, at the time when baseline data was collected, had one DEC Alpha system installed with 19 terminals and two PCs with terminal emulation software attached. The DEC Alpha is using Open VMS release 1.0 for its operating system. The DEC Alpha also had an two high speed line printers and a wide carriage dot matrix printer attached. The DEC Alpha contained 128 MB of system memory and 10 GB of disk storage. The DEC Alpha provided primary support for customer service request and billing for the 8 Governorates with no ADP support. Other uses for the DEC Alpha include processing payroll data, personnel data, and geographic information using the GDS system developed by McDonnell Douglas. The DEC Alpha was connected to an UPS system that had previously been used to support a suite of three VAX machines which were replaced by the DEC Alpha. In addition, HQ WAJ had 65 IBM compatible PCs, and 1 DEC 4060. Forty seven PCs were in a standalone configuration and 17 were networked to a Zenith Server running Novell 3.11. Many of the PCs contained network interface cards but were not connected to the network. Most PCs had 80386/80486 processors. One PC was an inoperable IBM 8086. Printing support for the PC users came from

printer directly attached to the PCs, using a parallel connection (Centronics interface). There were no network printers at the time of the baseline survey. A wide range of printers existed from 9-pin dot matrix printers to a Hewlett Packard Laserjet 4Si printer.

3.1.9 Amman Governorate Current Equipment Configuration.

The Amman Governorate, at the time the baseline data was collected, had one VAX 3200 with 11 terminals attached. The VAX 3200 was located on the third floor in a room designated as the computer room. Ten of the attached eleven terminals were on the third floor, with one terminal and an attached dot matrix printer on the ground floor. The VAX is using VMS release 5.3 for its operating system. The VAX had two high speed printers, a Mannesman Tally and CITOH CL 600Q, attached for output support. The VAX was attached to a Robotics 9600 Modem which is used to interface with HQ WAJ over a dial-out line. The Amman Governorate also had three standalone IBM compatible personal computers. There was one 80386 system and two 80286 systems. Each of the personal computers had dot matrix printer attached for hard copy output. Specific details can be found in the Jordan.MDB database.

Within the Amman Governorate facility, on the first floor, an operations center was being developed, with contract support from GTZ. The focus of this center will be to provide a customer focal point to contact the Amman Governorate for customer requests and for emergency reporting. The center will use a Geographic Information System, automated databases and a phone center to support this function. Subsequent to the initial visit, GTZ in cooperation with the Amman Governorate, issued a request for bid for the Amman Network Information System (ANIS). This request for bid will acquire software and hardware that support the Amman Governorate, and will directly impact the Unified MIS project for the Ministry. Data formats and files used in this newly acquired system need to be compatible with the Unified MIS for the Ministry. Without this compatibility, the largest source of data for the Unified MIS may be isolated from key Ministry management functions.

3.1.9.1 Amman Governorate - Stores Current Equipment Configuration.

The Amman Stores function, a subordinate organization of the Amman Governorate, at the time the baseline data was collected, had one VAX 3200 with nine terminals attached. The VAX 3200 is using VMS release 5.3 for its operating system. No printers were attached at the time data was collected. The VAX 3200 was just being installed and was not operational. The Stores organization provides a centralized acquisition and distribution point for consumable items used by the Governorates to install, maintain and repair the water distribution system. There was a power stabilizer (Claud Lyons) attached to the VAX 8200, but no UPS system. The VAX 3200 will be used to develop an automated capability for controlling inventory, develop automated ordering algorithms for restocking, and provide support for other Governorates to submit automated supply requests. The current plan is to develop the automated system using in-house

programming resources. The automated system will be developed using Oracle 7 as the database engine.

3.1.10 Zarqa Governorate Current Equipment Configuration.

The Zarqa Governorate, at the time the baseline data was collected, had just completed the installation a VAX 8200, with thirteen terminals (excess equipment from HQ WAJ). The VAX was using VMS release 5.3 for its operating system. Three high speed printers were attached to provide print output, a Mannesmann Tally, a CITOH CL 300 and a CON15 CI 300. There was a power stabilizer (Claud Lyons) attached to the VAX 8200, but no UPS system. There was one standalone IBM compatible personal computer (80836/20) used for administrative support. The personal computer had a dot matrix printer attached for hard copy output. Specific equipment details can be found in the Jordan.MDB database. The VAX 8200 will be used to support customer requests (new hookups, repairs, disconnects, new meters, etc.) and customer billing.

3.1.11 Irbid Governorate Current Equipment Configuration.

The Irbid Governorate, at the time the baseline data was collected, was preparing to install a VAX 8200. This was excess equipment from HQ WAJ. The equipment configuration was not available during the data collection period. The expected configuration is similar to the equipment identified at Zarqa.

3.1.12 Balqua Governorate Current Equipment Configuration.

The Balqua Governorate, at the time the baseline data was collected, had a single IBM compatible personal computer, with a Brother HL 631 printer attached. The system was used for administrative purposes.

3.2 Current Installed Networks.

3.2.1 Ministry Building Currently Installed Networks.

The Ministry Building currently has six small to medium sized networks installed. There are three Novell 3.1x networks, two Data General MV 2000 based networks and one DEC Alpha based DECNet. Several personal computers, especially in the WAJ have Network Interface Cards (NICs) installed but are not connected to a network. There is no consolidated network wiring scheme or coordinated approach to maximize the use of existing equipment.

3.2.1.1 Water Quality Improvement and Conservation Project Current Network.

The WQICP network is on an IBM Pentium Sever (60 MHz) running Novell 3.11. The server has 32 MB of RAM and a two 530 MB hard disk drives. The sever is located in general office space in room 223. The server is connected to an APC 400

Uninterruptable Power Supply (UPS). The physical network is uses a star configuration with three 3COM Link Builder FMS II, 48 port intelligent hubs attached to the server. Cabling consists of UTP Level 5 and 4 cable terminating in surface mounted receptacles in the WQICP occupied hall of the Ministry Building. There are 28 IBM compatible personal computers on the network and 4 MacIntosh systems. The IBM systems have ethernet NICs with RJ-45 physical interfaces. The MacIntoshes are connected through an Appletalk adapter. There are three network printers, HP Laser Jet III, a Mannesmann Tally laser printer and an IBM Colorjet printer. The network printers are connected to the network through three D-Link 950 print servers. Other printers are available, however, these printers are directly attached to personal computers located in the several offices and in general are not shared devices. The server also is host to Lotus Notes, version 3.2.

3.2.1.2 United Nations Development Programme (UNDP) Current Network.

The UNDP network is based on an IBM PS/2 (80386/20) personal computer using Novell 3.11 for the network operating system. The server had 8 MB of RAM and a 300 MB hard disk drive. The server also had Lotus Notes version 3.2 loaded. The server is located in general office space in room 223 and is connected to an UPS, no brand or capacity markings. The physical network is an ethernet bus, using RG 58 coaxial cable with T-connectors for NICs installed in personal computers attached to the network. There were 9 IBM compatible personal computers attached to the server at the time of the server. In addition, there are two IBM compatible personal computers owned by GTZ that can be and have been attached to the server in the past. One IBM compatible personal computer on the seventh floor has been attached to the UNDP server at various times, based on work requirements. No network printers were attached. Printers in use were directly attached to client personal computers.

3.2.1.3 Water Authority of Jordan (WAJ) Current Novell Network.

The WAJ Novell network is based on a Zenith Server LT (80486/66) tower, using Novell 3.11 for the network operating system. The server is located in general office space in room 430. The server has 32 MB of RAM and 3.2 GB of hard disk drive space. The server had a Reflections Write Once Read Many (WORM) optical disk storage device attached. In addition, the server had a 500 MB internal tape drive for performing network backups. The physical network consisted of RG 58 coaxial cabling to four hubs from the server, then UTP (Level of UTP could not be determined) links from the hubs to client work stations. No surface mounted receptacles were used. There were 19 IBM compatible personal computers physically connected to the server at the time of baseline data connection. There were 19 personal computers with NICs installed that were not part of the network. Most NIC cards were Eagle NE2000s, with RJ-45 and coaxial cable connections. The network hubs were Hewlett Packard (HP) hubs with 24 ports each. HP hubs were located in rooms 438, 503, 3 and 619. The hub in room 503 was to be moved in the near future to room 539. No designated network printers were attached at the time baseline data was collected. Several printers were attached to individual client systems.

3.2.1.4 WAJ Current DECNet Network.

The WAJ DECNet network is hosted on DEC Alpha 710 processor, using Open VMS release 1.0 as the operating system. A smaller UPS system is being purchased for the DEC Alpha. At the time the baseline data was collected, the DEC Alpha was connected to two DEC 100 hubs on the fourth floor, one DEC 100 hub on the ground floor, two Equinox hubs, one on the fourth floor and one on the fifth floor?. Nineteen terminals and two IBM compatible personal computers (using software terminal emulation) were attached to the DEC Alpha. The DEC Alpha also had three Gandolf bridges attached to Modems for dial out/in connectivity to the Governorates of Amman, Irbid and Zarqa. The DEC Alpha is located on the fourth, in the computer room at the end of the east wing. The serial cabling is used between the hubs and the terminals. The cabling has been spliced in several instances, joining two strand flat cable to four strand round cable with two strands shorted. Cabling between the DEC Alpha and the hubs is over serial cable. Kermit software is used as the communications software between the DEC Alpha processor and VAX equipment in the Amman, Irbid and Zarqa Governorates. At the time of the baseline data collection, there were three printers attached to the DEC Alpha. The printers, a Mannesman Tally MT 651, CITOH Line Printer and an Epson LQ 1170 were located in room 436.

3.2.1.5 Jordan Valley Authority (JVA) Current Network - Personnel.

The JVA network that hosts personnel and related records resides on a Data General MV 2000 system, using AOS as its operating system. The MV 2000 is located in general office space in room 318. At the time of baseline data collection there were 10 Opus 220 terminals directly attached to the MV 2000. The terminals were networked to the MV 2000 using serial cables.

3.2.1.6 JVA Current Network - Land Acquisition.

The JVA network that hosts the land acquisition records resides on a Data General MV 2000 system, using AOS as its operating system. The MV 2000 is located in general office space in room 333. The terminals were networked to the MV 2000 using serial cables. The MV 2000 also had Multitec 212E, 9600 baud Modem attached, with dial out/in capability.

3.2.1.7 Amman Governorate Current Network - Jebel Hussein.

The Amman Governorate Network in Jebel Hussein is hosted on a VAX 3200, using the VMS operating system version 5.3 and DECNet. The VAX 3200 is located on the third floor in the computer room (no number). At the time the baseline data was collected there were eleven terminals attached through a DEC 100 server hub located on the Ground Floor and through two eight port serial strips located in the computer room on the back of the VAX. The VAX had two line printers attached, a Mannesmann Tally MT

691 and a CITOH CL 600Q. The VAX 3200 also was connected serially to a Gandolf multiplexor, which in turn was connected serially to a Robotics Modem (variable speed 1200 to 9600 baud). The modem provided connectivity to the Ministry Building

3.2.1.8 Amman Governorate Current Network - Ain Ghazal.

The Amman Governorate Stores operation in Ain Ghazal had a VAX 3200 installed, running VMS version 5.3. The VAX 3200 is located on the ground floor in the computer room (no number). At the time of the baseline data collection there were seven terminals, one system console and one printer attached serially through two DEC 3104 eight port hubs. The network printer was an Al Arabi 1400.

3.2.1.9 Zarqa Governorate Current Network.

The Zarqa Governorate had a VAX 8200 installed, running VMS version 5.3. The VAX 8200 is installed on the first floor in the computer room (no number) The VAX has 16 MB of main memory and two disk drives with 453 MB each. At the time of the baseline data collection there were 13 terminals attached through a DEC DHU11 48 port distribution panel. There were three high speed line network printers, a Mannesman Tally MT 691, a CITOH 300 and a CON15 CI 300. The VAX will have a Gandolf multiplexor attached serially, which in turn will be attached to Modem for communications with the Ministry Building.

3.2.1.10 Fannoush (JVA) Current Network.

The Fannoush Operations and Maintenance facility network is based on a Data General MV 7800, using the AOS operating system. The Data General MV 7800 his installed on the Ground Floor in the computer room (no number). At the time of the baseline data collection there were six terminals attached to the MV 7800 through serial connectors on the MV 7800 main frame. There was one high speed printer attached to the mainframe through a serial connection (no brand name), The MV 7800 had a 9-track tape drive available for back ups. There were two Multitec 212E modems (1200 to 9600 baud) attached serially to the mainframe. The modems were previously used to communicate with staging offices when the system provided computer support for the water balance model and water distribution programs.

3.2.1.11 Typical Staging Office Current Network.

The typical JVA Staging Office contains a Data General MV 2000 system using the AOS operating system. The MV 2000s are in stalled in general office space. The normal configuration is two terminals, one printer and one Modem serially attached to the MV 2000. The Modem is used to receive water distribution data from Dirar and to transmit water requests submitted to each Staging Offices by customers. Each MV 2000 has 3 MB of RAM and 70 MB of hard disk storage. Each MV 2000 is attached to a Claud Lyons power stabilizer, but no UPS systems are employed.

3.2.1.12 Other Locations.

At the time the baseline data was collected, other locations did not have networks in place. Irbid had just received a VAX processor, but no installation had taken place. Other sites, such as the WAJ Laboratory had data processing equipment, but no network.

3.3 Supporting Infrastructure.

The capability to implement a robust Wide Area Network (WAN) within Jordan is severely limited. The Telecommunications Company (TCC) currently provides only analog voice grade circuits within Jordan. There are plans to upgrade this capability to an Integrated Digital Switch Network (ISDN), especially between switches within Jordan. However, this capability will not exist for at least four years, and then the service will only be between switches. Local loops between the switches and the customer premise will still be analog. There was an effort to provide X.25 packet switching in Jordan through the TCC. This effort has been abandoned recently. Customers requiring data communications capability within Jordan must use on demand lines (plain old telephone service (POTS)), leased lines or create their own by pass network. The TCC has an internal network, based on leased lines, that connect various TCC operating locations throughout Jordan. The optimum speed they attain on these lines is 9600 baud. Experience of Ministry organizations, such as the JVA and WAJ, is that with POTS the expected operational speed with good modems is 1200 baud, with occasional capabilities of 2400 baud.

3.3.1 TCC Service Reliability.

Service reliability is another concern. Although the phone system provided by TCC is general reliable, restoration to service once service is interrupted is not timely. Because of the service restoration is not always accomplished in a timely fashion, acquiring high cost, better quality leased lines, is not a viable option for a WAN as being proposed by this design. Slower data speeds using POTS, with more flexible data routing is the recommended solution for the design.

3.3.2 TCC By-Pass.

Alternate means of communication do exist within the Ministry. The JVA has developed a by-pass communication system connecting the Remote Transmission Units (RTU) which monitor the flow of water through the gates along the KAC and the computer center at Dirar. This system feeds the automated flow and monitoring system. This by-pass works well, but it services only the RTUs which are located on the KAC. Excess communications capabilities exist between the RTUs and Dirar. The by-pass operates on a near real-time basis and is very reliable. The WAJ has installed several radio transmitters installed at water pumping stages. These transmitters provide communication between the pumping stations and the Ministry Building on an hourly

basis. The data received by the personnel in the Ministry Building is hand recorded in ledgers. Both of these by-pass systems provide reliable communications and meet specific requirements. Unfortunately, the systems are not easily extendible as solutions to the overall WAN requirements to support a Unified MWI MIS.

3.3.3 TCC By-Pass Options.

Very Small Aperture Terminals (VSAT) could be a viable option to by-pass the TCC. This option does not require extensive land acquisitions and can be installed almost anywhere. The ground stations are moderately expensive ($2000 to $4000 each). There are problems with a VSAT approach. If a unit fails, repair or replacement can require long lead times. To counter this possibility, costly inventories of replacement items need to be maintained. The largest draw back to this solution is the high communications costs associated with leasing bandwidth on communications satellites. The availability of communication satellite bandwidth available to Jordan is unknown. In addition, the access to communications satellites can be denied because of satellite failures, usurpation by higher priorities and changes in international politics. Unless Jordan owns the communications satellite and has the ability to replace it in case of failure, using VSAT capabilities would be both very risky and expensive. A microwave network is another option that could support the communications requirements. The costs of land acquisition for towers, initial equipment costs and subsequent maintenance costs would exceed the hardware costs of all other components of the Unified MWI MIS. Although technically feasible, this option is extremely expensive and not recommended as part of the solution for the engineering design.

3.4 Level of Data Exchange.

The quantity of data and the timeliness of data transmission are key requirements in determining the WAN capacities Currently there is only limited electronic data transmission between Ministry sites. The majority of data transferred between locations is accomplished by moving hard copy information in the form of billing information and payment data between sites that do not have data automation support, particularly in the WAJ. This process amounts to transporting the data by hand to and from the Ministry Building. As the Governorates become automated and are capable of processing their own billing and customer service requests, this data will no longer have to be transmitted to the Ministry Building for processing. The JVA transfers some data electronically. The amount of data is relatively small.

3.4.1 WAJ Data Exchange.

The known current electronic data exchange between WAJ locations is limited to the Ministry Building and the Governorates of Amman, Zarqa and Irbid. The data exchanged is dominantly software maintenance related. Routine passing of data does not occur. Each of the listed Governorates have recently received excess VAX computers from the Ministry Building. These VAX computers are now being used to provide billing and

payment support for customers in each of Governorates. Billing and payment data processing for other Governorates is supported by transporting hard copy billing and payment information between the other Governorates and the Ministry Building, and entering the information into the DEC Alpha by data entry clerks. In addition, the pumping stations do pass on hourly data via a radio net to the Ministry Building. The data passed consists of operational numbers for the reporting pumping station and does not exceed 500 characters per report. The data is had recorded into ledgers at the Ministry Building. No other data exchanged electronically.

3.4.2 JVA Data Exchange.

The amount of data transmitted between the locations in JVA is dominated by the required link between the Staging Offices and the computer center at Dirar. The computer center daily provides each Staging Office with an electronic message describing the amount of water that is available for the Staging Office to allocate to its customers. The data transmitted is normally less than a page (approximately 1800 bytes). Similarly each of the Staging Offices send messages to the computer center at Dirar (twice daily) summarizing the customer requests water. Administrative messages can also be passed, but these are infrequent. The messages to Dirar are limited in length to one page (approximately 1800 bytes). There is a continuous flow of data between the RTUs and the computer center at Dirar to monitor the water flow in the KAC. This data flow may be of interest to managers in the Ministry Building. If the Unified MWI MIS needs to access this data, the access point will be Dirar and there will be no direct link to the RTU communication system from the Ministry Building. The capability exists to request or transmit data from any location to another location using existing Modems and their dial in/out capabilities. This capability is exercised to a limited extent by personnel working with the JVA personnel and payroll systems and the land acquisition systems. This capability is used irregularly for administrative purposes. No reliable data transmission quantities are available for this function. Data timeliness is important to ensure that water allocations can be made in timely manner and that data required by Dirar for use in their models is available. However, the processes involved operate in a batch mode, with the initiation of data processing being dependent on the complete arrival of data. The start of processing is not set to a specific time when a model must be run, but when the data is available.

CHAPTER 4.0 MIS ENGINEERING DESIGN

4.1 Recommended Design.

The recommended detailed engineering design for the network and hardware components of the Unified MWI MIS focuses on an open systems approach, that allows heterogeneous hardware components, and is scaleable, such that increasing capability can be integrated easily without redesigning the basic structure. Existing equipment and software is retained where possible, and recommended for replacement when the equipment or software was found not to be supportable or inadequate for its required mission (e.g. the JVA MV 2000 systems in the Staging Offices). Although a variety of systems exist throughout the Ministry, and the design will accommodate this diversity, the recommended new equipment is based on standard configurations and software suites. This standardization helps reduce training and maintenance costs in the long run, yet still provides the needed automation capability. In cases where the team's recommendation diverges widely from a Ministry or Authority suggested solution, rationale for the selection is provided as well as the alternative solutions and costs.

The detailed engineering design allows the three Ministry organizations, the MWI, the Water Authority of Jordan, and the Jordan Valley Authority to retain their independent data networks and organizations. Each organization, upon implementation will have the capability to electronically communicate with all s within their organizations. This capability is limited by the capacity of the Wide Area Network common carrier, the Telecommunications Company (TCC) of Jordan. The TCC can only provide data speeds of 9600 baud on the best of its lines, while the most common data transmission speeds are either 1200 or 2400 baud. With this WAN restriction, distributed processing over the WAN is not practical. The transfer of data electronically between sites will need to be restricted to messages, small files and summary reports that provide essential management information. As the TCC improves its capabilities the proposed modems and equipment can accommodate speeds that will allow much greater interactivity between sites. Within the Ministry Building, the three organizational networks can be connected, allowing the interchange of data. Prior to implementing this capability, a concept of operations is needed to determine who will have access to the available information and capabilities of the organizational networks.

The primary network software recommended is Novell version 3.12. There are currently three Novell networks in the Ministry Building. Staying with the Novell network software reduces the training burden and supports investments already made in this hardware. The recommended solution extends the current Novell networks to include attaching all systems within the Ministry Building, with the exception of those terminals connected to the WAJ DEC Alpha and potentially the JVA SunSparc 20 Workstation when it is installed. Terminals attached to these two identified systems will use the common network infrastructure, however they will access their host machines using DECNet or UNIX operating systems. Optionally Novell version 4.1 could be implemented. Novell 3.12 and Novell 4.1 are different product lines targeted for medium

and large networks respectively. Novell 4.1 is more complex to manage and is marginally higher in price, thus the recommendation to use Novell 3.12.

The network hardware, cables, hubs, modems, switches and other connectivity devices have been selected to ensure growth in speed and capacity without replacing the initial installed base of equipment. The network hardware will support a wide range of communication protocols, therefore network software is not bound to the network hardware, increasing overall system flexibility. The initial network speed will be 10 Mbps. The network can without cable replacement support speeds of 100 Mbps, providing significant growth without significant recabling.

4.1.1 Ministry Building - Common Physical Network.

The recommended detailed design of the Unified MIS for the Ministry Building is a common physical network that will support all agencies residing in the Ministry with a robust and flexible communications architecture. The recommended design is robust in that it provides connectivity for the currently installed equipment and recommended new equipment. It provides LAN communications at speeds of 10 Mbps, and without replacement of the cable plant, will support speeds of 100 Mbps. It is robust in that the design provides access to the network for all rooms that are used for Ministry office space or management functions. The design is flexible because regardless of changes in the use of a particular office or movement of personnel from office to office in the Ministry Building, access to each agency's server can accomplished by changing network addresses in software or moving a patch cord in a communications closet. The recommended physical network is based on a twenty four pair, multi-mode fiber optic backbone, with horizontal cable runs of Unshielded Twisted Pair (UTP) 5 cable. The design follows accepted architectures and uses the high quality materials to ensure optimum long term performance. Space for network equipment will be required in the computer room on the fourth floor and in rooms adjacent to the central electrical shaft located in the central stairwell. The rooms required are small and normally used to store administrative equipment or supplies. Even though the design provides a common physical network, each agency within the Ministry will retain access and control over its own file servers and data automation equipment. Connectivity between the agency networks is not recommended until an agreed upon Concept of Operations Plan (CONOP) is developed and implemented. The CONOP will describe what information will be exchanged or shared and who will have access to in terms or seeing or changing that information.

Computer Room - Fourth Floor.

The fiber optic cables will be terminated in an ethernet switch which provides for switching and routing of network signals to the correct network server or the DEC Alpha which is collocated in the computer room. Attached to the switch will be four servers, one each for the MWI, WAJ and JVA and one communications server. Also attached to the switch will be the DEC Alpha computer. This will enable WAJ personnel with

terminal emulation software on their PCs to communicate through the switch to the DEC Alpha. The communications server will provide external communication services to all Ministry networks through and attached modem next consisting of six modems. This modem nest can be expanded if additional lines are required. In addition, a back up server will be located in the computer room. It will be sized so that it can perform the server function of any of the three Novel networks. It will not be a backup to the DEC Alpha processor. Each of the agency servers will have Redundant Array of Inexpensive Disks (RAID) attached through a SCSI interface. The RAID equipment will provide a duplicate copy of each server configuration and data files to which it is attached. If the primary server of any agency fails, the RAID equipment will be switched to the backup server and the backup server will be attached to the ethernet switch in place of the failed server. This provides reliability at low cost and ensures very limited down times in cases of a server failure. Each of the servers will be connected to a UPS.

Twenty four strand, multi-mode fiber optic cable will be used to connect the fourth floor computer room with seven communications closets located on floors one through seven. The fiber cables will be run in the false ceiling space down the hallway to the central electrical conduit shaft in the central stairwell. The wall of the central electrical conduit shaft will be penetrated and fiber optic cables will be run in conduit in the shaft to the communications closets. In the communications closets the fiber optic cable will be terminated in a fiber optic patch panel in a 19 inch equipment rack. The fiber optic patch panel will be connected to collocated intelligent hubs mounted in the equipment rack.

Cabletron intelligent hubs are recommended for use in each of the communications closets. The hubs proposed will be of two types. The first will support ethernet networks such as Novell and the second will provide support to terminal users of equipment such as the DEC Alpha or Sun Sparc systems.

Horizontal cable runs from the communications closets will be made UTP 5 cable. Each office will have a minimum of two network receptacles installed. Some rooms, depending on use will have additional drops for network printers or additional terminals. Although each office will have multiple access points, not all rooms will be equipped with terminals or computers. Ministry management will decide which rooms will have what equipment. Equipment (terminals and computers) will be attached to the network receptacles with short UTP 5 patch cords with eight pin modular jacks. Connection adapters will be used where necessary to attach D-Pin connections to the modular jacks.

It is recommended that each wing of the Ministry Building on floors two through seven will have a print server with two printers, a high quality laser printer and a color ink jet printer. It is recommended that only one wing on the first floor have a print server with two printers. The recommendation will provide for better print quality support and reduce the overall number of printers throughout the Ministry Building. Excess printers will be reused in the JVA and WAJ remote from the Ministry Building. Key support locations such as Secretary Generals' offices will need to retain their printers attached to their support personal computers. Printers for the DEC Alpha will remain, but they will

receive their print files over the common building network. Specialized printers/plotters will remain attached to their current supporting computers. Not all printers will be removed from each of the individual offices. However, it is anticipated that twenty to twenty five reusable printers can be made available to other locations with the implementation of this architecture.

4.1.2 Ministry Building - Organizational Networks.

4.1.2.1 MWI Networks.

The MWI currently has two networks within the Ministry Building which operate independently. One network is based on an IBM Pentium personal computer and is used for administrative, project management and development activities for the WQIC Project and MWI Secretary General administrative support. The network uses Novell 3.11 for an operating system and has approximately 30 clients and three network printers. The second network is the UNDP network and is hosted on an IBM 80386 personal computer. This network supports the UNDP group and has nine personal computers attached to the server. The server uses Novell 3.11 as its network operating system.

The recommended design for the MWI Ministry Building network moves all internal networking to the Ministry Building common network. The design recommends consolidating the WQIC Project network and the UNDP network onto one server. The recommended server location is in the 4th floor computer room, collocated with other Ministry servers and the communications server. The recommended server for the MWI network is a Pentium based, 90 MHz, IBM compatible personal computer with 64 MB of memory and 3 GB of hard disk drive space. The system will also have an internal 500 MB backup tape drive. The recommended network operating system is Novell 3.12. The current WQIC server should be reused as a Lotus Notes server. The configuration for this reused server would include changing its operating system to IBM's OS/2 and including the Lotus Notes server as a part of the MWI network.

Existing personal computers in the WQIC Project and the UNDP network are recommended for memory upgrades or replacement. One personal computer in the WQIC and five in the UNDP are recommended for replacement by installation of five 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. In addition, 20 personal computers in the WQIC Project and UNDP are recommended for memory upgrades to bring them to 16 MB of memory per system.

Communication external to the Ministry Building will be through the collocated communications server in the 4th floor computer room.

The MWI has indicated that relocating its server to the 4th floor computer room may not be a suitable solution. The MWI server can technically be located anywhere within the Ministry Building or even within the new training facility being proposed for property

adjacent to the Ministry. Locating the server (or any server) in the 4th floor computer room provides many advantages. The computer room is designed to support computer systems and has more than adequate power, air conditioning and backup power. The computer room provides physical security in that it can be locked, there is limited access to the equipment and risk of inadvertent damage to equipment by normal office traffic and cleaning crews is reduced. If trouble shooting a network is required, it is easier to accomplish it from a central location where most of the network hardware is concentrated. Normal management actions by the Local Area Network Administrator is normally performed remotely from the server from the Administrator's workstation, further reducing traffic in an around the server. The recommended configuration provides a backup server that can be used to replace any of the Novell servers in the computer room. Locating the MWI server in another location would make a rapid exchange in case of failure very difficult. Security of data and information on the network is mostly a function of security within the network operating system and is accomplished by defining each user's access authorities, rights and privileges. It is controlled through log in scripts, passwords and the system administrator. The recommended solution is to locate the MWI server in the 4th floor computer room.

4.1.2.2 Water Authority of Jordan Networks.

The WAJ currently has two networks within the Ministry Building which operate independently. One network is based on a DEC Alpha 710 system and is used for subscriber billing, a geographical data system, development and administrative purposes. The second network provides administrative support for engineering, software development and design activities. The second network is based on a Zenith server, using Novell 3.11 as a network operating system. There are approximately 17 personal computers attached to the Zenith server. Some of the 17 personal computers are also connected to the DEC Alpha 710 system and use terminal emulation software to interact with the DEC system. HQ WAJ has 47 additional personal computers not attached to either network, but many do have ethernet cards and could be attached if cabling and hubs were available.

The recommended design for the WAJ Ministry Building network moves all internal networking to the Ministry installed common network. The design recommends moving the Zenith server to the 4th floor computer room from its current office location. Current network cabling should be removed after the common network is installed. The recommended design removes the current hubs and reuses them in other locations such as the Governorates and/or other WAJ offices. The server network operating system will be upgraded to Novell 3.12 and include a 100 user license. The DEC Alpha will be connected via an ethernet connection the an intelligent hub that supports the Novell server. This will allow personal computers attached to the Novell server to use terminal emulation software and attach to the DEC Alpha system as required. Network printers will be installed in one room in each wing of the Ministry Building to support network print requirements. The Novell server will have Netware Connect 2 installed to provide remote access to WAJ Network server.

Of the 64 personal computers in the WAJ offices, 43 are recommended to have memory upgrades to 16 MB of system memory. This will extend the life of the systems and make them more responsive. An additional five personal computers are recommended for the WAJ functions. Four of these systems are 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. One system to be used in conjunction with software development activities is a Pentium based personal computer, operating at 90 MHz, with 16 MB of memory and 1 GB of hard disk storage. Four of the older personal computers (80386 machines) replaced by the newer equipment will be reused as print servers for the network printers.

Access to the HQ WAJ network for remote offices to the Ministry Building will be through the Ministry communications server which will be collocated in the 4th floor computer room.

4.1.2.3 Jordan Valley Authority Network.

The JVA currently has two networks within the Ministry Building which operate independently. Each network is based on a Data General MV 2000 using AOS as its operating system. One network provides support for the JVA personnel and payroll functions. The second network provides support for JVA's land acquisition activities. Three standalone personal computers are also owned by JVA. The Sun Sparc workstation currently being used at the Dirar Computer Center to migrate software from the Oracle 5 environment to a Oracle 7 environment will be transferred to HQ WAJ and be used for the personnel and payroll functions.

The recommended design for the JVA Ministry Building network moves all internal networking to the Ministry Building installed common network. The design installs a single server in the 4th floor computer room, which will be the central component of the JVA network. The Sun Sparc workstation will be a node on the network and will be accessible by terminals installed on the network and by selected personal computers with terminal emulation software. The JVA functional area will have two network printers installed to support printing requirements.

The recommended server for the JVA network is a Pentium based, 90 MHz, IBM compatible personal computer with 64 MB of memory and 3 GB of hard disk drive space. The system will also have an internal 500 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the JVA Laboratory or the Director of Dams and Irrigation facilities. The server will also be connected to the communications server for the Ministry Building which will provide the external access to remote clients. The design requires the installation 17 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP 5 patch cable with eight pin

modular jacks. Each system will have a surge protector power strip. The 17 personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Five of the personal computers will have terminal emulation software that will allow operation as a Unix terminal working with the Sun Sparc workstation. The three existing personal computers will have ethernet cards installed and be connected to the network.

The Data General MV 2000 systems will be discarded. The current programs will need to be migrated to the Sun Sparc workstation and to the Novell server. This will require the personnel, payroll and land acquisition systems be migrated. The recommended migration path is to use Oracle 7 for Unix on the Sun Sparc workstation (personnel and payroll) and Oracle 7 for networks on the Novell server (land acquisitions).

4.1.3 Amman Governorate.

The Amman Governorate provides subscriber water services in its assigned area. Amman does have local data automation support from an excess VAX 3200 received from HQ WAJ. One personal computer currently installed provides administrative support. The Governorate facility is a Priority 1 for the purposes of implementing this design. The VAX 3200 is installed in a designated computer room.

The recommended detailed design for the Amman Governorate facility starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. One 24 AWG standard telephone cable will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle in the computer room. This receptacle will be the interface for the recommended server with internal Modem for this facility.

The Amman Governorate facility recommended design requires the installation of a UTP cable plant which is wall surface mounted and enclosed in conduit and panduit as appropriate. Wall surface mounted receptacle boxes will be used to house eight pin modular connectors. The cable plant will be terminated in a 24 port patch panel with eight pin modular jacks, which will intern be linked to a 24 port intelligent hub using eight pin modular jacks and patch cords. The cable plant will be wired in a star topology. The cable plant will be thoroughly tested for continuity and propagation factor to meet Category 5 specifications. The cable plant will be grounded to ensure safety and fire codes are met. Key offices will be networked including: the facility manager's office, the subscriber's service area, engineering design offices, administration offices, and the accounting office. The installation site for the server will be in the existing computer room. Collocated with the server will be an Uninterruptable Power Supply (UPS) with 15 minutes of battery power available after the power supply is lost to allow for a graceful shut down of the server. The current VAX 3200 will remain as currently installed with its terminals attached directly to the system. The VAX 3200 will have an DELQA-M 802.3/Ethernet to Q-bus controller installed to attach an ethernet 10BaseT transceiver with with one AUI port and one MJ-8 port (eight pin modular connector). The eight pin

modular adapter will be connected to the 24 port hub using UTP 5 cable. Personal computers attached to the hub that have Pathworks installed will have access the VAX an be able to act as another attached terminal.

The recommended server for the Amman Governorate is a Pentium based, 90 MHz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Amman Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of nine 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The nine personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

South Amman and West Amman are offices that report to Amman and are considered Priority 4 sites. These sites will have a telepphone punch down block installed and an RJ-11 wall mounted receptacle installed similar to the Operations and Maintenance facility and Stores facility. Each site will have installed one 80486 IBM compatible computer, running at 66 Mhz, with 16 MB of memory and a 400 MB hard disk. Each system will have an internal 14.4 Kpbs Modem with V.32 bis. Each of the city offices will have a 24 pin printer attached to the parallel port of their computer. Each system will have a surge protector power strip. Each system will have the latest version of Microsoft's Windows operating system and the latest Arabized version of Microsoft's Office Professional software suite. These supporting city offices will have dial-in access to the Amman Novell network as a client.

4.1.3.1 Amman Governorate Stores.

The Stores facility will have a 30 pair telephone punch down block and two RJ-11 wall mounted receptacles installed. There is an existing telephone line and Modem. An additional phone line and modem for the VAX 3200 is recommended to increase the dial in access capability from other Governorate Stores. The recommended design for the Amman Stores office retains the installed VAX 3200 with its 9 connected terminals. The design replaces the wiring plant with wiring run in conduits/panduits and surface mounted receptacles to improve physical security of the system. The design adds one

80486 66 MHz IBM compatible personal computer with terminal emulation that is attached to the VAX 3200. The new computer is configured with 16 MB of memory, 400 MB hard disk drive and an internal 14.4 Kbps Modem with V.32 bis. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Amman Stores personal computer will have installed a VT 220 software terminal emulation package to allow for access to the Amman Governorate Stores VAX 3200. The Amman Stores computer will have a dial in capability so that it can be attached to the Amman Governorate server as a Netware client.

4.1.3.2 Amman Governorate Operations and Maintenance.

The recommended design for the Amman Operations and Maintenance facility includes five 80486 66 MHz IBM compatible personal computers. One configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The other four systems configurations will be 80486 66 MHz IBM compatible personal computers, with 16 MB of memory and 300 MB of hard disk drive space. Each of these systems will have an internal ethernet card and be connected in a peer-to-peer configuration within the Operations and Maintenance facility. An RG-58 coaxial cable will be used for this connection. The systems will be attached to an electronic surge protectors. The recommended systems will have Microsoft's Windows for Work Groups operating system and an Arabized version of Microsoft's Office Professional software suite. The Amman Operations and Maintenance facility will have dial-in access to the Amman Governorate server as a Netware client. This organization is being moved from its current location at Ras El Ain into a new facility. The installation for this organization will be scheduled after the move has occurred. The recommended configuration suggests the migration of the JVA vehicle maintenance and tracking database used at Fannoush to the Amman vehicle operations and maintenance activity. This will require migrating the JVA Oracle 5 based system to Oracle 7 for personal computers and installing it for the Amman operation.

4.1.4 Zarqa Governorate.

The Zarqa Governorate provides subscriber water services in its assigned area. Zarqa does have local data automation support from an excess VAX 8200 received from HQ WAJ. One personal computer currently installed provides administrative support. The Governorate facility is a Priority 1 for the purposes of implementing this design. The VAX 8200 is installed in a designated computer room.

The recommended detailed design for the Zarqa Governorate facility starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. One 24 AWG standard telephone cable will be connected to the punch down block and terminated in a standard

RJ-11, wall surface mounted telephone receptacle in the computer room. This receptacle will be the interface for the recommended server with internal Modem for this facility.

The Zarqa Governorate facility recommended design requires the installation of a UTP cable plant which is wall surface mounted and enclosed in conduit and panduit as appropriate. Wall surface mounted receptacle boxes will be used to house eight pin modular connectors. The cable plant will be terminated in a 24 port patch panel with eight pin modular jacks, which will intern be linked to a 24 port intelligent hub using eight pin modular jacks and patch cords. The cable plant will be wired in a star topology. The cable plant will be thoroughly tested for continuity and propagation factor to meet Category 5 specifications. The cable plant will be grounded to ensure safety and fire codes are met. Key offices will be networked including: the facility manager's office, the subscriber's service area, engineering design offices, administration offices, and the accounting office. The installation site for the server will be selected at the time of implementation. Collocated with the server will be an Uninterruptable Power Supply (UPS) with 15 minutes of battery power available after the power supply is lost to allow for a graceful shut down of the server. The current VAX 8200 will remain as currently installed with its terminals attached directly to the system. The VAX 8200 will have a DEBNA-M interface installed that will attach to an ethernet 10BaseT transceiver with and AUI port and an MJ-8 port (eight pin modular jack). The eight pin modular adapter will be connected to the 24 port hub using UTP 5 cable. Personal computers attached to the hub that have Pathworks installed will have access the VAX an be able to act as another attached terminal.

The recommended server for the Zarqa Governorate is a Pentium based, 90 MHz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Zarqa Stores, Operation and Maintenance facilities, Rusaifa and Al-Azark. The server will be connected to the hub using UTP 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of nine 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The nine personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Zarqa Stores office is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Zarqa Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Zarqa Stores computer will have a dial in capability so that it can be attached to the Zarqa Governorate server as a Netware client.

The recommended design for the Zarqa Operations and Maintenance facility includes three 80486 66 MHz IBM compatible personal computers. One configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The other two systems configurations will be 80486 66 MHz IBM compatible personal computers, with 16 MB of memory and 300 MB of hard disk drive space. Each of these systems will have an internal ethernet card and be connected in a peer-to-peer configuration within the Operations and Maintenance facility. An RG-58 coaxial cable will be used for this connection. The systems will be attached to an electronic surge protectors. The recommended systems will have Microsoft's Windows for Work Groups operating system and an Arabized version of Microsoft's Office Professional software suite. The Zarqa Operations and Maintenance facility will have dial-in access to the Zarqa Governorate server as a Netware client.

Rusaifa and Al-Azark are cities that report to Zarqa and are considered Priority 4 sites. These sites will have a telepphone punch down block installed and an RJ-11 wall mounted receptaclel installed similar to the Operations and Maintenance facility and Stores facility. Each site will have installed one 80486 IBM compatible computer, running at 66 Mhz, with 16 MB of memory and a 400 MB hard disk. Each system will have an internal 14.4 Kpbs Modem with V.32 bis. Each of the city offices will have a 24 pin printer attached to the parallel port of their computer. Each system will have a surge protector power strip. Each system will have the latest version of Microsoft's Windows operating system and the latest Arabized version of Microsoft's Office Professional software suite. These supporting city offices will have dial-in access to the Zarqa Novell network as a client.

4.1.5 Irbid Governorate.

The Irbid Governorate provides subscriber water services in its assigned area. Irbid does have local data automation support from an excess VAX 8200 received from HQ WAJ. One personal computer currently installed provides administrative support. The Governorate facility is a Priority 1 for the purposes of implementing this design. The VAX 8200 is installed in a designated computer room.

The recommended detailed design for the Irbid Governorate facility starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. One 24 AWG standard telephone cable will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle in the computer room. This receptacle will be the interface for the recommended server with internal Modem for this facility.

The Irbid Governorate facility recommended design requires the installation of a UTP cable plant which is wall surface mounted and enclosed in conduit and panduit as appropriate. Wall surface mounted receptacle boxes will be used to house eight pin modular connectors. The cable plant will be terminated in a 24 port patch panel with eight pin modular jacks, which will intern be linked to a 24 port intelligent hub using eight pin modular jacks and patch cords. The cable plant will be wired in a star topology. The cable plant will be thoroughly tested for continuity and propagation factor to meet Category 5 specifications. The cable plant will be grounded to ensure safety and fire codes are met. Key offices will be networked including: the facility manager's office, the subscriber's service area, engineering design offices, administration offices, and the accounting office. The installation site for the server will in the existing computer room. Collocated with the server will be an Uninterruptable Power Supply (UPS) with 15 minutes of battery power available after the power supply is lost to allow for a graceful shut down of the server. The current VAX 8200 will remain as currently installed with its terminals attached directly to the system. The VAX 8200 will have a DEBNA-M interface installed that will attach to an ethernet 10BaseT transceiver with and AUI port and an MJ-8 port (eight pin modular jack). The eight pin modular adapter will be connected to the 24 port hub using UTP 5 cable. Personal computers attached to the hub that have Pathworks installed will have access the VAX an be able to act as another attached terminal.

The recommended server for the Irbid Governorate is a Pentium based, 90 MHz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Irbid Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of nine 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The nine personal computers will have the latest version on Microsoft's Windows operating system and an Arabized

version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Irbid Stores office is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Irbid Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Irbid Stores computer will have a dial in capability so that it can be attached to the Irbid Governorate server as a Netware client.

The recommended design for the Irbid Operations and Maintenance facility includes three 80486 66 MHz IBM compatible personal computers. One configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The other two systems configurations will be 80486 66 MHz IBM compatible personal computers, with 16 MB of memory and 300 MB of hard disk drive space. Each of these systems will have an internal ethernet card and be connected in a peer-to-peer configuration within the Operations and Maintenance facility. An RG-58 coaxial cable will be used for this connection. The systems will be attached to an electronic surge protectors. The recommended systems will have Microsoft's Windows for Work Groups operating system and an Arabized version of Microsoft's Office Professional software suite. The Irbid Operations and Maintenance facility will have dial-in access to the Irbid Governorate server as a Netware client.

Ramtha, Kora, Bany Kananah, Wadi Arab, and South Gor are cities that report to Irbid and are considered Priority 4 sites. These sites will have a telepphone punch down block installed and an RJ-11 wall mounted receptaclel installed similar to the Operations and Maintenance facility and Stores facility. Each site will have installed one 80486 IBM compatible computer, running at 66 Mhz, with 16 MB of memory and a 400 MB hard disk. Each system will have an internal 14.4 Kpbs Modem with V.32 bis. Each of the city offices will have a 24 pin printer attached to the parallel port of their computer. Each system will have a surge protector power strip. Each system will have the latest version of Microsoft's Windows operating system and the latest Arabized version of Microsoft's Office Professional software suite. These supporting city offices will have dial-in access to the Irbid Novell network as a client.

4.1.6 Jerash Governorate.

The Jerash Governorate provides subscriber water services in its assigned area. There is no current local data automation support for this operational organization. The Governorate facility is a Priority 3 for the purposes of implementing this design. To perform local billing, record payments and service subscriber requests in an automated fashion, software will need to be developed for implementation on the local area network. The software development is beyond the scope of this detailed design.
The recommended detailed design for the Jerash Governorate facility starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. Two 24 AWG standard telephone cables will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacles. One receptacle will be the interface for the recommended server with internal Modem for this facility, and the second will be in the Stores office. An addition punch down block and RJ-11 receptacle will be installed in the Operations and Maintenance facility.

The Jerash Governorate facility recommended design requires the installation of a UTP cable plant which is wall surface mounted and enclosed in conduit and panduit as appropriate. Wall surface mounted receptacle boxes will be used to house eight pin modular connectors. The cable plant will be terminated in a 24 port patch panel with eight pin modular jacks, which will intern be linked to a 14 port intelligent hub using eight pin modular jacks and patch cords. The cable plant will be wired in a star topology. The cable plant will be thoroughly tested for continuity and propagation factor to meet Category 5 specifications. The cable plant will be grounded to ensure safety and fire codes are met. Key offices will be networked including: the facility manager's office, the subscriber's service area, engineering design offices, administration offices, and the accounting office. The installation site for the server will be selected at the time of implantation. Collocated with the server will be an Uninterruptable Power Supply (UPS) with 15 minutes of battery power available after the power supply is lost to allow for a graceful shut down of the server.

The recommended server for the Jerash Governorate is a Pentium based, 90 MHz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Jerash Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 MHz IBM compatible personal computers. Each system

will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Jerash Stores office, which is collocated with the main Governorate offices, is one 80486 66 MHz IBM compatible personal computer installed. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Jerash Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Jerash Stores computer will be fully networked to the Jerash Governorate server.

The recommended design for the Jerash Operations and Maintenance facility is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Jerash Operations and Maintenance facility will have dial-in access to the Jerash Governorate server as a Netware client.

4.1.7 Ajlun Governorate.

The Ajlun Governorate provides subscriber water services in its assigned area. There is no current local data automation support for this operational organization. The Governorate facility is a Priority 3 for the purposes of implementing this design. To perform local billing, record payments and service subscriber requests in an automated fashion, software will need to be developed for implementation on the local area network. The software development is beyond the scope of this detailed design.
The recommended detailed design for the Ajlun Governorate facility starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. Two 24 AWG standard telephone cables will be connected to the punch down blocks and terminated in a standard RJ-11, wall surface mounted telephone receptacles. One receptacle will be the interface for the recommended server which will have an internal Modem with the second

RJ-11 receptacle for the Stores Office. An additional punch down block and RJ-11 receptacle will be installed for the Operations and Maintenance facility.

The Ajlun Governorate facility recommended design requires the installation of a UTP cable plant which is wall surface mounted and enclosed in conduit and panduit as appropriate. Wall surface mounted receptacle boxes will be used to house eight pin modular connectors. The cable plant will be terminated in a 24 port patch panel with eight pin modular jacks, which will intern be linked to a 14 port intelligent hub using eight pin modular jacks and patch cords. The cable plant will be wired in a star topology. The cable plant will be thoroughly tested for continuity and propagation factor to meet Category 5 specifications. The cable plant will be grounded to ensure safety and fire codes are met. Key offices will be networked including: the facility manager's office, the subscriber's service area, engineering design offices, administration offices, and the accounting office. The installation site for the server will be selected at the time of implantation. Collocated with the server will be an Uninterruptable Power Supply (UPS) with 15 minutes of battery power available after the power supply is lost to allow for a graceful shut down of the server.

The recommended server for the Ajlun Governorate is a Pentium based, 90 MHz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Ajlun Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Ajlun Stores office is one 80486 66 MHz IBM compatible personal computer installed. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Ajlun Stores personal

computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Ajlun Stores computer fully networked with the Ajlun Governorate server.

The recommended design for the Ajlun Operations and Maintenance facility is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Ajlun Operations and Maintenance facility will have dial-in access to the Ajlun Governorate server as a Netware client.

4.1.8 Mafraq Governorate.

The Mafraq Governorate provides subscriber water services in its assigned area. There is no current local data automation support for this operational organization. The Governorate facility is a Priority 3 for the purposes of implementing this design. To perform local billing, record payments and service subscriber requests in an automated fashion, software will need to be developed for implementation on the local area network. The software development is beyond the scope of this detailed design.

The recommended detailed design for the Mafraq Governorate facility starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. One 24 AWG standard telephone cable will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This receptacle will be the interface for the recommended server with internal Modem for this facility. Additional punch down blocks and RJ-11 receptacles will be installed in the Stores facility and the Operations and Maintenance facility.

The Mafraq Governorate facility recommended design requires the installation of a UTP cable plant which is wall surface mounted and enclosed in conduit and panduit as appropriate. Wall surface mounted receptacle boxes will be used to house eight pin modular connectors. The cable plant will be terminated in a 24 port patch panel with eight pin modular jacks, which will intern be linked to a 14 port intelligent hub using eight pin modular jacks and patch cords. The cable plant will be wired in a star topology. The cable plant will be thoroughly tested for continuity and propagation factor to meet Category 5 specifications. The cable plant will be grounded to ensure safety and fire codes are met. Key offices will be networked including: the facility manager's office, the subscriber's service area, engineering design offices, administration offices, and the accounting office. The installation site for the server will be selected at the time of implantation. Collocated with the server will be an Uninterruptable Power Supply (UPS)

with 15 minutes of battery power available after the power supply is lost to allow for a graceful shut down of the server.

The recommended server for the Mafraq Governorate is a Pentium based, 90 MHz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Mafraq Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Mafraq Stores office is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Mafraq Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Mafraq Stores computer will have a dial in capability so that it can be attached to the Mafraq Governorate server as a Netware client.

The recommended design for the Mafraq Operations and Maintenance facility is for three 80486 66 MHz IBM compatible personal computers. One configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The other two systems configurations will be 80486 66 MHz IBM compatible personal computers, with 16 MB of memory and 300 MB of hard disk drive space. Each of these systems will have an internal ethernet card and be connected in a peer-to-peer configuration within the Operations and Maintenance facility. An RG-58 coaxial cable will be used for this connection. The systems will be attached to an electronic surge protectors. The recommended systems will have Microsoft's Windows

for Work Groups operating system and an Arabized version of Microsoft's Office Professional software suite. The Mafraq Operations and Maintenance facility will have dial-in access to the Mafraq Governorate server as a Netware client.

4.1.9 Madaba Governorate.

The Madaba Governorate provides subscriber water services in its assigned area. There is no current local data automation support for this operational organization. The Governorate facility is a Priority 3 for the purposes of implementing this design. To perform local billing, record payments and service subscriber requests in an automated fashion, software will need to be developed for implementation on the local area network. The software development is beyond the scope of this detailed design. A new facility is being planned for Madaba, and is currently under review by HQ WAJ. The expected completion date is October 1996. The implementation of this portion of the Unified MIS will be delayed until the new building is complete. New cost figures maybe required depending on building design.

The recommended detailed design for the Madaba Governorate facility starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. One 24 AWG standard telephone cable will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. The receptacle will be the interface for the recommended server which will have an internal Modem. An additional punch down blocks and RJ-11 receptacles will be installed for the Operations and Maintenance, Stores and Dehiban city facilities.

The Madaba Governorate facility recommended design requires the installation of a UTP cable plant which is wall surface mounted and enclosed in conduit and panduit as appropriate. Wall surface mounted receptacle boxes will be used to house eight pin modular connectors. The cable plant will be terminated in a 24 port patch panel with eight pin modular jacks, which will intern be linked to a 14 port intelligent hub using eight pin modular jacks and patch cords. The cable plant will be wired in a star topology. The cable plant will be thoroughly tested for continuity and propagation factor to meet Category 5 specifications. The cable plant will be grounded to ensure safety and fire codes are met. Key offices will be networked including: the facility manager's office, the subscriber's service area, engineering design offices, administration offices, and the accounting office. The installation site for the server will be selected at the time of implantation. Collocated with the server will be an Uninterruptable Power Supply (UPS) with 15 minutes of battery power available after the power supply is lost to allow for a graceful shut down of the server.

The recommended server for the Madaba Governorate is a Pentium based, 90 MHz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system

is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Madaba Stores, Operation and Maintenance and Dehiban facilities. The server will be connected to the hub using UTP 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Madaba Stores office is one 80486 66 MHz IBM compatible personal computer installed. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle, which will be cabled to a telephone punch down block. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Madaba Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Madaba Stores computer will have a dial in capability so that it can be attached to the Madaba Governorate server as a Netware client.

The recommended design for the Madaba Operations and Maintenance facility is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Madaba Operations and Maintenance facility will have dial-in access to the Madaba Governorate server as a Netware client.

The recommended design for the Dehiban facility is one 80486 66 Mhz IBM compatible computer. The computer will have 16 MB of memory, a 400 MB hard disk drive and an internal 14.4. Kbps Modem. The system will be attached to an electronic surge protector and to the installed RJ-11 telephone jack. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Madaba Operations and Maintenance facility will have

dial-in access to the Madaba Governorate server as a Netware client. The Dehiban computer will have a 9 pin dot matrix printer attached to the parallel port for printer support. The Dehiban facility will have dial in access to the Madaba Governorat server as a Netware client.

4.1.10 Karak Governorate.

The Karak Governorate provides subscriber water services in its assigned area. There is no current local data automation support for this operational organization. The Governorate facility is a Priority 3 for the purposes of implementing this design. To perform local billing, record payments and service subscriber requests in an automated fashion, software will need to be developed for implementation on the local area network. The software development is beyond the scope of this detailed design.

The recommended detailed design for the Karak Governorate facility starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. One 24 AWG standard telephone cable will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. The receptacle will be the interface for the recommended server which will have an internal Modem. An additional punch down block and RJ-11 receptacle will be installed for the Operations and Maintenance facility.

The Karak Governorate facility recommended design requires the installation of a UTP cable plant which is wall surface mounted and enclosed in conduit and panduit as appropriate. Wall surface mounted receptacle boxes will be used to house eight pin modular connectors. The cable plant will be terminated in a 24 port patch panel with eight pin modular jacks, which will intern be linked to a 14 port intelligent hub using eight pin modular jacks and patch cords. The cable plant will be wired in a star topology. The cable plant will be thoroughly tested for continuity and propagation factor to meet Category 5 specifications. The cable plant will be grounded to ensure safety and fire codes are met. Key offices will be networked including: the facility manager's office, the subscriber's service area, engineering design offices, administration offices, and the accounting office. The installation site for the server will be selected at the time of implantation. Collocated with the server will be an Uninterruptable Power Supply (UPS) with 15 minutes of battery power available after the power supply is lost to allow for a graceful shut down of the server.

The recommended server for the Karak Governorate is a Pentium based, 90 MHz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Karak Stores and Operation and Maintenance facilities. The server will be connected to

the hub using UTP 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Karak Stores office is one 80486 66 MHz IBM compatible personal computer installed. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle, which will be cabled to a telephone punch down block. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Karak Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Karak Stores computer will have a dial in capability so that it can be attached to the Karak Governorate server as a Netware client.

The recommended design for the Karak Operations and Maintenance facility is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Karak Operations and Maintenance facility will have dial-in access to the Karak Governorate server as a Netware client.

4.1.11 Balqa (Salt) Governorate.

The Balqa Governorate provides subscriber water services in its assigned area. In addition there are several subordinate offices in small municipalities (Baq'a, Fushies, Deir Alla, and Soth Showneh) that work with Balqa to provide subscriber service. There is no current local data automation support for this operational organization. The Governorate facility is a Priority 3 for the purposes of implementing this design. The Balqa Governorate is scheduled to be relocated into a new facility. The implementation for this site should be delayed until the new facility is available. To perform local billing, record payments and service subscriber requests in an automated fashion, software will

need to be developed for implementation on the local area network. The software development is beyond the scope of this detailed design. The subordinate municipalities are Priority 4 facilities.

The recommended detailed design for the Balqa Governorate facility starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. One 24 AWG standard telephone cable will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. The receptacle will be the interface for the recommended server which will have an internal Modem. An additional punch down block and RJ-11 receptacle will be installed for the Operations and Maintenance facility.

The Balqa Governorate facility recommended design requires the installation of a UTP cable plant which is wall surface mounted and enclosed in conduit and panduit as appropriate. Wall surface mounted receptacle boxes will be used to house eight pin modular connectors. The cable plant will be terminated in a 24 port patch panel with eight pin modular jacks, which will intern be linked to a 14 port intelligent hub using eight pin modular jacks and patch cords. The cable plant will be wired in a star topology. The cable plant will be thoroughly tested for continuity and propagation factor to meet Category 5 specifications. The cable plant will be grounded to ensure safety and fire codes are met. Key offices will be networked including: the facility manager's office, the subscriber's service area, engineering design offices, administration offices, and the accounting office. The installation site for the server will be selected at the time of implantation. Collocated with the server will be an Uninterruptable Power Supply (UPS) with 15 minutes of battery power available after the power supply is lost to allow for a graceful shut down of the server.

The recommended server for the Balqa Governorate is a Pentium based, 90 MHz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Balqa Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite.

Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Balqa Stores office is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle, which will be cabled to a telephone punch down block. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Balqa Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Balqa Stores computer will have a dial in capability so that it can be attached to the Balqa Governorate server as a Netware client.

The recommended design for the Balqa Operations and Maintenance facility is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Balqa Operations and Maintenance facility will have dial-in access to the Balqa Governorate server as a Netware client.

The recommended design for each supporting municipality (Baq'a, Fushies, Deir Alla, and South Shouneh) includes a telephone punch down block, an RJ-11 receptacle, a surge protector and one 80486 66 MHz IBM compatible personal computer installed. Each computer includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. Each municipality will have dial in access to the Balqa Governorate server as a Netware client.

4.1.12 Ma'an Governorate.

The Ma'an Governorate provides subscriber water services in its assigned area. There is no current local data automation support for this operational organization. The Governorate has two buildings with some offices on the first floor of one building and the other offices on the ground floor of the second building. The Governorate facility is a Priority 3 for the purposes of implementing this design. To perform local billing, record payments and service subscriber requests in an automated fashion, software will need to be developed for implementation on the local area network. The software development is beyond the scope of this detailed design.

The recommended detailed design for the Ma'an Governorate facility starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. One 24 AWG standard telephone cable will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. The receptacle will be the interface for the recommended server which will have an internal Modem. An additional punch down block and RJ-11 receptacle will be installed for the Operations and Maintenance facility.

The Ma'an Governorate facility recommended design requires the installation of a UTP cable plant which is wall surface mounted and enclosed in conduit and panduit as appropriate. Wall surface mounted receptacle boxes will be used to house eight pin modular connectors. The cable plant will be terminated in a 24 port patch panel with eight pin modular jacks, which will intern be linked to a 14 port intelligent hub using eight pin modular jacks and patch cords. The cable plant will be wired in a star topology. Cable will be extended to the offices in the second building by suspending an overhead cable. The cable plant will be thoroughly tested for continuity and propagation factor to meet Category 5 specifications. The cable plant will be grounded to ensure safety and fire codes are met. Key offices will be networked including: the facility manager's office, the subscriber's service area, engineering design offices, administration offices, and the accounting office. The installation site for the server will be selected at the time of implantation. Collocated with the server will be an Uninterruptable Power Supply (UPS) with 15 minutes of battery power available after the power supply is lost to allow for a graceful shut down of the server.

The recommended server for the Ma'an Governorate is a Pentium based, 90 MHz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Ma'an Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Ma'an Stores office is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle, which will be cabled to a telephone punch down block. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Ma'an Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Ma'an Stores computer will have a dial in capability so that it can be attached to the Ma'an Governorate server as a Netware client.

The recommended design for the Ma'an Operations and Maintenance facility is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Ma'an Operations and Maintenance facility will have dial-in access to the Ma'an Governorate server as a Netware client.

4.1.13 Aqaba Governorate.

The Aqaba Governorate provides subscriber water services in its assigned area. There is no current local data automation support for this operational organization. The Governorate facility is a Priority 3 for the purposes of implementing this design. The Aqaba Governorate is scheduled to relocate to a new facility. Implementation for this site should be delayed until the new facility is occupied. To perform local billing, record payments and service subscriber requests in an automated fashion, software will need to be developed for implementation on the local area network. The software development is beyond the scope of this detailed design.

The recommended detailed design for the Aqaba Governorate facility starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. One 24 AWG standard telephone cable will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. The receptacle will be the interface for the recommended server which will have an internal Modem. An additional punch down block and RJ-11 receptacle will be installed for the Operations and Maintenance facility.

The Aqaba Governorate facility recommended design requires the installation of a UTP cable plant which is wall surface mounted and enclosed in conduit and panduit as appropriate. Wall surface mounted receptacle boxes will be used to house eight pin

modular connectors. The cable plant will be terminated in a 24 port patch panel with eight pin modular jacks, which will intern be linked to a 14 port intelligent hub using eight pin modular jacks and patch cords. The cable plant will be wired in a star topology. The cable plant will be thoroughly tested for continuity and propagation factor to meet Category 5 specifications. The cable plant will be grounded to ensure safety and fire codes are met. Key offices will be networked including: the facility manager's office, the subscriber's service area, engineering design offices, administration offices, and the accounting office. The installation site for the server will be selected at the time of implantation. Collocated with the server will be an Uninterruptable Power Supply (UPS) with 15 minutes of battery power available after the power supply is lost to allow for a graceful shut down of the server.

The recommended server for the Aqaba Governorate is a Pentium based, 90 MHz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Aqaba Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Aqaba Stores office is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle, which will be cabled to a telephone punch down block. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Aqaba Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Aqaba Stores computer will have a dial in capability so that it can be attached to the Aqaba Governorate server as a Netware client.

The recommended design for the Aqaba Operations and Maintenance facility is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Aqaba Operations and Maintenance facility will have dial-in access to the Aqaba Governorate server as a Netware client.

4.1.14 Tafelah Governorate.

The Tafelah Governorate provides subscriber water services in its assigned area. There is no current local data automation support for this operational organization. The Governorate facility is a Priority 3 for the purposes of implementing this design. The Tafelah Governorate is scheduled to relocate to a new facility. Implementation for this site should be delayed until the new facility is occupied. To perform local billing, record payments and service subscriber requests in an automated fashion, software will need to be developed for implementation on the local area network. The software development is beyond the scope of this detailed design.

The recommended detailed design for the Tafelah Governorate facility starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. One 24 AWG standard telephone cable will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. The receptacle will be the interface for the recommended server which will have an internal Modem. An additional punch down block and RJ-11 receptacle will be installed for the Operations and Maintenance facility.

The Tafelah Governorate facility recommended design requires the installation of a UTP cable plant which is wall surface mounted and enclosed in conduit and panduit as appropriate. Wall surface mounted receptacle boxes will be used to house eight pin modular connectors. The cable plant will be terminated in a 24 port patch panel with eight pin modular jacks, which will intern be linked to a 14 port intelligent hub using eight pin modular jacks and patch cords. The cable plant will be wired in a star topology. The cable plant will be thoroughly tested for continuity and propagation factor to meet Category 5 specifications. The cable plant will be grounded to ensure safety and fire codes are met. Key offices will be networked including: the facility manager's office, the subscriber's service area, engineering design offices, administration offices, and the accounting office. The installation site for the server will be selected at the time of implantation. Collocated with the server will be an Uninterruptable Power Supply (UPS) with 15 minutes of battery power available after the power supply is lost to allow for a graceful shut down of the server.

The recommended server for the Tafelah Governorate is a Pentium based, 90 MHz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Tafelah Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Tafelah Stores office is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle, which will be cabled to a telephone punch down block. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Tafelah Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Tafelah Stores computer have dial in capability to be attached to the Tafelah Governorate server.

The recommended design for the Tafelah Operations and Maintenance facility is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Tafelah Operations and Maintenance facility will have dial-in access to the Tafelah Governorate server as a Netware client.

4.1.15 WAJ Central Laboratory.

The WAJ Central Laboratory currently has several standalone personal computers and several laboratory instruments closely integrated with personal computers. The design does not include the laboratory instruments and associated personal computers as part of the network or MIS. The primary mission of the laboratory is to provide analysis of soil and water samples in support the Water Authority of Jordan. This is a Priority 2 facility and implementation here will follow implementation in selected Governorates.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines for the Central Laboratory. A 24 AWG telephone cable would be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modem which is a component of the server for the Central Laboratory.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the server at the Central Laboratory, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. A surge protection power strip will be installed for the other personal computers that are installed and provided to existing system that do not have a surge protector.

The recommended design requires the installation of six personal computers for the Central Laboratory. Most rooms in the Central Laboratory will have a single network drop, with the administration function having three network drops. The physical network will be UTP 5 cable with eight pin modular connectors, terminated at each computer in a sixteen bit ethernet card. Three of the four existing systems will have ethernet network cards installed. The UTP cable will be terminated in a 24 port patch panel, which will inturn be connected to a 16 port intelligent hub. The Central Laboratory server will be attached to the hub. The cable will be installed in surface mounted panduit with wall mounted receptacles. Wall penetrations will use conduit and be sealed. The network will use a star topology. The recommended network operating system is Novell 3.12. The server for the Central Laboratory will be a Pentium based personal computer, operating at 90 MHz, with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The primary software will be Microsoft's Windows 3.1 and Microsoft's Professional Office software suite. The six additional systems to be installed in the Central Laboratory will be 80486 based personal computers running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The 14 port hub will have HP compatible laser printer attached to act as the network printer.

The server will be connected to the RJ-11, wall mounted receptacle with standard telephone cable with RJ-11 jacks.

4.1.16 Water Treatment Facilities.

There are two types of water treatment plants managed by the WAJ, potable water treatment plants and waste water treatment plants. These different types of water treatment facilities are treated separately in paragraphs 4.1.16.1 and 4.1.16.2 respectively.

4.1.16.1 Water Treatment Plants.

There are two potable water plants that are included in the Unified MIS. These two plants are the Zai and Wadi Al Arab Water Treatment Plants. These facilities are modern installations with sophisticated monitoring and control systems. However, they have little office automation support for administration, inventory control, engineering, and design activities. The design for Zai and Wadi Al Arab plants is the same and will only be described once. The design recommends a small network be installed with dial-in/out access to HQ WAJ.

The recommended detailed design for the water treatment plants starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. One 24 AWG standard telephone cable will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This receptacle will be the interface for the recommended primary computer which will have an internal Modem.

Selected rooms within each facility will have network nodes installed using surface mounted eight pin modular receptacles and surface mounted panduit for running UTP 5 cabling. The cabling will terminate in a 9 port hub that is collocated with the primary computer.

The recommended design for the water treatment plants includes five 80486 66 MHz IBM compatible personal computers. One configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The other four systems configurations will be 80486 66 MHz IBM compatible personal computers, with 16 MB of memory and 300 MB of hard disk drive space. Each of these systems will have an internal ethernet card and be connected in a peer-to-peer configuration within the Operations and Maintenance facility. The systems will be attached to an electronic surge protectors. The recommended systems will have Microsoft's Windows for Work Groups operating system and an Arabized version of Microsoft's Office Professional software suite. The water treatment plants will have dial-in access to the HQ WAJ server as a Netware client.

4.1.16.2 Waste Water Treatment Plants.

There are eleven waste water treatement plants managed by the WAJ. These plants are; Al Kerbeh Alsamra Station, Mafraq Station, Al Ramtha Station, Irbid Station, Jerash

Station, Ajlun Station, Ma'an Station, Aqaba Station, Tafelah Station, Al Karak Station, and Madaba Station. The waste water treatment plants currently record operational data manually. This information is forwarded to HQ WAJ by each of waste water treatment plant as required. The recommended design for these plants is to install a single personal computer with the capability to record the operational data and forward it to HQ WAJ as necessary. The waste water treamtment plants are Priority 4 facilities for the purpose of implementation. These facilities will be implemented late in the schedule.

The recommended detailed design for the waster water treatment facilities starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. One 24 AWG standard telephone cable will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This receptacle will be the interface for the recommended computers with an internal Modems for these facilities.

The recommended design for the treatment facilities is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The treatment stations will have dial-in access to the HQ WAJ as a Netware client.

4.1.17 Pumping Stations (WAJ).

There are nine water pumping stations associated with the several Governorates within the WAJ. The pumping stations record water flow on an hourly basis. This information is forwarded by phone to HQ WAJ by each of pumping stations where it is entered into a log book. The recommended design for these stations is to install a single personal computer with the capability to monitor the water flow, record the data and forward it to HQ WAJ. The pumping stations are Priority 4 facilities for the purpose of implementation. The pumping stations are at Al Wala, Al Nafag, Al Tage, Al Qastal, Ain Gatzal, Al Azarq, Wadi Al Arab, Za'tari, and Al Deseh. These facilities will be implemented late in the schedule.

The recommended detailed design for the pumping facilities starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. One 24 AWG standard telephone cable will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This receptacle will be the interface for the recommended computers with an internal Modems for these facilities.

The recommended design for the pumping facilities is to install one 80486 66 MHz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB

hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The pumping stations will have dial-in access to the supported Governorate server or HQ WAJ as a Netware client.

4.1.18 Directorate of Dams and Irrigation, Jordan Valley Authority.

The Directorate of Dams and Irrigation in Shmeisani provides design, engineering, acquisition and administrative support for the JVA. This is a Priority 2 facility.

The recommended detailed design for Directorate of Dams and Irrigation facility starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. One 24 AWG standard telephone cable will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This receptacle will be the interface for the recommended server with internal Modem for this facility.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the server in the Directorate of Dams and Irrigation, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. A surge protection power strip will be installed for the other personal computers that are installed or that will be used in the new configuration.

The recommended design is for networking all floors of the Directorate of Dams and Irrigation facility using UTP 5 cable. The network will be installed using conduit and panduit with surface mounted wall receptacles in each room. The physical interface will be eight pin modular receptacles and jacks. The network cabling will be terminated in a 16 port hub collocated with the network server. The installation includes five additional personal computers. The networked system will operate using Novell's Netware Operating System 3.12. The server for Directorate of Dams and Irrigation will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The primary software on all systems will be Microsoft's Office Professional software suite. The five additional personal computers to be installed will be a 80486 based personal computers running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. Four of the existing computer systems will be retained. These systems will have an ethernet interface card installed so they can share network resources.

One of the existing systems, 80286 personal computer, is not planned for reuse.

The primary computer system will be connected to the RJ-11, wall mounted receptacle with standard telephone cable with RJ-11 jacks.

4.1.19 Dirar Computer Center.

The Dirar Computer Center provides support to each of the staging offices and to the automated monitoring of the KAC. In addition, the Computer Center provides programming support for water models and operational software for the JVA. The operational support makes this a Priority 1 facility.

The recommended detailed design for Computer Center starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC will be terminated in this device. Two 24 AWG standard telephone cables will be connected to the punch down block and terminated in two standard RJ-11, wall surface mounted telephone receptacles. One of the receptacles is designated for the Modem attached to Data General 15000 currently running the water balance model and the water distribution program. The Data General will be replaced by a Data General Aviion processor by another program. The interface through the Modem will remain the same. The second eight pin modular receptacle will be for the Modem in the primary computer to be installed as the lead processor in a peer-to-peer network.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the primary computer system for the peer-to-peer network, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. A surge protection power strip will be installed for the other personal computers that are installed.

The recommended design requires the installation of three personal computers for the Computer Center. An existing computer will have an ethernet card installed. The four systems will be networked together. The physical network will be UTP 5 cable with eight pin modular connectors, terminated at each computer in a sixteen bit ethernet card. The UTP cable will be terminated in a nine port hub attached to the primary peer computer system. The networked system will operate on a peer-to-peer network scheme. One of the systems will be a back up for the existing machines used to monitor the canal. This back up system will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer system will have Windows 3.11 for Work Groups for an operating system to match the existing KAC computers. The primary computer will have Oracle 7 for Personal Computers and Microsoft's Office Professional software suite. The primary system will be an 80486 personal computer running at 66 MHz, with 16 MB of memory and a 400 MB hard disk drive. The computer will have an internal 14.4 Kbps Modem The computer system will have Windows NT Workstation 3.5 for an operating system. The third system to be installed will be an 80486 personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have

Windows NT Workstation 3.5 for an operating system. The existing computer will have its memory upgraded from 4 MB to 16 MB and have Windows NT Workstation 3.5 installed. The Aviion system will be networked to the peer-to-peer network (this assumes the Aviion system will have a DG's Unix operating system. The three new computers will have a terminal emulation software package installed to allow the computers to act as terminals on the Aviion system. Terminals delivered with the Aviion system will remain directly connected to the system and not be terminated in the hub.

The designed configuration allows for continued operations at the Computer Center using the Aviion processor to provide operational and model support. The design increases access to the Aviion with terminal emulation packages. In addition, the primary peer-to-peer computer system becomes an additional dial in/out access point for the Computer Center. The KAC automated monitoring system remains isolated from the external connectivity except for its canal monitoring function. Software development in Oracle 7 can be accomplished on the personal computers or on the Aviion system, with file sharing between the systems. This configuration assumes that the SunSparc 20 workstation being used to convert the Oracle 5 database applications to Oracle 7 will be removed and re-installed at HQ JVA. This will leave the Aviion equipment as the primary operational processor for the Dirar Computer Center.

4.1.20 Fannoush Vehicle Operations and Maintenance.

The Fannoush Vehicle Operations and Maintenance facility will retain the Data General 7800 currently installed. Fannoush is a Priority 2 facility.

The design for the Fannoush facility is focused on providing an improved cable plant from the operational locations in the compound to the computer room. Currently cables are strung overhead between buildings, which causes exposure to weather and to heavy equipment that occasional break through the cables. The design calls for trenching with and buried conduits between the facilities to improve the reliability of the system. Trenching equipment will need to be rented to complete this portion of the implementation scheme.

An alternate proposal would be to upgrade or replace the current Data General equipment with a Data General Aviion system and migrate the Oracle 5 based vehicle maintenance tracking system to Oracle 7. This solution would have the advantage of moving the operational software to a supportable release of Oracle and moving the operating system from the proprietary AOS to DG's Unix operating system. This option would cost and estimated $32,000 for the equipment and Oracle 7 software. The cost to migrate the vehicle maintenance tracking system is not included in this estimate. This option was not selected because the current equipment can support the required processing and the cost to move to new equipment and migrate an existing operational application would be significant.

4.1.21 JVA Laboratory.

The JVA Laboratory does not currently have any automated support. The primary mission of the laboratory is to provide analysis of soil and water samples in support the Jordan Valley Authority. This is a Priority 4 facility and implementation here will follow implementation in the Staging and District Offices.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines for the JVA Laboratories. The telephone service from the TCC would be terminated in this device. A 24 AWG telephone cable will be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modem which is a component of the server for the Laboratory.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the server at the Laboratory, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. A surge protection power strip will be installed for the other personal computers that are installed.

The recommended design requires the installation of six personal computers for the Laboratory. The physical network will be UTP 5 cable with eight pin modular connectors, terminated at each computer in a sixteen bit ethernet card. The UTP cable will be terminated in a nine port hub attached to the Laboratory server. The cable will be installed in surface mounted panduit with wall mounted receptacles. Wall penetrations will use conduit and be sealed. The recommended network operating system is Novell 3.12. The server for the Laboratory will be a Pentium based personal computer, operating at 90 MHz, with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The primary software will be Microsoft's Windows 3.1 and Microsoft's Professional Office software suite. The six additional systems to be installed in the Laboratory will be 80486 based personal computers running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The 9 port hub will have HP compatible laser printer attached to act as the network printer. A 9 pin, wide carriage dot matrix printer will be connected to the parallel port on one of the workstations to provide additional print capability.

The server will be connected to the RJ-11, wall mounted receptacle with standard telephone cable with RJ-11 jacks.

4.1.22 JVA Stores Operations.

The JVA Stores facilities do not currently have any automated support, with the primary office being located in Deir Alla and five additional smaller offices. These are Priority 4 facilities.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines for each of the six sites. The telephone service from the TCC would be terminated in this device. A 24 AWG standard telephone cable would be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modem which is a component of the proposed computer system.

The recommendation for the Deir Alla stores operation is a Pentium 90 MHz personal computer, with 16 MB of memory and a 1 GB hard disk drive. The system is configured with an internal 14.4 Kbps Modem. The operating system is Windows NT Workstation 3.5, with Microsoft Professional Office software suite. This system will be the primary location for stores information and will provide an ordering point for other JVA Stores sites. A surge protection power strip is recommended.

The recommendation for the remaining sites is for a single 80486 personal computer, operating at 66 MHz, with 16 MB of memory and a 400 MB hard disk drive. Each system has an internal 14.4 Kbps Modem. The operating system is Windows NT Workstation 3.5, with Microsoft Professional Office software suite. A surge protection power strip is recommended. The smaller sites will have dial in/out connectivity to Deir Alla to process requests.

There is no current inventory or automated ordering software in use for these facilities in the JVA. This software will need to be developed prior to the installation of the equipment.

4.1.23 District Office 1/Staging Office 7.

District Office 1 and Staging Office 7 are collocated in a single building. Both functions have automated support currently which will be replaced by the recommended detailed design systems. District Office 1/Staging Office 7 is a Priority 1 facility. District Office 1 is administratively responsible for Staging Offices 1 and 2 as well as the collocated Staging Office 7.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC would be terminated in this device. Two 24 AWG standard telephone cables will be connected to the punch down block and terminated in two standard RJ-11, wall surface mounted telephone receptacles. One receptacle will be for the Staging Office 7 primary system and one for the primary administrative for the District Office. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modems which are components of the proposed computer systems.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the primary computer system of Staging Office 7, with a minimum of 15

minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. The excess Claud Lyons power conditioner will be used with the new administrative system for District Office 1. A surge protection power strip will be installed for the other personal computers that are installed.

