

## 付属資料 J 水道事業の経営分析



WAJから入手した財務諸表を基に財務分析を行った結果は以下のとおりである。

## 1. 上水道事業指標の現況

付表－1 上水道事業指標

No	指 標	「ジョ」国 (1992)	我が国 (1991)
1	負 荷 率 (%)	91.4	81.4
2	施 設 利 用 率 (%)	84.0	67.6
3	最 大 稼 働 率 (%)	91.9	83.0
4	有 収 率 (%)	39.1	88.5
5	供 給 単 価 (円/m <sup>3</sup> )	36.0	127.6
6	給 水 原 価 (円/m <sup>3</sup> )	76.6	141.4
7	職員1人当たり給水人 (人)	790	2,760
8	職員1人当たり有収水 (m <sup>3</sup> )	15,694	285,193

(出典)・「ジョ」国はWAJの資料より作成

・我が国は「水道経営」日本水道協会から抜粋して作成

・「ジョ」国の職員数は上水道、下水道で区別できないため、全職員の4/5が上水道を担当していると仮定した

上水道事業の指標から事業内容を判断すると次のとおりである。

### (1) 負荷率：1日平均配水量／1日最大配水量

需要量の変動を見る指標であり、100に近づく方が有利。「ジョ」国の方が年間を通じた需要変動が少ないことを示し、財務的には有利になる。

### (2) 施設利用率：1日平均配水量／1日配水能力

施設能力が効率的に利用されているかを見る指標であり、100に近づく方が有利。「ジョ」国の方が良く、財務的には有利になる。

### (3) 最大稼働率：1日最大配水量／1日配水能力

施設の余裕を見る指標であり、100に近づく程余裕がないことを示す。「ジョ」国はほとんど目一杯に使用しており、拡張の必要が近づいている。

### (4) 有収率：年間総有収水量／年間総配水量

配水量が効果的に収入に結びついているかを見る指標であり、100に近づく程良い。

「ジョ」国の状態が決定的に悪く、財務的に厳しい状態である。

### (5) 供給単価：給水収益／年間総有収水量

### (6) 給水原価：経常費用／年間総有収水量

水道事業は、通常、給水収益以外の収益があるので、(5) < (6) でも経営は成り立つが、「ジョ」国の場合は、(5) が小さすぎ経営は成り立たない。

### (7) 職員1人当たり給水人口：給水人口／損益勘定職員数

(8) 職員1人当たり有収水量：年間総有収水量／損益勘定職員数

職員数が仕事量に比較して適正かを見る指標。「ジョ」国はかなり少なく、職員数が適正ではないおそれがある。ただし、水源が井戸であり、施設数が多く、分散しているために、必然的に多くなるという不利な条件もある。財務的には不利である。

2. 財政収支の推移

付表-2 損益計算書

(JD)

項 目		1988	1989	1990	1991	1992	
収 益	水道事業収入	16,384,673	17,177,616	15,610,664	16,337,763	18,649,791	
	下水道事業収入	4,313,184	4,235,041	3,482,413	5,298,651	7,437,285	
	その他の収入	3,893,991	3,149,575	2,829,020	2,717,273	1,752,509	
	合 計	24,591,848	24,562,232	21,922,097	24,353,687	27,839,585	
支 出	営業費用	人件費	9,862,252	10,516,362	11,086,670	13,509,452	13,316,713
		動力費	10,724,767	9,264,173	4,098,908	17,761,433	8,318,363
		修繕費	415,640	899,996	1,766,039	2,223,453	2,525,551
		減価償却費	6,686,840	11,153,228	15,379,082	21,679,601	22,332,096
		その他	3,930,548	4,104,100	7,973,036	-2,806,660	8,667,114
	計	31,620,047	35,937,859	40,303,735	52,367,279	55,159,837	
営業外費用	支払利息	5,432,765	7,544,785	8,863,825	7,490,219	11,838,784	
	その他	0	0	0	0	0	
計	5,432,765	7,544,785	8,863,825	7,490,219	11,838,784		
合 計	37,052,812	43,482,644	49,172,560	59,857,498	66,998,621		
過年度修正等		0	0	-8,693,389	-3,555,741	-3,213,966	
当年度損失		-12,460,964	-26,787,389	-35,943,852	-39,059,552	-42,373,002	
累積欠損		-47,966,873	-74,754,262	-110,698,114	-149,757,666	-192,130,668	

(出典) WAJの資料より作成

損益計算書の結果から経営成績を判断すると次のとおりである。

- (1) 毎年の支出額は収益額の2.2倍以上に達しており、完全な赤字会計である。
- (2) 料金収入で経営されておらず、中央政府の補助金に依存している。
- (3) 累積赤字額が収益の7倍にも達しており、財政は破綻している。
- (4) このため、料金は最低でも営業費用に見合うか、収支均衡以上に設定するよう改定すべきである。

付表-3 貸借対照表

(JD)

項 目		1988	1989	1990	1991	1992		
資 産	固 定 資 産	303,831,675	307,356,234	311,126,547	397,891,563	413,037,284		
	流 動 資 産	21,683,665	20,786,880	26,987,744	26,121,891	34,779,527		
	そ の 他 の 資 産	0	83,035,416	82,700,909	0	0		
	合 計	325,515,340	411,178,830	420,815,200	424,013,454	447,816,811		
負 債 ・ 資 本	負 債	固 定 負 債	長 期 借 入 金	111,576,760	182,872,271	180,170,947	184,052,552	195,090,697
			引 当 金	1,500,000	1,473,000	1,472,820	1,462,746	1,462,686
			計	113,076,760	184,345,271	181,643,767	185,515,298	196,553,383
	債	流 動 負 債	流 動 負 債	48,965,996	79,641,326	116,327,866	138,721,437	170,131,803
			計	162,042,756	263,986,597	297,971,633	324,236,735	366,685,186
			資 本 金	211,439,457	221,946,195	233,541,681	249,534,385	271,022,280
	資 本	資 本	剩 余 金 ・ 欠 損 金	-47,966,873	-74,754,262	-110,698,114	-149,757,666	-189,890,655
			計	163,472,584	147,191,933	122,843,567	99,776,719	81,131,625
			合 計	325,515,340	411,178,530	420,815,200	424,013,454	447,816,811

(出典) WAJの資料より作成

貸借対照表から財政状態を判断すると次のとおりである。

- (5) 流動資産に対し流動負債が5倍もあり、日々の資金繰りが相当苦しい状態にあり、公的な背景がなければ破産状態である。
- (6) 資本金は政府の補助による割合が高いので、借入金はもう少し増加させてもよいが、料金収入の増加が前提である。

付表-4 キャッシュフロー

(JD)

項 目		1988	1989	1990	1991	1992		
資 金	内 資 部 金	純利益または損失	-12,460,964	-26,787,389	-35,943,852	-39,059,552	-40,132,989	
		減 価 償 却	6,686,849	11,153,228	15,379,082	29,117,653	22,332,095	
		計	-5,774,115	-15,634,161	-20,564,770	-9,941,899	-17,800,894	
	外 資 部 金	長 期 借 入 金	19,924,851	85,566,177	16,237,517	24,088,153	29,816,111	
		政府からの補助等	23,194,889	10,506,738	11,595,486	15,992,704	21,487,895	
		そ の 他	0	61,122,897	20,918,064	0	0	
計	43,119,740	157,195,812	48,751,067	40,080,857	51,304,006			
合 計	37,345,625	141,561,651	28,186,297	30,138,958	33,503,112			
支 出	建 設 事 業 費	建 設 事 業 費	24,869,664	75,800,684	39,732,952	33,181,759	37,477,816	
		長 期 借 入 金 済	海 外 債 務 返 済	4,695,010	6,610,000	12,680,646	14,482,890	4,407,529
			国 内 債 務 返 済	5,589,536	3,660,666	4,108,195	5,723,659	14,370,437
			社 債 返 済	9,000,000	4,000,000	2,150,000	0	0
			小 計	19,284,546	14,270,666	18,938,841	20,206,549	18,777,966
	引 当 金 の 増 加	0	27,000	180	10,074	60		
合 計	44,154,210	90,098,350	58,671,973	53,398,382	56,255,842			
残 高	-6,808,585	51,463,301	-30,485,676	-23,259,424	-22,752,730			

(出典) WAJの資料より作成

キャッシュフローから資金の状態を判断すると次のとおりである。

(7) 内部資金から建設事業に回す資金はなく、損失さえも埋められない。外部からの借入金も内部の赤字補填に使用され、建設事業へは十分に充当できない。

(8) 建設事業は、返済の必要がないグラントに多くを頼るべき状況にある。

付表-5 財務分析

項 目		1988	1989	1990	1991	1992	1991 日本の例
自己資本構成比率 (%)		50.2	35.8	29.2	23.5	18.1	44.5
固定資産対長期資本比率 (%)		109.9	92.7	102.2	139.5	148.7	92.6
流動比率 (%)		44.3	26.1	23.2	18.8	20.4	316.2
営業収支比率 (%)		77.8	68.3	54.4	46.5	52.6	123.8
経常収支比率 (%)		66.4	56.5	44.6	40.7	43.0	104.5
料金収入に 対する比率	長期借入金返済 (%)	93.2	66.6	99.2	93.4	72.0	12.8
	支払利息 (%)	26.2	35.2	46.5	34.6	45.4	23.9
	人件費 (%)	47.6	49.1	58.1	62.4	51.0	22.9
	減価償却費 (%)	32.3	52.1	80.5	100.2	85.6	19.6
費用構成比	人件費 (%)	26.6	24.2	22.5	22.6	20.6	22.2
	動力費 (%)	28.9	21.3	8.3	29.7	12.8	4.2
	修繕費 (%)	1.1	2.1	3.6	3.7	3.9	6.7
	減価償却費 (%)	18.0	25.6	31.3	36.2	34.5	20.9
	支払利息 (%)	14.7	17.4	18.0	12.5	18.3	30.2

(出典) WAJの資料より作成

財務分析表の結果と、我が国の上水道事業の値とを比較して、「ジョ」国の経営指標の特徴を記述すると以下のとおりである。

(9) 自己資本構成比率：(自己資本+剰余金・欠損金) / 負債・資本合計

財政状態が健全かどうかを見る指標であり、大きい方が良い。累積欠損金があるため、それだけ自己資本が食い潰されて、比率が低くなっており、状況が悪くなっている。累積欠損金が解消されれば、60%ほどになり、我が国の水道事業より上回る水準となることから、欠損金の解消が不可欠である。

(10) 固定資産対長期資本比率：固定資産 / (固定負債+資本金+剰余金)

建設投資の財源となった資金が安定しているかどうかを見る指標で100以下が良い。100%を超えているのは、安定しない財源で建設投資を賄っていることを示し、状況が悪くなっている。膨大な累積欠損金があるため、安定した長期資本で財源を賄えず、流動負債が増えることになっている。

(11) 流動比率：流動資産 / 流動負債

資金繰りの状況を見る指標であり、大きいほど良い。100%以下は危機的な状況であり、日々の現金の支払いに苦勞していることが推測され、悪化の傾向にある。

我が国の水道事業では、最近では銀行からの一時借入金を常時保有していた昭和50年代とは様変わりし、常時預金を保有できる状態になっており、日々の支払に苦勞することは全くない。

(12) 営業収支比率：営業収益／営業費用

収益性を見る指標であり、100%以上が良い。通常は100%を超え、超えた部分が支払利息など営業外費用への充当と利益になる。「ジョ」国の場合は、事業をやればやる程赤字になり、悪化の傾向にある。

(13) 経常収支比率：(営業収益＋営業外収益)／(営業費用＋営業外費用)

100%を超えると黒字、未満は赤字であり、100%以上が良い。大きな当年度損失(赤字)であるため、比率が極端に低い。我が国の場合、若干の純利益が生ずるような事業経営をしているため、100%をやや上回る。

(14) 料金収入に対する割合

いずれの項目も低い程良い。料金収入が低いため、我が国と比較し高くなっている。

なお、「長期借入金返済」は、我が国の統計では、この返済に際して、再度資金を借り入れて返済した部分は控除するため、「ジョ」国の値と一概に比較できない。

(15) 支出に対する比率

動力費の割合は、遠距離送水のため著しく大きくなっている。

修繕費の割合は、我が国と比較して少ないが、年々増額していることは好ましいが、一方では、これは施設全体の老朽化が進んでいることを示し、必ずしも良いこととは言えない。

(16) 財務的妥当性・持続性の総括について

現状は、旧国鉄と同じ状態であり、一時的にせよ、低利の融資を増加して赤字を棚上げする措置を取らないと、経営意欲がなくなり事業が完全に破綻してしまう。

現状のままでは、今後、次のことが心配される。

- ① 資金繰りに行き詰まり、現金の支払いが滞る。
- ② 財政健全化と称して、施設の運転経費が優先され、最もカットし易い維持管理のために必要な修繕費等の経費が削減される。
- ③ 外部の融資機関の信用がなくなり、長期的な資金の借り入れができなくなり、建設事業の財源手当てが難しくなる。