The recommended design requires the installation of four personal computers for the Staging Office and one personal computer for the District Office, networked together. The physical network will be UTP 5 cable with eight pin modular connectors, terminated at each computer in a sixteen bit ethernet card. The UTP cable will be terminated in a nine port hub attached to the primary Staging Office system. The networked system will operate on a peer-to-peer network scheme. The primary computer for Staging Office 7 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The three additional systems to be installed in the Staging Office 7 will be a 80486 based personal computers running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer systems will have Windows NT Workstation 3.5 for their operating systems, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

The primary computer system will be connected to the RJ-11, wall mounted receptacle with standard telephone cable with RJ-11 jacks. The primary computer system will have 24 pin dot matrix printer attached to the parallel port.

The administrative system to be installed in District Office 1 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 400 MB hard disk drive. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The new administrative system will be connected to the RJ-11 telephone receptacle through its internal Modem. The computer system will have Windows NT Workstation 3.5 for an operating system and Microsoft Office Professional Version 4.1. A terminal emulation software package will be installed for dial up access to the Dirar Computer Center. An excess HL Brother HL 631 printer from the MWI Building will be used for printer support. The system will be networked to Staging Office 7's system. This configuration will allow some redundancy and backup capability should any of the personal computers fail.

4.1.24 District Office 2.

The recommended design for District Office 2 provides a second personal computer for administrative purposes. The second system provides office support and dial up connectivity to HQ JVA, the Dirar Computer Center and subordinate Staging Offices 3, 4, 5 and 8. The existing system will have an ethernet card added and be networked to the new system. District Office 2 is a priority 2 facility.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC would be terminated in this device. A 24 AWG standard telephone cable would be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modem which is a component of the proposed computer system.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the new administrative computer system, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. A surge protection power strip will be installed for the existing personal computer.

The administrative system to be installed in District Office 2 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 400 MB hard disk drive. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The new administrative system will be connected to the RJ-11 telephone receptacle through its internal Modem. The computer system will have Windows NT Workstation 3.5 for an operating system and Microsoft Office Professional Version 4.1. A terminal emulation software package will be installed for dial up access to the Dirar Computer Center. An excess HL Brother HL 631 printer from the MWI Building will be used for printer support. The two systems will be networked using an RG 58 cable..

4.1.25 District Office 3.

The recommended design for District Office 3 provides a personal computer for administrative purposes. The administrative system provides office support and dial up connectivity to HQ JVA, the Dirar Computer Center and subordinate Staging Offices 6, 9 and 10. The existing system will have an ethernet card added and be networked to the new system. District Office 3 is a priority 4 facility. This District Office is not operational at this time. It will be scheduled for installation after operational requirements are met.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC would be

terminated in this device. A 24 AWG standard telephone cable would be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modem which is a component of the proposed computer system.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the new administrative computer system, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations..

The administrative system to be installed in District Office 3 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 400 MB hard disk drive. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The new administrative system will be connected to the RJ-11 telephone receptacle through its internal Modem. The computer system will have Windows NT Workstation 3.5 for an operating system and Microsoft Office Professional Version 4.1. A terminal emulation software package will be installed for dial up access to the Dirar Computer Center. An excess HL Brother HL 631 printer from the MWI Building will be used for printer support.

4.1.26 Staging Office 1.

The recommended design for Staging Office 1 replicates the current number of data entry terminals and replaces existing equipment with modern open systems. Staging Office 1 is a Priority 1 facility, because it has a current ongoing operational mission requiring automation support. Although Staging Office 1 is a priority 1 facility, this installation should be scheduled for implementation after a new building is acquired. The current facility should be replaced because of its deteriorated condition.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC would be terminated in this device. A 24 AWG standard telephone cable would be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modem which is a component of the proposed computer system. Current connection schemes vary widely in quality and design.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the primary computer system, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. The currently installed Claud Lyons power conditioner will be retained and used for the second computer system.

The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 1 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 1 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

The primary computer system will be connected to the RJ-11, wall mounted receptacle with standard telephone cable with RJ-11 jacks. The primary computer system will have 24 pin dot matrix printer attached to the parallel port.

This design allows for expansion of hardware with more or larger hard disk drives and memory for small incremental costs. If additional applications are need for mission support such as word processing capabilities, these are easily and inexpensively added under Windows NT Workstation 3.5. Windows NT Workstation 3.5 offers the widest range of connectivity in a single package and is very easy to use.

Alternate Configuration. An alternate configuration for Staging Office 1 would be to replace the Data General MV 2000s with low end Data General Aviion processors running Unix The configuration for the TCC connection remains the same under this alternative, with the exception of the Modem. The proposed Modem in this solution is external, but has the same specifications as the internal Modem. The Claud Lyons power conditioner is not used in this configuration. It is replaced by a UPS, again with 15 minutes of battery power. The Aviion 5500 H system would have two terminals, an 88110, 40 MHz single processor, a 530 MB hard disk drive, two monochrome terminals, UNIX System 5 and PC style keyboards. Oracle 5, currently running on the MV 2000 will need to be replaced with Oracle 7, the Oracle 5 version will not operate on Unix System 5, therefore it must be upgraded to a later version. The hardware and software cost for this option exceeds $27,000, more than two and one half times the cost of the recommended design.

4.1.27 Staging Office 2.

The recommended design for Staging Office 2, replicates the current number of data entry terminals and replaces existing equipment with modern open systems. Staging Office 2 is a Priority 1 facility, because it has a current ongoing operational mission requiring automation support.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC would be terminated in this device. A 24 AWG standard telephone cable would be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modem which is a component of the proposed computer system. Current connection schemes vary widely in quality and design.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the primary computer system, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. The currently installed Claud Lyons power conditioner will be retained and used for the second computer system.

The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 2 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 2 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

The primary computer system will be connected to the RJ-11, wall mounted receptacle with standard telephone cable with RJ-11 jacks. The primary computer system will have 24 pin dot matrix printer attached to the parallel port.

This design allows for expansion of hardware with more or larger hard disk drives and memory for small incremental costs. If additional applications are need for mission support such as word processing capabilities, these are easily and inexpensively added under Windows NT Workstation 3.5. Windows NT Workstation 3.5 offers the widest range of connectivity in a single package and is very easy to use.

Alternate Configuration. An alternate configuration for Staging Office 2 would be to replace the Data General MV 2000s with low end Data General Aviion processors running Unix The configuration for the TCC connection remains the same under this alternative, with the exception of the Modem. The proposed Modem in this solution is external, but has the same specifications as the internal Modem. The Claud Lyons power conditioner is not used in this configuration. It is replaced by a UPS, again with 15 minutes of battery power. The Aviion 5500 H system would have two terminals, an 88110, 40 MHz single processor, a 530 MB hard disk drive, two monochrome terminals, UNIX System 5 and PC style keyboards. Oracle 5, currently running on the MV 2000 will need to be replaced with Oracle 7, the Oracle 5 version will not operate on Unix System 5, therefore it must be upgraded to a later version. The hardware and software cost for this option exceeds $27,000, more than two and one half times the cost of the recommended design.

4.1.28 Staging Office 3.

The recommended design for Staging Office 3, replicates the current number of data entry terminals and replaces existing equipment with modern open systems. Staging Office 3 is a Priority 1 facility, because it has a current ongoing operational mission requiring automation support. Although Staging Office 3 is a priority 1 facility, this installation should be scheduled for implementation after a new building is acquired. The current facility should be replaced because of its deteriorated condition.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC would be terminated in this device. A 24 AWG standard telephone cable would be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modem which is a component of the proposed computer system. Current connection schemes vary widely in quality and design.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the primary computer system, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. The currently installed Claud Lyons power conditioner will be retained and used for the second computer system.

The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 3 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 3 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

The primary computer system will be connected to the RJ-11, wall mounted receptacle with standard telephone cable with RJ-11 jacks. The primary computer system will have 24 pin dot matrix printer attached to the parallel port.

This design allows for expansion of hardware with more or larger hard disk drives and memory for small incremental costs. If additional applications are need for mission support such as word processing capabilities, these are easily and inexpensively added under Windows NT Workstation 3.5. Windows NT Workstation 3.5 offers the widest range of connectivity in a single package and is very easy to use.

Alternate Configuration. An alternate configuration for Staging Office 3 would be to replace the Data General MV 2000s with low end Data General Aviion processors running Unix The configuration for the TCC connection remains the same under this alternative, with the exception of the Modem. The proposed Modem in this solution is external, but has the same specifications as the internal Modem. The Claud Lyons power conditioner is not used in this configuration. It is replaced by a UPS, again with 15 minutes of battery power. The Aviion 5500 H system would have two terminals, an 88110, 40 MHz single processor, a 530 MB hard disk drive, two monochrome terminals, UNIX System 5 and PC style keyboards. Oracle 5, currently running on the MV 2000 will need to be replaced with Oracle 7, the Oracle 5 version will not operate on Unix System 5, therefore it must be upgraded to a later version. The hardware and software cost for this option exceeds $27,000, more than two and one half times the cost of the recommended design.

4.1.29 Staging Office 4.

The recommended design for Staging Office 4, replicates the current number of data entry terminals (3) and replaces existing equipment with modern open systems. Staging Office 4 is a Priority 1 facility, because it has a current ongoing operational mission requiring automation support. This facility is old and susceptable to high rates of failure for computers due to electrical, heat and dust problems. This facility should be replaced prior to installation of new equipment.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC would be terminated in this device. A 24 AWG standard telephone cable would be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modem which is a component of the proposed computer system. Current connection schemes vary widely in quality and design.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the primary computer system, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. The currently installed Claud Lyons power conditioner will be retained and used for the second computer system.

The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 4 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second and third systems to be installed in the Staging Office 4 will be a 80486 based personal computers running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer systems will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

The primary computer system will be connected to the RJ-11, wall mounted receptacle with standard telephone cable with RJ-11 jacks. The primary computer system will have 24 pin dot matrix printer attached to the parallel port.

This design allows for expansion of hardware with more or larger hard disk drives and memory for small incremental costs. If additional applications are need for mission support such as word processing capabilities, these are easily and inexpensively added under Windows NT Workstation 3.5. Windows NT Workstation 3.5 offers the widest range of connectivity in a single package and is very easy to use.

Alternate Configuration. An alternate configuration for Staging Office 4 would be to replace the Data General MV 2000s with low end Data General Aviion processors running Unix The configuration for the TCC connection remains the same under this alternative, with the exception of the Modem. The proposed Modem in this solution is external, but has the same specifications as the internal Modem. The Claud Lyons power conditioner is not used in this configuration. It is replaced by a UPS, again with 15 minutes of battery power. The Aviion 5500 H system would have two terminals, an 88110, 40 MHz single processor, a 530 MB hard disk drive, three monochrome terminals, UNIX System 5 and PC style keyboards. Oracle 5, currently running on the MV 2000 will need to be replaced with Oracle 7, the Oracle 5 version will not operate on Unix System 5, therefore it must be upgraded to a later version. The hardware and software cost for this option exceeds $27,000, more than two and one half times the cost of the recommended design.

4.1.30 Staging Office 5.

The recommended design for Staging Office 5, replicates the current number of data entry terminals and replaces existing equipment with modern open systems. Staging Office 5 is a Priority 1 facility, because it has a current ongoing operational mission requiring automation support. Although Staging Office 5 is a priority 1 facility, this installation should be scheduled for implementation after a new building is acquired. The current facility should be replaced because of its deteriorated condition.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC would be terminated in this device. A 24 AWG standard telephone cable would be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modem which is a component of the proposed computer system. Current connection schemes vary widely in quality and design.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the primary computer system, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to

shield the system from dangerous power fluxuations. The currently installed Claud Lyons power conditioner will be retained and used for the second computer system.

The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 5 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 5 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

The primary computer system will be connected to the RJ-11, wall mounted receptacle with standard telephone cable with RJ-11 jacks. The primary computer system will have 24 pin dot matrix printer attached to the parallel port.

This design allows for expansion of hardware with more or larger hard disk drives and memory for small incremental costs. If additional applications are need for mission support such as word processing capabilities, these are easily and inexpensively added under Windows NT Workstation 3.5. Windows NT Workstation 3.5 offers the widest range of connectivity in a single package and is very easy to use.

Alternate Configuration. An alternate configuration for Staging Office 5 would be to replace the Data General MV 2000s with low end Data General Aviion processors running Unix The configuration for the TCC connection remains the same under this alternative, with the exception of the Modem. The proposed Modem in this solution is external, but has the same specifications as the internal Modem. The Claud Lyons power conditioner is not used in this configuration. It is replaced by a UPS, again with 15 minutes of battery power. The Aviion 5500 H system would have two terminals, an 88110, 40 MHz single processor, a 530 MB hard disk drive, two monochrome terminals, UNIX System 5 and PC style keyboards. Oracle 5, currently running on the MV 2000 will need to be replaced with Oracle 7, the Oracle 5 version will not operate on Unix System 5, therefore it must be upgraded to a later version. The hardware and software

cost for this option exceeds $27,000, more than two and one half times the cost of the recommended design.

4.1.31 Staging Office 6.

The recommended design for Staging Office 6, replicates the current number of data entry terminals and replaces existing equipment with modern open systems. Staging Office 6 is a Priority 1 facility, because it has a current ongoing operational mission requiring automation support.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC would be terminated in this device. A 24 AWG standard telephone cable would be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modem which is a component of the proposed computer system. Current connection schemes vary widely in quality and design.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the primary computer system, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. The currently installed Claud Lyons power conditioner will be retained and used for the second computer system.

The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 6 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 6 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

The primary computer system will be connected to the RJ-11, wall mounted receptacle with standard telephone cable with RJ-11 jacks. The primary computer system will have 24 pin dot matrix printer attached to the parallel port.

This design allows for expansion of hardware with more or larger hard disk drives and memory for small incremental costs. If additional applications are need for mission support such as word processing capabilities, these are easily and inexpensively added under Windows NT Workstation 3.5. Windows NT Workstation 3.5 offers the widest range of connectivity in a single package and is very easy to use.

Alternate Configuration. An alternate configuration for Staging Office 6 would be to replace the Data General MV 2000s with low end Data General Aviion processors running Unix The configuration for the TCC connection remains the same under this alternative, with the exception of the Modem. The proposed Modem in this solution is external, but has the same specifications as the internal Modem. The Claud Lyons power conditioner is not used in this configuration. It is replaced by a UPS, again with 15 minutes of battery power. The Aviion 5500 H system would have two terminals, an 88110, 40 MHz single processor, a 530 MB hard disk drive, two monochrome terminals, UNIX System 5 and PC style keyboards. Oracle 5, currently running on the MV 2000 will need to be replaced with Oracle 7, the Oracle 5 version will not operate on Unix System 5, therefore it must be upgraded to a later version. The hardware and software cost for this option exceeds $27,000, more than two and one half times the cost of the recommended design.

4.1.32 Staging Office 8.

The recommended design for Staging Office 8, replicates the current number of data entry terminals and replaces existing equipment with modern open systems. Staging Office 8 is a Priority 1 facility, because it has a current ongoing operational mission requiring automation support.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC would be terminated in this device. A 24 AWG standard telephone cable would be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modem which is a component of the proposed computer system. Current connection schemes vary widely in quality and design.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the primary computer system, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. The currently installed Claud Lyons power conditioner will be retained and used for the second computer system.

The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 8 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 8 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

The primary computer system will be connected to the RJ-11, wall mounted receptacle with standard telephone cable with RJ-11 jacks. The primary computer system will have 24 pin dot matrix printer attached to the parallel port.

This design allows for expansion of hardware with more or larger hard disk drives and memory for small incremental costs. If additional applications are need for mission support such as word processing capabilities, these are easily and inexpensively added under Windows NT Workstation 3.5. Windows NT Workstation 3.5 offers the widest range of connectivity in a single package and is very easy to use.

Alternate Configuration. An alternate configuration for Staging Office 8 would be to replace the Data General MV 2000s with low end Data General Aviion processors running Unix The configuration for the TCC connection remains the same under this alternative, with the exception of the Modem. The proposed Modem in this solution is external, but has the same specifications as the internal Modem. The Claud Lyons power conditioner is not used in this configuration. It is replaced by a UPS, again with 15 minutes of battery power. The Aviion 5500 H system would have two terminals, an 88110, 40 MHz single processor, a 530 MB hard disk drive, two monochrome terminals, UNIX System 5 and PC style keyboards. Oracle 5, currently running on the MV 2000 will need to be replaced with Oracle 7, the Oracle 5 version will not operate on Unix System 5, therefore it must be upgraded to a later version. The hardware and software cost for this option exceeds $27,000, more than two and one half times the cost of the recommended design.

4.1.33 Staging Office 9.

The recommended design for Staging Office 9, replicates the current number of data entry terminals and replaces existing equipment with modern open systems. Staging Office 9 is a Priority 1 facility, because it has a current ongoing operational mission requiring automation support. Staging Office 9 should not be implemented until the KAC begins supporting farmers the Staging Office 9 geographical area. This could be a delay in implementation for this facility until the Karameh Dam is complete.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC would be terminated in this device. A 24 AWG standard telephone cable would be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modem which is a component of the proposed computer system. Current connection schemes vary widely in quality and design.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the primary computer system, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. The currently installed Claud Lyons power conditioner will be retained and used for the second computer system.

The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 9 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 9 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

The primary computer system will be connected to the RJ-11, wall mounted receptacle with standard telephone cable with RJ-11 jacks. The primary computer system will have 24 pin dot matrix printer attached to the parallel port.

This design allows for expansion of hardware with more or larger hard disk drives and memory for small incremental costs. If additional applications are need for mission support such as word processing capabilities, these are easily and inexpensively added under Windows NT Workstation 3.5. Windows NT Workstation 3.5 offers the widest range of connectivity in a single package and is very easy to use.

Alternate Configuration. An alternate configuration for Staging Office 9 would be to replace the Data General MV 2000s with low end Data General Aviion processors running Unix The configuration for the TCC connection remains the same under this alternative, with the exception of the Modem. The proposed Modem in this solution is external, but has the same specifications as the internal Modem. The Claud Lyons power conditioner is not used in this configuration. It is replaced by a UPS, again with 15 minutes of battery power. The Aviion 5500 H system would have two terminals, an 88110, 40 MHz single processor, a 530 MB hard disk drive, two monochrome terminals, UNIX System 5 and PC style keyboards. Oracle 5, currently running on the MV 2000 will need to be replaced with Oracle 7, the Oracle 5 version will not operate on Unix System 5, therefore it must be upgraded to a later version. The hardware and software cost for this option exceeds $27,000, more than two and one half times the cost of the recommended design.

4.1.34 Staging Office 10.

The recommended design for Staging Office 10, replicates the current number of data entry terminals and replaces existing equipment with modern open systems. Staging Office 10 is a Priority 1 facility, because it has a current ongoing operational mission requiring automation support.

The recommended design starts with the installation of a 30-pair standard punch down block to terminate telephone lines. The telephone service from the TCC would be terminated in this device. A 24 AWG standard telephone cable would be connected to the punch down block and terminated in a standard RJ-11, wall surface mounted telephone receptacle. This configuration is used to ensure the best physical connectivity possible between the TCC service offered and the Modem which is a component of the proposed computer system. Current connection schemes vary widely in quality and design.

The recommended design requires the installation of an uninterruptable power supply (UPS) for the primary computer system, with a minimum of 15 minutes of battery power to allow for a graceful shutdown of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. The currently installed Claud Lyons power conditioner will be retained and used for the second computer system.

The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 10 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 10 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

The primary computer system will be connected to the RJ-11, wall mounted receptacle with standard telephone cable with RJ-11 jacks. The primary computer system will have 24 pin dot matrix printer attached to the parallel port.

This design allows for expansion of hardware with more or larger hard disk drives and memory for small incremental costs. If additional applications are need for mission support such as word processing capabilities, these are easily and inexpensively added under Windows NT Workstation 3.5. Windows NT Workstation 3.5 offers the widest range of connectivity in a single package and is very easy to use.

Alternate Configuration. An alternate configuration for Staging Office 10 would be to replace the Data General MV 2000s with low end Data General Aviion processors running Unix The configuration for the TCC connection remains the same under this alternative, with the exception of the Modem. The proposed Modem in this solution is external, but has the same specifications as the internal Modem. The Claud Lyons power conditioner is not used in this configuration. It is replaced by a UPS, again with 15 minutes of battery power. The Aviion 5500 H system would have two terminals, an 88110, 40 MHz single processor, a 530 MB hard disk drive, two monochrome terminals, UNIX System 5 and PC style keyboards. Oracle 5, currently running on the MV 2000 will need to be replaced with Oracle 7, the Oracle 5 version will not operate on Unix System 5, therefore it must be upgraded to a later version. The hardware and software cost for this option exceeds $27,000, more than two and one half times the cost of the recommended design.

4.1.35 JVA Dams.

There are five dams under JVA management, with a sixth under construction. The dams are the Wadi Arab Dam, the Ziqlab Dam, the King Talal Dam, the Schueb Dam, the Kafrein Dam, and under construction the Karameh Dam. The operational and administrative functions at each of the dams is currently performed manually. The Priority of these functions are 3 and 4 respectively.

The recommended installation for each dam requires the installation of an uninterruptable power supply (UPS) for the operational computer system, with a minimum of 15 minutes of battery power to allow for a graceful shut down of the system. The UPS includes power conditioning to shield the system from dangerous power fluxuations. The administrative computer system would be connected to a surge protection power strip.

The dam design requires the installation of two personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because extended distance between systems and the cabling system is more rugged then UTP. The operational primary computer for Staging Office 10 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be Microsoft Office Professional Version 4.1 for personal computers. The administrative system to be installed in the Staging Office 10 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 400 MB hard disk drive. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system and Microsoft Office Professional Version 4.1. One dot matrix printer will be installed on the operational computer system. This printer can be shared by the administrative system over the peer-to-peer capabilities of the networked systems. Both systems will be connected to separate telephone lines in order to provide alternate communications paths.

There is no requirement for the two computers supporting the dams within the JVA to be networked together using the peer-to-peer capabilities of their operating systems. The network will provide some redundancy and back up capability for these two systems and is recommended for these additional capabilities. Facility drawings and system locations have not been developed for the dams. The computer systems will be installed at the direction of the facility manager and with JVA concurrence. It is anticipated that the systems will be installed in an office environment.

The Karameh Dam is under construction and therefore will be scheduled for installation after the other dams have their equipment installed.

4.1.36 JVA Pumping Stations.

The JVA has several pumping stations located throughout the Jordan Valley. Although these stations are not scheduled to receive computer systems, they are equipped with flow meters that need to transmit the metered information to the Computer Center at Dirar. The most pumping stations are within 300 feet of the Remote Transmission Units (RTUs) on the KAC. The proposed installation for these pumping stations includes installing cabling between the flow meters or sensors at the pumping station and the RTUs. The design does not include any interface equipment or hardware at the pumping stations or RTUs. This equipment will be provided by the JVA. Cost figures in the Appendices are only for the cabling and installation of the cable. The sites included for the purposes of this portion of the design are: Arda (sites 12, 16, 21 and 25), Sawahla (site 16), Karameh (site 21), Abu Sidoh (sites 18 and 19), Alla Basah (sites 16 and 17), Al Yabis (sites 14 and 15), Al Mashareh (site 13), Al Zamalich (site 11 and 12), Al Mankatah (sites 11 and 12), Al Manshiah (sites 9 and 8), and Al Adassyia (sites 9 and 2). These sites are priority 3 installations.

4.2 Network Management Tools.

The detailed engineering design for the Unified MWI MIS uses extensive networking technology. When the engineering design is implemented the system will undergo thorough testing to ensure initial operating requirements are met. To ensure the continued effective operation of the Unified MWI MIS, software and hardware management and trouble shooting tools will be needed. The following paragraphs recommend appropriate software management tools and needed hardware analysis tools that will be needed to support the detailed engineering design solution covered in this report.

4.2.1 Software Management Tools.

A protocol analyzer is recommended to assist in trouble shooting and managing the Ministry Building LAN. Protocol analyzers provide data on network slowdowns and problems as well as providing recommended solutions. LAN segments can be isolated to determine traffic quantity and/or potential failing equipment such as a network interface card that is transmitting outside design limits. The recommended protocol analyzer is Notebook Sniffer Analyzer from Network General. In addition, it is recommended that a data analyzer be procured. A data analyzer provides information on data errors transmitted as opposed to the protocol analyzer which provides traffic analysis. The recommended data analyzer is Framescope 802, from Scope Communications, which is effective for both ethernet and token ring networks and provides analysis for Netware and DECNet protocols.

4.2.2 Hardware Management Tools.

A variety of hardware management tools and testers are recommended. As a reference the Cable Testing Handbook (HB-1) published by Anxiter, item number 150681 is a valuable guide for trouble shooting. Hardware testing equipment recommended includes Lanteck Pro XL Category 5 Cable Tester with a serial cable for downloading to PC. This cable tester is designed to measure cable impedance, continuity checks, wire mapping, length of cable run, cable noise and cable attenuation. The recommended equipment also can provide distance to cable break information. This type of equipment will be instrumental in supporting the large cable plant in the Ministry Building. Also recommended is the Lantek Pro Kit with battery packs, test leads, software, carrying case and printer. This test support equipment will ensure tester availability.

4.3 Risk Analysis.

The two significant areas of risk for the detailed engineering design of the Unified MIS are technical and security. Technical risks deal with the of technology proposed to satisfy requirements and how that technology is implemented in the design. Security risks deal with physical security of equipment and resources and risks of unauthorized access or disclosure of sensitive data. Both areas of risk need to be addressed in detailed designs, as well as risk mitigation considerations. The following paragraphs address these specific issues.

4.3.1 Technical.

Each site that is covered by the detailed design will have its own unique set of technical risks. Unique risks for specific sites will be covered in the site specific appendices. The technical risks associated with major sites or types of sites are considered in this section. There are two aspects of risks in the technical area, hardware and software. Both of these aspects will be addressed in the following paragraphs.

4.3.1.1 Ministry Building.

The most complex portion of the proposed design is networking the Ministry Building. The proposed network uses a fiber optic cable backbone as a key component for the network and unshielded twisted pair cabling. Size and the potential internetwork connectivity create risks. The following are technical risks and mitigation strategies for the Ministry Building:

Risk: Fiber optic installation in Jordan is new technology and represents a risk in finding the correct skills for a quality installation.

Mitigation Strategies: A quality local cable installer has been located that expects to have trained installers for fiber optic material by September 1995. This would be a

prime source for installation labor. An alternative solution would be to provide installers with fiber optic experience from any of several sources in the United States.

Risk: The proposed network makes extensive use of Unshielded Twisted Pair (UTP) 5 cabling. Installation requires strict compliance to standards or the resistance to interference capacity will be significantly reduced, impacting the network performance.

Mitigation Strategies: A quality local cable installer has been located that has successfully installed UTP cabling in several locations. Using this source for installation reduces risk. Additionally, on-site, independent quality assurance in the form of an Independent Validation and Verification (IV&V) contractor is recommended to ensure quality standards are met.

Risk: Large cabling installations are difficult to trouble-shoot (most network problems are physical cable or connection related) potentially causing long down times.

Mitigation Strategies: Require installation procedures that make the IV&V contractor responsible for ensuring the installer fully documents and labels each cable run at both ends of the run. Require installation documentation in both electronic and hard copy to include details of cable runs and labeling. Require automated network hardware monitoring software be included with network operating systems.

Risk: Large networks, internetworked, are complex to manage and when the network fails, prolonged downtime periods are possible.

Mitigation Strategies: Require intermediate and advanced training for network administrators/engineers (see recommendations in Chapter 5.0). Alternatively, contract out the network management functions to a local service provider. Require network management and trouble-shooting software be provided with the network operating systems.

4.3.1.2 Large Governorates (Amman, Irbid or Zarqa).

The large WAJ Governorates are less complex than the Ministry Building. Primary areas of risk include cable installation and networking heterogeneous hardware and software operating systems. The following technical risks and mitigation strategies have been identified for the large Governorates:

Risk: The proposed network makes use of Unshielded Twisted Pair (UTP) 5 cabling. Installation requires strict compliance to standards or the resistance to interference capacity will be significantly reduced, impacting the network performance.

Mitigation Strategies: A quality local cable installer has been located that has successfully installed UTP cabling in several locations. Using this source for installation reduces risk. Additionally, on-site, independent quality assurance in the form of an

Independent Validation and Verification (IV&V) contractor is recommended to ensure quality standards are met.

Risk: The network proposed will connect the existing VAX 3200? as a node on a Novell network, which will create a complex network to manage, and may cause long periods of network down time.

Mitigation Strategies: Require training in both DECNet and Novell certified courses for large governorate network administrators (see Chapter 5.0 for more details). Configure the network such that if the Novell server is down, the VAX node, with its attached terminals and printers can operate independently.

4.3.1.3 Intermediate Size Facility.

Includes: Directorate of Dams and Irrigation, WAJ Operations and Maintenance, WAJ Amman Stores, Dirar Computer Center, and Fannoush Operations and Maintenance. Intermediate size facilities are simpler installation and management environments. They have few technical risks.

Risk: The proposed network for intermediate size facilities makes use of Unshielded Twisted Pair (UTP) 5 cabling and intelligent hubs. Installation requires strict compliance to standards or the resistance to interference capacity will be significantly reduced, impacting the network performance.

Mitigation Strategies: A quality local cable installer has been located that has successfully installed UTP cabling in several locations. Using this source for installation reduces risk. Additionally, on-site, independent quality assurance in the form of an Independent Validation and Verification (IV&V) contractor is recommended to ensure quality standards are met.

Risk: Networks at intermediate sized facilities remotely accessing other locations may experience data loss/slow responses to network requests.

Mitigation Strategies: Require quality modems, capable of speed matching up to 14.4 Kbps. with hardware/software error correction are used with the installed server. Ensure connectivity to provided Telecommunications Company (TCC) lines use approved punch down blocks and standard RJ-11 connectors.

4.3.1.3 Laboratory (JVA or WAJ).

The laboratories represent low technical risk. The proposed networks are small and required external networking capability is limited. The primary risk for laboratories are focused on quality network installation.

Risk: The proposed network for small network facilities makes use of Unshielded Twisted Pair (UTP) 5 cabling and hubs. Installation requires strict compliance to standards or the resistance to interference capacity will be significantly reduced, impacting the network performance.

Mitigation Strategies: A quality local cable installer has been located that has successfully installed UTP cabling in several locations. Using this source for installation reduces risk. Additionally, on-site, independent quality assurance in the form of an Independent Validation and Verification (IV&V) contractor is recommended to ensure quality standards are met.

4.3.1.5 Small Governorates.

The installation for small Governorates represents low technical risk. Risks associated with cable installation and internetwork connectivity are primary concerns.

Risk: The proposed network for small Governorates makes use of Unshielded Twisted Pair (UTP) 5 cabling and hubs. Installation requires strict compliance to standards or the resistance to interference capacity will be significantly reduced, impacting the network performance.

Mitigation Strategies: A quality local cable installer has been located that has successfully installed UTP cabling in several locations. Using this source for installation reduces risk. Additionally, on-site, independent quality assurance in the form of an Independent Validation and Verification (IV&V) contractor is recommended to ensure quality standards are met.

Risk: Networks at small Governorates remotely accessing other locations may experience data loss/slow responses to network requests.

Mitigation Strategies: Require quality modems, capable of speed matching up to 14.4 Kbps, with hardware/software error correction are used with the installed server. Ensure connectivity to provided Telecommunications Company (TCC) lines use approved punch down blocks and standard RJ-11 connectors.

4.3.1.6 Staging Offices (JVA).

Installations for Staging Offices are simple and have limited technical risks, primarily in area of accessing remote networks such as the computer facility at Dirar for passing water quantity requests and receiving water allocation information.

Risk: Systems at Staging Offices remotely accessing other locations may experience data loss/slow responses to network requests.

Mitigation Strategies: Require quality modems, capable of speed matching up to 14.4 Kbps, with hardware/software error correction are used with the installed server. Ensure connectivity to provided Telecommunications Company (TCC) lines use approved punch down blocks and standard RJ-11 connectors.

4.3.2 Security.

As with technical risks, each site covered by the detailed engineering design will have its own unique set of security risks. Unique security risks for specific sites will be covered in the site specific appendices. The security risks associated with major sites or types of sites are considered in this section.

4.3.2.1 Ministry Building.

The Ministry Building is the repository of essential data use to plan for, operate and manage the water resources of Jordan. In addition, sensitive personnel data for Ministry personnel, payroll data, and land acquisition data is also maintained in the Ministry Building. Loss of the data, or unauthorized access to data are the primary security risks addressed in this section.

Risk: Loss of data due to natural disasters such as fire or earthquake.

Mitigation Strategies: Although the Ministry Building is a concrete structure it is susceptible to loss by fire and/or earthquake damage. To mitigate the possibility of significant loss, require weekly tape backups of all file servers, and daily differential backups. All backup tapes should be stored off-site (proposed location, Amman Governorate offices). There is a storage safe in the fourth floor computer room. However, if the building is destroyed the tapes may not be easily retrievable or usable after retrieval.

Risk: Unauthorized physical access to sensitive information.

Mitigation Strategies: Physical access to the equipment used to store data can be minimized by collocating file severs in a common area that can be secured. There is already limited access to the Ministry Building during non-normal work hours. By securing a single room containing the file servers and only providing access to that room limited distribution of keys or installing a cipher lock decreases the risk. File servers located in common work areas increase risk of unauthorized or accidental access or destruction of data. Similarly, network hubs should be in lockable rooms to prevent tampering or accidental damage.

Risk: Unauthorized electronic access to sensitive information.

Mitigation Strategies: The primary network system proposed, Novell, has extensive access and password control features. In addition, databases using Oracle 7

security features at the database, table and record further mitigate the risk of unauthorized access. Requiring strict control procedures by network administrators, especially in maintaining limited access to network supervisor capabilities, further mitigates unauthorized access. Even where networks are physically connected to each other, access to data on other networks can be limited by denying electronic addresses to clients on other than the host server. Some of risk will always exist in network environments.

Risk: Unauthorized electronic access to sensitive information, dial-in.

Mitigation Strategies: The proposed architecture provides dial-in access to the Ministry Building communications server, which in turn distributes the dial-in connections to the appropriate agency file server. Potentially non-authorized access can be gained by using the same dial-in access. Limiting the access to the numbers of the available dial-in access lines mitigates this risk. Requiring dial-in access from only Novell remote access software equipped systems further mitigates the risk. When access is allowed only as a remote client, then Novell's log in and password security features mitigate risks of unauthorized access.

Risk: Theft of equipment.

Mitigation Strategies: The Ministry Building is attended at all hours by security personnel. In addition, most rooms with computer equipment can be locked when not in use. Requiring key network components to be in locked rooms as well as requiring servers to be located in single location reduces risks. Implementing a routine security check of key areas by building security services would also reduce risk.

4.3.2.2 Large Governorates (Amman, Irbid or Zarqa).

Large Governorates must be concerned with the security of their data to ensure on going operations are not interrupted. Although less data is maintained at the large Governorates, its operational importance higher than the data maintained in the Ministry Building. Risk mitigation efforts to improve data security for the large Governorates is essential to successful long term operations.

Risk: Loss of data due to natural disasters such as fire or earthquake.

Mitigation Strategies: The large Governorates are housed in concrete structures, but they are still susceptible to loss by fire and/or earthquake damage. To mitigate the possibility of significant loss, require weekly tape backups of all file servers, and daily differential backups. All backup tapes should be stored off-site (proposed location, a separate governorate facility such as the stores office or operations and maintenance location). A fire proof safe in the off-site location further mitigates the risk.

Risk: Unauthorized physical access to sensitive information.

Mitigation Strategies: Physical access to the equipment used to store data can be minimized by collocating file severs and the VAX equipment in a common area that can be secured. The large Governorates have installed their VAX processor in air conditioned and controlled space. The network server should be collocated in the same area. By securing a the file server and VAX in a single, and only providing access to that room limited distribution of keys to select personnel, decreases the risk.

Risk: Unauthorized electronic access to sensitive information.

Mitigation Strategies: The primary network system proposed, Novell, has extensive access and password control features. In addition, databases using Oracle 7 (the target system for billing and customer databases) security features at the database, table and record further mitigate the risk of unauthorized access. Requiring strict control procedures by network administrator, especially in the area of accessing the network supervisor capabilities, further mitigates unauthorized access. Some of risk will always exist in network environments.

Risk: Unauthorized electronic access to sensitive information, dial-in.

Mitigation Strategies: The proposed architecture provides dial-in access to the large governorate file server from subordinate offices (stores, operations and maintenance, and small remote customer offices), and by other WAJ offices. Potentially non-authorized access can be gained by using the same dial-in access capability. Limiting the access to the number of the dial-in access line mitigates this risk. Requiring dial-in access from only Novell remote access software equipped systems further mitigates the risk. When access is allowed only as a remote client, then Novell's log in and password security features mitigate risks of unauthorized access.

4.3.2.3 Intermediate Size Facility.

Includes: Directorate of Dams and Irrigation, WAJ Operations and Maintenance, WAJ Amman Stores, Dirar Computer Center, and Fannoush Operations and Maintenance. Intermediate sized facilities often contain specific operational information that other organizations depend on to perform their mission. A prime example is the Dirar Computer Center and its daily output of data for allocating water from the KAC to the Staging Offices and subsequently to the farmers. Security of data for these location is important to ensure that operations can be sustained or reconstituted.

Risk: Loss of data due to natural disasters such as fire or earthquake.

Mitigation Strategies: The intermediate size facilities are housed in single or two story structures in general, and they are made of variety of materials from concrete to steel frame with metal siding. They are still susceptible to loss by fire, but less prone to significant damage by earthquake damage. To mitigate the possibility of significant loss,

require weekly tape backups of all file servers, and daily differential backups. All backup tapes should be stored off-site (proposed location, potentially a bank or local business with a safe).

Risk: Unauthorized electronic access to sensitive information. In general the information at the intermediate sized facilities is less sensitive than the information contained in the billing, personnel or financial databases in the Ministry Building and large Governorates. Therefore, the risk due to unauthorized access is less.

Mitigation Strategies: The primary network system proposed for these facilities, Novell, has extensive access and password control features. In addition, databases using Oracle 7 (the target system for stores inventory, the water balance and water allocation model) security features at the database, table and record further mitigate the risk of unauthorized access. Strict access control procedures by network administrator, especially in maintaining password control over network supervisor capabilities and establishing authorized clients for the file server, further mitigates unauthorized access.

4.3.2.4 Laboratory (JVA or WAJ).

The laboratories main extensive records on the soil and water samples. This data is important to support the ongoing operations of the JVA and WAJ. The data, if archived properly, can be the basis for comprehensive studies of specific problems. The data becomes a national asset for research.

Risk: Loss of data due to natural disasters such as fire or earthquake.

Mitigation Strategies: The laboratories are housed in a single in a two story structure. They are made of concrete block material (exception is temporary buildings at the WAJ laboratory). They are still susceptible to loss by fire, but less prone to significant damage by earthquake damage larger multiple story buildings. To mitigate the possibility of significant loss, require weekly tape backups of each file server, and daily differential backups. All backup tapes should be stored off-site (proposed location, potentially a bank for the JVA laboratory or at the Ministry Building for the WAJ laboratory).

Risk: Unauthorized electronic access to sensitive information. In general, the information at the laboratories is less sensitive than the information by other organizations in the Ministry.

Mitigation Strategies: The primary network system proposed for these facilities, Novell, has extensive access and password control features. These features help mitigate the risk of unauthorized access. Access control procedures by network administrator, especially in maintaining password control over network supervisor capabilities and establishing authorized clients for the file server, further mitigates unauthorized access.

4.3.2.5 Small Governorates.

As the small Governorates in the WAJ implement their networks, they will be developing billing and customer data that will require protection. Many of the small Governorates are not the sole occupants of the facilities where they are housed. There is some additional risk for unauthorized access by non-WAJ personnel.

Risk: Loss of data due to natural disasters such as fire or earthquake.

Mitigation Strategies: The small Governorates are housed in a variety of multi-story, multi-occupant buildings. Primarily the facilities are concrete structures, however many are very old. They are all susceptible to loss by fire and many would suffer significant damage by earthquakes of substantial magnitude. To mitigate the possibility of significant loss, require weekly tape backups of each file server, and daily differential backups. All backup tapes should be stored off-site (potentially a nearby bank or business with a safe.

Risk: Unauthorized electronic access to sensitive information. In general, the information at the laboratories is less sensitive than the information by other organizations in the Ministry.

Mitigation Strategies: The primary network system proposed for these facilities, Novell, has extensive access and password control features. These features help mitigate the risk of unauthorized access. Access control procedures by network administrator, especially in maintaining password control over network supervisor capabilities and establishing authorized clients for the file server, further mitigates unauthorized access.

Risk: Unauthorized electronic access to sensitive information.

Mitigation Strategies: The primary network system proposed, Novell, has extensive access and password control features. In addition, databases using Oracle 7 (the target system for billing and customer databases) security features at the database, table and record further mitigate the risk of unauthorized access. Requiring strict control procedures by the network administrator, especially in the area of accessing the network supervisor capabilities, further mitigates unauthorized access. Some of risk will always exist in network environments.

4.3.2.6 Staging Offices (JVA).

Staging Offices each contain important data on requests for water, farm land information (amount, type of soil, history, crops planted, etc.) and daily information on the water that can be allocated for irrigation. Additional data is maintained on billing and instructions for JVA personnel to distribute water by opening/closing valves or gates along the KAC.

Risk: Loss of data due to natural disasters such as fire or earthquake.

Mitigation Strategies: The Staging Offices are housed in small one story buildings along the KAC. Primarily the facilities are concrete structures, however many are very old and in disrepair. They are all susceptible to loss by fire and would suffer some damage by earthquakes of substantial magnitude. To mitigate the possibility of significant loss, require weekly tape backups of each file server, and daily differential backups. All backup tapes should be stored off-site (suggested location at the District Office of each Staging Office in a fireproof safe).

Risk: Unauthorized electronic access to data. This risk is considered minimal for the staging offices.

Mitigation Strategies: To mitigate the risk of unauthorized electronic access to data at the Staging Offices, the password controls available for Oracle databases, tables, and records should be used.

CHAPTER 5.0 RECOMMENDATIONS

5.1 Proposed Priorities.

The proposed detail engineering design is scheduled to be implemented over a nine to twelve month period. This is driven by the number of individual sites; the geographic dispersion of the sites; and the need to integrate, install and test each site separately prior to integration into the Unified MIS structure. To build a schedule a method was needed to determine which part of the implementation would be first, or have a higher priority than other components of the implementation. A set of four priorities were developed and applied to each site within the Ministry of Water and Irrigation. It should be noted that all of the sites and organizational structures are important and each will contribute to the Unified MIS. The four priorities are as follows:

- Priority 1 - Current, ongoing operational support using ADP, and core functions
- Priority 2 - Current, ongoing administrative support to operations, using ADP
- Priority 3 - Direct operational support, no current ADP
- Priority 4 - Future operational support or admin support to direct operations, no ADP

5.1.1 Priority 1.

Priority 1 is for current, ongoing operational support using ADP, and core functions. This priority is assigned to organizational entities or locations that support operational tasks are currently using data processing assets to accomplish their assigned missions. In addition, sites, such as the MWI Building in Amman, that are core functions are also rated as Priority 1. Core functions are those functions needed for the continued existence of the Ministry (e.g. payroll, long range planning, support to the Minister and Secretary's' General. Priority 1 facilities are scheduled ahead of other priorities. Some Priority 2 requirements are scheduled concurrently with Priority 1 sites, if both are collocated at the same physical location.

5.1.2 Priority 2.

Priority 2 is for current, ongoing administrative support to operations, using ADP. This priority is assigned to existing administrative functions that support on-going operations and currently use data processing equipment to perform the functions. For example, administrative support to the Irbid Governorate billing or customer request services. These functions could continue at their current , but would benefit from better equipment and connectivity to the LAN/WAN and be a contributor to the Unified MIS structure.

5.1.3 Priority 3.

Priority 3 is for direct operational support sites, with no current ADP. This priority is assigned to operational functions and sites that do not have data processing equipment to help with the performance of their mission. The operational data they produce is

required in the Unified MIS to ensure complete management information is available. An examples of such a site would be the Governorate of Karak, billing or stores function.

5.1.4 Priority 4.

Priority 4 is for future operational support or administrative support to direct operations, with no existing ADP. This priority is assigned administrative support functions for sites covered by Priority 3. This also includes sites that collect data on operations and perform administrative functions, but their contribution to the Unified MIS is not well defined. This priority also covers future sites or sites that are not currently active. Examples would be Kiarama Dam or District Office 3 in the Jordan Valley Authority.

5.1.5 The Priority Scheme.

The priority scheme provides a convenient scheduling and costing tool. In the development of the priorities it was necessary to ensure that existing functions that used data processing continued to support their missions with the same or enhanced capabilities. Assigning higher priorities to existing locations with data processing support also reflects existing Ministry priorities. to use the priorities in scheduling, higher priorities are scheduled for implementation first. The only exception to this is for locations where several priorities for equipment exists and it would be cost prohibitive to return to the same location several times based solely on implementing the system only according to the priority without consideration for location. The priorities were presented at the Preliminary Design Review held in the MWI Building on June 20, 1995. No revisions or suggestions were made at that time, therefore they have been retained as a tool for scheduling. The priorities can also be used to help determine what portions of the Unified MIS should be implemented if inadequate funding is available to complete the entire effort. Using the identified priorities, implementation costs for all of the sites in each priority are as follows:

Table 5.1 Cost by Priority

	Priority	**Cost**
Priority	1	$435,552.78
Priority	2	$189,978.70
Priority	3	$271,968.80
Priority	4	$188,928.46
Total:		$1,086,428.74

Note: This does not include labor costs.

Further subdivisions of any priority could be made. In general this should be done on a site by site basis. A decision to implement Priorities 1 and 2 would result in more completely automating the core functions, bringing existing automation capabilities up to a high standard, and networking all the sites covered by these priorities.

Other priority schemes can be developed and applied to the costing structure if the current scheme is considered non-representative. The basic structure provided in the Microsoft Excel 5.0 electronic spreadsheets (disks located in the back of this binder) can be modified with little effort to accommodate different schemes.

5.2 Proposed Schedule.

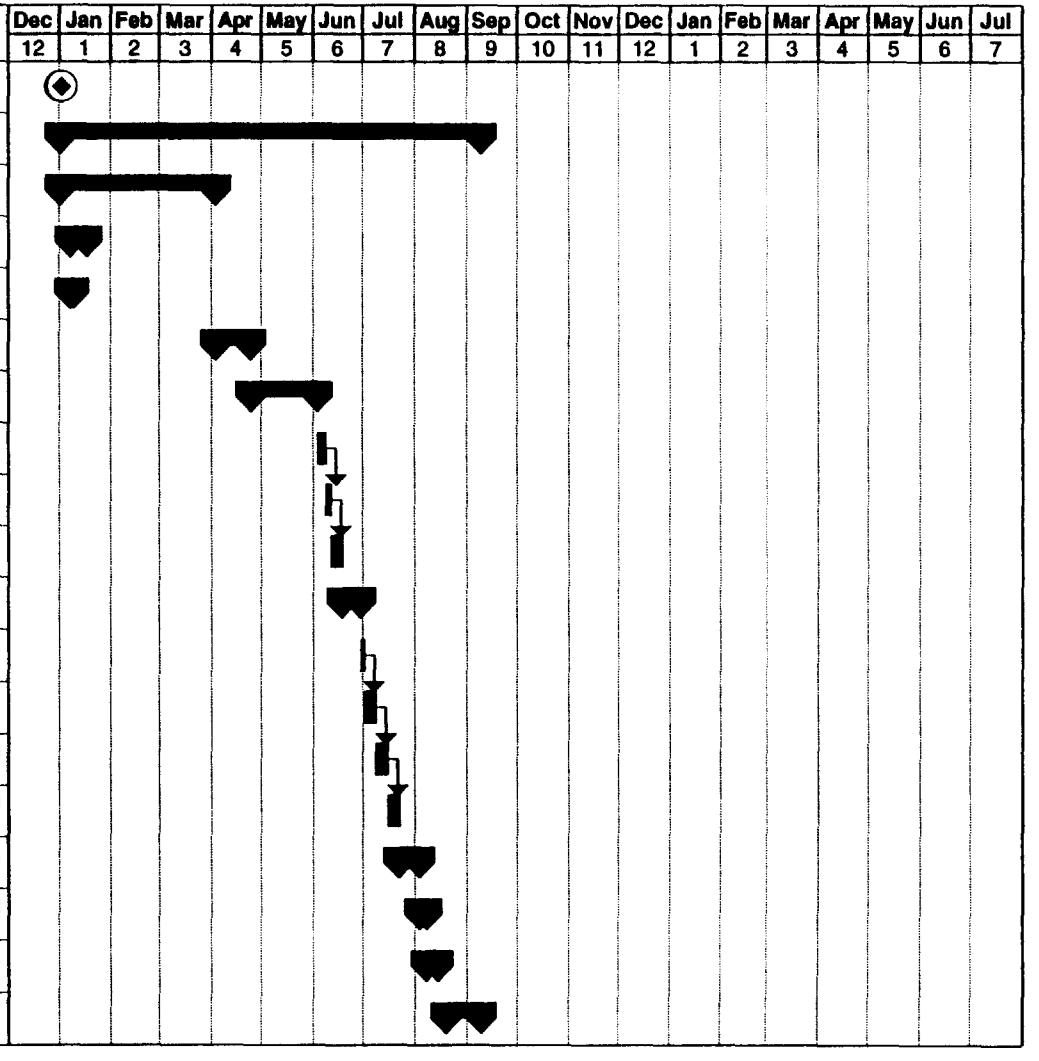
The proposed schedule is designed to be inclusive of all sites and activities covered in this report. The implementation schedule follows priorities established in paragraph 5.1 above, and combines implementation at sites where multiple priorities are represented. The following assumptions were made in developing the schedule:

- All equipment and materials are on hand prior to each site's installation
- Two installation teams will be used after the Ministry Building is completed
- Designated LAN Administrators for each site, where appropriate, will be trained and available to help the installation team
- Training will be accomplished in parallel, in accordance with paragraph 5.3 below
- Access to each location will be available in accordance with the schedule

The overall schedule is presented in Figure 5.1 below. The Schedule Appendix provides details on the overall program. Each site is also provided with a site specific schedule, which is identified as beginning a specified number of weeks after the beginning of implementation schedule.

Figure 5.1 Overall MIS Installation Schedule

ID	Task Name	Duration
1	EQUIPMENT DELIVERY CONFIRMED	1d
2	MWI MIS INSTALLATION	216d
3	MINISTRY BUILDING WIRING	80d
62	INSTALL MINISTRY SERVERS	9d
64	MODEM INSTALL	2d
66	MINISTRY NETWORK TESTING	18d
76	WAJ GOVERNORATES	34d
89	WAJ STORES AIN GHAZAL	4d
90	WAJ VEHICLE O & M RAS ELAINE	3d
91	WAJ LABS BAIADER WADI SEER	6d
92	JVA DISTRICT OFFICES	9d
96	JVA COMPUTER CENTER DIRAR	2d
97	JVA FANNOUSH STORES	6d
98	JVA LABS UNIVERSITY FARMS	6d
99	JVA DIRECTORATE OF DAMS	6d
100	JVA STAGING OFFICES	10d
111	JVA WATER TREATMENT PLANTS	4d
114	JVA WASTE WATER TREATMENT PLANTS	6d
126	NETWORK TESTING	18d



5.2.1 Overall Schedule.

The overall schedule for full implementation of the detailed engineering design of the Unified MIS requires nine months for completion. This does not include acquisition or shipping time for components that will be installed. The start time is considered to be the date the installation team can start the implementation in the Ministry Building (the assumptions in paragraph 5.2 must be met) and the complete date is the time when the last site is fully tested and accepted by the Government of Jordan. The Overall Implementation schedule is Appendix 1 of the Technical Appendices. Individual site schedules are provide in the Site Specific Appendices.

5.2.2 The Ministry Building, Amman.

Each floor of this nine story building will be connected by a fiber optic backbone running from the first floor to the seventh floor inside the main electrical cable shaft, which is located in the central stairway. Patch panels and hubs will be located in rooms adjacent to the cable shaft. Patch panels and hubs on the first floor will serve the ground floor and the first floor and patch panels and hubs on the seventh floor will serve the eighth floor and seventh floor. From these patch panels, Level 5 UTP will be routed down the main hallways on all nine floors. Virtually every office room will have 2 UTP cables terminated with eight pin modular receptacles. Large rooms like the library and conference rooms will receive an appropriate number of receptacles. The fourth floor will be the recommended site for a consolidated network server room, housing all Ministry building servers and a modem rack. This is recommended because the room is air conditioned, has limited access and it has adequate electrical power and backup power capability. Based on the existing computer equipment and software inventory (see Jordan.MDB), older computers with less than an 80386 processor and 2 MB of RAM will be replaced. Some of these systems will be used as print servers on the network. Other systems will be upgraded as indicated in Chapter 4. Excess equipment (computers, hubs, cables, printers, etc.) will be salvaged and used throughout the WAJ and JVA field offices. The installation schedule for the Ministry Building will require two weeks for the fiber optic installation and ten weeks for the UTP cable installation and termination. an additional three weeks will be used for quality assurance and testing.

Special tools needed during the Ministry building installation will be used to drill through walls between hallways and offices. Concrete saws, power drills, and potential a cutting torch will be needed for the fiber optic cable installation. All exposed UTP cable will be protected by panduit. The delicate fiber optic cables will be protected inside the cable shaft by conduit.

Standardized practices will be employed to route and terminate cables to assure high network performance and reliability.

5.2.3 Typical Schedule for WAJ Governorate.

Each governorate in the WAJ will, because of their difference, require site unique times to install their components of the Unified MIS architecture. Large Governorates such as Amman, Irbid and Zarqa will require approximately xx work days. This time includes both installation and testing. Subordinate offices of a Governorate, such as the stores or operations facility if separate from the Governorate, will only require one half to one day each for installation and testing. The smaller Governorates, such as Madaba, Karak, Mafraq, etc., will require approximately xx work days. Again this time includes installation and testing. In the overall schedule, the larger Governorates are scheduled prior to the smaller Governorates, because they have existing data processing support and support requirements. The smaller Governorates that expect to remain in their current facilities are scheduled next, according to their geographic proximity to Amman. Finally, Governorates that are awaiting new facilities are scheduled last. This reduces the need to install and test equipment multiple times for a specific Governorate. The exception to this scheduling within WAJ would be in the instance where a new facility under construction or recently completed can be scheduled for installation and testing prior to moving the Governorate operations to the new facility.

5.2.4 Typical Schedule for Laboratory or Similar Facility.

The two laboratories and facilities of similar size such as the JVA's Directorate of Dams and Irrigation in general will require seven work days or less for installation and testing. These sites will each have a relatively simple network, with external connectivity through the file server. The WAJ Laboratory and the JVA Directorate of Dams and Irrigation are scheduled for early installation as Priority 2 sites. In addition, their location in Amman provides easy access for the installation team. The JVA Laboratory is a Priority 4 facility and is scheduled late in the installation process.

5.2.5 Typical Schedule for Staging Office, JVA.

The schedule for a typical Staging Office, or small administrative office, in general will require two days. A single team may work concurrently on two offices during the testing phase of the implementation. The JVA Staging Offices are Priority 1 facilities, and are scheduled for early installation. Exceptions to this case, are Staging Offices 1, 3, and 5, which require replacement prior to installation of new equipment. Staging Office 9 is also scheduled late (a Priority 4 facility) because it is not known when this Staging Office will be activated. Other small facilities such as dams and stores for the JVA and small city offices supporting a WAJ Governorate will be installed according to their priority and as funding allows.

5.3 Proposed Training.

Several s of training will be required to effectively implement the Unified MIS for the MWI. A top down approach to training is recommended. The approach emphasizes training the individuals that will be responsible for the management and guidance, the implementation, operation and maintenance; and the users of the Unified MIS, in that respective order. In addition, the training will be scheduled prior to each phase of the implementation. However, training will not be scheduled so far in advance of a phase that its usefulness is eroded by long periods of time between the time of training and the time the training can be used because of a lack of equipment or meaningful work. Training for the Unified MIS implementation is treated as a one time effort for the purposes of this report. This approach has the advantage of showing the types, timing and quantifying costs for implementing the Unified MIS. In the longer view, training must be an integral part of the MWI periodic planning cycle. New managers, database administrators and users will always need to be trained. Previously trained people will require refresher training, upgrade training and training for new capabilities. The sustainability of the Unified MIS will be determined by the quality of the training during the implementation of the Unified MIS and the follow-on training program during the operational life of the Unified MIS.

5.3.1 Specific Training Requirements.

The following seven paragraphs specify the training requirements for the Unified MIS. Each paragraph and its supporting subparagraphs contain a description of the requirement, number of personnel to be trained, specific course name, source of training, proposed location of training, length of training, timing in relation to implementation, cost per trainee, and total cost. The specific requirements addressed are:

- Senior MIS Managers
- Local Area Network (LAN) Administrators (Ministry Building)
- LAN Administrators (External to the Ministry Building)
- Database Administrators
- Key Users
- Routine Users
- Specialized Users

5.3.2 Requirement - Senior MIS Managers.

The MWI will need to provide high planning and guidance to personnel who will be assigned to implement the Unified MIS. The personnel assigned these responsibilities will set MIS goals, assign priorities, develop high plans, analyze system requirements, analyze management information requirements, and provide guidance to the MWI MIS staff for implementing, changing, and maintaining the MIS. To prepare for these

responsibilities requires training in MIS management disciplines that use automated databases and local area/wide area network planning, management and use.

5.3.2.1 Number of personnel to be trained. Two senior MIS managers fro the MWI's resources.

5.3.2.2 Specific Courses.

Database Related
- Introduction to Oracle
- Development of Complex Data Models and Design Databases
- Analyze Strategic Business Requirements
- Analyze Systems Requirements
- Implement Systems Analysis and Design Using Case Tools

Network Related
- Fundamentals of Internetwork and Management Design

Corporate Implementation Training
- Corporate Overview of MIS and Network System
- Physical Implementation of LAN/WAN System
- Database Management Control
- MIS Structure and Products
- Developing MIS Products

5.3.2.3 Sources for training.

Database Related Training:	Certified Oracle Training Center
Network Related Training:	Novell Certified Education Center
Corporate Implementation Training:	Host Corporation

5.3.2.4 Location for training.

Database Related Training:	United States (Washington DC area)
Novell Related Training:	United States (Washington DC area)
Corporate Implementation Training:	United States (Washington DC area)

5.3.2.5 Duration of training.

Database Related Training:	21 work days
Novell Related Training:	4 work days
Corporate Implementation Training:	5 work days

5.3.2.6 Timing in relation to implementation schedule. This training should be scheduled as soon as possible. As soon as the training is complete the trained personnel

should form the core of the management team for the MWI MIS. The training should be scheduled as soon as possible.

5.3.2.7 Cost per person trained.

Database Related Training:	$7,700
Novell Related Training:	$1,600
Corporate Implementation Training:	$1,300

5.3.2.8 Total cost of training: $21,200

This does not include transportation, personnel salaries or per diem rates.

5.3.3 Requirement - LAN Administrators (Ministry Building).

To meet the MWI Unified MIS structure described in the December 1994 report, "Water Quality Improvement and Conversation Project, Management Information System Report", and to ensure maximum flexibility while supporting continuous operations, three separate LANs will be instituted in the Ministry Building. There will be a LAN for WQIC and UNDP functions (including all functions known as the "Little Ministry"), a LAN for JVA, and a LAN for WAJ. Each of these LANs will have a designated LAN administrator and an alternate. In addition to supporting Ministry personnel in the Ministry Building, these LANs will form the hub connection for subordinate organizations in geographically separated locations through dial-in access. The LAN administrators will need training in managing the LANs they are responsible for and the interface to external organizations. The LAN administrators will need to work with heterogeneous equipment within their respective LANs.

5.3.3.1 Number of personnel to be trained.

Three Primary Network Administrators
Three Alternate Network Administrators

5.3.3.2 Specific Courses.

Primary LAN Administrator

Netware 3.1x Administration	Course 508
Netware 3.1x Advanced Administration	Course 518
*DECNet Basics (WAJ Primary only)	

Alternate LAN Administrator

Netware 3.1x Administration	Course 508
*DECNet Basics (WAJ Alternate only)	

5.3.3.3 Sources for training.

Network Related Training:	Novell Certified Education Center Graytech - Computer 2000
DECNet Training:	Computer & Communications Systems

5.3.3.4 Location for training.

Novell Related Training:	Dubai
DECNet Training:	Amman

Network training could also occur in Amman provided by the University of Jordan or by bringing the instructor to Amman from Dubai.

5.3.3.5 Duration of training.

Primary LAN Administrator	6 work days Add 5 days for WAJ Primary
Alternate LAN Administrators	4 work days Add 5 days for WAJ Alternate

5.3.3.6 Timing in relation to implementation schedule. The primary and alternate LAN administrators for the "Little Ministry" and WAJ should be scheduled for training as soon as possible training should be scheduled as soon as possible since these organizations have existing LANs. Training for the JVA primary and alternate LAN administrators should begin 45 days prior to installing the new JVA server in the Ministry Building. All LAN Administrators should participate with the installation team during the installation and configuration process.

5.3.3.7 Cost per person trained.

Primary LAN Administrator:	$1,600
Primary LAN Administrator WAJ:	$2,600
Alternate LAN Administrator :	$1,000
Alternate LAN Administrator WAJ:	$1,000

5.3.3.8 Total cost of training: $9,800

5.3.4 Requirement - LAN Administrators (External to Ministry Building).

To achieve a Unified MWI MIS, the larger subordinate MWI offices not collocated in the MWI Building will be connected by point-to-point dial-in capabilities which will connect them to the WAJ, JVA or "Little Ministry" LANs in the Ministry Building. These

external facilities, such as the Laboratories, Governorate Offices and Computer Centers, will also have smaller LANs installed that will integrate their local activities and provide connectivity the Ministry Building or other locations as required. Each subordinate office that has a LAN installed will require a primary and alternate LAN Administrator. These LANs will be simpler and not require as much training to operate and maintain them as the LANs in the Ministry Building.

5.3.4.1 Number of personnel to be trained.

Primary Network Administrators	19
Alternate Network Administrators	19

5.3.4.2 Specific Courses.

Primary LAN Administrator

Netware 3.1x Administration	Course 508
*DECNet Basics (Amman Stores Only)	

Alternate LAN Administrator

Netware 3.1x Administration	Course 508
*DECNet Basics (Amman Stores Only)	

5.3.4.3 Sources for training.

Network Related Training:	Novell Certified Education Center Graytech - Computer 2000
DECNet Training:	Computer & Communications Systems

5.3.4.4 Location for training.

Novell Related Training:	Dubai
DECNet Training:	Amman

Network training could also occur in Amman, provided by the University of Jordan or by bringing the instructor to Amman from Dubai.

5.3.4.5 Duration of training.

Primary LAN Administrator	4 work days
Primary LAN Administrator (Amman Stores)	5 work days for Amman Stores
Primary LAN Administrator (Amman, Irbid, Zarqa)	9 work days

Alternate LAN Administrators	4 work days
Alternate LAN Administrator (Amman Stores)	5 days for Amman Stores
Alternate LAN Administrator (Amman, Irbid, Zarqa)	5 work days

5.3.4.6 Timing in relation to implementation schedule. Training for the Amman Stores primary and alternate LAN Administrators should be started as soon as possible. Training for the other primary and alternate LAN administrators should be scheduled 45 days in advance of the installation and configuration of their respective sites. The primary and alternate LAN Administrators fore each site should participate in the installation and configuration of their respective sites.

5.3.4.7 Cost per person trained.

Primary LAN Administrator:	$1,000
Primary LAN Administrator (Amman Stores):	$700
Primary LAN Administrator (Amman, Irbid, Zarqa)	$1,700
Alternate LAN Administrator:	$1,000
Alternate LAN Administrator (Amman Stores):	$700
Alternate LAN Administrator (Amman, Irbid, Zarqa)	$1,700

5.3.4.8 Total cost of training: $41,600

5.3.5 Requirement - Database Administrators.

The MWI will need trained personnel who are responsible for designing, controlling and performing database administration functions for the several databases that will comprise the Unified MIS. The responsibilities of the personnel assigned as database administrators will include control of data dictionaries, implementing guidance provided by the senior MIS staff, ensuring compliance of the designers and users with guidelines, management activities supporting the operation of the databases (access authorities, control of data storage, security of data, recovery procedures, etc.). Each agency in the MWI should have one primary database administrator and one alternate. In addition, the WAJ, Amman Stores in Ain Ghazal, and the JVA Computer Center in Dirar should have primary and alternate database administrators.

5.3.5.1 Number of personnel to be trained.

Primary Database Administrators	5
Alternate Database Administrators	5

5.3.5.2 Specific Courses.

Primary Database Administrator
- Introduction to Oracle
- Administer the Oracle 7 Database I
- Administer the Oracle 7 Database II
- Tune and Troubleshoot the Oracle 7 Database

Alternate Database Administrator
- Introduction to Oracle
- Administer the Oracle 7 Database I

5.3.5.3 Sources for training.

Oracle:	Computer & Communications Systems

5.3.5.4 Location for training.

Oracle:	Amman

5.3.5.5 Duration of training.

Primary Database Administrator	17 work days
Alternate Database Administrators	13 work days

5.3.5.6 Timing in relation to implementation schedule. Training for the Amman Stores primary and alternate LAN Administrators should be started as soon as possible. Training for the other primary and alternate LAN administrators should be scheduled 45 days in advance of the installation and configuration of their respective sites. The primary and alternate LAN Administrators fore each site should participate in the installation and configuration of their respective sites.

5.3.5.7 Cost per person trained.

Primary Database Administrator:	$5,950
Alternate Database Administrator:	$4,550

5.3.5.8 Total cost of training $52,500

The Ministry is currently purchasing several copies of Oracle 7, with training provided by the winning contractor. Many of the above requirements will be satisfied by this training.

5.3.6 Requirements - Key Users.

Each location external to the Ministry Building needs to identify a "Key User". The Key User is an individual who is normally responsible for ensuring that the equipment is operating properly (other than the network), the software is operating properly, knows how to use the available software applications, knows what data needs to be transferred using the network and how to do it; and provides some quality control for data that is entered into systems that feed into the Unified MIS (i.e. requests for water by farmers in the JVA or billing data in the WAJ). The Key Users provide a local "expertise" on computer operations and use that employees can use to resolve issues on-site.

5.3.6.1 Number of personnel to be trained.

Key Users 61

This equates to one Key User per site external to the Ministry Building

5.3.6.2 Specific Courses.

Key User
WQIC Basic Computer Course
Additional course materials on equipment maintenance and operation

5.3.6.3 Sources for training.

WQIC Staff and additional trained Ministry personnel

5.3.6.4 Location for training.

Amman, Irbid and potentially Madaba, in Ministry arranged facilities.

5.3.6.5 Duration of training.

Key User: 15 hours in class room

5.3.6.6 Timing in relation to implementation schedule. Training should be scheduled for completion one week prior to the completion of the installation of each site's new or upgraded equipment.

5.3.6.7 Cost per person trained.

Key User In house resources used.

5.3.6.8 Total cost of training: Cost of salary for trainer/trainees
Ministry Employees

5.3.7 Requirement - Routine User.

Each location external to the Ministry Building will be changing from manual methods of work to using automated tools. This change will require the new users of the equipment to be trained on the equipment and software applications they will be using. The requirement to train new users will be on going because of personnel turnover and people moving to new positions within the Ministry.

5.3.7.1 Number of personnel to be trained.

Routine Users 2000

This is a percentage of the total employees of the Ministry

5.3.7.2 Specific Courses.

Routine User

WQIC Basic Computer Course

5.3.7.3 Sources for training.

WQIC Staff and additional trained Ministry personnel

5.3.7.4 Location for training.

Amman, Irbid and potentially Madaba, in Ministry arranged facilities.

5.3.7.5 Duration of training.

Routine User: 10 hours in class room

5.3.7.6 Timing in relation to implementation schedule. Training should be scheduled for completion concurrently with to the completion of the installation of each site's new or upgraded equipment.

5.3.7.7 Cost per person trained.

Routine User In house resources used.

5.3.7.8 Total cost of training: Cost of salary for trainer/trainees. Ministry Employees

5.3.8 Requirement - Specialized Users.

Select employees will have specialized requirements that will need to be supported but cannot be defined at this time. These personnel should be able to request courses to meet their special needs, for example, budget development using standard spreadsheet applications. There should be a request procedure established with requests forwarded to the WQIC training function for consolidation and arrangement of classes. As the users become more sophisticated, request for this type of training will increase. The requirements will be ad hod in nature and may require one time curriculum development or contracting out to local vendors with expertise in a particular area of interest.

5.3.8.1 Number of Personnel to be trained.

Specialized User 20 per year

5.3.8.2 Specific Courses.

User Requested

5.3.8.3 Sources for Training.

WQIC Staff or contract supplied.

5.3.8.4 Location for training.

Ministry Building Amman

5.3.8.5 Duration of training.

Course dependent

5.3.8.6 Training in relation to implementation schedule. Implementation schedule independent.

5.3.8.7 Cost Per Person Trained.

Course dependent.

5.3.8.8 Total Cost of Training.

Course dependent.

5.3.9 Summary of Training Requirements.

The total number of people to be trained exceeds 2100. Fifty five personnel will receive their training from external Ministry sources. The remaining training can potentially be supported through Ministry resources. This will require selecting some personnel to be trained as trainers, and dispatching to training sites. This large effort is anticipated to take approximately two years. Equipment and software for training can come from the initial procurement of hardware and software. A small portion of the equipment can be used for training and later be used during the last stages of installation. This will reduce the overall cost of training by maximizing use of available resources.

CHAPTER 6.0 REFERENCES

6.1 Personnel Contacts.

1. Dr. Mohammad Bani Hani, Secretary General MWI
2. Dr. Muwaffaq Saqqar, MWI, WQIC Project Coordinator
3. Mr. Zuhair Hyassat, WAJ, Director of Computer Services
4. Mr. Dia El Madani, JVA
5. Mr. Yousef Hassan Ayadi, JVA
6. Mr. Mashal Wadie, WAJ
7. Mr. Issam Garadat, WAJ
8. Mr. Ahmad Abu Senneh, DAI
9. Mr. Ed Stains, Chief of Party, DAI
10. Mr. Dario Dal Santo, SAIC
11. Mr. George Ring, SAIC
12. Mr. Bob Smail, DAI
13. Mr. Othman Sweite, TCC
14. Mr. Abdul Nanni, JVA, Land Management Director
15. Ms. Nadia Ghandour
16. Mr. Dieter Bohnet, GTZ, MIS Contractor
17. Dr. Peter Ohlymer, GTZ, Project Director
18. Mr. Christoph Gleitsmann, GTZ, Advisor Network Operations
19. Dr. Ingo Leutiger, GTZ, Advisor Management Accounting
20. Mr. Bruno Grawitz, GERSAR, JVA TRU Monitoring System Representative
21. Mr. Abdullah Ahmed, USAID Project Officer.
22. The Director of the Amman Governorate, WAJ
23. The Director of the Irbid Governorate, WAJ
24. The Director of the Zarqa Governorate, WAJ
25. The Director of the Mafraq Governorate, WAJ
26. The Director of the Ajlun Governorate, WAJ
27. The Director of the Jerash Governorate, WAJ
28. The Director of the Madaba Governorate, WAJ
29. The Director of the Karak Governorate, WAJ
30. The Director of the Ma'an Governorate, WAJ
31. The Director of the Tafelah Governorate, WAJ
32. The Director of the Aqaba Governorate, WAJ
33. The Director of the Balqa Governorate, WAJ
34. The Manager for the Central Laboratories WAJ
35. The Manager for the Amman Stores Operation
36. The Manager for the Amman Operations and Maintenance Facility
37. The Manager of the Zai Water Treatment Plant
38. The Director for the JVA District Office 1
39. The Director for the JVA District Office 2
40. The Manager for the Dirar Computer Center
41. The Manager for the Fannoush Operations and Maintenance Facility

42. The Director of the JVA Laboratory
43. The Manager of JVA Staging Office 7
44. The Manager of JVA Staging Office 4
45. The Manager of JVA Staging Office 5
46. The Manager of JVA Staging Office 6
47. The Manager of JVA Staging Office 10
48. Engineer for the Karameh Dam Project
49. Manager Directorate of Dams and Irrigation, JVA
50. Mr. Hisham M. Qattan, HQ Establishment, Cabe Contractor
51. Mr. Maher Mouasher, Scientific and Medical Supplies Co., Manager
52. Mr. Hatem Ramadan, Ministry Building Security and Maintenance Manager

6.2 Sites Visited.

1. Ministry Building, Shmeisani, Amman, Jordan
2. Directorate of Dams and Irrigation (JVA), Shmeisani, Amman, Jordan
3. Amman Governorate, Jebel Hussein, Amman, Jordan
4. Amman Governorate - Stores, Ain Ghazal, Amman, Jordan
5. Amman Governorate - Operations and Maintenance, Ras Al Ein, Amman, Jordan
6. Water Authority of Jordan, Laboratories, Amman, Jordan
7. Water Treatment Plant, Zai, Jordan
8. Irbid Governorate, Irbid, Jordan
9. Zarqa Governorate, Zarqa, Jordan
10. Jerash Governorate, Jerash, Jordan
11. Ajlun Governorate, Ajlun, Jordan
12. Madaba Governorate, Madaba, Jordan
13. Karak Governorate, Karak, Jordan
14. Ma'an Governorate, Ma'an, Jordan
15. Aqaba Governorate, Aqaba, Jordan
16. Tafelah Governorate, Tafelah, Jordan
17. Balqa Governoate, Balqa (Salt), Jordan
18. Dirar Computer Center, Deir Alla, Jordan
19. Fannoush, Operations and Maintenance (JVA), , Jordan
20. District Office 1/Staging Office 7, Kulaiat, Jordan
21. District Office 2, Deir Alla, Jordan
22. District Office 3 (non operational), Al Jawasreh, Jordan
22. Staging Office 4, Al Sawalha, Jordan
22. Staging Office 5, Al Arada, Jordan
23. Staging Office 6, Thahret Al Ramel, Jordan
24. Staging Office 10, Batous, Jordan
25. Karameh Dam, Jordan
26. Kufrein Dam, Batous, Jordan
27. JVA Laboratories, University Agricultural Station Jordan

6.3 Document References.

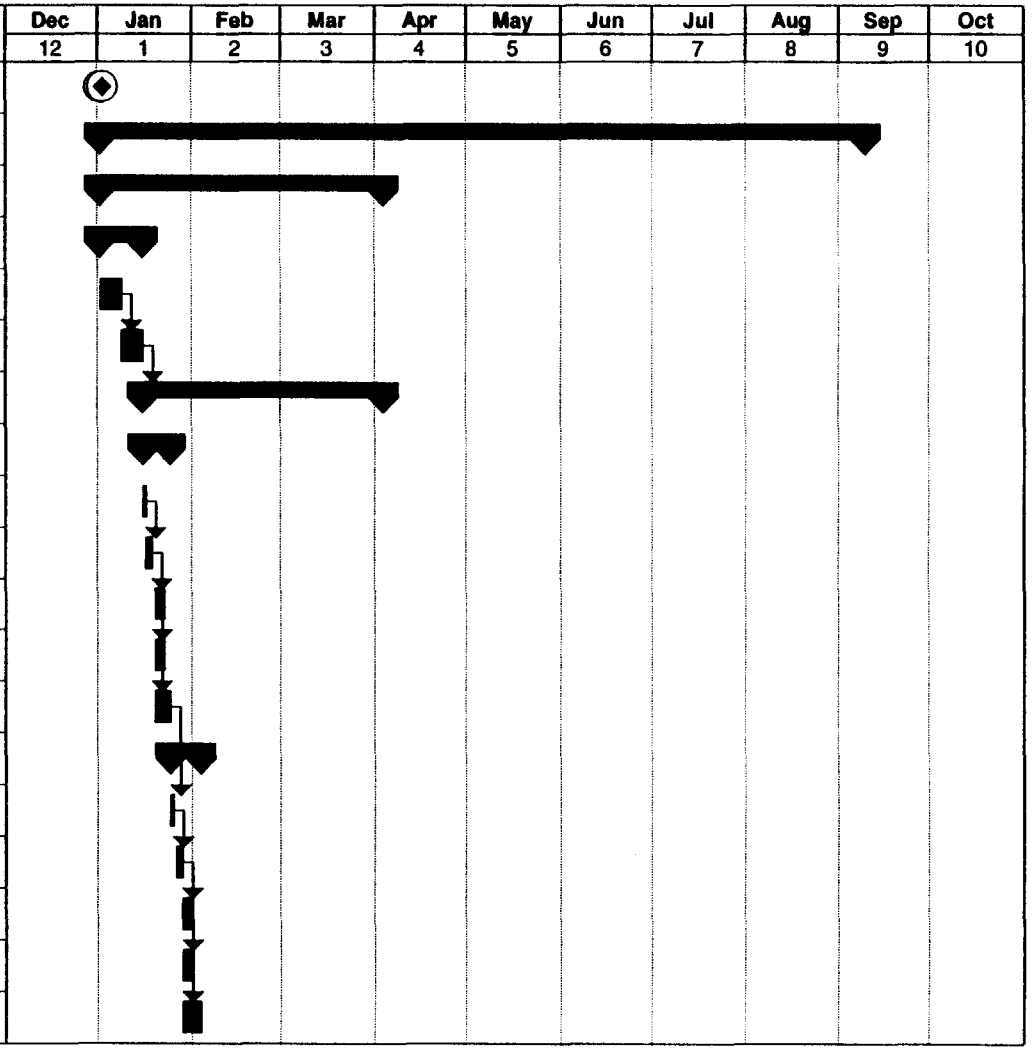
1. Invitation for Bids (Draft), GTZ, date of draft June 19, 1995
2. Jordan Water Quality Improvement and Conservation Project, Computer Automation Plan, Report 3114-95-00-07, June 1995
3. Water Quality Improvement and Conservation Project, Management Information Systems Report, December 1994
4. Education Course Catalog, Novell, Issue Two 1994
5. Oracle Education Schedule and Catalog, January - July 1995

TECHNICAL DATA APPENDICES

A-1. Overall Schedule for Implementation.