この対策としては、次のことが考えられる。

- ④ 料金値上げによる事業収益の増加
- ⑤ 赤字穴埋めのため政府による補助金の増額
- ⑥ 事業資産の売却による収益の増加

いずれにしる、実現可能な赤字解消策を含めた財政計画の策定が不可欠である。

W A J の財務諸表

WATER AUTHORITY OF JORDAN  
AUTONOMOUS PUBLIC DEPARTMENT  
AMMAN - HASHEMITE KINGDOM  
STATEMENT OF REVENUE AND EXPENSES

	1985	1986	1987	1988	1989	1990	1991	1992
<b>REVENUE</b>								
WATER REVENUE	14,393,648	16,123,857	16,260,870	16,160,800	16,980,684	16,410,033	16,006,536	18,464,468
REVENUE OF WATER BY TANKS	284,085	280,738	208,813	224,873	196,832	190,731	241,227	185,323
SEWERAGE & DRAINAGE REVENUE	413,526	485,152	768,501	829,047	900,434	982,410	1,581,221	3,380,958
SEWERAGE TAX	2,922,438	2,496,621	3,183,570	3,484,137	3,334,607	2,500,003	3,717,430	4,056,347
SUBSCRIPTION, MAINTENANCE & CONNECTION REVENUE	1,474,218	1,364,188	1,424,878	2,725,100	2,283,431	2,245,538	1,647,984	1,807,992
BANK INTEREST	10,117	20,669	4,828	491,076	518,579	384,788	530,618	128,218
OTHER REVENUE	353,279	898,901	753,784	787,815	347,865	198,094	538,671	16,298
<b>TOTAL REVENUE</b>	<b>19,851,311</b>	<b>20,648,184</b>	<b>22,603,644</b>	<b>24,591,848</b>	<b>24,562,232</b>	<b>21,922,097</b>	<b>24,353,687</b>	<b>27,839,585</b>
<b>EXPENSES</b>								
SALARIES AND WAGES	8,822,286	9,427,938	9,568,622	9,862,282	10,516,362	11,088,670	13,509,452	13,316,713
OPERATION AND MAINTENANCE EXPEN.	9,571,014	10,858,082	10,118,791	13,723,757	12,527,082	13,166,111	16,665,405	19,057,232
GENERAL & ADMINISTRATIVE EXPEN.	1,914,054	2,872,467	1,690,561	1,347,189	1,741,187	671,872	572,821	453,796
DEPRECIATION	2,682,168	5,623,864	6,023,687	8,688,849	11,163,228	15,379,082	21,879,801	22,332,086
INTEREST ON LOANS	3,271,870	4,460,654	4,380,944	5,432,765	7,544,785	8,888,825	7,490,219	11,838,784
<b>TOTAL EXPENSES</b>	<b>26,261,340</b>	<b>32,983,005</b>	<b>31,762,515</b>	<b>37,052,812</b>	<b>43,482,644</b>	<b>49,172,560</b>	<b>59,857,498</b>	<b>66,998,621</b>
EXCESS OF EXPENSES OVER REVENUE	0	0	0	0	0	27,250,463	35,503,811	38,919,023
DIFFERENCES IN RATE OF EXCHANGE	0	0	0	0	0	8,693,389	4,310,173	3,213,966
PREVIOUS YEARS ADJUSTMENTS	0	0	0	0	0	0	763,432	0
<b>DEFICIT FOR THE YEAR</b>	<b>6,410,029</b>	<b>12,394,821</b>	<b>9,158,871</b>	<b>12,460,964</b>	<b>26,787,389</b>	<b>35,943,862</b>	<b>38,059,552</b>	<b>42,373,023</b>
PRIOR YEARS DEFICIT	7,602,188	14,012,217	26,347,038	35,505,908	47,966,873	74,754,282	110,688,114	148,757,666
<b>ACCUMULATED DEFICIT</b>	<b>14,012,217</b>	<b>26,347,038</b>	<b>35,505,909</b>	<b>47,966,873</b>	<b>74,754,262</b>	<b>110,698,114</b>	<b>149,757,666</b>	<b>192,130,668</b>

WATER AUTHORITY OF JORDAN  
AUTONOMOUS PUBLIC DEPARTMENT  
AMMAN - HASHEMITE KINGDOM  
BALANCE SHEET AT DECEMBER 31  
\*\*\*\*\*

	1985	1986	1987	1988	1989	1990	1991	1992
ASSETS								
FIXED ASSETS								
COST	174,639,780	189,508,619	217,013,198	229,269,968	305,070,682	344,803,604	449,334,987	477,354,772
ACCUMULATED DEPRECIATION	10,504,876	16,128,740	22,152,337	28,339,186	39,992,414	55,371,496	84,489,149	106,821,244
NET BOOK VALUE	164,134,904	177,379,879	194,860,861	200,930,782	265,078,239	289,432,108	364,845,838	370,533,528
WORK IN PROGRESS OF PROJECTS	44,540,247	79,716,052	90,787,999	103,400,980	42,277,996	21,694,439	33,045,725	42,503,756
CURRENT ASSETS								
INVENTORIES	1,353,296	3,394,175	7,190,768	5,628,155	5,210,766	7,593,379	9,205,893	11,658,097
PREPAYMENTS ON LETTERS OF CREDIT	40,351	368,415	330,397	76,309	98,976	0	0	0
DEBTORS NET OF PROVISION	3,385,973	10,065,391	8,839,952	11,752,282	12,210,391	14,103,568	11,798,444	16,635,459
MISCELLANEOUS DEBTORS	1,761,813	2,370,881	225,647	1,012,895	336,901	876,832	975,974	2,486,375
CASH	188,822	284,376	192,320	3,212,025	2,959,846	4,424,065	4,081,583	4,099,596
TOTAL CURRENT ASSETS	11,729,655	16,513,229	16,787,084	21,083,665	20,786,880	26,987,744	26,121,891	34,779,527
DEFERRED CURRENCIES DIFFERENCES								
DIFFERENCES OF INTERNATIONAL LOANS REEVALUATION	0	0	0	0	90,902,393	91,394,298	0	0
MINUS THE AMOUNT ON THIS YEAR	0	0	0	0	0	0	0	0
NOTE - B	0	0	0	0	7,866,977	8,693,389	0	0
NET DIFFERENCES	0	0	0	0	83,035,416	82,700,909	0	0
TOTAL ASSETS	220,404,806	273,609,159	302,435,944	325,515,340	411,178,530	420,815,200	424,013,454	447,816,811
CONTRA ACCOUNTS								
LAND IN USE	852,298	852,298	852,298	852,298	0	0	0	0

	1985	1986	1987	1988	1989	1990	1991	1992
<b>EQUITY AND LIABILITIES</b>								
<b>EQUITY</b>								
CAPITAL	130,618,912	164,700,017	188,244,568	211,439,457	221,946,195	233,541,681	249,534,385	271,022,280
ACCUMULATED DEFICIT	14,012,217	26,347,033	35,505,909	47,966,873	74,754,232	110,608,114	149,757,666	189,890,655
NET CAPITAL	116,606,695	138,352,984	152,738,659	163,472,584	147,191,963	122,933,567	99,776,719	81,131,625
PROVISION FOR CONTINGENCIES	1,500,000	1,500,000	1,500,000	1,500,000	1,473,000	1,472,820	1,402,746	1,462,686
<b>LONG TERM LOANS</b>								
INTERNATIONAL LOANS	35,386,789	50,059,828	72,363,009	75,861,278	145,642,455	147,049,328	141,044,580	134,233,955
LOCAL LOANS	27,983,657	26,894,977	23,393,446	20,565,482	21,904,816	17,796,621	21,682,972	39,531,742
BONDS AND DEBTURES	17,150,000	17,150,000	15,150,000	15,150,000	15,325,000	15,325,000	21,325,000	21,325,000
TOTAL LONG TERM LOANS	80,520,446	103,104,805	110,906,455	111,576,760	182,872,271	180,170,947	184,052,552	195,090,697
<b>CURRENT LIABILITIES</b>								
CREDITORS	308,199	641,634	257,309	257,369	257,309	5,385,313	257,309	4,127,935
RETENTION OF CONTRACTORS	2,482,849	5,926,148	4,482,477	618,257	706,813	900,444	861,380	1,612,364
DEPOSITS	8,541,359	10,378,172	11,920,232	16,543,865	14,706,064	17,893,892	21,599,711	24,069,073
OVERDUE INSTALLEMENTS AND ACCRUED INTEREST ON LOANS	2,976,236	7,789,381	16,819,398	24,150,576	57,636,603	84,427,830	109,170,293	133,633,105
PENSION FUND	154,839	154,839	153,998	101,596	89,721	89,721	89,721	89,029
BANKS	7,302,183	5,753,341	3,617,355	7,294,303	6,254,856	7,624,666	6,743,023	6,702,197
TOTAL CURRENT LIABILITIES	21,776,665	30,643,575	37,260,830	48,965,996	79,641,326	116,327,866	138,721,437	173,371,816
<b>TOTAL EQUITY AND LIABILITIES</b>	<b>220,404,806</b>	<b>273,609,159</b>	<b>302,435,944</b>	<b>325,515,340</b>	<b>411,178,530</b>	<b>420,815,200</b>	<b>424,013,454</b>	<b>447,816,911</b>
<b>CONTRA ACCOUNTS</b>								
COMMITMENTS FOR LAND IN USE	852,298	852,298	852,298	852,298	0	0	0	0

SOURCE OF FUNDS	1985	1986	1987	1988	1989	1990	1991	1992
NET DEFICIT FOR THE YEAR	(6,410,029)	(12,334,921)	(9,158,871)	(12,480,964)	(26,787,309)	(35,943,852)	(39,059,552)	(42,373,662)
DEPRECIATION	2,682,188	5,633,864	6,023,597	6,690,949	11,153,228	15,379,092	20,117,653	22,332,095
CONTRIBUTIONS	NA	34,089,105	23,536,551	23,194,889	10,506,730	11,595,436	15,992,704	21,487,895
LONG TERM LOANS	NA	24,468,531	16,898,155	19,924,851	85,566,177	16,237,517	24,088,153	29,816,111
PROJECTS IN PROGRESS	NA	0	0	0	61,122,897	20,583,557	0	0
DIFERD CURRENCY DIFFERENCES						304,507	0	0
TOTAL SOURCE OF FUNDS	NA	51,846,679	37,299,432	37,345,625	141,561,651	28,186,297	30,138,958	33,503,112
APPLICATION OF FUNDS	1985	1986	1987	1988	1989	1990	1991	1992
SETTLEMENT OF INTERNATIONAL LOANS	NA	0	4,369,654	4,695,010	6,610,000	12,580,646	14,482,890	4,407,529
SETTLEMENT OF LOCAL LOANS	NA	1,886,372	2,696,651	5,589,596	3,660,666	4,108,195	5,723,650	14,370,437
SETTLEMENT OF BONDS & DEBENTURES	NA	0	2,000,000	9,000,000	4,000,000	2,150,000	0	0
FIXED ASSETS	NA	18,868,839	23,504,579	12,256,770	75,800,804	39,732,952	21,830,473	28,019,785
WORK IN PROGRESS	NA	35,175,805	11,071,947	12,612,894	0	0	11,351,288	9,458,031
PROVISION FOR CONTINGENCIES	NA	0	0	0	27,000	180	10,074	60
REEVALUATION L DIFFERENCES	NA	0	0	0	83,035,416	0	0	0
TOTAL APPLICATION FUNDS	55,931,016	43,842,831	43,842,831	44,154,210	173,136,766	58,871,973	50,388,382	56,255,842
DECREASE IN WORKING CAPITAL	4,084,337	6,943,399	6,943,399	6,808,585	31,572,115	30,485,676	23,259,424	24,992,743
CHANGES IN WORKING CAPITAL	1985	1986	1987	1988	1989	1990	1991	1992
INCREASE (DEC) IN CURRENT ASSETS								
INVENTORIES	NA	2,040,879	3,804,593	(1,570,613)	(417,389)	2,372,613	1,682,514	2,392,204
PREPAYMENT ON LETTERS OF CREDIT	NA	328,064	(38,018)	(252,089)	20,668	(88,976)	0	0
DEBTORS	NA	1,710,008	(1,255,429)	2,912,330	459,109	1,892,977	(2,304,924)	4,737,015
MISCELLANEOUS DEBTORS	NA	609,068	(2,145,234)	787,248	(875,904)	540,031	99,042	1,510,401
CASH	NA	95,554	(92,056)	3,019,705	(282,170)	1,494,219	(342,465)	18,018
INCREASE IN CURRENT ASSETS	NA	4,783,573	273,856	4,896,581	(896,785)	6,200,864	(885,853)	8,657,838
INC. (DEC) IN CURRENT LIABILITIES	1985	1986	1987	1988	1989	1990	1991	1992
CREDITORS	NA	(333,495)	284,325	0	0	(5,127,944)	5,127,944	(3,859,666)
CONTRACTORS RETENTIONS	NA	(3,433,209)	1,433,871	3,874,220	(88,556)	(189,631)	30,064	(750,984)
DEPOSITS	NA	(1,836,813)	(1,542,060)	(4,623,663)	1,837,931	(2,193,828)	(3,699,819)	(2,468,362)
LOANS OVERDUE INSTALLEMENTS	NA	(1,359,053)	(3,976,486)	(3,872,365)	(33,475,927)	(26,801,327)	(24,742,403)	(24,382,872)
LOANS ACCRUED INTEREST	NA	(3,454,092)	(5,053,532)	(3,459,812)	0	0	0	0
PENSION FUND	NA	0	841	52,402	11,875	0	0	632
BANKS	NA	1,548,842	2,135,988	(3,676,948)	1,039,447	(1,369,810)	881,643	40,828
INCREASE IN CURRENT LIABILITIES	(8,867,910)	(8,617,255)	(6,917,255)	(1,170,516)	(30,675,930)	(36,886,540)	(22,383,571)	(33,652,377)
DECREASE IN WORKING CAPITAL	(4,084,337)	(6,943,399)	(6,943,399)	(6,808,585)	(31,572,115)	(30,485,676)	(23,259,424)	(24,992,743)

	FIXED ASSETS									
	1985	1986	1987	1988	1989	1990	1991	1992		
LANDS	7,385,357	8,920,270	10,117,471	11,206,229	12,209,564	13,257,319	15,250,872	10,244,363		
BUILDINGS	6,981,562	7,048,452	7,360,090	9,685,093	9,732,909	9,812,538	9,812,538	10,059,373		
ACCUMULATED DEPRECIATION	783,749	1,016,445	1,293,028	1,575,815	1,965,232	2,352,552	2,745,053	3,143,197		
NET BOOK VALUE	6,197,813	6,032,007	6,116,062	8,109,288	7,767,677	7,459,986	7,067,485	6,916,176		
WELLS	10,530,103	12,151,914	13,115,936	14,228,359	14,957,542	15,859,075	18,025,201	20,927,918		
ACCUMULATED DEPRECIATION	919,261	1,722,223	2,589,853	3,536,003	4,715,111	5,954,910	7,313,064	8,841,642		
NET BOOK VALUE	9,610,842	10,429,691	10,526,083	10,690,356	10,242,431	9,904,165	10,712,137	12,086,276		
DISTRIBUTION NETWORK	118,372,495	131,739,445	134,326,939	137,189,951	208,265,922	244,159,097	343,702,037	357,153,364		
ACCUMULATED DEPRECIATION	3,994,696	7,037,725	10,334,030	13,762,614	20,622,223	31,036,229	55,140,085	72,326,616		
NET BOOK VALUE	114,377,799	124,701,720	123,992,909	123,427,337	187,643,699	213,122,868	288,562,552	284,826,748		
WATER STORAGE	3,321,904	3,351,727	3,556,012	6,872,071	6,879,238	6,930,435	6,931,731	7,225,363		
ACCUMULATED DEPRECIATION	138,344	295,345	272,982	410,424	822,748	1,235,502	1,651,328	2,067,232		
NET BOOK VALUE	3,183,560	3,146,382	3,283,030	6,461,647	6,056,490	5,694,933	5,280,403	5,158,131		
ALAZRAO PROJECT	14,684,433	14,684,433	14,684,433	14,686,706	14,750,406	14,750,406	14,750,406	14,750,408		
ACCUMULATED DEPRECIATION	1,797,291	2,164,972	2,531,483	2,898,822	3,406,090	4,076,106	4,668,122	5,256,136		
NET BOOK VALUE	12,887,172	12,520,061	12,152,950	11,788,084	11,264,316	10,674,300	10,082,284	9,494,268		
FURNITURE	282,480	295,528	302,225	947,348	957,848	960,406	960,406	964,783		
ACCUMULATED DEPRECIATION	117,007	146,560	176,732	271,487	368,202	461,987	558,027	654,503		
NET BOOK VALUE	165,473	148,968	125,493	675,861	591,646	498,419	402,379	310,278		
VEHICLES	1,877,154	2,135,158	2,143,558	2,143,558	2,791,560	2,791,560	2,913,160	3,612,150		
ACCUMULATED DEPRECIATION	1,110,359	1,537,391	1,968,103	2,143,557	2,143,557	2,582,291	2,791,550	2,913,160		
NET BOOK VALUE	766,795	597,767	177,455	1	648,003	229,269	121,610	698,000		
ELECTRIC GENERATORS	1,145,650	1,162,014	1,177,004	1,177,004	1,285,920	1,287,738	1,353,884	1,368,835		
ACCUMULATED DEPRECIATION	0	77,471	154,943	233,455	327,623	430,642	533,662	642,242		
NET BOOK VALUE	1,145,650	1,084,543	1,022,151	943,639	958,297	857,096	820,222	726,593		
PUMPS & OTHER MOTORS	644,596	1,927,204	2,031,545	2,342,420	3,094,857	3,552,092	4,026,322	7,642,173		
ACCUMULATED DEPRECIATION	0	84,543	212,253	368,489	602,735	916,922	1,272,132	1,674,764		
NET BOOK VALUE	644,596	1,842,661	1,819,292	1,973,927	2,492,122	2,635,170	2,754,190	5,967,409		
DRILLING MACHINERY & EQUIPMENT	1,418,726	1,416,726	1,416,726	1,592,169	1,592,170	1,609,495	1,654,654	3,313,289		
ACCUMULATED DEPRECIATION	0	94,453	188,949	283,444	394,896	506,348	619,014	734,840		
NET BOOK VALUE	1,416,726	1,322,273	1,227,777	1,308,725	1,197,274	1,103,147	1,035,640	2,578,449		
IRRIGATION & DAMS	3,211,732	3,300,666	3,324,314	3,324,314	3,326,258	3,720,272	3,763,380	3,883,235		
ACCUMULATED DEPRECIATION	0	80,293	162,810	245,918	329,028	412,182	505,189	599,274		
NET BOOK VALUE	3,211,732	3,220,373	3,161,504	3,078,396	2,997,232	3,308,090	3,258,191	3,284,061		





LOANS	INTERNATIONAL LOANS												
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	
EUROPEAN INVESTMENT BANK	0	0	0	0	0	0	0	0	0	0	0	0	0
K.F.W. NEW	0	0	0	0	0	0	0	0	0	0	0	0	0
INTERNATIONAL BANK LOAN (2425)	4,816,598	9,050,113	10,650,795	9,812,885	15,461,250	14,216,251	12,873,000	13,808,688	1,912,201	0	0	0	0
INTERNATIONAL BANK LOAN (2433)	1,155,800	7,970,209	10,371,424	9,651,869	16,275,000	15,052,500	13,520,000	12,110,000	12,873,000	0	0	0	0
INTERNATIONAL BANK LOAN (2219)	3,682,324	4,751,904	4,920,570	4,678,408	8,508,570	7,867,441	7,064,200	6,324,880	7,064,200	0	0	0	0
USAID LOAN 278K/23	5,305,000	5,106,901	4,800,401	4,617,401	7,551,800	7,275,375	6,861,400	6,522,100	6,861,400	0	0	0	0
USAID LOAN 278K/26	977,682	2,174,068	2,412,060	2,460,179	4,882,501	4,852,959	4,903,772	4,349,640	4,903,772	0	0	0	0
USAID LOAN 278K/28	2,803,900	4,891,484	6,056,629	6,720,488	12,845,675	12,292,975	11,647,043	11,196,113	11,647,043	0	0	0	0
K. F. W.	1,068,785	3,833,511	4,619,324	5,215,403	11,559,000	13,410,000	15,082,502	13,520,304	15,082,502	0	0	0	0
SAUDI FUND FOR DEVELOPMENT	4,673,401	4,972,707	3,420,657	3,193,657	4,682,078	4,189,860	3,655,847	3,185,369	3,655,847	0	0	0	0
ARAB FUND FOR ECONOMIC & SOCIAL	1,799,272	1,681,212	1,547,912	1,411,312	1,802,821	1,535,377	1,362,222	1,310,118	1,362,222	0	0	0	0
ARAB FUND FOR ECONOMIC & SOCIAL	408,014	658,152	628,552	575,552	900,330	804,375	772,723	642,493	772,723	0	0	0	0
ISLAMIC BANK FOR DEVELOPMENT	299,089	1,378,262	2,277,335	2,366,049	4,380,200	4,371,044	4,028,568	3,662,165	4,028,568	0	0	0	0
BRITISH FUND LOAN (514902)	1,573,435	1,465,981	1,347,900	1,235,900	1,810,840	1,984,322	1,899,704	1,532,350	1,984,322	0	0	0	0
BRITISH FUND LOAN (99397)	1,664,769	1,594,988	1,525,207	1,455,207	1,348,207	1,276,628	1,046,727	876,946	1,046,727	0	0	0	0
INTERNATIONAL DEV. ASSOCIAT(780)	3,201,354	2,971,232	2,892,837	2,668,987	2,928,328	2,786,385	2,254,460	2,077,248	2,254,460	0	0	0	0
INTERNATIONAL DEV. ASSOCIAT(385)	1,888,296	1,769,430	1,732,833	1,678,833	2,293,000	2,021,000	1,853,333	1,628,014	1,853,333	0	0	0	0
EUROPEAN INVESTMENT BANK	0	1,039,819	2,026,324	3,039,627	6,483,339	6,795,687	6,246,014	5,238,563	6,246,014	0	0	0	0
USAID LOAN 278/30	0	935,644	1,178,031	1,339,276	5,029,975	4,465,575	3,991,760	3,450,540	3,991,760	0	0	0	0
USAID LOAN 278/31	0	1,351,672	2,885,714	2,789,287	9,640,068	8,173,528	8,271,215	7,708,551	8,271,215	0	0	0	0
INTERNATIONAL BANK LOAN (2694)	0	1,921,359	7,034,951	8,642,024	19,172,019	21,770,963	20,881,891	21,055,101	20,881,891	0	0	0	0
SAUDI FUND FOR DEVELOPMENT 8/145	0	0	0	1,189,345	2,349,371	3,335,272	3,954,938	4,048,964	3,954,938	0	0	0	0
SAUDI FUND FOR DEVELOPMENT 4/871	0	0	0	701,608	1,407,622	1,454,862	2,372,917	2,428,132	2,372,917	0	0	0	0
EUROPEAN INVESTMENT BANK	0	0	0	0	615,712	2,170,659	2,016,123	1,717,781	2,016,123	0	0	0	0
TOTAL	35,388,789	59,050,628	72,893,009	75,861,278	145,642,455	147,049,326	141,044,580	134,233,955	141,044,580	0	0	0	0

LOANS	LOCAL LOANS												
	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	
MINI. OF FINANCE - SAO UDIAN LOAN	0	0	0	0	0	0	0	0	0	0	0	0	0
SOCIAL SECURITY CORPORATION	80337	0	0	0	0	0	0	0	0	0	0	0	0
SOCIAL SECURITY CORPORATION	320,000	160,000	0	0	0	0	0	0	0	0	0	0	0
BANK OF CITIES & VILLAGES DEV.	375,000	350,000	300,000	275,000	250,000	225,000	200,000	175,000	200,000	0	0	0	0
MINISTRY OF PLANNING	459,033	413,132	367,220	321,328	275,328	229,428	183,525	137,623	275,328	0	0	0	0
ARAB BANK - MINI. OF FINANCE	4,500,000	3,500,000	2,500,000	0	0	0	0	0	0	0	0	0	0
SYNDICATED LOAN	0	0	0	0	0	0	0	0	0	0	0	0	0
DOLLARS SYNDICATED LOAN	3,485,906	3,965,906	3,290,906	2,581,106	1,475,490	148,490	0	0	1,475,490	0	0	0	0
BONDS - FIRST ISSUE	6,000,000	6,000,000	5,405,400	4,800,800	4,195,100	3,600,600	2,400,400	1,211,200	4,195,100	0	0	0	0
BONDS - SECOND ISSUE	4,000,000	4,000,000	3,500,500	3,000,500	3,192,000	2,994,000	1,505,000	797,000	3,192,000	0	0	0	0
BONDS - THIRD ISSUE	3,925,371	4,000,000	4,000,000	4,000,000	3,600,000	3,201,600	2,802,700	2,014,500	3,600,000	0	0	0	0
HOUSING BANK	568,939	1,393,847	1,801,971	1,509,543	943,543	383,843	0	0	1,801,971	0	0	0	0
BANK OF CITIES & VILLAGES DEV.	500,000	500,000	184,310	184,310	184,310	79,630	0	0	184,310	0	0	0	0
BANK OF CITIES & VILLAGES DEV.	922,628	772,850	408,020	323,455	219,946	79,630	1,347	67,568	219,946	0	0	0	0
MINISTRY OF FINANCE	2,846,443	1,614,843	999,043	383,243	0	0	0	0	999,043	0	0	0	0
MINISTRY OF PLANNING	0	204,309	138,266	102,193	68,129	34,132	0	0	102,193	0	0	0	0
SYNDICATED LOAN	0	0	0	2,500,000	2,500,000	2,500,000	1,501,000	500,000	2,500,000	0	0	0	0
BONDS - FOURTH ISSUE	0	0	0	5,000,000	5,000,000	5,000,000	5,000,000	4,483,500	5,000,000	0	0	0	0
TOTAL	27,983,657	36,894,977	23,993,446	20,565,482	21,904,816	17,796,621	21,682,972	39,551,742	21,682,972	0	0	0	0

FILENAME=CASH92

FISCAL YEARS : 1982 , 1991 , 1990 , 1989 , 1988 , 1987 , 1986

(FROM CASH FLOW STATEMENTS)

**CASH FLOW**

DESCRIPTION	1986	1987	1988	1989	1990	1991	1992
INCOME SOURCES							
-> WATER REVENUE <-							
WATER CHARGE	15,194,181	13,591,848	15,019,486	15,924,136	14,882,047	18,880,393	17,674,016
RECONNECTION FEES	16,164	18,767	22,848	17,994	16,206	17,448	16,188
NEW CONNECTION FEES	586	732	348	0	0	0	0
METER CHARGE	178,670	250,539	398,865	423,958	338,753	410,581	597,609
LINE MAINTENANCE AND REPAIR	3,565	4,541	2,123	5,093	1,616	873	3,581
BANK INTEREST	1,190	3,378	14,381	275,983	136,190	912,907	123,368
CONTRIBUTIONS IN AID OF CONSTRUCTION	570,999	537,840	637,516	652,845	615,822	712,067	799,470
MISCELLANEOUS	682,646	603,473	502,427	250,639	248,221	315,249	226,706
ELECTRICITY	5,488	1,245	3,240	1,981	2,857	0	429
<b>TOTAL WATER REVENUE</b>	<b>16,571,399</b>	<b>15,082,082</b>	<b>16,891,239</b>	<b>17,552,529</b>	<b>16,241,912</b>	<b>20,649,518</b>	<b>19,441,427</b>
-> SEWAGE REVENUE <-							
CONNECTION FEES	1,039,342	1,501,206	2,099,474	1,606,278	1,853,840	1,135,871	900,948
SEWAGE USER CHARGE	873,708	850,033	731,070	788,873	759,577	910,130	2,238,125
CESSPOOL PUMPING CHARGES	29,326	32,758	29,981	24,426	22,811	23,681	26,045
SEWAGE TAX 3% OF PROPERTY VALUE	2,200,240	2,828,274	3,086,677	3,702,964	2,394,639	3,934,555	3,878,206
BANK INTEREST	512	1,449	6,163	122,093	57,737	125,791	52,873
CONTRIBUTIONS IN AID OF CONSTRUCTION	94,394	82,557	8,090	4,200	10,000	0	14,998
MISCELLANEOUS	101,916	115,243	168,763	69,707	59,003	94,950	61,387
<b>TOTAL SEWAGE REVENUE</b>	<b>4,339,439</b>	<b>5,411,490</b>	<b>6,142,118</b>	<b>6,378,541</b>	<b>4,957,607</b>	<b>6,224,978</b>	<b>7,171,582</b>
CUSTOMER DEPOSITS BALANCE (NOT ADDED)	0	1,308,473	3,574,872	(1,424,668)	3,318,399		
<b>TOTAL COMBINED REVENUE</b>	<b>20,910,837</b>	<b>20,473,552</b>	<b>22,743,351</b>	<b>23,931,070</b>	<b>21,199,519</b>	<b>26,874,496</b>	<b>26,613,009</b>
OTHER INCOME							
GOV CONTRIBUTIONS (MINISTRIES OF FINANCE)	18,999,896	10,492,767	21,351,384	6,673,496	6,500,000	15,284,342	19,169,595
GOV CONTRIBUTIONS (MINISTRIES OF PLANNING)	13,403,753	11,997,394	0	2,721,091	4,488,967	0	0
MINISTRY OF PLANNING DEBT BALANCE	0	0	0	0	180,752	33,268	0
FOREIGN LOANS	22,036,890	16,222,093	8,137,397	9,069,296	9,172,106	4,878,478	5,008,908
LOCAL LOANS	0	0	264,928	9,175,000	2,150,000	14,000,000	20,000,000
GRANTS	0	1,197,956	200,831	0	0	144,480	1,413,864
OTHER CONTRIBUTIONS	240,587	0	89,768	0	0	0	212,635
CUSTOMER DEPOSITS	360,582	1,908,473	3,574,872	0	3,318,399	3,608,006	2,396,801
HOUSING BANK LOAN FACILITIES	816,755	861,099	3,000,000	0	0	0	0
MINISTRIES OF FINANCE LOAN							
<b>TOTAL OTHER INCOME</b>	<b>55,860,559</b>	<b>42,079,782</b>	<b>36,619,181</b>	<b>25,437,883</b>	<b>24,799,284</b>	<b>38,161,209</b>	<b>55,833,767</b>
<b>ALL COMBINED INCOME (TOTAL)</b>	<b>76,771,396</b>	<b>62,553,334</b>	<b>59,362,532</b>	<b>48,853,663</b>	<b>45,998,803</b>	<b>65,035,705</b>	<b>82,446,774</b>