The overall detailed schedule is provided on the succeeding pages. An artificial start date of January 2, 1996 was provided to show the relative task and how the implementation plan would be accomplished. The schedule assumes completion of the entire project. The schedule would require adjustments based on priorities and installation order as directed by the Ministry.

ID	Task Name	Duration
1	**EQUIPMENT DELIVERY CONFIRMED**	1d
2	**MWI MIS INSTALLATION**	216d
3	**MINISTRY BUILDING WIRING**	80d
4	**FIBER OPTIC CABLING**	12d
5	FO CONDUIT	6d
6	FO CABLE RUNS	6d
7	**UTP WIRING**	68d
8	**GROUND FLOOR**	8d
9	INSTALL HUBS	1d
10	WIRE HALLWAYS UTP	2d
11	INSTALL ROOM PANDUIT	3d
12	RECEPTICALS	3d
13	UTP TERMINATION	5d
14	**1ST FLOOR**	8d
15	INSTALL HUBS	1d
16	WIRE HALLWAYS UTP	2d
17	INSTALL ROOM PANDUIT	3d
18	RECEPTICALS	3d
19	UTP TERMINATION	5d



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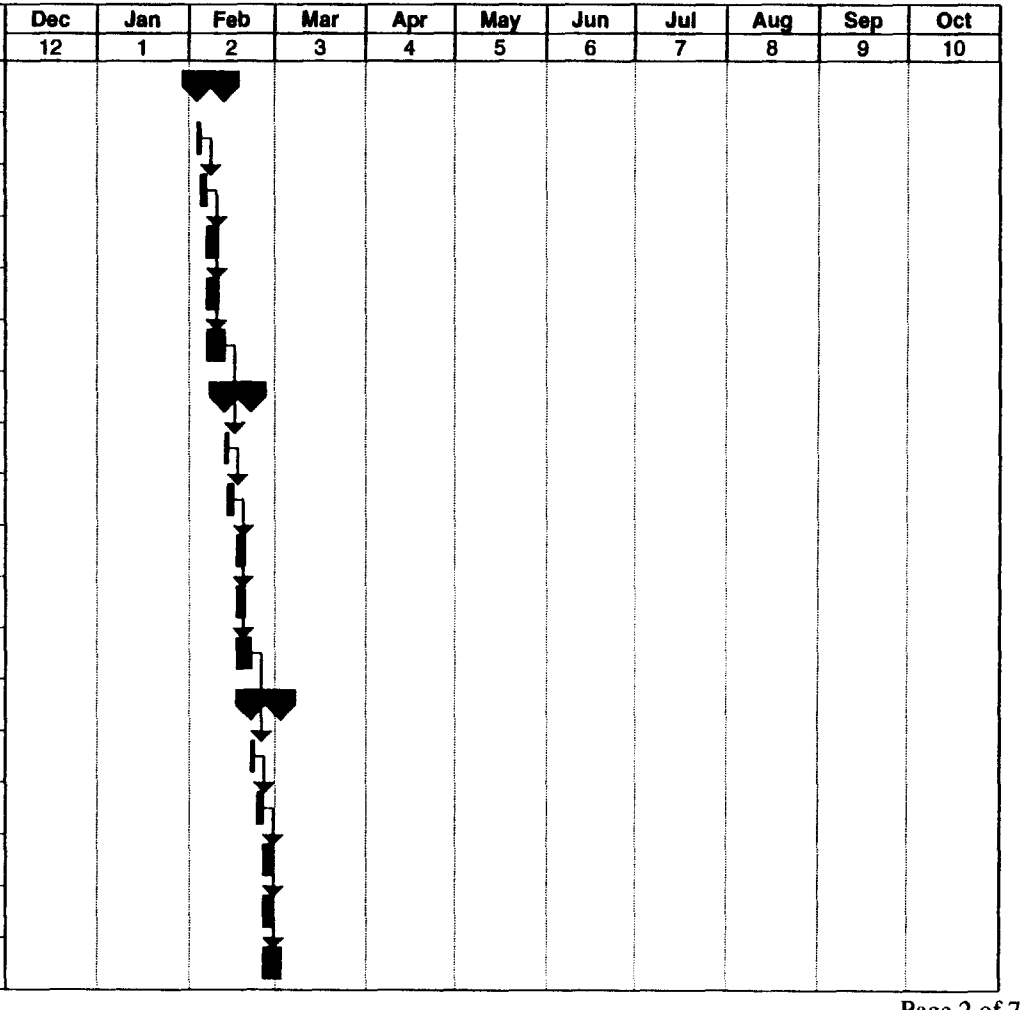
MIS Implementation Schedule

ID	Task Name	Duration
20	**2ND FLOOR**	**8d**
21	INSTALL HUBS	1d
22	WIRE HALLWAYS UTP	2d
23	INSTALL ROOM PANDUIT	3d
24	RECEPTICALS	3d
25	UTP TERMINATION	5d
26	**3RD FLOOR**	**8d**
27	INSTALL HUBS	1d
28	WIRE HALLWAYS UTP	2d
29	INSTALL ROOM PANDUIT	3d
30	RECEPTICALS	3d
31	UTP TERMINATION	5d
32	**4TH FLOOR**	**8d**
33	INSTALL HUBS	1d
34	WIRE HALLWAYS UTP	2d
35	INSTALL ROOM PANDUIT	3d
36	RECEPTICALS	3d
37	UTP TERMINATION	5d



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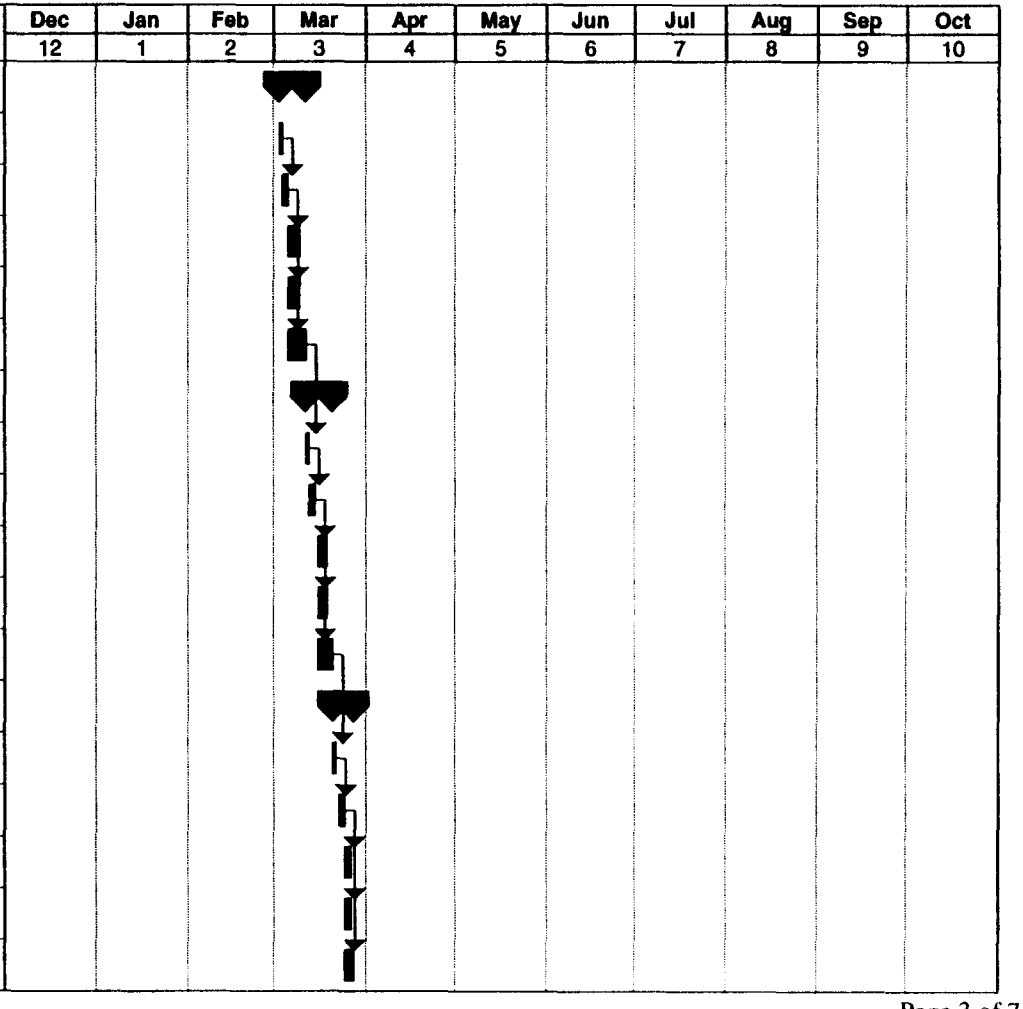
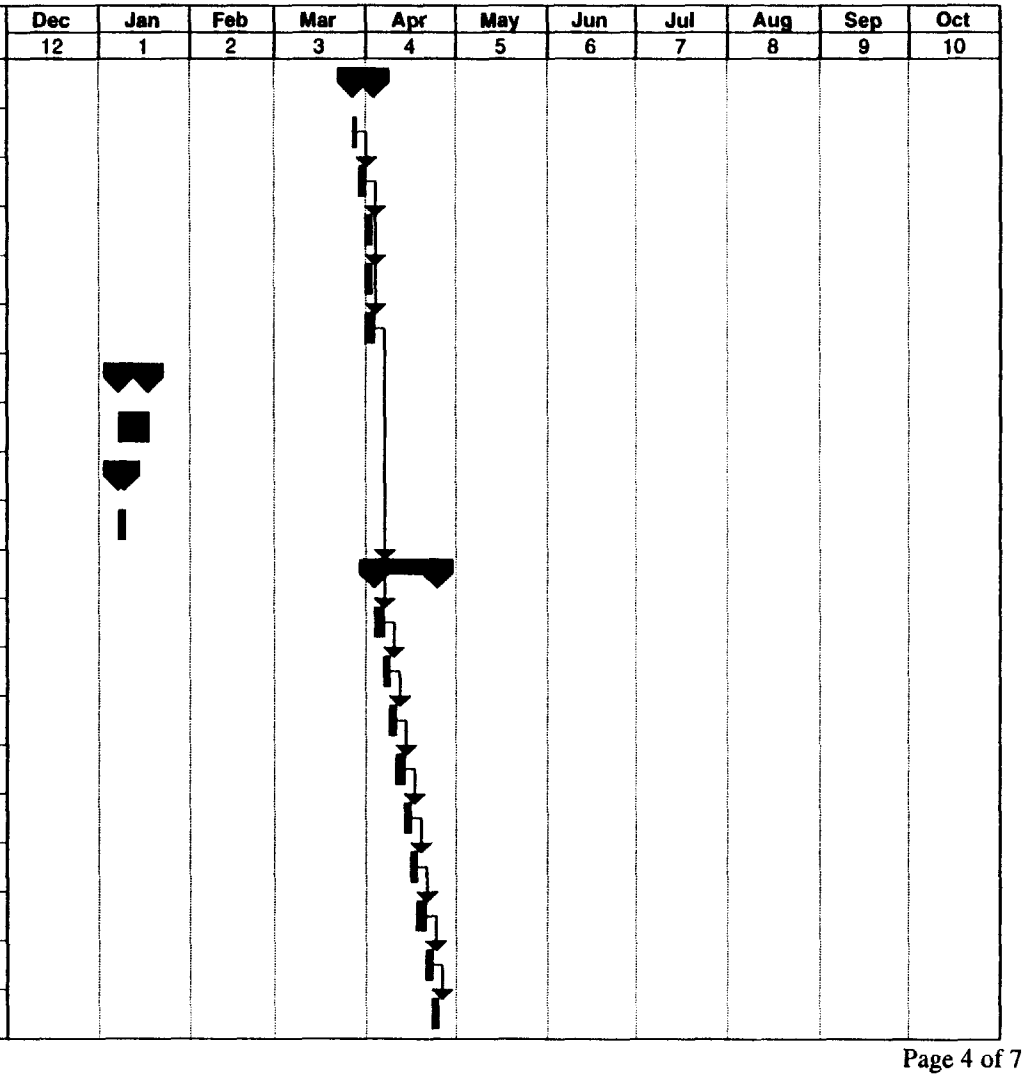
MIS Implementation Schedule (continued)

ID	Task Name	Duration
38	**5TH FLOOR**	**8d**
39	INSTALL HUBS	1d
40	WIRE HALLWAYS UTP	2d
41	INSTALL ROOM PANDUIT	3d
42	RECEPTICALS	3d
43	UTP TERMINATION	5d
44	**6TH FLOOR**	**8d**
45	INSTALL HUBS	1d
46	WIRE HALLWAYS UTP	2d
47	INSTALL ROOM PANDUIT	3d
48	RECEPTICALS	3d
49	UTP TERMINATION	5d
50	**7TH FLOOR**	**6d**
51	INSTALL HUBS	1d
52	WIRE HALLWAYS UTP	2d
53	INSTALL ROOM PANDUIT	2d
54	RECEPTICALS	2d
55	UTP TERMINATION	3d



MIS Implementation Schedule (continued)

ID	Task Name	Duration
56	**8TH FLOOR**	**6d**
57	INSTALL HUBS	1d
58	WIRE HALLWAYS UTP	2d
59	INSTALL ROOM PANDUIT	2d
60	RECEPTICALS	2d
61	UTP TERMINATION	3d
62	**INSTALL MINISTRY SERVERS**	**9d**
63	BURN-IN/INSTALL SERVERS	9d
64	**MODEM INSTALL**	**2d**
65	MODEM TESTING/INSTALL RACK	2d
66	**MINISTRY NETWORK TESTING**	**18d**
67	GROUND FLOOR TESTS/QA	2d
68	1ST FLOOR TESTS/QA	2d
69	2ND FLOOR TESTS/QA	2d
70	3RD FLOOR TESTS/QA	2d
71	4TH FLOOR TESTS/QA	2d
72	5TH FLOOR TESTS/QA	2d
73	6TH FLOOR TESTS/QA	2d
74	7TH FLOOR TESTS/QA	2d
75	8TH FLOOR TESTS/QA	2d



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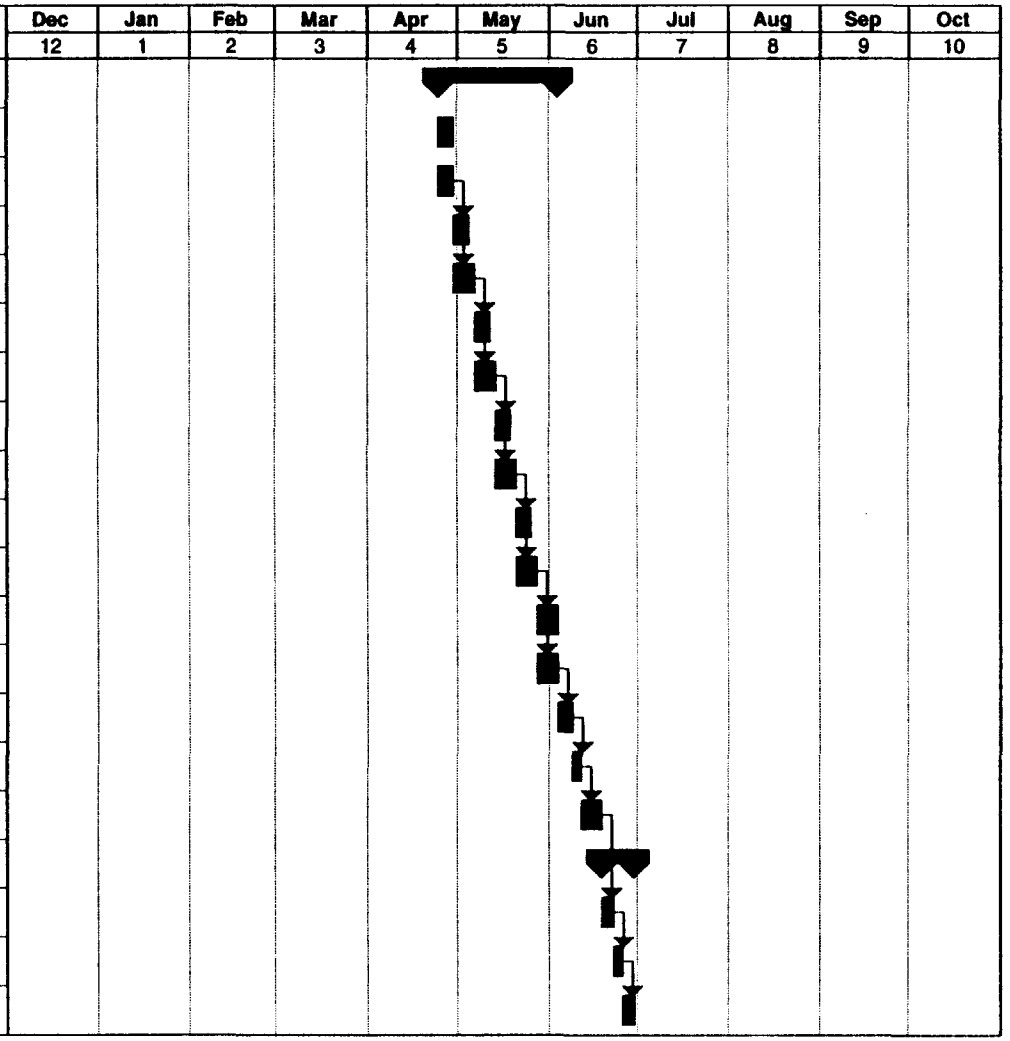
MIS Implementation Schedule (continued)

ID	Task Name	Duration
76	**WAJ GOVERNORATES**	**34d**
77	AMMAN	4d
78	IRBID	4d
79	ZARQA	4d
80	TAFELAH	6d
81	KARAK	4d
82	MA'AN	6d
83	MAFRAQ	4d
84	AQABA	6d
85	MADABA	4d
86	JERASH	6d
87	BALQA	6d
88	AJLUN	6d
89	**WAJ STORES AIN GHAZAL**	4d
90	**WAJ VEHICLE O & M RAS ELAINE**	3d
91	**WAJ LABS BAIADER WADI SEER**	6d
92	**JVA DISTRICT OFFICES**	**9d**
93	NORTH DO-01 NORTH SHOUNAH	3d
94	MIDDLE DO-02 DEIR ALLA	3d
95	SOUTH DO-03 AL JAWASREH	3d



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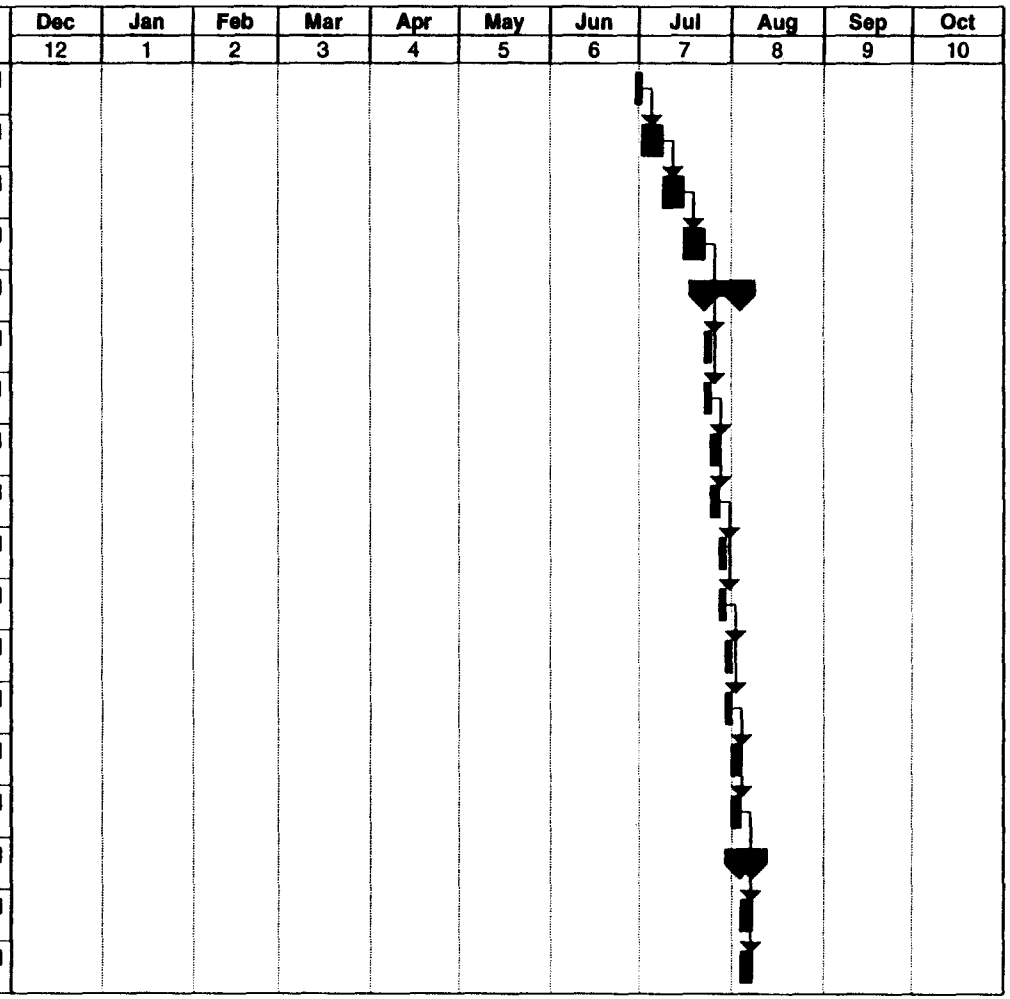
MIS Implementation Schedule (continued)

ID	Task Name	Duration
96	**JVA COMPUTER CENTER DIRAR**	2d
97	**JVA FANNOUSH STORES**	6d
98	**JVA LABS UNIVERSITY FARMS**	6d
99	**JVA DIRECTORATE OF DAMS**	6d
100	**JVA STAGING OFFICES**	10d
101	SO-01 NORTH SHOUNAH	2d
102	SO-02 WADI AL YABIS	2d
103	SO-07 KULAIAT	2d
104	SO-03 KURAIMEH	2d
105	SO-04 AL SAWALHA	2d
106	SO-05 AL ARDA	2d
107	SO-08 DIER ALLA	2d
108	SO-06 THAHRET AL RAMEL	2d
109	SO-10 BATOUS PUMPING STATION	2d
110	SO-09 (FUTURE SITE)	2d
111	**JVA WATER TREATMENT PLANTS**	4d
112	AMMAN ZAI STATION	4d
113	IRBID WADI AL ARAB STATION	4d



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MIS Implementation Schedule (continued)

ID	Task Name	Duration	Dec 12	Jan 1	Feb 2	Mar 3	Apr 4	May 5	Jun 6	Jul 7	Aug 8	Sep 9	Oct 10
114	**JVA WASTE WATER TREATMENT PLANTS**	**6d**											
115	AL KERBEH AL SAMRA STATION	1d											
116	MAFRAQ STATION	1d											
117	AL RAMTHA	1d											
118	IRBID	1d											
119	JERASH	1d											
120	AJLUN	1d											
121	MA'AN	1d											
122	AQABA	1d											
123	TAFELEH	1d											
124	AL KARAK	1d											
125	MADABA	1d											
126	**NETWORK TESTING**	**18d**											
127	OVERALL NETWORK QA	18d											

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MIS Implementation Schedule (continued)

A-2. Summary Listing of Required Hardware/Costs.

Includes costs for cables, connectors, conduit and non-data processing equipment.

ITEM	UNITS	UNIT COSTS	TOTALS
UTP Level 5 Cable	115730	$.088	$10,184.24
Fiber Optic Cable	1600	$1.64	$2,624.00
Coaxial Cable	1640	$.143	$ 234.52
Outside Cable	6300	$1.02	$6,426.00
Panduit Large	0	$2.40	$ 0.00
Panduit Small	17760	$1.4167	$25,160.59
Raceway	17820	$1.4167	$25,245.59
End Caps	632	$.795	$ 502.44
Couplers	2810	$.90	$2,529.00
Low Profile Box	1066	$3.75	$3,997.50
Jack	1066	$3.95	$4,210.70
Right Angle Corners	1112	$.8975	$ 998.02
Outside Corners	283	$.85	$ 240.55
Inside Corners	1177	$.795	$ 935.72
BNC Plugs	136	$1.20	$ 163.20
BNC T Connectors	46	$3.25	$ 149.50
BNC Terminators	34	$2.30	$ 78.20
Drop Ceiling Collars	60	$1.275	$ 76.50
Cable Ties	360	$.1625	$ 58.50
Racks	8	$450.00	$3,600.00
Punch Down Block	59	$18.88	$1,113.92
RJ-11 Jack	61	$10.33	$ 630.13
UPS	34	$167.00	$5,678.00
Surge Protector	196	$21.00	$4,116.00
TOTALS:			$98,952.82

A-3. Summary Listing of Required Network Equipment/Costs.

The following listing includes network hardware internal to the Ministry Building and at geographically separated locations.

ITEM	UNITS	UNIT COST	TOTAL COST
24 Port Hub, type 1	3	$1,295.00	$3,885.00
16 Port Hub, type 2	11	$795.00	$8,745.00
9 Port Hub	2	$399.00	$ 798.00
24 Port Patch Panel, type 1	16	$211.00	$3,376.00
Ethernet Switch	2	$11,395.25	$22,790.50
Modem, External	6	$139.00	$ 834.00
RAID	3	$12,575.00	$37,725.00
Chassis 1	1	$4,745.25	$4,745.25
Environment Modules	1	$2,845.25	$2,845.25
Power Supply 1	1	$3,320.25	$3,320.25
Chassis 2	7	$1,200.00	$8,400.00
Power Supply 2	7	$1,150.00	$8,050.00
Bridge/Router	7	$5,595.00	$39,165.00
10BaseT MMF	7	$245.00	$1,715.00
21 Port 10BaseT MIM	12	$2,795.00	$33,540.00
32 Port Com, LAT	1	$4,650.00	$4,650.00
16 Port Com, LAT	2	$3,365.00	$6,730.00
12 Port HubStack	9	$1,500.00	$13,500.00
24 Port HubStack	3	$2,200.00	$6,600.00
Backup Server	1	$5,930.00	$5,930.00
Server	1	$5,930.00	$5,930.00
Communications Server	1	$3,147.00	$3,147.00
Communications Card	1	$885.00	$ 885.00
Network Laser Printer	12	$1,399.00	$16,788.00
Network Color Jet Printer	13	$499.00	$6,487.00
TOTALS:			$250,581.25

Includes computers, hubs, modems, switches, patch panels and routers.

A-4. Summary Listing of Required Software/Costs.

ITEM	LICENSES	COSTS	TOTAL COSTS
Novell Netware 3.12	17	$1,100.00	$18,700.00
Windows NT for Workstations 3.5 *	55	$288.00	$15,840.00
Pathworks	11	$185.00	$2,035.00
Netware Connect 2	5	$695.00	$3,475.00
Oracle 7 (Multi-processor)	0	$2,500.00	$ 0.00
Oracle 7 (PC)	0	$795.00	$ 0.00
MS Office Professional	203	$0.00	$ 0.00
LanView	1	$3,405.00	$3,405.00
DEC Ultrix	1	$435.00	$ 435.00
Terminal Emulator	14	$185.00	$2,590.00
TOTALS:			$46,480.00

*Note: Average Price Used, price per number of users varies.

A-5. Summary Lisitng of Required Tools.

(Description)	Quantity
<u>Power Tools</u>	
Concrete Saw	1
Cutting Torch	1
Hammer Drill with 12" drill bits	1
Hand drill with masonry bits	1
<u>Manual Tools</u>	
(One for each team, two teams of two technicians)	
Tool Cart	2
Tool Box	2
Gohper Pole	2
Snake (fish line)	2
Mallet & Chisel	2
Heavy duty hammer	2
Tin Snips	2
Assorted screw drivers	2
Measuring Tape	2
Ladders (2 per team)	4
Hot Glue Gun with glue sticks (to stick panduit on fiber materials/wall paper)	2
Crimp Tool with RJ45 and RJ11 die	2
Crimp Tool with circular dies to terminate BNC connectors for coaxial cables	2
Cable stripper to use on coaxial cable	2
(One for each person, two teams of two technicians)	
Electrical Scissors with pouches	4
Level	4
Flashlight	4
Punch down (impact) tool with 110 blades to terminate twisted pair cables to 110 connections	4
<u>Fiber Optic Tools</u>	
Installation Kit	2
Portable Oven (for fiber terminations)	2
Auto Polishing Machine	2

<u>Miscellaneous</u>	
First Aid Kit	2
Cable testing equipment to certify Level 5 twisted pair cables, recommend Microtest Penta-scanner	1
Label maker	1

A-6. Summary Listing of Installation Labor Costs.

Includes labor hours and estimated costs, based on a US installation team.

Labor Category	Hours	Rate	Total
Installation Engineer	1178	$72.00	$84,816.00
Quality Assurance Engineer	1078	$53.00	$57,134.00
Lead Installation Technician	1997	$34.00	$67,898.00
Journeyman Installation Tech.	1997	$29.00	$57,913.00
TOTALS:	6250		$267,761.00

SITE SPECIFIC APPENDICES

APPENDIX NUMBER	TITLE
A-01	MINISTRY
A-02	HQ MWI
A-03	HQ WAJ
A-04	HQ JVA
A-05	UNDP
A-06	WQICP
A-07	AJLUN GOVERNORATE
A-08	AMMAN GOVERNORATE
A-09	AMMAN O&M
A-10	AMMAN STORES
A-11	AQABA GOVERNORATE
A-12	BALQA GOVERNORATE
A-13	IRBID GOVERNORATE
A-14	JERASH GOVERNORATE
A-15	KARAK GOVERNORATE
A-16	MA'AN GOVERNORATE
A-17	MADABA GOVERNORATE
A-18	MAFRAQ GOVERNORATE
A-19	TAFELAH GOVERNORATE
A-20	ZARQA GOVERNORATE
A-21	WAJ LABORATORIES
A-22	WAJ PUMPING STATIONS
A-23	WAJ WASTE TREATMENT PLANTS
A-24	WAJ WATER TREATMENT PLANTS
A-25	JVA DIRECTOR OF DAMS
A-26	DO 01/SO 07
A-27	DO 02
A-28	DO 03
A-29	DIRAR COMPUTER CENTER
A-30	FANOUSH O & M
A-31	JAV LABORATORIES
A-32	SO 01
A-33	SO 02
A-34	SO 03
A-35	SO 04
A-36	SO 05
A-37	SO 06
A-38	SO 07/DO 01
A-39	SO 08

A-40	SO 09
A-41	SO 10
A-42	JVA STORES
A-43	JVA DAMS
A-43	JVA PUMPING STATIONS

APPENDIX A-01

THE MINISTRY of WATER and IRRIGATION (MINISTRY)
MINISTRY BUILDING
AMMAN

1. Organization Information
   a. Organization Name: The Ministry of Water and Irrigation
   b. Organization Belongs to What Ministry: N/A
   c. Organization falls immediately under which organization: As all Ministries in Jordan, the Ministry of Water and Irrigation is directly under the Ministries and Affiliated Departments under the Council of Ministers which is under the Prime Minister.
   d. Location of Organization, Governorate, City, Building (address?): Ministry Building, Amman
   e. Manager of Organization, (Name and Title): His Excellency, Dr. Saleh Rusheidat, Minister of Water and Irrigation
   f. Phone Number of Manager:
   g. Principle Purpose for organization (verbal description of functionality): The Ministry of Water and Irrigation is responsible at the national level for administering water policy and managing water resources in the Hashemite Kingdom of Jordan. Under the Ministry there are three separate agencies that manage water resources across the Kingdom: the Jordan Valley Authority (JVA), the Water Authority of Jordan (WAJ), and the Ministry of Water and Irrigation (MWI).

2. Facility Information
   a. Name of Building (Address?): Ministry Building, Amman, Ground Floor to 8th Floor
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30-amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as UPS equipment will be available at the 4th floor server room and at critical network nodes.
   d. Facility Construction: 9 story reinforced concrete and concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: Yes (during office hours)
   h. Qualitative assessment of dust: Low to Moderate
   i. Changes to Facility: N/A

3. Hardware

a. Description of existing hardware at site:

The MWI, which includes the WQIC Project Staff, the UNDP Project Staff and a small additional number of Ministry officials, have the most extensive level of automated support in terms of available equipment for the number of personnel of the three independent agencies.. The WQIC Project at the time of data collection for the baseline data, had 28 IBM compatible PCs, with 80386/80486 or Pentium based processors. In addition, there were 4 Apple Macintosh systems. External to the Ministry Building are 5 Apple Macintosh systems at the Jordan Environmental Society. The WQIC Project has four additional Apple Macintosh systems at the Jordan Environmental Society. The systems are networked using Novell 3.11. There are a variety of printers installed. There are two network printers designated, a Mannesmann Tally laser printer and a Hewlett Packard color inkjet printer. Specific equipment configurations can be reviewed using the equipment database developed for this task and included on disk at the back of this report. The database was developed using Microsoft Access 2.0. The UNDP Project Staff has 10 IBM compatible PC systems. GTZ has two IBM compatible PCs, that can be connected to the UNDP network. The UNDP systems are networked using a Novell 3.11 based LAN. Printers under UNDP control are connected directly to host computers and are not network shared.

b. Description of existing network at site: The Ministry Building currently has six small to medium sized networks installed. There are three Novell 3.1x networks, two Data General MV 2000 based networks and one DEC Alpha based DECNet. Several personal computers, especially in the WAJ have Network Interface Cards (NICs) installed but are not connected to a network. There is no consolidated network wiring scheme or coordinated approach to maximize the use of existing equipment.

The Ministry Building currently has six small to medium sized networks installed. There are three Novell 3.1x networks, two Data General MV 2000 based networks and one DEC Alpha based DECNet. Several personal computers, especially in the WAJ have Network Interface Cards (NICs) installed but are not connected to a network. There is no consolidated network wiring scheme or coordinated approach to maximize the use of existing equipment.

The WQICP network is on an IBM Pentium Sever (60 Mhz) running Novell 3.11. The server has 32 MB of RAM and a two 530 MB hard disk drives. The sever is located in general office space in room 223. The server is connected to an APC 400 Uninterruptable Power Supply (UPS). The physical network is uses a star configuration with three 3COM Link Builder FMS II, 48 port intelligent hubs attached to the server. Cabling consists of UTP Level 5 and 4 cable terminating in surface mounted receptacles in the WQICP occupied hall of the Ministry Building. There are 28 IBM compatible personal computers on the network and 4 Macintosh systems. The IBM systems have ethernet NICs with RJ-45 physical interfaces. The Macintosh's are connected through an Appletalk adapter. There are three network printers, HP Laser Jet III, a Mannesmann Tally laser printer and an IBM Colorjet printer. The network printers are connected to the network through three D-Link 950 print servers. Other printers are available, however,

these printers are directly attached to personal computers located in the several offices and in general are not shared devices. The server also is host to Lotus Notes, version 3.2. The UNDP network is based on an IBM PS/2 (80386/20) personal computer using Novell 3.11 for the network operating system. The server had 8 MB of RAM and a 300 MB hard disk drive. The server also had Lotus Notes version 3.2 loaded. The server is located in general office space in room 223 and is connected to an UPS, no brand or capacity markings. The physical network is an ethernet bus, using RG 58 coaxial cable with T-connectors for NICs installed in personal computers attached to the network. There were 9 IBM compatible personal computers attached to the server at the time of the server. In addition, there are two IBM compatible personal computers owned by GTZ that can be and have been attached to the server in the past. One IBM compatible personal computer on the seventh floor has been attached to the UNDP server at various times, based on work requirements. No network printers were attached. Printers in use were directly attached to client personal computers.

The WAJ Novell network is based on a Zenith Server LT (80486/66) tower, using Novell 3.11 for the network operating system. The server is located in general office space in room 430. The server has 32 MB of RAM and 3.2 GB of hard disk drive space. The server had a Reflections Write Once Read Many (WORM) optical disk storage device attached. In addition, the server had a 500 MB internal tape drive for performing network backups. The physical network consisted of RG 58 coaxial cabling to four hubs from the server, then UTP (level of UTP could not be determined) links from the hubs to client work stations. No surface mounted receptacles were used. There were 19 IBM compatible personal computers physically connected to the server at the time of baseline data connection. There were 19 personal computers with NICs installed that were not part of the network. Most NIC cards were Eagle NE2000s, with RJ-45 and coaxial cable connections. The network hubs were Hewlett Packard (HP) hubs with 24 ports each. HP hubs were located in rooms 438, 503, 3 and 619. The hub in room 503 was to be moved in the near future to room 539. No designated network printers were attached at the time baseline data was collected. Several printers were attached to individual client systems.

The WAJ DECNet network is hosted on DEC Alpha 710 processor, using Open VMS release 1.0 as the operating system. A smaller UPS system is being purchased for the DEC Alpha. At the time the baseline data was collected, the DEC Alpha was connected to two DEC 100 hubs on the fourth floor, one DEC 100 hub on the ground floor, two Equinox hubs, one on the fourth floor and one on the fifth floor?. Nineteen terminals and two IBM compatible personal computers (using software terminal emulation) were attached to the DEC Alpha. The DEC Alpha also had three Gandolf bridges attached to Modems for dial out/in connectivity to the Governorates of Amman, Irbid and Zarqa. The DEC Alpha is located on the fourth, in the computer room at the end of the east wing. The serial cabling is used between the hubs and the terminals. The cabling has been spliced in several instances, joining two strand flat cable to four strand round cable with two strands shorted. Cabling between the DEC Alpha and the hubs is over serial cable. Kermit software is used as the communications software between the DEC Alpha processor and VAX equipment in the Amman, Irbid and Zarqa Governorates. At the time of the baseline data collection, there were three printers attached to the DEC Alpha. The

printers, a Mannesman Tally MT 651, CITOH Line Printer and an Epson LQ 1170 were located in room 436.

The JVA network that hosts personnel and related records resides on a Data General MV 2000 system, using AOS as its operating system. The MV 2000 is located in general office space in room 318. At the time of baseline data collection there were 10 Opus 220 terminals directly attached to the MV 2000. The terminals were networked to the MV 2000 using serial cables.

The JVA network that hosts the land acquisition records resides on a Data General MV 2000 system, using AOS as its operating system. The MV 2000 is located in general office space in room 333. The terminals were networked to the MV 2000 using serial cables. The MV 2000 also had Multitec 212E, 9600 baud Modem attached, with dial out/in capability.

c. Description of existing external communications links (data) at site: Multitec 212E, 9600 baud dial-up modems

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: data on Subscriber Billing/Water Usage, Personnel, Payroll, Budget, Accounting, Loans, Land Acquisition, O & M, and Stores.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom):): Data flow internal to each organization combines electronic formats, hard copy out put and hand written data.

c. Description of automated reports accomplished by site (size, frequency, to whom): The known current electronic data exchange between WAJ locations is limited to the Ministry Building and the Governorates of Amman, Zarqa and Irbid. The data exchanged is dominantly software maintenance related. Routine passing of data does not occur.

There is a continuous flow of data between the RTUs and the computer center at Dirar to monitor the water flow in the KAC. This data flow may be of interest to managers in the Ministry Building. The capability exists to request or transmit data from any location to another location using existing Modems and their dial in/out capabilities. This capability is exercised to a limited extent by personnel working with the JVA personnel and payroll systems and the land acquisition systems. This capability is used irregularly for administrative purposes. No reliable data transmission quantities are available for this function.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended detailed design of the Unified MIS for the Ministry Building is a common physical network that will support all agencies residing in the Ministry with a robust and flexible communications architecture. The recommended design is robust in that it provides connectivity for the currently installed equipment and recommended new equipment. It provides LAN communications at speeds of 10 Mbps, and without replacement of the cable plant, will support speeds of 100 Mbps. It is robust in that the design provides access to the network for all rooms that are used for Ministry office space or management functions. The design is flexible because regardless of changes in the use of a particular office or movement of personnel from office to office in the Ministry Building, access to each agency's server can accomplished by changing network addresses in software or moving a patch cord in a communications closet. The recommended physical network is based on a twenty four pair, multi-mode fiber optic backbone, with horizontal cable runs of Unshielded Twisted Pair (UTP) Level 5 cable. Space for network equipment will be required in the computer room on the fourth floor and in rooms adjacent to the central electrical shaft located in the central stairwell. The rooms required are small and normally used to store administrative equipment or supplies. Even though the design provides a common physical network, each agency within the Ministry will retain access and control over its own file servers and data automation equipment.

The fiber optic cables will be terminated in an ethernet switch which provides for switching and routing of network signals to the correct network server or the DEC Alpha which is collocated in the computer room. Attached to the switch will be four servers, one each for the MWI, WAJ and JVA and one communications server. Also attached to the switch will be the DEC Alpha computer. This will enable WAJ personnel with terminal emulation software on their PCs to communicate through the switch to the DEC Alpha. The communications server will provide external communication services to all Ministry networks through and attached modem next consisting of six modems. This modem nest can be expanded if additional lines are required. In addition, a back up server will be located in the computer room. It will be sized so that it can perform the server function of any of the three Novel networks. It will not be a backup to the DEC Alpha processor. Each of the agency servers will have Redundant Array of Inexpensive Disks (RAID) attached through a SCSI interface. The RAID equipment will provide a duplicate copy of each server configuration and data files to which it is attached. If the primary server of any agency fails, the RAID equipment will be switched to the backup server and the backup server will be attached to the ethernet switch in place of the failed server. This provides reliability at low cost and ensures very limited down times in cases of a server failure. Each of the servers will be connected to a UPS.

Twenty four strand, multi-mode fiber optic cable will be used to connect the fourth floor computer room with seven communications closets located on floors one through seven. The fiber cables will be run in the false ceiling space down the hallway to the central electrical conduit shaft in the central stairwell. The wall of the central electrical conduit shaft will be penetrated and fiber optic cables will be run in conduit in the shaft to the communications closets. In the communications closets the fiber optic cable will be

terminated in a fiber optic patch panel in a 19 inch equipment rack. The fiber optic patch panel will be connected to collocated intelligent hubs mounted in the equipment rack. Cabletron intelligent hubs are recommended for use in each of the communications closets. The hubs proposed will be of two types. The first will support ethernet networks such as Novell and the second will provide support to terminal users of equipment such as the DEC Alpha or Sun Sparc systems.

Horizontal cable runs from the communications closets will be made UTP Level 5 cable. Each office will have a minimum of two network receptacles installed. Some rooms, depending on use will have additional drops for network printers or additional terminals. Although each office will have multiple access points, not all rooms will be equipped with terminals or computers. Ministry management will decide which rooms will have what equipment. Equipment (terminals and computers) will be attached to the network receptacles with short UTP Level 5 patch cords with eight pin modular jacks. Connection adapters will be used where necessary to attach D-Pin connections to the modular jacks.

It is recommended that each wing of the Ministry Building on floors two through seven will have a print server with two printers, a high quality laser printer and a color ink jet printer. It is recommended that only one wing on the first floor have a print server with two printers. The recommendation will provide for better print quality support and reduce the overall number of printers throughout the Ministry Building. Excess printers will be reused in the JVA and WAJ remote from the Ministry Building. Key support locations such as Secretary Generals' offices will need to retain their printers attached to their support personal computers. Printers for the DEC Alpha will remain, but they will receive their print files over the common building network. Specialized printers/plotters will remain attached to their current supporting computers. Not all printers will be removed from each of the individual offices. However, it is anticipated that twenty to twenty five reusable printers can be made available to other locations with the implementation of this architecture.

The MWI currently has two networks within the Ministry Building which operate independently. One network is based on an IBM Pentium personal computer and is used for administrative, project management and development activities for the WQIC Project and MWI Secretary General administrative support. The network uses Novell 3.11 for an operating system and has approximately 30 clients and three network printers. The second network is the UNDP network and is hosted on an IBM 80386 personal computer. This network supports the UNDP group and has nine personal computers attached to the server. The server uses Novell 3.11 as its network operating system.

The recommended design for the MWI Ministry Building network moves all internal networking to the Ministry Building common network. The design recommends consolidating the WQIC Project network and the UNDP network onto one server. The recommended server location is in the 4th floor computer room, collocated with other Ministry servers and the communications server. The recommended server for the MWI network is a Pentium based, 90 Mhz, IBM compatible personal computer with 64 MB of memory and 3 GB of hard disk drive space. The system will also have an internal 500 MB backup tape drive. The recommended network operating system is Novell 3.12. The current WQIC server should be reused as a Lotus Notes server. The configuration for this

reused server would include changing its operating system to IBM's OS/2 and including the Lotus Notes server as a part of the MWI network.

Existing personal computers in the WQIC Project and the UNDP network are recommended for memory upgrades or replacement. One personal computer in the WQIC and five in the UNDP are recommended for replacement by installation of five 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. In addition, 20 personal computers in the WQIC Project and UNDP are recommended for memory upgrades to bring them to 16 MB of memory per system.

Communication external to the Ministry Building will be through the collocated communications server in the 4th floor computer room.

The recommended solution is to locate the MWI server in the 4th floor computer room. Locating the server (or any server) in the 4th floor computer room provides many advantages. The computer room is designed to support computer systems and has more than adequate power, air conditioning and backup power. The computer room provides physical security in that it can be locked, there is limited access to the equipment and risk of inadvertent damage to equipment by normal office traffic and cleaning crews is reduced. If trouble shooting a network is required, it is easier to accomplish it from a central location where most of the network hardware is concentrated. Normal management actions by the Local Area Network Administrator is normally performed remotely from the server from the Administrator's workstation, further reducing traffic in an around the server. The recommended configuration provides a backup server that can be used to replace any of the Novell servers in the computer room. Security of data and information on the network is mostly a function of security within the network operating system and is accomplished by defining each user's access authorities, rights and privileges. It is controlled through log in scripts, passwords and the system administrator

The WAJ currently has two networks within the Ministry Building which operate independently. One network is based on a DEC Alpha 710 system and is used for subscriber billing, a geographical data system, development and administrative purposes. The second network provides administrative support for engineering, software development and design activities. The second network is based on a Zenith server, using Novell 3.11 as a network operating system. There are approximately 17 personal computers attached to the Zenith server. Some of the 17 personal computers are also connected to the DEC Alpha 710 system and use terminal emulation software to interact with the DEC system. HQ WAJ has 47 additional personal computers not attached to either network, but many do have ethernet cards and could be attached if cabling and hubs were available.

The recommended design for the WAJ Ministry Building network moves all internal networking to the Ministry installed common network. The design recommends moving the Zenith server to the 4th floor computer room from its current office location. Current network cabling should be removed after the common network is installed. The recommended design removes the current hubs and reuses them in other locations such as the Governorates and/or other WAJ offices. The server network operating system will be upgraded to Novell 3.12 and include a 100 user license. The DEC Alpha will be connected via an ethernet connection the an intelligent hub that supports the Novell

server. This will allow personal computers attached to the Novell server to use terminal emulation software and attach to the DEC Alpha system as required. Network printers will be installed in one room in each wing of the Ministry Building to support network print requirements. The Novell server will have Netware Connect 2 installed to provide remote access to WAJ Network server.

Of the 64 personal computers in the WAJ offices, 43 are recommended to have memory upgrades to 16 MB of system memory. This will extend the life of the systems and make them more responsive. An additional five personal computers are recommended for the WAJ functions. Four of these systems are 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. One system to be used in conjunction with software development activities is a Pentium based personal computer, operating at 90 Mhz, with 16 MB of memory and 1 GB of hard disk storage. Four of the older personal computers (80386 machines) replaced by the newer equipment will be reused as print servers for the network printers.

Access to the HQ WAJ network for remote offices to the Ministry Building will be through the Ministry communications server which will be collocated in the 4th floor computer room.

The JVA currently has two networks within the Ministry Building which operate independently. Each network is based on a Data General MV 2000 using AOS as its operating system. One network provides support for the JVA personnel and payroll functions. The second network provides support for JVA's land acquisition activities. Three standalone personal computers are also owned by JVA. The Sun Sparc workstation currently being used at the Dirar Computer Center to migrate software from the Oracle 5 environment to a Oracle 7 environment will be transferred to HQ WAJ and be used for the personnel and payroll functions.

The recommended design for the JVA Ministry Building network moves all internal networking to the Ministry Building installed common network. The design installs a single server in the 4th floor computer room, which will be the central component of the JVA network. The Sun Sparc workstation will be a node on the network and will be accessible by terminals installed on the network and by selected personal computers with terminal emulation software. The JVA functional area will have two network printers installed to support printing requirements.

The recommended server for the JVA network is a Pentium based, 90 Mhz, IBM compatible personal computer with 64 MB of memory and 3 GB of hard disk drive space. The system will also have an internal 500 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the JVA Laboratory or the Director of Dams and Irrigation facilities. The server will also be connected to the communications server for the Ministry Building which will provide the external access to remote clients. The design requires the installation 17 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP Level 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The 17 personal computers will have the latest version on Microsoft's Windows operating system and an

Arabized version the Microsoft's Office Professional software suite. Five of the personal computers will have terminal emulation software that will allow operation as a Unix terminal working with the Sun Sparc workstation. The three existing personal computers will have ethernet cards installed and be connected to the network.
The Data General MV 2000 systems will be discarded. The current programs will need to be migrated to the Sun Sparc workstation and to the Novell server. This will require the personnel, payroll and land acquisition systems be migrated. The recommended migration path is to use Oracle 7 for Unix on the Sun Sparc workstation (personnel and payroll) and Oracle 7 for networks on the Novell server (land acquisitions).

b. Site Unique Risks (Technical or Security):

c. Proposed Schedule: 3 month plus 3 weeks for QA and testing

d. Schematic of site (old and new equipment): see floor layout drawings

e. Listing of Recommended Equipment: 1 Pentium software development platform and 4 486s plus memory upgrades to 43 PCs (WAJ); 1 Pentium and 17 486s (JVA); and, 1 Pentium server and 5 486s (MWI).

f. Listing of Recommended Software: The recommended network operating system is Novell 3.12. The servers will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices. Personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite.

g. Equipment/Software Cost Estimate: $ 260,853.78 (for the Ministry Building only, Priority 1, 2, and 3 equipment included). Costs for all phases and priorities of the MIS Project (Ministry Building, and all MWI, JVA, and WAJ sites): $1,089,903.74

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 155,636.00 78 (for the Ministry Building). Costs for all phases of the MIS Project (Ministry Building, and all MWI, JVA, and WAJ sites): $267,754.50

(3) Training: see Chapter 5

MWI PROJECT SUMMARY

DETAILED ENGINEERING PLAN

COMPONENT	PRIORITY 1	PRIORITY 2	PRIORITY 3	PRIORITY 4	TOTALS
Ministry Building Network	$ 235,708.78	$ 16,788.00	$ 8,357.00	$ -	$ 260,853.78
MWI (Little Ministry)	$ -	$ 10,596.00	$ -	$ -	$ 10,596.00
Jordan Valley Authority	$ 116,957.36	$ 25,715.25	$ 28,307.96	$ 59,577.48	$ 230,558.04
Water Authority of Jordan	$ 85,666.64	$ 136,879.46	$ 235,998.84	$ 129,350.98	$ 587,895.92
Totals	$ 438,332.78	$ 189,978.70	$ 272,663.80	$ 188,928.46	$ 1,089,903.74
Rolling Totals	$ 438,332.78	$ 628,311.48	$ 900,975.28	$ 1,089,903.74	

Priority 1 Current, ongoing operational support, with ADP or Core Functions
Priority 2 Current, ongoing, administrative support to operations using ADP
Priority 3 No current ADP support, site operational, site supports direct operations
Priority 4 No current ADP support, future operational or support site, administrative support to operations

Labor Summary	Hours Ministry	Hours MWI	Hours JVA	Hours WAJ	Hours Total	Cost
Installation Engineer	656	247	64	212	1178	$ 84,830.40
Quality Insurance Engineer	676	127	64	212	1078	$ 57,144.60
Lead Installation Technician	1152	13	245	587	1997	$ 67,881.00
Journey Man Installation Tech.	1152	13	245	587	1997	$ 57,898.50
TOTALS:	3636	399	618	1596	6249	$ 267,754.50

Cable Run Calculation Table

Todays Date:		Aug 23, 95	
Conversion Rate:	$	1.37	Dollar to JD
	$	0.69	JD to Dollar

ROOM COUNT FOR WMI

FLOOR	South Wing	North Wing	Existing Systems	Terminals
GROUND	18	11	4	5
FIRST	18	10	3	3
SECOND	27	19	40	
THIRD	25	19	3	12
FOURTH	25	13	27	15
FIFTH	24	16	10	
SIXTH	25	18	5	
SEVENTH	6	19	20	
EIGHTH	11	7	2	
SUBTOTALS	179	132	114	
GRAND TOTALS		311		

RJ-45 CONNECTORS

Connections for terminals	2
Patch cords	2
Line to Patch Panel	-
Total Per Drop	5
Subtotal Per System	2970
Margin	110
GRAND TOTALS	3080

HORIZONTAL RUNS DOWN HALLWAYS

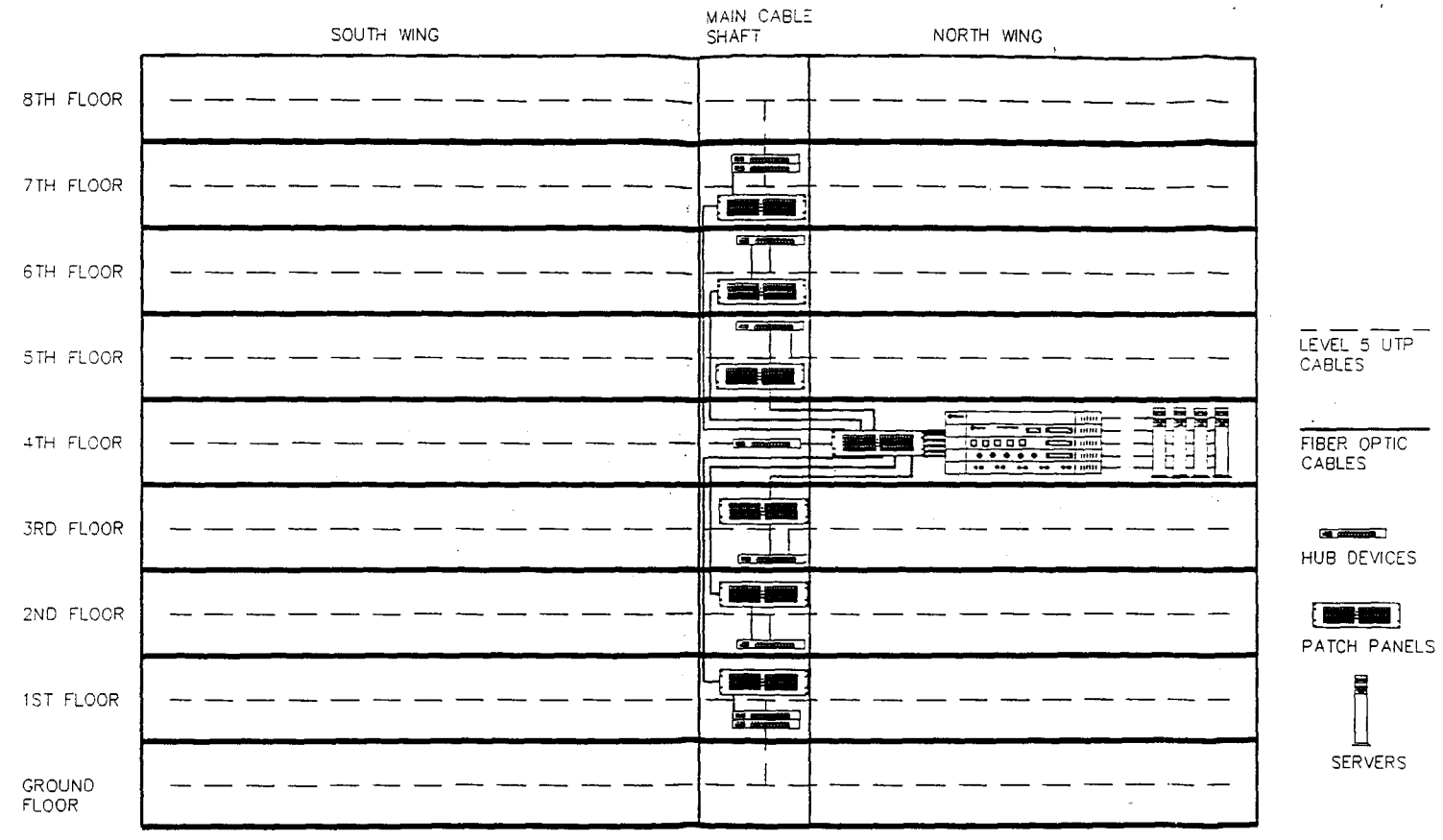
FLOORS	Shaft Out (ft)	Hall Run (ft)	Outlets	Totals	Notes
Floor 8 S	50	50	3	300	
Floor 8 N	24	91	14	1610	
Floor 7 S	50	25	15	1125	1 run to back c
Floor 7 N	24	35	34	2006	
Floor 6 S	50	43	50	4650	
Floor 6 N	24	35	34	2006	
Floor 5 S	50	43	48	4464	
Floor 5 N	24	35	26	1534	
Floor 4 S	50	43	48	4464	
Floor 4 N	24	35	22	1296	
Floor 3 S	50	43	44	4092	
Floor 3 N	24	35	36	2124	
Floor 2 S	50	43	50	4650	
Floor 2 N	24	35	36	2124	
Floor 1 S	50	43	36	3348	
Floor 1 N	24	35	18	1062	
Ground Floor S	50	43	32	2976	
Ground Floor N	24	35	18	1062	
Plus 30 for options(included)			594	44895	
				65900	

EACH DROP AVERAGES 25 FT

TOTAL FOR CABLE RUNS TO WALL DROPS	14850
GRAND TOTALS FOR HALLS AND DROPS	80750
COST LEVEL 5 CABLING	$ 7,106.00

FIBER OPTIC				
	FROM COMPUTER ROOM		675	
	DOWN SHAFT 4TH FLOOR		425	
	UP SHAFT		250	
	DOWN SHAFT		250	
			1600	
	ST Connectors	$	1,338.00	
COST OF FIBER OPTIC RUN		$	3,962.00	
CABLE TRAYS				
	Raceways	17820	$ 25,245.00	Raceways
	End Caps	594	$ 458.87	Conduit
	Inside corners	594	$ 458.87	Cable Tray
	Couplers	1485	$ 1,336.50	
	Jack Box/Jack	594	$ 4,573.80	
	Inside Corners	594	$ 458.87	
	Right Angles	594	$ 504.90	
	Outside Corners	149	$ 94.99	
	TOTALS:		$ 30,736.53	
SUMMARY OF COSTS		$	61,028.51	IN JD
		$	41,804.53	IN US $
RANGE OF INSTALLED COSTS				
	LOW	$	66,887.25	
	HIGH	$	83,609.06	

147



MWI BUILDING
SIDE VIEW

Science Applications International Corporation
670 West Highway 36, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
7/19/95	MWIFIBER.DWG	--

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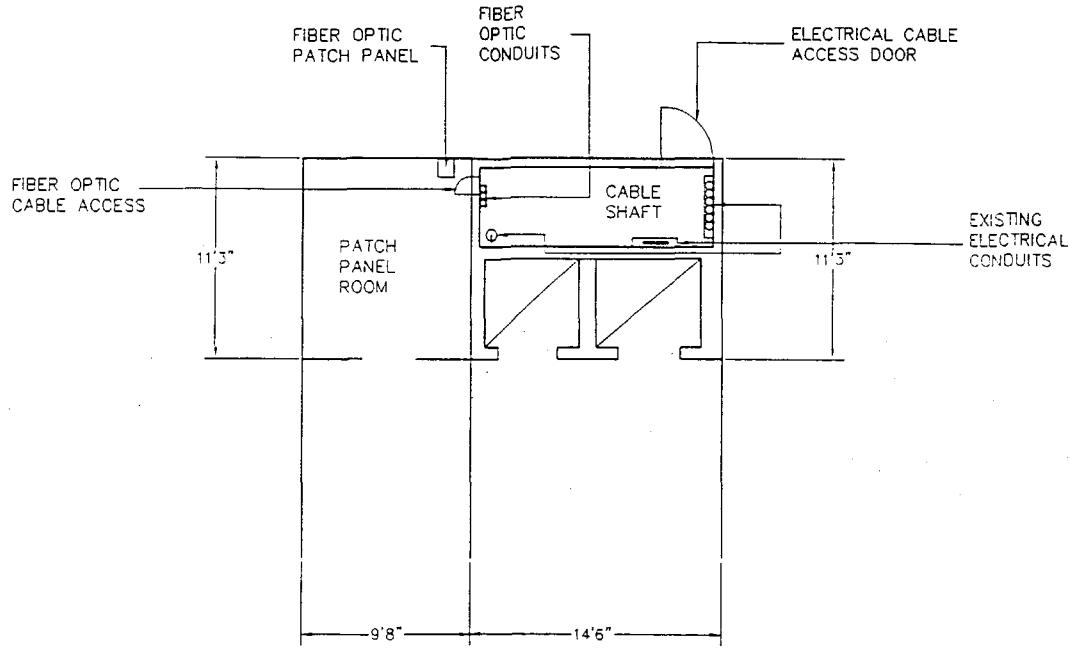


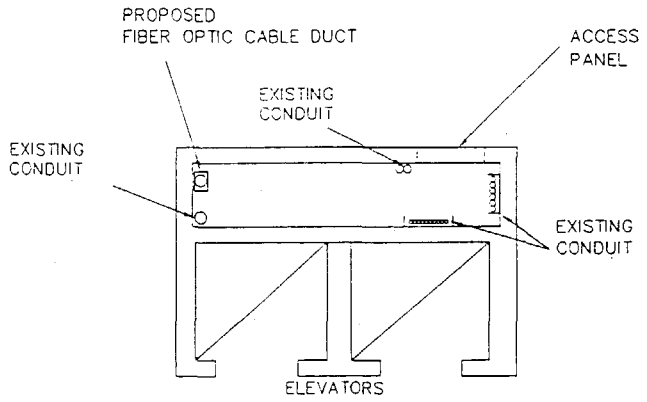
MINISTRY BUILDING
PATCH PANEL ROOM/
FIBER OPTIC CABLE SHAFT

Science Applications International Corporation
619 West Highway 50, O'Fallon IL 62269

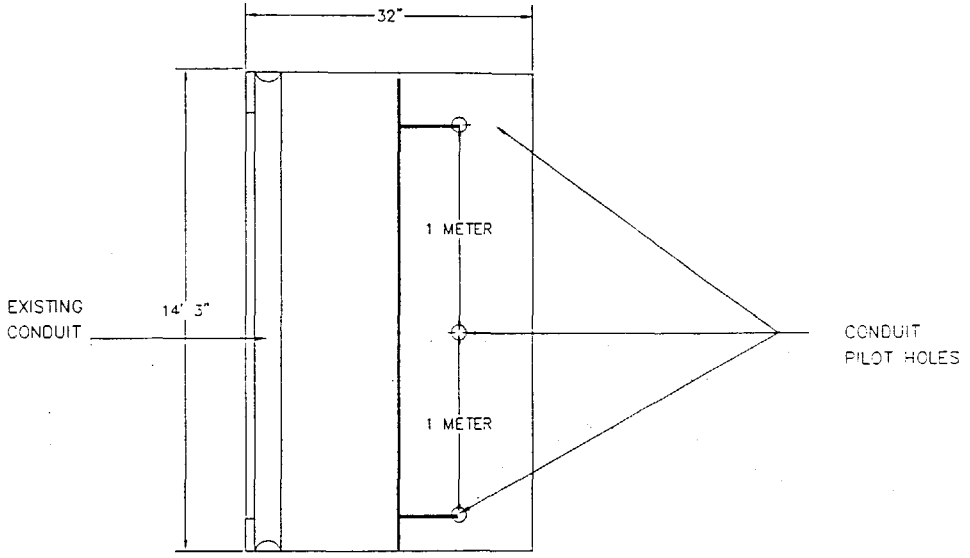
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
8/04/95	PPANELRM.DWG	--

SCALE | SHEET 1 OF 1



TOP VIEW



INSIDE VIEW

FIBER OPTIC CABLE RUN

CABLE SHAFT DETAIL

Science Applications International Corporation
810 West Highway 50, O'Fallon, IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	JOB NO.	REV
7/19/95	SHAFT.DWG	--

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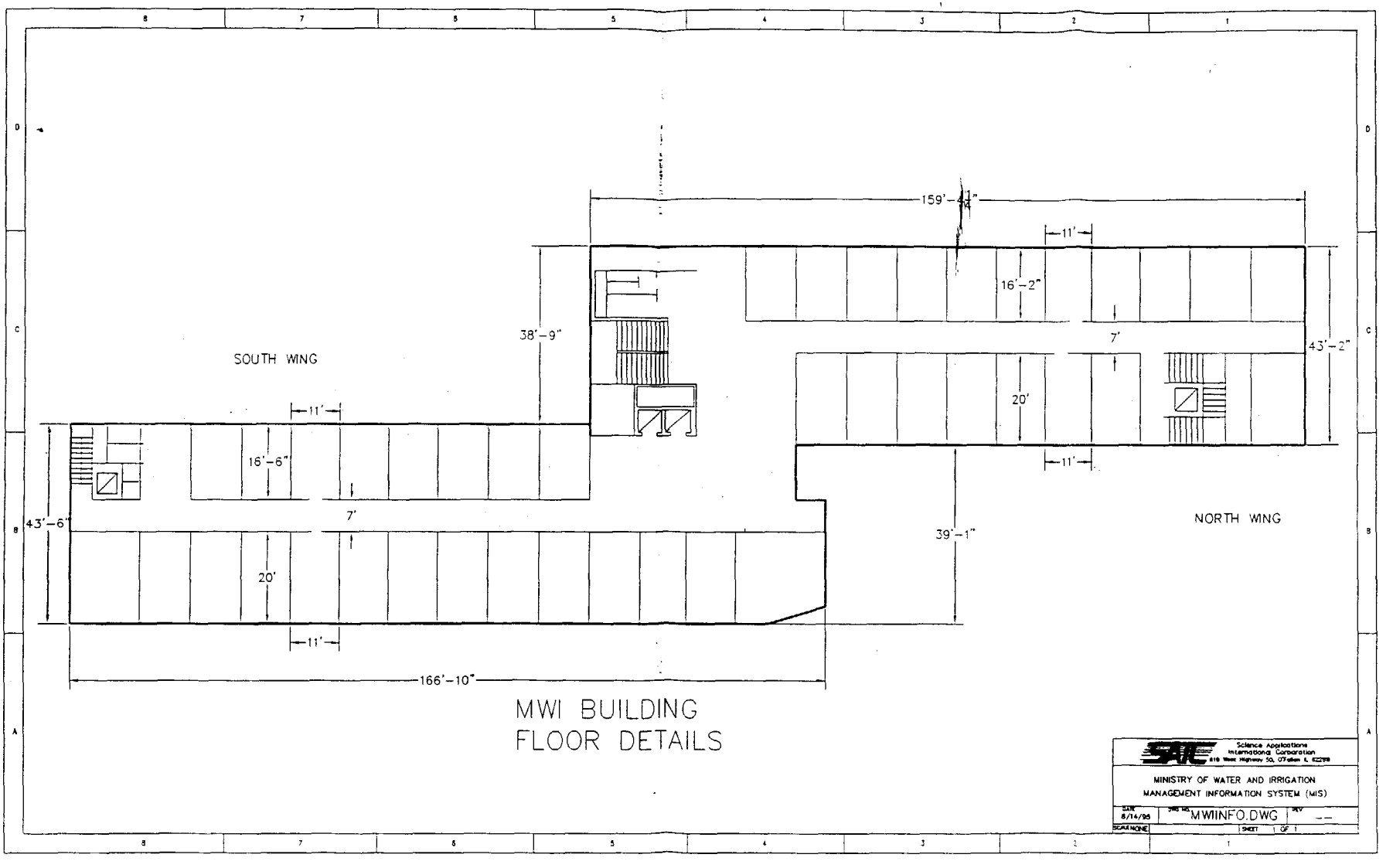

MWI BUILDING
FLOOR DETAILS

Science Applications International Corporation
818 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO	REV
8/14/95	MWIINFO.DWG	--

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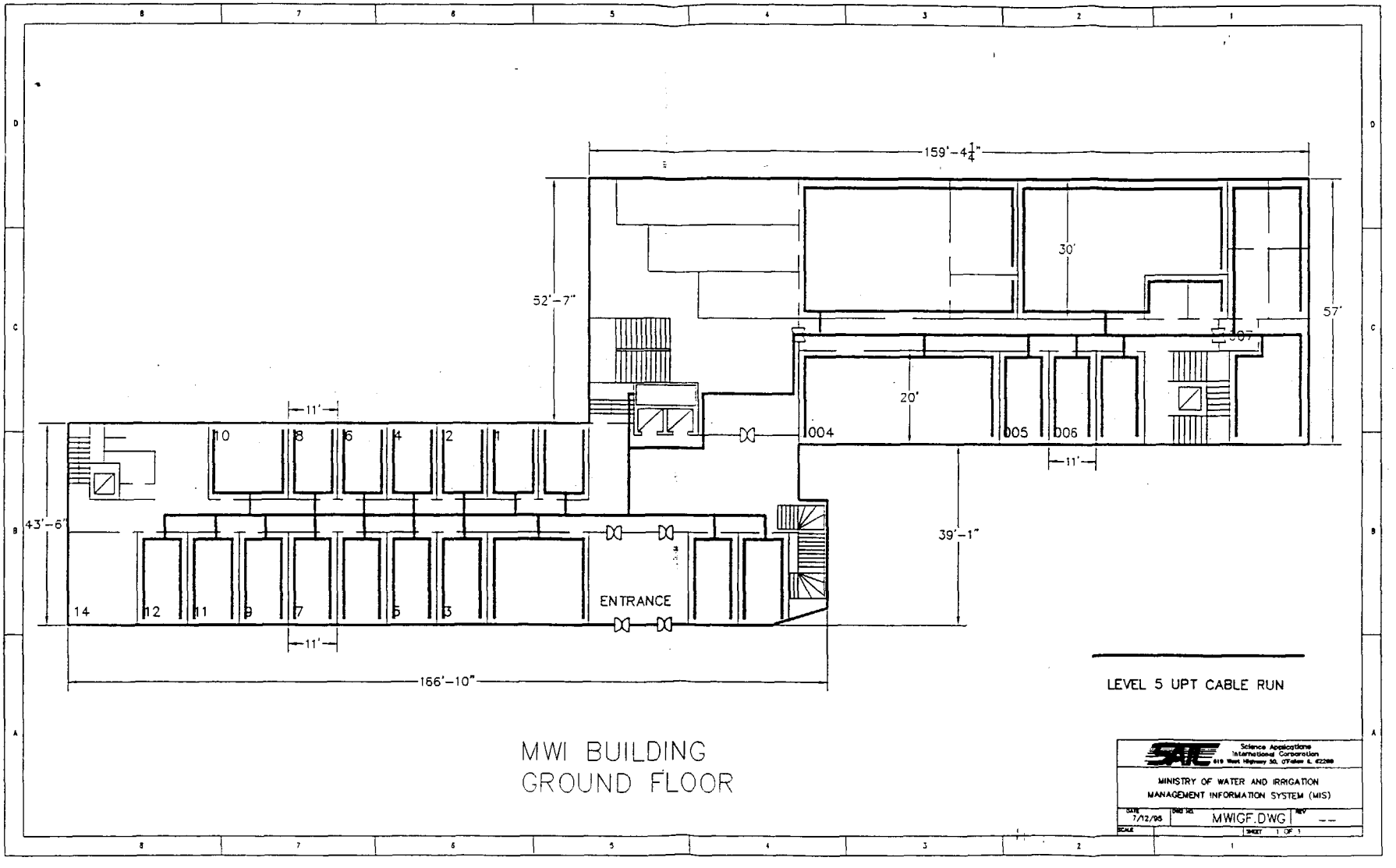
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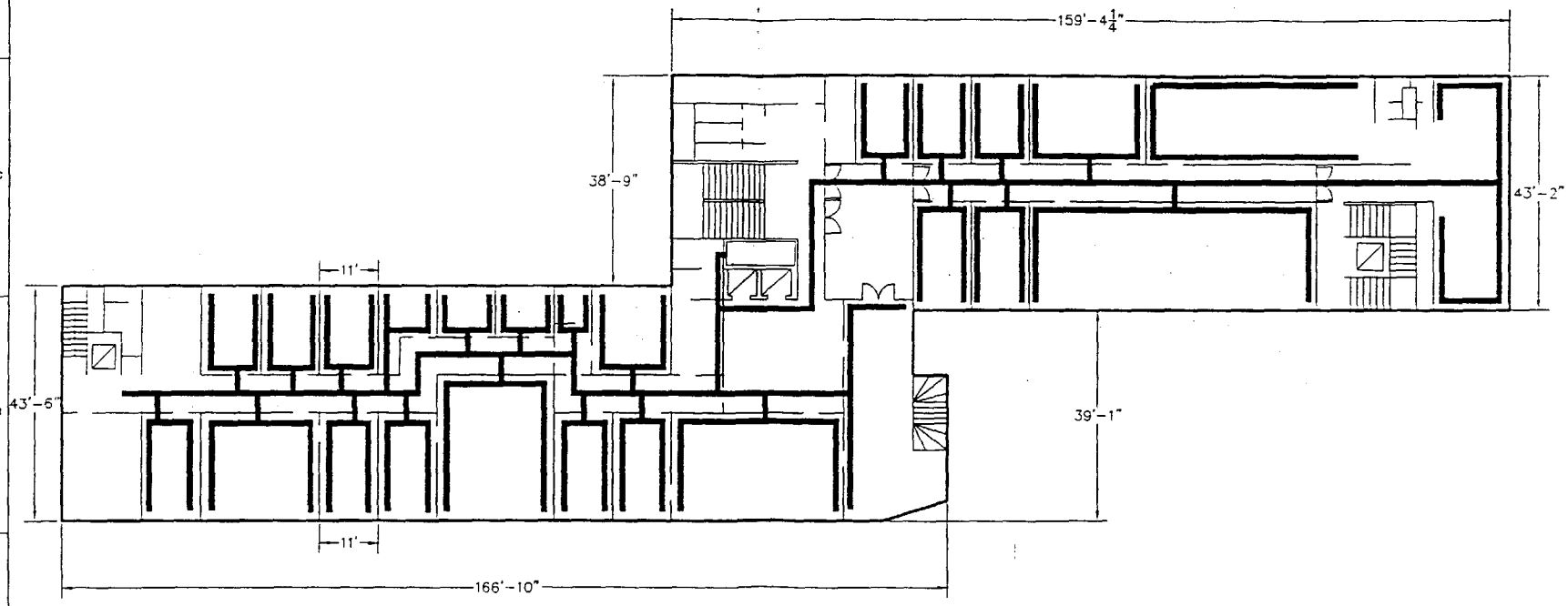
52'-7"
30'
57'
20'
11'
10
8
6
4
2
1
004
005
006
007
43'-6"
39'-1"
14
12
11
9
7
5
3
ENTRANCE
166'-10"
LEVEL 5 UPT CABLE RUN
MWI BUILDING
GROUND FLOOR
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
7/12/95
MWIGF.DWG
SHEET 1 OF 1



MWI BUILDING
1ST FLOOR

LEVEL 5 UTP CABLE RUN

Science Applications International Corporation
616 West Highway 50, O'Fallon, IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE 7/13/95 | DWG NO. MWI1STF.DWG | REV --
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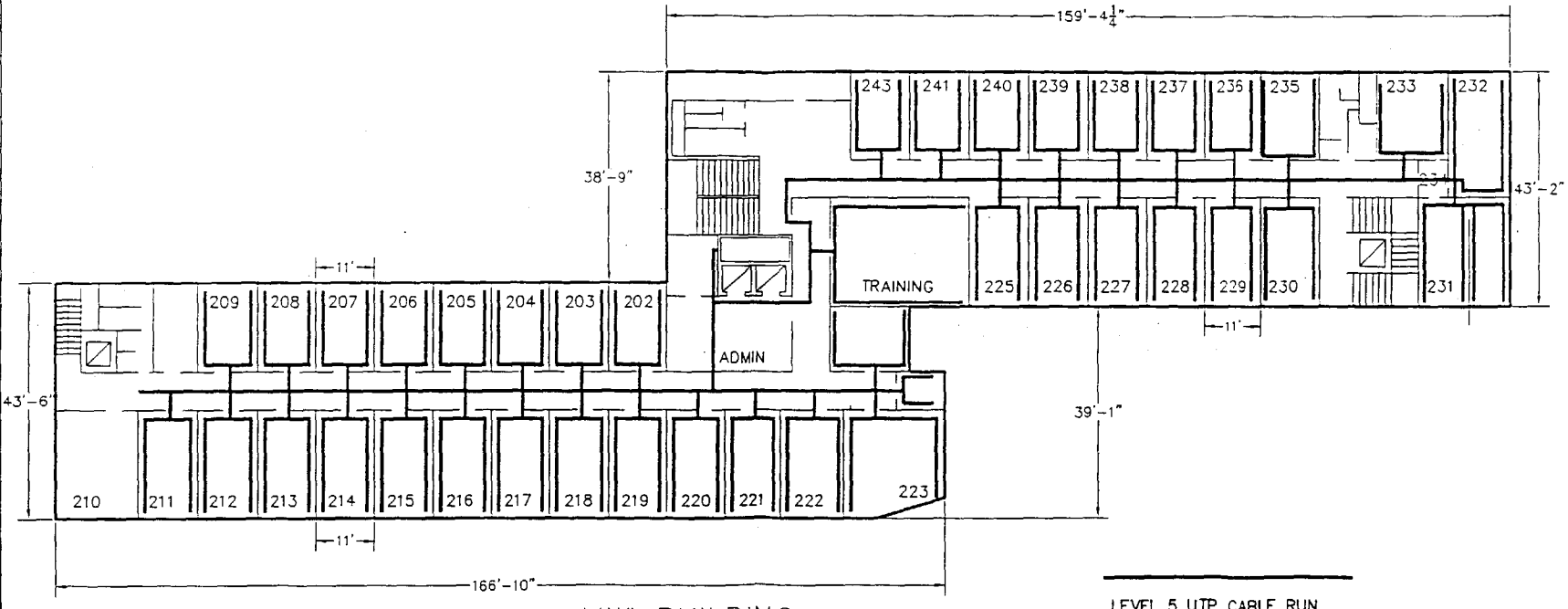