DESCRIPTION	1986	1987	1988	1989	1990	1991	1992
<b>OPERATION AND MAINTENANCE EXPENSES</b>							
PAYROLL	10,957,534	10,456,320	10,480,187	11,414,875	11,795,327	12,467,960	12,485,701
TRANSPORTATION CHARGES (FREIGHT)	34,723	30,186	34,959	30,326	19,913	0	0
TRANSPORTATION PAYMENTS (RELOCATION)	24,424	6,210	956	960	960	0	0
TRANSPORTATION ALLOWANCE	47,423	20,000	41,814	49,995	49,985	0	0
FIELD ALLOWANCE	435,973	100,000	103,346	176,510	149,985	0	0
RENTS	181,021	152,041	80,186	83,610	73,762	81,842	90,323
TELEPHONE AND TELEX AND POSTAL CHARGES	61,529	79,050	60,005	76,259	69,731	69,438	69,248
WATER	0	0	771	2,904	32,964	7,161	37,816
ELECTRICITY	8,284,476	7,226,327	10,724,767	9,264,173	4,098,908	17,781,433	8,319,353
FUEL (ALL KINDS)	1,679,390	1,374,649	1,823,954	1,197,522	853,527	1,089,839	946,411
FURNITURE, EQUIPMENTS, TOOLS	0	0	0	0	0	0	8,843
MATERIALS AND EQUIPMENT AND TOOLS	1,054	4,000	2,309	0	0	2,106,314	2,385,453
SUPPLIES	559,483	532,034	413,331	899,996	1,786,030	117,139	130,455
MISCELLANEOUS	961,755	983,761	1,057,888	1,199,543	759,708	798,562	1,010,622
<b>TOTAL OPERATION &amp; MAINTENANCE EXPE.</b>	<b>23,198,685</b>	<b>20,964,178</b>	<b>24,634,491</b>	<b>24,396,752</b>	<b>19,670,810</b>	<b>24,508,709</b>	<b>25,484,025</b>

DESCRIPTION	1986	1987	1988	1989	1990	1991	1992
<b>CONVERSION EXPENSES</b>							
SOCIAL SECURITY	17,308	11,911	9,974	9,530	4,990	1,046,473	17,903
REWARDS (BONUSES, ETC.)	0	0	13,278	0	1,584	9,158	15,375
SCIENTIFIC MISSION	343	0	27,595	21,113	12,885	29,327	5,176
CONTRIBUTIONS	4,219,857	2,999,368	6,014,213	3,956,387	3,770,957	3,762,585	4,481,800
INTEREST	0	0	0	0	0	0	1,813
OTHERS	0	0	0	0	0	0	0
<b>TOTAL CONVERSION EXPENSES</b>	<b>4,237,308</b>	<b>3,011,279</b>	<b>6,065,060</b>	<b>3,987,030</b>	<b>3,789,816</b>	<b>4,847,543</b>	<b>5,592,031</b>

DESCRIPTION	1986	1987	1988	1989	1990	1991	1992
<b>TOTAL O &amp; M AND CONVERSION EXP.</b>	<b>27,435,993</b>	<b>23,975,457</b>	<b>30,699,551</b>	<b>28,383,783</b>	<b>23,460,626</b>	<b>29,356,251</b>	<b>31,076,056</b>

DESCRIPTION	1986	1987	1988	1989	1990	1991	1992
<b>CAPITAL EXPENSES</b>							
PROJECTS FINANCED BY LOANS & GOV CONTRIBUTIONS	35,862,847	28,774,949	18,748,270	8,848,656	11,810,112	6,736,741	14,134,047
LOCAL CAPITAL EXPENSES	13,475,119	11,468,505	8,079,034	10,556,911	9,554,541	16,882,269	29,848,073
MINISTRY OF PLANNING DEBT BALANCE	0	0	0	0	1,040,113	1,521,282	2,319,124
PAYMENTS FOR MIN. OF FINANCE (BORROWMS)	0	0	0	307,040	0	0	5,212,635
<b>TOTAL CAPITAL EXPENSES</b>	<b>49,337,966</b>	<b>40,243,454</b>	<b>26,827,304</b>	<b>19,713,513</b>	<b>22,404,766</b>	<b>25,140,292</b>	<b>51,311,879</b>

DESCRIPTION	1986	1987	1988	1989	1990	1991	1992
<b>TOTAL OF ALL EXPENSES</b>	<b>76,773,650</b>	<b>64,218,911</b>	<b>57,526,854</b>	<b>48,096,295</b>	<b>45,865,384</b>	<b>54,496,543</b>	<b>82,387,905</b>
1991 BEGINNING DEFICIT	0	0	3,471,988	4,002,278	3,325,011	2,861,442	(2,861,442)

DESCRIPTION	1986	1987	1988	1989	1990	1991	1992
<b>TOTAL OF ALL EXPENSES</b>	<b>76,773,650</b>	<b>64,218,911</b>	<b>60,998,842</b>	<b>52,179,573</b>	<b>49,190,405</b>	<b>54,496,543</b>	<b>82,387,905</b>



付属資料 K ザルカ地区における実施済み  
プロジェクトの詳細



Zarqa branches and House connections Project

C1 - 56/90

Commencement Date : 25/11/90

Completion Date : 7/4/93

DESCRIPTION	UNIT	Length	Unit Price	Total amount JD
A - A <sub>3</sub> , 8" $\phi$ , Ductile Pipe - in earth	L.m	1268.55	15	19028.25
B - B <sub>1</sub> , 6" $\phi$ , Ductile Pipe - in earth	L.m	1626.2	20	32524.
B - B <sub>3</sub> , 6" $\phi$ , Ductile Pipe - in earth	L.m	532.25	15	7983.75
C - C <sub>1</sub> , 4" $\phi$ , Ductile Pipe - in earth	L.m	433.5	18	7803.00
C - C <sub>3</sub> , 4" $\phi$ , Ductile Pipe - in earth	L.m	71.5	14	1001.00
D - D <sub>1</sub> , 3" $\phi$ , Ductile Pipe - in earth	L.m	6442.8	15	96642.00
D - D <sub>3</sub> , 3" $\phi$ , Ductile Pipe - in earth	L.m	1553.85	10	15538.50
63 mm $\phi$ , Polyethylene (HDPE) - Road	L.m	23997.9	10	239979.
63 mm $\phi$ , Polyethylene (HDPE) - Sholder	L.m	13850.-	10	138500
63 mm $\phi$ , Polyethylene (HDPE) - eatth	L.m	44976.3	8	359810.4
32 mm $\phi$ , Polyethylene (HDPE) - Road	L.m	4379.35	9	39414.15
32 mm $\phi$ , Polyethylene (HDPE) - Sholder	L.m	2330.-	9	20970.-
32 mm $\phi$ , Polyethylene (HDPE) - earth	L.m	14430	7.5	108225
25 mm $\phi$ , Polyethylene (HDPE) - Road	L.m	4263.2	8	34105.6
25 mm $\phi$ , Polyethylene (HDPE) - Sholder	L.m	5070.-	8	40560
25 mm $\phi$ , Polyethylene (HDPE) - earth	L.m	9376.-	7	65632.-
8" D. I. P. Ductile from Pipe - Road	L.m	1447	20	28940.-
8" D. I. P. Ductile from Pipe - Road	L.m	483.05	20	9661.-
3" D. I. P. Ductile from Pipe - Road	L.m	45	15	675.-
1" G. S. P. Galvanized shel Pipe (exposed)	L.m	844.5	4.695	3964.920
¾" G. S. P. Galvanized shel Pipe (exposed)	L.m	9235.-	4.165	38463.775
½" G. S. P. Galvanized shel Pipe (exposed)	L.m	32937.-	3.675	121043.475

Zarqa branches and House connections Project

C2 - 57/90

Commencement Date : 18/11/90

Completion Date : 4/4/93

DESCRIPTION	UNIT	Length	Unit Price	Total amount JD
6" $\phi$ , Ductile Pipe - Road	L.m	961.5	15.75	15143.625
6" $\phi$ , Ductile Pipe - earth	L.m	243	12.56	3052.08
3" $\phi$ , Ductile Pipe - Road	L.m	1649.8	13.50	22272.30
3" $\phi$ , Ductile Pipe - earth	L.m	1940.1	11.250	21826.125
63 mm $\phi$ , HDPE (Polyethylene) - Road	L.m	37496	13.50	506196. -
63 mm $\phi$ , HDPE (Polyethylene) - Sholder	L.m	14214	13.50	191889. -
63 mm $\phi$ , HDPE (Polyethylene) - eatth	L.m	70971	12. -	851652. -
32 mm $\phi$ , HDPE (Polyethylene) - Road	L.m	2431. -	11.25	27348.75
32 mm $\phi$ , HDPE (Polyethylene) - Sholder	L.m	4333. -	11.25	48746.25
32 mm $\phi$ , HDPE (Polyethylene) - earth	L.m	13965. -	9.75	136158.75
25 mm $\phi$ , HDPE (Polyethylene) - Road	L.m	4604. -	8.25	37983. -
25 mm $\phi$ , HDPE (Polyethylene) - Sholder	L.m	9828. -	8.25	81081. -
25 mm $\phi$ , HDPE (Polyethylene) - earth	L.m	16790. -	6.75	113332.500
6" $\phi$ G. S. P (Galvonized) - exposed	L.m	346	4.995	1728.27
¾" $\phi$ G. S. P (Galvonized) - exposed	L.m	8250	4.430	36547.50
½" $\phi$ G. S. P (Galvcnized) - exposed	L.m	60674	3.910	237235.34
8" $\phi$ D. I. P (Ductile pipe) - Road	L.m	1623.80	19. -	30852.20
8" $\phi$ D. I. P (Ductile pipe) - earth	L.m	183.10	14.50	2654.95

Zarqa branches and House connections Project

C3 (90/58)

Commencement Date : 30/12/90

Completion Date : 8/ 3/93

(Quantities of Galvanized Pipes)

(m)

Zone No.	Exposed G. S. P			Burried G. S. P				
	(1/2" ) $\phi$	(3/4" ) $\phi$	1" $\phi$	1/2" $\phi$ - sholder	1/2" $\phi$ - earth	3/4" $\phi$ - sholder	3/4" $\phi$ - earth	
Zone A-1	2734.10	559.10	111.150	11.25	11.25	0.85	0.85	
Zone A-2	4553.10	999.75	115.20	6.95	6.95	14.95	0.55	
Zone A-3	2571.50	681.95	38.40	20.90	17.40	-	-	
Zone A-4	4774.90	784.20	126.25	11.70	08.00	9.00	9.00	
Zone A-5	3045.85	483.85	63.5	59.75	41.2	2.95	1.45	
Zone A-6	2176.80	575.65	74.40	44.90	36.9	13.5	1.85	
Zone B-1	2143.15	612.20	25.65	17.00	28.4	16.85	-	
Zone B-2	2085.05	902.10	70.75	49.25	20.75	11.85	1.00	
Zone B-3	2240.15	714.25	97.30	47.65	31.95	27.75	-	
Zone B-4	1324.70	568.80	120.45	24.00	-	11.40	2.00	
Zone B-5	1304.10	361.80	69.50	03.50	5.00	10.80	-	
Zone C-1	6246.30	1079.15	193.60	62.70	109.35	17.40	2.50	
Zone C-2	6114.85	1403.1	380.3	112.95	172.40	26.20	9.10	
Zone C-3	3866.5	1049.7	91.10	89.55	38.15	20.70	24.60	
TOTAL	45181.05	10775.6	1577.55	562.05	527.7	184.2	52.9	

POLYETHYLENE PIPE (HDPE)

C - 3 (58/90) (Lenght in m)

Area	63 mm $\phi$			32 mm $\phi$			25 mm $\phi$		
	Road	Shoulder	Earth	Road	Shoulder	Earth	Road	Shoulder	Earth
A	23769.05	10115.25	4716.45	1318.45	4312.55	1463.80	1920.40	7573.25	1200.10
B	8726.1	15484.55	418.00	845.5	3027.45	249.4	842.15	4763.25	202.8
C	12276.0	7009.5	13823.70	589.70	1158.25	2672.40	1708.90	2876.75	2739.35
TOTAL	44771.15	32609.30	18958.15	2753.65	8498.25	4385.6	4471.45	15213.25	4142.25

Diameter	on Road	Shoulder	Earth
12"	704.4	-	-
8"	2549.6	-	-
4"	1960.39	-	482.93
3"	3019.3	88.95	856.30

## 付属資料 L 収集資料リスト等

1. 収集資料リスト

2. 資料リスト



1. 収集資料リスト

事前調査団が収集した資料リストは次のとおりである。

番号	資料の名称	形態	判型	ページ数	部数	収集先名称 又は 発行機関
1	Review Of Water Resource Development And Use Jordan	報告書	A 4	300	1	WAJ
2	地図 1/250,000	地図	A 1 変形	1	1	
3	地図 1/50,000	地図	A 1 変形	4	1	Geographical Authority
4	General Lay Out For Water Mains ; Springs Wells And Reservoirs Executed ジョルダン国水道施設概略図 1/300,000	地図	A 0 変形	1	1	WAJ
5	Pumps Wells & The Main Distributions Water Lines In Zarqa ザルカ地区水道施設模式図	地図	A 0 変形	1	2	WAJ
6	Zarqa Water Distribution System And House Connection Plan 配管図(見本) 1/1,000	地図	A 0 変形	1	1	WAJ
7	下水道処理区域図	地図	A 3 変形	1	1	MWI
8	IMPLEMENTING JORDAN'S NATIONAL ENVIRONMENTAL STARATEGY	報告書 コピー	A 4	44	1	WAJ
9	UPGRADING AND EXPANSION OF THE WASTEWATER STABILIZATION POND SYSTEM AT AS - SAMRA	報告書	A 4	150	1	WAJ
10	Analysis of Jordanian Laws and Institutions	報告書 コピー	A 4	70	1	WAJ
11	ZARQA - RUSEIFA, WATER DISTRIBUTION, SEWERAGE AND STORMWATER SYSTEMS (F/S, DRAFT)	報告書 コピー	A 4	15	1	WAJ
12	環境に関する加盟国際条約一覧表 (アラビア語)	リスト	A 4	2	1	DOE
13	Economic and Social Development Plan 1993 - 97	報告書 原本	B 5	211	1	MOP
14	Water Authority Law	原本	B 5	26	1	WAJ
15	General Specifications for Water Mains & Distribution Systems & Appurtenances	コピー	A 4	38	1	WAJ
16	Inception Report ; Technical, Economic and Financial Feasibility Study For Wastewater Collection and Treatment Systems in the Greater Irbid Area	コピー	A 4	31	1	WAJ

WAJ ; WATER AUTHORITY OF JORDAN  
MWI ; MINISTRY OF WATER AND IRRIGATION  
DOE ; DEPARTMENT OF ENVIRONMENT

## 2. 資料リスト

- ・本報告書に記載されているものは除く。
- ・「有無」とは、当該資料がジョ国内に存在するか否かを示す。
- ・「存在場所」とは、もっとも容易に入手できる場所、保管されている場所を示す。

資料名	内容	有無	存在場所	備考
水資源に開発及び利用に関する報告書		有	JICA 図書館	Review Of Water Resources Development And Use Jordan Project No Sem.03/62/032 (EEC)
地図	1/250,000	有		
	1/50,000	有	Geographical Authority	等高線入り 1961年作成、その後部分的に修正
	1/2,500	有	WAJ	2m毎の等高線入り 調査対象地区の大部分についてある 1988年作成、その後修正
水道施設概略図	1/300,000	有	WAJ	ジョ国全域の水源、送水ルート、ポンプ場等の概略位置が示されている
水道施設模式図		有	WAJ	ザルカ地区の水源、ポンプ場、配水池等の模式図
配管図	1/2,500	有	WAJ	リハビリ完了地区についてのみある
設計基準	水道施設用	無		
地質図	1/50,000	有	National Resources Authority	
	1/100,000			
	1/250,000			
	1/500,000			
水文地質図		有	National Resources Authority	
空中写真	1/30,000	有	Royal Geographic Center	1992年撮影
National Atlas of Jordan (II)		有	JICA OFFICE	Hydrology and Agrohydrology, 1986
全国水資源M/P		有	WAJ	ドイツ援助によるレポート、水文地質図付き、1977
Meteorological Data Handbook		有	Meteorological Department	
Report on Brakish Groundwater in Jordan		有	WAJ	
Groundwater Quality Data in Jordan		有	WAJ	Technical Paper No. 53

資料名	内容	有無	存在場所	備考
Rainfall Data in Jordan		有	WAJ	Technical Paper No. 52 1980-85
Spring Flow Data		有	WAJ	Technical Paper No. 51 -85
排水水質データ	ザルカ川、工場、下水道	有	WAJ	WAJ. Labo. で定期的に検査
Archaeological Map of Jordan		有	Department of Land and Survey	
井戸台帳		有	WAJ, Zarqa Governorate	ザルカのものは未整理
土地利用図	1/25,000	無		
土地計画図	1/25,000	無		
人口分布図	1/25,000	無		
アズ・サムラ F/S レポート		有	JICA OFFICE	Draft Report, 1992
A National Environmental Strategy		有	Department of Environment	1991年制定
Analysis of Jordanian Law & Institution		有	JICA OFFICE	抜粋
排水基準	工場排水 家庭用水 ガス 騒音・振動	有	WAJ	未設定
		無	WAJ	未設定



## 付属資料 M ローカルコンサルタント等に関する資料

1. 資料M-1：ローカルコンサルタントへの見積り依頼書
2. 資料M-2：ローカルコンサルタント3社からの見積書
3. 資料M-3：ローカルコンサルタント3社の調査用資機材保有状況
4. 資料M-4：Royal Scientific Society への水質調査再委託費用



## ローカルコンサルタントへの見積り依頼書

## CONSULTING SERVICES FOR "THE STUDY THE IMPROVEMENT OF THE WATER SUPPLY SYSTEM FOR THE ZARQA DISTRICT IN THE HASHEMITE KINGDOM OF JORDAN"

## I. DEFINITIONS

It is understood that wherever the following terms appear in this document, they signify:

- (1) "The Study" means "The Study on the Improvement of the Water Supply System for the Zarqa District in the Hashemite Kingdom of Jordan".
- (2) "The Team" means the study team which contracted with Japan International Cooperation Agency (JICA).
- (3) "Employer" means The Team.

## II. INTRODUCTION

This document is aiming to provide the necessary information concerning consulting services (hereinafter referred to as "The Service") on some items in connection with The Study. Consultant shall submit a quotation of The Service to JICA Jordan Office.

## III. STUDY AREA

The Study area covers the Zarqa District (Zarqa, Rusaiifa, Shennuler Refugee Camp, Hashmeyeh, New Zarqa, Sukhna, Awajan), Pumping stations and Wellfields.

## IV. OBJECTIVES OF THE STUDY

The main objective of The Study is to define a program for the improvement and rehabilitation of Water Supply serving the growing service area in Zarqa Governorate, and thereby to improve living standards by providing an improved Water Supply System. The Study shall include the determination of all rehabilitation requirements to assure the adequate and safe operation and maintenance of the project and related works. This refers to physical requirements (equipments, materials, building, Reservoirs etc.) as well as personnel requirements and organizational and financial needs. The Study shall serve the needs of Zarqa population to the year 2015.

This overall goal will be met through the following objectives of The Service.

## V. OBJECTIVES AND SCOPE OF THE SERVICE

## 5-1 System Layout of the Existing Network.

The available drawings of the existing system of Zarqa Governorate are old and have never been updated. System layouts will therefore have to be drawn up from existing record drawings, as-built drawings from main-laying contracts, local knowledge of Water Authority staff and field exploration using Pipe-Locating Equipment and Spot-Chick Excavation. It should be noted that a new water distribution and house connection system has been implemented for the city of Zarqa and the "As-built drawings of system can be supplied directly from Water Authority of Jordan (WAJ).

The stages of system layout preparation shall include the following:

**Existing Drawings and Maps:** Obtaining the latest copy of the maps and drawings for the Project Area from the WAJ and official departments. It is the Consultant's responsibility to compare and update these maps and drawings to actual conditions, including the naming of main roads and other identifying features.

**System Maps:** Preparing drawings with a scale of 1:10,000 on A1 size paper to show the existing Water System facilities such as well fields, pumping stations, reservoirs, and transmission and primary pipe networks.

## 5-2 NETWORK ANALYSIS

Perform a network analysis of the existing water system by developing computerized modeling techniques to show the complex relationships between the network, water consumption, pressure levels, energy and flow rates.

An overall system network model will be prepared to include analysis up to supply points for each city and town. Also, a detailed distribution system network hydraulic analysis will be performed for communities with populations of 2,000 and above.

Collect hydraulic data and water demand information, calculate future demands and identify pressure extremes. Prepare water system network model using an internationally accepted computer software program which is totally suitable for use with the WAJ's IBM-Compatible PC computers. A copy of this software should be handed over to the WAJ. The minimum requirements of the software is shown in Annex 2. Calibrate model with tests. Evaluate system flexibility, optimize pumping schedules and source utilization, identify pipeline constructions, assess total hydraulic capacity, optimize pressure zones and study system deficiencies. Finally, prepare a report for the water system that will examine alternative mode of operation, identify potential savings, define optimum pumping schedules and recommend measures to reduce operating costs.

After the model development is finished, a user manual should be prepared to assist future users of the Zarqa network model. The model should be turned over to WAJ along with the necessary licenses, computer equipment, documentation and users manual.

## 5-3 UNACCOUNTED FOR WATER AND LEAKAGE CONTROL

Conduct study to investigate and quantify water which is either lost from trunk lines, reservoirs, and distribution systems due to leakage or is otherwise unaccounted for. The Study shall look into and assess

administrative regulations, procedures and current resources charged with control of unaccounted-for water (UFW). Based on the surveys in the selected pilot areas, recommend appropriate leakage control methods and prepare proposals for the expansion and development of the UFW Section in WAJ. The primary objective is to investigate the economics of improving the present program of controlling water system losses:

Collect information on present administrative procedures related to water system connections, registration of water meters, utilization of meters, accuracy of meters, meter reading frequency and billing and collection procedures.

Collect data on meter performance including source meters and meters within the pilot areas.

Check and evaluate unmetered public water services, unauthorized or illegal connections and under registration of revenue meters.

Select pilot areas to reflect typical conditions relating to the water system all over the Governorate. WAJ has selected the following areas in the Governorate from which the consultant shall choose at least five pilot areas:

Zarqa city center, Awajan, Rusaiifa city center, North Rusaiifa, Shennuler Camp, Hashmeyeh, Sukhna, North Azraq and Dhlail. Selection of the pilot area will depend on results of the water system network analysis conducted in item (2) above.

Provide the necessary specialized equipment to evaluate UFW in the pilot areas. They shall be handed over to WAJ in good conditions at the end of the contract free of charge. This shall include, but not limited to, the following:

- Personal computer (IBM compatible);
- Electronic listening devices;
- Leak noise correlators with Radio-Linked Amplifier;
- Pipe and service box locators;
- Water meters and meter testing equipment;
- Data loggers.

The "combined district and waste metering method" of investigation should be employed in the leakage surveys. As a result of the tests, it is necessary to compare the potential value of water saved against the cost of monitoring, detecting and remedying leaks of varying magnitude and complexity, and to employ the appropriate method of leakage control policy. Interim reports shall be produced by the consultant for each the pilot areas

as work proceeds. The reports shall describe the pilot area, leakage problems encountered, alternative remedial measures, recommended solutions and cost-benefit information. A final report shall be assembled and submitted at the conclusion of the project.

#### VI. SCHEDULE AND REPORTS OF THE SERVICE

- (1) Inception Report  
Ten (10) copies within one <sup>(1)</sup>/<sub>2</sub> weeks after the agreement.
- (2) Progress Report  
Ten (10) copies within one (1) month after the agreement.  
approval of Inception Report.
- (3) Draft Final Report  
Twenty (20) copies within two <sup>(2)</sup>/<sub>3</sub> months after the agreement.
- (4) Final Report  
Ten (10) copies within three <sup>(3)</sup>/<sub>3.5</sub> months after the agreement.

#### VII. DOCUMENT TO BE SUBMITTED

The consultant is expected to submit both technical and financial offers. The quotation shall be submitted to JICA Jordan Office by May 5th, 1994.

JICA'S ADDRESS: P. O. BOX 926355 Amman 11110 JORDAN  
TEL. 613581/2 FAX. 613583

In the quotation/following items shall be described.

##### 6-1 System Layout of the Existing Network

- (1) Required personnel of the consultant  
Field, qualification and Man · Month.
- (2) Cost  
Personal cost: Man · Month × Cost/Man · Month

Material cost:

Administrative cost:

Other cost:

##### 6-2 Network Analysis

Same as 6-1.

##### 6-3 Unaccounted for Water and Leakage Control

Same as 6-1.

##### 6-4 Installation of Water Meters

Material cost and installation cost of the following Ultra-sonic Watermeters.

*supersonic flow meter*

(US\$)

	Φ 300	Φ 400	Φ 500	Φ 600	<del>Φ 800</del>
Material Cost					
Installation Cost					

The Financial offer (the prices) will be kept confidential and shall be valid for (1.5) months without any commitments from both sides.

All cost of equipment and devices listed in the documents which will be handed to IAJ by the end of the study shall be exempted from duties, taxes and any other charges.