MWI BUILDING
2ND FLOOR

LEVEL 5 UTP CABLE RUN

Science Applications International Corporation
616 West Highway 30, Ottawa, IL 61350

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE 7/14/95 | DWG NO. MWI2NDF.DWG | REV --

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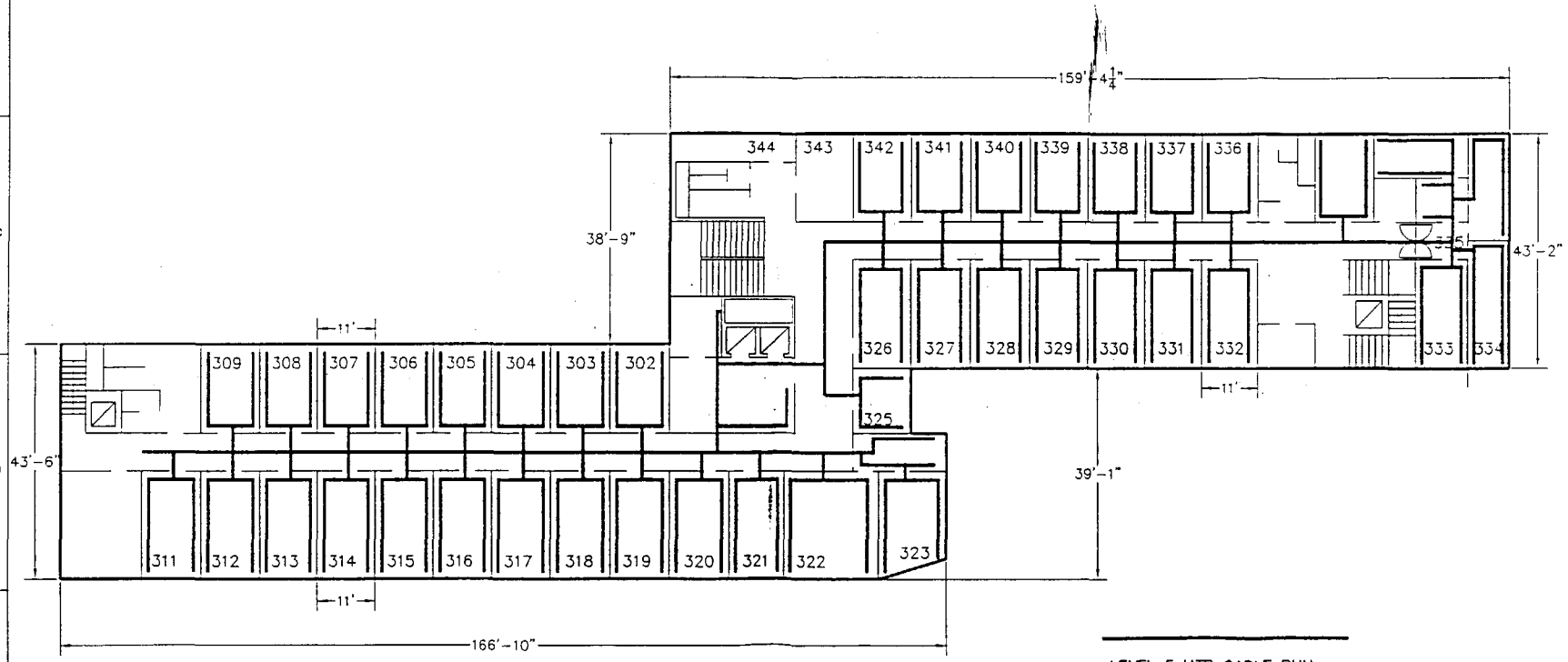

MWI BUILDING
3RD FLOOR

LEVEL 5 UTP CABLE RUN

Science Applications International Corporation
619 West Highway 30, Ottawa IL 61299

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

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7/17/95	MWI3RDF.DWG1	--

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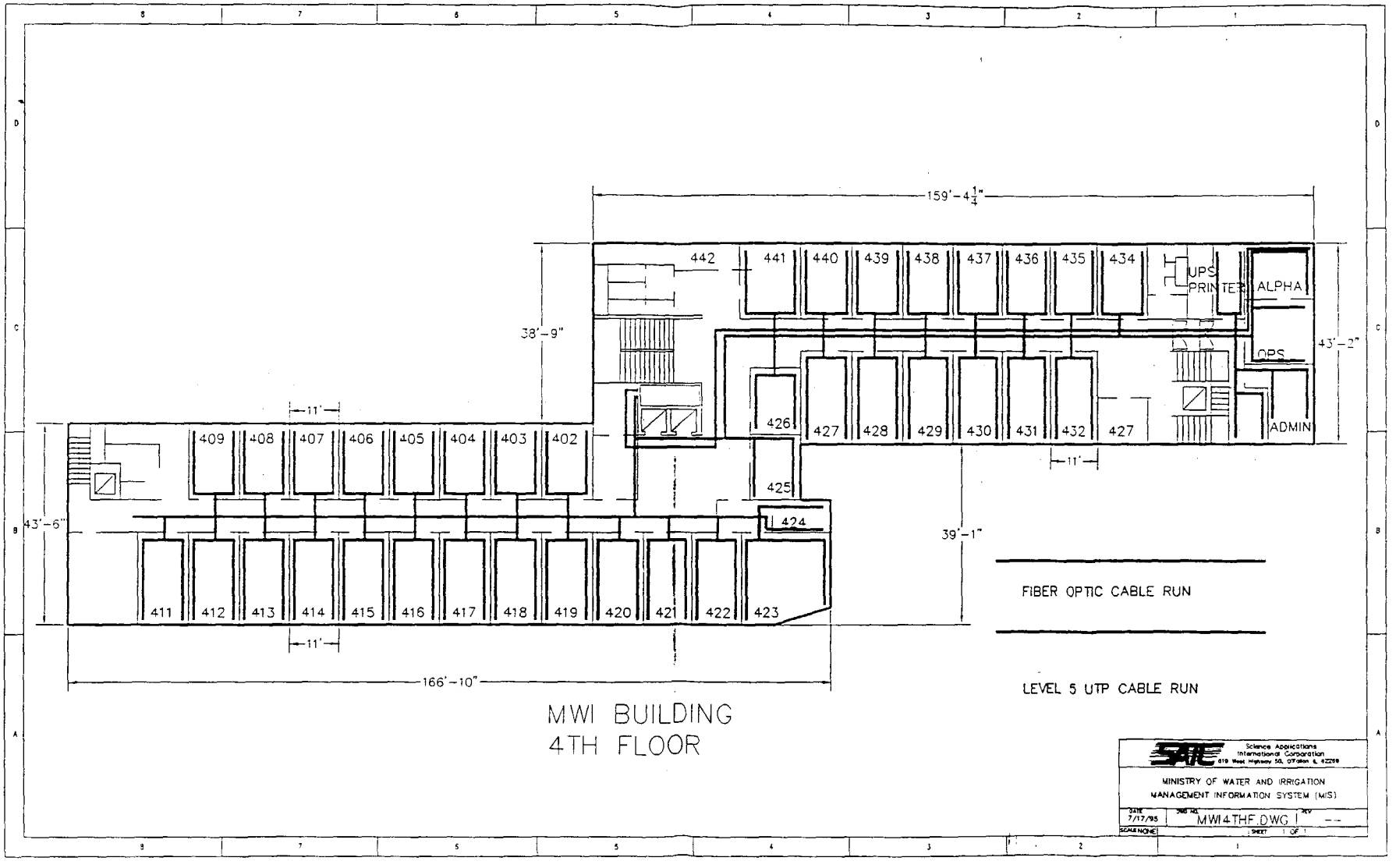

MWI BUILDING
4TH FLOOR

Science Applications International Corporation
619 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE 7/17/95 | DWG NO. MWI4THF.DWG | REV --
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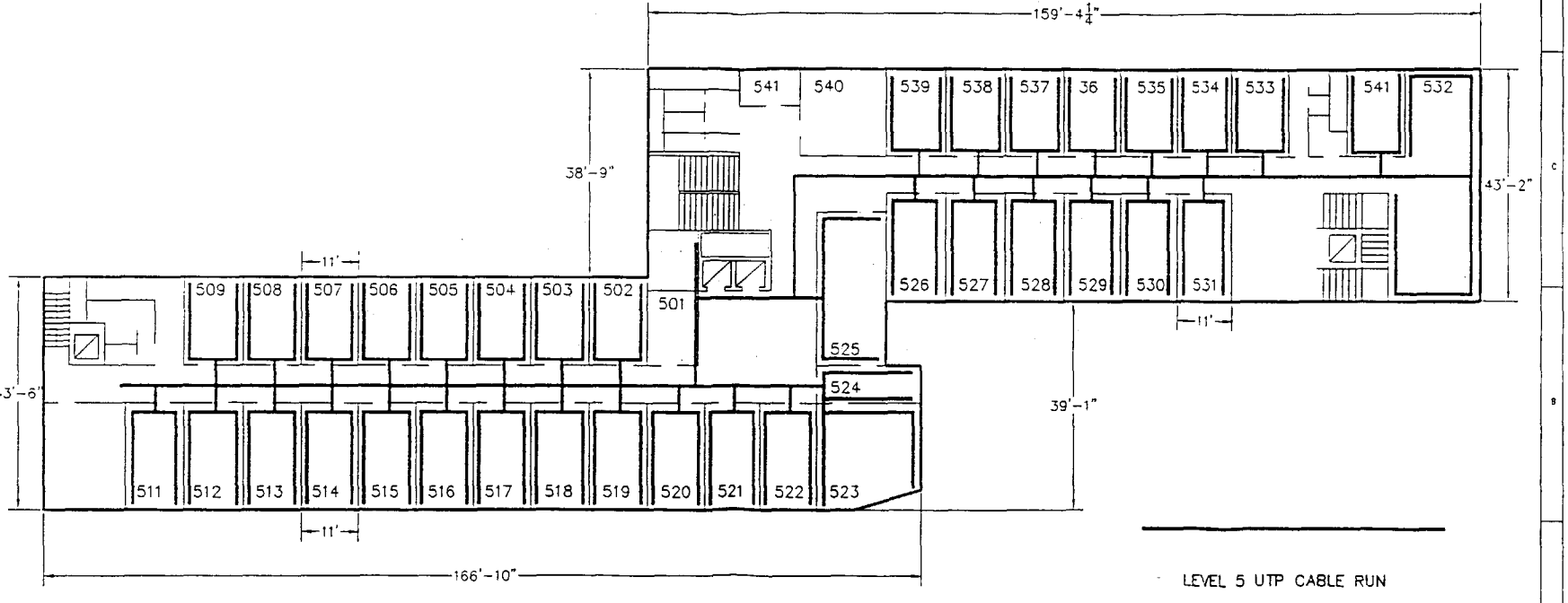

LEVEL 5 UTP CABLE RUN

MWI BUILDING
5TH FLOOR

Science Applications International Corporation
819 West Highway 50, O'Fallon, IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
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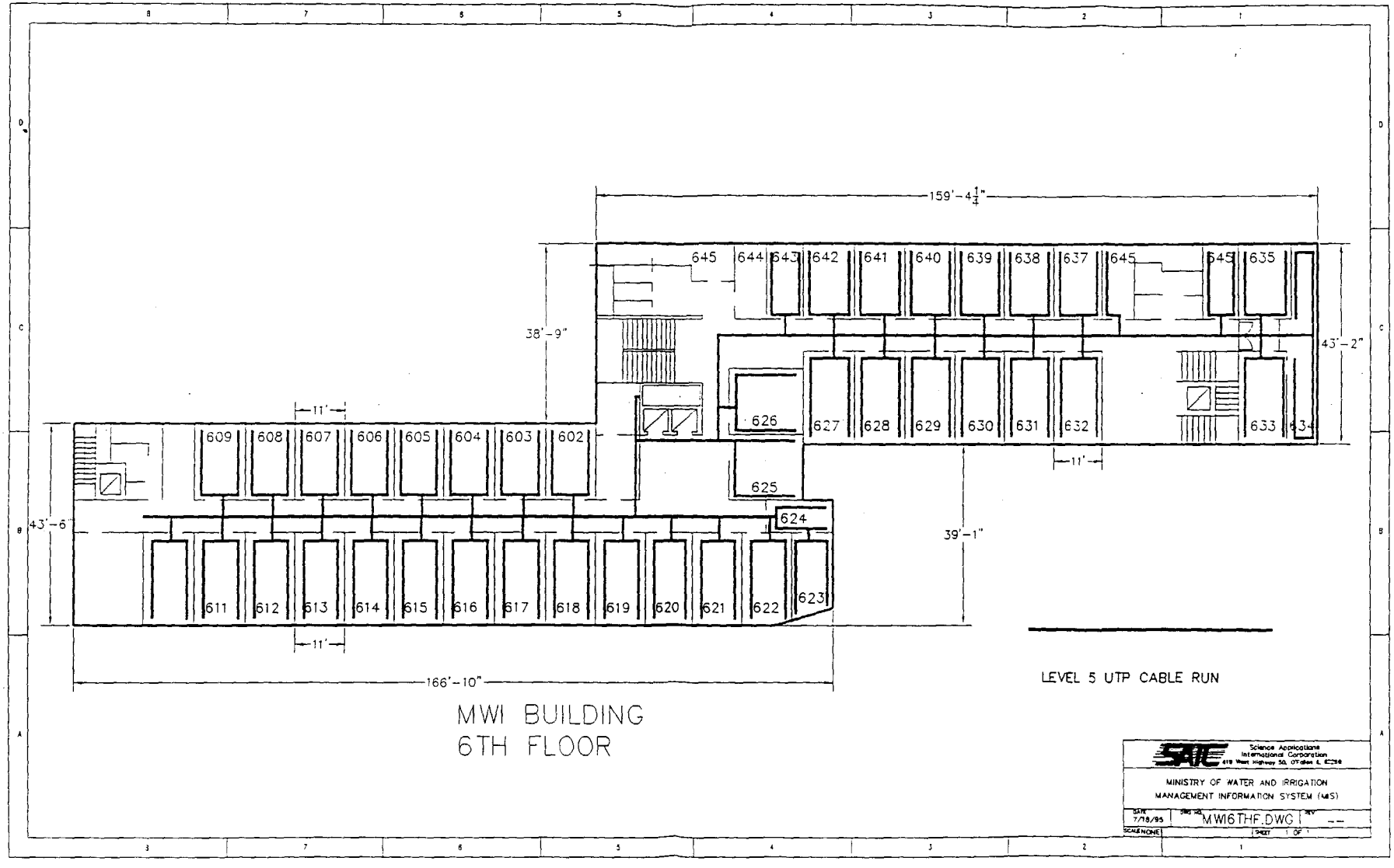
159'-4 1/4"
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38'-9"
43'-2"
626
627
628
629
630
631
632
633
634
11'
609
608
607
606
605
604
603
602
625
624
43'-6"
39'-1"
611
612
613
614
615
616
617
618
619
620
621
622
623
11'
166'-10"
LEVEL 5 UTP CABLE RUN
MWI BUILDING
6TH FLOOR
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
DATE 7/18/95
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REV --
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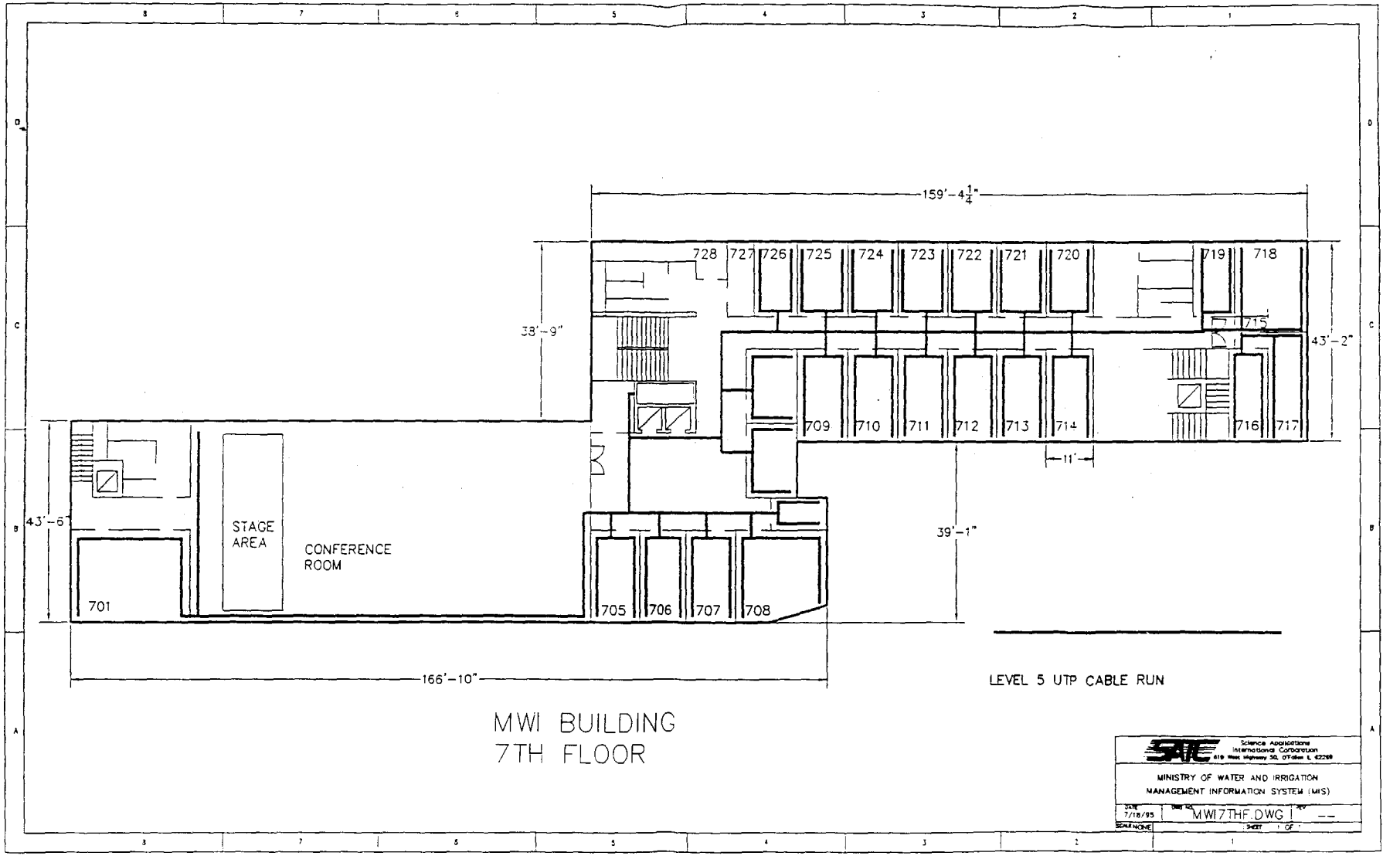
SHEET 1 OF 1


159'-4 1/4"
728
727
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725
724
723
722
721
720
719
718
715
38'-9"
43'-2"
709
710
711
712
713
714
716
717
11'
43'-6"
STAGE AREA
CONFERENCE ROOM
39'-1"
701
705
706
707
708
166'-10"
LEVEL 5 UTP CABLE RUN
MWI BUILDING
7TH FLOOR
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
7/18/95
MWI7THF.DWG
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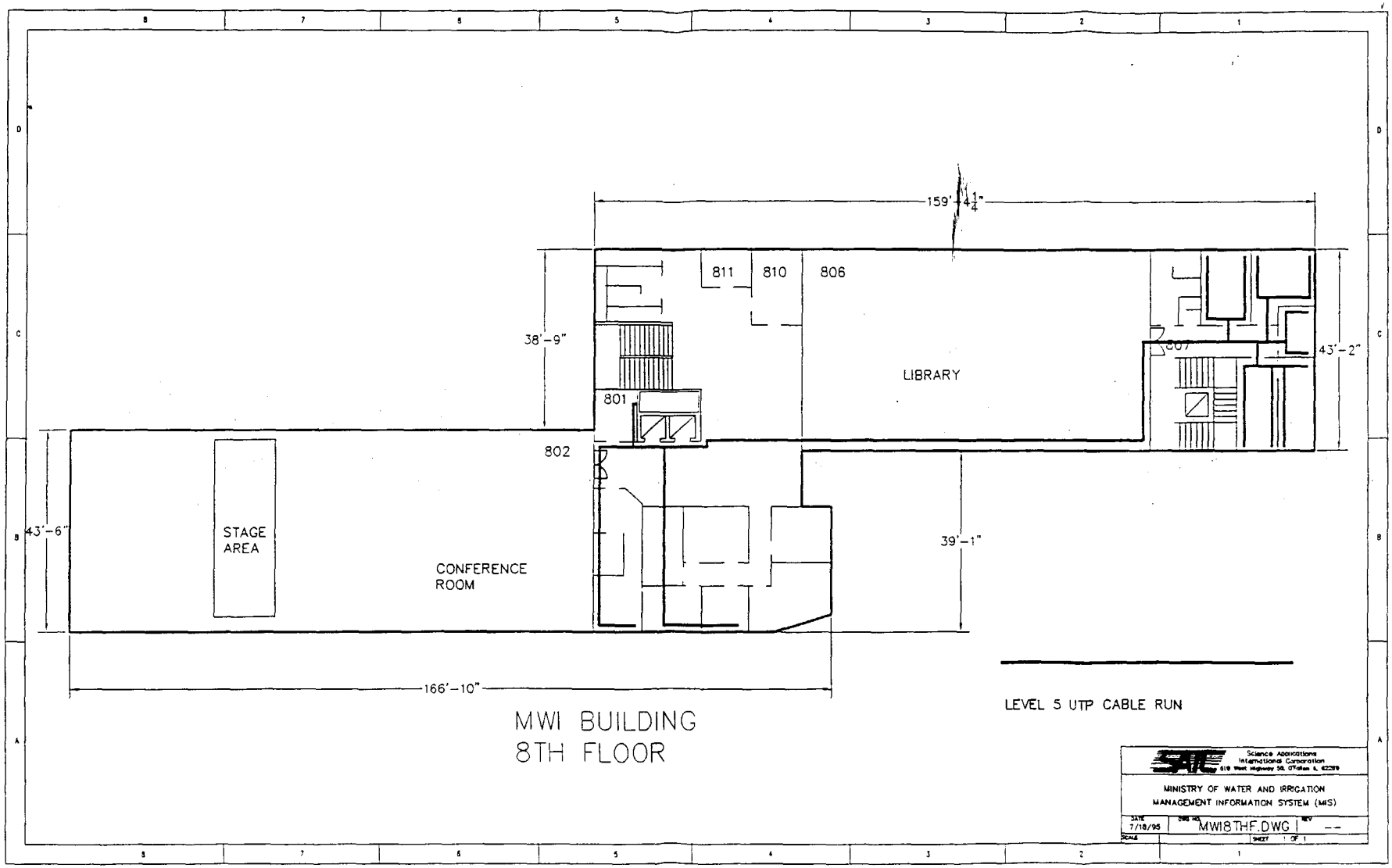
SCALE NONE


159'-4 1/4"
811
810
806
38'-9"
LIBRARY
807
43'-2"
801
802
43'-6"
STAGE AREA
CONFERENCE ROOM
39'-1"
166'-10"
LEVEL 5 UTP CABLE RUN
MWI BUILDING
8TH FLOOR
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
DATE 7/18/95
DWG NO. MWI8THF.DWG
REV --
SHEET 1 OF 1

APPENDIX A-02

HQ MINISTRY of WATER and IRRIGATION (MWI)
MINISTRY BUILDING
AMMAN

1. Organization Information
   a. Organization Name: Headquarters Ministry of Water and Irrigation
   b. Organization Belongs to What Ministry: Ministry
   c. Organization falls immediately under which organization: Ministry
   d. Location of Organization, Governorate, City, Building (address?): Ministry Building, Amman
   e. Manager of Organization, (Name and Title): Dr. Mohammad Bani Hani, Secretary General MWI
   f. Phone Number of Manager:
   g. Principle Purpose for organization (verbal description of functionality): With a staff of under 100, the MWI is the smallest of the agencies under the Ministry of Water and Irrigation dealing with the water resources in the Kingdom of Jordan. Specifically, the MWI is responsible for Finance and Administration, Legal Affairs, Finance and Loans, Planning, Development, and Information, Public Awareness, the Water Quality Improvement and Conservation Project (WQICP), the United Nations Development Programme (UNDP) and the Canadian International Development Agency (CIDA) Project.

2. Facility Information
   a. Name of Building (Address?): Ministry Building, Amman, 2nd Floor
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: 9 story reinforced concrete and concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: Yes (during office hours)
   h. Qualitative assessment of dust: Low to Moderate
   i. Changes to Facility: N/A

3. Hardware

a. Description of existing hardware at site:
The MWI, which includes the WQIC Project Staff, the UNDP Project Staff and a small additional number of Ministry officials, have the most extensive level of automated support in terms of available equipment for the number of personnel of the three independent agencies.. The WQIC Project at the time of data collection for the baseline data, had 28 IBM compatible PCs, with 80386/80486 or Pentium based processors. In addition, there were 4 Apple Macintosh systems. External to the Ministry Building are 5 Apple Macintosh systems at the Jordan Environmental Society. The WQIC Project has four additional Apple Macintosh systems at the Jordan Environmental Society. The systems are networked using Novell 3.11. There are a variety of printers installed. There are two network printers designated, a Mannesmann Tally laser printer and a Hewlett Packard color inkjet printer. Specific equipment configurations can be reviewed using the equipment database developed for this task and included on disk at the back of this report. The database was developed using Microsoft Access 2.0. The UNDP Project Staff has 10 IBM compatible PC systems. GTZ has two IBM compatible PCs, that can be connected to the UNDP network. The UNDP systems are networked using a Novell 3.11 based LAN. Printers under UNDP control are connected directly to host computers and are not network shared.

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: dial up modems

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: data related to surface water resources, water demand, water quality, water sector infrastructure, and non-conventional water resources (also independent databases referred to as the Hobbier, Hadidi, and UNDP).

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom) Data flow internal to HQ MWI combines electronic formats, hard copy out put and hand written data, with the majority of reports in hard copy.

c. Description of automated reports accomplished by site (size, frequency, to whom): while action is ongoing to make data available automatically via electronic format, very little is currently available.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The MWI currently has two networks within the Ministry Building which operate independently. One network is based on an IBM Pentium personal

computer and is used for administrative, project management and development activities for the WQIC Project and MWI Secretary General administrative support. The network uses Novell 3.11 for an operating system and has approximately 30 clients and three network printers. The second network is the UNDP network and is hosted on an IBM 80386 personal computer. This network supports the UNDP group and has nine personal computers attached to the server. The server uses Novell 3.11 as its network operating system.

The recommended design for the MWI Ministry Building network moves all internal networking to the Ministry Building common network. The design recommends consolidating the WQIC Project network and the UNDP network onto one server. The recommended server location is in the 4th floor computer room, collocated with other Ministry servers and the communications server. The recommended server for the MWI network is a Pentium based, 90 Mhz, IBM compatible personal computer with 64 MB of memory and 3 GB of hard disk drive space. The system will also have an internal 500 MB backup tape drive. The recommended network operating system is Novell 3.12. The current WQIC server should be reused as a Lotus Notes server. The configuration for this reused server would include changing its operating system to IBM's OS/2 and including the Lotus Notes server as a part of the MWI network.

Existing personal computers in the WQIC Project and the UNDP network are recommended for memory upgrades or replacement. One personal computer in the WQIC and five in the UNDP are recommended for replacement by installation of five 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. In addition, 20 personal computers in the WQIC Project and UNDP are recommended for memory upgrades to bring them to 16 MB of memory per system.

Communication external to the Ministry Building will be through the collocated communications server in the 4th floor computer room.

The MWI has indicated that relocating its server to the 4th floor computer room may not be a suitable solution. The MWI server can technically be located anywhere within the Ministry Building or even within the new training facility being proposed for property adjacent to the Ministry. Locating the server (or any server) in the 4th floor computer room provides many advantages. The computer room is designed to support computer systems and has more than adequate power, air conditioning and backup power. The computer room provides physical security in that it can be locked, there is limited access to the equipment and risk of inadvertent damage to equipment by normal office traffic and cleaning crews is reduced. If trouble shooting a network is required, it is easier to accomplish it from a central location where most of the network hardware is concentrated. Normal management actions by the Local Area Network Administrator is normally performed remotely from the server from the Administrator's workstation, further reducing traffic in an around the server. The recommended configuration provides a backup server that can be used to replace any of the Novell servers in the computer room. Locating the MWI server in another location would make a rapid exchange in case of failure very difficult. Security of data and information on the network is mostly a function of security within the network operating system and is accomplished by defining each user's access authorities, rights and privileges. It is

controlled through log in scripts, passwords and the system administrator. The recommended solution is to locate the MWI server in the 4th floor computer room.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule:

d. Schematic of site (old and new equipment): see floor layout drawing

e. Listing of Recommended Equipment: 5 486 PCs and 20 existing computer memory upgrades.

f. Listing of Recommended Software: The recommended network operating system is Novell 3.12. The servers will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices. PCs will have Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite.

g. Equipment/Software Cost Estimate: $ 10,596.00

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 25,271.50 (includes Project Management and Configuration Management tasks)

(3) Training: see Chapter 5

MWI Summary Sheet

DATE:: Aug 23, 1995

Total MWI Costs: $ 10,596.00

US Option: X

Jordan Option:

Organization	Priority 1	Priority 2	Priority 3	Priority 4	Totals
UNDP	$ -	$ 2,200.00	$ -	$ -	$ 2,200.00
WQIC	$ -	$ 8,396.00	$ -	$ -	$ 8,396.00
Totals:	$ -	$ 10,596.00	$ -	$ -	$ 10,596.00
Priority Totals	$ -	$ 10,596.00	$ 10,596.00	$ 10,596.00	

Priority 1: Current, ongoing operational support, with ADP or Core Functions

Priority 2: Current, ongoing, administrative support to operations using ADP

Priority 3: No current ADP support, site operational, site supports direct operations

Priority 4: No current ADP support, future operational or support site, administrative support to operations

Labor Summary	Hours	Cos:		
Installation Engineer	247	$ 17,748.00	Project Management Hours Inc.	
Quality Insurance Engineer	127	$ 6,704.50	Configuration Management Hours Inc.	
Lead Installation Technician	13	$ 442.00		
Journey Man Installation Tecn.	13	$ 377.00		
TOTALS:	399	$ 25,271.50		

APPENDIX A-03

HQ WATER AUTHORITY OF JORDAN
MINISTRY BUILDING
AMMAN

1. Organization Information
   a. Organization Name: Headquarters, Water Authority of Jordan (WAJ)
   b. Organization Belongs to What Ministry: Ministry of Water and Irrigation
   c. Organization falls immediately under which organization: Ministry of Water and Irrigation
   d. Location of Organization, Governorate, City, Building (address?): Ministry Building, Amman
   e. Manager of Organization, (Name and Title): Mr. Zuhair Hyassat, WAJ, Director of Computer Services
   f. Phone Number of Manager:
   g. Principle Purpose for organization (verbal description of functionality): The HQ WAJ functions as the administrative center for all Jordan sites serviced by the network of well and pipes that deliver drinking water, irrigation, and waste water to the appropriate points across the Kingdom. HQ WAJ deals with 12 Governorate Offices that administer to the subscriber base at these Governorates. Information from the Governorates is transmitted to the HQ WAJ mostly in hardcopy format. Billing information for water provided to Subscribers is collected at the Governorate offices and processed for collection. Governorates with data automation equipment can process the administrative tasks on site. Those without automation rely on the HQ WAJ for administrative support. The HQ also maintains records on data related to the farms in their area of interest--soil type, crop type, planting cycle, etc. Land use and land ownership records are retained at the HQ WAJ in Amman. Routine administrative tasks such as personnel records, payroll, accounting, etc. are maintained at HQ WAJ.

2. Facility Information
   a. Name of Building: Ministry Building, Amman
   b. Location of Data Processing Equipment (see 6.d for schematic) Main computer room housing the DEC Alpha is on the 4th Floor
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: 9 story reinforced concrete and concrete brick
   e. Code Restrictions: N/A

f. Location of telephone service entry point (comm closet if available)
   (1) Gauge of Wire: 24 AWG
   (2) Type of interface (four prong, RJ-11, etc.): RJ-11
g. Facility Air Conditioned: Yes (during office hours)
h. Qualitative assessment of dust: Low to Moderate
i. Changes to Facility: N/A

3. Hardware

a. Description of existing hardware at site:

The HQ WAJ, at the time when baseline data was collected, had one DEC Alpha system installed with 19 terminals and two PCs with terminal emulation software attached. The DEC Alpha is using Open VMS release 1.0 for its operating system. The DEC Alpha also had an two high speed line printers and a wide carriage dot matrix printer attached. The DEC Alpha contained 128 MB of system memory and 10 GB of disk storage. The DEC Alpha provided primary support for customer service request and billing for the 8 Governorates with no ADP support. Other uses for the DEC Alpha include processing payroll data, personnel data, and geographic information using the GDS system developed by McDonnell Douglas. The DEC Alpha was connected to an UPS system that had previously been used to support a suite of three VAX machines which were replaced by the DEC Alpha. In addition, HQ WAJ had 65 IBM compatible PCs, and 1 DEC 4060. Forty seven PCs were in a standalone configuration and 17 were networked to a Zenith Server running Novell 3.11. Many of the PCs contained network interface cards but were not connected to the network. Most PCs had 80386/80486 processors. One PC was an inoperable IBM 8086. Printing support for the PC users came from printer directly attached to the PCs, using a parallel connection (Centronics interface). There were no network printers at the time of the baseline survey. A wide range of printers existed from 9-pin dot matrix printers to a Hewlett Packard Laserjet 4Si printer.

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: dial-up modems

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: data on Subscriber Billing/Water Usage, Personnel, Payroll, Budget, Accounting, Loans, Land Acquisition, O & M, and Stores.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): Within the WAJ, there is some electronically transmitted data between the WAJ computer facilities in the Ministry Building and the Governorates of Amman, Irbid and Zarqa, which have organic data processing capabilities. Much of the data (billing and customer information) handled by the WAJ computer facilities in the Ministry Building are received as hand written forms, and then entered into the data processing system. This is done for Governorates that do not have organic data processing capabilities. The exception is the Governorate of Ajlun which receives it data processing support from Zarqa. In addition there are a variety of daily, monthly, yearly , and seasonal summaries and ad hoc reports generated within the WAJ.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The WAJ management information system would be integrated for the Ministry Building offices, the associated organizations within the 12 Governorates, and critical field offices. The recommended design for the WAJ Ministry Building network moves all internal networking to the Ministry installed common network. The design recommends moving the Zenith server to the 4th floor computer room from its current office location. Current network cabiing should be removed after the common network is installed. The recommended design removes the current hubs and reuses them in other locations such as the Governorates and/or other WAJ offices. The server network operating system will be upgraded to Novell 3.12 and include a 100 user license. The DEC Alpha will be connected via an ethernet connection the an intelligent hub that supports the Novell server. This will allow personal computers attached to the Novell server to use terminal emulation software and attach to the DEC Alpha system as required. Network printers will be installed in one room in each wing of the Ministry Building to support network print requirements. The Novell server will have Netware Connect 2 installed to provide remote access to WAJ Network server.
Of the 64 personal computers in the WAJ offices, 43 are recommended to have memory upgrades to 16 MB of system memory. This will extend the life of the systems and make them more responsive. An additional five personal computers are recommended for the WAJ functions. Four of these systems are 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. One system to be used in conjunction with software development activities is a Pentium based personal computer, operating at 90 Mhz, with 16 MB of memory and 1 GB of hard disk storage. Four of the older personal computers (80386 machines) replaced by the newer equipment will be reused as print servers for the network printers.

b. Site Unique Risks (Technical or Security)

c. Proposed Schedule: each floor of the ministry will take 6 days, plus 2 days of testing.

d. Schematic of site (old and new equipment)

e. Listing of Recommended Equipment: 1 Pentium based personal computer for software development and 4 80486 66 Mhz IBM compatible personal computers. Also, memory upgrades to existing computers.

f. Listing of Recommended Software: The server network operating system will be upgraded to Novell 3.12 and include a 100 user license. The DEC Alpha will be connected via an ethernet connection the an intelligent hub that supports the Novell server. This will allow personal computers attached to the Novell server to use terminal emulation software and attach to the DEC Alpha system as required. Network printers will be installed in one room in each wing of the Ministry Building to support network print requirements. The Novell server will have Netware Connect 2 installed to provide remote access to WAJ Network server.

g. Equipment/Software Cost Estimate: $ 28,584.00

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $2808.25 (only for memory upgrade

(3) Training: see Chapter 5

SUMMARY FOR HQ WAJ AT THE MWI FACILITY

						priority 1	priority 2	priority 3	priority 4
Office:	HQ WAJ		Priority:	2		$ -	$ 28,584.00	$ -	$ -
Location:	Ministry Building								
Name:	Zuhair Heyasat		Drops:	0	In Ministry Bldg				
Phone:	680100 ext 440								
Reports To:	Minister MWI								
Material Cost for Site:		$ 28,584.00							

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Memory Upgrades	$ 335.00	17	2	$ 5,695.00	$ -	$ 5,695.00	$ -	$ -
Configuration 1	$ 2,001.00	4	2	$ 8,004.00	$ -	$ 8,004.00	$ -	$ -
Configuration 2	$ 2,377.00	0	2	$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	2	$ 4,485.00	$ -	$ 4,485.00	$ -	$ -
Oracle File Server	$ 2,500.00	0	2	$ -	$ -	$ -	$ -	$ -
Oracle Developer	$ 450.00	0	2	$ -	$ -	$ -	$ -	$ -
Oracle PC	$ 125.00	0	2	$ -	$ -	$ -	$ -	$ -
Memory Upgrades	$ 400.00	26	2	$ 10,400.00	$ -	$ 10,400.00	$ -	$ -
Network S/W	$ 795.00	0	2	$ -	$ -	$ -	$ -	$ -
PathWorks	$ -	0	2	$ -	$ -	$ -	$ -	$ -
Phone	$ 15.00	0	2	$ -	$ -	$ -	$ -	$ -
				$ 28,584.00	$ -	$ 28,584.00	$ -	$ -

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling				$ -
Hubs				$ -
Patch Panels				$ -
Receptacles				$ -
Connectors				$ -
Conduit/Panduit				$ -
Corners (Panduit/Conduit)				$ -
Consumables				$ -
Totals				$ -

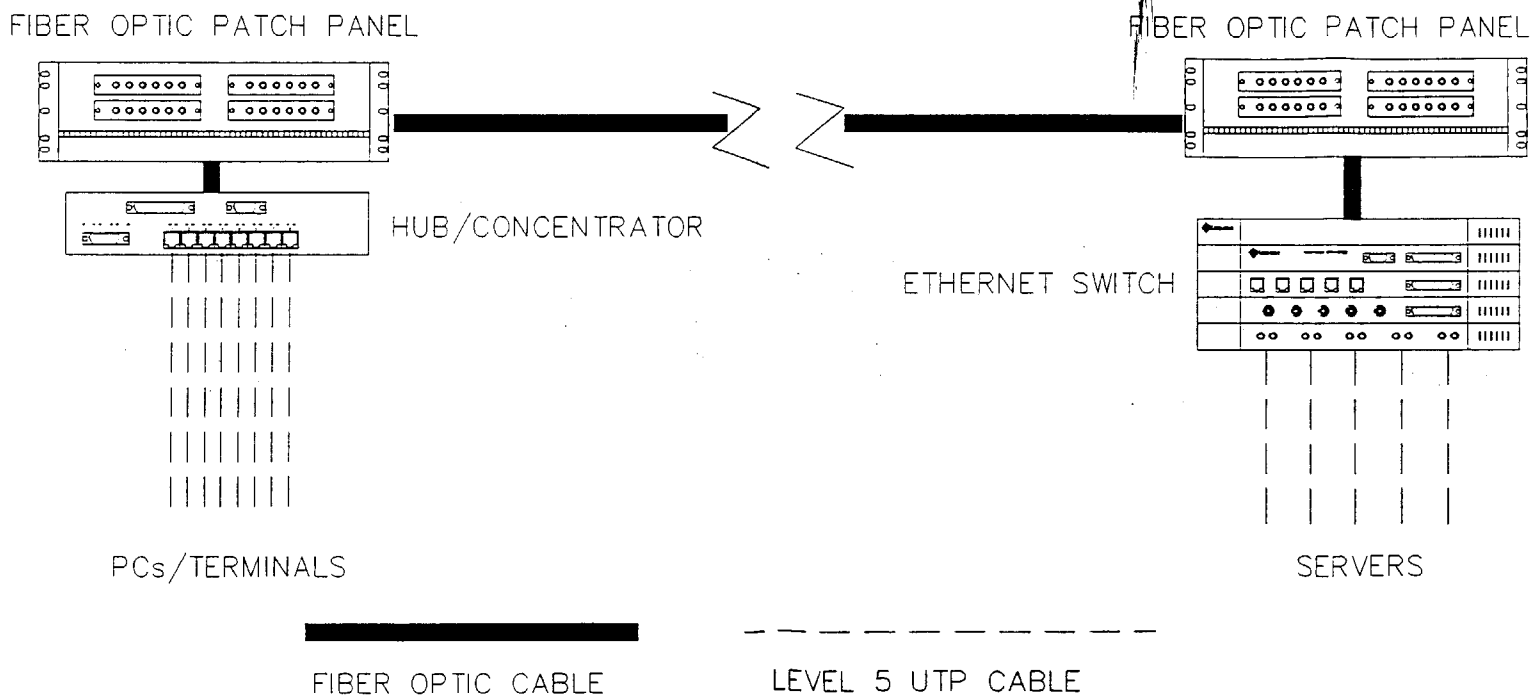
*In Ministry Building Figures

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	11	$ 792.00
Quality Assurance Engineer		$ 53.00	11	$ 583.00
Lead Installation Technician		$ 34.00	22.75	$ 773.50
Journey Man Installation Tech		$ 29.00	22.75	$ 659.75
Totals			67.5	$ 2,808.25

*In Ministry Building Figures

4TH FLOOR FILE SERVER ROOM WIRING DETAIL



Science Applications International Corporation
619 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO	REV
8/03/95	SERVERRM.DWG	--

SCALE | SHEET 1 OF 1

APPENDIX A-04

HQ JORDAN VALLEY AUTHORITY
MINISTRY BUILDING
AMMAN

1. Organization Information
   a. Organization Name: Headquarters JVA
   b. Organization Belongs to What Ministry: Ministry of Water and Irrigation
   c. Organization falls immediately under which organization: Ministry of Water and Irrigation
   d. Location of Organization, Governorate, City, Building (address?): Ministry Building, Amman
   e. Manager of Organization, (Name and Title): Engineer Nadia Ghandour, Head of Computer Division
   f. Phone Number of Manager: 1st Floor, ext. 434
   g. Principle Purpose for organization (verbal description of functionality): The HQ JVA functions as the administrative center for all Jordan Valley sites serviced by the King Abdullah Canal and the dams which feed the Jordan River. The dams include Wadi Arab, Ziglab, Shueib, Talal, and Fafrein. Along the King Abdullah Canal there are Remote Transmission Units (10) which monitor water flow within the canal and transmit this information to the Staging Offices (10). The Staging Offices pass water requirements to the District Offices (3) that manage water resources for the North, Central, and South Jordan Valley. Information from the District Offices and the Dams is transmitted to the Computer Center in Dirar. Dirar runs several water balance and water allocation models and relays the model output to the Staging Offices where adjustments to the water requests, if necessary, are translated into the water released to the subscribers. Billing information for water provided to Subscribers is collected at the Staging Offices and processed by the District Offices for collection. Staging Offices also collect data related to the farms in their area of interest--soil type, crop type, planting cycle, etc. Land use and land ownership records are retained at the HQ JVA in Amman. Routine administrative tasks such as personnel records, payroll, accounting, etc. are maintained at HQ JVA.

2. Facility Information
   a. Name of Building: Ministry Building, Amman
   b. Location of Data Processing Equipment (see 6.d for schematic) Data Entry is on the 3rd Floor
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages

(5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation

d. Facility Construction: 9 story reinforced concrete and concrete brick

e. Code Restrictions: N/A

f. Location of telephone service entry point (comm closet if available)

(1) Gauge of Wire: 24 AWG

(2) Type of interface (four prong, RJ-11, etc.): RJ-11

g. Facility Air Conditioned: Yes (during office hours)

h. Qualitative assessment of dust: Low to Moderate

i. Changes to Facility: N/A

3. Hardware

a. Description of existing hardware at site:

The HQ JVA at the time when the baseline data was collected had three stand alone IBM compatible PCs and two Data General MV 2000 systems with 15 terminals connected serially. The IBM compatible computers were 80386/80486 devices (see database for additional details). One MV 2000 on the third floor, used as the land acquisition system, had a Multitec 1200 - 9600 Baud Modem attached. Printing provided by dot matrix printers directly attached to the MV 2000 terminals via serial cables or by two laser printers directly attached to two PCs. Printing from the third PC was accomplished by copying a file to a diskette and walking the diskette to a PC with a printer attached, and using the PC with the attached printer for the output.

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: Multitec 1200 - 9600 Baud Modems

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: data on Subscriber Billing/Water Usage, Personnel, Payroll, Budget, Accounting, Loans, Land Acquisition, O & M, and Stores.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): Data flow internal to each organization combines electronic formats, hard copy out put and hand written data. Within the JVA, the primary producers of electronically transmitted data are the Staging Offices, Remote Transmission Units and the Computer Center at Dirar. In addition there are a variety of daily, monthly, yearly, and seasonal summaries and ad hoc reports generated within the JVA..

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The JVA management information system would be integrated for the Ministry Building offices, the three District Offices, the 10 staging offices in the Jordan Valley, Dirar, Fanoush, the Dams and Irrigation Directorate, Stores, and the Laboratory. The recommended design for the JVA Ministry Building network moves all internal networking to the Ministry Building installed common network. The design installs a single server in the 4th floor computer room, which will be the central component of the JVA network. The Sun Sparc workstation will be a node on the network and will be accessible by terminals installed on the network and by selected personal computers with terminal emulation software. The JVA functional area will have two network printers installed to support printing requirements.

The recommended server for the JVA network is a Pentium based, 90 Mhz, IBM compatible personal computer with 64 MB of memory and 3 GB of hard disk drive space. The system will also have an internal 500 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the JVA Laboratory or the Director of Dams and Irrigation facilities. The server will also be connected to the communications server for the Ministry Building which will provide the external access to remote clients. The design requires the installation 17 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP Level 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The 17 personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Five of the personal computers will have terminal emulation software that will allow operation as a Unix terminal working with the Sun Sparc workstation. The three existing personal computers will have ethernet cards installed and be connected to the network.

The Data General MV 2000 systems will be discarded. The current programs will need to be migrated to the Sun Sparc workstation and to the Novell server. This will require the personnel, payroll and land acquisition systems be migrated. The recommended migration path is to use Oracle 7 for Unix on the Sun Sparc workstation (personnel and payroll) and Oracle 7 for networks on the Novell server (land acquisitions).

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: Each floor in the Ministry Building will take 6-8 days for UTP cabling, Fiber Optic cabling will take 12 days, and overall testing in the Ministry will take 24 days.

d. Schematic of site (old and new equipment): see site drawings

e. Listing of Recommended Equipment: A Pentium based, 90 Mhz, IBM compatible personal computer will be the new server plus add 17 486 66 Mhz IBM compatible personal computers.

f. Listing of Recommended Software: The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide

dial in/out connection to the network for the geographically separated offices such as the JVA Laboratory or the Director of Dams and Irrigation facilities. PCs will have Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Five of the personal computers will have terminal emulation software that will allow operation as a Unix terminal working with the Sun Sparc workstation.

g. Equipment/Software Cost Estimate: $ 43,019.00

f. Site Installation Cost

(1) Tools Required (Rent?):

(2) Labor: not computed separately--labor for the Ministry Building cabling and network tasks amounts to $ 155.636.00

(3) Training: see Chapter 5

HQ JVA, Ministry Building

Priority: 1

Location: Amman, WMI

Name: Dia El-Modani

Drops: In Minstry Building Est.

Phone: 689400 ext 434

Reports To: Secretary General, JVA

Material Cost for Site: $ 43,019.00

Computers and Communications

	Item	Description	Unit Cost	Number	Cost
1	Configuration 1	486/66	$ 2,001.00	17	$ 34,017.00
2	Configuration 2	486/66	$ 2,377.00	0	$ -
3	Configuration 3	Pentium	$ 3,147.00	0	$ -
4	MWI Server	Pentium	$ 5,930.00	1	$ 5,930.00
5	14.4. modem	Interna	$ 79.00	0	$ -
6	Terminal Emulation S/W	Espri	$ 189.00	10	$ 1,890.00
7	UPS	1KVA 15 min	$ 167.00	0	$ -
8	E-Net Card	Internal	$ 129.00	3	$ 387.00
9	Novell 3.12	NOS	$ 795.00	1	$ 795.00
10	Punch Down Block	AT&T	$ 29.21	0	$ -
11	Phone Line	D	$ 15.00	0	$ -
	Totals:				$ 43,019.00

Network Components

*Note: Cost in MWI Building

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling				$ -
Hubs				$ -
Patch Panels				$ -
Receptacles				$ -
Connectors				$ -
Conduit/Panduit				$ -
Corners (Panduit/Conduit)				$ -
Consumables				$ -
Totals:				$ -

Labor Costs

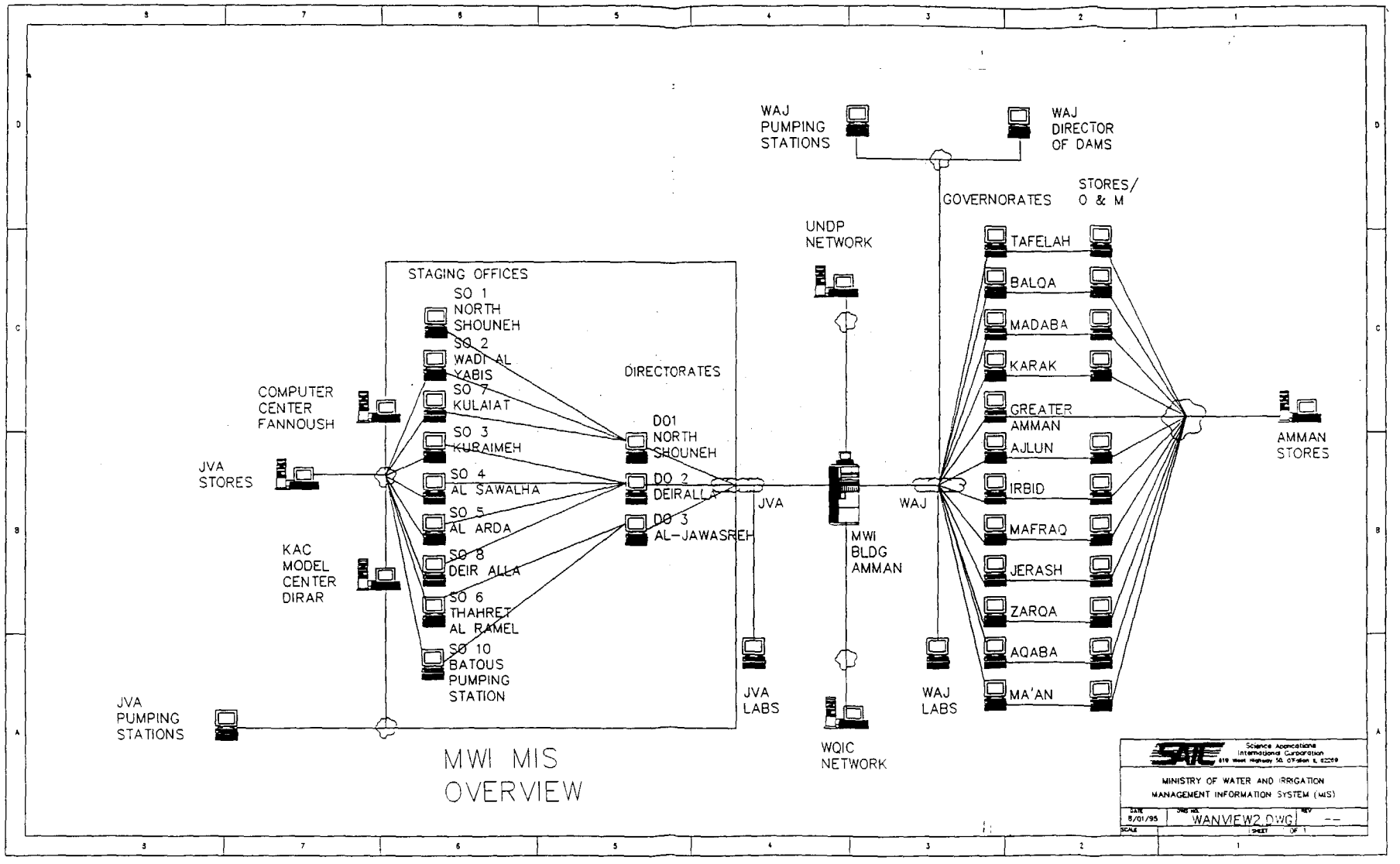
*Note: Cost in MWI Building

Labor Category	Rate	Units	TOTAL COSTS
Installation Engineer	$ 72.00	0	$ -
Quality Insurance Engineer	$ 53.00	0	$ -
Lead Installation Technician	$ 34.00	0	$ -
Journey Man Installation Tech.	$ 29.00	0	$ -
Totals:		0	$ -

MWI BUILDING CABLING AND NETWORK

Description	Priority 1	Priority 2	Priority 3	Priority 4	Totals
Cable	$ 11,068.00				$ 11,068.00
Cable Hardware	$ 5,032.67				$ 5,032.67
Trays and Conduit	$ 25,703.87				$ 25,703.87
Network Hardware	$ 170,100.25				$ 170,100.25
Network Servers	$ 15,007.00				$ 15,007.00
Network Software	$ 8,797.00	$ -	$ 1,870.00		$ 10,667.00
Network Printers		$ 16,788.00	$ 6,487.00		$ 23,275.00
Totals:	$ 235,708.78	$ 16,788.00	$ 8,357.00	$ -	$ 260,853.78

Labor Summary	Hours	Cost
Installation Engineer	656	$ 47,232.00
Quality Insurance Engineer	676	$ 35,828.00
Lead Installation Technician	1152	$ 39,168.00
Journey Man Installation Tech.	1152	$ 33,408.00
TOTALS:	3636	$ 155,636.00


WAJ PUMPING STATIONS
WAJ DIRECTOR OF DAMS
GOVERNORATES
STORES/ O & M
UNDP NETWORK
TAFELAH
BALQA
MADABA
KARAK
GREATER AMMAN
AJLUN
IRBID
MAFRAQ
JERASH
ZARQA
AQABA
MA'AN
AMMAN STORES
STAGING OFFICES
SO 1 NORTH SHOUNEH
SO 2 WADI AL YABIS
SO 7 KULAIAT
SO 3 KURAIMEH
SO 4 AL SAWALHA
SO 5 AL ARDA
SO 8 DEIR ALLA
SO 6 THAHRET AL RAMEL
SO 10 BATOUS PUMPING STATION
DIRECTORATES
DO1 NORTH SHOUNEH
DO 2 DEIRALLA
DO 3 AL-JAWASREH
COMPUTER CENTER FANNOUSH
JVA STORES
KAC MODEL CENTER DIRAR
JVA PUMPING STATIONS
JVA
JVA LABS
MWI BLDG AMMAN
WAJ
WAJ LABS
WQIC NETWORK
MWI MIS OVERVIEW
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
DATE 8/01/95
DWG NO. WANVIEW2.DWG
REV --
SCALE
SHEET OF 1

MWI UNITED NATIONS DEVELOPMENT PROGRAMME
MINISTRY BUILDING
AMMAN

1. Organization Information
   a. Organization Name: United Nations Development Programme (UNDP)
   b. Organization Belongs to What Ministry: MWI
   c. Organization falls immediately under which organization MWI
   d. Location of Organization, Governorate, City, Building (address?): Ministry Building, Amman
   e. Manager of Organization, (Name and Title): Engineer Edward Qunqur, UNDP, UNDP Project Coordinator
   f. Phone Number of Manager:
   g. Principle Purpose for organization (verbal description of functionality): The UNDP consists of a database of water resources originally built on the WAJ DEC Alpha DATATRIEVE system. The German Agency for Technical Cooperation (GTZ), a German firm working on a Geographical Information System (GIS) for the Amman Governorate, will validate the United Nations Development Programme (UNDP) databases and consolidate it with other (Hobbler, Hadidi, etc.) databases to form the core Ground Water database.

2. Facility Information
   a. Name of Building (Address?): Ministry Building, Amman, 2nd Floor
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: 9 story reinforced concrete and concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: Yes (during office hours)
   h. Qualitative assessment of dust: Low to Moderate
   i. Changes to Facility: N/A

3. Hardware

a. Description of existing hardware at site: The UNDP network is based on an IBM PS/2 (80386/20) personal computer using Novell 3.11 for the network operating system. The server had 8 MB of RAM and a 300 MB hard disk drive. The server also had Lotus Notes version 3.2 loaded. The server is located in general office space in room 223 and is connected to an UPS, no brand or capacity markings. The physical network is an ethernet bus, using RG 58 coaxial cable with T-connectors for NICs installed in personal computers attached to the network. There were 9 IBM compatible personal computers attached to the server at the time of the server. In addition, there are two IBM compatible personal computers owned by GTZ that can be and have been attached to the server in the past. One IBM compatible personal computer on the seventh floor has been attached to the UNDP server at various times, based on work requirements. No network printers were attached. Printers in use were directly attached to client personal computers.

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: N/A

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: approximately 400 Mbytes of data, software, and development tools.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom)

c. Description of automated reports accomplished by site (size, frequency, to whom)

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The design recommends consolidating the WQIC Project network and the UNDP network onto one server. The recommended server location is in the 4th floor computer room, collocated with other Ministry servers and the communications server. The recommended server for the MWI network is a Pentium based, 90 MHz, IBM compatible personal computer with 64 MB of memory and 3 GB of hard disk drive space. The system will also have an internal 500 MB backup tape drive. The recommended network operating system is Novell 3.12. The current WQIC server should be reused as a Lotus Notes server. The configuration for this reused server would include changing its operating system to IBM's OS/2 and including the Lotus Notes server as a part of the MWI network.

Existing personal computers in the WQIC Project and the UNDP network are recommended for memory upgrades or replacement. One personal computer in the WQIC and five in the UNDP are recommended for replacement by installation of five 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. In addition, 20 personal computers in the WQIC Project and UNDP are recommended for memory upgrades to bring them to 16 MB of memory per system.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: each floor in the Ministry will take 6 days plus 2 days of testing

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: The recommended server for the joint WQIC Project and UNDP network is a Pentium PC. 5 PCs in the UNDP are recommended for replacement by installation of 5 486s. In addition, 20 personal computers in the WQIC Project and UNDP are recommended for memory upgrades to bring them to 16 MB of memory per system.

f. Listing of Recommended Software

g. Equipment/Software Cost Estimate: $ 2.200.00

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 690.25

(3) Training: see Chapter 5

SUMMARY FOR UNDP

					priority 1	priority 2	priority 3	priority 4
Office:	UNDP	**Priority:**	2					
Location:	Ministry Building				$ -	$ 2,200.00	$ -	$ -
Name:	Jamil Al-Hajj	**Drops:**	0	In Ministry Blog				
Phone:	680100 ext 613							
Reports To:	MWI							

Material Cost for Site: $ 2,200.00

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Configuration 1	$ 2,001.00	0	2	$ -	$ -	$ -	$ -	$ -
Configuration 2	$ 2,377.00	0	2	$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 3,147.00	0	2	$ -	$ -	$ -	$ -	$ -
Memory Upgrades	$ 400.00	5.5	2	$ 2,200.00	$ -	$ 2,200.00	$ -	$ -
Oracle File Server	$ 2,500.00	0	2	$ -	$ -	$ -	$ -	$ -
Oracle Developer	$ 450.00	0	2	$ -	$ -	$ -	$ -	$ -
Oracle PC	$ 795.00	0	2	$ -	$ -	$ -	$ -	$ -
Network S/W	$ 795.00	0	2	$ -	$ -	$ -	$ -	$ -
Cabling	$ 900.00	0	2	$ -	$ -	$ -	$ -	$ -
Phone	$ 12.50	0	1	$ -	$ -	$ -	$ -	$ -
Operations & Maintenance			3	$ -	$ -	$ -	$ -	$ -
Stores			3	TOTAL COSTS	$ -	$ -	TOTAL COST	$ -
				$ 2,200.00	$ -	$ 2,200.00	$ -	$ -

*Replacement systems in WQIC Project ADP

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling				$ -
Hubs				$ -
Patch Panels				$ -
Receptacles				$ -
Connectors				$ -
Conduit/Pandui				$ -
Corners (Pandui/Condui				$ -
Consumable:				$ -
Totals:				$ -

*In Ministry Building Calculation

Labor Costs

Labor Category	Rate	Units	TOTAL COSTS
Installation Engineer	$ 72.00	2.75	$ 198.00
Quality Assurance Engineer	$ 53.00	2.75	$ 145.75
Lead Installation Technician	$ 34.00	5.5	$ 187.00
Journey Man Installation Tech.	$ 29.00	5.5	$ 159.50
Totals:		16.5	$ 690.25

For Memory upgrades only.

MWI WATER QUALITY IMPROVEMENT and CONSERVATION PROJECT
MINISTRY BUILDING
AMMAN

1. Organization Information
   a. Organization Name: Water Quality Improvement and Conservation Project (WQICP)
   b. Organization Belongs to What Ministry: MWI
   c. Organization falls immediately under which organization: MWI
   d. Location of Organization, Governorate, City, Building (address?): Ministry Building, Amman
   e. Manager of Organization, (Name and Title): Dr. Muwaffaq Saqqar, MWI, WQIC Project Coordinator
   f. Phone Number of Manager:
   g. Principle Purpose for organization (verbal description of functionality): The WQIC Project provides a basis for addressing serious water quality issues and water resource problems identified by the Kingdom of Jordan's national water management program. The goal of WQIC Project is to improve the overall management and conservation of water resources of Jordan. Objectives include: (1) improving water quality; (2) reducing demand for water; (3) augmenting water supply; and, (4) building a sustainable water use system. To meet these objectives several technical programs were developed and implemented: (1)water resources monitoring and management; (2) water pollution prevention and cleanup; (3) irrigation water management; and, (4) water management education.

2. Facility Information
   a. Name of Building (Address?): Ministry Building, Amman, 2nd Floor
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: 9 story reinforced concrete and concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: Yes (during office hours)
   h. Qualitative assessment of dust: Low to Moderate

i. Changes to Facility: N/A

3. Hardware

a. Description of existing hardware at site: The WQICP network is on an IBM Pentium Sever (60 MHz) running Novell 3.11. The server has 32 MB of RAM and a two 530 MB hard disk drives. The sever is located in general office space in room 223. The server is connected to an APC 400 Uninterruptable Power Supply (UPS). The physical network is uses a star configuration with three 3COM Link Builder FMS II. 48 port intelligent hubs attached to the server. Cabling consists of UTP Level 5 and 4 cable terminating in surface mounted receptacles in the WQICP occupied hall of the Ministry Building. There are 28 IBM compatible personal computers on the network and 4 Macintosh systems. The IBM systems have ethernet NICs with RJ-45 physical interfaces. The Macintosh's are connected through an Appletalk adapter. There are three network printers, HP Laser Jet III, a Mannesmann Tally laser printer and an IBM Colorjet printer. The network printers are connected to the network through three D-Link 950 print servers. Other printers are available, however, these printers are directly attached to personal computers located in the several offices and in general are not shared devices. The server also is host to Lotus Notes, version 3.2.

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: dial-up modems

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: the types of activities involved with water resource management include data on (1) identifying and developing water resources; (2) certifying water resources for appropriate usage levels; (3) collecting and storing water resources; (4) allocating water resources; (5) transporting water resources; (6) delivering water resources; (7) consuming and paying for water resources; (8) recovering and restoring wastewater treatment water resources; and, (9) general overhead support.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): daily, weekly, monthly, seasonally, yearly, reports and ad hoc requests.

c. Description of automated reports accomplished by site (size, frequency, to whom): daily, weekly, monthly, seasonally, yearly, reports and ad hoc requests.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.) The design recommends consolidating the WQIC Project network and the UNDP network onto one server. The recommended server location is in the 4th floor computer room, collocated with other Ministry servers and the communications server. The recommended server for the MWI network is a Pentium based, 90 MHz, IBM compatible personal computer with 64 MB of memory and 3 GB of hard disk drive space. The system will also have an internal 500 MB backup tape drive. The recommended network operating system is Novell 3.12. The current WQIC server should be reused as a Lotus Notes server. The configuration for this reused server would include changing its operating system to IBM's OS/2 and including the Lotus Notes server as a part of the MWI network.

Existing personal computers in the WQIC Project and the UNDP network are recommended for memory upgrades or replacement. One personal computer in the WQIC and five in the UNDP are recommended for replacement by installation of five 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. In addition, 20 personal computers in the WQIC Project and UNDP are recommended for memory upgrades to bring them to 16 MB of memory per system.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: each floor in the Ministry will take 6 days with an additional 2 days for testing.

d. Schematic of site (old and new equipment): see site drawings

e. Listing of Recommended Equipment: 1 Pentium server and 486 66 MHz PC. (The current WQIC server should be reused as a Lotus Notes server.) In addition, 20 personal computers in the WQIC Project and UNDP are recommended for memory upgrades to bring them to 16 MB of memory per system.

f. Listing of Recommended Software: The recommended network operating system is Novell 3.12. The current WQIC server should be reused as a Lotus Notes server. The configuration for this reused server would include changing its operating system to IBM's OS/2 and including the Lotus Notes server as a part of the MWI network.

g. Equipment/Software Cost Estimate: $ 8,396.00

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 941.25

(3) Training: see Chapter 5

SUMMARY FOR WQIC

					priority 1	priority 2	priority 3	priority 4
Office:	WQIC, DAI	Priority:	2		$ -	$ 8,396.00	$ -	$ -
Location:	Ministry Building							
Name:	Ahmed Abu Sennen	Drops:	0	In Ministry Bldg				
Phone:	680100 ext 316							
Reports To:	Ministry							

Material Cost for Site: $ 8,396.00

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Configuration *	$ 2,001.00	1	2	$ 2,001.00	$ -	$ 2,001.00	$ -	$ -
Network Server	$ 5,930.00	0	2	$ -	$ -	$ -	$ -	$ -
Memory Upgrades	$ 400.00	14	2	$ 5,600.00	$ -	$ 5,600.00	$ -	$ -
GIS W/S	$ 4,715.00	0	2	$ -	$ -	$ -	$ -	$ -
Oracle File Server	$ 2,500.00	0	2	$ -	$ -	$ -	$ -	$ -
Oracle Developer	$ 450.00	0	2	$ -	$ -	$ -	$ -	$ -
Oracle PC	$ 795.00	0	2	$ -	$ -	$ -	$ -	$ -
Network S/W	$ 795.00	1	2	$ 795.00	$ -	$ 795.00	$ -	$ -
Cabling	$ 900.00	0	2	$ -	$ -	$ -	$ -	$ -
Phone	$ 15.00	0	1	$ -	$ -	$ -	$ -	$ -
				$ 8,396.00	$ -	$ 8,396.00	$ -	$ -

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling				$ -
Hubs				$ -
Patch Panels				$ -
Receptacles				$ -
Connectors				$ -
Conduit/Plenum				$ -
Corners (Plenum/Conduit)				$ -
Consumables				$ -
Totals:				$ -

*In Ministry Building Calculation

Labor Costs

Labor Category	Rate	Units	TOTAL COSTS
Installation Engineer	$ 72.00	3.75	$ 270.00
Quality Assurance Engineer	$ 53.00	3.75	$ 198.75
Lead Installation Technician	$ 34.00	7.5	$ 255.00
Journey Man Installation Tech.	$ 29.00	7.5	$ 217.50
Totals:		22.5	$ 941.25

*In Ministry Building Calculation

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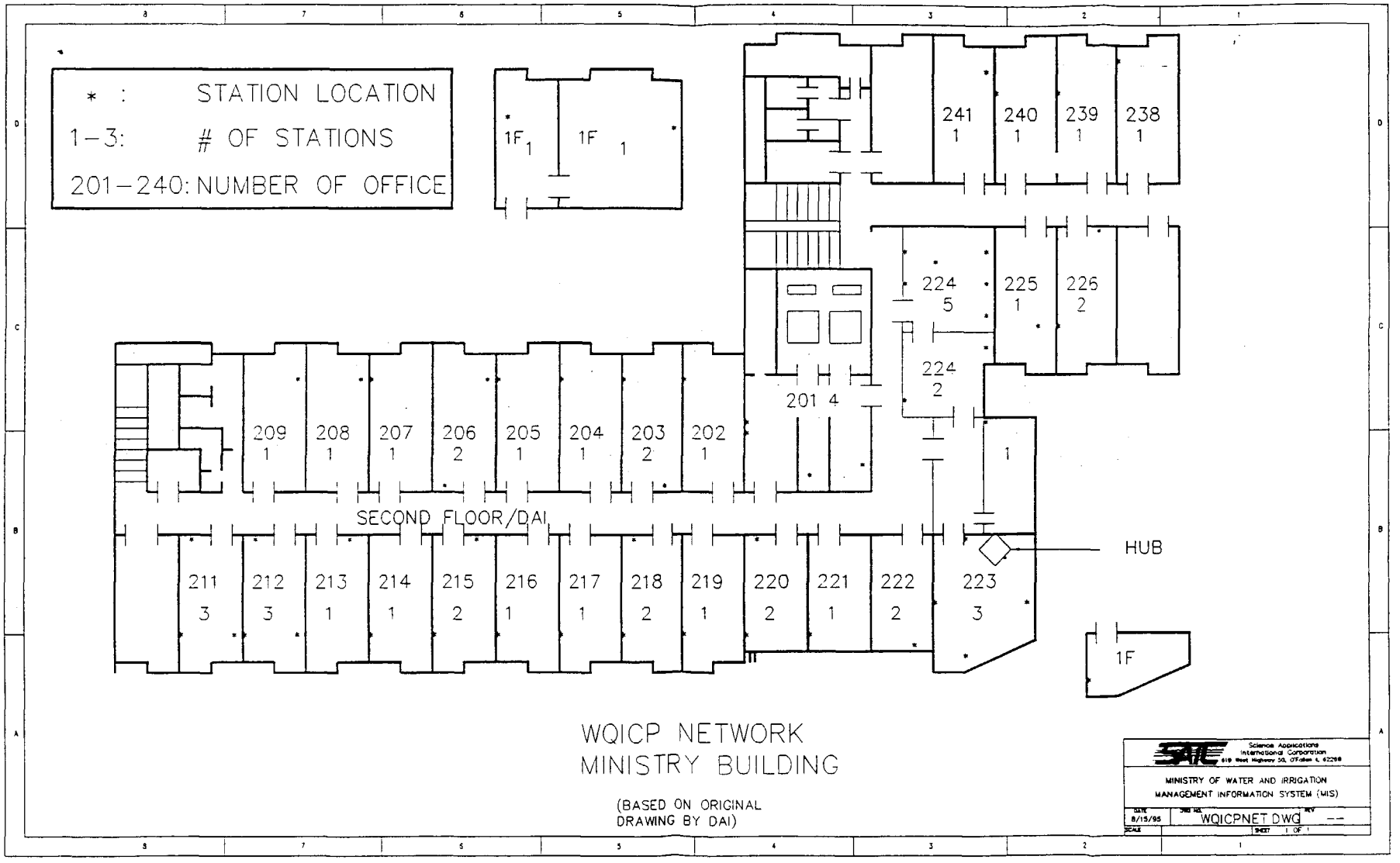


WQICP NETWORK
MINISTRY BUILDING

(BASED ON ORIGINAL
DRAWING BY DAI)

Science Applications International Corporation
619 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
8/15/95	WQICPNET.DWG	--
SCALE	SHEET 1 OF 1	

APPENDIX A-07

WAJ
AJLUN GOVERNORATE

1. Organization Information
   a. Organization Name: Ajlun Water Administration
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?): Ajlun
   e. Manager of Organization, (Name and Title): Engineer Mohealden Shbool
   f. Phone Number of Manager: 04462137
   g. Principle Purpose for organization (verbal description of functionality):

The Ajlun Governorate provides subscriber water services in its assigned area. There is no current local data automation support for this operational organization. Unique in that Stores function is internal to the building on the second floor. Operations and Maintenance is external, about 4 Km. No current automation, but likely candidates for support are Stores, Claims, Operations and Maintenance, Design, Planning, and Studies, Subscribers, Administration, and Finance.

2. Facility Information
   a. Name of Building (Address?): Ajlun
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an

UPS will be provided at installation

   d. Facility Construction: concrete 2 story building
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: N/A There is no current local data automation support for this operational organization.
   b. Description of existing network at site: None
   c. Description of existing external communications links (data) at site: None

4. Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A

5. Data

a. Description of type and amount of data at each site: subscriber billing accounts, water allocations, personnel, payroll, and accounting.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended server for the Ajlun Governorate is a Pentium based, 90 Mhz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Ajlun Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP Level 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP Level 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Ajlun Stores office is one 80486 66 Mhz IBM compatible personal computer installed. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Ajlun Stores personal computer will have installed a VT 220 software terminal emulation package to allow for

dial out access to the Amman Governorate Stores central ordering capability. The Ajlun Stores computer fully networked with the Ajlun Governorate server.

The recommended design for the Ajlun Operations and Maintenance facility is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Ajlun Operations and Maintenance facility will have dial-in access to the Ajlun Governorate server as a Netware client.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 6 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium server, 8 486 PCs (Store: 1 486 PC and O & M 1 486 PC)

f. Listing of Recommended Software: Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Ajlun Stores and Operation and Maintenance facilities. The Stores and the Operations and Maintenance facilities will have dial-in access to the Ajlun Governorate server as a Netware client.

g. Equipment/Software Cost Estimate: $ 30,902.85 (including Stores and O & M)

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 1,695.00 (including Stores and O & M)

(3) Training: see Chapter 5

SUMMARY FOR AJLUN

						priority 1	priority 2	priority 3	priority 4	
Office:	Ajlun Governorate	Priority:	3			$ -	$ -	$ 30,902.85	$ -	$30,902.8
Location:	Ajlun									
Name:	Mohealden Shbool	Drops:	12							
Phone:	04-462137									
Reports To:	HQ WAJ									

Material Cost for Site: $ 30,902.85

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Configuration 1	$ 2,001.00	8	3	$ 16,008.00	$ -	$ -	$ 16,008.00	$ -
Configuration 2	$ 2,377.00	0	3	$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	3	$ 4,485.00	$ -	$ -	$ 4,485.00	$ -
Printer	$ 1,299.00	1	3	$ 1,299.00	$ -	$ -	$ 1,299.00	$ -
Printer DM	$ 259.00	1	3	$ 259.00	$ -	$ -	$ 259.00	$ -
Oracle File Server	$ 2,500.00	0	3	$ -	$ -	$ -	$ -	$ -
Oracle Developer	$ 450.00	0	3	$ -	$ -	$ -	$ -	$ -
Oracle PC	$ 125.00	0	3	$ -	$ -	$ -	$ -	$ -
Network S/W	$ 795.00	1	3	$ 795.00	$ -	$ -	$ 795.00	$ -
Punch Down Block	$ 29.21	1	3	$ 29.21	$ -	$ -	$ 29.21	$ -
Surge Protectors	$ 21.00	8	3	$ 168.00	$ -	$ -	$ 168.00	$ -
UPS	$ 167.00	1	3	$ 167.00	$ -	$ -	$ 167.00	$ -
Phone	$ 12.50	1	3	$ 12.50	$ -	$ -	$ 12.50	$ -
Operations & Maintenance			3	$ 2,427.21	$ -	$ -	$ 2,427.21	$ -
Stores			3	$ 2,846.00	$ -	$ -	$ 2,846.00	$ -
				$ 28,495.92	$ -	$ -	$ 28,495.92	$ -

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS
Operations & Maintenance				
Configuration 1	$ 2,001.00	0	4	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
ReUse Printer	$	1	4	$ -
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector	$ 21.00	1	4	$ 21.00
Phone	$ 15.00	0	4	$ -
Summary				$ 2,427.21
Stores				
Configuration 2	$ 2,377.00	1	3	$ 2,377.00

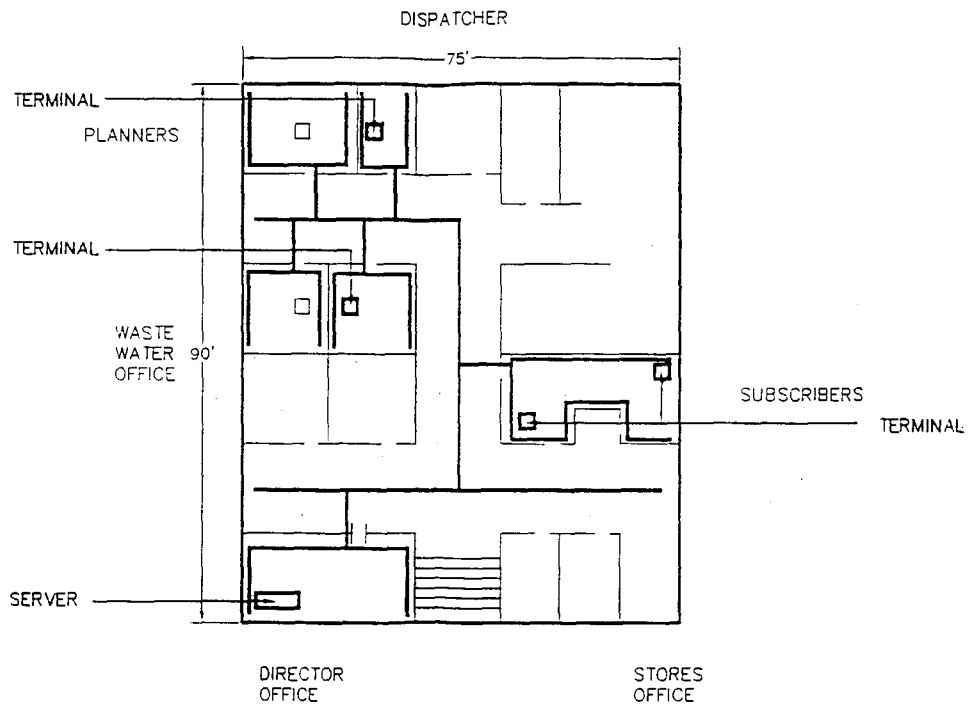
Terminal Emulation	$ 189.00	1	3	$ 189.00
Punch Down Block	$ 29.21	0	4	$ -
Surge Protector	$ 21.00	1	4	$ 21.00
Printer DM	$ 259.00	1	3	$ 259.00
Phone	$ 15.00	0	3	$ -
Summary				$ 2,846.00

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	1500	$ 132.00
Hubs	16 Port	$ 795.00	1	$ 795.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles	2.25 x 4 box	$ 3.50	12	$ 42.00
Connectors	Couplers	$ 0.90	75	$ 67.50
Conduit/Panduit	Small	$ 1.42	750	$ 1,062.53
Corners (Panduit/Conduit)			68	$ 56.90
Consumables		$ 40.00	1	$ 40.00
Totals:				$ 2,406.93

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	6	$ 432.00
Quality Assurance Engineer		$ 53.00	6	$ 318.00
Lead Installation Technician		$ 34.00	15	$ 510.00
Journey Man Installation Tech.		$ 29.00	15	$ 435.00
Totals:			42	$ 1,695.00



WAJ
AJLUN
GOVERNORATE

LEVEL 5 UTP CABLE RUN

Science Applications International Corporation
619 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
8/11/95	WAJAJLUN.DWG1	--

SCALE | SHEET 1 OF 1

APPENDIX A-08

WAJ
AMMAN GOVERNORATE

1. Organization Information
   a. Organization Name: Amman Water Administration
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?): Amman Governorate
   e. Manager of Organization, (Name and Title): Engineer Saed Al-Bakree
   f. Phone Number of Manager: 666111
   g. Principle Purpose for organization (verbal description of functionality): Main offices are on the Ground, 2nd, and 3rd Floors of a 4 story building. City offices include West Amman and South Amman. In addition the main Stores and Warehouse is in Ain Gazal, the Vehicle Workshop and Transportation is in Ras Elaine (future site in February 1996 is 7 Km outside Amman on the way to Zarqa). The Main Office on the 3rd Floor has a networked MicroVax 3200 with 10 terminals and 2 printers. An additional terminal and printer are on the Ground Floor, connected to the network through a hub on the Ground Floor and to HQ WAJ via modem. The 2nd Floor office has 3 PCs and 2 printers for word processing. There is an independent GIS network with 4 workstations and 2 data entry terminals located on the 1st Floor. Automation support will replace and upgrade the existing network. The GIS is run by GTZ in conjunction with a WAJ trouble desk for locating and repairing water line problems. There is no automation at the Vehicle Workshop site in Ras Elaine. The Stores Office in Ein Gazal has moved from a VAX server to a MicroVax 5500 with 6 terminals in the computer building and one in the Director's office. The Stores Office deals directly with all 12 Governorate Stores Directorates via modem. The current database is in COBOL and the Royal Geologic Society is assisting Stores in migrating this database to Oracle. The Zai Water Treatment Plant and the WAJ Water Laboratory are also under the Amman Governorate. Neither of these offices is automated.