*vane wheel type flow meter*

	Φ 100	Φ 150	Φ 200		
Material Cost					
Installation Cost					

Computer software for hydraulic analyses

1. PC-based network analysis software package for computer modeling of water supply systems:
  - modeling flow level, pressure and energy
  - capable of using and analyzing real information flowing telemetry system
  - a comprehensive error trapping system to guard user in locating and identifying mistakes
  
2. Features of the programme
  - Interface to real time telemetry data and data loggers for simultaneous display of real data and model predictions
  - Extensive graphical analysis package for telemetry and logger data such that model results and real data are displayed simultaneously
  - Wide range of pump and valve controls reflecting actual conditions in the network
  - Sophisticated pump modeling features with integral tariff analysis for pump scheduling and modeling actual energy costs
  - Capability to model up to 1,000 pipes and 800 nodes
  - On-line display of the simulation as it proceeds with the capability to interrupt and view results so far
  - Chlorine residual modeling

**JAPAN INTERNATIONAL COOPERATION AGENCY**  
**( JICA )**

**CONSULTING SERVICES  
FOR THE STUDY FOR  
THE IMPROVEMENT OF  
THE WATER SUPPLY SYSTEM FOR  
THE ZARQA DISTRICT IN  
THE HASHEMITE KINGDOM OF JORDAN**

**FINANCIAL PROPOSAL**

**MAY 1994**

---

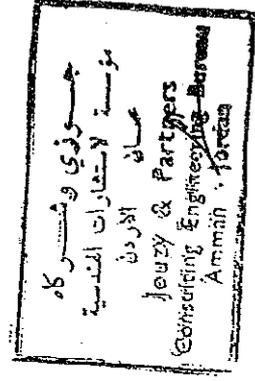
**CEB** Jouzy & Partners  
CONSULTING ENGINEERING BUREAU  
Amman - Jordan



FEES

6- Total Personnel and Expenses Costs

<u>Staff</u>		<u>m/m</u>	<u>Rate JD</u>	<u>Total JD</u>
Project Director	Dr. N. Jouzy	1	3,000	3,000
Project Manager	N. Tleel	6	2,500	15,000
System Layout leader	R. Sabella	6	1,200	7,200
Assistant System Layout	I. Tleel	6	600	3,600
Computer Specialist	K. Balqar	2	1,600	3,200
Hydraulic Analysis Model	H. Basha	3	2,500	7,500
Leakage Detection Expert	A. Douglas	1	10,000	10,000
Sr. Economist	M. Ismail	1	3,300	3,300
Leakage Detection Engineer	Ammari/Hamad	12	1,000	12,000
Technicians		24	500	12,000
Draftsman		12	400	4,800
Home Office Specialists & Support	Inglessis/Halaby Zabaneh	L.S.		6,000
<u>Expenses</u>				
Local Transport		L.S.		6,000
Printing, ...etc		L.S.		1,000
				-----
				94,600



Break down for the 3 Categories is as follows:

6-1 System Layout	L.S.	24,000 J.D.
6-2 Network Analysis	L.S.	21,000 J.D.
6-3 UFW & Leakage Control	L.S.	49,600 J.D.
		-----
Total		94,600 J.D.
		=====

Overhead and fringe benefits are included in the personnel rates as follows:

Fringe Benefits: Vacation, Medical Insurance (Sick Leave)  
Social Security.

Overheads: Running costs, management costs, head office and costs of proposals, financial costs, research and development costs.

Validity of Rates: Rates are Firm assuming studies started in 1994 .

Should the project be delayed beyond these dates then the rates will be revised by mutual agreement between the Employer and the Consultant.



### Schedule of Payments

For Lump Sum cost the following payment schedule is proposed:

- A) Advance Payment of 20% of the Lump Sum cost to cover the cost of mobilization.

The advance payment will be reimbursed by deducting 20% of each further payment until complete reimbursement. A bank guarantee will be provided in an amount equivalent to the advance payment.

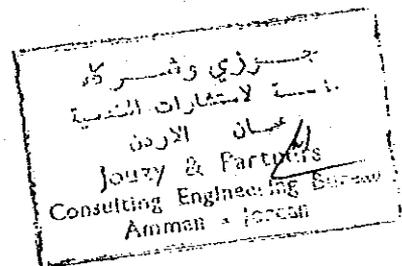
- B) Other payments will be made on a monthly payments of 15 percent upon submittal of a progress report  $6 \times 15 = 90\%$  Final Payment of 10 percent upon approval and submittal of Final Reports and Drawings.

Or any other payment schedule to be agreed upon.

- C) Procurement of Equipment

A provisional sum to be budgeted for the procurement of equipment. This is based on recent quotations of some of the items. Others are based on older quotations but updated.

The Employer will open the letter of credit for the procurement and arrange to pay upon request as agreed with the suppliers.



Provisional Sum (All items without customs duties)

A-	Computer Hardware/Software	Estimated	J.D. 8000
B-	Instrumentation & Equipment	Estimated	J.D. 92000
Total Provisional			J.D. 100000
C-	Fee 10% (see note)		J.D. 10000
Total			J.D. 110000
D-	Contractor*		J.D. 30000

**NOTE**

Owing to the wide range of equipment which may be provided under this Contract, the cost of equipment to be provided and which WAJ would need is included in the above provisional sum.

This section shows the various-budgets based on the equipment which could be procured. In order to avoid delays and to guarantee Employer that the best and most feasible equipment is provided, the Consultant proposed that the equipment be provided on a cost plus fee basis.

The fee would cover the Consultant cost for preparation of specifications, consultants, analysis and evaluation of proposals, presentation to the Employer and decision negotiations, preparation of orders, expedition, control, processing of payments etc.

The fee is set up at Ten Percent of each payment related to the supply and delivery of such equipment.

We feel that WAJ might wish to unify the makes for easy maintenance and especially if WAJ already has similar equipment the Consultant will get quotes for similar makes and order what WAJ decides upon.

We believe that the purchase of these or any others on a cost plus fee basis is to best interest of the Employer.

\* Provisional Sum for a contractor to carry out all excavation work, back filling, and other tasks associated with locating pipes and valves, installing valves, meters and other equipment. A special contract agreement will be made for details.

Installation of Water Meters.

Material cost and installation for the Ultrasonic water meters of all sizes of dia 300 to dia 600 is JD 8000 per water meter.

Material cost of Vane wheel type flow meters is

dia 100 mm	JD	500
dia 150 mm	JD	700
dia 200 mm	JD	1000

Cost of installation for the Vane wheel meters is 30% of cost.



## SCHEDULE OF ACTIVITIES

ACTIVITY	MONTHS				
	1	2	3	4	5
<p>1- <u>PHASE I : SYSTEM LAYOUT</u></p> <p>COLLECTING DOCUMENTS AND PREPARATION OF DRAWINGS</p>					
<p>2- <u>PHASE II : NETWORK ANALYSIS</u></p> <p>MODEL PREPARATION, ESTIMATION OF PARAMETERS</p> <p>MODEL CALIBRATION</p> <p>ANALYSIS</p> <p>REPORT</p>					
<p>3- <u>PHASE III : UFW AND LEAKAGE CONTROL</u></p> <p>PILOT AREAS    INSTALMETERS</p> <p>                  OPEN RUN</p> <p>                  STEP TESTING</p> <p>                  LEAK LOCATION</p> <p>                  REPAIR</p> <p>                  REPORT</p>					

JAPAN INTERNATIONAL COOPERATION AGENCY



*Study the Improvement of  
the Water Supply System for  
the Zarqa District in  
the Hashemite Kingdom of Jordan*

**Financial Proposal**

MAY 1994



مركز الإستشارات الهندسية  
CONSULTING ENGINEERING CENTER

P.O.Box 8180-Telax 23489 CENTER JO-Amman-Jordan



**Consulting Engineering Center**  
(Sajdi & Partners)



مركز الاستشارات الهندسية  
(سجدي وشركاه)

Ref.: P49/94

Date: 18/5/1994

Japan International Cooperation Agency  
P.O.Box 926355  
Amman - Jordan

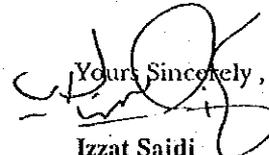
**Project** : *Study the Improvement of the Water Supply System for the Zarqa District*  
**Subject** : *Financial Proposal*

Dear Sirs ,

It is our pleasure to submit our financial proposal in rpsone to your kind invitation seeking consultancy services for the reference project.

CEC will dedicate its efforts and resources for the successful completion of the required services.

We would appreciate the opportunity to be of service to you and we look forward to your favourable consideration of our proposal. Should you require any clarification or additional informations , please do not hesitate to contact us.

Yours Sincerely ,  
  
**Izzat Sajdi**  
Vice President  
CEC

RK/aa

1.1 Personnel

Position Name	Charge Rate (J. D.) J.D.	Data Collection		Network Analysis		Unaccounted Water		Total	
		Duration MM	Total Cost (J.D.)	Duration MM	Total Cost (J.D.)	Duration MM	Cost J.D.	Duration MM	Cost J.D.
Project Director (Izzat Saïdi)	2500	0.5	1250	0.5	1250	0.5	1250	1.5	3750
Project Manager (M.A. Ghani)	2200	1.5	3300	1.5	3300	1	2200	4	8800
Design Engineer (Qasem Nazzal)	2000	1.5	3000	1.5	3000	1	2000	4	8000
Design Engineer (Mohammed Salem)	1800	1	1800	1.5	2700	0.5	900	3	5400
Design Engineer (Mazen Nuri)	1600	1.5	2400	0.5	800	1	1600	3	4800
Mechanical Engineer (Malnoum Barghoutli)	1600	0.25	400	0.25	400	0	0	0.5	800
Electrical Engineer (Maher A.Ali)	1600	0.25	400	0.25	400	0	0	0.5	800
Data Collection Eng. (Khaled Saïd)	900	1.5	1350	1.5	1350	1	900	4	3600
Hydraulic Specialist (Dr. A. Al Salhi)	1800	0.25	450	1.5	2700	0	0	1.75	3150
Quantity Surveyor (Majdi Hambali)	1100	0.25	275	0.5	550	0.5	550	1.25	1375
Expert Technician BIWATER	7056	0	0	0	0	0	0	1	7056
Technician (5 Staff)	650	7.5	4875	5	3250	7.5	4875	20	13000
Workman (10 Staff)	350	15	5250	10	3500	15	5250	40	14000
Surveying (2 teams)	2500	3	7500	2	5000	2	5000	7	17500
Drafting (3 Staff)	600	4.5	2700	3	1800	2	1200	9.5	5700
Typing	350	1.5	525	1.5	525	1	350	4	1400
<b>TOTAL</b>		<b>40</b>	<b>35475</b>	<b>31</b>	<b>30525</b>	<b>33</b>	<b>26075</b>	<b>105</b>	<b>99131</b>

MM : Man - Month.

J.D. : Jordanian Dinars

MISCELLANEOUS

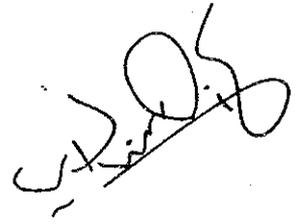
JD

1.2	Reproduction	2000
1.3	Communications (Fax, Mail & Phone)	500
1.4	Transportation	1500
	Sub - Total	4000
1.5	<u>Equipments :-</u>	
1	Personnel Compute (IBM compatible)	4500
5	Electronic Listening Devices	4906
5	Leak Noise Correlators with Radio-Linked Amplifier	63061
5	Pipe and Service box locators	2211
5	Water Meters and Meter Testing Equipments	16260
5	Data Loggers	7140
1	Software	11125
1	<u>Supersonic Flowmeter:-</u>	
	Material Cost	39312
	Installation Cost	2948
1	<u>Van Wheel Flowmeter :-</u>	
	Material Cost	1158
	Installation Cost	632
	Sub - Total	153242



FINANCIAL SUMMARY

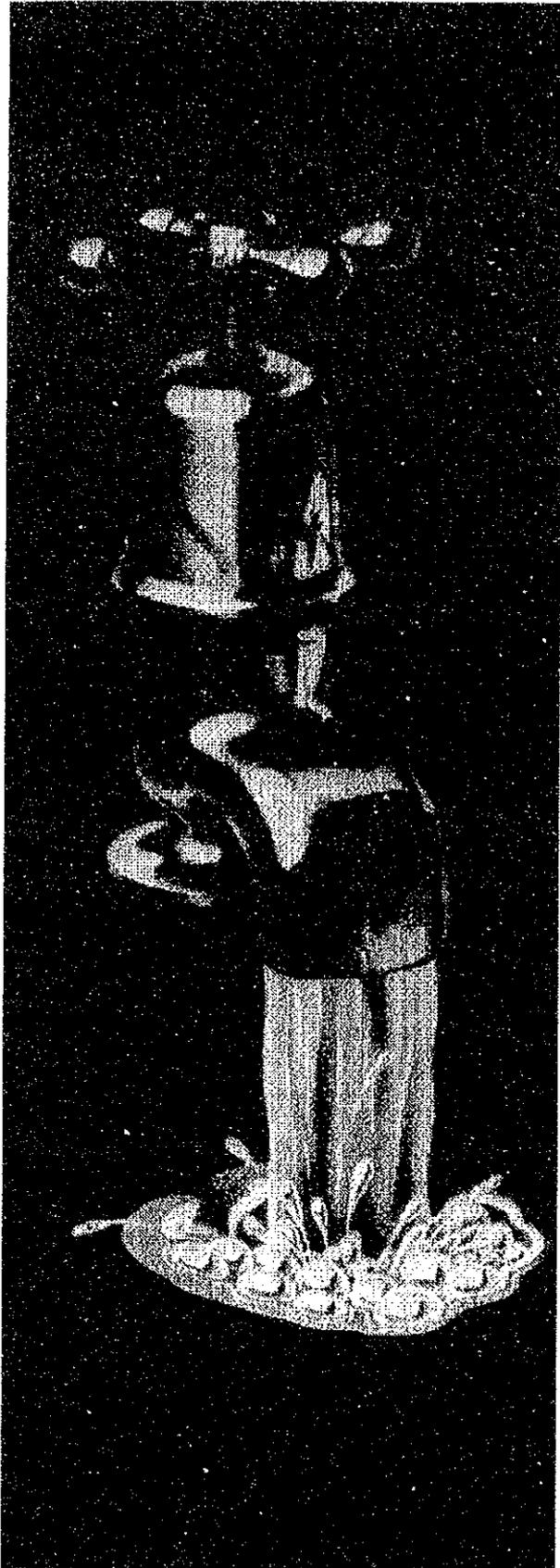
Data Collection	35475
Network Analysis	30525
Unaccounted Water	26075
Miscellaneous	4000
Equipments	153253
<u>Total Project Cost</u>	JD <u>249328</u>