2. Facility Information
   a. Name of Building (Address?)
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz. 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation

d. Facility Construction: reinforced concrete and concrete brick 4 story building

e. Code Restrictions: N/A

f. Location of telephone service entry point (comm closet if available)

(1) Gauge of Wire: 24 AWG

(2) Type of interface (four prong, RJ-11, etc.): RJ-11

g. Facility Air Conditioned: N/A

h. Qualitative assessment of dust: High

i. Changes to Facility: N/A

3. Hardware

a. Description of existing hardware at site: The Amman Governorate, at the time the baseline data was collected, had one VAX 3200 with 11 terminals attached. The VAX 3200 was located on the third floor in a room designated as the computer room. Ten of the attached eleven terminals were on the third floor, with one terminal and an attached dot matrix printer on the ground floor. The VAX is using VMS release 5.3 for its operating system. The VAX had two high speed printers, a Mannesman Tally and CITOH CL 600Q, attached for output support. The VAX was attached to a Robotics 9600 Modem which is used to interface with HQ WAJ over a dial-out line. The Amman Governorate also had three standalone IBM compatible personal computers. There was one 80386 system and two 80286 systems. Each of the personal computers had dot matrix printer attached for hard copy output. Specific details can be found in the Jordan.MDB database.

Within the Amman Governorate facility, on the first floor, an operations center was being developed, with contract support from GTZ. The focus of this center will be to provide a customer focal point to contact the Amman Governorate for customer requests and for emergency reporting. The center will use a Geographic Information System (GIS) with 4 workstations and 2 data entry terminals, automated databases and a phone center to support this function. Subsequent to the initial visit, GTZ in cooperation with the Amman Governorate, issued a request for bid for the Amman Network Information System (ANIS). This request for bid will acquire software and hardware that support the Amman Governorate, and will directly impact the Unified MIS project for the Ministry. Data formats and files used in this newly acquired system need to be compatible with the Unified MIS for the Ministry. Without this compatibility, the largest source of data for the Unified MIS may be isolated from key Ministry management functions.

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: dial-up modem

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: subscribe billing accounts, water allocations, personnel, payroll, and accounting.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The Amman Governorate facility recommended design requires the installation of a UTP Level cable plant which is wall surface mounted and enclosed in conduit and panduit as appropriate. Wall surface mounted receptacle boxes will be used to house eight pin modular connectors. The cable plant will be terminated in a 24 port patch panel with eight pin modular jacks, which will intern be linked to a 24 port intelligent hub using eight pin modular jacks and patch cords. The cable plant will be wired in a star topology. The cable plant will be thoroughly tested for continuity and propagation factor to meet Category 5 specifications. The cable plant will be grounded to ensure safety and fire codes are met. Key offices will be networked including: the facility manager's office, the subscriber's service area, engineering design offices, administration offices, and the accounting office. The installation site for the server will be in the existing computer room. Collocated with the server will be an Uninterruptable Power Supply (UPS) with 15 minutes of battery power available after the power supply is lost to allow for a graceful shut down of the server. The current VAX 3200 will remain as currently installed with its terminals attached directly to the system. The VAX 3200 will have an DELQA-M 802.3/Ethernet to Q-bus controller installed to attach an ethernet 10BaseT transceiver with one AUI port and one MJ-8 port (eight pin modular connector). The eight pin modular adapter will be connected to the 24 port hub using UTP Level 5 cable. Personal computers attached to the hub that have Pathworks installed will have access the VAX an be able to act as another attached terminal.

The recommended server for the Amman Governorate is a Pentium based, 90 MHz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Amman Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP Level 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the

installation of nine 80486 66 MHz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP Level 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The nine personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

South Amman and West Amman are offices that report to Amman and are considered Priority 4 sites. These sites will have a telephone punch down block installed and an RJ-11 wall mounted receptacle installed similar to the Operations and Maintenance facility and Stores facility. Each site will have installed one 80486 IBM compatible computer, running at 66 Mhz, with 16 MB of memory and a 400 MB hard disk. Each system will have an internal 14.4 Kpbs Modem with V.32 bis. Each of the city offices will have a 24 pin printer attached to the parallel port of their computer. Each system will have a surge protector power strip. Each system will have the latest version of Microsoft's Windows operating system and the latest Arabized version of Microsoft's Office Professional software suite. These supporting city offices will have dial-in access to the Amman Novell network as a client.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 4 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium server 9 486 PCs (South Amman office 1 486 PC and West Amman office 1 486 PC)

f. Listing of Recommended Software: The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Amman Stores and Operation and Maintenance facilities. The personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite.

g. Equipment/Software Cost Estimate: $ 49,745.97 (includes Stores, West Amman, and South Amman)

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 5,650.00 (includes Stores, West Amman, and South Amman)

(3) Training: see Chapter 5

SUMMARY FOR AMMAN

Office:	Amman Governorate	Priority:	1
Location:	Jebel Husein		
Name:	Saed Al-Bakree	Drops:	40
Phone:	666111		
Reports To:	HQ WAJ, Amman		

	priority 1	priority 2	priority 3	priority 4	
	$ 25,047.55	$ 8,004.00	$ 836.00	$ 15,858.42	$ 49,745.97

Material Cost for Site: $ 49,745.97

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS		priority 1	priority 2	priority 3	priority 4
VAX Interface	$ 836.00	1	3	$ 836.00		$ -	$ -	$ 836.00	$ -
Configuration 1	$ 2,001.00	5	1	$ 10,005.00		$ 10,005.00	$ -	$ -	$ -
Configuration 1	$ 2,001.00	4	2	$ 8,004.00		$ -	$ 8,004.00	$ -	$ -
Configuration 2	$ 2,377.00	0	1	$ -		$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	1	$ 4,485.00		$ 4,485.00	$ -	$ -	$ -
Oracle File Server	$ 2,500.00	0	1	$ -		$ -	$ -	$ -	$ -
Oracle Developer	$ 450.00	0	2	$ -		$ -	$ -	$ -	$ -
Oracle PC	$ 125.00	0	1	$ -		$ -	$ -	$ -	$ -
Pathworks (Term Em S/W)	$ 185.00	3	1	$ 555.00		$ 555.00	$ -	$ -	$ -
Network S/W	$ 795.00	1	1	$ 795.00		$ 795.00	$ -	$ -	$ -
Netware Connect 2	$ 695.00	1	1	$ 695.00		$ 695.00	$ -	$ -	$ -
Punch Down Block	$ 28.88	1	1	$ 28.88		$ 28.88	$ -	$ -	$ -
RJ-11 Wall Mount	$ 10.33	2	1	$ 20.66		$ 20.66	$ -	$ -	$ -
Surge Protector	$ 21.00	10	1	$ 210.00		$ 210.00	$ -	$ -	$ -
UPS	$ 167.00	1	1	$ 167.00		$ 167.00	$ -	$ -	$ -
Phone	$ 15.00	0	1	$ -	2 required	$ -	$ -	$ -	$ -
Operations & Maintenance			4	$ 10,486.00		$ -	$ -	$ -	$ 10,486.00
South Amman			4	$ 2,686.21		$ -	$ -	$ -	$ 2,686.21
West Amman			4	$ 2,686.21		$ -	$ -	$ -	$ 2,686.21
Stores			1	$ 3,448.21		$ 3,448.21	$ -	$ -	$ -
				$ 45,108.17		$ 20,409.75	$ 8,004.00	$ 836.00	$ 15,858.42

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS
Operations & Maintenance				
Configuration 1	$ 2,001.00	4	4	$ 8,004.00
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
Surge Protector	$ 21.00	5	1	$ 105.00
ReUse Printer	$ -	1	4	$ -
Phone	$ 15.00	0	4	$ -

Summary				$	10,486.00
South Amman					
Configuration 2	$	2,377.00	1	4	$ 2,377.00
Printer DM	$	259.00	1	4	$ 259.00
Surge Protector	$	21.00	1	4	$ 21.00
Phone	$	15.00	0	4	$ -
Punch Down Block	$	29.21	1	4	$ 29.21
Summary				$	2,686.21
West Amman					
Configuration 2	$	2,377.00	1	4	$ 2,377.00
Printer DM	$	259.00	1	4	$ 259.00
Surge Protector	$	21.00	1	4	$ 21.00
Phone	$	15.00	0	4	$ -
Punch Down Block	$	29.21	1	4	$ 29.21
Summary				$	2,686.21
Ain Ghazal - Stores					
VAX Config	$	836.00	1	1	$ 836.00
Configuration 2	$	2,377.00	1	1	$ 2,377.00
Terminal Emulation	$	185.00	1	1	$ 185.00
Surge Protector	$	21.00	1	1	$ 21.00
Phone Lines	$	15.00	0	1	$ - 2 required
Punch Down Block	$	29.21	1	1	$ 29.21
Summary				$	3,448.21

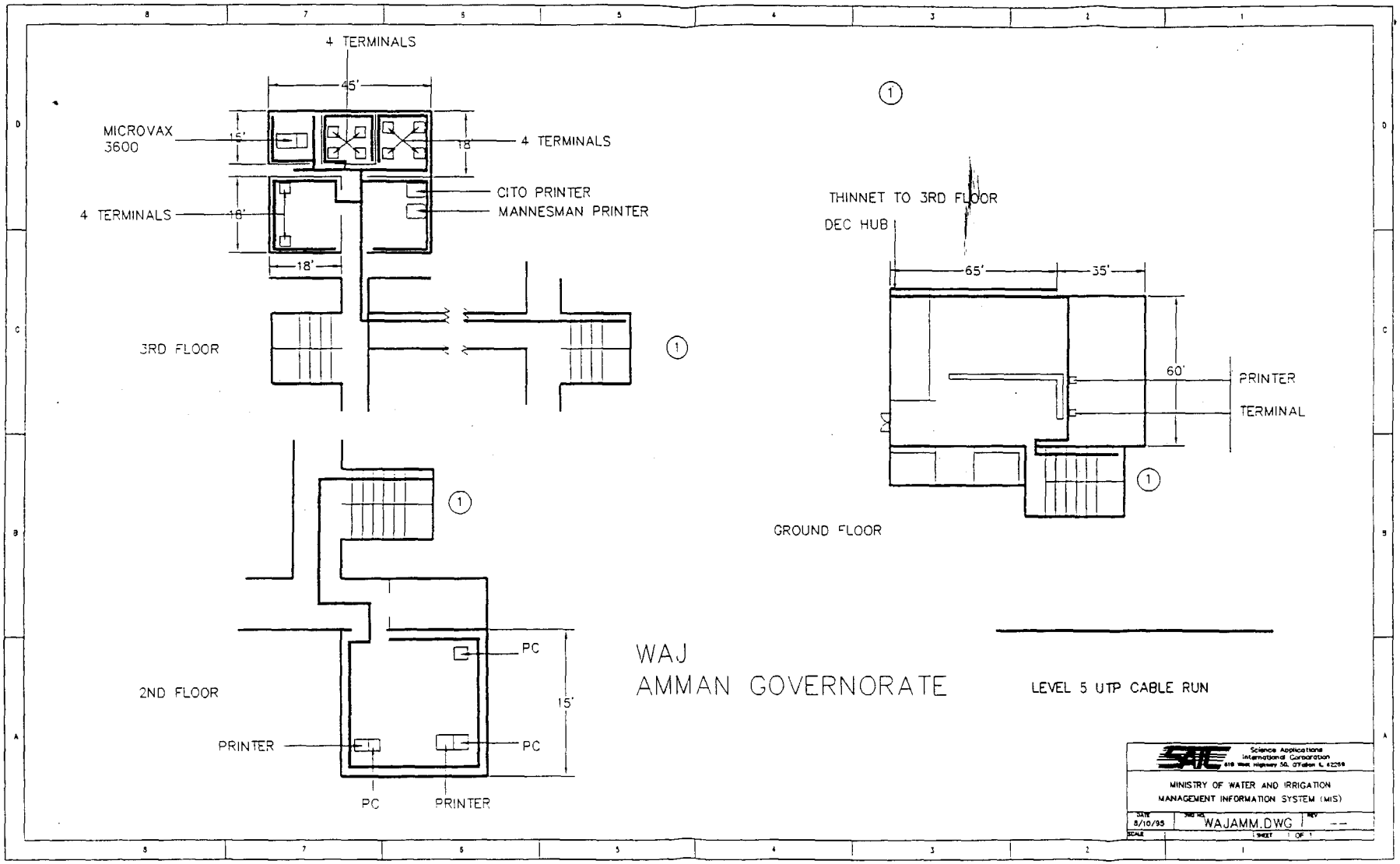
Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	2460	$ 216.48
Hubs	24 Port	$ 1,295.00	1	$ 1,295.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles		$ 7.70	50	$ 385.00
Connectors	Couplers	$ 0.90	100	$ 90.00
Conduit/Panduit	Small	$ 1.42	1600	$ 2,266.72
Corners (Panduit/Conduit)	In and Outside		88	$ 73.60
Consumables		$ 100.00	1	$ 100.00
Totals:				$ 4,637.80

Labor Costs

Totals

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	20	$ 1,440.00
Quality Assurance Engineer		$ 53.00	20	$ 1,060.00
Lead Installation Technician		$ 34.00	50	$ 1,700.00
Journey Man Installation Tech.		$ 29.00	50	$ 1,450.00
Totals:			140	$ 5,650.00


4 TERMINALS
45'
MICROVAX
3600
15'
18'
4 TERMINALS
CITO PRINTER
MANNESMAN PRINTER
4 TERMINALS
18'
18'
3RD FLOOR
1
THINNET TO 3RD FLOOR
DEC HUB
65'
35'
60'
PRINTER
TERMINAL
1
GROUND FLOOR
1
PC
2ND FLOOR
15'
PRINTER
PC
PC
PRINTER
WAJ
AMMAN GOVERNORATE
LEVEL 5 UTP CABLE RUN
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
DATE 8/10/95
WAJAMM.DWG
REV --
SHEET 1 OF 1

APPENDIX A-09

WAJ
VEHICLE OPERATIONS AND MAINTENANCE
AMMAN (RAS ELAIN)

1. Organization Information
   a. Organization Name: WAJ Vehicle Operations and Maintenance
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?): Amman (Ras Elain)
   e. Manager of Organization, (Name and Title): Dr Jamel Boka
   f. Phone Number of Manager: 771125
   g. Principle Purpose for organization (verbal description of functionality): The main function of the O & M facility is to maintain and track all WAJ vehicles from purchase to salvage. Vehicle maintenance records are used to determine the appropriate cost-benefit of keeping a vehicle in service or purchasing a replacement vehicle.

2. Facility Information
   a. Name of Building (Address?): Amman (Ras Elain)
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: concrete 2 story building
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: O & M facilities will move to new location outside of Amman in 1996-1997.

3. Hardware
   a. Description of existing hardware at site: N/A
   b. Description of existing network at site: N/A
   c. Description of existing external communications links (data) at site: N/A

4 Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A

5. Data

a. Description of type and amount of data at each site: vehicle maintenance data on equipment, maintenance actions and life-cycle costs for over 100 vehicles used to support WAJ operations

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): vehicle inspections, maintenance records, and trouble tickets for tracking on-going vehicle maintenance. Reports provided to HQ WAJ on vehicle expense history to determine new acquisition phase points on each vehicle.

c. Description of automated reports accomplished by site (size, frequency, to whom: N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design for the Amman Operations and Maintenance facility includes five 80486 66 Mhz IBM compatible personal computers. One configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The other four systems configurations will be 80486 66 Mhz IBM compatible personal computers, with 16 MB of memory and 300 MB of hard disk drive space. Each of these systems will have an internal ethernet card and be connected in a peer-to-peer configuration within the Operations and Maintenance facility. An RG-58 coaxial cable will be used for this connection. The systems will be attached to an electronic surge protectors. The recommended systems will have Microsoft's Windows for Work Groups operating system and an Arabized version of Microsoft's Office Professional software suite. The Amman Operations and Maintenance facility will have dial-in access to the Amman Governorate server as a Netware client. This organization is being moved from its current location at Ras Elain into a new facility. The installation for this organization will be scheduled after the move has occurred. The recommended configuration suggests the migration of the JVA vehicle maintenance and tracking database used at Fanoush to the Amman vehicle operations and maintenance activity. This will require migrating the JVA Oracle 5 based system to Oracle 7 for personal computers and installing it for the Amman operation.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 3 days

d. Schematic of site (old and new equipment): see site drawing (a revised site drawing will be made when the new facility is available)

e. Listing of Recommended Equipment: 5 486 PCs

f. Listing of Recommended Software: The recommended systems will have Microsoft's Windows for Work Groups operating system and an Arabized version of Microsoft's Office Professional software suite.

g. Equipment/Software Cost Estimate: $ 10,486.00

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: (included as part of the Amman Governorate which costs $5,650.00 for O & M, Stores, South Amman, and West Amman))

(3) Training: see Chapter 5

SUMMARY FOR AMMAN

Office:	Amman Governorate	Priority:	1
Location:	Jebel Husein		
Name:	Saed Al Bakree	Drops:	40
Phone:	666111		
Reports To:	HQ WAJ, Amman		

		priority 1	priority 2	priority 3	priority 4	
Material Cost for Site:	$ 49,745.97	$ 25,047.55	$ 8,004.00	$ 836.00	$ 15,858.42	$ 49,745.97

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS		priority 1	priority 2	priority 3	priority 4
VAX Interface	$ 836.00	1	3	$ 836.00		$ -	$ -	$ 836.00	$ -
Configuration 1	$ 2,001.00	5	1	$ 10,005.00		$ 10,005.00	$ -	$ -	$ -
Configuration 1	$ 2,001.00	4	2	$ 8,004.00		$ -	$ 8,004.00	$ -	$ -
Configuration 2	$ 2,377.00	0	1	$ -		$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	1	$ 4,485.00		$ 4,485.00	$ -	$ -	$ -
Oracle File Server	$ 2,500.00	0	1	$ -		$ -	$ -	$ -	$ -
Oracle Developer	$ 450.00	0	2	$ -		$ -	$ -	$ -	$ -
Oracle PC	$ 125.00	0	1	$ -		$ -	$ -	$ -	$ -
Pathworks (Term Em S/W)	$ 185.00	3	1	$ 555.00		$ 555.00	$ -	$ -	$ -
Network S/W	$ 795.00	1	1	$ 795.00		$ 795.00	$ -	$ -	$ -
Netware Connect 2	$ 695.00	1	1	$ 695.00		$ 695.00	$ -	$ -	$ -
Punch Down Block	$ 28.88	1	1	$ 28.88		$ 28.88	$ -	$ -	$ -
RJ-11 Wall Mount	$ 10.33	2	1	$ 20.66		$ 20.66	$ -	$ -	$ -
Surge Protector	$ 21.00	10	1	$ 210.00		$ 210.00	$ -	$ -	$ -
UPS	$ 167.00	1	1	$ 167.00		$ 167.00	$ -	$ -	$ -
Phone	$ 15.00	0	1	$ -	2 required	$ -	$ -	$ -	$ -
Operations & Maintenance			4	$ 10,486.00		$ -	$ -	$ -	$ 10,486.00
South Amman			4	$ 2,686.21		$ -	$ -	$ -	$ 2,686.21
West Amman			4	$ 2,686.21		$ -	$ -	$ -	$ 2,686.21
Stores			1	$ 3,448.21		$ 3,448.21	$ -	$ -	$ -
				$ 45,108.17		$ 20,409.75	$ 8,004.00	$ 836.00	$ 15,858.42

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS
Operations & Maintenance				
Configuration 1	$ 2,001.00	4	4	$ 8,004.00
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
Surge Protector	$ 21.00	5	1	$ 105.00
ReUse Printer	$ -	1	4	$ -
Phone	$ 15.00	0	4	$ -

Summary				$ 10,486.00	
South Amman					
Configuration 2	$ 2,377.00	1	4	$ 2,377.00	
Printer DM	$ 259.00	1	4	$ 259.00	
Surge Protector	$ 21.00	1	4	$ 21.00	
Phone	$ 15.00	0	4	$ -	
Punch Down Block	$ 29.21	1	4	$ 29.21	
Summary				$ 2,686.21	
West Amman					
Configuration 2	$ 2,377.00	1	4	$ 2,377.00	
Printer DM	$ 259.00	1	4	$ 259.00	
Surge Protector	$ 21.00	1	4	$ 21.00	
Phone	$ 15.00	0	4	$ -	
Punch Down Block	$ 29.21	1	4	$ 29.21	
Summary				$ 2,686.21	
Ain Ghazal - Stores					
VAX Config	$ 836.00	1	1	$ 836.00	
Configuration 2	$ 2,377.00	1	1	$ 2,377.00	
Terminal Emulation	$ 185.00	1	1	$ 185.00	
Surge Protector	$ 21.00	1	1	$ 21.00	
Phone Lines	$ 15.00	0	1	$ -	2 required
Punch Down Block	$ 29.21	1	1	$ 29.21	
Summary				$ 3,448.21	

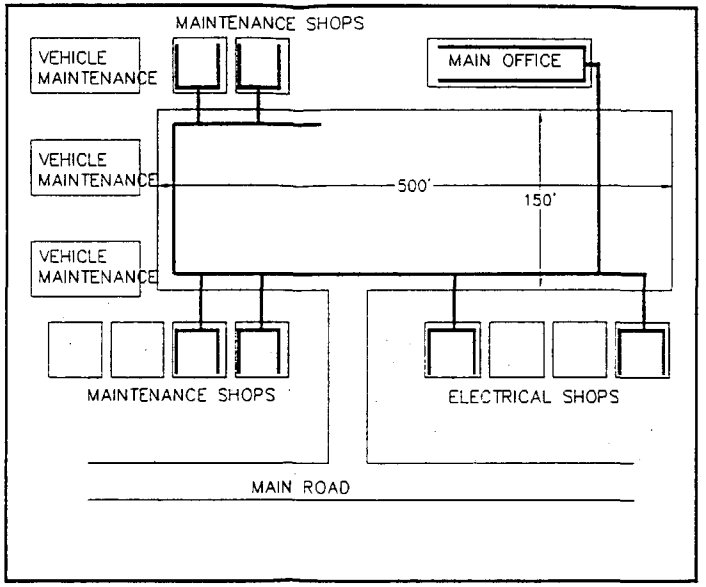
Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	2460	$ 216.48
Hubs	24 Port	$ 1,295.00	1	$ 1,295.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles		$ 7.70	50	$ 385.00
Connectors	Couplers	$ 0.90	100	$ 90.00
Conduit/Panduit	Small	$ 1.42	1600	$ 2,266.72
Corners (Panduit/Conduit)	In and Outside		88	$ 73.60
Consumables		$ 100.00	1	$ 100.00
Totals:				$ 4,637.80

Labor Costs

Totals

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	20	$ 1,440.00
Quality Assurance Engineer		$ 53.00	20	$ 1,060.00
Lead Installation Technician		$ 34.00	50	$ 1,700.00
Journey Man Installation Tech.		$ 29.00	50	$ 1,450.00
Totals:			140	$ 5,650.00



WAJ
AMMAN (RAS AL AIN)
O & M

LEVEL 5 UTP CABLE RUN

Science Applications International Corporation
610 West Highway 50, O'Fallon, IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
8/03/95	WAJO&M.DWG	--

SCALE | SHEET 1 OF 1

APPENDIX A-10

WAJ STORES
AMMAN (AIN GHAZAL)

1. Organization Information
   a. Organization Name: WAJ Stores
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?): Amman (Ain Ghazal)
   e. Manager of Organization, (Name and Title): Mr. Nouman Shawahen
   f. Phone Number of Manager: 891261
   g. Principle Purpose for organization (verbal description of functionality): The Stores organization provides a centralized acquisition and distribution point for consumable items used by the Governorates to install, maintain and repair the water distribution system.

2. Facility Information
   a. Name of Building (Address?): Amman (Ain Ghazal)
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: concrete 1 story buildings
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: Moderate
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: The Amman Stores function, a subordinate organization of the Amman Governorate, at the time the baseline data was collected, had one VAX 3200 with nine terminals attached. The VAX 3200 is using VMS release 5.3 for its operating system. No printers were attached at the time data was collected. The VAX 3200 was just being installed and was not operational. The Stores organization provides a centralized acquisition and distribution point for consumable

items used by the Governorates to install, maintain and repair the water distribution system. There was a power stabilizer (Claude Lyons) attached to the VAX 8200, but no UPS system. The VAX 3200 will be used to develop an automated capability for controlling inventory, develop automated ordering algorithms for restocking, and provide support for other Governorates to submit automated supply requests. The current plan is to develop the automated system using in-house programming resources. The automated system will be developed using Oracle 7 as the database engine.

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: dial up modems

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: The VAX 3200 will be used to develop an automated capability for controlling inventory, develop automated ordering algorithms for restocking, and provide support for other Governorates to submit automated supply requests. The current plan is to develop the automated system using in-house programming resources. The automated system will be developed using Oracle 7 as the database engine.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The Stores facility will have a 30 pair telephone punch down block and two RJ-11 wall mounted receptacles installed. There is an existing telephone line and Modem. An additional phone line and modem for the VAX 3200 is recommended to increase the dial in access capability from other Governorate Stores. The recommended design for the Amman Stores office retains the installed VAX 3200 with its 9 connected terminals. The design replaces the wiring plant with wiring run in conduits/panduits and surface mounted receptacles to improve physical security of the system. The design adds one 80486 66 Mhz IBM compatible personal computer with terminal emulation that is attached to the VAX 3200. The new computer is configured with 16 MB of memory, 400 MB hard disk drive and an internal 14.4 Kbps Modem with V.32 bis. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Amman Stores personal computer will have installed a VT 220 software terminal emulation package to allow for access to

the Amman Governorate Stores VAX 3200. The Amman Stores computer will have a dial in capability so that it can be attached to the Amman Governorate server as a Netware client.

b. Site Unique Risks (Technical or Security): underground trenching of cable between computer room and main building and/or warehouses

c. Proposed Schedule: 4 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: one 80486 66 Mhz IBM PC

f. Listing of Recommended Software: Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Amman Stores personal computer will have installed a VT 220 software terminal emulation package to allow for access to the Amman Governorate Stores VAX 3200.

g. Equipment/Software Cost Estimate: $ 3,448.21

f. Site Installation Cost

(1) Tools Required (Rent?): Trenching equipment will need to be rented to complete this portion of the implementation scheme

(2) Labor: (included as part of the Amman Governorate which costs $5,650.00 for O & M, Stores, South Amman, and West Amman)

(3) Training: see Chapter 5

SUMMARY FOR AMMAN

Office:	Amman Governorate	Priority:	1
Location:	Jebel Huseln		
Name:	Saed Al Bakree	Drops:	40
Phone:	666111		
Reports To:	HQ WAJ, Amman		

		priority 1	priority 2	priority 3	priority 4	
Material Cost for Site:	$ 49,745.97	$ 25,047.55	$ 8,004.00	$ 836.00	$ 15,858.42	$ 49,745.97

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS		priority 1	priority 2	priority 3	priority 4
VAX Interface	$ 836.00	1	3	$ 836.00		$ -	$ -	$ 836.00	$ -
Configuration 1	$ 2,001.00	5	1	$ 10,005.00		$ 10,005.00	$ -	$ -	$ -
Configuration 1	$ 2,001.00	4	2	$ 8,004.00		$ -	$ 8,004.00	$ -	$ -
Configuration 2	$ 2,377.00	0	1	$ -		$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	1	$ 4,485.00		$ 4,485.00	$ -	$ -	$ -
Oracle File Server	$ 2,500.00	0	1	$ -		$ -	$ -	$ -	$ -
Oracle Developer	$ 450.00	0	2	$ -		$ -	$ -	$ -	$ -
Oracle PC	$ 125.00	0	1	$ -		$ -	$ -	$ -	$ -
Pathworks (Term Em S/W)	$ 185.00	3	1	$ 555.00		$ 555.00	$ -	$ -	$ -
Network S/W	$ 795.00	1	1	$ 795.00		$ 795.00	$ -	$ -	$ -
Netware Connect 2	$ 695.00	1	1	$ 695.00		$ 695.00	$ -	$ -	$ -
Punch Down Block	$ 28.88	1	1	$ 28.88		$ 28.88	$ -	$ -	$ -
RJ-11 Wall Mount	$ 10.33	2	1	$ 20.66		$ 20.66	$ -	$ -	$ -
Surge Protector	$ 21.00	10	1	$ 210.00		$ 210.00	$ -	$ -	$ -
UPS	$ 167.00	1	1	$ 167.00		$ 167.00	$ -	$ -	$ -
Phone	$ 15.00	0	1	$ -	2 required	$ -	$ -	$ -	$ -
Operations & Maintenance			4	$ 10,486.00		$ -	$ -	$ -	$ 10,486.00
South Amman			4	$ 2,686.21		$ -	$ -	$ -	$ 2,686.21
West Amman			4	$ 2,686.21		$ -	$ -	$ -	$ 2,686.21
Stores			1	$ 3,448.21		$ 3,448.21	$ -	$ -	$ -
				$ 45,108.17		$ 20,409.75	$ 8,004.00	$ 836.00	$ 15,858.42

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS
Operations & Maintenance				
Configuration 1	$ 2,001.00	4	4	$ 8,004.00
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
Surge Protector	$ 21.00	5	1	$ 105.00
ReUse Printer	$ -	1	4	$ -
Phone	$ 15.00	0	4	$ -

Summary				$ 10,486.00	
South Amman					
Configuration 2	$ 2,377.00	1	4	$ 2,377.00	
Printer DM	$ 259.00	1	4	$ 259.00	
Surge Protector	$ 21.00	1	4	$ 21.00	
Phone	$ 15.00	0	4	$ -	
Punch Down Block	$ 29.21	1	4	$ 29.21	
Summary				$ 2,686.21	
West Amman					
Configuration 2	$ 2,377.00	1	4	$ 2,377.00	
Printer DM	$ 259.00	1	4	$ 259.00	
Surge Protector	$ 21.00	1	4	$ 21.00	
Phone	$ 15.00	0	4	$ -	
Punch Down Block	$ 29.21	1	4	$ 29.21	
Summary				$ 2,686.21	
Ain Ghazal - Stores					
VAX Config	$ 836.00	1	1	$ 836.00	
Configuration 2	$ 2,377.00	1	1	$ 2,377.00	
Terminal Emulation	$ 185.00	1	1	$ 185.00	
Surge Protector	$ 21.00	1	1	$ 21.00	
Phone Lines	$ 15.00	0	1	$ -	2 required
Punch Down Block	$ 29.21	1	1	$ 29.21	
Summary				$ 3,448.21	

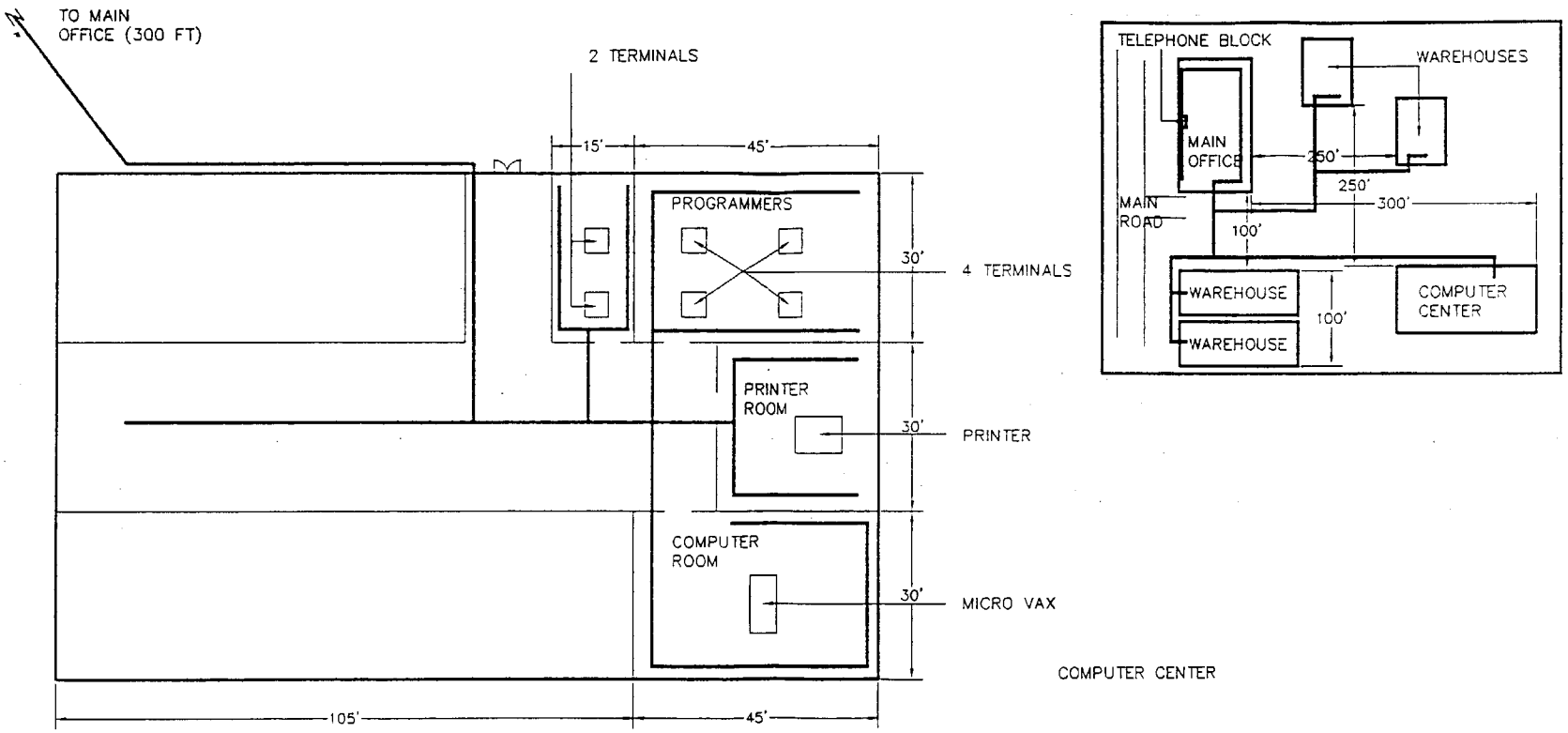
Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	2460	$ 216.48
Hubs	24 Port	$ 1,295.00	1	$ 1,295.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles		$ 7.70	50	$ 385.00
Connectors	Couplers	$ 0.90	100	$ 90.00
Conduit/Panduit	Small	$ 1.42	1600	$ 2,286.72
Corners (Panduit/Conduit)	In and Outside		88	$ 73.60
Consumables		$ 100.00	1	$ 100.00
Totals:				$ 4,637.80

Labor Costs

Totals

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	20	$ 1,440.00
Quality Assurance Engineer		$ 53.00	20	$ 1,060.00
Lead Installation Technician		$ 34.00	50	$ 1,700.00
Journey Man Installation Tech.		$ 29.00	50	$ 1,450.00
Totals:			140	$ 5,650.00



COMPUTER CENTER

WAJ
AMMAN (AIN GHAZAL)
STORES

LEVEL 5 UTP CABLE RUN

Science Applications International Corporation
618 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
8/03/95	WAJSTORE.DWG	--

SCALE | SHEET 1 OF 1

APPENDIX A-11

WAJ
AQABA GOVERNORATE

1. Organization Information
   a. Organization Name: Aqaba Water Administration
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?): Aqaba Governorate
   e. Manager of Organization, (Name and Title): Engineer Walid Ammare
   f. Phone Number of Manager: 03314399
   g. Principle Purpose for organization (verbal description of functionality): The Aqaba Governorate provides subscriber water services in its assigned area. Total employees 130 support 13,000 subscriber base. Main offices are on the Ground Floor and 1st Floor of a 2 story building. The Stores office is remote (3 Km). Additional city offices include Quera (maintenance) and a future site in Wadi Arab (Wadi Shloam). Likely candidates for automation include Studies and Plans, Finance and Accounting, Personnel Administration, Claims, O & M, and Subscriber Data Entry.

2. Facility Information
   a. Name of Building (Address?): Aqaba
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: reinforced concrete and concrete brick 2 story building
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: Plans for a new building--4 stories--in 1996-1997.

3. Hardware
   a. Description of existing hardware at site: N/A
   b. Description of existing network at site: None

c. Description of existing external communications links (data) at site: None

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: subscribe billing accounts, water allocations, personnel, payroll, and accounting.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended server for the Aqaba Governorate is a Pentium based, 90 Mhz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Aqaba Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP Level 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP Level 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Aqaba Stores office is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle, which will be cabled to a telephone punch down block. The recommended system will have Microsoft's Windows operating

system and an Arabized version of Microsoft's Office Professional software suite. The Aqaba Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Aqaba Stores computer will have a dial in capability so that it can be attached to the Aqaba Governorate server as a Netware client.

The recommended design for the Aqaba Operations and Maintenance facility is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Aqaba Operations and Maintenance facility will have dial-in access to the Aqaba Governorate server as a Netware client.

b. Site Unique Risks (Technical or Security)N/A

c. Proposed Schedule: 6 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: Pentium server (Stores Office 1 486 PC and O & M Office 1 486 PC)

f. Listing of Recommended Software: The personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Aqaba Stores and Operation and Maintenance facilities. The Aqaba Stores Office and the Operations and Maintenance facility will have dial-in access to the Aqaba Governorate server as a Netware client. The Aqaba Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability.

g. Equipment/Software Cost Estimate: $ 30,973.96 (includes Stores and O & M)

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 2,825.00 (includes Stores and O & M)

(3) Training: see Chapter 5

SUMMARY FOR AQABA

Office:	Aqaba Governorate	Priority:	3		priority 1	priority 2	priority 3	priority 4	
Location:	Aqaba				$ -	$ -	$ 30,973.96	$ -	$ 30,973.9
Name:	Walid Ammare	Drops:	20						
Phone:	03-314399								
Reports To:	HQ WAJ								

Material Cost for Site: $ 30,973.96

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Configuration 1	$ 2,001.00	8	3	$ 16,008.00	$ -	$ -	$ 16,008.00	$ -
Configuration 2	$ 2,377.00	0	3	$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	3	$ 4,485.00	$ -	$ -	$ 4,485.00	$ -
Printer	$ 1,299.00	1	3	$ 1,299.00	$ -	$ -	$ 1,299.00	$ -
Printer DM	$ 259.00	1	3	$ 259.00	$ -	$ -	$ 259.00	$ -
Oracle File Server	$ 2,500.00	0	3	$ -	$ -	$ -	$ -	$ -
Oracle Developer	$ 450.00	0	3	$ -	$ -	$ -	$ -	$ -
Oracle PC	$ 125.00	0	3	$ -	$ -	$ -	$ -	$ -
Network S/W	$ 795.00	1	3	$ 795.00	$ -	$ -	$ 795.00	$ -
Punch Down Block	$ 29.21	1	3	$ 29.21	$ -	$ -	$ 29.21	$ -
Surge Protector	$ 21.00	8	3	$ 168.00	$ -	$ -	$ 168.00	$ -
UPS	$ 167.00	1	3	$ 167.00	$ -	$ -	$ 167.00	$ -
Phone	$ 15.00	0	3	$ -	$ -	$ -	$ -	$ -
Operations & Maintenance			3	$ 2,427.21	$ -	$ -	$ 2,427.21	$ -
Stores			3	$ 2,875.21	$ -	$ -	$ 2,875.21	$ -
				$ 28,512.63	$ -	$ -	$ 28,512.63	$ -

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS
Operations & Maintenance				
Configuration 1	$ 2,001.00	0	4	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
ReUse Printer	$ -	1	4	$ -
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector	$ 21.00	1	4	$ 21.00
Phone	$ 15.00	0	4	$ -
Summary				$ 2,427.21
Stores				

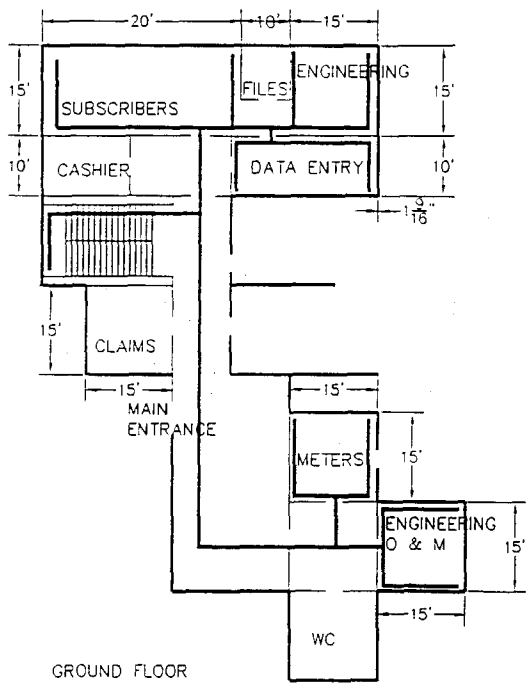
Configuration 2	$ 2,377.00	1	3	$ 2,377.00
Printer DM	$ 259.00	1	3	$ 259.00
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector	$ 21.00	1	4	$ 21.00
Phone	$ 15.00	0	3	$ -
Terminal Emulator	$ 189.00	1	3	$ 189.00
Summary				$ 2,875.21

Network Components

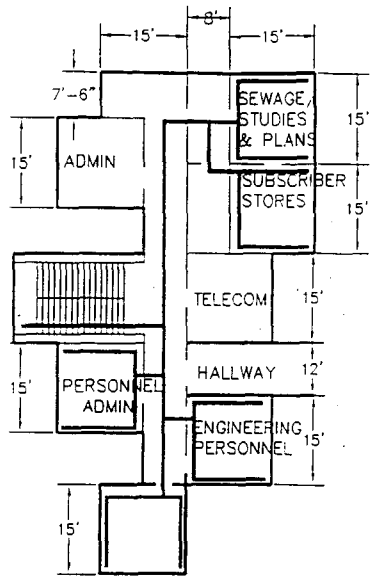
ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	1800	$ 158.40
Hubs	16 Port	$ 795.00	1	$ 795.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles	2.25 x 4 box	$ 3.50	20	$ 70.00
Connectors	Couplers	$ 0.90	75	$ 67.50
Condult/Pandult	Small	$ 1.42	750	$ 1,062.53
Corners (Pandult/Condult)			68	$ 56.90
Consumables		$ 40.00	1	$ 40.00
Totals:				$ 2,461.33

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	10	$ 720.00
Quality Assurance Engineer		$ 53.00	10	$ 530.00
Lead Installation Technician		$ 34.00	25	$ 850.00
Journey Man Installation Tech.		$ 29.00	25	$ 725.00
Totals:			70	$ 2,825.00



GROUND FLOOR



1ST FLOOR

WAJ
AQABA GOVERNORATE

LEVEL 5 UTP CABLE RUN

Science Applications International Corporation
619 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
8/01/95	WAJAQABA.DWG	--

SCALE | SHEET 1 OF 1

APPENDIX A-12

WAJ
BALQA GOVERNORATE

1. Organization Information
   a. Organization Name: Balqa Water Administration
   b. Organization Belongs to What Ministry WAJ
   c. Organization falls immediately under which organization WAJ
   d. Location of Organization, Governate, City, Building (address?): Salt, Balqa Governorate
   e. Manager of Organization, (Name and Title): Engineer Jarees Dababmeh
   f. Phone Number of Manager: 05554841
   g. Principle Purpose for organization (verbal description of functionality): The Balqa Governorate provides subscriber water services in its assigned area. In addition there are several subordinate offices in small municipalities (Al Baq'a, Fushies, Deir Alla, and South Shouneh) that work with Balqa to provide subscriber service. Balqa has an external office for Stores and O & M. Main offices are on the 2nd floor of a 2 story building. Likely candidates are the Director, Personnel, Information and Design, Stores, Claims, Accounts, Subscribers, and Purchasing.

2. Facility Information
   a. Name of Building (Address?): Balqa (Salt)
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: reinforced concrete and concrete brick 2 story building
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: Building is a rental. Plans are to replace this facility by mid-June 1996.

3. Hardware

a. Description of existing hardware at site: N/A There is no current local data automation support for this operational organization.

b. Description of existing network at site: None

c. Description of existing external communications links (data) at site: None

4. Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A

5. Data

a. Description of type and amount of data at each site: subscribe billing accounts, water allocations, personnel, payroll, and accounting.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended server for the Balqa Governorate is a Pentium based, 90 Mhz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Balqa Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP Level 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP Level 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Balqa Stores office is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an

electronic surge protector and to the RJ-11 receptacle, which will be cabled to a telephone punch down block. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Balqa Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Balqa Stores computer will have a dial in capability so that it can be attached to the Balqa Governorate server as a Netware client.

The recommended design for the Balqa Operations and Maintenance facility is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Balqa Operations and Maintenance facility will have dial-in access to the Balqa Governorate server as a Netware client.

The recommended design for each supporting municipality (Baq'a, Fushies, Deir Alla, and South Shouneh) includes a telephone punch down block, an RJ-11 receptacle, a surge protector and one 80486 66 Mhz IBM compatible personal computer installed. Each computer includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. Each municipality will have dial in access to the Balqa Governorate server as a Netware client.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 6 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium server and 8 486 PCs. (Stores 1 486, O & M 1 486) 4 486s--1 each for Baq'a, Fushies, Deir Alla, and South Shouneh.

f. Listing of Recommended Software: The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Balqa Stores and Operation and Maintenance facilities. The PCs will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. The Balqa Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability.

g. Equipment/Software Cost Estimate: $ 43,058.31 (includes Stores and O & M plus Baq'a, Fushies, Deir Alla, and South Shouneh)

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 3,107.50 (includes Stores and O & M plus Baq'a, Fushies, Deir Alla, and South Shouneh)

(3) Training: see Chapter 5

SUMMARY FOR BALQA

Office:	Balqa Governorate	Priority:	3			priority 1	priority 2	priority 3	priority 4	
Location:	Balqa (Salt					$ -	$ -	$ 29,886.26	$ 13,172.05	$ 43,058.31
Name:	Yousef Iswani	Drops:	22							
Phone:	05-554841									
Reports To:	HQ WAJ									
Material Cost for Site:	$ 43,058.31									

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Configuration 1	$ 2,001.00	8	3	$ 16,008.00	$ -	$ -	$ 16,008.00	$ -
Configuration 2	$ 2,377.00	0	3	$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	3	$ 4,485.00	$ -	$ -	$ 4,485.00	$ -
Printer	$ 1,299.00	1	3	$ 1,299.00	$ -	$ -	$ 1,299.00	$ -
Printer DM	$ 259.00	1	3	$ 259.00	$ -	$ -	$ 259.00	$ -
Oracle File Server	$ 2,500.00	0	3	$ -	$ -	$ -	$ -	$ -
Oracle Developer	$ 450.00	0	3	$ -	$ -	$ -	$ -	$ -
Oracle PC	$ 125.00	0	3	$ -	$ -	$ -	$ -	$ -
Network S/W	$ 795.00	1	3	$ 795.00	$ -	$ -	$ 795.00	$ -
Netware Connect 2	$ 695.00	1	3	$ 695.00	$ -	$ -	$ 695.00	$ -
Punch Down Block	$ 29.21	1	3	$ 29.21	$ -	$ -	$ 29.21	$ -
Surge Protector	$ 21.00	8	3	$ 168.00	$ -	$ -	$ 168.00	$ -
UPS	$ 167.00	1	3	$ 167.00	$ -	$ -	$ 167.00	$ -
Phone	$ 15.00	0	3	$ -	$ -	$ -	$ -	$ -
Operations & Maintenance			4	$ 2,427.21	$ -	$ -	$ -	$ 2,427.21
Stores			3	$ 2,875.21	$ -	$ -	$ 2,875.21	$ -
Baq'a			4	$ 2,686.21	$ -	$ -	$ -	$ 2,686.21
Fushles			4	$ 2,686.21	$ -	$ -	$ -	$ 2,686.21
Deir Alla			4	$ 2,686.21	$ -	$ -	$ -	$ 2,686.21
Soth Showneh			4	$ 2,686.21	$ -	$ -	$ -	$ 2,686.21
				$ 39,952.47	$ -	$ -	$ 26,780.42	$ 13,172.05

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS
Operations & Maintenance				
Configuration 1	$ 2,001.00	0	4	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
ReUse Printer	$ -	1	4	$ -
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector	$ 21.00	1	4	$ 21.00
Phone		1	4	$ -

	Summary				$ 2,427.21
Stores					
	Configuration 2	$ 2,377.00	1	3	$ 2,377.00
	Terminal Emulator	$ 189.00	1	3	$ 189.00
	Printer DM	$ 259.00	1	3	$ 259.00
	Punch Down Block	$ 29.21	1	4	$ 29.21
	Surge Protector	$ 21.00	1	4	$ 21.00
	Phone	$ 15.00	0	3	$ -
	Summary				$ 2,875.21
Baq'a					
	Configuration 2	$ 2,377.00	1	4	$ 2,377.00
	Printer DM	$ 259.00	1	4	$ 259.00
	Punch Down Block	$ 29.21	1	4	$ 29.21
	Surge Protector	$ 21.00	1	4	$ 21.00
	Phone	$ 15.00	0	4	$ -
	Summary				$ 2,686.21
Fushies					
	Configuration 2	$ 2,377.00	1	4	$ 2,377.00
	Printer DM	$ 259.00	1	4	$ 259.00
	Punch Down Block	$ 29.21	1	4	$ 29.21
	Surge Protector	$ 21.00	1	4	$ 21.00
	Phone	$ 15.00	0	4	$ -
	Summary				$ 2,686.21
Deir Alla					
	Configuration 2	$ 2,377.00	1	4	$ 2,377.00
	Printer DM	$ 259.00	1	4	$ 259.00
	Punch Down Block	$ 29.21	1	4	$ 29.21
	Surge Protector	$ 21.00	1	4	$ 21.00
	Phone	$ 15.00	0	4	$ -
	Summary				$ 2,686.21
Soth Shownah					
	Configuration 2	$ 2,377.00	1	4	$ 2,377.00
	Printer DM	$ 259.00	1	4	$ 259.00
	Punch Down Block	$ 29.21	1	4	$ 29.21
	Surge Protector	$ 21.00	1	4	$ 21.00
	Phone	$ 15.00	0	4	$ -
	Summary				$ 2,686.21

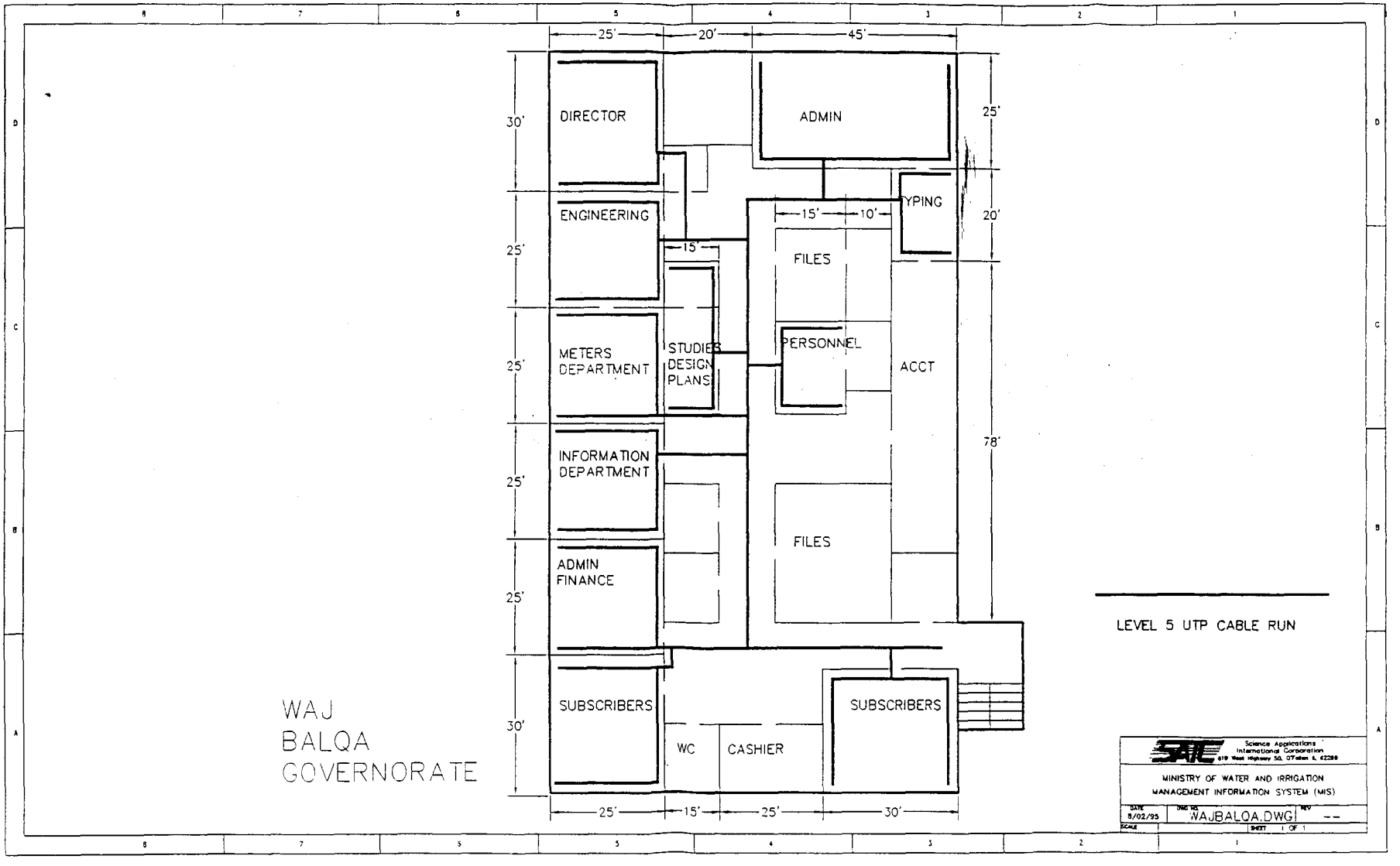
Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	1800	$ 158.40
Hubs	16 Port	$ 795.00	1	$ 795.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles	2.25 x 4 box	$ 3.50	22	$ 77.00

Connectors	Couplers	$ 0.90	75	$ 67.50	
Conduit/Panduit	Small	$ 1.42	1200	$ 1,700.04	
Corners (Panduit/Conduit)			68	$ 56.90	
Consumables		$ 40.00	1	$ 40.00	
Totals:				$ 3,105.84	

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	11	$ 792.00
Quality Assurance Engineer		$ 53.00	11	$ 583.00
Lead Installation Technician		$ 34.00	27.5	$ 935.00
Journey Man Installation Tech.		$ 29.00	27.5	$ 797.50
Totals:			77	$ 3,107.50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ACCT
INFORMATION DEPARTMENT
FILES
ADMIN FINANCE
SUBSCRIBERS
SUBSCRIBERS
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CASHIER
25'
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WAJ
BALQA
GOVERNORATE
LEVEL 5 UTP CABLE RUN
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
DATE
8/02/95
DWG NO.
WAJBALQA.DWG
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SCALE
SHEET 1 OF 1

APPENDIX A-13

WAJ
IRBID GOVERNORATE

1. Organization Information
   a. Organization Name: Irbid Water Administration
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?) Irbid
   e. Manager of Organization, (Name and Title) Engineer Rezeek Gazlan
   f. Phone Number of Manager: 02271112
   g. Principle Purpose for organization (verbal description of functionality): Total employees: 1050. Supports additional city offices Ramtha, Kora, Bany Kananah, Wadi Arab, and South Gor. Also directly involved with the Wadi Arab Dam, 4 pumping stations, and a water treatment plant. Stores is remoted. Internal offices of the Irbid Water Administration include Operations and Maintenance, Studies and Planning Directorate, Administration and Finance Directorate, Water and Waste Water Directorate, and Subscribers. Likely functions for automation are Studies and Planning, Subscribers, Claims, Vehicle Repair, Maintenance and Spare Parts, Operations and Maintenance, Personnel, Finance and Accounts, and information related to water--pumping stations, wells, water network, repairs, and replacement parts. Irbid will have a MicroVax 3600 to support its own operations and to assist the Governorates of Ajlun and Jerash via dial-up modems.

2. Facility Information
   a. Name of Building (Address?): Irbid
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: reinforced concrete and concrete brick 3 story building
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm cioset if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High

.. Changes to Facility: Newer single story building across parking lot for Operations and Maintenance.

3. Hardware

a. Description of existing hardware at site: The Irbid Governorate, at the time the baseline data was collected, was preparing to install a VAX 8200. This was excess equipment from HQ WAJ. The equipment configuration was not available during the data collection period. The expected configuration is similar to the equipment identified at Zarqa.

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: dial-up modems and Kermit software is used as the communications software between the DEC Alpha processor and VAX equipment in the Amman, Irbid and Zarqa Governorates.

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: The new VAX computers are being used to provide billing and payment support for customers in each of Governorates (Amman, Irbid and Zarqa).

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): The data exchanged is dominantly software maintenance related. Routine passing of data does not occur. Each of the listed Governorates have recently received excess VAX computers from the Ministry Building. These VAX computers are now being used to provide billing and payment support for customers in each of Governorates.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended server for the Irbid Governorate is a Pentium based, 90 Mhz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Irbid Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP Level 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with

RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation nine 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP Level 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The nine personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Irbid Stores office is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Irbid Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Irbid Stores computer will have a dial in capability so that it can be attached to the Irbid Governorate server as a Netware client.

The recommended design for the Irbid Operations and Maintenance facility includes three 80486 66 Mhz IBM compatible personal computers. One configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The other two systems configurations will be 80486 66 Mhz IBM compatible personal computers, with 16 MB of memory and 300 MB of hard disk drive space. Each of these systems will have an internal ethernet card and be connected in a peer-to-peer configuration within the Operations and Maintenance facility. An RG-58 coaxial cable will be used for this connection. The systems will be attached to an electronic surge protectors. The recommended systems will have Microsoft's Windows for Work Groups operating system and an Arabized version of Microsoft's Office Professional software suite. The Irbid Operations and Maintenance facility will have dial-in access to the Irbid Governorate server as a Netware client.

Ramtha, Kora, Bany Kananah, Wadi Arab, and South Gor are cities that report to Irbid and are considered Priority 4 sites. These sites will have a telephone punch down block installed and an RJ-11 wall mounted receptacle installed similar to the Operations and Maintenance facility and Stores facility. Each site will have installed one 80486 IBM compatible computer, running at 66 Mhz, with 16 MB of memory and a 400 MB hard disk. Each system will have an internal 14.4 Kpbs Modem with V.32 bis. Each of the city offices will have a 24 pin printer attached to the parallel port of their computer. Each system will have a surge protector power strip. Each system will have the latest version

of Microsoft's Windows operating system and the latest Arabized version of Microsoft's Office Professional software suite. These supporting city offices will have dial-in access to the Irbid Novell network as a client.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 4 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium server and 9 486 PCs. (Stores 1 486 PC and O & M 3 486 PCs) 5 additional 486 PCs--1 each for the city offices of Ramtha, Kora, Bany Kananah, Wadi Arab, and South Gor.

f. Listing of Recommended Software: The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Irbid Stores and Operation and Maintenance facilities. Each PC will have the latest version of Microsoft's Windows operating system and the latest Arabized version of Microsoft's Office Professional software suite.

g. Equipment/Software Cost Estimate: $ 54,259.20 (includes Stores and O & M plus offices in Ramtha, Kora, Bany Kananah, South Gor, and Wadi Arab)

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 5,650.00 (includes Stores and O & M plus offices in Ramtha, Kora, Bany Kananah, South Gor, and Wadi Arab)

(3) Training: see Chapter 5

SUMMARY FOR IRBID

Office:	Irbid Governorate	Priority:	1							
Location:	Irbid									
Name:	Rezeek Gazlan	Drops:	40			priority 1	priority 2	priority 3	priority 4	
Phone:	02 271112					$ 32,824.15	$ -	$ 8,004.00	$ 13,431.05	$ 54,259.20
Reports to:	HQ WAJ									$ 0.00

Materiel Cost for Site: $ 54,259.20

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4	
VAX	$ 2,500.00	1	1	$ 2,500.00	$ 2,500.00	$ -	$ -	$ -	
Configuration 1	$ 2,001.00	4	1	$ 8,004.00	$ 8,004.00	$ -	$ -	$ -	
Configuration 1	$ 2,001.00	4	3	$ 8,004.00	$ -	$ -	$ 8,004.00	$ -	
Configuration 2	$ 2,377.00	0	1	$ -	$ -	$ -	$ -	$ -	
Configuration 3	$ 4,485.00	1	1	$ 4,485.00	$ 4,485.00	$ -	$ -	$ -	
Pathworks (Term EM S/W)	$ 185.00	3	1	$ 555.00	$ 555.00	$ -	$ -	$ -	
Printer	$ 1,299.00	1	1	$ 1,299.00	$ 1,299.00	$ -	$ -	$ -	
Oracle File Server	$ 2,500.00	0	1	$ -	$ -	$ -	$ -	$ -	
Pathworks	$ 185.00	5	1	$ 925.00	$ 925.00	$ -	$ -	$ -	
Oracle PC	$ 125.00	0	1	$ -	$ -	$ -	$ -	$ -	
Network S/W	$ 795.00	1	1	$ 795.00	$ 795.00	$ -	$ -	$ -	
Netware Connect 2	$ 695.00	1	1	$ 695.00	$ 695.00	$ -	$ -	$ -	
Punch Down Block	$ 29.21	1	1	$ 29.21	$ 29.21	$ -	$ -	$ -	
Surge Protector	$ 21.00	9	1	$ 189.00	$ 189.00	$ -	$ -	$ -	
UPS	$ 167.00	1	1	$ 167.00	$ 167.00	$ -	$ -	$ -	
Phone	$ 15.00	0	1	$ -	$ -	$ -	$ -	$ -	
Operations & Maintenance			1	$ 6,471.21	$ 6,471.21	$ -	$ -	$ -	
Stores			1	$ 2,875.21	$ 2,875.21	$ -	$ -	$ -	
Ramtha			4	$ 2,686.21	$ -	$ -	$ -	$ 2,686.21	
Kora			4	$ 2,686.21	$ -	$ -	$ -	$ 2,686.21	
Bany Kananah			4	$ 2,686.21	$ -	$ -	$ -	$ 2,686.21	
South Gor			4	$ 2,686.21	$ -	$ -	$ -	$ 2,686.21	
Wadi Arab			4	$ 2,686.21	$ -	$ -	$ -	$ 2,686.21	
SUMMARY				$ 50,424.68	$ 28,989.63	$ -	$ 8,004.00	$ 13,431.05	$ 50,424.68

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS
Operations & Maintenance				
Configuration 1	$ 2,001.00	2	1	$ 4,002.00
Configuration 2	$ 2,377.00	1	1	$ 2,377.00
ReUse Printer	$ -	1	1	$ -
Punch Down Block	$ 29.21	1	1	$ 29.21
Surge Protector	$ 21.00	3	1	$ 63.00
Phone	$ 15.00	0	1	$ -
Summary				$ 6,471.21
Ramtha				
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
Printer DM	$ 259.00	1	4	$ 259.00
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector	$ 21.00	1	4	$ 21.00
Phone	$ 15.00	0	4	$ -
Summary				$ 2,686.21
Kora				

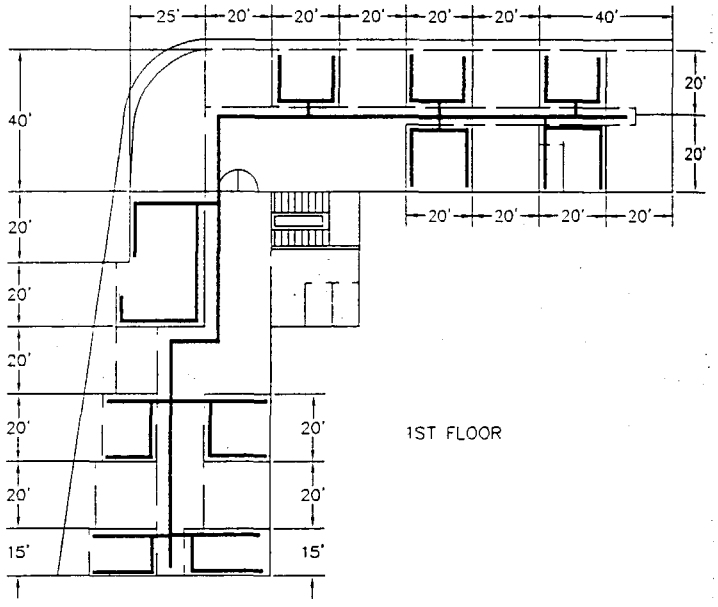
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
Printer DM	$ 259.00	1	4	$ 259.00
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector:	$ 21.00	1	4	$ 21.00
Phone	$ 15.00	0	4	$ -
Summary				$ 2,686.21
Rany Kanaan				
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
Printer DM	$ 259.00	1	4	$ 259.00
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector:	$ 21.00	1	4	$ 21.00
Phone	$ 15.00	0	4	$ -
Summary				$ 2,686.21
South Gor				
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
Printer DM	$ 259.00	1	4	$ 259.00
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector:	$ 21.00	1	4	$ 21.00
Phone	$ 15.00	0	4	$ -
Summary			4	$ 2,686.21
Wadi Arab				
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
Printer DM	$ 259.00	1	4	$ 259.00
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector:	$ 21.00	1	4	$ 21.00
Phone	$ 15.00	0	4	$ -
Summary				$ 2,686.21
Stores				
Configuration 2	$ 2,377.00	1	1	$ 2,377.00
Terminal Emulator	$ 189.00	1	1	$ 189.00
Printer DM	$ 259.00	1	1	$ 259.00
Punch Down Block	$ 29.21	1	1	$ 29.21
Surge Protector:	$ 21.00	1	1	$ 21.00
Phone	$ 15.00	0	1	$ -
Summary				$ 2,875.21

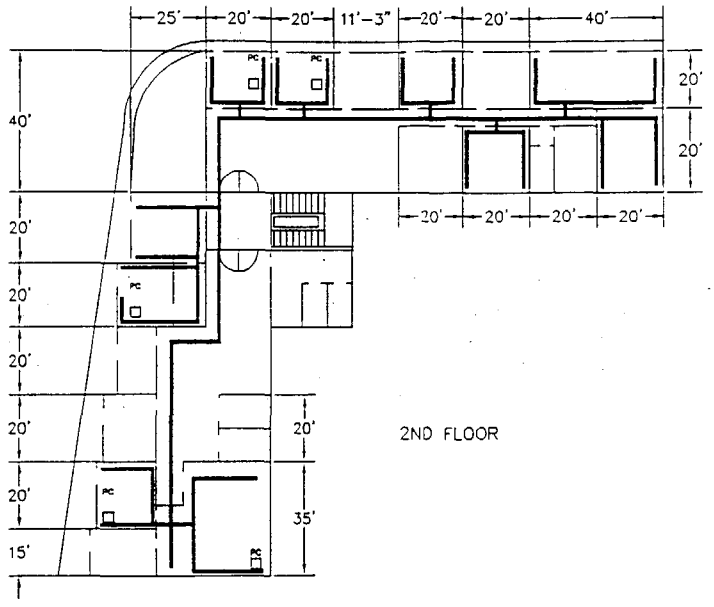
Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	1660	$ 146.08
Hube	24 Port	$ 1,295.00	1	$ 1,295.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles		$ 7.70	40	$ 308.00
Connectors	Couplers	$ 0.90	75	$ 67.50
Conduit/Panduit	Small	$ 1.42	1200	$ 1,700.04
Corners (Panduit/Conduit)	In and Outside		68	$ 56.90
Consumables		$ 50.00	1	$ 50.00
Totals:				$ 3,834.52

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	20	$ 1,440.00
Quality Assurance Engineer		$ 53.00	20	$ 1,060.00
Lead Installation Technician		$ 34.00	50	$ 1,700.00
Journey Man Installation Tech.		$ 29.00	50	$ 1,450.00
Totals:			140	$ 5,650.00





WAJ
IRBID GOVERNORATE

LEVEL 5 UTP CABLE RUN

Science Applications International Corporation
619 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
8/10/95	WAJIRBID.DWG	--
SCALE	SHEET 1 OF 1	

APPENDIX A-14

WAJ
JERASH GOVERNORATE

1. Organization Information
   a. Organization Name: Jerash Water Administration
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?): Jerash Governorate
   e. Manager of Organization, (Name and Title): Engineer Abed Al Hamed Abo Esa
   f. Phone Number of Manager: 04451577
   g. Principle Purpose for organization (verbal description of functionality): The Jerash Governorate provides subscriber water services in its assigned area. There is no current local data automation support for this operational organization. Jerash is a new Governorate. Subscriber servicing is done by Irbid, but when computers are available for Jerash, Jerash will take on that responsibility. Operations and Maintenance is remoted from the main building, about 200 m. Total workers in Jerash Governorate are 145 with additional 46 at O & M office. Automation candidates include O & M, Subscribers, Studies and Planning, Administration and Finance, and Water and Waste Water Directorates.

2. Facility Information
   a. Name of Building (Address?): Jerash
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: reinforced concrete and concrete brick 4 story building. Governorate offices are in an old bank office. Governorate uses 1st, 2nd, and 3rd floors for office space. External O & M building is the city pumping station, a single story concrete "garage" with 3 rooms--the pumping station, radio controller, and claims. Building is under-going some refurbishing.
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A

h. Qualitative assessment of dust: High

i. Changes to Facility: N/A

3. Hardware

a. Description of existing hardware at site: N/A

b. Description of existing network at site: N/A

c. Description of existing external communications links (data) at site: N/A

4. Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A

5. Data

a. Description of type and amount of data at each site: billing and payment support for customers

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): To perform local billing, record payments and service subscriber requests in an automated fashion, software will need to be developed for implementation on the local area network.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended server for the Jerash Governorate is a Pentium based, 90 Mhz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Jerash Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP Level 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP Level 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

Stores				
Configuration 2	$ 2,377.00	1	3	$ 2,377.00
Terminal Emulator	$ 150.00	1	3	$ 150.00
Printer DM	$ 259.00	1	3	$ 259.00
Punch Down Block	$ 29.21	0	3	$ -
Surge Protector	$ 21.00	1	3	$ 21.00
Phone	$ 15.00	0	3	$ -
Summary				$ 2,807.00

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	1500	$ 132.00
Hubs	16 Port	$ 795.00	1	$ 795.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles	2.25 x 4 box	$ 3.50	28	$ 98.00
Connectors	Couplers	$ 0.90	75	$ 67.50
Conduit/Panduit	Small	$ 1.42	750	$ 1,062.53
Corners (Panduit/Conduit)			68	$ 56.90
Consumables		$ 40.00	1	$ 40.00
Totals:				$ 2,462.93

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	14	$ 1,008.00
Quality Assurance Engineer		$ 53.00	14	$ 742.00
Lead Installation Technician		$ 34.00	35	$ 1,190.00
Journey Man Installation Tech.		$ 29.00	35	$ 1,015.00
Totals:			98	$ 3,955.00

The recommended design for the Jerash Stores office, which is collocated with the main Governorate offices, is one 80486 66 Mhz IBM compatible personal computer installed. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Jerash Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Jerash Stores computer will be fully networked to the Jerash Governorate server.