**WATER ANALYSIS  
ZARQA DISTRICT  
EXECUTION SCHEDULE**

**Figure 4.1**

ACTIVITY	M O N T H				
	1	2	3	4	5
<u>System Layouts of existing network .</u>					
Update the layouts of existing network .	▨				
Preparing drawings and record drawings, scale 1:10,000 .					
<u>Network Analysis .</u>					
Network analysis of existing network, simulation of the behavior of the distribution system .		▨			
Identifying poor quality pipework caused by internal corrosion .			▨		
Optimizing planning (pumping schedules, water sources, network) .				▨	
Assisting in UFW-section .			▨		
Evaluate future water demand and simulation of future network .			▨		
Develop and hand over computer software suitable for use on microcomputers of WAJ .					▨
<u>Unaccounted - for water (UFW) and leakage control .</u>					
Leakage Surveys .				▨	
Economic studies for leakage control .				▨	
Determination of the most economic method of leakage control .					▨
<u>Optimization of System .</u>					
Optimization studies, alternative operations for each pressure zone and for the overall water system .				▨	
Recommendations concerning more sophisticated on-line computer solutions and automatic control .				▨	
<u>Rehabilitation of System .</u>					
Identifying parts of the system which need rehabilitation .					▨
System layouts of the existing and the proposed facilities, scale 1:10,000 .					▨



**JICA**

CONSULTANCY SERVICES  
STUDY FOR

**IMPROVEMENT OF  
WATER SUPPLY SYSTEM  
FOR  
ZARQA DISTRICT**

**FINANCIAL PROPOSAL**

**ARABTECH-JARDANEH**  
CONSULTING ENGINEERS & ARCHITECTS

MAY 1994

**ARABTECH-JARDANEH**  
CONSULTING ENGINEERS & ARCHITECTS

P. O. Box 9532 Amman, Jordan  
Tel. 827167 Fax. (952-6)824532  
Telex. 21705 Raoteen

REF. : J.E./02/0022/ 1117  
DATE : 18.5.1994

Messrs.: JICA  
P.O. Box 926355  
Amman 11110, Jordan

**Project:** The Study for the Improvement of Water Supply System  
For the Zarqa District

**Subject:** Financial Proposal

Dear Sir,

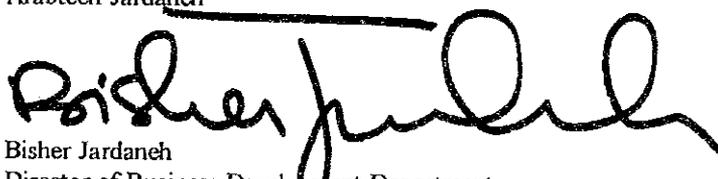
We are pleased to enclose herewith our "Financial Proposal" for the above mentioned project.

We trust you will find our proposal responsive and reasonable and assure you that if awarded the project we will be worthy of the trust and confidence you have put in our firm.

Looking forward to hearing from you, we remain.

Faithfully yours,

Arabtech-Jardaneh

  
Bisher Jardaneh  
Director of Business Development Department

**A JOINT VENTURE FIRM OF ARABTECH CONSULTING ENGINEERS & MOHAMMAD A.R. JARDANEH & PARTNERS**

**FOUNDERS:** Mohammad A. R. Jardaneh, Ibrahim A. Abu Ayyash, Tala't I. Kawalit, Bisher M. Jardaneh

**DIRECTORS:**

Mohammad A. R. Jardaneh, BSc Mech. Eng.  
Bisher M. Abu Ayyash, MSc Civil Eng.  
Tala't I. Kawalit, BSc Arch. Eng.  
Khaled M. Fakhri, MSc Civil Eng.  
Bisher M. Jardaneh, MSc Civil Eng.

**ASSOCIATES:**

Ibrahim H. Amer, BSc Elect. Eng.  
Adnan B. Issa, BSc Civil Eng.  
Wafiq S. Hameed, Dip. Arch. Eng.  
Ahmed A. Abu Zaid, Dip. Mech. Eng.

Zaid S. Hameed, BSc Civil Eng.  
Yousif N. Alsharrah, BSc Civil Eng.  
Amjad J. Al-Sayid, MSc Struct. Eng.  
Sulaiman J. Al-Jumayl, BSc Arch. Eng.

# **FINANCIAL PROPOSAL**

**ARABTECH - JARDANEH**  
**CONSULTING ENGINEERS & ARCHITECTS**

**PROJECT THE STUDY FOR THE IMPROVEMENT OF WATER SUPPLY SYSTEM FOR THE ZARQA DISTRICT**  
**DATE: 18 MAY 1994**

**5. RECAP**

CATGE	A-J	MW	TOTAL
	JD	JD	JD
2 PROFESSIONAL EFFORT	110,674	162,460	263,134
3.1 DOCUMENTATION	4,183		4,183
3.2 O.S TRAVEL		5,225	5,225
3.3 LOCAL TRANSPORTATION	16,300		16,300
3.4 COMMUNICATION	4,000		4,000
3.5 ACCOMMODATION		11,400	11,400
4.1 TESTING EQUIPMENT			108,384
4.2 COMPUTER			2,660
4.3 SOFTWARE			55,000
TAX (ON FEES)		17,521	17,521
TOTAL	135,157	186,606	
GRAND TOTAL			488,797

**TOTAL FEES : FOUR HUNDRED EIGHTY EIGHT THOUSAND SEVEN HUNDRED AND NINTY SEVEN JORDANIAN DINARS**

**ARABTECH - JARDANEH**  
**CONSULTING ENGINEERS & ARCHITECTS**

PROJECT **THE STUDY FOR THE IMPROVEMENT OF WATER SUPPLY SYSTEM FOR THE ZARQA DISTRICT**  
 DATE : 18 MAY 1994  
 RUN: 2

**2. PROFESSIONAL EFFORT**

A. ARABTECH JARDANEH									
POSITION	NAME	RATES @ 20%		MANAG- MENT MM	SYSTEM LAYOUT MM	NETWORK ANALYSIS MM	UFW & LEAKAGE MM	TOTAL MM	AMOUNT JD
		TO WAJ (Man/Month) BASIC	RATE						
								0.00	0
Project Manager		800	1,628	12.00				12.00	19,541
Office/Design Engineer		600	1,221		13.06	4.78		17.84	21,784
UFW Supervisor		600	1,221				7.00	7.00	8,549
Field Engineer		500	1,018		6.53	8.98		15.51	15,788
W.D Engineer		500	1,018				7.00	7.00	7,124
Technician		250	509		4.41	8.98	21.00	34.39	17,499
Survey Crew *			2,500		2.78	1.39		4.18	10,408
Draftsman		340	772		4.90			4.90	3,782
Data Clerks (4 No.)		300	691			8.98		8.98	8,202
TOTAL Man Month Input / Stage		MM		12.00	31.67	33.10	35.00	111.78	
TOTAL Amount / Stage		JD		19,641	35,562	29,212	26,360	110,674	
<b>GRAND TOTAL</b>									<b>110,674</b>

\* Includes Surveyor + 2 Chainmen + 1 Labour + Material + Equipment( Transport Included In Expenses )

B. MONTGOMERY WATSON									
POSITION	NAME	RATES @ 1.1		MANAG- MENT MM	SYSTEM LAYOUT MM	NETWORK ANALYSIS MM	UFW & LEAKAGE MM	TOTAL MM	AMOUNT JD
		TO WAJ (Man/Month) BASIC	RATE						
Network Analysis Splst (J)			8628			9.00		9.00	76,725
Database Specialist (UK)			5500			1.00		1.00	5500
Senior UFW Specialist (J)			13200				1.50	1.50	19600
Senior UFW Specialist (U)			11550				0.50	0.50	5775
UFW Specialist (J)			6380				7.00	7.00	44,660
TOTAL Man Month Input / Stage		MM		0.00	0.00	10.00	9.00	19.00	
TOTAL Amount / Stage		JD		0	0	82,225	70,236	152,460	
<b>GRAND TOTAL</b>									<b>152,460</b>

**3. EXPENSES**

3.1 DOCUMENTATION							
ITEM	QNT	BINDING	A4	A3	B.P.A1	SEPIA	
Cost / Unit	JD	0.000	0.035	0.065	0.500	3.500	
Inception Report	10+3	1	50				
Progress Reports	10+3	1	100				
Draft Final	10+10+3	1	150				
Final Report	10+3	1	150				
Updating Drwg-Draft	10+10+3				160		
Updating Drwg-Final	10+3				160		
Drawings-Draft	10+10+3				20		
Drawings-Final	10+3				20		
Sepla	1					160+20	
Total Quantity		62	7350	0	6480	160	
Amount - JD		56	257	0	3,240	630	<b>4,183</b>

### 3.2 O.S TRAVEL

STAGE	Qty	Unit	Unit Rate	Total	Remarks
Air Fares UK-JO-UK	5	No.	935	4,675	
Travel Expenses	5	No.	110	550	
<b>Total / Stage</b>				<b>5,225</b>	

### 3.3 LOCAL TRANSPORTATION

STAGE	DAYS		Unit Rate	Total	Remarks
SYSTEM LAYOUT	147		17	2,450	JD 400 / MONTH
NET WORK ANALYSIS	196		17	3,287	JD 400 / MONTH
UFW	110		17	1,833	JD 400 / MONTH
MW Staff	625		17	8750	JD 400 / MONTH
<b>TOTAL CARS</b>				<b>16,300</b>	

### 3.4 COMMUNICATION

TEL, FAX & DHL				4,000	
----------------	--	--	--	-------	--

### 3.5 ACCOMMODATION

MW STAFF	MM		Unit Rate	Total	Remarks
Network Analysts Splet (J)	9.00		600	5,400	FURN. APPARTMENT
Senior UFW Specialist (J)	1.50		1,200	1,800	HOTEL
UFW Specialist (J)	7.00		600	4,200	FURN. APPARTMENT
<b>TOTAL ACCOMMODATION</b>				<b>11,400</b>	

## EQUIPMENT

### 4.1 TESTING EQUIPMENT

ITEM	QUANTITY	UNIT RATE	TOTAL - JD
ELECTRONIC LISTENING EQUIPMENT	1	2,366	2,366
LEAK NOISE CORRELATOR (incl RADIO LINK AMPLIFIER)	1	16,698	16,698
PIPE LOCATOR	1	5,288	5,288
SURFACE BOX LOCATOR	2	181	362
WATER METERS (PERMANENTS) - 150 mm	2	1,071	2,143
WATER METERS (PERMANENTS) - 100 mm	3	737	2,212
WATER METER TESTING EQUIPMENT	1	14,611	14,611
DATA LOGGERS (incl PRESSURE TRANSDUCER)			
SINGLE CHANNEL (PRESSURE ONLY)	30	1,531	45,920
DUAL CHANNEL (PRESSURE + FLOW)	10	1,879	18,785
<b>TOTAL TESTING EQUIPMENT</b>			<b>108,384</b>

ALL ABOVE EQUIPMENT ARE EXEMPTED FROM TAXES, DUTIES AND ANY OTHER CHARGES

### 4.2 COMPUTER

ITEM	QUANTITY	UNIT RATE	TOTAL - JD
PC, IBM COMPATABLE 486/33 MHZ 4 MB RAM 120 MB HARD DISK 2 FLOPPY DRIVES	1	2,650	2,650
<b>TOTAL COMPUTER</b>			<b>2650</b>

### 4.3 SOFTWARE

ITEM	QUANTITY	UNIT RATE	TOTAL - JD
STONER (SINGLE USER)	1	56,000	56,000
<b>TOTAL SOFTWARE</b>			<b>56000</b>

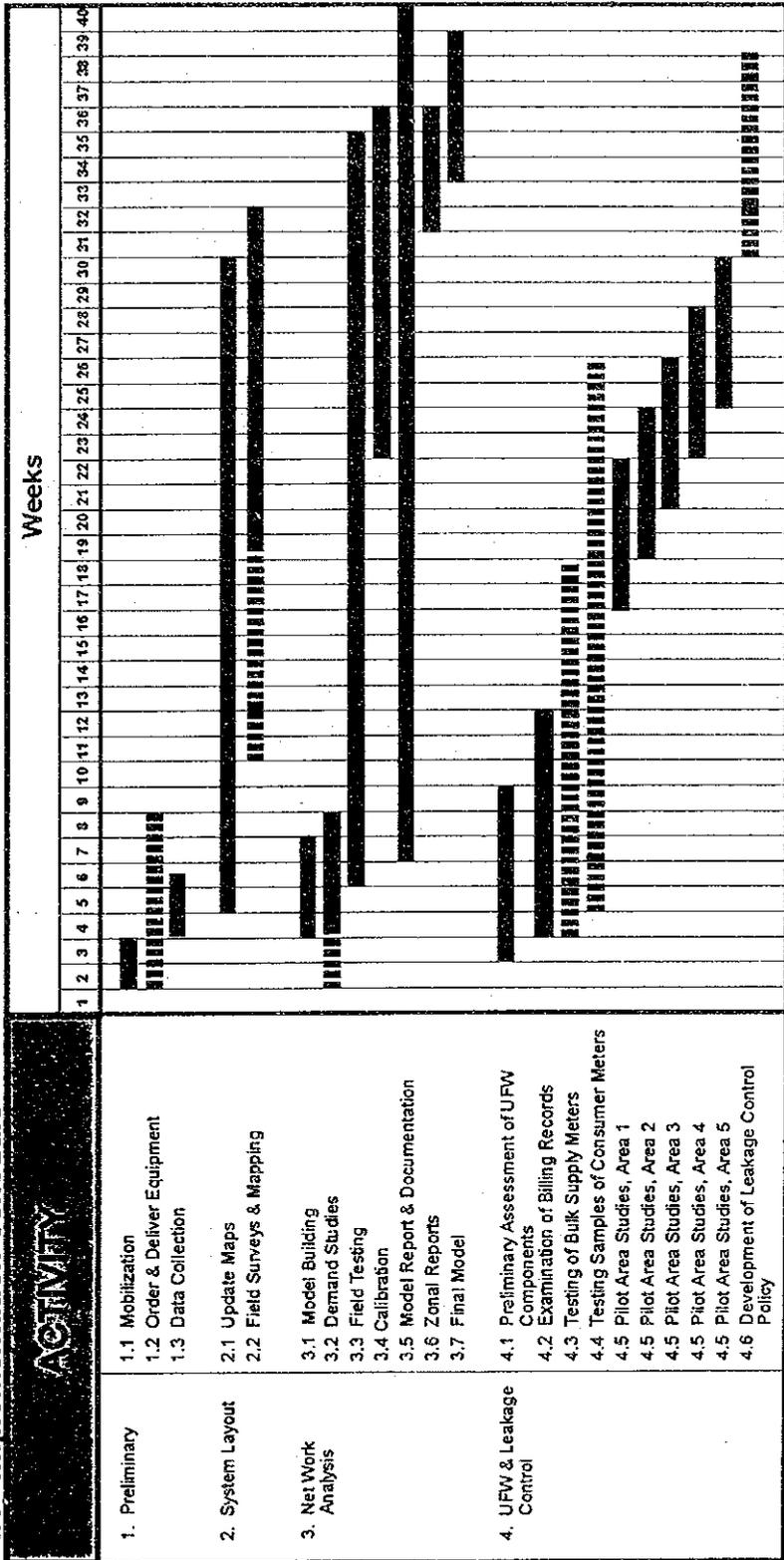
## EQUIPMENT

All equipment are exempted from Jordanian Duties, taxes and any other charges

EQUIPMENT SCHEDULE	UNIT COST ( J. D. )
1- Electric Listening Equipment 1 No. Sewerin Aquaphon	2,380
2- Leak noise correlator ( include radio link amplifier) 1 No. Palmer Microcarr 4	16,800
3- Pipe locator 1 No. Radiodetection RD600	5,320
4- Surface box locator 2 No. Radiodetection RD312	182
5- Water meters (permanent) Kent Helix 3000    2 No. 150 mm 3 No. 100 mm	1,078 742
6- Water meter testing equipment 1 No. Kent Test Station 15/40	14,700
7- Data loggers (include pressure transducer) 30 No. Single channel ( pressure only) Spectrascan 1L 10 No. Dual channel( pressure+ flow ) Spectrascan 2L	1,540 1,890