The recommended design for the Jerash Operations and Maintenance facility is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Jerash Operations and Maintenance facility will have dial-in access to the Jerash Governorate server as a Netware client.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 6 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium server and 8 486 PCs. (Stores 1 486 PC and O & M 1 486)

f. Listing of Recommended Software: The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Jerash Stores and Operation and Maintenance facilities. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite.

g. Equipment/Software Cost Estimate: $ 32,929.14 (includes Stores and O & M)

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 3,955.00 (includes Stores and O & M)

(3) Training: see Chapter 5

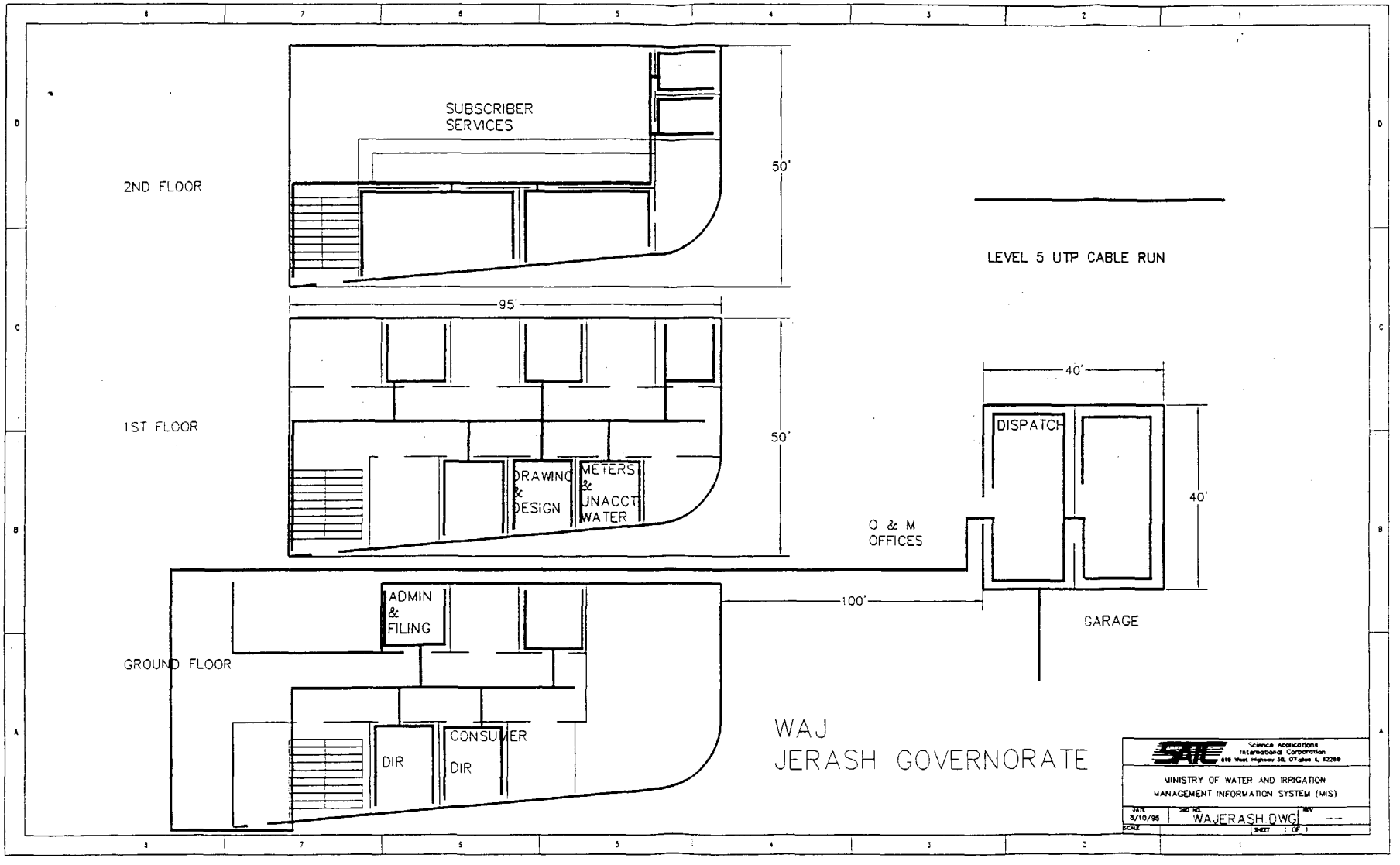
SUMMARY FOR JERASH

Office:	Jerash Governorate	Priority:	3		priority 1	priority 2	priority 3	priority 4	
Location:	Jerash				$ -	$ -	$ 28,450.93	$ 4,478.21	########
Name:	Abed Al Hamed Abu Esa	Drops:	28						
Phone:	04-451577								
Reports To:	HQ WAJ								
Material Cost for Site:	$ 32,929.14								

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Configuration 1	$ 2,001.00	8	3	$ 16,008.00	$ -	$ -	$ 16,008.00	$ -
Configuration 2	$ 2,377.00	0	3	$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	3	$ 4,485.00	$ -	$ -	$ 4,485.00	$ -
Printer	$ 1,299.00	1	3	$ 1,299.00	$ -	$ -	$ 1,299.00	$ -
Printer DM	$ 259.00	1	3	$ 259.00	$ -	$ -	$ 259.00	$ -
Oracle File Server	$ 2,500.00	0	3	$ -	$ -	$ -	$ -	$ -
Oracle Developer	$ 450.00	0	3	$ -	$ -	$ -	$ -	$ -
Oracle PC	$ 125.00	0	3	$ -	$ -	$ -	$ -	$ -
Network S/W	$ 795.00	1	3	$ 795.00	$ -	$ -	$ 795.00	$ -
Punch Down Block	$ 29.21	0	3	$ -	$ -	$ -	$ -	$ -
Surge Protector	$ 21.00	8	3	$ 168.00	$ -	$ -	$ 168.00	$ -
UPS	$ 167.00	1	3	$ 167.00	$ -	$ -	$ 167.00	$ -
Phone	$ 15.00	0	3	$ -	$ -	$ -	$ -	$ -
Operations & Maintenance			4	$ 4,478.21	$ -	$ -	$ -	$ 4,478.21
Stores			3	$ 2,807.00	$ -	$ -	$ 2,807.00	$ -
				$ 30,466.21	$ -	$ -	$ 25,988.00	$ 4,478.21

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS
Operations & Maintenance				
Configuration 1	$ 2,001.00	1	4	$ 2,001.00
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
ReUse Printer	$ -	1	4	$ -
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector	$ 21.00	1	4	$ 21.00
Cabling	$ 50.00	1	4	$ 50.00
Phone	$ 15.00	0	4	$ -
Summary				$ 4,478.21


2ND FLOOR
SUBSCRIBER SERVICES
50'
95'
1ST FLOOR
DRAWING & DESIGN
METERS & UNACCT WATER
50'
LEVEL 5 UTP CABLE RUN
40'
DISPATCH
40'
O & M OFFICES
100'
GARAGE
GROUND FLOOR
ADMIN & FILING
DIR
CONSUMER
DIR
WAJ
JERASH GOVERNORATE
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
DATE 8/10/95
DWG NO. WAJERASH.DWG
REV --
SCALE
SHEET 1 OF 1

APPENDIX A-15

WAJ
KARAK GOVERNORATE

1. Organization Information
   a. Organization Name: Karak Water Administration
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?): Karak Governorate
   e. Manager of Organization, (Name and Title): Engineer Malik Rawashdeh
   f. Phone Number of Manager: 03351050
   g. Principle Purpose for organization (verbal description of functionality): The Karak Governorate provides subscriber water services in its assigned area. There is no current local data automation support for this operational organization. Total employees 380 support 23,000 subscribers. Main offices are on the 3rd floor of a 3 story concrete building. Stores office is remoted 25 Km and O & M office is remoted 15 Km. City offices include South Masar (20 Km) and South Ghor (70 Km). Karak Governorate has a relationship with the local (15 Km) Mo'ta University for training. Currently there is a stand alone PC in the Director's office, but no other data automation. Likely candidates for automation include Personnel, Administration and Finance, Planning and Design, Meters and Unaccountable Water, Subscribers, and O & M.

2. Facility Information
   a. Name of Building (Address?) Drivers License Bureau, Karak
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: reinforced concrete and concrete brick 4 story building
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: N/A

3. Hardware

a. Description of existing hardware at site: N/A

b. Description of existing network at site: N/A

c. Description of existing external communications links (data) at site: N/A

4. Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A

5. Data

a. Description of type and amount of data at each site: billing and payment support for customers

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): To perform local billing, record payments and service subscriber requests in an automated fashion, software will need to be developed for implementation on the local area network.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended server for the Karak Governorate is a Pentium based, 90 Mhz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Karak Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP Level 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP Level 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Karak Stores office is one 80486 66 Mhz IBM compatible personal computer installed. Its configuration includes 16 MB of memory, a

400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle, which will be cabled to a telephone punch down block. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Karak Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Karak Stores computer will have a dial in capability so that it can be attached to the Karak Governorate server as a Netware client.

The recommended design for the Karak Operations and Maintenance facility is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Karak Operations and Maintenance facility will have dial-in access to the Karak Governorate server as a Netware client.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 4 days

d. Schematic of site (old and new equipment)

e. Listing of Recommended Equipment: 1 Pentium server and 8 486 PCs. (Stores 1 486 and O & M 1 486)

f. Listing of Recommended Software: The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Karak Stores and Operation and Maintenance facilities. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Karak Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability.

g. Equipment/Software Cost Estimate: $ 30,937.06 (includes Stores and O & M)

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 3,390.00 (includes Stores and O & M)

f. Site Installation Cost

(3) Training: see Chapter 5

SUMMARY FOR KARAK

Office:	Karak Governorate	Priority:	3			priority 1	priority 2	priority 3	priority 4	
Location:	Karak					$ -	$ -	$ 28,509.85	$ 2,427.21	$ 30,937.06
Name:	Malik Rawashdeh	Drops:	24							
Phone:	03 351050									
Reports To:	HQ WAJ									
	Material Cost for Site:	$ 30,937.06								
	Computers and Communications									
	ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4	
	Configuration 1	$ 2,001.00	8	3	$ 16,008.00	$ -	$ -	$ 16,008.00	$ -	
	Configuration 2	$ 2,377.00	0	3	$ -	$ -	$ -	$ -	$ -	
	Configuration 3	$ 4,485.00	1	3	$ 4,485.00	$ -	$ -	$ 4,485.00	$ -	
	Printer	$ 1,299.00	1	3	$ 1,299.00	$ -	$ -	$ 1,299.00	$ -	
	Printer DM	$ 259.00	1	3	$ 259.00	$ -	$ -	$ 259.00	$ -	
	Oracle File Server	$ 2,500.00	0	3	$ -	$ -	$ -	$ -	$ -	
	Oracle Developer	$ 450.00	0	3	$ -	$ -	$ -	$ -	$ -	
	Oracle PC	$ 125.00	0	3	$ -	$ -	$ -	$ -	$ -	
	Network S/W	$ 795.00	1	3	$ 795.00	$ -	$ -	$ 795.00	$ -	
	Punch Down Block	$ 29.21	1	3	$ 29.21	$ -	$ -	$ 29.21	$ -	
	Surge Protector	$ 21.00	6	3	$ 126.00	$ -	$ -	$ 126.00	$ -	
	UPS	$ 167.00	1	3	$ 167.00	$ -	$ -	$ 167.00	$ -	
	Phone	$ 12.50	1	3	$ 12.50	$ -	$ -	$ 12.50	$ -	
	Operations & Maintenance			4	$ 2,427.21	$ -	$ -	$ -	$ 2,427.21	
	Stores			3	$ 2,836.21	$ -	$ -	$ 2,836.21	$ -	
	SUMMARY				$ 28,444.13	$ -	$ -	$ 26,016.92	$ 2,427.21	
	ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS					
	Operations & Maintenance									
	Configuration 1	$ 2,001.00	0	4	$ -					
	Configuration 2	$ 2,377.00	1	4	$ 2,377.00					
	ReUse Printer	$ -	1	4	$ -					
	Punch Down Block	$ 29.21	1	4	$ 29.21					
	Surge Protector	$ 21.00	1	4	$ 21.00					
	Phone	$ 15.00	0	4	$ -					
	Summary				$ 2,427.21					
	Stores									

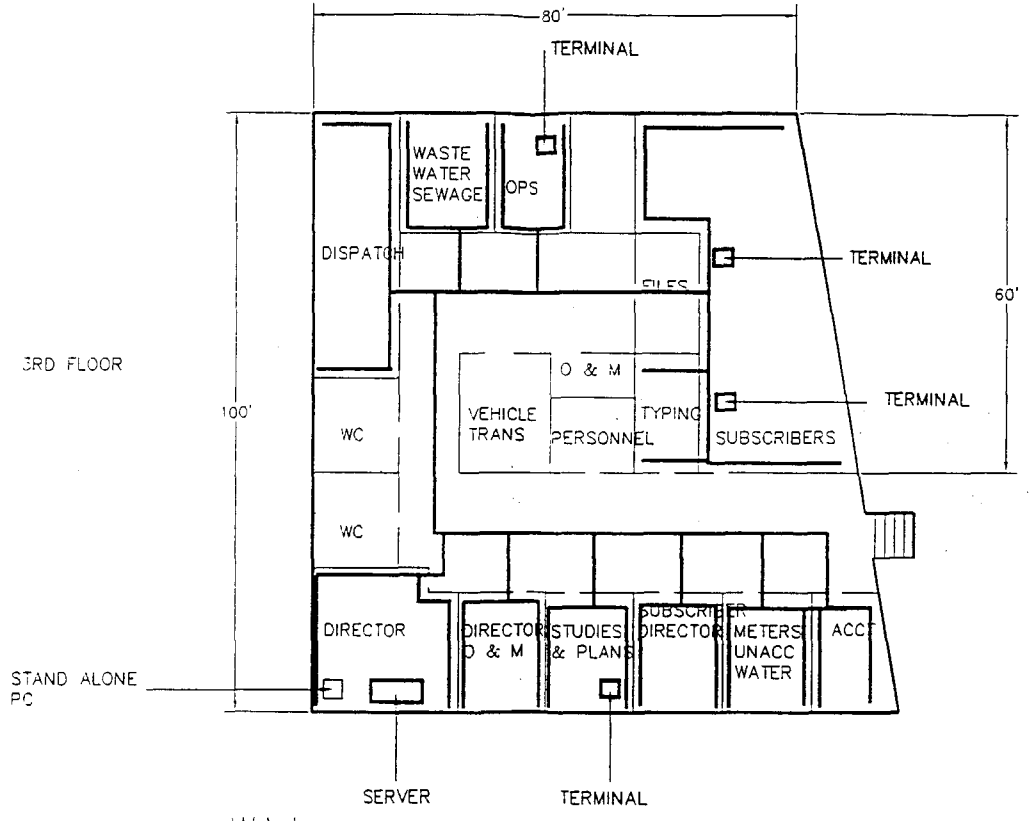
Configuration 2	$ 2,377.00	1	3	$ 2,377.00
Terminal Emulator	$ 150.00	1	3	$ 150.00
Printer DM	$ 259.00	1	3	$ 259.00
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector	$ 21.00	1	4	$ 21.00
Phone	$ 15.00	0	3	$ -
Summary				$ 2,836.21

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	2000	$ 176.00
Hubs	16 Port	$ 795.00	1	$ 795.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles	2.25 x 4 box	$ 3.50	24	$ 84.00
Connectors	Couplers	$ 0.90	75	$ 67.50
Conduit/Panduit	Small	$ 1.42	750	$ 1,062.53
Corners (Panduit/Conduit)			68	$ 56.90
Consumables		$ 40.00	1	$ 40.00
Totals:				$ 2,492.93

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	12	$ 864.00
Quality Assurance Engineer		$ 53.00	12	$ 636.00
Lead Installation Technician		$ 34.00	30	$ 1,020.00
Journey Man Installation Tech.		$ 29.00	30	$ 870.00
Totals:			84	$ 3,390.00



WAJ
KARAK GOVERNORATE

LEVEL 5 UTP CABLE RUN

Science Applications International Corporation
619 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
8/10/95	WAJKARAK.DWG	--

SCALE SHEET 1 OF 1

APPENDIX A-16

WAJ
MA'AN GOVERNORATE

1. Organization Information
   a. Organization Name: Ma'an Water Administration
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?): Ma'an Governorate
   e. Manager of Organization, (Name and Title): Engineer Walid Al-Deeh
   f. Phone Number of Manager: 03341544
   g. Principle Purpose for organization (verbal description of functionality): Ma'an has an external Stores office about 2 Km away from the main office. City offices that report to Ma'an are Wadi Musa and Hosaineah. There are 300 employees and it serves 13,000 subscribers. There are no computers now, but likely candidates for data automation support include O & M, Accounting and Finance, Studies and Planning, Subscriber Data Entry, Claims, and Personnel.

2. Facility Information
   a. Name of Building (Address?)
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: Offices are in a compound with 2 concrete buildings both 2 stories and a single story building (no offices) surrounding a parking area. Offices in the main building occupy the ground and 1st floors. The second building offices are on the 1st floor.
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: N/A

b. Description of existing network at site: N/A

c. Description of existing external communications links (data) at site: N/A

4. Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A

5. Data

a. Description of type and amount of data at each site: billing and payment support for customers

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): To perform local billing, record payments and service subscriber requests in an automated fashion, software will need to be developed for implementation on the local area network.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.):

The recommended server for the Ma'an Governorate is a Pentium based, 90 Mhz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Ma'an Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP Level 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telèphone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP Level 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Ma'an Stores office is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-

pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle, which will be cabled to a telephone punch down block. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Ma'an Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Ma'an Stores computer will have a dial in capability so that it can be attached to the Ma'an Governorate server as a Netware client.

The recommended design for the Ma'an Operations and Maintenance facility is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Ma'an Operations and Maintenance facility will have dial-in access to the Ma'an Governorate server as a Netware client.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 6 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium and 8 486 PCs. (Stores 1 486 PC and O & M 1 486 PC)

f. Listing of Recommended Software: The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Ma'an Stores and Operation and Maintenance facilities. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Ma'an Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability.

g. Equipment/Software Cost Estimate: $ 30,980.96 (includes Stores and O& M)

h. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 3,107.50 (includes Stores and O& M)

(3) Training: see Chapter 5

SUMMARY FOR MA'AN

						priority 1	priority 2	priority 3	priority 4	
Office:	Ma'an Governorate	Priority:	3			$ -	$ -	$ 28,553.75	$ 2,427.21	########
Location:	Ma'an									$ -
Name:	Walid Al-Deeh	Drops:	22							
Phone:	03-341544									
Reports To:	HQ WAJ									

Material Cost for Site: $ 30,980.96

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Configuration 1	$ 2,001.00	8	3	$ 16,008.00	$ -	$ -	$ 16,008.00	$ -
Configuration 2	$ 2,377.00	0	3	$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	3	$ 4,485.00	$ -	$ -	$ 4,485.00	$ -
Printer	$ 1,299.00	1	3	$ 1,299.00	$ -	$ -	$ 1,299.00	$ -
Printer DM	$ 259.00	1	3	$ 259.00	$ -	$ -	$ 259.00	$ -
Oracle File Server	$ 2,500.00	0	3	$ -	$ -	$ -	$ -	$ -
Oracle Developer	$ 450.00	0	3	$ -	$ -	$ -	$ -	$ -
Oracle PC	$ 125.00	0	3	$ -	$ -	$ -	$ -	$ -
Network S/W	$ 795.00	1	3	$ 795.00	$ -	$ -	$ 795.00	$ -
Punch Dwon Block	$ 29.21	1	3	$ 29.21	$ -	$ -	$ 29.21	$ -
Surge Protectors	$ 21.00	8	3	$ 168.00	$ -	$ -	$ 168.00	$ -
UPS	$ 167.00	1	3	$ 167.00	$ -	$ -	$ 167.00	$ -
Phone	$ 15.00	0	3	$ -	$ -	$ -	$ -	$ -
Operations & Maintenance			4	$ 2,427.21	$ -	$ -	$ -	$ 2,427.21
Stores			3	$ 2,875.21	$ -	$ -	$ 2,875.21	$ -
				$ 28,512.63	$ -	$ -	$ 26,085.42	$ 2,427.21

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS
Operations & Maintenance				
Configuration 1	$ 2,001.00	0	4	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
ReUse Printer	$ -	1	4	$ -
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector	$ 21.00	1	4	$ 21.00
Phone	$ 15.00	0	4	$ -
Summary				$ 2,427.21
Stores				
Configuration 2	$ 2,377.00	1	3	$ 2,377.00
Terminal Emulator	$ 189.00	1	3	$ 189.00

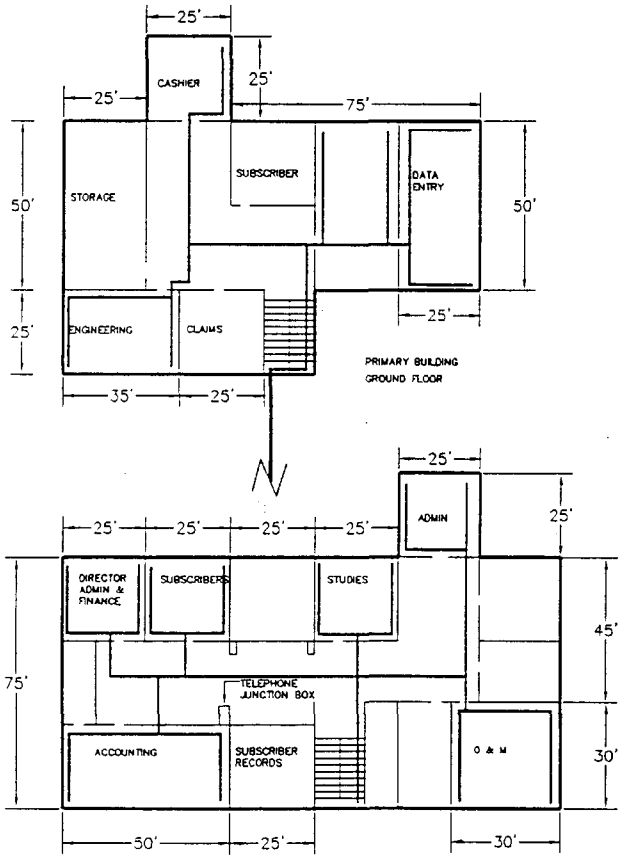
Printer DM	$ 259.00	1	3	$ 259.00
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector	$ 21.00	1	4	$ 21.00
Phone	$ 15.00	0	3	$ -
Summary				$ 2,875.21

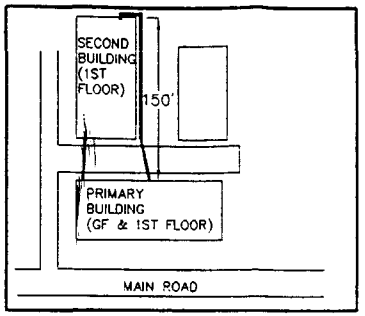
Network Components

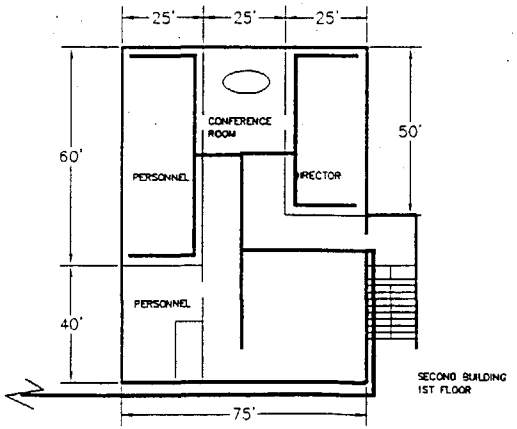
ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	1800	$ 158.40
Hubs	16 Port	$ 795.00	1	$ 795.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles	2.25 x 4 box	$ 3.50	22	$ 77.00
Connectors	Couplers	$ 0.90	75	$ 67.50
Conduit/Panduit	Small	$ 1.42	750	$ 1,062.53
Corners (Panduit/Conduit)			68	$ 56.90
Consumables		$ 40.00	1	$ 40.00
Totals:				$ 2,468.33

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	11	$ 792.00
Quality Assurance Engineer		$ 53.00	11	$ 583.00
Lead Installation Technician		$ 34.00	27.5	$ 935.00
Journey Man Installation Tech.		$ 29.00	27.5	$ 797.50
Totals:			77	$ 3,107.50







WAJ
MA'AN GOVERNORATE

LEVEL 5 UTP CABLE RUN

Science Applications International Corporation
410 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	JOB NO.	REV
8/01/95	WAJMAAN.DWG	--
SCALE	SHEET 1 OF 1	

APPENDIX A-17

WAJ
MADABA GOVERNORATE

1. Organization Information
   a. Organization Name: Madaba Water Administration
   b. Organization Belongs to What Ministry WAJ
   c. Organization falls immediately under which organization WAJ
   d. Location of Organization, Governate, City, Building (address?): Madaba
   e. Manager of Organization, (Name and Title): Engineer Ibraheem Abo Shames
   f. Phone Number of Manager: 08544268
   g. Principle Purpose for organization (verbal description of functionality): The Madaba Governorate provides subscriber water services in its assigned area. Madaba is a new Governorate (much like Jerash and Ajlun). It has 206 employees and supports a subscriber base of 18,500. Both O & M and Stores offices are remoted from the main office. The Stores and O & M offices are about 1 Km away in a compound with several single story concrete buildings, with the administrative offices located directly under a water tower. Main offices are rented space on the 2nd and 3rd floors of a 4 story building in downtown Madaba. Additional city office is located in Dehiban. There is currently no automation support other than a stand alone PC for word processing. Candidates for automation include O & M, Stores, Subscribers, Technical, and Administration and Finance Divisions

2. Facility Information
   a. Name of Building (Address?): Madaba
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: a 4 story concrete building (offices on the 2nd and 3rd floors). Offices are relatively new (refurbished).
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High

i. Changes to Facility: Plans for a new facility are under review at WAJ HQ. Expect new facility in October 1996.

3. Hardware

a. Description of existing hardware at site: N/A

b. Description of existing network at site: N/A

c. Description of existing external communications links (data) at site: N/A

4. Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A e

5. Data

a. Description of type and amount of data at each site: subscriber billing accounts, water allocations, personnel, payroll, and accounting.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended server for the Madaba Governorate is a Pentium based, 90 Mhz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Madaba Stores, Operation and Maintenance and Dehiban facilities. The server will be connected to the hub using UTP Level 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation eight 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP Level 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Madaba Stores office is one 80486 66 Mhz IBM compatible personal computer installed. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle, which will be cabled to a telephone punch down block. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Madaba Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Madaba Stores computer will have a dial in capability so that it can be attached to the Madaba Governorate server as a Netware client.

The recommended design for the Madaba Operations and Maintenance facility is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Madaba Operations and Maintenance facility will have dial-in access to the Madaba Governorate server as a Netware client.

The recommended design for the Dehiban facility is one 80486 66 Mhz IBM compatible computer. The computer will have 16 MB of memory, a 400 MB hard disk drive and an internal 14.4. Kbps Modem. The system will be attached to an electronic surge protector and to the installed RJ-11 telephone jack. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Madaba Operations and Maintenance facility will have dial-in access to the Madaba Governorate server as a Netware client. The Dehiban computer will have a 9 pin dot matrix printer attached to the parallel port for printer support. The Dehiban facility will have dial in access to the Madaba Governorate server as a Netware client.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 4 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium server and 8 486 PCs. (Stores 1 486 PC and O & M 1 486 PC). 1 additional 486 PC for city office in Dehiban.

f. Listing of Recommended Software: The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Madaba Stores, Operation and Maintenance and Dehiban facilities. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Madaba Stores personal computer

will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability.

g. Equipment/Software Cost Estimate: $ 31,111.46 (includes Stores and O & M)

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 4,802.50 (includes Stores and O & M)

(3) Training: see Chapter 5

SUMMARY FOR MADABA

Office:	Madaba Governorate	Priority:	3		priority 1	priority 2	priority 3	priority 4	
Location:	Madaba				$ -	$ -	$ 28,684.25	$ 2,427.21	$31,111.46
Name:	Ibraheem Abu Shamies	Drops:	34						
Phone:	08-544268								
Reports To:	HQ WAJ								

Material Cost for Site: $ 31,111.46

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Configuration 1	$ 2,001.00	8	3	$ 16,008.00	$ -	$ -	$ 16,008.00	$ -
Configuration 2	$ 2,377.00	0	3	$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	3	$ 4,485.00	$ -	$ -	$ 4,485.00	$ -
Printer	$ 1,299.00	1	3	$ 1,299.00	$ -	$ -	$ 1,299.00	$ -
Printer DM	$ 259.00	1	3	$ 259.00	$ -	$ -	$ 259.00	$ -
Oracle File Server	$ 2,500.00	0	3	$ -	$ -	$ -	$ -	$ -
Oracle Developer	$ 450.00	0	3	$ -	$ -	$ -	$ -	$ -
Oracle PC	$ 125.00	0	3	$ -	$ -	$ -	$ -	$ -
Network S/W	$ 795.00	1	3	$ 795.00	$ -	$ -	$ 795.00	$ -
Punch Down Block	$ 29.21	1	3	$ 29.21	$ -	$ -	$ 29.21	$ -
Surge Protector	$ 21.00	8	3	$ 168.00	$ -	$ -	$ 168.00	$ -
UPS	$ 167.00	1	3	$ 167.00	$ -	$ -	$ 167.00	$ -
Phone	$ 12.50	1	3	$ 12.50	$ -	$ -	$ 12.50	$ -
Operations & Maintenance			4	$ 2,427.21	$ -	$ -	$ -	$ 2,427.21
Stores			3	$ 2,875.21	$ -	$ -	$ 2,875.21	$ -
				$ 28,525.13	$ -	$ -	$ 26,097.92	$ 2,427.21

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS
Operations & Maintenance				
Configuration 1	$ 2,001.00	0	4	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
ReUse Printer	$ -	1	4	$ -
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector	$ 21.00	1	4	$ 21.00
Phone	$ 15.00	0	4	$ -
Summary				$ 2,427.21
Configuration 2	$ 2,377.00	1	3	$ 2,377.00

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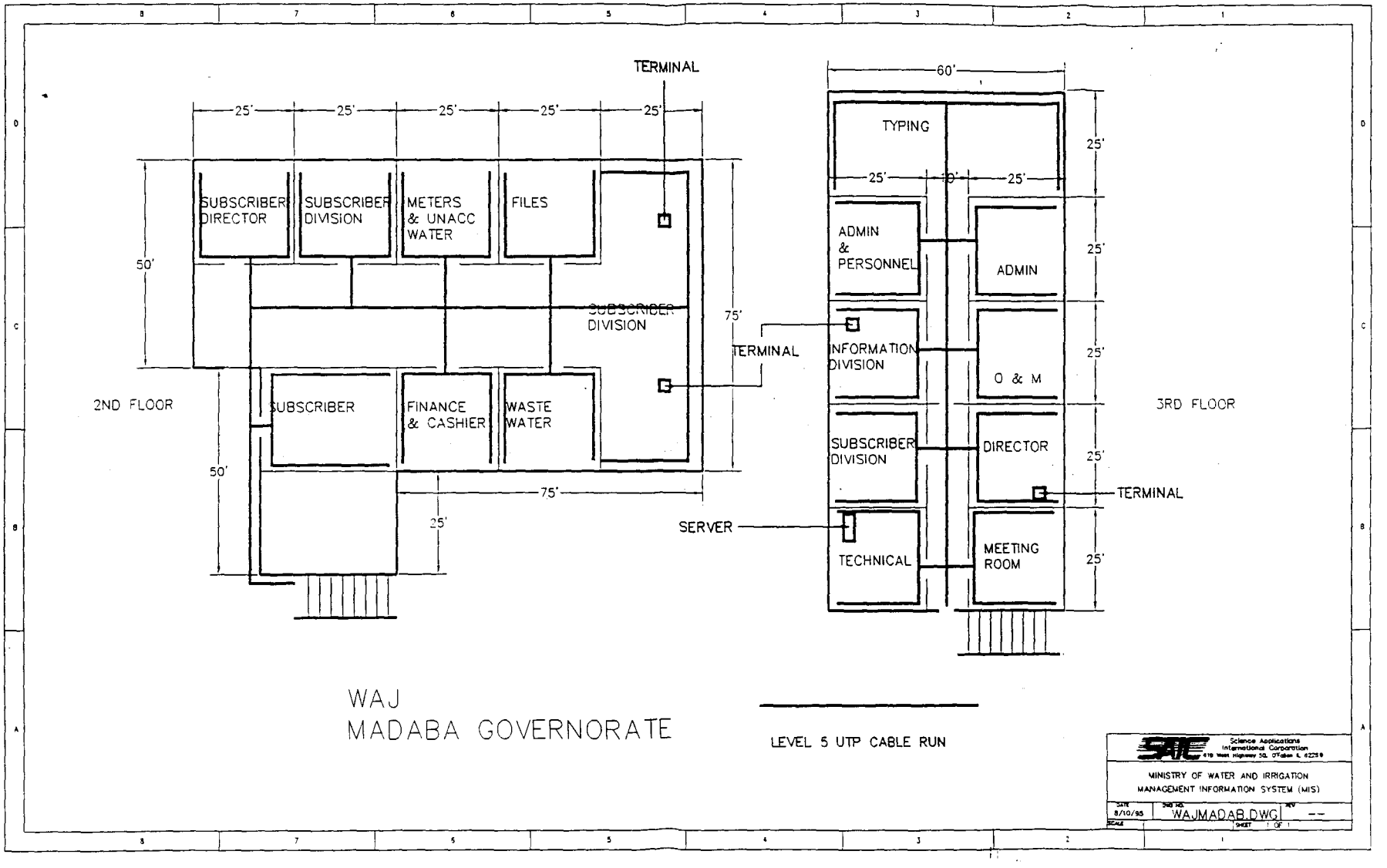
Terminal Emulator	$ 189.00	1	3	$ 189.00
Printer DM	$ 259.00	1	3	$ 259.00
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector	$ 21.00	1	4	$ 21.00
Phone	$ 15.00	0	3	$ -
Summary				$ 2,875.21

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	2550	$ 224.40
Hubs	16 Port	$ 795.00	1	$ 795.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles	2.25 x 4 box	$ 3.50	34	$ 119.00
Connectors	Couplers	$ 0.90	75	$ 67.50
Conduit/Panduit	Small	$ 1.42	750	$ 1,062.53
Corners (Panduit/Conduit)			68	$ 56.90
Consumables		$ 50.00	1	$ 50.00
Totals:				$ 2,586.33

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	17	$ 1,224.00
Quality Assurance Engineer		$ 53.00	17	$ 901.00
Lead Installation Technician		$ 34.00	42.5	$ 1,445.00
Journey Man Installation Tech.		$ 29.00	42.5	$ 1,232.50
Totals:			119	$ 4,802.50


TERMINAL
25'
25'
25'
25'
25'
SUBSCRIBER DIRECTOR
SUBSCRIBER DIVISION
METERS & UNACC WATER
FILES
50'
SUBSCRIBER DIVISION
75'
TERMINAL
2ND FLOOR
SUBSCRIBER
FINANCE & CASHIER
WASTE WATER
50'
75'
25'
60'
TYPING
25'
10'
25'
25'
ADMIN & PERSONNEL
ADMIN
25'
INFORMATION DIVISION
O & M
25'
3RD FLOOR
SUBSCRIBER DIVISION
DIRECTOR
25'
TERMINAL
SERVER
TECHNICAL
MEETING ROOM
25'
WAJ
MADABA GOVERNORATE
LEVEL 5 UTP CABLE RUN
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
DATE 8/10/95
DWG NO. WAJMADAB.DWG
REV --
SHEET 1 OF 1

APPENDIX A-18

WAJ
MAFRAQ GOVERNORATE

1. Organization Information
   a. Organization Name: Mafraq Water Administration
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?): Mafraq Governorate
   e. Manager of Organization, (Name and Title): Engineer Nawaf Shwbaki
   f. Phone Number of Manager: 04433710
   g. Principle Purpose for organization (verbal description of functionality): The Mafraq Governorate provides subscriber water services in its assigned area. There is no current local data automation support for this operational organization. The Total employees: 43. Mafraq is organized with major Subscriber automation support supplied by Zarqa via dial-up modem. The O & M function is external to the main building, but Store is internal. Likely candidates for automation support are Administration and Finance, Subscribers, O & M, Planning and Studies, and Stores.

2. Facility Information
   a. Name of Building (Address?): Mafraq
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz
      (2) Service available (service to breaker box)
      (3) Service used (already accounted for)
      (4) Qualitative statement on reliability of service
      (5) Observed measurement at outlet and variances
   d. Facility Construction: relatively new single story concrete building
   e. Code Restrictions
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire
      (2) Type of interface (four prong, RJ-11, etc.)
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: Moderate
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: N/A There is no current local data automation support for this operational organization.
   b. Description of existing network at site: N/A
   c. Description of existing external communications links (data) at site: N/A

4. Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A

5. Data

a. Description of type and amount of data at each site: subscriber billing accounts, water allocations, personnel, payroll, and accounting.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended server for the Mafraq Governorate is a Pentium based, 90 Mhz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Mafraq Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP Level 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP Level 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Mafraq Stores office is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Mafraq Stores personal computer will have installed a VT 220 software terminal emulation package to allow for

dial out access to the Amman Governorate Stores central ordering capability. The Mafraq Stores computer will have a dial in capability so that it can be attached to the Mafraq Governorate server as a Netware client.

The recommended design for the Mafraq Operations and Maintenance facility is for three 80486 66 Mhz IBM compatible personal computers. One configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The other two systems configurations will be 80486 66 Mhz IBM compatible personal computers, with 16 MB of memory and 300 MB of hard disk drive space. Each of these systems will have an internal ethernet card and be connected in a peer-to-peer configuration within the Operations and Maintenance facility. An RG-58 coaxial cable will be used for this connection. The systems will be attached to an electronic surge protectors. The recommended systems will have Microsoft's Windows for Work Groups operating system and an Arabized version of Microsoft's Office Professional software suite. The Mafraq Operations and Maintenance facility will have dial-in access to the Mafraq Governorate server as a Netware client.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 4 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium server and 8 486 PCs. (Stores 1 486 PC and O & M 3 486 PCs).

f. Listing of Recommended Software: The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Mafraq Stores and Operation and Maintenance facilities. The recommended systems will have Microsoft's Windows for Work Groups operating system and an Arabized version of Microsoft's Office Professional software suite. The Mafraq Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability.

g. Equipment/Software Cost Estimate: $ 35,030.46 (includes Stores and O & M)

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 2,825.00 (includes Stores and O & M)

(3) Training: see Chapter 5

SUMMARY FOR MAFRAQ

Office:	Mafraq Governorate	Priority:	3		priority 1	priority 2	priority 3	priority 4	
Location:	Mafraq				$ -	$ 28,392.25	$ 6,638.21	$ -	
Name:	Nawal Shwbaki	Drops:	20						
Phone:	04-433710								
Reports To:	HQ WAJ								

Material Cost for Site: $ 35,030.46

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Configuration 1	$ 2,001.00	8	2	$ 16,008.00	$ -	$ 16,008.00	$ -	$ -
Configuration 2	$ 2,377.00	0	2	$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	2	$ 4,485.00	$ -	$ 4,485.00	$ -	$ -
Printer	$ 1,299.00	1	2	$ 1,299.00	$ -	$ 1,299.00	$ -	$ -
Printer DM	$ 259.00	1	2	$ 259.00	$ -	$ 259.00	$ -	$ -
Oracle File Server	$ 2,500.00	0	2	$ -	$ -	$ -	$ -	$ -
Oracle Developer	$ 450.00	0	2	$ -	$ -	$ -	$ -	$ -
Oracle PC	$ 125.00	0	2	$ -	$ -	$ -	$ -	$ -
Network S/W	$ 795.00	1	2	$ 795.00	$ -	$ 795.00	$ -	$ -
Punch Down Block	$ 29.21	1	2	$ 29.21	$ -	$ 29.21	$ -	$ -
Surge Protector	$ 21.00	8	2	$ 168.00	$ -	$ 168.00	$ -	$ -
UPS	$ 167.00	1	3	$ 167.00	$ -	$ -	$ 167.00	$ -
Phone	$ 12.50	1	2	$ 12.50	$ -	$ 12.50	$ -	$ -
Operations & Maintenance			3	$ 6,471.21	$ -	$ -	$ 6,471.21	$ -
Stores			2	$ 2,875.21	$ -	$ 2,875.21	$ -	$ -
				$ 32,569.13	$ -	$ 25,930.92	$ 6,638.21	$ -

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS
Operations & Maintenance				
Configuration 1	$ 2,001.00	2	3	$ 4,002.00
Configuration 2	$ 2,377.00	1	3	$ 2,377.00
ReUse Printer	$ -	1	3	$ -
Punch Down Block	$ 29.21	1	3	$ 29.21
Surge Protector	$ 21.00	3	3	$ 63.00
Phone	$ 15.00	0	3	$ -
Summary				$ 6,471.21
Stores				

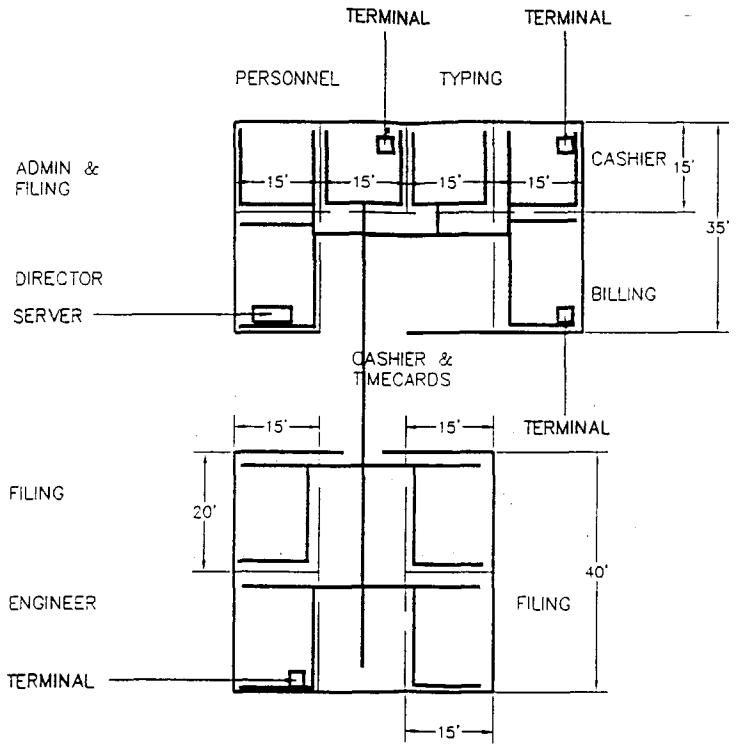
Configuration 2	$ 2,377.00	1	2	$ 2,377.00	
Terminal Emulation	$ 189.00	1	2	$ 189.00	
Printer DM	$ 259.00	1	2	$ 259.00	
Punch Down Block	$ 29.21	1	2	$ 29.21	
Surge Protector	$ 21.00	1	2	$ 21.00	
Phone	$ 15.00	0	2	$ -	
Summary				$ 2,875.21	

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	1800	$ 158.40
Hubs	16 Port	$ 795.00	1	$ 795.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles	2.25 x 4 box	$ 3.50	20	$ 70.00
Connectors	Couplers	$ 0.90	75	$ 67.50
Conduit/Panduit	Small	$ 1.42	750	$ 1,062.53
Corners (Panduit/Conduit)			68	$ 56.90
Consumables		$ 40.00	1	$ 40.00
Totals:				$ 2,461.33

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	10	$ 720.00
Quality Assurance Engineer		$ 53.00	10	$ 530.00
Lead Installation Technician		$ 34.00	25	$ 850.00
Journey Man Installation Tech		$ 29.00	25	$ 725.00
Totals:			70	$ 2,825.00



WAJ
MAFRAQ GOBVERNORATE

LEVEL 5 UTP CABLE RUN

Science Applications International Corporation
619 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
8/00/95	WAJMAFRQ.DWG	--

SCALE SHEET 1 OF 1

APPENDIX A-19

WAJ
TAFELAH GOVERNORATE

1. Organization Information
   a. Organization Name: Tafelah Water Administration
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?): Tafelah Governorate
   e. Manager of Organization, (Name and Title): Engineer Akram Za'Anen
   f. Phone Number of Manager: 03341104
   g. Principle Purpose for organization (verbal description of functionality): The Tafelah Governorate provides subscriber water services in its assigned area. There is no current local data automation support for this operational organization. The Total employees 220 support 9,000 subscribers. Main offices are on the Ground Floor and First Floor. City offices include Sara (25 Km) and possibly another city office in the future. Stores office is remoted 6 Km. No current data automation, but one stand alone PC and printer on the Ground Floor. Likely candidates for automation include Personnel, Accounting and Finance, O & M, Administration, Engineering, and Subscribers.

2. Facility Information
   a. Name of Building (Address?): Tafelah
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: concrete 2 story building
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: Expect a new building in 1997-1998.

3. Hardware
   a. Description of existing hardware at site: N/A There is no current local data automation support for this operational organization.

b. Description of existing network at site: None

c. Description of existing external communications links (data) at site: None

4. Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A

5. Data

a. Description of type and amount of data at each site: subscriber billing accounts, water allocations, personnel, payroll, and accounting.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.):

The recommended server for the Tafelah Governorate is a Pentium based, 90 Mhz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Tafelah Stores and Operation and Maintenance facilities. The server will be connected to the hub using UTP Level 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network, controlled by the server. The design requires the installation of eight 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP Level 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The eight personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Tafelah Stores office is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle, which will be cabled to a telephone

punch down block. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Tafelah Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Tafelah Stores computer have dial in capability to be attached to the Tafelah Governorate server.

The recommended design for the Tafelah Operations and Maintenance facility is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Tafelah Operations and Maintenance facility will have dial-in access to the Tafelah Governorate server as a Netware client.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 6 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium server and 8 486 PCs. (Stores 1 486 PC and O & M 1 486 PC)

f. Listing of Recommended Software: The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated offices such as the Tafelah Stores and Operation and Maintenance facilities. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Tafelah Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability.

g. Equipment/Software Cost Estimate: $ 31,028.06 (includes Stores and O & M)

h. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 3,390.00 (includes Stores and O & M)

(3) Training: see Chapter 5

SUMMARY FOR TAFELAH

Office:	Tafelah Governorate	Priority:	3		priority 1	priority 2	priority 3	priority 4	
Location:	Tafelah				$	$ -	$ 28,600.85	$ 2,427.21	$ 31,028.06
Name:	Akram Za'Anen	Drops:	24						
Phone:	03 341104								
Reports To:	HQ WAJ								

Material Cost for Site: $ 31,028.06

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Configuration 1	$ 2,001.00	8	3	$ 16,008.00	$ -	$ -	$ 16,008.00	$ -
Configuration 2	$ 2,377.00	0	3	$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	3	$ 4,485.00	$ -	$ -	$ 4,485.00	$ -
Printer	$ 1,299.00	1	3	$ 1,299.00	$ -	$ -	$ 1,299.00	$ -
Printer DM	$ 259.00	1	3	$ 259.00	$ -	$ -	$ 259.00	$ -
Oracle File Server	$ 2,500.00	0	3	$ -	$ -	$ -	$ -	$ -
Oracle Developer	$ 450.00	0	3	$ -	$ -	$ -	$ -	$ -
Oracle PC	$ 125.00	0	3	$ -	$ -	$ -	$ -	$ -
Network S/W	$ 795.00	1	3	$ 795.00	$ -	$ -	$ 795.00	$ -
Punch Down Block	$ 29.21	1	3	$ 29.21	$ -	$ -	$ 29.21	$ -
Surge Protector	$ 21.00	8	3	$ 168.00	$ -	$ -	$ 168.00	$ -
UPS	$ 167.00	1	3	$ 167.00	$ -	$ -	$ 167.00	$ -
Phone	$ 15.00	0	3	$ -	$ -	$ -	$ -	$ -
Operations & Maintenance			4	$ 2,427.21	$ -	$ -	$ -	$ 2,427.21
Stores			3	$ 2,887.71	$ -	$ -	$ 2,887.71	$ -
				$ 28,525.13	$ -	$ -	$ 26,097.92	$ 2,427.21

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS
Operations & Maintenance				
Configuration 1	$ 2,001.00	0	4	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
ReUse Printer	$ -	1	4	$ -
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector	$ 21.00	1	4	$ 21.00
Phone	$ 15.00	0	4	$ -
Summary				$ 2,427.21

Configuration 2	$ 2,377.00	1	3	$ 2,377.00
Terminal Emulator	$ 189.00	1	3	$ 189.00
Printer DM	$ 259.00	1	3	$ 259.00
Punch Down Block	$ 29.21	1	4	$ 29.21
Surge Protector	$ 21.00	1	4	$ 21.00
Phone	$ 12.50	1	3	$ 12.50
Summary				$ 2,887.71

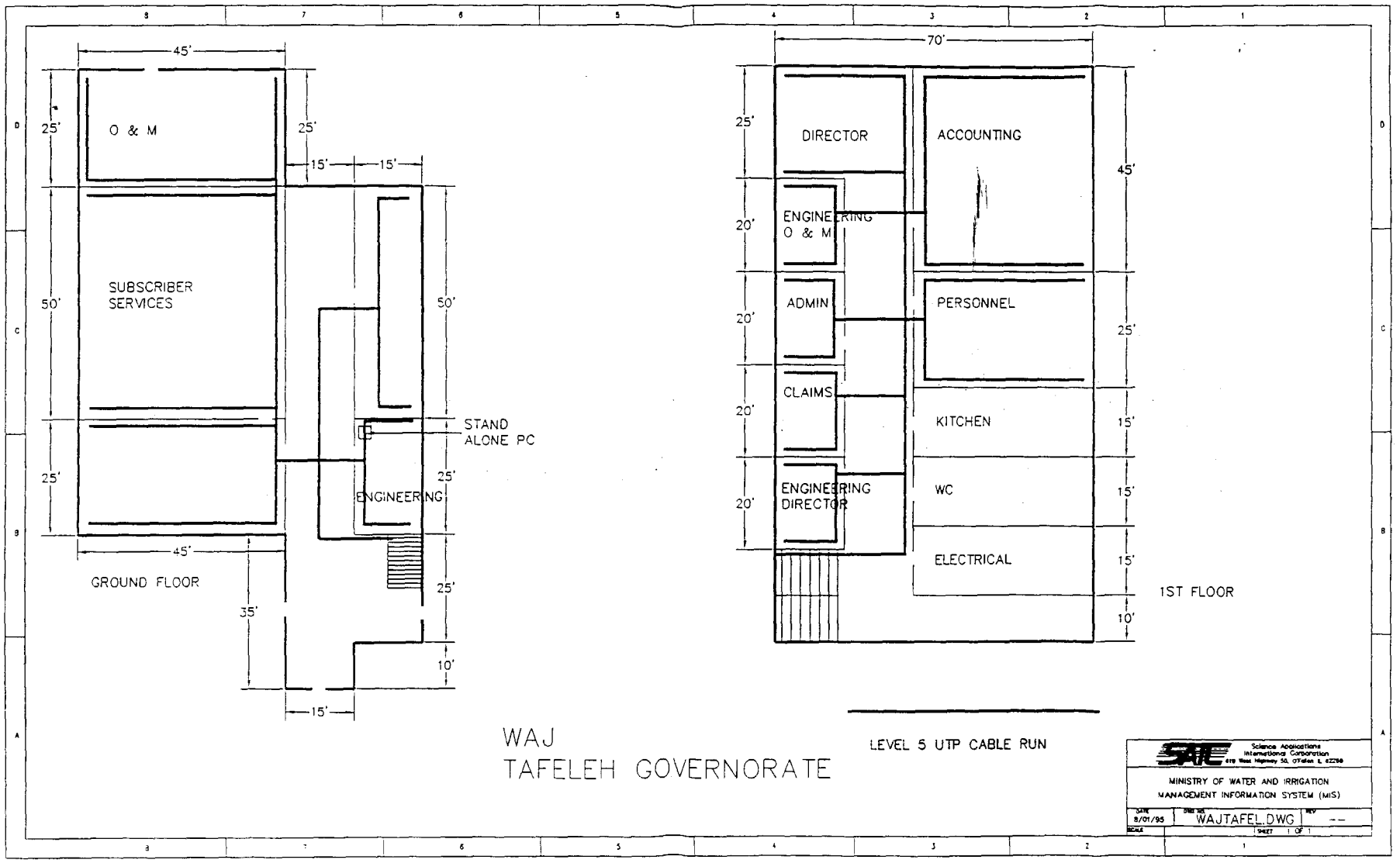
Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	2000	$ 176.00
Hubs	16 Port	$ 795.00	1	$ 795.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles	2 25 x 4 box	$ 3.50	24	$ 84.00
Connectors	Couplers	$ 0.90	75	$ 67.50
Conduit/Panduit	Small	$ 1.42	750	$ 1,062.53
Corners (Panduit/Conduit)			68	$ 56.99
Consumables		$ 50.00	1	$ 50.00
Totals:				$ 2,502.93

Labor Costs

Labor Category	Rate	Units	TOTAL COSTS
Installation Engineer	$ 72.00	12	$ 864.00
Quality Assurance Engineer	$ 53.00	12	$ 636.00
Lead Installation Technician	$ 34.00	30	$ 1,020.00
Journey Man Installation Tech.	$ 29.00	30	$ 870.00
Totals:		84	$ 3,390.00

262


45'
25'
O & M
25'
15'
15'
SUBSCRIBER SERVICES
50'
50'
STAND ALONE PC
25'
25'
ENGINEERING
45'
GROUND FLOOR
35'
25'
10'
15'
70'
25'
DIRECTOR
ACCOUNTING
45'
20'
ENGINEERING O & M
20'
ADMIN
PERSONNEL
25'
20'
CLAIMS
KITCHEN
15'
20'
ENGINEERING DIRECTOR
WC
15'
ELECTRICAL
15'
1ST FLOOR
10'
LEVEL 5 UTP CABLE RUN
WAJ
TAFELEH GOVERNORATE
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
DATE 8/01/95
WAJTAFEL.DWG
REV --
SHEET 1 OF 1

APPENDIX A-20

WAJ
ZARQA GOVERNORATE

1. Organization Information
   a. Organization Name: Zarqa Water Administration
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?): Zarqa Governorate
   e. Manager of Organization, (Name and Title): Engineer Gaze Khaleel
   f. Phone Number of Manager: 09986499
   g. Principle Purpose for organization (verbal description of functionality): Zarqa performs the data automation for itself and Mafraq. It has city offices in Rosipha and Azraq. Main offices are in a 4 story concrete building, with most of its offices on the 3rd floor. Total workers number 80. The main computer is a VAX 8200 with 8 terminals and 3 printers. Functions likely to be automated include the Planning, Studies, and Information, Claims, Work and Maintenance, Subscribers, Administration and Finance Departments and the Rosipha Directorate. The Claims department is about 200 feet behind the main building. Zarqa has a remote O & M office which is a single story relatively new concrete building 3-4 Km from the main office. The O & M office administers a contract for the maintenance of pipes and pumps and modems customer claims and water distribution data to the main office in Zarqa .O & M also reports to Zarqa on the performance of the Azraq, Murhib, Hallabat, Za Attari, and Khaldieh pumping stations and the main pumping stations at Hashmyeh, Khaw, and Zarqa.

2. Facility Information
   a. Name of Building (Address?): Zarqa
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: reinforced concrete and concrete brick 4 story building
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A

h. Qualitative assessment of dust: High

i. Changes to Facility: N/A

3. Hardware

a. Description of existing hardware at site: a VAX 8200, with thirteen terminals (excess equipment from HQ WAJ). Three high speed printers were attached to provide print output, a Mannesmann Tally, a CITOH CL 300 and a CON15 CI 300. There was a power stabilizer (Claude Lyons) attached to the VAX 8200, but no UPS system. There was one standalone IBM compatible personal computer (80836/20) used for administrative support. The personal computer had a dot matrix printer attached for hard copy output.

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: dial-up modems and Kermit software is used as the communications software between the DEC Alpha processor and VAX equipment in the Amman, Irbid and Zarqa Governorates.

4. Software

a. Description of existing operating software at site: the VAX was using VMS release 5.3 for its operating system.

b. Description of application software at each site: (see software inventory database)

c. Description of Network Software at each site(see software inventory database)

d. Description of Communication Software at each site: (see software inventory database)

5. Data

a. Description of type and amount of data at each site: the VAX 8200 will be used to support customer requests (new hookups, repairs, disconnects, new meters, etc.) and customer billing.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): Internal tracking subscriber requests, billing, and equipment outages. Monthly reports to HQ WAJ of water use and billing information.

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A at the time of survey, although with the VAX 8200 automation of reports will be possible.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended server for the Zarqa Governorate is a Pentium based, 90 Mhz, IBM compatible personal computer with 16 MB of memory and 3 GB of hard disk drive space. The server will have a 14.4 Kbps internal Modem with v.32 bis. The system will also have an internal 250 MB backup tape drive. The recommended network operating system is Novell 3.12. The server will also have Netware Connect 2 installed to provide dial in/out connection to the network for the geographically separated

offices such as the Zarqa Stores. Operation and Maintenance facilities. Rusaifa and Al-Azark. The server will be connected to the hub using UTP Level 5 cabling and eight pin modular jacks. The server will also be connected to the RJ-11 receptacle using common telephone cable with RJ-11 jacks attached to the receptacle and the Modem port. The recommended design includes an HP compatible laser printer for the network. controlled by the server. The design requires the installation nine 80486 66 Mhz IBM compatible personal computers. Each system will 16 MB of memory and 300 MB of hard disk drive space. Each system will have an internal ethernet card and be attached to the network with UTP Level 5 patch cable with eight pin modular jacks. Each system will have a surge protector power strip. The nine personal computers will have the latest version on Microsoft's Windows operating system and an Arabized version the Microsoft's Office Professional software suite. Printing support will be provided by the network printer. Communications external to the LAN will be through the server's Modem.

The recommended design for the Zarqa Stores office is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a 9-pin dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The Zarqa Stores personal computer will have installed a VT 220 software terminal emulation package to allow for dial out access to the Amman Governorate Stores central ordering capability. The Zarqa Stores computer will have a dial in capability so that it can be attached to the Zarqa Governorate server as a Netware client.

The recommended design for the Zarqa Operations and Maintenance facility includes three 80486 66 Mhz IBM compatible personal computers. One configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The other two systems configurations will be 80486 66 Mhz IBM compatible personal computers, with 16 MB of memory and 300 MB of hard disk drive space. Each of these systems will have an internal ethernet card and be connected in a peer-to-peer configuration within the Operations and Maintenance facility. An RG-58 coaxial cable will be used for this connection. The systems will be attached to an electronic surge protectors. The recommended systems will have Microsoft's Windows for Work Groups operating system and an Arabized version of Microsoft's Office Professional software suite. The Zarqa Operations and Maintenance facility will have dial-in access to the Zarqa Governorate server as a Netware client.

Rusaifa and Al-Azark are cities that report to Zarqa and are considered Priority 4 sites. These sites will have a telephone punch down block installed and an RJ-11 wall mounted receptacle installed similar to the Operations and Maintenance facility and Stores facility. Each site will have installed one 80486 IBM compatible computer, running at 66 Mhz, with 16 MB of memory and a 400 MB hard disk. Each system will have an internal 14.4

Kpbs Modem with V.32 bis. Each of the city offices will have a 24 pin printer attached to the parallel port of their computer. Each system will have a surge protector power strip. Each system will have the latest version of Microsoft's Windows operating system and the latest Arabized version of Microsoft's Office Professional software suite. These supporting city offices will have dial-in access to the Zarqa Novell network as a client.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 4 days

d. Schematic of site (old and new equipment): (see site drawing)

e. Listing of Recommended Equipment: 1 Pentium server and 9 486 PCs. (Stores 1 486 PC and the O & M 3 486 PCs) 2 additional 486 PCs 1 each for the city offices of Rusaifa and Al-Azark.

f. Listing of Recommended Software:

Each system will have the latest version of Microsoft's Windows operating system and the latest Arabized version of Microsoft's Office Professional software suite.

g. Equipment/Software Cost Estimate: $ 47,667.57 (includes Stores, O & M, plus Rusaifa and Al Azrak)

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 5,650.00 00 (includes Stores, O & M, plus Rusaifa and Al Azrak)

(3) Training: see Chapter 5

SUMMARY FOR ZARQA

Office:	Zarqa Governorate	Priority:	1			priority 1	priority 2	priority 3	priority 4
Location:	Zarqa					$ 27,794.94	$ 6,471.21	$ 8,004.00	$ 5,397.42
Name:	Gazo Khaleel	Drops:	40						
Phone:	09-986499								
Reports To:	HQ WAJ								

Material Cost for Site: $ 47,687.57

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
VAX Interface	$ 2,500.00	1	1	$ 2,500.00	$ 2,500.00	$ -	$ -	$ -
Configuration 1	$ 2,001.00	5	1	$ 10,005.00	$ 10,005.00	$ -	$	$ -
Configuration 1	$ 2,001.00	4	3	$ 8,004.00	$ -	$ -	$ 8,004.00	$ -
Configuration 2	$ 2,377.00	0	1	$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	1	$ 4,485.00	$ 4,485.00	$ -	$ -	$ -
Printer	$ 1,299.00	1	1	$ 1,299.00	$ 1,299.00	$ -	$ -	$ -
Oracle File Server	$ 2,500.00	0	1	$ -	$ -	$ -	$ -	$ -
Pathworks	$ 185.00	5	1	$ 925.00	$ 925.00	$ -	$ -	$ -
Oracle PC	$ 695.00	0	1	$ -	$ -	$ -	$ -	$ -
Network S/W	$ 795.00	1	1	$ 795.00	$ 795.00	$ -	$ -	$ -
Netware Connect 2	$ 695.00	1	1	$ 695.00	$ 695.00	$ -	$ -	$ -
Punch Down Block	$ 29.21	1	1	$ 29.21	$ 29.21	$ -	$ -	$ -
Surge Protector	$ 21.00	9	1	$ 189.00	$ 189.00	$ -	$ -	$ -
UPS	$ 167.00	1	1	$ 167.00	$ 167.00	$ -	$ -	$ -
Phone	$ 15.00	0	1	$ -	$ -	$ -	$ -	$ -
Operations & Maintenance			2	$ 6,471.21	$ -	$ 6,471.21	$ -	$ -
Stores			1	$ 2,871.21	$ 2,871.21	$ -	$ -	$ -
Rusaifa			4	$ 2,698.71	$ -	$ -	$ -	$ 2,698.71
Al Azrak			4	$ 2,698.71	$ -	$ -	$ -	$ 2,698.71
SUMMARY				$ 43,833.05	$ 23,960.42	$ 6,471.21	$ 8,004.00	$ 5,397.42

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS
Operations & Maintenance				
Configuration 1	$ 2,001.00	2	2	$ 4,002.00
Configuration 2	$ 2,377.00	1	2	$ 2,377.00
ReUse Printer	$ -	1	2	$ -
Surge Protector	$ 21.00	3	2	$ 63.00
Punch Down Block	$ 29.21	1	2	$ 29.21

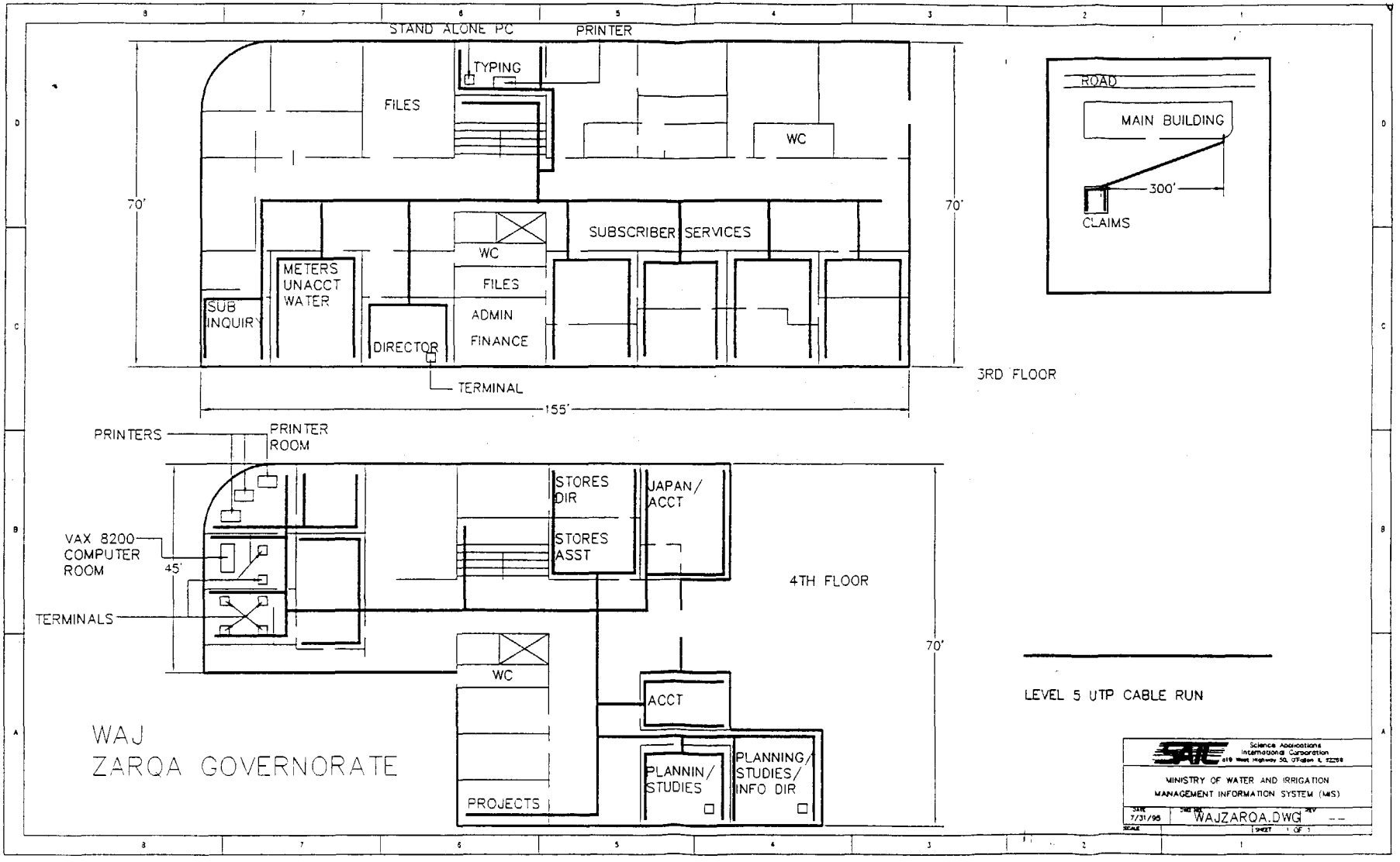
Phone	$ 15.00	0	2	$ -
Summary				$ 6,471.21
Stores				
Configuration 2	$ 2,377.00	1	1	$ 2,377.00
Terminal Emulation	$ 185.00	1	1	$ 185.00
Printer DM	$ 259.00	1	1	$ 259.00
Surge Protector	$ 21.00	1	1	$ 21.00
Punch Down Block	$ 29.21	1	1	$ 29.21
Phone	$ 15.00	0	1	$ -
Summary				$ 2,871.21
Rusaifa				
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
Printer DM	$ 259.00	1	4	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00
Punch Down Block	$ 29.21	1	4	$ 29.21
Phone	$ 12.50	1	4	$ 12.50
Summary				$ 2,698.71
Al Azrak				
Configuration 2	$ 2,377.00	1	4	$ 2,377.00
Printer DM	$ 259.00	1	4	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00
Punch Down Block	$ 29.21	1	4	$ 29.21
Phone	$ 12.50	1	4	$ 12.50
Summary				$ 2,698.71

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	1660	$ 146.08
Hubs	24 Port	$ 1,295.00	1	$ 1,295.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles		$ 7.70	40	$ 308.00
Connectors	Couplers	$ 0.90	75	$ 67.50
Conduit/Panduit	Small	$ 1.42	1200	$ 1,700.04
Corners (Panduit/Conduit)	In and Outside		68	$ 56.90
Consumables		$ 50.00	1	$ 50.00
Totals:				$ 3,834.52

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	20	$ 1,440.00
Quality Assurance Engineer		$ 53.00	20	$ 1,060.00
Lead Installation Technician		$ 34.00	50	$ 1,700.00
Journey Man Installation Tech.		$ 29.00	50	$ 1,450.00
Totals:			140	$ 5,650.00


STAND ALONE PC
PRINTER
TYPING
FILES
WC
70'
70'
SUBSCRIBER SERVICES
WC
FILES
ADMIN
FINANCE
METERS
UNACCT
WATER
SUB
INQUIRY
DIRECTOR
TERMINAL
155'
3RD FLOOR
ROAD
MAIN BUILDING
300'
CLAIMS
PRINTERS
PRINTER
ROOM
VAX 8200
COMPUTER
ROOM
45'
TERMINALS
STORES
DIR
STORES
ASST
JAPAN/
ACCT
4TH FLOOR
70'
WC
ACCT
PLANNIN/
STUDIES
PLANNING/
STUDIES/
INFO DIR
PROJECTS
LEVEL 5 UTP CABLE RUN
WAJ
ZARQA GOVERNORATE
Science Applications
International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
7/31/95
WAJZARQA.DWG
SHEET 1 OF 1

WAJ LABORATORIES
AMMAN (BAIADER WADI SEER)

1. Organization Information
   a. Organization Name: WAJ Water Laboratories
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?): Amman (Baiader Wadi Seer)
   e. Manager of Organization, (Name and Title): Dr Raja Jadoon
   f. Phone Number of Manager: 711361
   g. Principle Purpose for organization (verbal description of functionality): The primary mission of the laboratory is to provide analysis of water samples in support the Water Authority of Jordan. The Total employee number is 75. Main focus in on the water quality of both drinking water and waste water.

2. Facility Information
   a. Name of Building (Address?): Amman (Baiader Wadi Seer)
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: concrete 1 story building
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: yes
   h. Qualitative assessment of dust: Low
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: The WAJ Central Laboratory currently has several stand alone personal computers and several laboratory instruments closely integrated with personal computers. The design does not include the laboratory instruments and associated personal computers as part of the network or MIS. A major problem is the lack of storage space for historical water sample results.
   b. Description of existing network at site: N/A

c. Description of existing external communications links (data) at site: N/A

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): numerous monthly and yearly reports regarding water quality based on the results of the water sample tests.

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design requires the installation of six personal computers for the Central Laboratory. Most rooms in the Central Laboratory will have a single network drop, with the administration function having three network drops. The physical network will be UTP Level 5 cable with eight pin modular connectors, terminated at each computer in a sixteen bit ethernet card. Three of the four existing systems will have ethernet network cards installed. The UTP cable will be terminated in a 24 port patch panel, which will in turn, be connected to a 16 port intelligent hub. The Central Laboratory server will be attached to the hub. The cable will be installed in surface mounted panduit with wall mounted receptacles. Wall penetrations will use conduit and be sealed. The network will use a star topology. The recommended network operating system is Novell 3.12. The server for the Central Laboratory will be a Pentium based personal computer, operating at 90 Mhz, with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The primary software will be Microsoft's Windows 3.1 and Microsoft's Professional Office software suite. The six additional systems to be installed in the Central Laboratory will be 80486 based personal computers running at 66 Mhz, with 16 MB of memory and a 300 MB hard disk drive. The 14 port hub will have HP compatible laser printer attached to act as the network printer.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 6 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium server and 6 486 PCs

f. Listing of Recommended Software: The primary software will be Microsoft's Windows 3.1 and Microsoft's Professional Office software suite. The recommended network operating system is Novell 3.12.

g. Equipment/Software Cost Estimate: $ 22,410.93

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 3,531.25

(3) Training: see Chapter 5

WAJ Central Laboratory

						priority 1	priority 2	priority 3	priority 4
Office:	Central Laboratory	Priority:	2			$ -	$ 22,410.93	$ -	$
Location:	Amman								
Name:	Raja Jadoon	Drops:	25						
Phone:	711361								
Reports To:	HQ WAJ								

Material Cost for Site: $ 22,410.93

Computers and Communications

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority
Configuration 1	$ 2,001.00	6	2	$ 12,006.00	$ -	$ 12,006.00	$ -	$
Configuration 2	$ 2,377.00	0	2	$ -	$ -	$ -	$ -	$
Configuration 3	$ 4,485.00	1	2	$ 4,485.00	$ -	$ 4,485.00	$ -	$
Network S/W	$ 795.00	1	2	$ 795.00	$ -	$ 795.00	$ -	$
Ethernet Card	$ 129.00	3	2	$ 387.00	$ -	$ 387.00	$ -	$
Surge Protector	$ 21.00	9	2	$ 189.00	$ -	$ 189.00	$ -	$
UPS	$ 167.00	1	2	$ 167.00	$ -	$ 167.00	$ -	$
Punch Down Block	$ 29.21	1	2	$ 29.21	$ -	$ 29.21	$ -	$
Phone	$ 15.00	0	2	$ -	$ -	$ -	$ -	$
				$ 18,058.21	$ -	$ 18,058.21	$ -	$

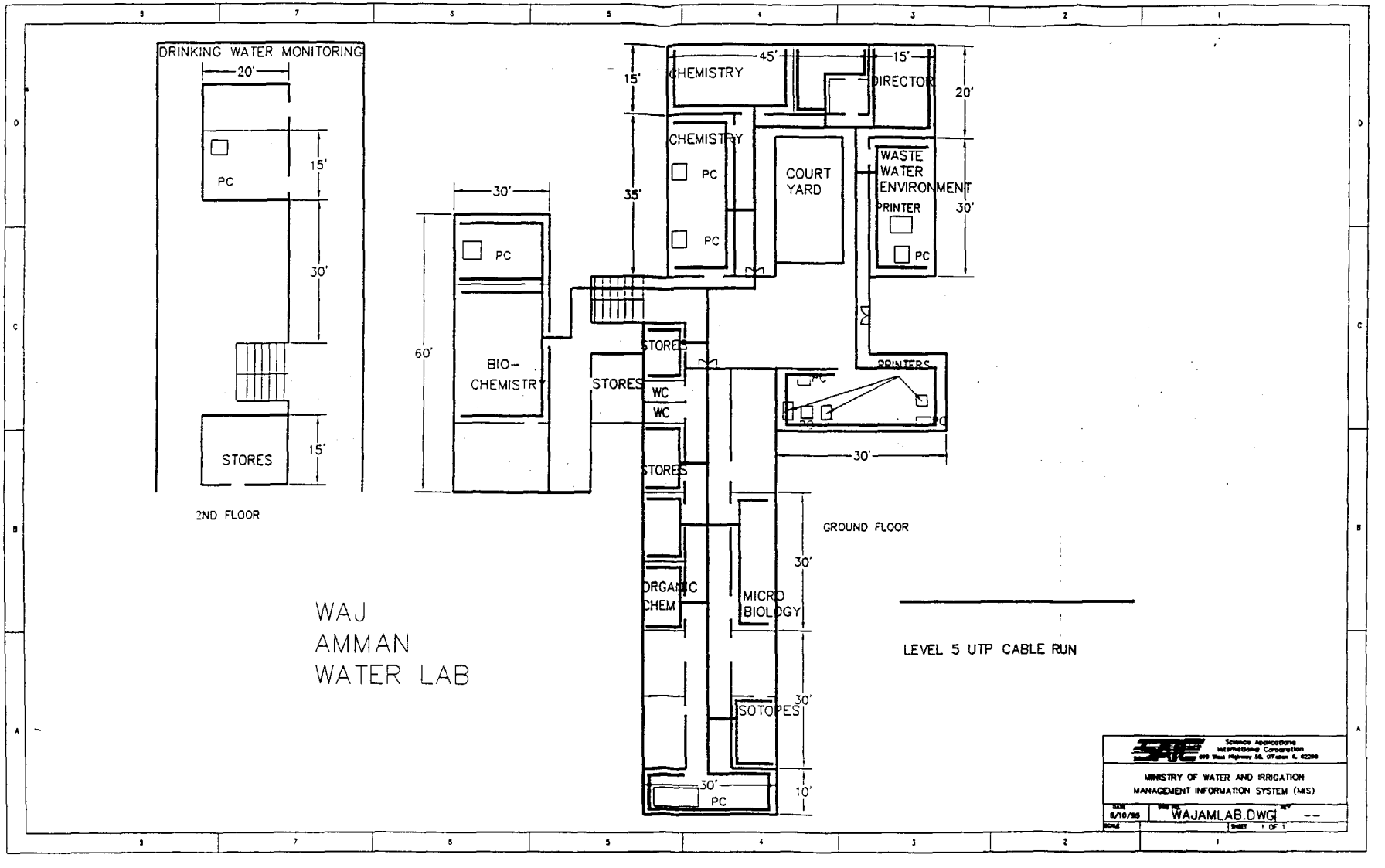
Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST	
Cabling	UTP	$ 0.09	5100	$ 448.80	
Hubs	16 Port	$ 795.00	1	$ 795.00	JPM085A/Easy
Patch Panels	24 Port	$ 211.00	1	$ 211.00	LE667A
Receptacles	2.25 x 4 box	$ 7.70	30	$ 231.00	
Connectors	Couplers	$ 0.90	150	$ 135.00	
Conduit/Panduit	Lg & Small		1480	$ 2,372.04	
Corners (Panduit/Conduit)	In and Outside		130	$ 109.88	
Consumables		$ 50.00	1	$ 50.00	
Totals:				$ 4,352.72	

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS

	Installation Engineer		$ 72.00	12.5	$ 900.00						
	Quality Assurance Engineer		$ 53.00	12.5	$ 662.50						
	Lead Installation Technician		$ 34.00	31.25	$ 1,062.50						
	Journey Man Installation Tech.		$ 29.00	31.25	$ 906.25						
	Totals:			87.5	$ 3,531.25						


DRINKING WATER MONITORING
20'
PC
15'
30'
STORES
15'
2ND FLOOR
30'
PC
60'
BIO-
CHEMISTRY
STORES
WC
WC
STORES
ORGANIC
CHEM
15'
35'
CHEMISTRY
45'
15'
DIRECTOR
20'
CHEMISTRY
PC
PC
COURT
YARD
WASTE
WATER
ENVIRONMENT
PRINTER
PC
30'
PRINTERS
30'
GROUND FLOOR
MICRO
BIOLOGY
30'
SOTOPES
30'
30'
PC
10'
WAJ
AMMAN
WATER LAB
LEVEL 5 UTP CABLE RUN
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
WAJAMLAB.DWG
SHEET 1 OF 1

APPENDIX A-22

WAJ PUMPING STATIONS (9)

1. Organization Information
   a. Organization Name: Water Pumping Stations (9)
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?): see below
   e. Manager of Organization, (Name and Title): Engineer Zuheir Heyasat
   f. Phone Number of Manager: 680100
   g. Principle Purpose for organization (verbal description of functionality): There are nine water pumping stations associated with the several Governorates within the WAJ. The pumping stations record water flow on an hourly basis. This information is forwarded by phone to HQ WAJ by each of pumping stations where it is entered into a log book. The recommended design for these stations is to install a single personal computer with the capability to monitor the water flow, record the data and forward it to HQ WAJ. The pumping stations are Priority 4 facilities for the purpose of implementation. The pumping stations are at Al Wala, Al Nafag, Al Tage, Al Qastal, Ain Gatzal, Al Azarq, Wadi Al Arab, Za'tari, and Al Deseh.

2. Facility Information
   a. Name of Building (Address?): see above
   b. Location of Data Processing Equipment: sites not visited
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: concrete 1 story building
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: N/A These sites were not surveyed.

b. Description of existing network at site: N/A

c. Description of existing external communications links (data) at site: N/A

4. Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A

5. Data

a. Description of type and amount of data at each site: There are nine water pumping stations associated with the several Governorates within the WAJ. The pumping stations record water flow on an hourly basis.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): The nine water pumping stations record water flow on an hourly basis. This information is forwarded by phone to HQ WAJ by each of pumping stations where it is entered into a log book. Reports are made hourly at least during normal duty hours.

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design for these stations is to install a single personal computer with the capability to monitor the water flow, record the data and forward it to HQ WAJ. The pumping stations are Priority 4 facilities for the purpose of implementation.

The recommended design for the pumping facilities is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The pumping stations will have dial-in access to the supported Governorate server or HQ WAJ as a Netware client.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 1 day each site

d. Schematic of site (old and new equipment)

e. Listing of Recommended Equipment: 9 486 PCs with 1 486 at each site

f. Listing of Recommended Software: Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite

g. Equipment/Software Cost Estimate: $ 24,490.89 (inclusive for all 9 stations)

f. Site Installation Cost

(1) Tools Required (Rent?)
(2) Labor: $ 1,980.00 (inclusive for all 9 stations)
(3) Training: see Chapter 5

WAJ Pumping Stations

Office:	Pumping Station	PRIORITY	4	
Location:	Several Locations			
Name:		Drops:	9	
Phone:				
Reports To:	Area Governorate			

	priority 1	priority 2	priority 3	priority 4
	$ -	$ -	$ -	$ 24,175 89

Material Cost for Site: $ 24,490 89

Computers and Communications

	Location	Under	Item	Units	Unit Cost	Priority	Total Cost	priority 1	priority 2	priority 3	priority 4
1	Al Wala Project	Amman									
			Configuration 2	1	$ 2,377 00	4	$ 2,377 00	$ -	$ -	$ -	$ 2,377 00
			Punch Down Block	1	$ 29 21	4	$ 29 21	$ -	$ -	$ -	$ 29 21
			Printer	1	$ 259 00	4	$ 259 00	$ -	$ -	$ -	$ 259 00
			Surge Protector	1	$ 21 00	4	$ 21 00	$ -	$ -	$ -	$ 21 00
2	Al Nafag Station	Amman						$ -	$ -	$ -	$ -
			Configuration 2	1	$ 2,377 00	4	$ 2,377 00	$ -	$ -	$ -	$ 2,377 00
			Punch Down Block	1	$ 29 21	4	$ 29 21	$ -	$ -	$ -	$ 29 21
			Printer	1	$ 259 00	4	$ 259 00	$ -	$ -	$ -	$ 259 00
			Surge Protector	1	$ 21 00	4	$ 21 00	$ -	$ -	$ -	$ 21 00
3	Al Tage Station	Amman						$ -	$ -	$ -	$ -
			Configuration 2	1	$ 2,377 00	4	$ 2,377 00	$ -	$ -	$ -	$ 2,377 00
			Punch Down Block	1	$ 29 21	4	$ 29 21	$ -	$ -	$ -	$ 29 21
			Printer	1	$ 259 00	4	$ 259 00	$ -	$ -	$ -	$ 259 00
			Surge Protector	1	$ 21 00	4	$ 21 00	$ -	$ -	$ -	$ 21 00
4	Al Qastal Station	Amman						$ -	$ -	$ -	$ -
			Configuration 2	1	$ 2,377 00	4	$ 2,377 00	$ -	$ -	$ -	$ 2,377 00
			Punch Down Block	1	$ 29 21	4	$ 29 21	$ -	$ -	$ -	$ 29 21
			Printer	1	$ 259 00	4	$ 259 00	$ -	$ -	$ -	$ 259 00
			Surge Protector	1	$ 21 00	4	$ 21 00	$ -	$ -	$ -	$ 21 00
5	Ain Gatzal Station	Amman						$ -	$ -	$ -	$ -
			Configuration 2	1	$ 2,377 00	4	$ 2,377 00	$ -	$ -	$ -	$ 2,377 00
			Punch Down Block	1	$ 29 21	4	$ 29 21	$ -	$ -	$ -	$ 29 21
			Printer	1	$ 259 00	4	$ 259 00	$ -	$ -	$ -	$ 259 00
			Surge Protector	1	$ 21 00	4	$ 21 00	$ -	$ -	$ -	$ 21 00
6	Al Azarq Station	Zarqa						$ -	$ -	$ -	$ -
			Configuration 2	1	$ 2,377 00	4	$ 2,377 00	$ -	$ -	$ -	$ 2,377 00
			Punch Down Block	1	$ 29 21	4	$ 29 21	$ -	$ -	$ -	$ 29 21
			Printer	1	$ 259 00	4	$ 259 00	$ -	$ -	$ -	$ 259 00
			Surge Protector	1	$ 21 00	4	$ 21 00	$ -	$ -	$ -	$ 21 00
7	Wadi al Arab Station	Irbid						$ -	$ -	$ -	$ -
			Configuration 2	1	$ 2,377 00	4	$ 2,377 00	$ -	$ -	$ -	$ 2,377 00
			Punch Down Block	1	$ 29 21	4	$ 29 21	$ -	$ -	$ -	$ 29 21
			Printer	1	$ 259 00	4	$ 259 00	$ -	$ -	$ -	$ 259 00
			Surge Protector	1	$ 21 00	4	$ 21 00	$ -	$ -	$ -	$ 21 00
8	Za'tari Station	Mafraq						$ -	$ -	$ -	$ -
			Configuration 2	1	$ 2,377 00	4	$ 2,377 00	$ -	$ -	$ -	$ 2,377 00
			Punch Down Block	1	$ 29 21	4	$ 29 21	$ -	$ -	$ -	$ 29 21

			Printer	1	$ 259.00	4	$ 259.00		$ -	$ -	$ -	$ 259.00
			Surge Protector	1	$ 21.00	4	$ 21.00		$ -	$ -	$ -	$ 21.00
9	Al Deseh Station	Aqaba							$ -	$ -	$ -	$ -
			Configuration 2	1	$ 2,377.00	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
			Punch Down Block	1	$ 29.21	4	$ 29.21		$ -	$ -	$ -	$ 29.21
			Printer	1	$ 259.00	4	$ 259.00		$ -	$ -	$ -	$ 259.00
			Surge Protector	1	$ 21.00	4	$ 21.00		$ -	$ -	$ -	$ 21.00
	Totals:						$ 24,175.89		$ -	$ -	$ -	$ 24,175.89

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling				$ -
Hubs				$ -
Patch Panels				$ -
Receptacles				$ -
Connectors				$ -
Conduit/Panduit				$ -
Corners (Panduit/Conduit)				$ -
Consumables		$ 35.00	9	$ 315.00
Totals:				$ 315.00

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	4.5	$ 324.00
Quality Assurance Engineer		$ 53.00	4.5	$ 238.50
Lead Installation Technician		$ 34.00	22.5	$ 765.00
Journey Man Installation Tech		$ 29.00	22.5	$ 652.50
Totals:			54	$ 1,980.00

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APPENDIX A-23

WAJ
WASTE WATER TREATMENT STATIONS (11)

1. Organization Information
   a. Organization Name: Waste Water Treatment Stations (11 sites)
   b. Organization Belongs to What Ministry: HQ WAJ
   c. Organization falls immediately under which organization: HQ WAJ
   d. Location of Organization, Governate, City, Building (address?): see below
   e. Manager of Organization, (Name and Title): Engineer Zuheir Heyasat
   f. Phone Number of Manager: 680100 ext. 440
   g. Principle Purpose for organization (verbal description of functionality): The waste water treatment stations process waste water at the major urban centers. There are eleven waste water treatment plants managed by the WAJ. These plants are; Al Kerbeh Alsamra Station, Mafraq Station, Al Ramtha Station, Irbid Station, Jerash Station, Ajlun Station, Ma'an Station, Aqaba Station, Tafelah Station, Al Karak Station, and Madaba Station.

2. Facility Information
   a. Name of Building (Address?): see above
   b. Location of Data Processing Equipment: N/A as these sites were not visited
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: N/A
   b. Description of existing network at site: N/A
   c. Description of existing external communications links (data) at site: N/A

4. Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A

5. Data

a. Description of type and amount of data at each site water volume processed, administration, inventory control, engineering, and design activities

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): as required

c. Description of automated reports accomplished by site (size, frequency, to whom): . The waste water treatment plants currently record operational data manually. This information is forwarded to HQ WAJ by each of waste water treatment plant as required.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design for these plants is to install a single personal computer with the capability to record the operational data and forward it to HQ WAJ as necessary. The waste water treatment plants are Priority 4 facilities for the purpose of implementation. These facilities will be implemented late in the schedule.

The recommended design for the treatment facilities is to install one 80486 66 Mhz IBM compatible personal computer. Its configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have a dot matrix printer attached to the parallel port. The system will be attached to an electronic surge protector and to the RJ-11 receptacle mentioned above. The recommended system will have Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The treatment stations will have dial-in access to the HQ WAJ as a Netware client.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 1 day each site

d. Schematic of site (old and new equipment): N/A

e. Listing of Recommended Equipment: 11 486 PCs with 1 PC at each Waste Water Treatment Plant

f. Listing of Recommended Software: Microsoft's Windows operating system and an Arabized version of Microsoft's Office Professional software suite. The treatment stations will have dial-in access to the HQ WAJ as a Netware client.

g. Equipment/Software Cost Estimate: $ 29,548.31 (for the 11 Waste Water Treatment Plants--network components at the 2 Water Treatment Plants and the 11 Waste Water Treatment Plants will cost $3,184.41.

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 9,020.00 (for the 2 Water Treatment Plants and the 11 Waste Water Treatment Plants)

(3) Training: see Chapter 5

SUMMARY FOR WATER TREATMENT PLANT

Office:	Water Treatment Plants	Priority:	2 & 4
Location:	Several Locations		
Name:	Mohmmod Abu Taha	Drops:	41
Phone:	05-55320X		
Reports To:	Local Governorates		

	priority 1	priority 2	priority 3	priority 4
	$ -	$ 14,624.83	$ -	$ 45,556.31

Material Cost for Site: $ 60,181.14

Computers and Communications

ZAI WTP

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Configuration 1	$ 2,001.00	4	4	$ 8,004.00	$ -	$ -	$ -	$ 8,004.00
Configuration 2	$ 2,377.00	0		$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	2	$ 4,485.00	$ -	$ 4,485.00	$ -	$ -
Network S/W	$ 795.00	1	2	$ 795.00	$ -	$ 795.00	$ -	$ -
UPS	$ 167.00	2	2	$ 334.00	$ -	$ 334.00	$ -	$ -
Ethernet Card	$ 129.00	1	2	$ 129.00	$ -	$ 129.00	$ -	$ -
Punch Down Block	$ 29.21	1	2	$ 29.21	$ -	$ 29.21	$ -	$ -
Reuse Printer WAJ	$ -	1	2	$ -	$ -	$ -	$ -	$ -
Phone	$ 12.50	1	2	$ 12.50	$ -	$ 12.50	$ -	$ -
				$ 13,768.71	$ -	$ 5,784.71	$ -	$ 8,004.00

Wadi Al Arab WTP

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Configuration 1	$ 2,001.00	4	4	$ 8,004.00	$ -	$ -	$ -	$ 8,004.00
Configuration 2	$ 2,377.00	0		$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	2	$ 4,485.00	$ -	$ 4,485.00	$ -	$ -
Network S/W	$ 795.00	1	2	$ 795.00	$ -	$ 795.00	$ -	$ -
UPS	$ 167.00	2	2	$ 334.00	$ -	$ 334.00	$ -	$ -
Ethernet Card	$ 129.00	0		$ -	$ -	$ -	$ -	$ -
Punch Down Block	$ 29.21	1	2	$ 29.21	$ -	$ 29.21	$ -	$ -
Reuse Printer WAJ	$ -	1	2	$ -	$ -	$ -	$ -	$ -
Phone	$ 12.50	1	2	$ 12.50	$ -	$ 12.50	$ -	$ -
				$ 13,659.71	$ -	$ 5,655.71	$ -	$ 8,004.00

			Priority	4						
	Waste Water Treatment Stations									
		UNIT COST	UNIT	PRIORITY	TOTAL		priority 1	priority 2	priority 3	priority 4
	Al Kerbeh Alsamra Station									
	Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
	Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
	Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
	Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
	Mafraq Station						$ -	$ -	$ -	$ -
	Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
	Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
	Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
	Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
	Al Ramtha Station						$ -	$ -	$ -	$ -
	Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
	Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
	Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
	Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
	Irbid Station						$ -	$ -	$ -	$ -
	Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
	Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
	Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
	Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
	Jerash Station						$ -	$ -	$ -	$ -
	Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
	Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
	Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
	Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
	Ajlun Station						$ -	$ -	$ -	$ -
	Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
	Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
	Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
	Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
	Ma'an Station						$ -	$ -	$ -	$ -
	Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
	Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
	Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
	Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
	Aqaba Station						$ -	$ -	$ -	$ -
	Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
	Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
	Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
	Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
	Tafelah Station						$ -	$ -	$ -	$ -
	Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
	Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21

Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
Al Karak Station						$ -	$ -	$ -	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
Madaba Station						$ -	$ -	$ -	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
				$ 29,548.31		$ -	$ -	$ -	$ 29,548.31

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	1000	$ 88.00
Hubs	9 Port	$ 399.00	2	$ 798.00
Patch Panels	24 Port	$ 211.00	2	$ 422.00
Receptacles	SFC Box & Plug	$ 7.70	30	$ 231.00
Connectors	RJ-45	$ 0.79	60	$ 47.40
Conduit/Panduit		$ 1.42	700	$ 991.69
Corners (Panduit/Conduit)			68	$ 58.32
Consumables		$ 50.00	11	$ 550.00
Totals:				$ 3,184.41

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	20.5	$ 1,476.00
Quality Assurance Engineer		$ 53.00	20.5	$ 1,086.50
Lead Installation Technician		$ 34.00	102.5	$ 3,485.00
Journey Man Installation Tech.		$ 29.00	102.5	$ 2,972.50
Totals:			246	$ 9,020.00

APPENDIX A-24

WAJ
WATER TREATMENT STATIONS (2)

1. Organization Information
   a. Organization Name: Water Treatment Stations (2)
   b. Organization Belongs to What Ministry: WAJ
   c. Organization falls immediately under which organization: WAJ
   d. Location of Organization, Governate, City, Building (address?): see below
   e. Manager of Organization, (Name and Title): Engineer Zuheir Heyasat
   f. Phone Number of Manager: 680100 ext. 440
   g. Principle Purpose for organization (verbal description of functionality): There are two potable water plants that are included in the Unified MIS. These two plants are the Zai and Wadi Al Arab Water Treatment Plants.

2. Facility Information
   a. Name of Building (Address?): Amman (Zai Station) and Irbid (Wadi Al Arab Station)
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   I Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: These facilities are modern installations with sophisticated monitoring and control systems. However, they have little office automation support for administration, inventory control, engineering, and design activities. The design for Zai and Wadi Al Arab plants is the same.
   b. Description of existing network at site: N/A
   c. Description of existing external communications links (data) at site: N/A

4. Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A

5. Data

a. Description of type and amount of data at each site: water volume processed, administration, inventory control, engineering, and design activities

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): as required

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The design recommends a small network be installed with dial-in/out access to HQ WAJ.

The recommended design for the water treatment plants includes five 80486 66 Mhz IBM compatible personal computers. One configuration includes 16 MB of memory, a 400 MB hard disk drive an internal 14.4. Kbps Modem with v.32 bis. The system will have an excess printer from WAJ assets in the Ministry Building attached to the parallel port. The other four systems configurations will be 80486 66 Mhz IBM compatible personal computers, with 16 MB of memory and 300 MB of hard disk drive space. Each of these systems will have an internal ethernet card and be connected in a peer-to-peer configuration within the Operations and Maintenance facility. The systems will be attached to an electronic surge protectors. The recommended systems will have Microsoft's Windows for Work Groups operating system and an Arabized version of Microsoft's Office Professional software suite. The water treatment plants will have dial-in access to the HQ WAJ server as a Netware client.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 2 days each

d. Schematic of site (old and new equipment): N/A

e. Listing of Recommended Equipment: 5 80486 66 Mhz IBM compatible personal computers

f. Listing of Recommended Software: Microsoft's Windows for Work Groups operating system and an Arabized version of Microsoft's Office Professional software suite

g. Equipment/Software Cost Estimate: $ 13,788.71 (Zai), $ 13,659.71 (Wadi Al Arab)-- $ 29,548.31 (11 Waste Water Treatment Plants) and $ 3,184.41 for network components at all locations.

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 9,020.00 (for the 2 Water Treatment Plants and the 11 Waste Water Treatment Plants

(3) Training: see Chapter 5

SUMMARY FOR WATER TREATMENT PLANT

Office:	Water Treatment Plants	**Priority:**	2 & 4
Location:	Several Locations		
Name:	Mohammed Abu Taha	**Drops:**	41
Phone:	05-55320X		
Reports To:	Local Governorates		

	priority 1	priority 2	priority 3	priority 4
	$ -	$ 14,624.83	$ -	$ 45,556.31

Material Cost for Site: $ 60,181.14

Computers and Communications

ZAI WTP

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Configuration 1	$ 2,001.00	4	4	$ 8,004.00	$ -	$ -	$ -	$ 8,004.00
Configuration 2	$ 2,377.00	0		$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	2	$ 4,485.00	$ -	$ 4,485.00	$ -	$ -
Network S/W	$ 795.00	1	2	$ 795.00	$ -	$ 795.00	$ -	$ -
UPS	$ 167.00	2	2	$ 334.00	$ -	$ 334.00	$ -	$ -
Ethernet Card	$ 129.00	1	2	$ 129.00	$ -	$ 129.00	$ -	$ -
Punch Down Block	$ 29.21	1	2	$ 29.21	$ -	$ 29.21	$ -	$ -
Reuse Printer WAJ	$ -	1	2	$ -	$ -	$ -	$ -	$ -
Phone	$ 12.50	1	2	$ 12.50	$ -	$ 12.50	$ -	$ -
				$ 13,788.71	$ -	$ 5,784.71	$ -	$ 8,004.00

Wadi Al Arab WTP

ITEM DESCRIPTION	UNIT COST	UNITS	PRIORITY	TOTAL COSTS	priority 1	priority 2	priority 3	priority 4
Configuration 1	$ 2,001.00	4	4	$ 8,004.00	$ -	$ -	$ -	$ 8,004.00
Configuration 2	$ 2,377.00	0		$ -	$ -	$ -	$ -	$ -
Configuration 3	$ 4,485.00	1	2	$ 4,485.00	$ -	$ 4,485.00	$ -	$ -
Network S/W	$ 795.00	1	2	$ 795.00	$ -	$ 795.00	$ -	$ -
UPS	$ 167.00	2	2	$ 334.00	$ -	$ 334.00	$ -	$ -
Ethernet Card	$ 129.00	0		$ -	$ -	$ -	$ -	$ -
Punch Down Block	$ 29.21	1	2	$ 29.21	$ -	$ 29.21	$ -	$ -
Reuse Printer WAJ	$ -	1	2	$ -	$ -	$ -	$ -	$ -
Phone	$ 12.50	1	2	$ 12.50	$ -	$ 12.50	$ -	$ -
				$ 13,659.71	$ -	$ 5,655.71	$ -	$ 8,004.00

			Priority	4						
Waste Water Treatment Stations	UNIT COST	UNIT	PRIORITY	TOTAL		priority 1	priority 2	priority 3	priority 4
Al Keibeh Alsamra Station									
Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
Mafraq Station						$ -	$ -	$ -	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
Al Ramtha Station						$ -	$ -	$ -	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
Irbid Station						$ -	$ -	$ -	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
Jerash Station						$ -	$ -	$ -	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
Ajlun Station						$ -	$ -	$ -	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
Ma'an Station						$ -	$ -	$ -	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
Aqaba Station						$ -	$ -	$ -	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
Tafolah Station						$ -	$ -	$ -	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21

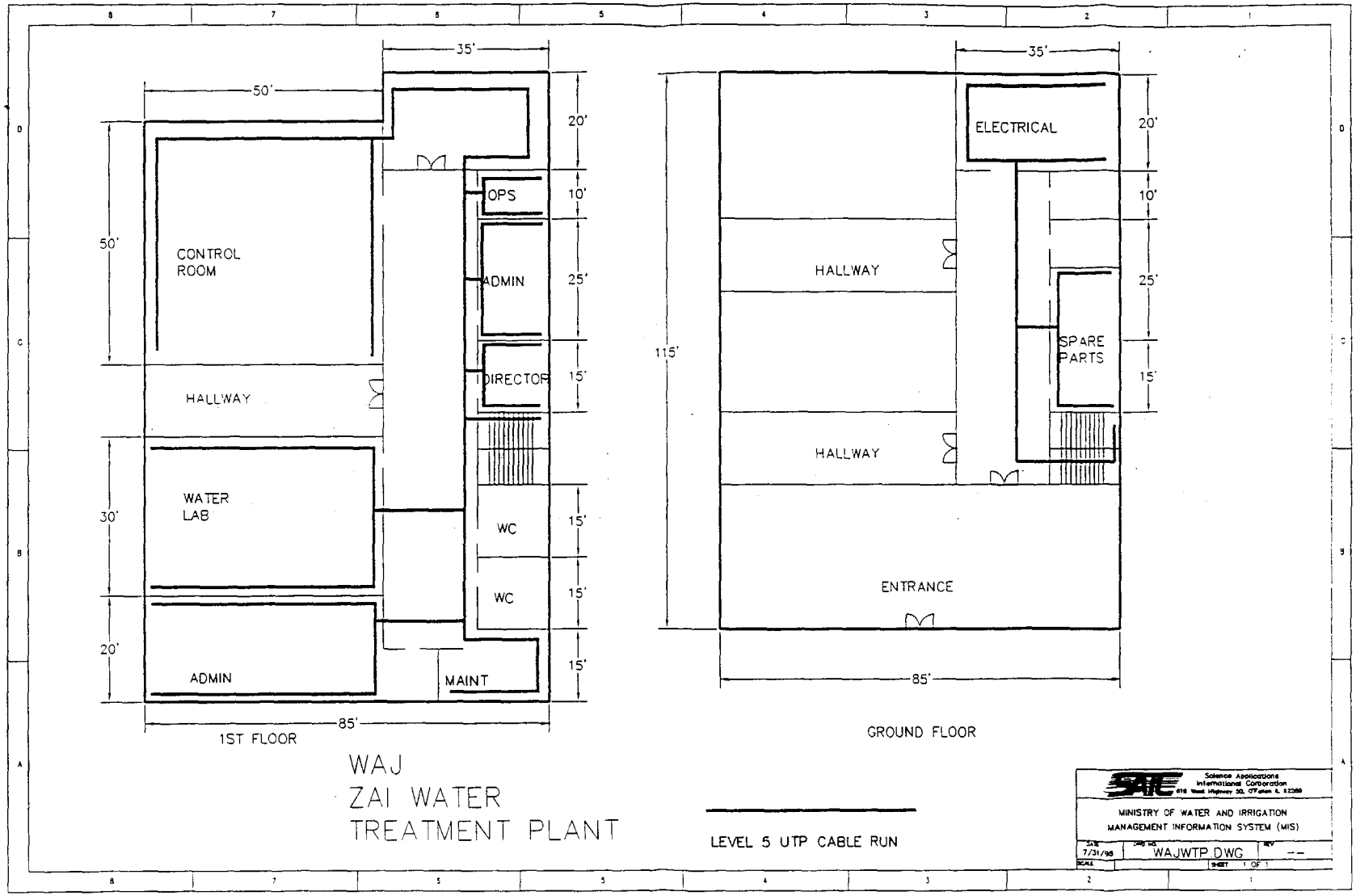
Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
Al Karak Station						$ -	$ -	$ -	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
Madaba Station						$ -	$ -	$ -	$ -
Configuration 2	$ 2,377.00	1	4	$ 2,377.00		$ -	$ -	$ -	$ 2,377.00
Punch Down Block	$ 29.21	1	4	$ 29.21		$ -	$ -	$ -	$ 29.21
Printer	$ 259.00	1	4	$ 259.00		$ -	$ -	$ -	$ 259.00
Surge Protector	$ 21.00	1	4	$ 21.00		$ -	$ -	$ -	$ 21.00
				$ 29,548.31		$ -	$ -	$ -	$ 29,548.31

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	1000	$ 88.00
Hubs	9 Port	$ 399.00	2	$ 798.00
Patch Panels	24 Port	$ 211.00	2	$ 422.00
Receptacles	SFC Box & Plug	$ 7.70	30	$ 231.00
Connectors	RJ-45	$ 0.79	60	$ 47.40
Conduit/Pandult		$ 1.42	700	$ 991.69
Corners (Pandult/Conduit)			68	$ 56.32
Consumables		$ 50.00	11	$ 550.00
Totals:				$ 3,184.41

Labor Costs

Labor Category		Rate	Units	TOTAL COSTS
Installation Engineer		$ 72.00	20.5	$ 1,476.00
Quality Assurance Engineer		$ 53.00	20.5	$ 1,086.50
Lead Installation Technician		$ 34.00	102.5	$ 3,485.00
Journey Man Installation Tech.		$ 29.00	102.5	$ 2,972.50
Totals:			246	$ 9,020.00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HALLWAY
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ENTRANCE
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ZAI WATER
TREATMENT PLANT
LEVEL 5 UTP CABLE RUN
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
7/31/95
WAJWTP.DWG
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SHEET 1 OF 1

JVA
DIRECTOR OF DAMS AND IRRIGATION
AMMAN (SHMEISANI)

1. Organization Information
   a. Organization Name: Director of Dams and Irrigation
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: JVA
   d. Location of Organization, Governorate, City, Building (address?): Amman
   e. Manager of Organization, (Name and Title): Engineer Maher Scandar
   f. Phone Number of Manager: 681340 ext. 104
   g. Principle Purpose for organization (verbal description of functionality): The Directorate of Dams and Irrigation in Shmeisani provides design, engineering, acquisition and administrative support for the JVA. Responsible for the monitoring the 5 major dams (Wadi Arab, Ziglab, Shueib, Talal, and Kafrein) feeding the Jordan Valley and for the irrigation these dams provide. A sixth dam, the Karameh Dam is currently under construction and expected to be operational in late 1997.

2. Facility Information
   a. Name of Building (Address): Amman (Shmeisani)
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: 4 story concrete cinder block
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: Low to Moderate
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: The Directorate of Dams and Irrigation at the time when baseline data was collected had five IBM compatible PCs that were standalone machines. There were two laser printers available and directly connected

to two host computers. The computers were used for administrative purposes, typing letters and keeping records, or in the engineering and planning section to perform studies and design activities. No network was available and all output was in hard copy format and forwarded in hard copy to meet mission requirements.

b. Description of existing network at site: N/A

c. Description of existing external communications links (data) at site: telephone only and links to the HQ JVA at the Ministry Building were poor.

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: maintains administrative records and engineering plans

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): manages the activities of the 5 major dams in the JVA

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The installation includes five additional personal computers. The networked system will operate using Novell's Netware Operating System 3.12. The server for Directorate of Dams and Irrigation will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The primary software on all systems will be Microsoft's Office Professional software suite. The five additional personal computers to be installed will be a 80486 based personal computers running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. Four of the existing computer systems will be retained. These systems will have an ethernet interface card installed so they can share network resources. One of the existing systems, 80286 personal computer, is not planned for reuse.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 6 days

d. Schematic of site (old and new equipment)

e. Listing of Recommended Equipment: 1 Pentium server and 5 486 PCs

f. Listing of Recommended Software: Novell's Netware Operating System 3.12 and Microsoft's Office Professional software suite.

g. Equipment/Software Cost Estimate: $ 18,119.95

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 4,520.00

(3) Training: see Chapter 5

DIRECTORATE OF DAMS AND IRRIGATION

Office:	Directorate of Dams	Priority	2
Location:	Shmeisani		
Name:	Maher Skandar	Drops:	32
Phone:	681340 ext 104		
Reports To:	JVA Amman		

Material Cost for Site: $ 18,119.95

Computers and Communications

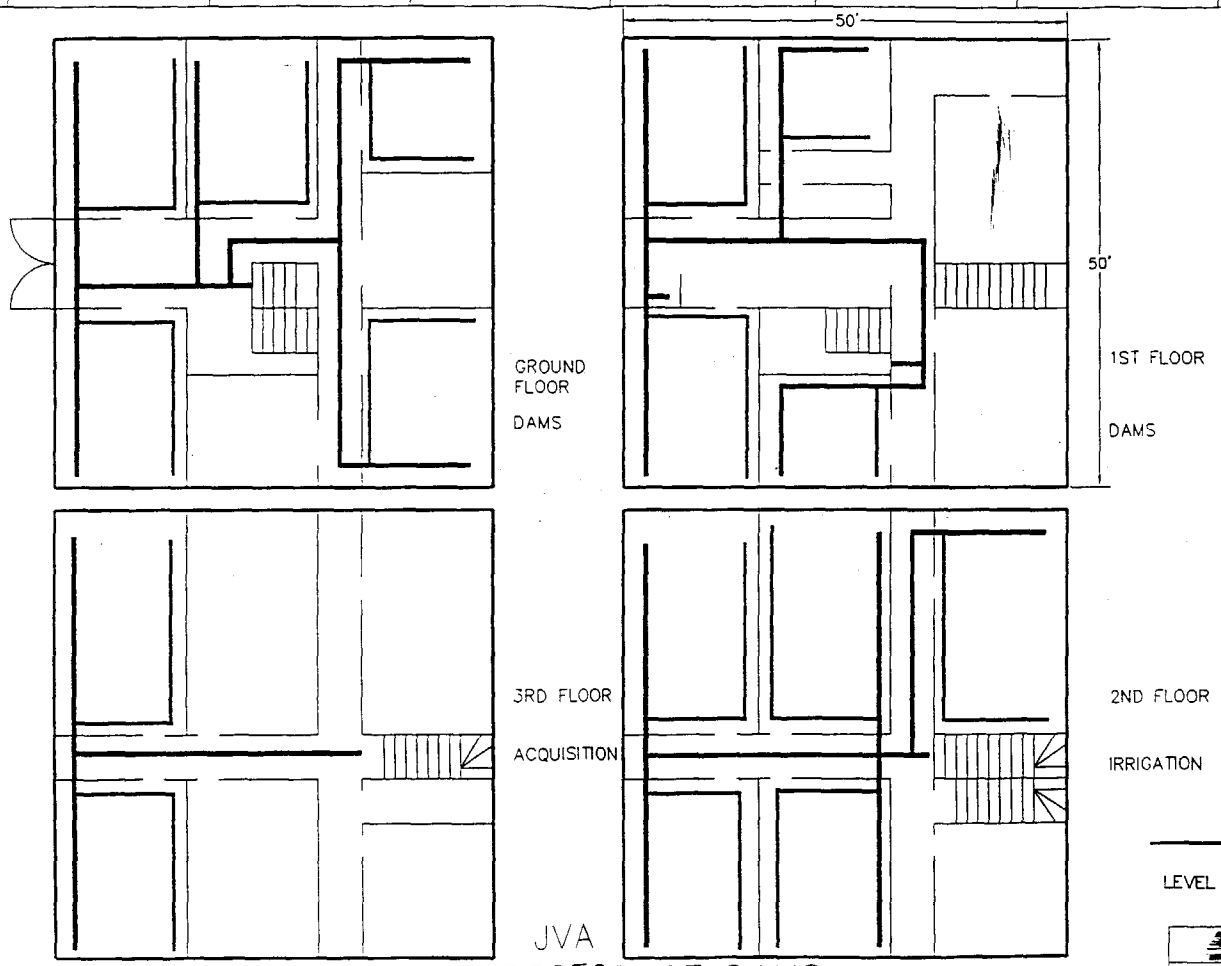
ITEM	Description	Unit Cost	Units	TOTAL COST	
Cabling	UTP	$ 0.09	0	$ -	See Dam.est
Hub	16 Port	$ 400.00	0	$ -	
Configuration 1	486/66	$ 2,001.00	5	$ 10,005.00	
Configuration 2	486/66	$ 2,377.00	0	$ -	
Configuration 3	Pentium	$ 3,147.00	1	$ 3,147.00	
Power Strip	5 Pluc	$ 21.00	7	$ 147.00	
UPS	1KVA 15 min	$ 167.00	1	$ 167.00	
Network Operating system	Novell 3.12	$ 846.00	1	$ 846.00	
Punch Down Block	AT&T	$ 18.88	1	$ 18.88	
Phone Line	D	$ 15.00	0	$ -	
				$ 14,330.88	

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	5100	$ 448.80
Hubs	16 Port	$ 400.00	1	$ 400.00
Patch Panels	48 Port	$ 211.00	1	$ 211.00
Receptacles	Box and Jack	$ 7.70	30	$ 231.00
Connectors	Couplers	$ 0.90	75	$ 67.50
Conduit/Panduit	Lg and Small		1480	$ 2,372.04
Corners (Panduit/Conduit)	In and Outside		38	$ 33.73
Consumables		$ 25.00	1	$ 25.00
Totals:				$ 3,789.07

Labor Costs

Labor Category	Rate	Units	TOTAL COSTS
Installation Engineer	$ 72.00	16	$ 1,152.00
Quality Insurance Engineer	$ 53.00	16	$ 848.00
Lead Installation Technician	$ 34.00	40	$ 1,360.00
Journey Man Installation Tech.	$ 29.00	40	$ 1,160.00
Totals:		112	$ 4,520.00


50'
50'
GROUND FLOOR
DAMS
1ST FLOOR
DAMS
3RD FLOOR
ACQUISITION
2ND FLOOR
IRRIGATION
LEVEL 5 UTP CABLE RUN
JVA
DIRECTOR OF DAMS
AND IRRIGATION
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
DATE 8/11/95
DWG NO. DIRDAMS.DWG
REV --
SCALE
SHEET OF 1

APPENDIX A-26

JVA
DISTRICT OFFICE 01
KULAIAT

1. Organization Information
   a. Organization Name: North Jordan Valley Irrigation Directorate
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: Dirar Computer Center
   d. Location of Organization, Governate, City, Building (address?): Kulaiat
   e. Manager of Organization, (Name and Title): Engineer Izat Sakaji
   f. Phone Number of Manager: 02291682
   g. Principle Purpose for organization (verbal description of functionality): administratively responsible for the Staging Offices in the northern Jordan Valley (SO 1, SO 2. and SO 7).

2. Facility Information
   a. Name of Building (Address?): North Shounah/Kulaiat
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided during installation
   d. Facility Construction: concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available): radio/telecommunications room
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: Moderate to High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: The District Office 1, at the time when baseline data was collected was configured with one terminal connected to Staging Office 7's MV 2000.
   b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: DO 1 had access to the Multitec 9600 Modem attached to the MV 2000 for connection to Staging Offices 1 or 2, to the computer center, or to HQ JVA.

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: Requests for water from subscribers is turned into the SOs and transmitted to the DOs for entry into the water balance programs. Water allocation information is passed from Dirar to the SOs. Water billing information is forwarded from the SOs to the DOs and then to the HQ JVA for processing.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): DO 1 communicates daily with SO 1, SO 2, and SO 7 (which is collocated with DO 1).

c. Description of automated reports accomplished by site (size, frequency, to whom): reports consist of customer water requests from the SOs on a weekly basis and water allocation amounts based on the water balance model outputs to each SO several times a week.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design requires the installation of four personal computers for the Staging Office and one personal computer for the District Office, networked together. The physical network will be UTP Level 5 cable with eight pin modular connectors, terminated at each computer in a sixteen bit ethernet card. The UTP cable will be terminated in a nine port hub attached to the primary Staging Office system. The networked system will operate on a peer-to-peer network scheme. The primary computer for Staging Office 7 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The three additional systems to be installed in the Staging Office 7 will be a 80486 based personal computers running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer systems will

have Windows NT Workstation 3.5 for their operating systems, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.
The administrative system to be installed in District Office 1 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 400 MB hard disk drive. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The new administrative system will be connected to the RJ-11 telephone receptacle through its internal Modem. The computer system will have Windows NT Workstation 3.5 for an operating system and Microsoft Office Professional Version 4.1. A terminal emulation software package will be installed for dial up access to the Dirar Computer Center. An excess HL Brother HL 631 printer from the MWI Building will be used for printer support. The system will be networked to Staging Office 7's system. This configuration will allow some redundancy and backup capability should any of the personal computers fail.

b. Site Unique Risks (Technical or Security): Three Staging Offices (SO 1, SO 3 and SO 5) are in very old buildings. Placing data processing equipment in these buildings is very risky due to poor power, lack any air conditioning and high levels of dust.

c. Proposed Schedule: 3 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 486 PC for administrative work

f. Listing of Recommended Software: Windows NT 3.5 operating system, Microsoft Office Professional 4.1, terminal emulation package; network to SO 7 PCs.

g. Equipment/Software Cost Estimate: $ 3,118.57

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 220.00

(3) Training: see Chapter 5

DISTRICT OFFICE CONFIGURATION

District Office: DO 1 **Priority** 2
Location: Kulalat
Name: Hazem Al-Azawi **Drops:** 1
Phone: 05-570594
Reports To: JVA Amman

Material Cost for Site: $ 3,118.57

Computers and Communications

	Item	Description	Unit Cost	Number	Cost	
1	Configuration 1	486/66	$ 2,001.00		$ -	
2	Configuration 2	486/66	$ 2,377.00	1	$ 2,377.00	
3	Configuration 3	Pentium	$ 3,147.00		$ -	
4	14.4 modem	Internal	$ 79.00	0	$ -	
5	UPS	1KVA 15 min	$ 167.00	1	$ 167.00	
6	Terminal Emulation	VT220	$ 185.00	1	$ 185.00	
7	Windows WS NT.3.5	OS	$ 288.00	1	$ 288.00	
8	E-Net Card	Internal	$ 129.00	0	$ -	
9	Coax Cable	RG-58	$ 0.14	0	$ -	
10	RJ-11 Wall Mount	AT&T	$ 10.33	1	$ 10.33	Note block in SC 7 costs.
11	Phone Line	D	$ 15.00	0	$ -	
					$ 3,027.33	

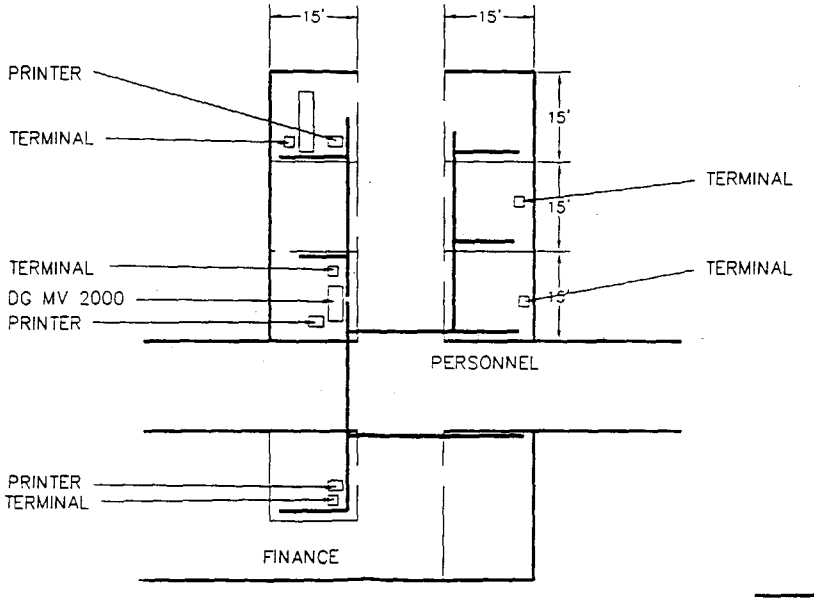
Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	Coax	$ 0.14	40	$ 5.72
Hubs				$ -
Patch Panels				$ -
Receptacles				$ -
Connectors	BNC	$ 0.90	15	$ 13.46
Conduit/Panduit	Pan	$ 1.42	40	$ 56.67
Corners (Panduit/Conduit)		$ 0.90	6	$ 5.39
Consumables		$ 10.00	1	$ 10.00
Totals:				$ 91.24

Labor Costs

Labor Category	Rate	Units	TOTAL COSTS
Installation Engineer	$ 72.00	0.5	$ 36.00
Quality Insurance Engineer	$ 53.00	0.5	$ 26.50
Lead Installation Technician	$ 34.00	2.5	$ 85.00
Journey Man Installation Tech.	$ 29.00	2.5	$ 72.50
Totals:		6	$ 220.00

202



LEVEL 5 UTP CABLE RUN

JVA
DISTRICT OFFICE 01/
STAGING OFFICE 07
NORTH SHOUNAH

Science Applications International Corporation
619 West Highway 30, O'Fallon, IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
8/11/95	JVAD01.DWG	--

SCALE | SHEET 1 OF 1

APPENDIX A-27

JVA
DISTRICT OFFICE 02
DEIR ALLA

1. Organization Information
   a. Organization Name: Middle Jordan Valley Irrigation Directorate
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: Dirar Computer Center
   d. Location of Organization, Governate, City, Building (address?): Deir Alla
   e. Manager of Organization, (Name and Title): Engineer Farouk Bashbsheh
   f. Phone Number of Manager: 05570046
   g. Principle Purpose for organization (verbal description of functionality): administratively responsible for the Staging Offices in the central Jordan Valley (SO 3, SO 4, SO 5, and SO 8).

2. Facility Information
   a. Name of Building (Address?): Deir Alla
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for)): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances): adequate because an UPS will be provided at installation
   d. Facility Construction: concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available): radio/telecommunications room
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: Moderate to High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: District Office 2 had a single terminal attached to Multitec 1200 - 9600 baud Modem. District Office 2 used this terminal to dial-out to subordinate Staging Offices, the computer center or if necessary, HQ JVA in the Ministry Building. DO 2 also had one standalone IBM compatible PC for

administrative purposes. DO 2 had one dot matrix printer that could be used with either the terminal or the IBM compatible PC.

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: Multitec 1200 - 9600 baud Modem

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: Requests for water from subscribers is turned into the SOs and transmitted to the DOs for entry into the water balance programs. Water allocation information is passed from Dirar to the SOs. Water billing information is forwarded from the SOs to the DOs and then to the HQ JVA for processing.

b Description of hard copy/manual reports accomplished by site (size and frequency, to whom): DO 2 communicates daily with SO 3, SO 4, SO 5 and SO 8.

c. Description of automated reports accomplished by site (size, frequency, to whom): reports consist of customer water requests from the SOs on a weekly basis and water allocation amounts based on the water balance model outputs to each SO several times a week.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers of items.). The administrative system to be installed in District Office 2 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 400 MB hard disk drive. The computer will have an internal 14.4 Kbps Modem with V.32 bis The new administrative system will be connected to the RJ-11 telephone receptacle through its internal Modem. The computer system will have Windows NT Workstation 3.5 for an operating system and Microsoft Office Professional Version 4.1. A terminal emulation software package will be installed for dial up access to the Dirar Computer Center. An excess HL Brother HL 631 printer from the MWI Building will be used for printer support. The two systems will be networked using an RG 58 cable..

b. Site Unique Risks (Technical or Security): N/A

c Proposed Schedule: 2 days

d. Schematic of site (old and new equipment): see site drawing

e Listing of Recommended Equipment: 1 486 PC

f. Listing of Recommended Software: Windows NT Workstation 3.5 for an operating system and Microsoft Office Professional Version 4.1. A terminal emulation software package will be installed for dial up access to the Dirar Computer Center.

g. Equipment/Software Cost Estimate: $ 3,077.21

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 220.00

(3) Training: see Chapter 5

DISTRICT OFFICE CONFIGURATION

District Office: DO 2 **Priority** 2
Location: Deir Allah
Name: Yasin Abu Znemeh **Drops:** 1
Phone: 05-570046
Reports To: JVA Amman

Material Cost for Site: $ 3,077.21

Computers and Communications

	Item	Description	Unit Cost	Number	Cost	
1	Configuration 1	486/66	$ 2,001.00		$ -	
2	Configuration 2	486/66	$ 2,377.00	1	$ 2,377.00	
3	Configuration 3	Pentium	$ 3,147.00		$ -	
4	Terminal Emulation	For Dirar	$ 185.00	1	$ 185.00	Not Sure. Have to check
5	Windows for WS NT 3.5	OS	$ 288.00	1	$ 288.00	
6	Power Strip		$ 21.00	1	$ 21.00	
7	UPS	1KVA 15 min	$ 167.00	1	$ 167.00	
8	E-Net Card	Internal	$ 106.00	0	$ -	
9	Reuse Printer	Brother HL	$ -	1	$ -	
10	Punch Down Block	AT&T	$ 29.21	1	$ 29.21	
11	Phone Line	D	$ 15.00	0	$ -	
					$ 3,067.21	

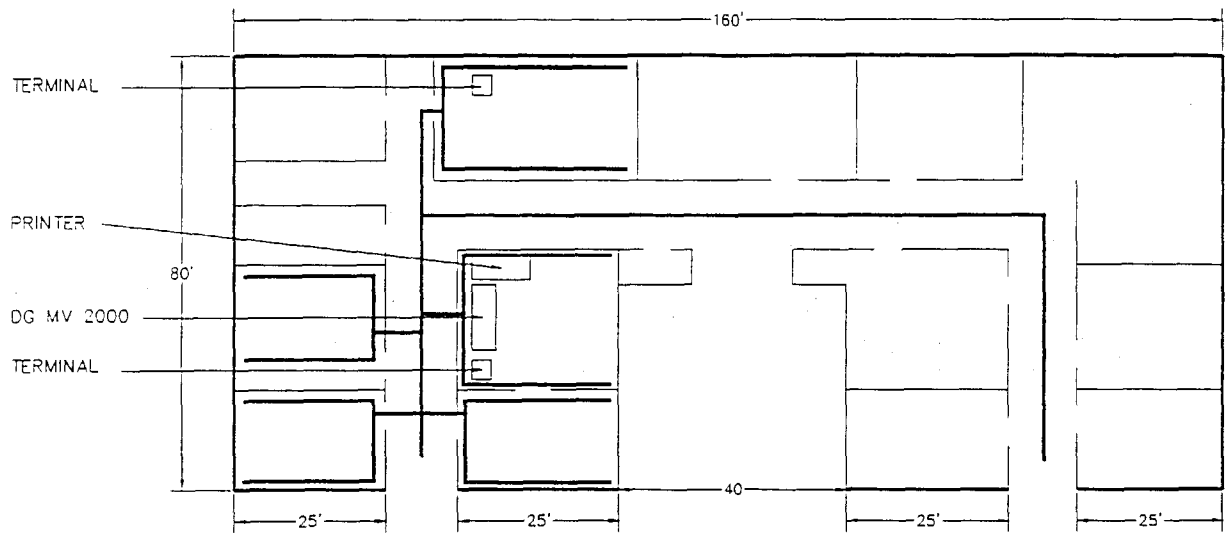
Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling				$ -
Hubs				$ -
Patch Panels				$ -
Receptacles				$ -
Connectors				$ -
Conduit/Panduit				$ -
Corners (Panduit/Conduit)				$ -
Consumables		$ 10.00	1	$ 10.00
Totals:				$ 10.00

Labor Costs

Labor Category	Rate	Units	TOTAL COSTS
Installation Engineer	$ 72.00	0.5	$ 36.00
Quality Insurance Engineer	$ 53.00	0.5	$ 26.50
Lead Installation Technician	$ 34.00	2.5	$ 85.00
Journey Man Installation Tech	$ 29.00	2.5	$ 72.50
Totals:		6	$ 220.00

309



JVA
DISTRICT OFFICE 02
DIER ALLA

LEVEL 5 UTP CABLE RUN

Science Applications International Corporation
610 West Highway 50, O'Fallon, IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
7/25/95	JVAD02.DWG	--

SCALE | SHEET 1 OF 1

APPENDIX A-28

JVA
DISTRICT OFFICE 03
AL JAWASREH

1. Organization Information
   a. Organization Name: South Jordan Valley Irrigation Directorate
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: Dirar Computer Center
   d. Location of Organization, Governate, City, Building (address?): Al Jawasreh
   e. Manager of Organization, (Name and Title): Engineer Mohamed Habashneh
   f. Phone Number of Manager: 05572303
   g. Principle Purpose for organization (verbal description of functionality): administratively responsible for the Staging Offices in the southern Jordan Valley (SO 6, SO 10, and, when operational, SO 9).

2. Facility Information
   a. Name of Building (Address?): Al Jawasreh
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for)): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances): adequate because an UPS will be provided at installation
   d. Facility Construction: concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available): radio/telecommunications room
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: Moderate to High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: District Office 3 was not active at the time of the baseline data collection.
   b. Description of existing network at site: N/A

c. Description of existing external communications links (data) at site: N/A, but these links are typically via modem.

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: Requests for water from subscribers is turned into the SOs and transmitted to the DOs for entry into the water balance programs. Water allocation information is passed from Dirar to the SOs. Water billing information is forwarded from the SOs to the DOs and then to the HQ JVA for processing.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): DO 3 communicates daily with SO 6, and SO 10 (SO 9 is not yet operational)

c. Description of automated reports accomplished by site (size, frequency, to whom): reports consist of customer water requests from the SOs on a weekly basis and water allocation amounts based on the water balance model outputs to each SO several times a week.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The administrative system to be installed in District Office 3 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 400 MB hard disk drive. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The new administrative system will be connected to the RJ-11 telephone receptacle through its internal Modem. The computer system will have Windows NT Workstation 3.5 for an operating system and Microsoft Office Professional Version 4.1. A terminal emulation software package will be installed for dial up access to the Dirar Computer Center. An excess HL Brother HL 631 printer from the MWI Building will be used for printer support.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 2 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 486 PC

f. Listing of Recommended Software: Windows NT Workstation 3.5 for an operating system and Microsoft Office Professional Version 4.1. A terminal emulation software package will be installed for dial up access to the Dirar Computer Center.

g. Equipment/Software Cost Estimate: $ 3,056.21

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 220.00

(3) Training: see Chapter 5

DISTRICT OFFICE CONFIGURATION

District Office: DO 3 — **Priority** 4
Location: Al-Jawasreh
Name: Mohamed Al-Ayed — **Drops:** 1
Phone: 05-572303
Reports To: JVA Amman

Material Cost for Site: $ 3,056.21

Computers and Communications

	Item	Description		Unit Cost	Number		Cost
1	Configuration 1	486/66	$	2,001.00	0	$	-
2	Configuration 2	486/66	$	2,377.00	1	$	2,377.00
3	Configuration 3	Pentium	$	3,147.00	0	$	-
4	14.4. modem	Internal	$	79.00	0	$	-
5	Windows for WS NT 3.5	OS	$	288.00	1	$	288.00
6	Terminal Emulation	VT 220	$	185.00	1	$	185.00
7	UPS	1KVA 15 min	$	167.00	1	$	167.00
8	E-Net Card	Internal	$	106.00	0	$	-
9	Reuse Printer	Brother HL	$	-	1	$	-
10	Punch Down Block	AT&T	$	29.21	1	$	29.21
11	Phone Line	D	$	15.00	0	$	-
						$	3,046.21

Network Components

ITEM	Description		Unit Cost	Units		TOTAL COST
Cabling					$	-
Hubs					$	-
Patch Panels					$	-
Receptacles					$	-
Connectors					$	-
Conduit/Panduit					$	-
Corners (Panduit/Conduit)					$	-
Consumables		$	10.00	1	$	10.00
Totals:					$	10.00

Labor Costs

Labor Category		Rate	Units		TOTAL COSTS
Installation Engineer	$	72.00	0.5	$	36.00
Quality Insurance Engineer	$	53.00	0.5	$	26.50
Lead Installation Technician	$	34.00	2.5	$	85.00
Journey Man Installation Tech.	$	29.00	2.5	$	72.50
Totals:			6	$	220.00

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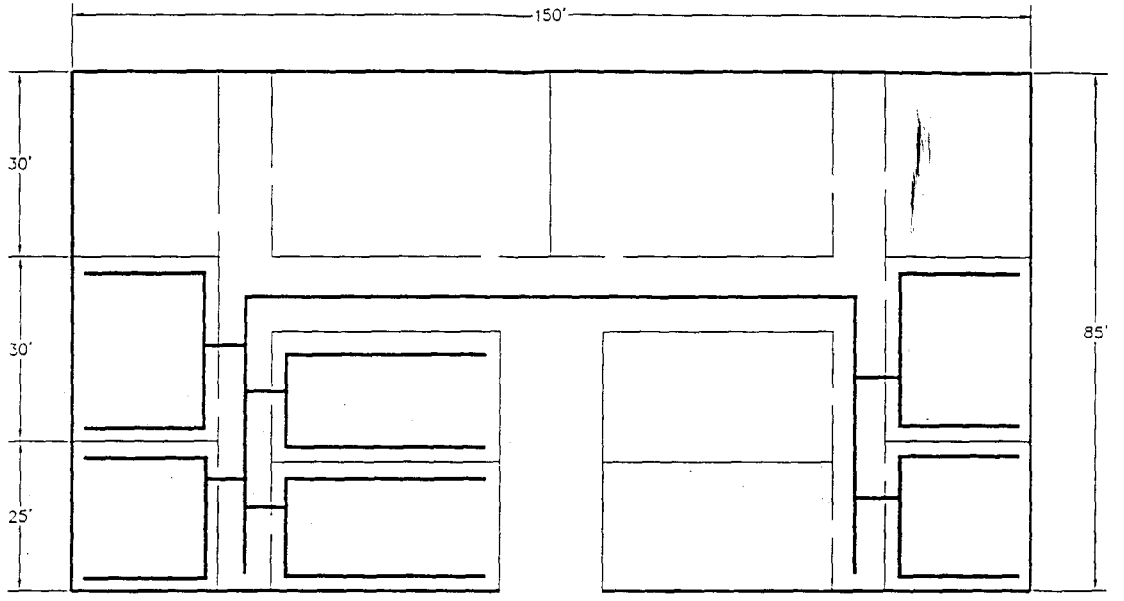

JVA
DIRECTORATE 03
AL-JAWASREH

LEVEL 5 UTP CABLE RUN

Science Applications International Corporation
410 West Highway 50, O'Fallon, IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
7/25/95	JVAD03.DWG	--

SCALE | SHEET 1 OF 1

APPENDIX A-29

JVA
WATER MANAGEMENT COMPUTER CENTER
DIRAR

1. Organization Information
   a. Organization Name: Water Management Computer Center
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: JVA
   d. Location of Organization, Governate, City, Building (address?): Dirar
   e. Manager of Organization, (Name and Title): Engineer Adnan Garaibeh
   f. Phone Number of Manager: 05570561
   g. Principle Purpose for organization (verbal description of functionality):

The Dirar Computer Center provides support to each of the staging offices and to the automated monitoring of the KAC. In addition, the Computer Center provides programming support for water models and operational software for the JVA. As the main computer center Dirar runs the hydrological water balance, the seasonal planting and forecasting, and the water allocation models and provides output to the Staging Offices. Dirar also houses the King Abdullah Canal monitoring system's collecting water flow data from the Remote Transmission Units (RTUs) along the canal.

2. Facility Information
   a. Name of Building (Address?): Dirar
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as UPS

will be augmented during installation

   d. Facility Construction: new concrete brick building
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available):

utility room at the rear of the computer room

      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: yes in computer room
   h. Qualitative assessment of dust: Low
   i. Changes to Facility: N/A

3. Hardware

a. Description of existing hardware at site: The Computer Center at Dirar at the time when baseline data was collected had a variety of systems. Two Pentium 60 PCs were configured to automatically monitor the King Abdullah Canal (KAC) and its gates' status (open, closed or partially open) and the associated flow of water (measured by water flow meters immersed in the KAC and transmitted back to the center by the Remote Transmission Units (RTUs)). One system Pentium system was designated as a backup. However, it was primarily used as a software/modification development system for the canal monitoring function. A Data General 15000 was recently installed at Dirar as an interim processor to run the water balance model and water allocation program. The Data General 15000 communicates with the Data General MV 2000s at the nine Staging Offices using a Multitec 9600 baud modem. A Data General MV 2000 with two terminals attached was being used as a software development/modification platform to enhance and troubleshoot software used in the Staging Offices. A SunSparc 20 workstation was transferred from Finnish in May 95, and is being used in conjunction with an IBM compatible PC to transfer Oracle 5 databases to Oracle 7 databases. The SunSparc workstation uses UNIX Version 5 for its operating system. The transitioned software will subsequently reside on a new Data General processor (from the Aviion product line) that will run the water balance model and water allocation program. The SunSparc 20 workstation will be transferred to HQ JVA when the software transition effort is complete. The SunSparc will replace one, and potentially both MV 2000 systems in the Ministry Building. The Data General 15000 system was not documented, because of its temporary nature.

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: Multitec 9600 baud modem

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: data from the KAC RTUs on the water flow in the canal, and customer requests from the Staging Offices

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): daily, monthly, and yearly reports generated on the water availability in the JVA.

c. Description of automated reports accomplished by site (size, frequency, to whom): The computer center daily provides each Staging Office with an electronic message describing the amount of water that is available for the Staging Office to allocate to its customers. The data transmitted is normally less than a page (approximately 1800 bytes). Similarly each of the Staging Offices send messages to the computer center at Dirar (twice daily) summarizing the customer requests water. Administrative messages

can also be passed, but these are infrequent. The messages to Dirar are limited in length to one page (approximately 1800 bytes).

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design requires the installation of three personal computers for the Computer Center. An existing computer will have an ethernet card installed. The four systems will be networked together. The physical network will be UTP Level 5 cable with eight pin modular connectors, terminated at each computer in a sixteen bit ethernet card. The UTP cable will be terminated in a nine port hub attached to the primary peer computer system. The networked system will operate on a peer-to-peer network scheme. One of the systems will be a back up for the existing machines used to monitor the canal. This back up system will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer system will have Windows 3.11 for Work Groups for an operating system to match the existing KAC computers. The primary computer will have Oracle 7 for Personal Computers and Microsoft's Office Professional software suite. The primary system will be an 80486 personal computer running at 66 MHz, with 16 MB of memory and a 400 MB hard disk drive. The computer will have an internal 14.4 Kbps Modem. The computer system will have Windows NT Workstation 3.5 for an operating system. The third system to be installed will be an 80486 personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system. The existing computer will have its memory upgraded from 4 MB to 16 MB and have Windows NT Workstation 3.5 installed. The Aviion system will be networked to the peer-to-peer network (this assumes the Aviion system will have a DG's Unix operating system. The three new computers will have a terminal emulation software package installed to allow the computers to act as terminals on the Aviion system. Terminals delivered with the Aviion system will remain directly connected to the system and not be terminated in the hub.

The designed configuration allows for continued operations at the Computer Center using the Aviion processor to provide operational and model support. The design increases access to the Aviion with terminal emulation packages. In addition, the primary peer-to-peer computer system becomes an additional dial in/out access point for the Computer Center. The KAC automated monitoring system remains isolated from the external connectivity except for its canal monitoring function. Software development in Oracle 7 can be accomplished on the personal computers or on the Aviion system, with file sharing between the systems. This configuration assumes that the SunSparc 20 workstation being used to convert the Oracle 5 database applications to Oracle 7 will be removed and re-installed at HQ JVA. This will leave the Aviion equipment as the primary operational processor for the Dirar Computer Center.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 2 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium (backup) and 2 486 PCs

f. Listing of Recommended Software: Oracle 7 for Personal Computers anc Windows NT Workstation 3.5 for an operating system with Microsoft's Office Professional software suite. The existing computer will have Windows NT Workstation 3.5 installed. The Aviion system will have a DG's Unix operating system. The three new computers will have a terminal emulation software package to allow the computers to act as terminals on the Aviion system.

g. Equipment/Software Cost Estimate: $ 10,420.61

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 1,130.00

(3) Training: see Chapter 5

Dirar Computer Center

Office: Computer Center **Priority** 1
Location: Dirar
Name: Adnan Garavper **Drops:** 8
Phone: 05-57056
Reports To: JVA Amman

Material Cost for Site: $ 10,420.61

Computers and Communications

ITEM	Description	Unit Cost	Units	TOTAL COST	
Cabling	UTP	$ -	0	$ -	
Hub	9 Port	$ 399.00	0	$ -	
Configuration 1	486/66	$ 2,001.00	1	$ 2,001.00	
Configuration 2	486/66	$ 2,377.00	1	$ 2,377.00	Peer to Peer Primary Machine
Configuration 3	Pentium	$ 3,147.00	1	$ 3,147.00	Backup Machine for Canal Monitoring
Configuration 4	Sun	$ 24,941.00	0	$ -	
Power Strips	6 Plug	$ 21.00	3	$ 63.00	
Windows NT WS 3.5	Op Sys	$ 288.00	4	$ 1,152.00	
UPS	1KVA 15 min	$ 167.00	1	$ 167.00	
E-Net Card	Internal	$ 129.00	1	$ 129.00	
Punch Down Block	AT&T	$ 18.88	1	$ 18.88	
Phone Line	D	$ 15.00	0	$ -	
				$ 9,054.88	

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	500	$ 44.00
Hubs	9 Port	$ 399.00	1	$ 399.00
Patch Panels	24 Port	$ 211.00	1	$ 211.00
Receptacles		$ 7.70	8	$ 61.60
Connectors	Couplers	$ 0.90	30	$ 27.00
Conduit/Pandur	Small	$ 1.42	400	$ 566.68
Corners (Pandur/Conduit	In and Outside		30	$ 26.45
Consumables		$ 30.00	1	$ 30.00
Totals:				$ 1,365.73

Labor Costs

Labor Category	Rate	Units	TOTAL COSTS
Installation Engineer	$ 72.00	4	$ 288.00
Quality Insurance Engineer	$ 53.00	4	$ 212.00
Lead Installation Technician	$ 34.00	10	$ 340.00
Journey Man Installation Tech.	$ 29.00	10	$ 290.00
Totals:		28	$ 1,130.00

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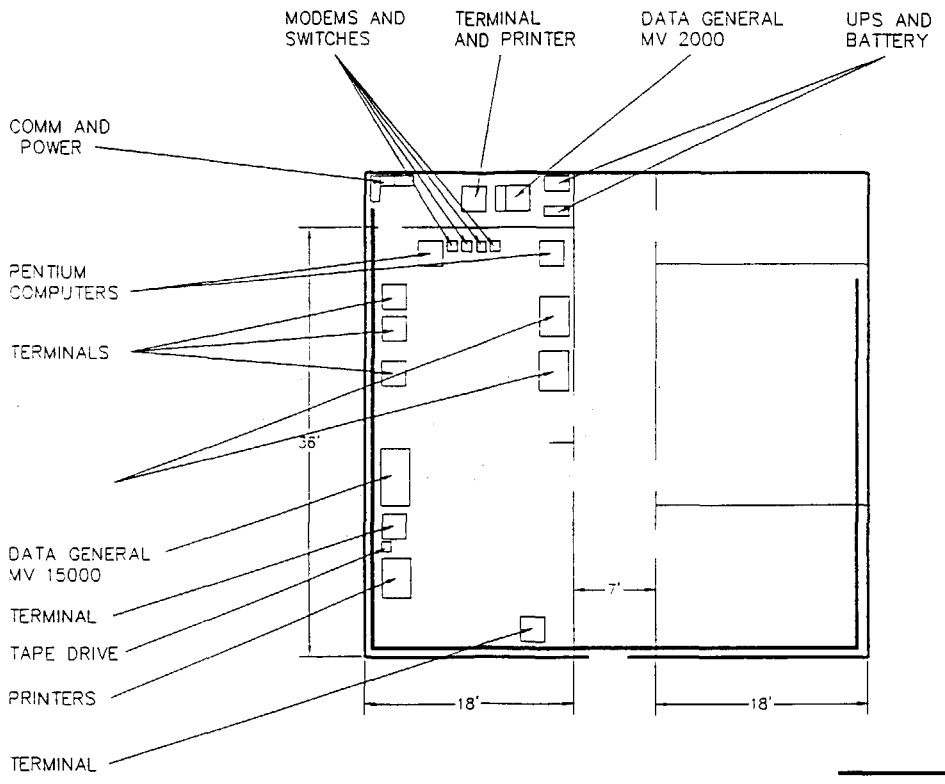

JVA
DIRAR
COMPUTER
CENTER

LEVEL 5 UTP CABLE

Science Applications International Corporation
618 West Highway 36, O'Fallon, IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
7/20/95	JVADIRAR.DWG	--

SCALE | SHEET 1 OF 1

APPENDIX A-30

JVA
VEHICLE OPERATIONS AND MAINTENANCE
FANOUSH

1. Organization Information
   a. Organization Name: Vehicle Operations and Maintenance
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: JVA
   d. Location of Organization, Governorate, City, Building (address?): Fanoush (Al Arda)
   e. Manager of Organization, (Name and Title): Mr. Hazam Al-Azawi
   f. Phone Number of Manager: 05581079
   g. Principle Purpose for organization (verbal description of functionality): The main function of the O & M facility is to maintain and track all JVA vehicles from purchase to salvage. Vehicle maintenance records are used to determine the appropriate cost-benefit of keeping a vehicle in service or purchasing a replacement vehicle.

2. Facility Information
   a. Name of Building (Address?): Fanoush (Al Arda)
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as UPS will be augmented during installation
   d. Facility Construction: single story concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: yes in computer room
   h. Qualitative assessment of dust: Low to Moderate
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site:

The Fanoush Operations and Maintenance center at the time when baseline data was collected had a Data General 7800 with three terminals attached. Fanoush had been the computer center for the JVA until May of 1995, when the center, with its programmers were transferred to Dirar. The Data General 7800 system was originally used for the

water balance model, the water allocation program and the JVA vehicle maintenance tracking program. The Data General MV 7800 uses AOS, a proprietary operating system. The MV 7800 is connected to a UPS. The Data General MV 7800 is now dedicated to running the vehicle maintenance tracking database. The tracking database is written in Oracle 5, and contains data on equipment, maintenance actions and life-cycle costs for vehicles used to support JVA operations. There are no current plans to upgrade the database software to Oracle 7, or the customized application developed for tracking vehicle maintenance.

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: modem.

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: vehicle maintenance database is written in Oracle 5, and contains data on equipment, maintenance actions and life-cycle costs for vehicles used to support JVA operations

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): vehicle inspections, maintenance records, and trouble tickets for tracking on-going vehicle maintenance. Reports provided to HQ JVA on vehicle expense history to determine new acquisition phase points on each vehicle.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers, or items.): The design for the Fanoush facility is focused on providing an improved cable plant from the operational locations in the compound to the computer room. Currently cables are strung overhead between buildings, which causes exposure to weather and to heavy equipment that occasional break through the cables. The design calls for trenching with and buried conduits between the facilities to improve the reliability of the system. Trenching equipment will need to be rented to complete this portion of the implementation scheme.

An alternate proposal would be to upgrade or replace the current Data General equipment with a Data General Aviion system and migrate the Oracle 5 based vehicle maintenance tracking system to Oracle 7. This solution would have the advantage of moving the operational software to a supportable release of Oracle and moving the operating system from the proprietary AOS to DG's Unix operating system. This option would cost and estimated $32,000 for the equipment and Oracle 7 software. The cost to migrate the

vehicle maintenance tracking system is not included in this estimate. This option was not selected because the current equipment can support the required processing and the cost to move to new equipment and migrate an existing operational application would be significant.

b. Site Unique Risks (Technical or Security): underground trenching of cable between computer room and maintenance buildings

c. Proposed Schedule: 6 days

d. Schematic of site (old and new equipment)

e. Listing of Recommended Equipment: only new wiring

f. Listing of Recommended Software: N/A

g. Equipment/Software Cost Estimate: $ 1,399.53

f. Site Installation Cost

(1) Tools Required (Rent?): Trenching equipment will need to be rented to complete this portion of the implementation scheme.

(2) Labor: $ 2,640.00

(3) Training: see Chapter 5

FANOUSH CONFIGURATION

		Priority	2
District Office:	Fanoush		
Location:	Al Arda	Drops:	12
Name:	Hazem Al-Azawi		
Phone:	05-581079		
Reports To:	JVA Amman		

Material Cost for Site: $ 1,399.53

Computers and Communications

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	Recable	$ -	0	$ -
Conduit	1 inch	$ 1.02	500	$ 510.00
Hub	Equinox	$ 229.00	0	$ -
Patch Panel	Black Box	$ 72.00	0	$ -
Connectors	D-25	$ 4.00	0	$ -
Punch Down Block	50 Pair	$ 18.88	1	$ 18.88
Modem	9600 baud/hayes	$ 129.00	0	$ -
Totals:				$ 528.88

Install Labor $ 960.00

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	500	$ 44.00
Hubs				$ -
Patch Panels				$ -
Receptacles		$ 7.70	12	$ 92.40
Connectors				$ -
Conduit/Panduit	Small	$ 1.42	500	$ 708.35
Corners (Panduit/Conduit)	In and Outside		25	$ 0.90
Consumables		$ 25.00	1	$ 25.00
Totals:				$ 870.65

Labor Costs

Labor Category	Rate	Units	TOTAL COSTS
Installation Engineer	$ 72.00	6	$ 432.00
Quality Insurance Engineer	$ 53.00	6	$ 318.00
Lead Installation Technician	$ 34.00	30	$ 1,020.00
Journey Man Installation Tech.	$ 29.00	30	$ 870.00
Totals:		72	$ 2,640.00

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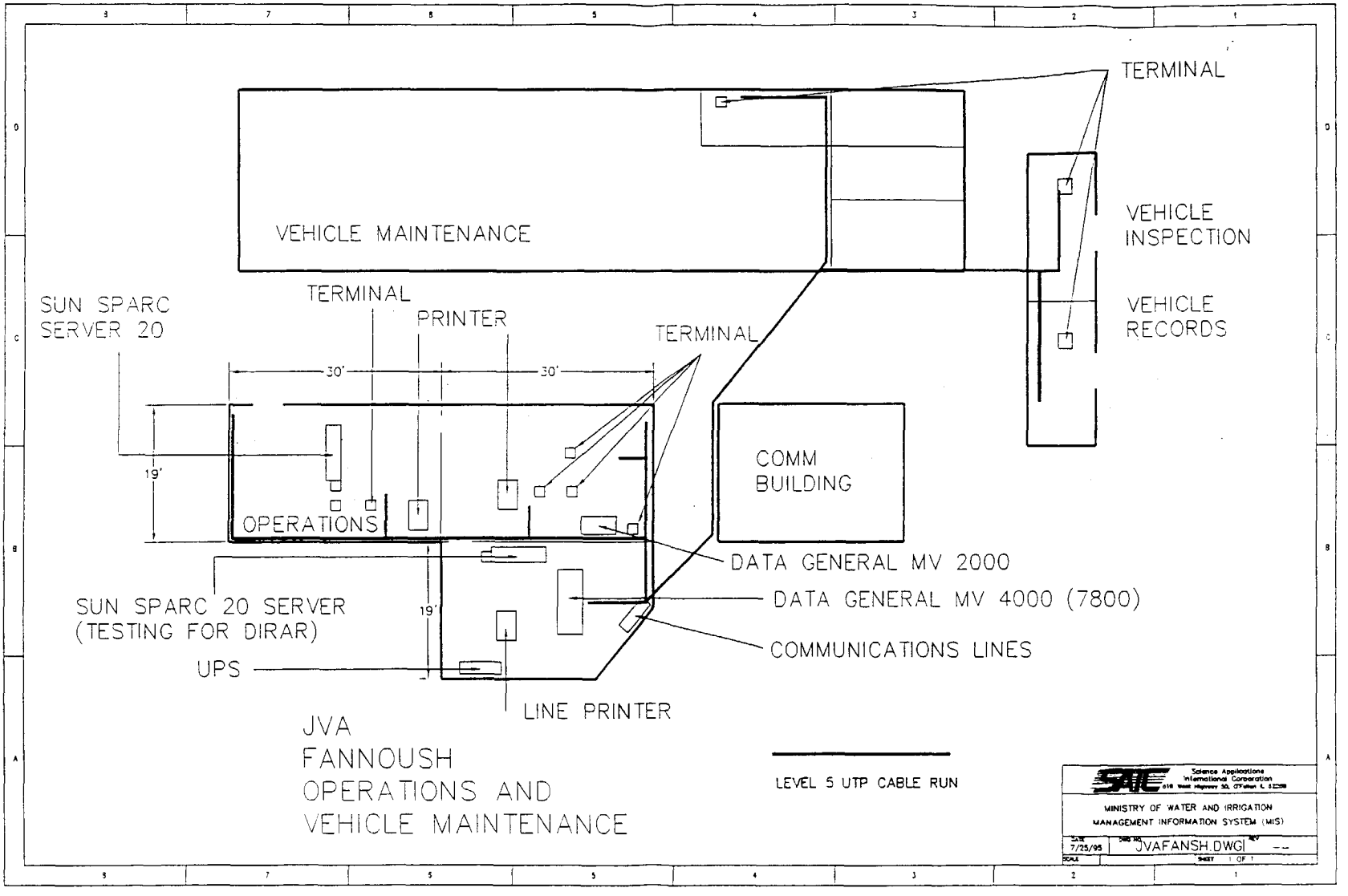
TERMINAL
VEHICLE MAINTENANCE
VEHICLE INSPECTION
VEHICLE RECORDS
SUN SPARC SERVER 20
TERMINAL
PRINTER
TERMINAL
30'
30'
19'
COMM BUILDING
OPERATIONS
DATA GENERAL MV 2000
DATA GENERAL MV 4000 (7800)
SUN SPARC 20 SERVER (TESTING FOR DIRAR)
19'
COMMUNICATIONS LINES
UPS
LINE PRINTER
JVA FANNOUSH OPERATIONS AND VEHICLE MAINTENANCE
LEVEL 5 UTP CABLE RUN
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION MANAGEMENT INFORMATION SYSTEM (MIS)
7/25/95
JVAFANSH.DWG
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1 OF 1

APPENDIX A-31

JVA
SOIL AND LABORATORIES DIRECTORATE
AL KARAMA

1. Organization Information
   a. Organization Name: Soil and Laboratories Directorate
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: JVA
   d. Location of Organization, Governate, City, Building (address?): Al Karama (University of Jordan agricultural site)
   e. Manager of Organization, (Name and Title): DR Refaar Refai
   f. Phone Number of Manager: 05570032
   g. Principle Purpose for organization (verbal description of functionality): The primary mission of the laboratory is to provide analysis of soil and water samples in support the Jordan Valley Authority.

2. Facility Information
   a. Name of Building (Address?): Al Karama
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: single story concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: yes
   h. Qualitative assessment of dust: Low
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: The JVA Laboratory does not currently have any automated support beyond a few stand alone PCs and printers.
   b. Description of existing network at site: N/A
   c. Description of existing external communications links (data) at site: N/A

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: 4000 water samples, 4000 soil samples, 100-200 plant samples, and an undetermined number of biological samples yearly.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design requires the installation of six personal computers for the Laboratory. The physical network will be UTP Level 5 cable with eight pin modular connectors, terminated at each computer in a sixteen bit ethernet card. The UTP cable will be terminated in a nine port hub attached to the Laboratory server. The cable will be installed in surface mounted panduit with wall mounted receptacles. Wall penetrations will use conduit and be sealed. The recommended network operating system is Novell 3.12. The server for the Laboratory will be a Pentium based personal computer, operating at 90 MHz, with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The primary software will be Microsoft's Windows 3.1 and Microsoft's Professional Office software suite. The six additional systems to be installed in the Laboratory will be 80486 based personal computers running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The 9 port hub will have HP compatible laser printer attached to act as the network printer. A 9 pin, wide carriage dot matrix printer will be connected to the parallel port on one of the workstations to provide additional print capability.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 6 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium server and 6 486 PCs

f. Listing of Recommended Software: Novell 3.12 network operating system, Microsoft's Windows 3.1 and Microsoft's Professional Office software suite.

g. Equipment/Software Cost Estimate: $ 21,022.22

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 3,390.00

(3) Training: see Chapter 5

JVA LABORATORY

Office: Laboratory **Priority** 4
Location: University Farm
Name: Dr. Refaar Refai **Drops:** 24
Phone: 05-570032
Reports To: JVA Amman

Material Cost for Site: $ 21,022.22

Computers and Communications

ITEM	Description	Unit Cost	Units	TOTAL COST	
Cabling				$ -	
Hub				$ -	
Configuration 1	486/66	$ 2,001.00	6	$ 12,006.00	
Configuration 2	486/66	$ 2,377.00	0	$ -	
Configuration 3	Pentium	$ 3,147.00	1	$ 3,147.00	
14.4. modem	Internal	$ 79.00	0	$ -	
Windows NT WS 3.5	Op Sys	$ 288.00	7	$ 2,016.00	
UPS	1KVA 15 min	$ 167.00	1	$ 167.00	
Surge Protectors	5 Socket	$ 21.00	6	$ 126.00	
Coax Cable	RG-58	$ 0.27	0	$ -	
Punch Down Block	AT&T	$ 29.21	0	$ -	With RJ-11 Receptacl
Phone Line	D	$ 12.50	1	$ 12.50	
				$ 17,474.50	

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	UTP	$ 0.09	2000	$ 176.00
Hubs	9 Port	$ 399.00	1	$ 399.00
Patch Panels	24 port	$ 211.00	1	$ 211.00
Receptacles		$ 7.70	24	$ 184.80
Connectors		$ 0.90	50	$ 45.00
Conduit/Panduit	LG & Small		2000	$ 2,420.04
Corners (Panduit/Conduit)	In and Outside		70	$ 61.88
Consumables		$ 50.00	1	$ 50.00
Totals:				$ 3,547.72

Labor Costs

Labor Category	Rate	Units	TOTAL COSTS
Installation Engineer	$ 72.00	12	$ 864.00
Quality Insurance Engineer	$ 53.00	12	$ 636.00
Lead Installation Technician	$ 34.00	30	$ 1,020.00
Journey Man Installation Tech.	$ 29.00	30	$ 870.00
Totals:		84	$ 3,390.00

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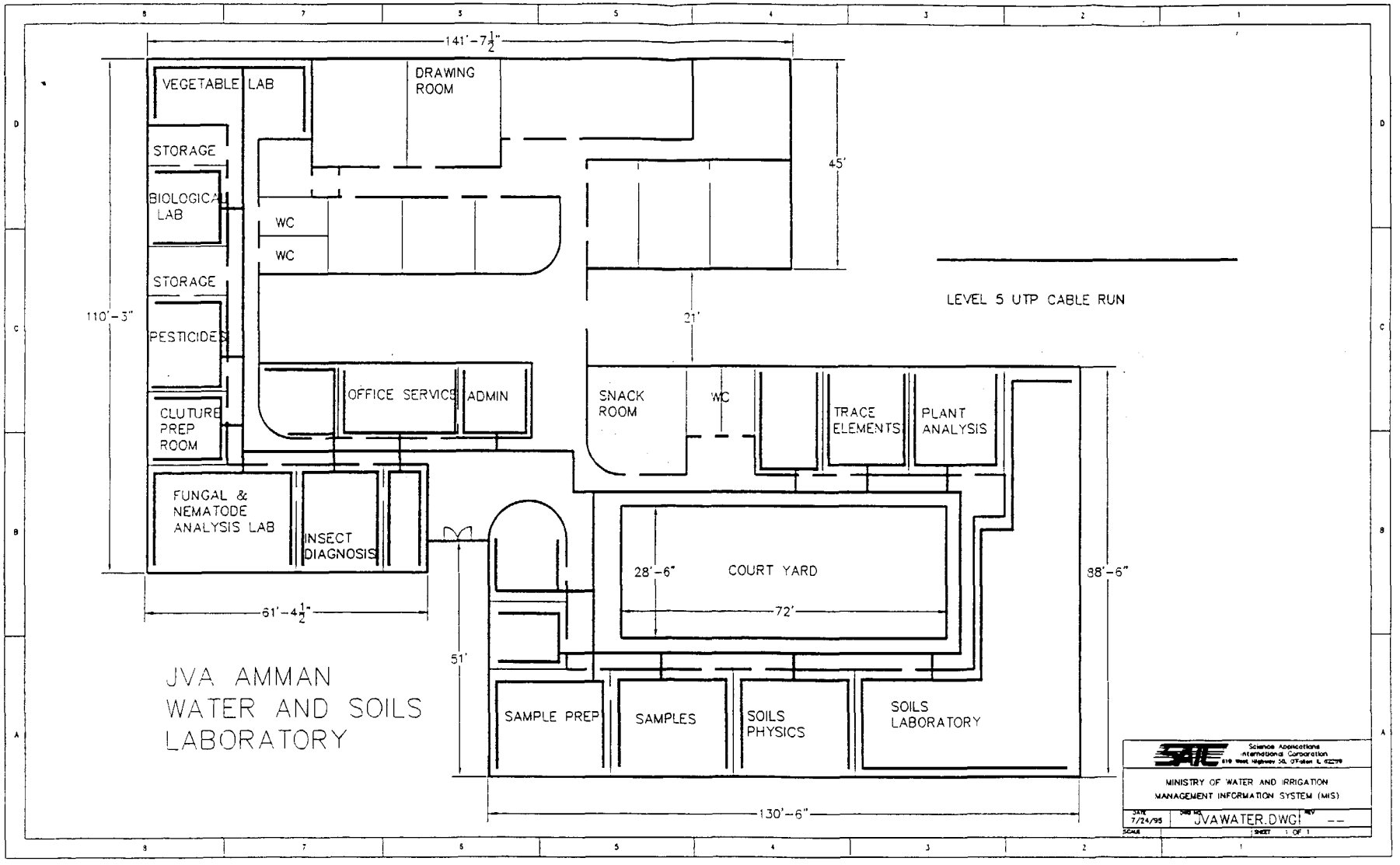
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VEGETABLE LAB
DRAWING ROOM
STORAGE
BIOLOGICAL LAB
WC
WC
STORAGE
PESTICIDES
CLUTURE PREP ROOM
110'-3"
45'
21'
LEVEL 5 UTP CABLE RUN
OFFICE SERVICE
ADMIN
SNACK ROOM
WC
TRACE ELEMENTS
PLANT ANALYSIS
FUNGAL & NEMATODE ANALYSIS LAB
INSECT DIAGNOSIS
28'-6"
COURT YARD
72'
88'-6"
61'-4½"
51'
JVA AMMAN
WATER AND SOILS
LABORATORY
SAMPLE PREP
SAMPLES
SOILS PHYSICS
SOILS LABORATORY
130'-6"
Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)
DATE 7/24/95
JVAWATER.DWG
REV --
SHEET 1 OF 1

APPENDIX A-32

JVA
STAGING OFFICE SO-1
NORTH SHOUNEH

1. Organization Information
   a. Organization Name: Staging Office 1
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: DO-1
   d. Location of Organization, Governate, City, Building (address?): North Shouneh
   e. Manager of Organization, (Name and Title): Mr. Mahmoud Mujali
   f. Phone Number of Manager: 02237006
   g. Principle Purpose for organization (verbal description of functionality): services the Subscribers assigned to this staging office, collecting water requests, distributing the allocated water, and forwarding the appropriate water billing information to the HQ JVA for collection

2. Facility Information
   a. Name of Building (Address?): North Shouneh
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: single story concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: The Staging Offices at the time when baseline data was collected were typically configured with one Data General MV 2000 with two terminals. The Data General MV 2000s use AOS, a proprietary operating system. The terminals were attached using a serial connections. Each site had one Multitec 9600 baud Modem attached to the MV 2000 using a serial cable (RS-232C).

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: Multitec 9600 baud Modem

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: water requests, allocated water, and water billing information collected on a daily basis.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): water requests are done manually; allocated water amounts are transmitted by Dirar; and, billing is automated.

c. Description of automated reports accomplished by site (size, frequency, to whom): billing consists of a single page of text for each subscriber and the billing is produced monthly

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 1 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 1 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

b. Site Unique Risks (Technical or Security): Three Staging Offices (SO 1, SO 3 and SO 5) are in very old buildings. Placing data processing equipment in these

buildings is very risky due to poor power, lack any air conditioning and high levels of dust.

c. Proposed Schedule: 2 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium and 1 486 PC

f. Listing of Recommended Software: Windows NT Workstation 3.5 operating system, which will allow concurrent use over the network of Oracle 7.

g. Equipment/Software Cost Estimate: $ 6,254.96

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 440.00

(3) Training: see Chapter 5

STAGING OFFICE 1

STAGING OFFICE:	Staging Office 1	**Priority**	1
REPORTING TO:	District Office 1		
POINT OF CONTACT:	Mahmoud Mijalli	**Drops:**	2
TELEPHONE NUMBER:	02-237006		
LOCATION:	North Shouneh		

Material Cost for Site: $ 6,254.96

Computers and Communications

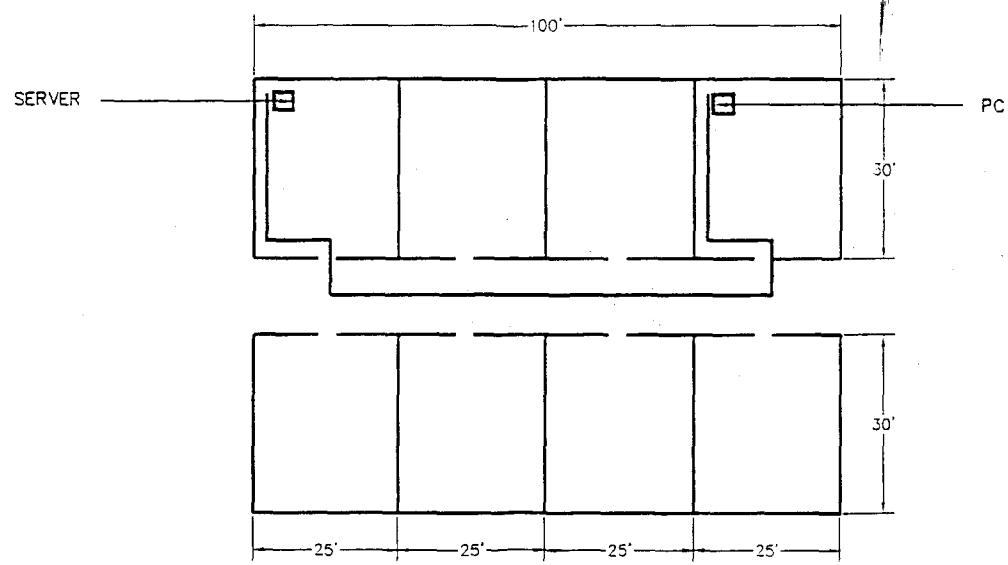
	Item	Description		Unit Cost	Number		Cost
1	Configuration 1	486/66	$	2,001.00	1	$	2,001.00
2	Configuration 2	486/66	$	2,377.00		$	-
3	Configuration 3	Pentium	$	3,147.00	1	$	3,147.00
4	Terminal Emulation	For Dirar	$	185.00		$	-
5	Windows for WS NT 3.5	OS	$	288.00	2	$	576.00
6	Power Strip	5 receptacle	$	21.00	1	$	21.00
7	UPS	1KVA 15 min	$	167.00	1	$	167.00
8	E-Net Card	Internal	$	106.00	0	$	-
9	Printer	Dot matrix	$	259.00	1	$	259.00
10	Punch Down Block	AT&T	$	29.21	1	$	29.21
11	Phone Line	D	$	15.00	0	$	-
						$	6,200.21

Network Components

ITEM	Description		Unit Cost	Units		TOTAL COST
Cabling	RG-58	$	0.14	100	$	14.30
Hubs					$	-
Patch Panels					$	-
Receptacles					$	-
Connectors	BNC			13	$	23.95
Conduit/Panduit	Cable Ties	$	0.16	40	$	6.50
Corners (Panduit/Conduit)					$	-
Consumables		$	10.00	1	$	10.00
Totals:					$	54.75

Labor Costs

Labor Category		Rate	Units		TOTAL COSTS
Installation Engineer	$	72.00	1	$	72.00
Quality Insurance Engineer	$	53.00	1	$	53.00
Lead Installation Technician	$	34.00	5	$	170.00
Journey Man Installation Tech.	$	29.00	5	$	145.00
Totals:			12	$	440.00



JVA
"TYPICAL"
STAGING OFFICE

RG-58 CABLE RUN

Science Applications International Corporation
819 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
7/25/95	JVATYPIC.DWG	--
SCALE	SHEET 1 OF 1	

APPENDIX A-33

JVA
STAGING OFFICE SO-2
WADI AL YABIS

1. Organization Information
   a. Organization Name: Staging Office No 2
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: DO-01
   d. Location of Organization, Governate, City, Building (address?): Wadi Al Yabis
   e. Manager of Organization, (Name and Title): Mr. Ali Hindi
   f. Phone Number of Manager: 02236006
   g. Principle Purpose for organization (verbal description of functionality): services the Subscribers assigned to this staging office, collecting water requests, distributing the allocated water, and forwarding the appropriate water billing information to the HQ JVA for collection.

2. Facility Information
   a. Name of Building (Address?)
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for) adequate
      (4) Qualitative statement on reliability of service occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: single story concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility

3. Hardware
   a. Description of existing hardware at site: The Staging Offices at the time when baseline data was collected were typically configured with one Data General MV 2000 with two terminals. The Data General MV 2000s use AOS, a proprietary operating system. The terminals were attached using a serial connections. Each site had one Multitec 9600 baud Modem attached to the MV 2000 using a serial cable (RS-232C).

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: Multitec 9600 baud Modem

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: water requests, allocated water, and water billing information collected on a daily basis.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): water requests are done manually; allocated water amounts are transmitted by Dirar; and, billing is automated.

c. Description of automated reports accomplished by site (size, frequency, to whom): billing consists of a single page of text for each subscriber and the billing is produced monthly.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 2 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 2 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 2 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium and 1 486 PC

f. Listing of Recommended Software: Windows NT Workstation 3.5 operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

g. Equipment/Software Cost Estimate: $ 6,254.96

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 440.00

(3) Training: see Chapter 5

STAGING OFFICE 2

STAGING OFFICE:	Staging Office 2	**Priority**	1
REPORTING TO:	District Office 1		
POINT OF CONTACT:	Ali Hindi	**Drops:**	2
TELEPHONE NUMBER:	02=236006		
LOCATION:	Wadi El Yabis		

Material Cost for Site: $ 6,254.96

Computers and Communications

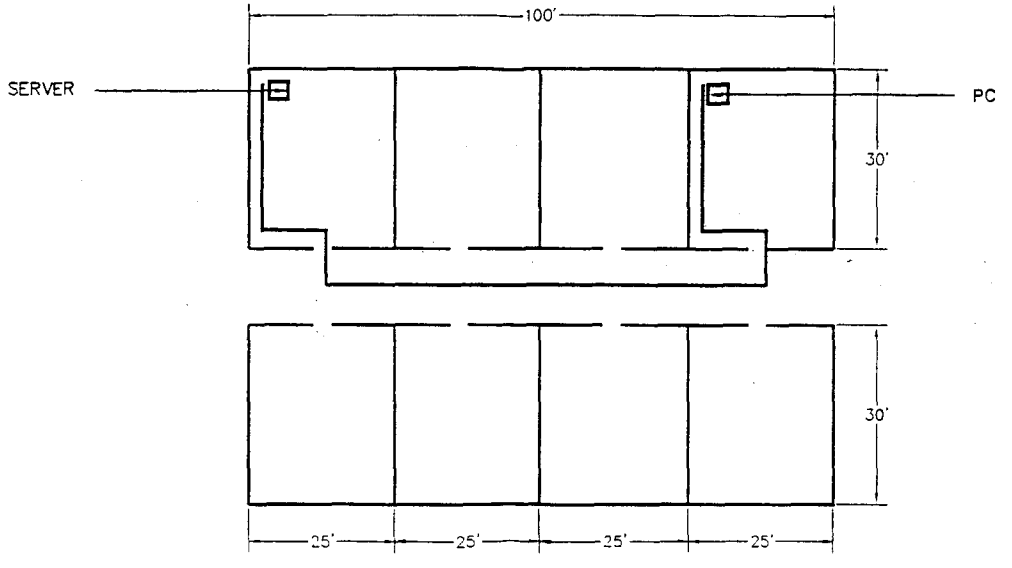
	Item	Description		Unit Cost	Number		Cost
1	Configuration 1	486/66	$	2,001.00	1	$	2,001.00
2	Configuration 2	486/66	$	2,377.00		$	-
3	Configuration 3	Pentium	$	3,147.00	1	$	3,147.00
4	Terminal Emulation	For Dirar	$	185.00		$	-
5	Windows for WS NT 3.5	OS	$	288.00	2	$	576.00
6	Power Strip	5 Receptacle	$	21.00	1	$	21.00
7	UPS	1KVA 15 min	$	167.00	1	$	167.00
8	E-Net Card	Internal	$	106.00	0	$	-
9	Printer	Dot Matrix	$	259.00	1	$	259.00
10	Punch Down Block	AT&T	$	29.21	1	$	29.21
11	Phone Line	D	$	15.00	0	$	-
						$	6,200.21

Network Components

ITEM	Description		Unit Cost	Units		TOTAL COST
Cabling	RG-58	$	0.14	100	$	14.30
Hubs					$	-
Patch Panels					$	-
Receptacles					$	-
Connectors	BNC			13	$	23.95
Conduit/Panduit	Cable Ties	$	0.16	40	$	6.50
Corners (Panduit/Conduit)					$	-
Consumables		$	10.00	1	$	10.00
Totals:					$	54.75

Labor Costs

Labor Category		Rate	Units		TOTAL COSTS
Installation Engineer	$	72.00	1	$	72.00
Quality Insurance Engineer	$	53.00	1	$	53.00
Lead Installation Technician	$	34.00	5	$	170.00
Journey Man Installation Tech.	$	29.00	5	$	145.00
Totals:			12	$	440.00



JVA
"TYPICAL"
STAGING OFFICE

RG-58 CABLE RUN

Science Applications International Corporation
619 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
7/25/95	JVATYPIC.DWG	--

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APPENDIX A-34

JVA
STAGING OFFICE SO-3
KURAIMEH

1. Organization Information
   a. Organization Name: Staging Office No 3
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: DO-02
   d. Location of Organization, Governate, City, Building (address?): Kuraimeh
   e. Manager of Organization, (Name and Title): Engineer Salameh Ahmad
   f. Phone Number of Manager: 05575010
   g. Principle Purpose for organization (verbal description of functionality): services the Subscribers assigned to this staging office, collecting water requests, distributing the allocated water, and forwarding the appropriate water billing information to the HQ JVA for collection.

2. Facility Information
   a. Name of Building (Address?)
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for) adequate
      (4) Qualitative statement on reliability of service occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: single story concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility

3. Hardware
   a. Description of existing hardware at site: The Staging Offices at the time when baseline data was collected were typically configured with one Data General MV 2000 with two terminals. The Data General MV 2000s use AOS, a proprietary operating system. The terminals were attached using a serial connections. Each site had one Multitec 9600 baud Modem attached to the MV 2000 using a serial cable (RS-232C).

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: Multitec 9600 baud Modem

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: water requests, allocated water, and water billing information collected on a daily basis.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): water requests are done manually; allocated water amounts are transmitted by Dirar; and, billing is automated.

c. Description of automated reports accomplished by site (size, frequency, to whom): billing consists of a single page of text for each subscriber and the billing is produced monthly.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 3 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 3 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

b. Site Unique Risks (Technical or Security): Three Staging Offices (SO 1, SO 3 and SO 5) are in very old buildings. Placing data processing equipment in these

buildings is very risky due to poor power, lack any air conditioning and high levels of dust.

c. Proposed Schedule: 2 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium and 1 486 PC

f. Listing of Recommended Software: Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

g. Equipment/Software Cost Estimate: $ 6,254.96

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 440.00

(3) Training: see Chapter 5

STAGING OFFICE 3

STAGING OFFICE:	Staging Office 3	**Priority**	1
REPORTING TO:	District Office 2		
POINT OF CONTACT:	Salameh Ahned	**Drops:**	2
TELEPHONE NUMBER:	05-575010		
LOCATION:	Kureiyima		

Material Cost for Site: $ 6,254.96

Computers and Communications

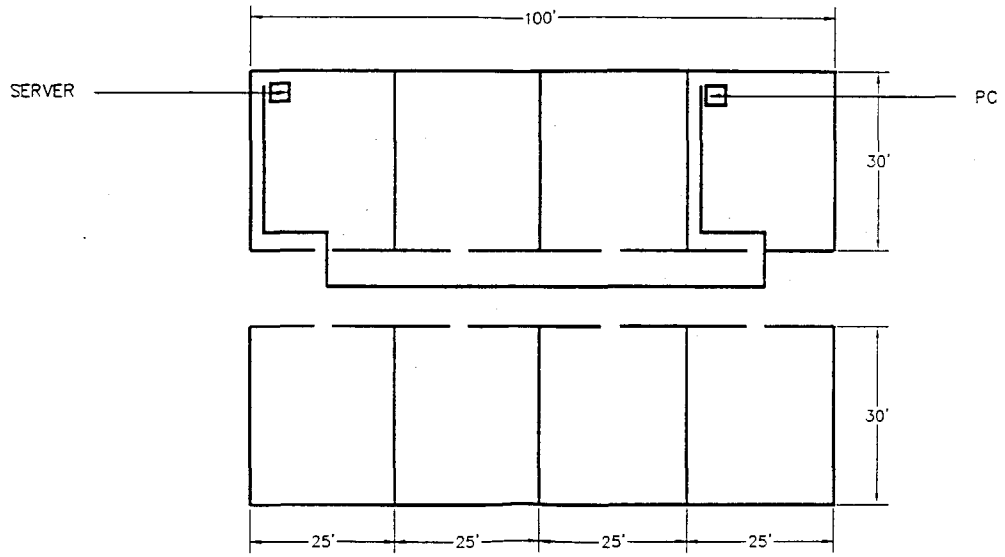
	Item	Description		Unit Cost	Number		Cost
1	Configuration 1	486/66	$	2,001.00	1	$	2,001.00
2	Configuration 2	486/66	$	2,377.00		$	-
3	Configuration 3	Pentium	$	3,147.00	1	$	3,147.00
4	Terminal Emulation	For Dirar	$	185.00		$	-
5	Windows for WS NT 3.5	OS	$	288.00	2	$	576.00
6	Power Strip	5 receptacle	$	21.00	1	$	21.00
7	UPS	1KVA 15 min	$	167.00	1	$	167.00
8	E-Net Card	Internal	$	106.00		$	-
9	Printer	Dot matrix	$	259.00	1	$	259.00
10	Punch Down Block	AT&T	$	29.21	1	$	29.21
11	Phone Line	D	$	15.00	0	$	-
						$	6,200.21

Network Components

ITEM	Description		Unit Cost	Units		TOTAL COST
Cabling	RG-58	$	0.14	100	$	14.30
Hubs					$	-
Patch Panels					$	-
Receptacles					$	-
Connectors	BNC			13	$	23.95
Conduit/Panduit	Cable Ties	$	0.16	40	$	6.50
Corners (Panduit/Conduit)					$	-
Consumables		$	10.00	1	$	10.00
Totals:					$	54.75

Labor Costs

Labor Category		Rate	Units		TOTAL COSTS
Installation Engineer	$	72.00	1	$	72.00
Quality Insurance Engineer	$	53.00	1	$	53.00
Lead Installation Technician	$	34.00	5	$	170.00
Journey Man Installation Tech.	$	29.00	5	$	145.00
Totals:			12	$	440.00



JVA
"TYPICAL"
STAGING OFFICE

RG-58 CABLE RUN

Science Applications International Corporation
819 West Highway 50, O'Fallon, IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
7/25/95	JVATYPIC.DWG	--

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APPENDIX A-35

JVA
STAGING OFFICE SO-4
AL SAWALHA

1. Organization Information
   a. Organization Name: Staging Office No 4
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: DO-02
   d. Location of Organization, Governate, City, Building (address?): Al Sawalha
   e. Manager of Organization, (Name and Title): Engineer Zaid Halaseh
   f. Phone Number of Manager: 05570554
   g. Principle Purpose for organization (verbal description of functionality): services the Subscribers assigned to this staging office, collecting water requests, distributing the allocated water, and forwarding the appropriate water billing information to the HQ JVA for collection.

2. Facility Information
   a. Name of Building (Address?)
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for) adequate
      (4) Qualitative statement on reliability of service occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: single story concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility

3. Hardware
   a. Description of existing hardware at site: The Staging Offices at the time when baseline data was collected were typically configured with one Data General MV 2000 with two terminals. The Data General MV 2000s use AOS, a proprietary operating system. The terminals were attached using a serial connections. Each site had one Multitec 9600 baud Modem attached to the MV 2000 using a serial cable (RS-232C).

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: Multitec 9600 baud Modem

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: water requests, allocated water, and water billing information collected on a daily basis.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): water requests are done manually; allocated water amounts are transmitted by Dirar; and, billing is automated.

c. Description of automated reports accomplished by site (size, frequency, to whom): billing consists of a single page of text for each subscriber and the billing is produced monthly.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 4 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second and third systems to be installed in the Staging Office 4 will be a 80486 based personal computers running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer systems will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

b. Site Unique Risks (Technical or Security) N/A

c. Proposed Schedule: 2 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium and 1 486 PC

f. Listing of Recommended Software: Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

g. Equipment/Software Cost Estimate: $ 8,570.61

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 660.00

(3) Training: see Chapter 5

STAGING OFFICE 4

STAGING OFFICE:	Staging Office 4	**Priority**	1
REPORTING TO:	District Office 2		
POINT OF CONTACT:	Zai'd Halseh	**Drops:**	3
TELEPHONE NUMBER:	05-570554		
LOCATION:	Sawalha		

Material Cost for Site: $ 8,570.61

Computers and Communications

	Item	Description		Unit Cost	Number		Cost
1	Configuration 1	486/66	$	2,001.00	2	$	4,002.00
2	Configuration 2	486/66	$	2,377.00		$	-
3	Configuration 3	Pentium	$	3,147.00	1	$	3,147.00
4	Terminal Emulation	For Dirar	$	185.00		$	-
5	Windows for WS NT 3.5	OS	$	288.00	3	$	864.00
6	Power Strip	5 receptacle	$	21.00	2	$	42.00
7	UPS	1KVA 15 min	$	167.00	1	$	167.00
8	E-Net Card	Internal	$	106.00		$	-
9	Printer	Dot matrix	$	259.00	1	$	259.00
10	Punch Down Block	AT&T	$	29.21	1	$	29.21
11	Phone Line	D	$	15.00	0	$	-
						$	8,510.21

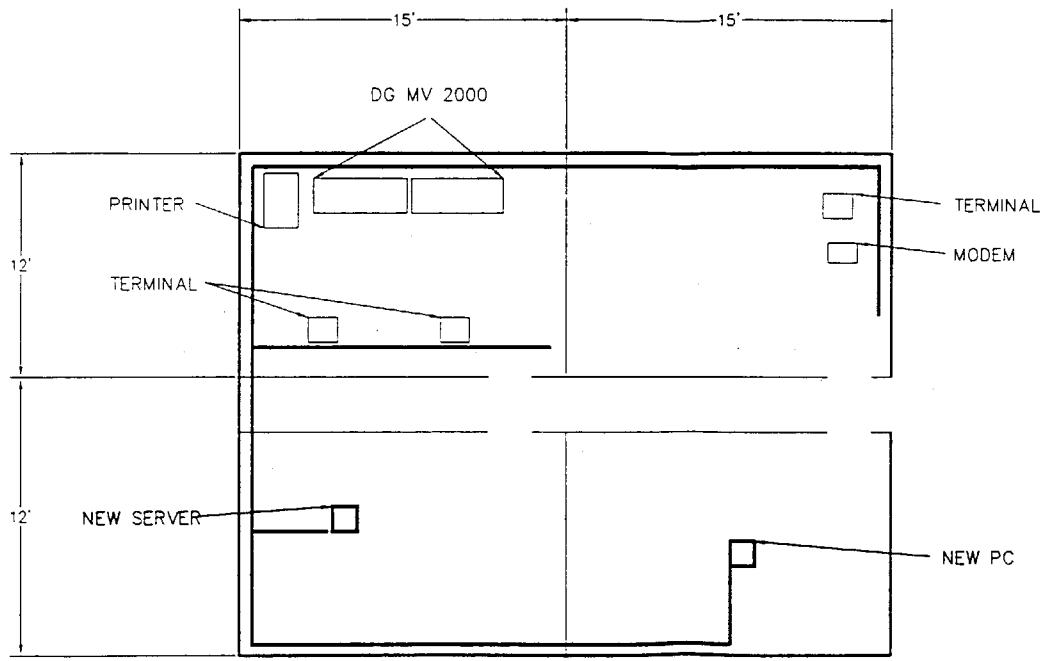
Network Components

ITEM	Description		Unit Cost	Units		TOTAL COST
Cabling	RG-58	$	0.14	100	$	14.30
Hubs					$	-
Patch Panels					$	
Receptacles					$	-
Connectors	BNC			16	$	29.60
Conduit/Panduit	Cable Ties	$	0.16	40	$	6.50
Corners (Panduit/Conduit)					$	-
Consumables		$	10.00	1	$	10.00
Totals:					$	60.40

Labor Costs

Labor Category		Rate	Units		TOTAL COSTS
Installation Engineer	$	72.00	1.5	$	108.00
Quality Insurance Engineer	$	53.00	1.5	$	79.50
Lead Installation Technician	$	34.00	7.5	$	255.00
Journey Man Installation Tech.	$	29.00	7.5	$	217.50
Totals:			18	$	660.00

298



RG-58 CABLE

JVA
STAGE OFFICE 04
AL SAWALHA

Science Applications International Corporation
619 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	SAIC NO.	REV
7/20/95	JVASO4.DWG	--

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APPENDIX A-36

JVA
STAGING OFFICE SO-5
AL ARDA

1. Organization Information
   a. Organization Name: Staging Office No 5
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: DO-02
   d. Location of Organization, Governate, City, Building (address?): Al Arda
   e. Manager of Organization, (Name and Title): Mr. Ahmad Al Gadi
   f. Phone Number of Manager: 05581003
   g. Principle Purpose for organization (verbal description of functionality): services the Subscribers assigned to this staging office, collecting water requests, distributing the allocated water, and forwarding the appropriate water billing information to the HQ JVA for collection.

2. Facility Information
   a. Name of Building (Address?): Al Arda
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: single story concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: The Staging Offices at the time when baseline data was collected were typically configured with one Data General MV 2000 with two terminals. The Data General MV 2000s use AOS, a proprietary operating system. The terminals were attached using a serial connections. Each site had one Multitec 9600 baud Modem attached to the MV 2000 using a serial cable (RS-232C).
   b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: Multitec 9600 baud Modem

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: water requests, allocated water, and water billing information collected on a daily basis.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): water requests are done manually; allocated water amounts are transmitted by Dirar; and, billing is automated.

c. Description of automated reports accomplished by site (size, frequency, to whom): billing consists of a single page of text for each subscriber and the billing is produced monthly.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 5 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 5 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

b. Site Unique Risks (Technical or Security): Three Staging Offices (SO 1, SO 3 and SO 5) are in very old buildings. Placing data processing equipment in these buildings is very risky due to poor power, lack any air conditioning and high levels of dust.

c. Proposed Schedule: 2 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium and 1 486 PC

f. Listing of Recommended Software: Windows NT Workstation 3.5 operating system, which will allow concurrent use over the network of Oracle 7.

g. Equipment/Software Cost Estimate: $ 6,254.96

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 440.00

(3) Training: see Chapter 5

STAGING OFFICE 5

STAGING OFFICE:	Staging Office 5	**Priority**	1
REPORTING TO:	District Office 2		
POINT OF CONTACT:	Ahmed Aljadi	**Drops:**	2
TELEPHONE NUMBER:	05-581003		
LOCATION:	Arda		

Material Cost for Site: $ 6,254.96

Computers and Communications

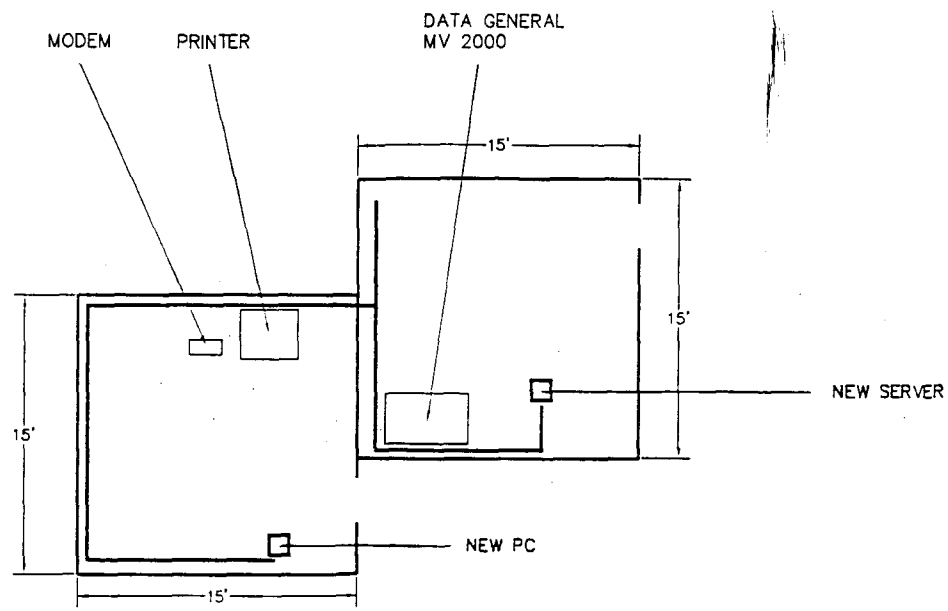
	Item	Description		Unit Cost	Number		Cost
1	Configuration 1	486/66	$	2,001.00	1	$	2,001.00
2	Configuration 2	486/66	$	2,377.00		$	-
3	Configuration 3	Pentium	$	3,147.00	1	$	3,147.00
4	Terminal Emulation	For Dirar	$	185.00		$	-
5	Windows for WS NT 3.5	OS	$	288.00	2	$	576.00
6	Power Strip	5 receptacle	$	21.00	1	$	21.00
7	UPS	1KVA 15 min	$	167.00	1	$	167.00
8	E-Net Card	Internal	$	106.00		$	-
9	Printer	Dot matrix	$	259.00	1	$	259.00
10	Punch Down Block	AT&T	$	29.21	1	$	29.21
11	Phone Line	D	$	15.00	0	$	-
						$	6,200.21

Network Components

ITEM	Description		Unit Cost	Units		TOTAL COST
Cabling	RG-58	$	0.14	100	$	14.30
Hubs					$	-
Patch Panels					$	-
Receptacles					$	-
Connectors	BNC			13	$	23.95
Conduit/Panduit	Cable Ties	$	0.16	40	$	6.50
Corners (Panduit/Conduit)					$	-
Consumables		$	10.00	1	$	10.00
Totals:					$	54.75

Labor Costs

Labor Category		Rate	Units		TOTAL COSTS
Installation Engineer	$	72.00	1	$	72.00
Quality Insurance Engineer	$	53.00	1	$	53.00
Lead Installation Technician	$	34.00	5	$	170.00
Journey Man Installation Tech.	$	29.00	5	$	145.00
Totals:			12	$	440.00



JVA
STAGING OFFICE 05
AL-ARDA

RG-58 CABLE

Science Applications International Corporation
MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
8/11/95	JVAS05.DWG	--

SCALE | SHEET 1 OF 1

JVA
STAGING OFFICE SO-6
THAHRET AL RAMEL

1. Organization Information
   a. Organization Name: Staging Office No 6
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: DO-03
   d. Location of Organization, Governate, City, Building (address?): Thahret Al Ramel
   e. Manager of Organization, (Name and Title): Engineer Shafik Habash
   f. Phone Number of Manager: 05582105
   g. Principle Purpose for organization (verbal description of functionality): services the Subscribers assigned to this staging office, collecting water requests, distributing the allocated water, and forwarding the appropriate water billing information to the HQ JVA for collection.

2. Facility Information
   a. Name of Building (Address?): Thahret Al Ramel
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: single story concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: The Staging Offices at the time when baseline data was collected were typically configured with one Data General MV 2000 with two terminals. The Data General MV 2000s use AOS, a proprietary operating system. The terminals were attached using a serial connections. Each site had one Multitec 9600 baud Modem attached to the MV 2000 using a serial cable (RS-232C).

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: Multitec 9600 baud Modem

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: water requests, allocated water, and water billing information collected on a daily basis.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): water requests are done manually; allocated water amounts are transmitted by Dirar; and, billing is automated.

c. Description of automated reports accomplished by site (size, frequency, to whom): billing consists of a single page of text for each subscriber and the billing is produced monthly.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 6 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 6 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 2 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium and 1 486 PC

f. Listing of Recommended Software: Windows NT Workstation 3.5 operating system, which will allow concurrent use over the network of Oracle 7.

g. Equipment/Software Cost Estimate: $ 6,254.96

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 440.00

(3) Training: see Chapter 5

STAGING OFFICE 6

STAGING OFFICE:	Staging Office 6	**Priority**	1
REPORTING TO:	District Office 3		
POINT OF CONTACT:	Shafia Habush	**Drops:**	2
TELEPHONE NUMBER:	05-582105		
LOCATION:	Dahret Er Ramil		

Material Cost for Site: $ 6,254.96

Computers and Communications

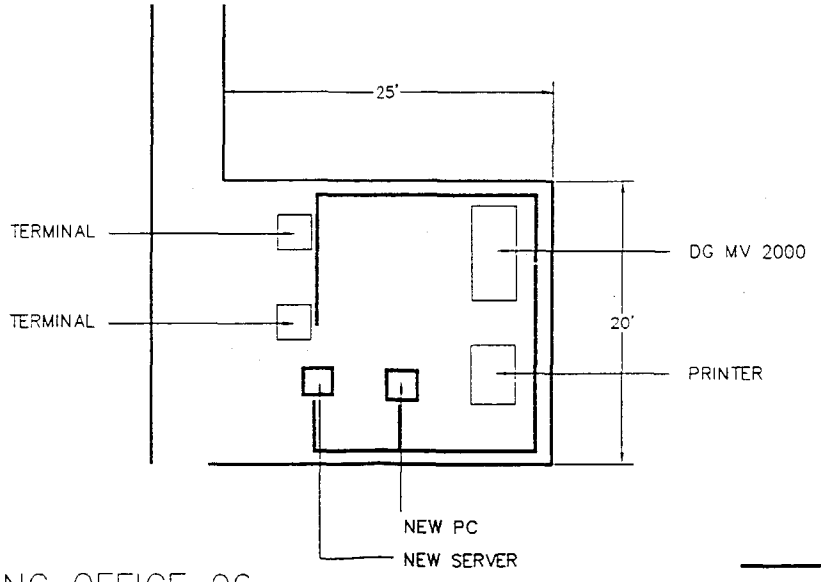
	Item	Description		Unit Cost	Number		Cost
1	Configuration 1	486/66	$	2,001.00	1	$	2,001.00
2	Configuration 2	486/66	$	2,377.00		$	-
3	Configuration 3	Pentium	$	3,147.00	1	$	3,147.00
4	Terminal Emulation	For Dirar	$	185.00		$	-
5	Windows for WS NT 3.5	OS	$	288.00	2	$	576.00
6	Power Strip	5 receptacle	$	21.00	1	$	21.00
7	UPS	1KVA 15 min	$	167.00	1	$	167.00
8	E-Net Card	Internal	$	106.00	0	$	-
9	Printer	Dot matrix	$	259.00	1	$	259.00
10	Punch Down Block	AT&T	$	29.21	1	$	29.21
11	Phone Line	D	$	15.00	0	$	-
						$	6,200.21

Network Components

ITEM	Description		Unit Cost	Units		TOTAL COST
Cabling	RG-58	$	0.14	100	$	14.30
Hubs					$	-
Patch Panels					$	-
Receptacles					$	-
Connectors	BNC			13	$	23.95
Conduit/Panduit	Cable Ties	$	0.16	40	$	6.50
Corners (Panduit/Conduit)					$	-
Consumables		$	10.00	1	$	10.00
Totals:					$	54.75

Labor Costs

Labor Category		Rate	Units		TOTAL COSTS
Installation Engineer	$	72.00	1	$	72.00
Quality Insurance Engineer	$	53.00	1	$	53.00
Lead Installation Technician	$	34.00	5	$	170.00
Journey Man Installation Tech.	$	29.00	5	$	145.00
Totals:			12	$	440.00



JVA
STAGING OFFICE 06
THAHRET AL-RAMEL

RG-58 CABLE

Science Applications International Corporation
819 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
8/11/95	JVAS06.DWG	--

SCALE | SHEET 1 OF 1

APPENDIX A-38

JVA
STAGING OFFICE SO-7
KULAIAT

1. Organization Information
   a. Organization Name: Staging Office No 7
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: DO-01
   d. Location of Organization, Governate, City, Building (address?): Kulaiat
   e. Manager of Organization, (Name and Title): Mr. Ezzat Sakaji
   f. Phone Number of Manager: 02291682
   g. Principle Purpose for organization (verbal description of functionality): services the Subscribers assigned to this staging office, collecting water requests, distributing the allocated water, and forwarding the appropriate water billing information to the HQ JVA for collection.

2. Facility Information
   a. Name of Building (Address?): Kulaiat
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: single story concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: The Staging Offices at the time when baseline data was collected were typically configured with one Data General MV 2000 with two terminals. The Data General MV 2000s use AOS, a proprietary operating system. The terminals were attached using a serial connections. Each site had one Multitec 9600 baud Modem attached to the MV 2000 using a serial cable (RS-232C).
   b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: Multitec 9600 baud Modem

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: water requests, allocated water, and water billing information collected on a daily basis.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): water requests are done manually; allocated water amounts are transmitted by Dirar; and, billing is automated.

c. Description of automated reports accomplished by site (size, frequency, to whom): billing consists of a single page of text for each subscriber and the billing is produced monthly.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design requires the installation of four personal computers for the Staging Office 7 and one personal computer for the District Office 1 networked together. The physical network will be UTP Level 5 cable with eight pin modular connectors, terminated at each computer in a sixteen bit ethernet card. The UTP cable will be terminated in a nine port hub attached to the primary Staging Office system. The networked system will operate on a peer-to-peer network scheme. The primary computer for Staging Office 7 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The three additional systems to be installed in the Staging Office 7 will be a 80486 based personal computers running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer systems will have Windows NT Workstation 3.5 for their operating systems, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.
The administrative system to be installed in District Office 1 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 400 MB hard disk drive. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The new administrative system will be connected to the RJ-11 telephone receptacle through its

internal Modem. The computer system will have Windows NT Workstation 3.5 for an operating system and Microsoft Office Professional Version 4.1. A terminal emulation software package will be installed for dial up access to the Dirar Computer Center. An excess HL Brother HL 631 printer from the MWI Building will be used for printer support. The system will be networked to Staging Office 7's system. This configuration will allow some redundancy and backup capability should any of the personal computers fail.

b. Site Unique Risks (Technical or Security): Three Staging Offices (SO 1, SO 3 and SO 5) are in very old buildings. Placing data processing equipment in these buildings is very risky due to poor power, lack any air conditioning and high levels of dust.

c. Proposed Schedule: 2 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium and 1 486 PC

f. Listing of Recommended Software: Windows NT Workstation 3.5 operating system, which will allow concurrent use over the network of Oracle 7.

g. Equipment/Software Cost Estimate: $ 11,162.42

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 565.00

(3) Training: see Chapter 5

STAGING OFFICE 7

STAGING OFFICE:	Staging Office 7	**Priority**	1
REPORTING TO:	District Office 1		
POINT OF CONTACT:	Ezzat Sakaji	**Drops:**	4
TELEPHONE NUMBER:	02-291682		
LOCATION:	Kulaiat		

Material Cost for Site: $ 11,162.42

Computers and Communications

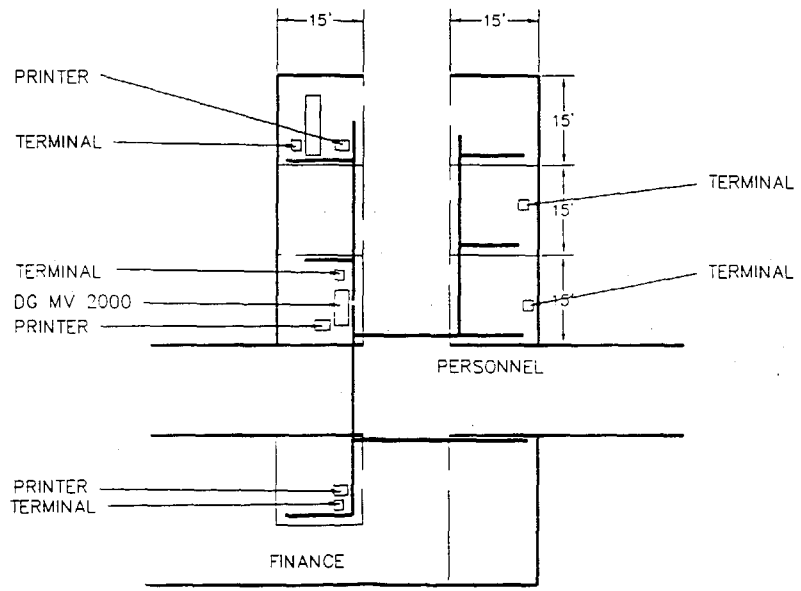
	Item	Description		Unit Cost	Number		Cost
1	Configuration 1	486/66	$	2,001.00	3	$	6,003.00
2	Configuration 2	486/66	$	2,377.00		$	-
3	Configuration 3	Pentium	$	3,147.00	1	$	3,147.00
4	Terminal Emulation	For Dirar	$	185.00		$	-
5	Windows for WS NT 3.5	OS	$	288.00	4	$	1,152.00
6	Power Strip	5 receptacle	$	21.00	3	$	63.00
7	UPS	1KVA 15 min	$	167.00	1	$	167.00
8	E-Net Card	Internal	$	106.00		$	-
9	Printer	Dot Matrix	$	259.00	1	$	259.00
10	Punch Down Block	AT&T	$	29.21	1	$	29.21
11	Phone Line	D	$	15.00	0	$	-
						$	10,820.21

Network Components

ITEM	Description		Unit Cost	Units		TOTAL COST
Cabling	RG-58	$	0.14	200	$	28.50
Hubs					$	-
Patch Panels					$	-
Receptacles					$	-
Connectors	BNC			22	$	35.25
Conduit/Panduit	Small	$	1.42	160	$	226.67
Corners (Panduit/Conduit)				30	$	26.69
Consumables		$	25.00	1	$	25.00
Totals:					$	342.21

Labor Costs

Labor Category		Rate	Units		TOTAL COSTS
Installation Engineer	$	72.00	2	$	144.00
Quality Insurance Engineer	$	53.00	2	$	106.00
Lead Installation Technician	$	34.00	5	$	170.00
Journey Man Installation Tech.	$	29.00	5	$	145.00
Totals:			14	$	565.00



JVA
DISTRICT OFFICE 01/
STAGING OFFICE 07
NORTH SHOUNAH

LEVEL 5 UTP CABLE RUN

Science Applications International Corporation
870 West Highway 50, O'Fallon, IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
8/11/95	JVAD01.DWG	--

SCALE | SHEET 1 OF 1

APPENDIX A-39

JVA
STAGING OFFICE SO-8
DIER ALLA

1. Organization Information
   a. Organization Name: Staging Office No 8
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: DO-02
   d. Location of Organization, Governate, City, Building (address?): Deir Alla
   e. Manager of Organization, (Name and Title): Engineer Issa Hadad
   f. Phone Number of Manager: 05573171
   g. Principle Purpose for organization (verbal description of functionality): services the Subscribers assigned to this staging office, collecting water requests, distributing the allocated water, and forwarding the appropriate water billing information to the HQ JVA for collection.

2. Facility Information
   a. Name of Building (Address?): Deir Alla
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: single story concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: The Staging Offices at the time when baseline data was collected were typically configured with one Data General MV 2000 with two terminals. The Data General MV 2000s use AOS, a proprietary operating system. The terminals were attached using a serial connections. Each site had one Multitec 9600 baud Modem attached to the MV 2000 using a serial cable (RS-232C).
   b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: Multitec 9600 baud Modem

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: water requests, allocated water, and water billing information collected on a daily basis.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): water requests are done manually; allocated water amounts are transmitted by Dirar; and, billing is automated.

c. Description of automated reports accomplished by site (size, frequency, to whom): billing consists of a single page of text for each subscriber and the billing is produced monthly.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 8 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 8 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 2 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium and 1 486 PC

f. Listing of Recommended Software: Windows NT Workstation 3.5 operating system, which will allow concurrent use over the network of Oracle 7.

g. Equipment/Software Cost Estimate: $ 6,254.96

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 440.00

(3) Training: see Chapter 5

STAGING OFFICE 8

STAGING OFFICE:	Staging Office 8	**Priority**	1
REPORTING TO:	District Office 2		
POINT OF CONTACT:	Eisa Haddad	**Drops:**	2
TELEPHONE NUMBER:	05-573171		
LOCATION:	Deir Alla		

Material Cost for Site: $ 6,254.96

Computers and Communications

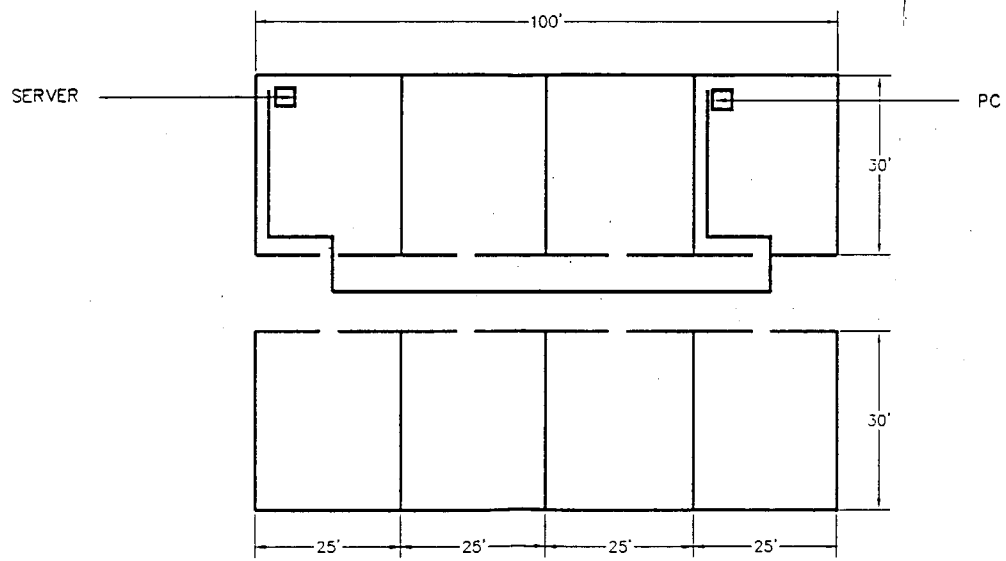
	Item	Description		Unit Cost	Number		Cost
1	Configuration 1	486/66	$	2,001.00	1	$	2,001.00
2	Configuration 2	486/66	$	2,377.00		$	-
3	Configuration 3	Pentium	$	3,147.00	1	$	3,147.00
4	Terminal Emulation	For Dirar	$	185.00		$	-
5	Windows for WS NT 3.5	OS	$	288.00	2	$	576.00
6	Power Strip	5 receptacle	$	21.00	1	$	21.00
7	UPS	1KVA 15 min	$	167.00	1	$	167.00
8	E-Net Card	Internal	$	106.00		$	-
9	Printer	Dot Matrix	$	259.00	1	$	259.00
10	Punch Down Block	AT&T	$	29.21	1	$	29.21
11	Phone Line	D	$	15.00	0	$	-
						$	6,200.21

Network Components

ITEM	Description		Unit Cost	Units		TOTAL COST
Cabling	RG-58	$	0.14	100	$	14.30
Hubs					$	-
Patch Panels					$	-
Receptacles					$	-
Connectors	BNC			13	$	23.95
Conduit/Panduit	Cable Ties	$	0.16	40	$	6.50
Corners (Panduit/Conduit)					$	-
Consumables		$	10.00	1	$	10.00
Totals:					$	54.75

Labor Costs

Labor Category		Rate	Units		TOTAL COSTS
Installation Engineer	$	72.00	1	$	72.00
Quality Insurance Engineer	$	53.00	1	$	53.00
Lead Installation Technician	$	34.00	5	$	170.00
Journey Man Installation Tech.	$	29.00	5	$	145.00
Totals:			12	$	440.00



JVA
"TYPICAL"
STAGING OFFICE

RG-58 CABLE RUN

Science Applications International Corporation
619 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
7/25/95	JVATYPIC.DWG	--

SCALE | SHEET 1 OF 1

APPENDIX A-40

JVA
STAGING OFFICE SO-09
JAWASREH (FUTURE)

1. Organization Information
   a. Organization Name: Staging Office No 09
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: DO-03
   d. Location of Organization, Governate, City, Building (address?): Jawasreh (Future)
   e. Manager of Organization, (Name and Title): Engineer Mohamed Habshneh
   f. Phone Number of Manager: 05572303
   g. Principle Purpose for organization (verbal description of functionality): Future site when the 14.5 extension project of the King Abdullah Canal becomes operational--will service the Subscribers assigned to this staging office, collecting water requests, distributing the allocated water, and forwarding the appropriate water billing information to the HQ JVA for collection.

2. Facility Information
   a. Name of Building (Address?): Jawasreh
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: single story concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: N/A (future site)

3. Hardware
   a. Description of existing hardware at site: N/A
   b. Description of existing network at site: N/A
   c. Description of existing external communications links (data) at site: N/A

4. Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A

5. Data

a. Description of type and amount of data at each site: water requests, allocated water, and water billing information collected on a daily basis.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): water requests are done manually; allocated water amounts are transmitted by Dirar; and, billing is automated.

c. Description of automated reports accomplished by site (size, frequency, to whom): billing consists of a single page of text for each subscriber and the billing is produced monthly.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 9 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 9 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

b. Site Unique Risks (Technical or Security): N/A

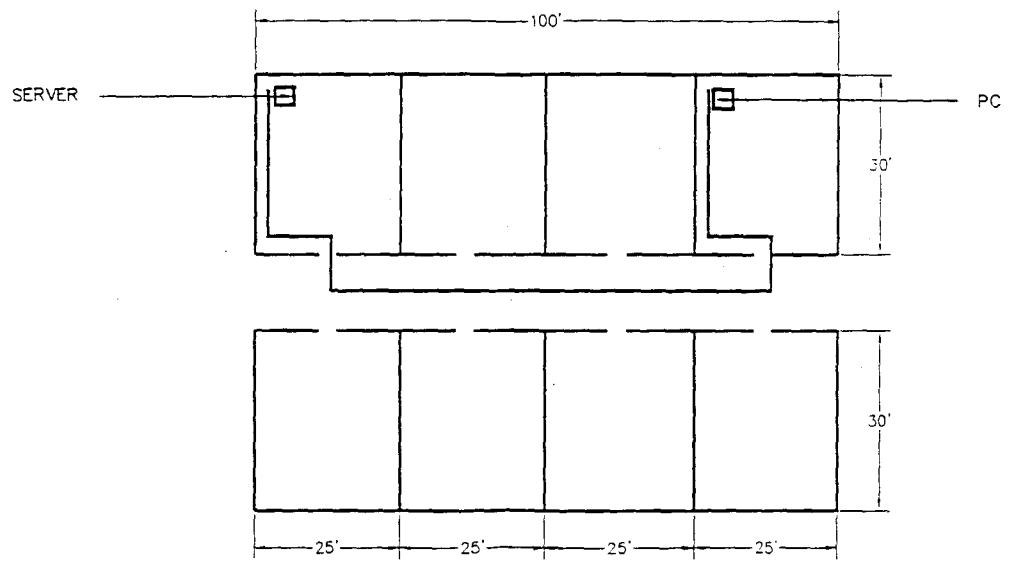
c. Proposed Schedule: 2 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium and 1 486 PC

f. Listing of Recommended Software: Windows NT Workstation 3.5 operating system, which will allow concurrent use over the network of Oracle 7.

g. Equipment/Software Cost Estimate: $ 6,254.96



JVA
"TYPICAL"
STAGING OFFICE

RG-58 CABLE RUN

Science Applications International Corporation
816 West Highway 50, O'Fallon, IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
7/25/95	JVATYPIC.DWG	--

SCALE | SHEET 1 OF 1

APPENDIX A-41

JVA
STAGING OFFICE SO-10
BATOUS PUMPING STATION

1. Organization Information
   a. Organization Name: Staging Office No 10
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: DO-03
   d. Location of Organization, Governate, City, Building (address?): Batous Pumping Station
   e. Manager of Organization, (Name and Title): Engineer Farah Thalgi
   f. Phone Number of Manager: 05571047
   g. Principle Purpose for organization (verbal description of functionality): services the Subscribers assigned to this staging office, collecting water requests, distributing the allocated water, and forwarding the appropriate water billing information to the HQ JVA for collection.

2. Facility Information
   a. Name of Building (Address?): Batous Pumping Station
   b. Location of Data Processing Equipment (see 6.d for schematic)
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: single story concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: The Staging Offices at the time when baseline data was collected were typically configured with one Data General MV 2000 with two terminals. The Data General MV 2000s use AOS, a proprietary operating system. The terminals were attached using a serial connections. Each site had one Multitec 9600 baud Modem attached to the MV 2000 using a serial cable (RS-232C).

b. Description of existing network at site: see above

c. Description of existing external communications links (data) at site: Multitec 9600 baud Modem

4. Software

a. Description of existing operating software at site: see inventory database

b. Description of application software at each site: see inventory database

c. Description of Network Software at each site: see inventory database

d. Description of Communication Software at each site: see inventory database

5. Data

a. Description of type and amount of data at each site: water requests, allocated water, and water billing information collected on a daily basis.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): water requests are done manually; allocated water amounts are transmitted by Dirar; and, billing is automated.

c. Description of automated reports accomplished by site (size, frequency, to whom): billing consists of a single page of text for each subscriber and the billing is produced monthly.

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommended design requires the installation of two powerful personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because of the limited number of computers to be networked and this cabling system can withstand the primitive environment better. The primary computer for Staging Office 10 will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be a runtime version of Oracle 7 for personal computers. This is an upgrade from the current Oracle 5 based software running on the existing Data General MV 2000 and will require conversion to the later software release. The second system to be installed in the Staging Office 10 will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 300 MB hard disk drive. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow concurrent use over the network of Oracle 7 loaded on the primary computer.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 2 days

d. Schematic of site (old and new equipment): see site drawing

e. Listing of Recommended Equipment: 1 Pentium and 1 486 PC

f. Listing of Recommended Software: Windows NT Workstation 3.5 operating system, which will allow concurrent use over the network of Oracle 7.

g. Equipment/Software Cost Estimate: $ 6,254.96

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 440.00

(3) Training: see Chapter 5

STAGING OFFICE 10

STAGING OFFICE:	Staging Office 10	**Priority**	1
REPORTING TO:	District Office 3		
POINT OF CONTACT:	Farah Thalji	**Drops:**	2
TELEPHONE NUMBER:	05-571047		
LOCATION:	Batous		

Material Cost for Site: $ 6,254.96

Computers and Communications

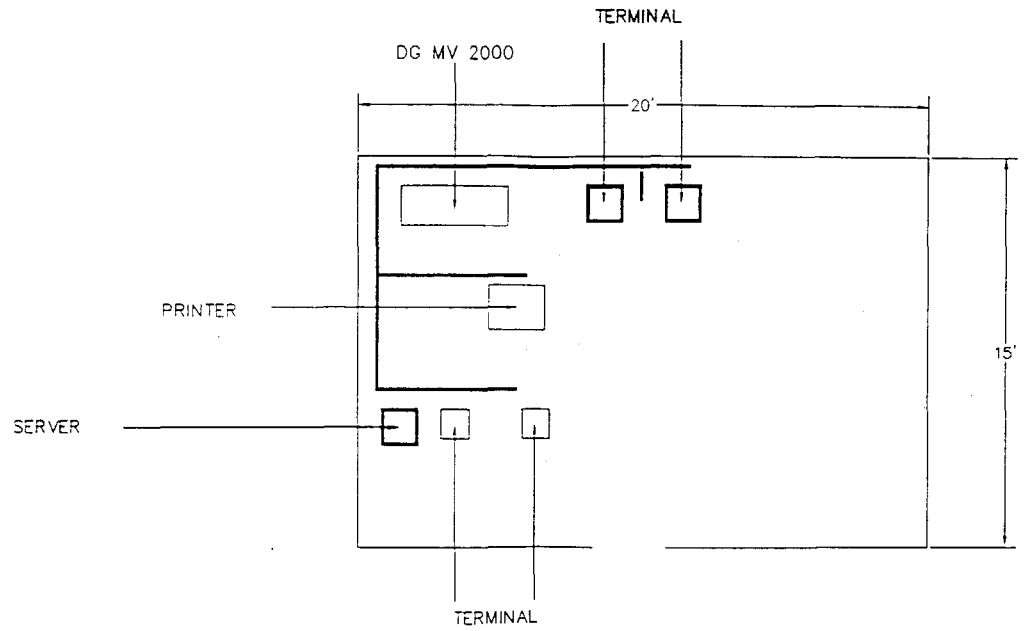
	Item	Description		Unit Cost	Number		Cost
1	Configuration 1	486/66	$	2,001.00	1	$	2,001.00
2	Configuration 2	486/66	$	2,377.00		$	-
3	Configuration 3	Pentium	$	3,147.00	1	$	3,147.00
4	Terminal Emulation	For Dirar	$	185.00		$	-
5	Windows for WS NT 3.5	OS	$	288.00	2	$	576.00
6	Power Strip	5 receptacle	$	21.00	1	$	21.00
7	UPS	1KVA 15 min	$	167.00	1	$	167.00
8	E-Net Card	Internal	$	106.00	0	$	-
9	Printer	Dot matrix	$	259.00	1	$	259.00
10	Punch Down Block	AT&T	$	29.21	1	$	29.21
11	Phone Line	D	$	15.00	0	$	-
						$	6,200.21

Network Components

ITEM	Description		Unit Cost	Units		TOTAL COST
Cabling	RG-58	$	0.14	100	$	14.30
Hubs					$	-
Patch Panels					$	-
Receptacles					$	-
Connectors	BNC			13	$	23.95
Conduit/Panduit	Cable Ties	$	0.16	40	$	6.50
Corners (Panduit/Conduit)					$	-
Consumables		$	10.00	1	$	10.00
Totals:					$	54.75

Labor Costs

Labor Category		Rate	Units		TOTAL COSTS
Installation Engineer	$	72.00	1	$	72.00
Quality Insurance Engineer	$	53.00	1	$	53.00
Lead Installation Technician	$	34.00	5	$	170.00
Journey Man Installation Tech.	$	29.00	5	$	145.00
Totals:			12	$	440.00



JVA
STAGING OFFICE 10
BATOUS PUMPING STATION

RG-58 CABLE

Science Applications International Corporation
619 West Highway 50, O'Fallon IL 62269

MINISTRY OF WATER AND IRRIGATION
MANAGEMENT INFORMATION SYSTEM (MIS)

DATE	DWG NO.	REV
8/11/95	JVAS010.DWG	--

SCALE | SHEET

APPENDIX A-42

JVA
STORES (6)
DEIR ALLA

1. Organization Information
   a. Organization Name: JVA Stores
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: JVA
   d. Location of Organization, Governate, City, Building (address?): Deir Alla and 5 small locations
   e. Manager of Organization, (Name and Title): N/A
   f. Phone Number of Manager: N/A
   g. Principle Purpose for organization (verbal description of functionality): Maintains logistical support for the JVA facilities in terms of pipe, meters, and irrigation equipment.

2. Facility Information
   a. Name of Building (Address?): Deir Alla
   b. Location of Data Processing Equipment: N/A
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: single story concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: The JVA Stores facilities do not currently have any automated support, with the primary office being located in Deir Alla and five additional smaller offices.
   b. Description of existing network at site: N/A
   c. Description of existing external communications links (data) at site: N/A

4. Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A

5. Data

a. Description of type and amount of data at each site: logistical data on the ordering and storage of parts and equipment used throughout the JVA

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The recommendation for the Deir Alla stores operation is a Pentium 90 MHz personal computer, with 16 MB of memory and a 1 GB hard disk drive. The system is configured with an internal 14.4 Kbps Modem. The operating system is Windows NT Workstation 3.5, with Microsoft Professional Office software suite. This system will be the primary location for stores information and will provide an ordering point for other JVA Stores sites. A surge protection power strip is recommended.

The recommendation for the remaining sites is for a single 80486 personal computer, operating at 66 MHz, with 16 MB of memory and a 400 MB hard disk drive. Each system has an internal 14.4 Kbps Modem. The operating system is Windows NT Workstation 3.5, with Microsoft Professional Office software suite. A surge protection power strip is recommended. The smaller sites will have dial in/out connectivity to Deir Alla to process requests.

There is no current inventory or automated ordering software in use for these facilities in the JVA. This software will need to be developed prior to the installation of the equipment.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 1 day for each site

d. Schematic of site (old and new equipment): N/A

e. Listing of Recommended Equipment: 1 Pentium at Deir Alla and 5 486 PCs for the remaining sites

f. Listing of Recommended Software: The operating system is Windows NT Workstation 3.5, with Microsoft Professional Office software suite

g. Equipment/Software Cost Estimate: $ 18,675.26

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 847.50

(3) Training: see Chapter 5

JVA STORES COSTING SHEET

Priority 4

Drops: 6

Material Cost for Site: $ 18,675.26

STORES NAME	EQUIPMENT	COST/UNIT	UNITS	TOTAL COST	PRIORITY
Deir Alla	Configuration 3	$ 3,147.00	1	$ 3,147.00	4
Stores 2	Configuration 2	$ 2,377.00	1	$ 2,377.00	4
Stores 3	Configuration 2	$ 2,377.00	1	$ 2,377.00	4
Stores 4	Configuration 2	$ 2,377.00	1	$ 2,377.00	4
Stores 5	Configuration 2	$ 2,377.00	1	$ 2,377.00	4
Stores 6	Configuration 2	$ 2,377.00	1	$ 2,377.00	4
Windows NT WS 3.5	Operating System	$ 288.00	6	$ 1,728.00	4
Punch Down Blocks	30 Pin	$ 18.88	6	$ 113.28	4
Telephone Block	RJ-11	$ 10.33	6	$ 61.98	4
Power Strip	5 Plug	$ 21.00	6	$ 126.00	4
Printer	Dot Matrix	$ 259.00	6	$ 1,554.00	4
Total				$ 18,615.26	

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling				$ -
Hubs				$ -
Patch Panels				$ -
Receptacles				$ -
Connectors				$ -
Conduit/Panduit				$ -
Corners (Panduit/Conduit)				$ -
Consumables		$ 10.00	6	$ 60.00
Totals:				$ 60.00

Labor Costs

Labor Category	Rate	Units	TOTAL COSTS
Installation Engineer	$ 72.00	3	$ 216.00
Quality Insurance Engineer	$ 53.00	3	$ 159.00
Lead Installation Technician	$ 34.00	7.5	$ 255.00
Journey Man Installation Tech.	$ 29.00	7.5	$ 217.50
Totals:		21	$ 847.50

24

JVA
DAMS (6)

1. Organization Information
   a. Organization Name: JVA Dams (6)
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: JVA
   d. Location of Organization, Governate, City, Building (address?): see below
   e. Manager of Organization, (Name and Title): Engineer
   f. Phone Number of Manager: N/A
   g. Principle Purpose for organization (verbal description of functionality): The dams in the Jordan Valley are used to store excess ground water during the rainy season. This prevents the excess water from flowing into the Jordan River and eventually into the Dead Sea. It also allows the JVA to distribute the stored water for irrigation throughout the rest of the year when irrigation water demands exceed the available rainfall and well output. There are five dams under JVA management, with a sixth under construction. The dams are the Wadi Arab Dam, the Ziqlab Dam, the King Talal Dam, the Schueb Dam, the Kafrein Dam, and under construction the Karameh Dam. The operational and administrative functions at each of the dams is currently performed manually. Data from the dams are useful as inputs to the water balance models run at the computer center in Dirar.

2. Facility Information
   a. Name of Building (Address): Wadi Arab Dam, the Ziqlab Dam, the King Talal Dam, the Schueb Dam, the Kafrein Dam, and the Karameh Dam (under construction).
   b. Location of Data Processing Equipment: N/A
   c. Electrical Power
      (1) Volts/Hz: 220 v, 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: typically single story concrete brick
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: Low to Moderate

i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: N/A
   b. Description of existing network at site: N/A
   c. Description of existing external communications links (data) at site: N/A

4. Software
   a. Description of existing operating software at site: N/A
   b. Description of application software at each site: : N/A
   c. Description of Network Software at each site: : N/A
   d. Description of Communication Software at each site: : N/A

5. Data
   a. Description of type and amount of data at each site: maintains administrative records and engineering plans
   b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): manages the activities of the 5 major dams in the JVA
   c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics
   a. General Description Planned Installation (Server, connections, software, numbers or items.): The dam design requires the installation of two personal computers networked together. The physical network will be an RG-58 coaxial cable with BNC connectors. Each computer system will have a sixteen bit ethernet card with dual BNC and eight pin modular ports. RG-58 coaxial cable is recommended for the site because extended distance between systems and the cabling system is more rugged then UTP. The operational primary computer for each dam will be a Pentium based, 90 MHz based personal computer with 16 MB of memory, a 1.0 GB hard disk drive, and 250 MB internal tape drive for backups. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system, which will allow multitasking and multithreaded operations and supports both TCP/IP and IPX/SPX networking protocols (UNIX and Novell respectively). The primary software will be Microsoft Office Professional Version 4.1 for personal computers. The administrative system to be installed in the dam will be a 80486 based personal computer running at 66 MHz, with 16 MB of memory and a 400 MB hard disk drive. The computer will have an internal 14.4 Kbps Modem with V.32 bis. The computer system will have Windows NT Workstation 3.5 for an operating system and Microsoft Office Professional Version 4.1. One dot matrix printer will be installed on the operational computer system. This printer can be shared by the administrative system over the peer-to-peer capabilities of the networked systems. Both systems will be connected to separate telephone lines in order to provide alternate communications paths.

DAMS COSTING SHEET

Priority: 3 & 4

Drops: 12

Material Cost for Site: $ 33,179.79

Computers and Communications

DAM NAME	EQUIPMENT	COST/UNIT	UNITS	TOTAL COST	PRIORITY
Wadi Arab Dam					
Operations	CONFIGURATION 1	$ 2,001.00	1	$ 2,001.00	3
Data/Administration	CONFIGURATION 2	$ 2,377.00	1	$ 2,377.00	4
	PHONE LINE	$ 15.00	0	$ -	3
	PRINTER	$ 259.00	1	$ 259.00	3
	UPS	$ 167.00	1	$ 167.00	3
	POWER STRIP	$ 21.00	1	$ 21.00	4
	Windows NT WS 3.5	$ 288.00	1	$ 288.00	3
	Windows NT WS 3.5	$ 288.00	1	$ 288.00	4
Subtotal				$ 5,401.00	
Ziglab Dam					
Operations	CONFIGURATION 1	$ 2,001.00	1	$ 2,001.00	3
Data/Administration	CONFIGURATION 2	$ 2,377.00	1	$ 2,377.00	4
	PHONE LINE	$ 15.00	0	$ -	3
	PRINTER	$ 259.00	1	$ 259.00	3
	UPS	$ 167.00	1	$ 167.00	3
	POWER STRIP	$ 21.00	1	$ 21.00	4
	Windows NT WS 3.5	$ 288.00	1	$ 288.00	3
	Windows NT WS 3.5	$ 288.00	1	$ 288.00	4
Subtotal				$ 5,401.00	
King Talal Dam					
Operations	CONFIGURATION 1	$ 2,001.00	1	$ 2,001.00	3
Data/Administration	CONFIGURATION 2	$ 2,377.00	1	$ 2,377.00	4
	PHONE LINE	$ 15.00	0	$ -	3
	PRINTER	$ 185.00	1	$ 185.00	3
	UPS	$ 167.00	1	$ 167.00	3
	POWER STRIP	$ 21.00	1	$ 21.00	4
	Windows NT WS 3.5	$ 288.00	1	$ 288.00	3
	Windows NT WS 3.5	$ 288.00	1	$ 288.00	4
Subtotal				$ 5,327.00	
Karameh Dam					
Operations	CONFIGURATION 1	$ 2,001.00	1	$ 2,001.00	3
Data/Administration	CONFIGURATION 2	$ 2,377.00	1	$ 2,377.00	4
	PHONE LINE	$ 15.00	0	$ -	3
	PRINTER	$ 259.00	1	$ 259.00	3
	UPS	$ 167.00	1	$ 167.00	3
	POWER STRIP	$ 21.00	1	$ 21.00	4
	Windows NT WS 3.5	$ 288.00	1	$ 288.00	3
	Windows NT WS 3.5	$ 288.00	1	$ 288.00	4
Subtotal				$ 5,401.00	
Shueb Dam					
Operations	CONFIGURATION 1	$ 2,001.00	1	$ 2,001.00	3
Data/Administration	CONFIGURATION 2	$ 2,377.00	1	$ 2,377.00	4
	PHONE LINE	$ 15.00	0	$ -	3
	PRINTER	$ 185.00	1	$ 185.00	3

There is no requirement for the two computers supporting the dams within the JVA to be networked together using the peer-to-peer capabilities of their operating systems. The network will provide some redundancy and back up capability for these two systems and is recommended for these additional capabilities. Facility drawings and system locations have not been developed for the dams. The computer systems will be installed at the direction of the facility manager and with JVA concurrence. It is anticipated that the systems will be installed in an office environment.

b. Site Unique Risks (Technical or Security): N/A

c. Proposed Schedule: 1 day each

d. Schematic of site (old and new equipment): N/A

e. Listing of Recommended Equipment: 1 Pentium server and 1 486 PC at each dam

f. Listing of Recommended Software: Novell's Netware Operating System 3.12 and Microsoft's Office Professional software suite.

g. Equipment/Software Cost Estimate: $ 33,179.79

f. Site Installation Cost

(1) Tools Required (Rent?)

(2) Labor: $ 1,695.00

(3) Training: see Chapter 5

	UPS	$	167.00	1	$	167.00	3
	POWER STRIP	$	21.00	1	$	21.00	4
	Windows NT WS 3.5	$	288.00	1	$	288.00	3
	Windows NT WS 3.5	$	288.00	1	$	288.00	4
Subtotal					$	5,327.00	
Kafrein Dam							
Operations	CONFIGURATION 1	$	2,001.00	1	$	2,001.00	3
Data/Administration	CONFIGURATION 2	$	2,377.00	1	$	2,377.00	4
	PHONE LINE	$	15.00	0	$	-	3
	PRINTER	$	185.00	1	$	185.00	3
	UPS	$	167.00	1	$	167.00	3
	POWER STRIP	$	21.00	1	$	21.00	4
	Windows NT WS 3.5	$	288.00	1	$	288.00	3
	Windows NT WS 3.5	$	288.00	1	$	288.00	4
Subtotal					$	5,327.00	
Grand Total					$	32,184.00	

Network Components

ITEM	Description	Unit Cost		Units	TOTAL COST	
Cabling	RG-58	$	0.14	500	$	71.50
Hubs					$	-
Patch Panels					$	-
Receptacles					$	-
Connectors	BNC			24	$	124.20
Conduit/Panduit	Conduit	$	1.42	500	$	708.35
Corners (Panduit/Conduit)				36	$	31.74
Consumables		$	10.00	6	$	60.00
Totals:					$	995.79

Labor Costs

Labor Category	Rate		Units	TOTAL COSTS	
Installation Engineer	$	72.00	6	$	432.00
Quality Insurance Engineer	$	53.00	6	$	318.00
Lead Installation Technician	$	34.00	15	$	510.00
Journey Man Installation Tech.	$	29.00	15	$	435.00
Totals:			42	$	1,695.00

APPENDIX A-44

JVA PUMPING STATIONS (11)

1. Organization Information
   a. Organization Name: Water Pumping Stations (9)
   b. Organization Belongs to What Ministry: JVA
   c. Organization falls immediately under which organization: JVA
   d. Location of Organization, Governate, City, Building (address?): see below
   e. Manager of Organization, (Name and Title): N/A
   f. Phone Number of Manager: N/A
   g. Principle Purpose for organization (verbal description of functionality): There are eleven water pumping stations associated with the King Abdullah Canal in the Jordan Valley. The pumping stations record water flow. This information can forwarded by Remote Transmission Units (RTUs) to Dirar for use in the overall water balance models. The recommended design for these stations is to wire the pumping station flow meter outputs to the RTUs so that the information can be forward to Dirar. The pumping stations are Priority 3 facilities for the purpose of implementation. The pumping stations are at Arda, Sawahala, Karameh, Abu Sidoh, Alla Basah, Al Yabis, Al Mashareh, Al Zamalich, Al Mankatarh, Al Manshiah, and Al Adassyia.

2. Facility Information
   a. Name of Building (Address?): see above
   b. Location of Data Processing Equipment: sites not visited
   c. Electrical Power
      (1) Volts/Hz: 220 v 50 Hz, 30 amp
      (2) Service available (service to breaker box): adequate
      (3) Service used (already accounted for): adequate
      (4) Qualitative statement on reliability of service: occasional outages
      (5) Observed measurement at outlet and variances: adequate as an UPS will be provided at installation
   d. Facility Construction: small concrete 1 story building
   e. Code Restrictions: N/A
   f. Location of telephone service entry point (comm closet if available)
      (1) Gauge of Wire: 24 AWG
      (2) Type of interface (four prong, RJ-11, etc.): RJ-11
   g. Facility Air Conditioned: N/A
   h. Qualitative assessment of dust: High
   i. Changes to Facility: N/A

3. Hardware
   a. Description of existing hardware at site: N/A These sites were not surveyed.

b. Description of existing network at site: N/A

c. Description of existing external communications links (data) at site: N/A

4. Software

a. Description of existing operating software at site: N/A

b. Description of application software at each site: N/A

c. Description of Network Software at each site: N/A

d. Description of Communication Software at each site: N/A

5. Data

a. Description of type and amount of data at each site: There are eleven water pumping stations associated with the King Abdullah Canal. The pumping stations record water flow with a flow meter probe.

b. Description of hard copy/manual reports accomplished by site (size and frequency, to whom): N/A

c. Description of automated reports accomplished by site (size, frequency, to whom): N/A

6. Site Installation Specifics

a. General Description Planned Installation (Server, connections, software, numbers or items.): The JVA has several pumping stations located throughout the Jordan Valley. Although these stations are not scheduled to receive computer systems, they are equipped with flow meters that need to transmit the metered information to the Computer Center at Dirar. The most pumping stations are within 300 feet of the Remote Transmission Units (RTUs) on the KAC. The proposed design for these pumping stations includes installing cabling between the flow meters or sensors at the pumping station and the RTUs. The design does not include any interface equipment or hardware at the pumping stations or RTUs. This equipment will be provided by the JVA. Cost figures in the Appendices are only for the cabling and installation of the cable. The sites included for the purposes of this portion of the design are: Arda (sites 12, 16, 21 and 25), Sawahla (site 16), Karameh (site 21), Abu Sidoh (sites 18 and 19), Alla Basah (sites 16 and 17), Al Yabis (sites 14 and 15), Al Mashareh (site 13), Al Zamalich (site 11 and 12), Al Mankatah (sites 11 and 12), Al Manshiah (sites 9 and 8), and Al Adassyia (sites 9 and 2). These sites are priority 3 installations.

b. Site Unique Risks (Technical or Security): interface equipment must be available at the pumping stations to permit connection to the RTUs

c. Proposed Schedule: 1 day each site

d. Schematic of site (old and new equipment): N/A

e. Listing of Recommended Equipment: cable only for the 11 pumping stations

f. Listing of Recommended Software: N/A

g. Equipment/Software Cost Estimate: $ 5,985.00 (inclusive for all 11 stations) plus

f. Site Installation Cost

(1) Tools Required (Rent?)

PUMPING STATION CONNECTIVITY

Priority 3

Drops: 42

Material Cost for Sites: $ 5,985.00

LOCATIONS		DISTANCE TO RTU	CABLE UNIT PRICE	TOTAL PRICE	PRIORITY
Arda					
	Site 12	300	$ 0.75	$ 225.00	3
	Site 16	300	$ 0.75	$ 225.00	3
	Site 21	300	$ 0.75	$ 225.00	3
	Site 25	300	$ 0.75	$ 225.00	3
Sawahala					
	Site 16	300	$ 0.75	$ 225.00	3
Karamen					
	Site 21	300	$ 0.75	$ 225.00	3
Abu Sidon					
	Site 18	300	$ 0.75	$ 225.00	3
	Site 19	300	$ 0.75	$ 225.00	3
Alla Basah					
	Site 16	300	$ 0.75	$ 225.00	3
	Site 17	300	$ 0.75	$ 225.00	3
Al Yabis					
	Site 14	300	$ 0.75	$ 225.00	3
	Site 15	300	$ 0.75	$ 225.00	3
Al Masharen					
	Site 13	300	$ 0.75	$ 225.00	3
Al Zamalich					
	Site 11	300	$ 0.75	$ 225.00	3
	Site 12	300	$ 0.75	$ 225.00	3
Al Mankatarh					
	Site 11	300	$ 0.75	$ 225.00	3
	Site 12	300	$ 0.75	$ 225.00	3
Al Mansnian					
	Site 9	300	$ 0.75	$ 225.00	3
	Site 8	300	$ 0.75	$ 225.00	3
Al Adassyia					
	Site 9	300	$ 0.75	$ 225.00	3
	Site 2	300	$ 0.75	$ 225.00	3

Network Components

ITEM	Description	Unit Cost	Units	TOTAL COST
Cabling	Outside Cable	$ 0.75	6300	$ 4,725.00
Hubs				$ -
Patch Panels				$ -
Receptacles				$ -
Connectors		$ 15.00	42	$ 630.00
Conduit/Panduit				$ -

(2) Labor: $ 3,832.50 (inclusive for all 11 stations)

(3) Training: see Chapter 5

Corners (Panduit/Conduit)				$	-
Consumables	$	30.00	21	$	630.00
Totals:				$	5,985.00
Labor Costs					
Labor Category		**Rate**	**Units**	**TOTAL COSTS**	
Installation Engineer	$	72.00	4.2	$	302.40
Quality Insurance Engineer	$	53.00	4.2	$	222.60
Lead Installation Technician	$	34.00	52.5	$	1,785.00
Journey Man Installation Tech.	$	29.00	52.5	$	1,522.50
Totals:			113.4	$	3,832.50