# Study for the Improvement of Water Supply System for Zarqa District

## 4.1 Implementation Schedule



Submission of Report

Sign of Agreement

Notice to Proceed

Commence Work



**JOUZY & PARTNERS**  
CONSULTING ENGINEERING BUREAU  
P. O. BOX 9112 — AMMAN, JORDAN



**جوزي وشركاه**

مؤسسة الاستشارات الهندسية  
ص.ب : ٩١١٢ - عمان - الأردن

الرقم : ج ٤/٥٧٤٦/٢٢  
التاريخ : ١٩٩٤/٧/٣٠

الوكالة اليابانية للتعاون الدولي  
عمان / الأردن

الموضوع: مشروع تطوير شبكة مياه الرمثاء

اشير الى كتابكم رقم ٩٤/١٨٧ تاريخ ١٩٩٤/٧/٣٠ وارقنق طيه  
النمادح المطلوب شعبنتها امليس ان تصكم في الوائت المناسب .

ونتفضلوا بقبول فانق الاحترام . . .

جوزي وشركاه  
مؤسسة الاستشارات الهندسية

QUOTATION OF EQUIPMENT(2) If your firm possesses each equipment listed below please fill c to e and if not d to f.

a. PURPOSE OF THE STUDY	b. NAME OF EQUIPMENT	c. If your firm possesses the equipment, mark (✓) and describe number and specification of item. If not, go to d to f.		d. SPECIFICATION	e. NUMBER OF UNITS	f. UNIT PRICE (US\$)	g. TOTAL PRICE (US\$)	h. MANUFACTURER	i. NUMBER OF DAYS REQUIRED FOR DELIVERY
		✓	NUMBER						
1. MEASURE- MENT OF AMOUNT OF DISTRIBUTED WATER	1. PORTABLE SUPERSONIC FLOWMETER			1. DIAMETER OF THE PIPE $\phi$ 50-500mm * including installation	2 Nos.	8000	16000*	Sparling A500	90 days
2. INVESTIG- ATION OF LEAKAGE	1. ELECTRIC LISTENING DEVICES			Fuji Leak noise detector HG-10 with Amplifiers	2 sets	1632.-	3264.-	Fuji Tecom Inc.	90 days
	2. LEAKAGE DETECTOR			Fuji Leak noise correla- tor LC-2100	2 sets	17474.-	34948.-	Fuji Tecom Inc.	90 days
	3. LEAK NOISE CORRELATOR (INCLUDE RADIO LINK AMPLIFIER)			Fuji ONTAN, Model PL-130 with standard accessories	1 set	5790.-	5790.-	Fuji Tecom Inc.	90 days
	4. PIPE LOCATOR			Fuji Metal Locator F-90 with standard accessories	1 set	890.-	790.-	Fuji Tecom. Inc.	90 days
	6. DATA LOGGERS			Celia Logger and Ancillaries	20.	1000	20000	Celia	90 days

*Janey & Partners*

11/62/077  
C. 6. 1. 1. 1.

別紙 2  
J. S. Jay & Partners

QUOTATION OF EQUIPMENT(2) : Every consulting firm is required to fill this form.

PURPOSE OF THE STUDY	NAME OF EQUIPMENT	SPECIFICATION	NUMBER OF UNITS	UNIT PRICE(US\$)	TOTAL PRICE(US\$) F.O.B.	MANUFACTURER	NUMBER OF DAYS REQUIRED FOR DELIVERY
1. MEASUREMENT OF AMOUNT OF DISTRIBUTED WATER	1. SUPERSONIC FLOWMETER (PERMANENT)	1. DIAMETER OF THE PIPE $\phi$ 400mm including installation	2 Nos.	8000	16000	Sparking A500	90 days
	2. VANE WHEEL FLOWMETER	2. DIAMETER OF THE PIPE $\phi$ 150mm Vane wheel "	2 Nos. 2 Nos.	700 210	1400 420	Kent Helix	90 days
	3. INSTALLATI- ON COST OF ABOVE TWO				\$ 1,700,000		



**Consulting Engineering Center**  
(Sajdi & Partners)



مركز الاستشارات الهندسية  
(سجدي وشركاه)

Ref. : P49/94  
Date : 27/7/1994

Japan International Cooperation Agency  
P.O. Box 926355  
Amman - Jordan

**Project :** *Study the Improvement of the Water Supply System  
for the Zarqa District*  
**Subject :** *Quotation and details of Equipment*

---

---

Dear Sirs,

Please find enclosed the requested prices and details for the equipment necessary for the investigation of Leakage, and for measurement of water quantity, as requested by your letter dated 20/7/1994.

The given equipment prices are net prices at source and subject to change.

Should you have any clarification, please do not hesitate to contact us.

*Sincerely yours,*

**Izzat Sajdi**  
Vice President  
CEC.

MS/na.

**QUOTATION OF EQUIPMENT (1) : If your firm possesses each equipment listed below please fill c to e and if not d to i**

A. PURPOSE OF THE STUDY	B. NAME OF EQUIPMENT	C. IF YOUR FIRM POSSESSES THE EQUIPMENT MARK (✓) AND DESCRIBE NUMBER AND SPECIFICATION OF THEM. IF NOT GO TO D TO I		D. SPECIFICATION	E. NUMBER OF UNITS	F. UNIT PRICE (US\$)	G. TOTAL PRICE (US\$)	H. MANUFACTURER	I. NUMBER OF DAYS REQUIRED FOR DELIVERY
		✓	NUMBER						
1. Measurement of amount of distributed water	1. Portable Supersonic Flowmeter			1. Diameter of the Pipe Ø 50 - 500mm	4	14000	56000	KDG Mobrey Sparling U.K.	75
	2. Investigation of Leakage	1. Electronic Listening Devices				5	1425	7125	Biwater U.K.
2. Leakage Detector					-	-	-		-
3. Leak Noise Correlator (Include Radio Link Amplifier)					5	17410	87050	Biwater U.K.	75
4. Pipe Locator									
5. Surface Box Locator					5	1600	8000	Silentec Ltd. Canada	75
6. Data Loggers					5	2070	10350	Biwater U.K.	75

Σ T = 16,250,000  
/ 1000000

**QUOTATION OF EQUIPMENT (2) : Every consulting firm is required to fill this form**

PURPOSE OF THE STUDY	NAME OF EQUIPMENT	SPECIFICATION	NUMBER OF UNITS	UNIT PRICE (US\$)	TOTAL PRICE (US\$)	MANUFACTURER	NUMBER OF DAYS REQUIRED FOR DELIVERY
1. Measurement of amount of distributed water	1. Supersonic flowmeter (Permanent)	1. Diameter of the pipe Ø 400mm	1	13000	13000	KDG Morbrey Sparling U.K.	75
	2. Vane Wheel flowmeter	2. Diameter of the pipe Ø 150 mm	1	550	550	KDG Morbrey Sparling U.K.	75
	3. Installation cost of above two		-	900	900	-	-
					£1 14 450 (14450000)		

# ARABTECH-JARDANEH

---

Ref. : JE 02/ 0022 / 1196  
Date : 4.8.1994

JICA JORDAN OFFICE  
P.O. Box 926355  
Amman - Jordan

**Subject: Zarqa Water Network Development**

Dear Sir;

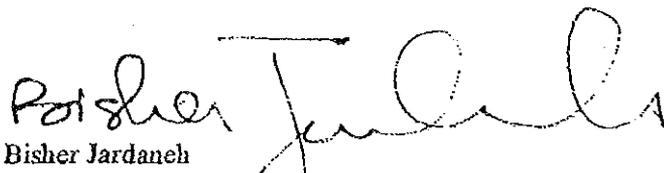
In reference to your letter Ref. 187/94 dated 20.7.1994. We are pleased to attach herewith the filled equipment details forms.

We are also pleased to inform you that we were able to lactate an alternative network analysis software EPANET which is very powerful and cheaper than the suggested STONER. This software is widely used in USA and our associates Montgomery Watson have helped to develop it.

If you require further information do not hesitate to contact us.

Yours Faithfully;

Arabtech - Jardaneh

  
Bisher Jardaneh  
Director of Business Development Dept.

A JOINT VENTURE FIRM OF ARABTECH CONSULTING ENGINEERS & MOHAMMAD A.R. JARDANEH & PARTNERS

FOUNDERS:

DIRECTORS:

ASSOCIATES:

EXPLANATION OF EQUIPMENT: If your firm possesses each equipment listed below please fill C to E, and if not, D to F. 別紙 1

A. PURPOSE OF THE STUDY	B. NAME OF EQUIPMENT	C. If your firm possesses the equipment, mark (✓) and describe number and specification of them. If not, go to d to f.		D. SPECIFICATION	E. NUMBER OF UNITS	F. FOB PRICE / UNIT (US\$)	G. TOTAL PRICE (UK £)	H. MANUFACTURER	I. NUMBER OF DAYS REQUIRED FOR DELIVERY
		✓	NUMBER						
1. MEASUREMENT OF AMOUNT OF DISTRIBUTED WATER	1. PORTABLE SUPERSONIC FLOWMETER ULTRASONIC			1. DIAMETER OF THE PIPE $\phi$ 50~500mm	1	£7500 Sterling	7500	TOKYO KAIKI UFP-1000	90
2. INVESTIGATION OF LEAKAGE	1. ELECTRIC LISTENING DEVICES	✓	1	FISCHER PORTABLE GROUND MICROPHONE (£120 per month)					
	2. LEAKAGE DETECTOR		0			£350	350	FUJI FS6-78	90
	3. LEAK NOISE CORRELATOR (INCLUDE RADIO LINK AMPLIFIER)		1	PALMER MICROCORR 4 (£1600 per month)					
	4. PIPE LOCATOR		1	RADIO DETECTION RDC400 PXL (£350 per month)					
	5. SURFACE BOX LOCATOR		1	SCHONSTEDT GA-52C MAGNETIC LOCATOR (£70 per month)					
	6. DATA LOGGERS		30	SPECTRASCAN MICROLOG 2					
	EXCL. PRESSURE TRANSDUCERS		35	SPECTRASCAN MICROLOG, 1L/2L/					

Aradtech-Jarrah

別紙 2

QUOTATION OF EQUIPMENT(2) Every consulting firm is required to fill this form.

PURPOSE OF THE STUDY	NAME OF EQUIPMENT	SPECIFICATION	NUMBER OF UNITS	FOB UK UNIT PRICE(US\$)	TOTAL PRICE(US\$)	MANUFACTURER	NUMBER OF DAYS REQUIRED FOR DELIVERY
1. MEASUREMENT OF AMOUNT OF DISTRIBUTED WATER	1. SUPERSONIC FLOWMETER (PERMANENT)	1. DIAMETER OF THE PIPE $\phi$ 40mm	2	£ 2000	2156 JD	ABB - KENT MAGMASTER	90
	2. VANE WHEEL FLOWMETER	2. DIAMETER OF THE PIPE $\phi$ 150mm		1078 JD		ABB-KENT HELIX 3000	
	3. INSTALLATION COST OF ABOVE TWO						

Royal Scientific Societyへの水質調査委託費用

ROYAL SCIENTIFIC SOCIETY

Services Unit Rates-1993

Water and Soil Division

Biological Analysis:

No.	Tests	Unit	Abbr.	Rate (JD/Test)
1	Total Heterotrophic Bacterial Count.....	CFU/mL	THBC	16.00
2	Total Coliform Count (Presumptive).....	MPN/100ml	TCC	20.00
3	Total Coliform Count (Confirmed).....	MPN/100ml	TCC	30.00
4	Total Fecal Coliform Count.....	MPN/100mL	TFCC	20.00
5	Chlorophyll (a).....	ug/L	Chl.a	13.50
6	Algae Type.....	-	AT	17.00
7	Algae Type & Count.....	Cells/mL or Units/mL	AT&C	20.00
8	Pathogenic Bacteria, each.....	CFU/100ml.	P.B	27.00
9	Nematodes.....	E/L	N	33.00
10	Fungus.....	(+ve) or (-ve)	FG	20.00

**Royal Scientific Society**  
 Environmental Research Centre  
 Water and Soil Division  
 P.O.Box 925819  
 Amman - JORDAN  
 Phone: 844701 - Fax: 844806  
 Tlx. 21276

Physical & Chemical Analysis:

No.	Tests	Unit	Abbr.	Rate (JD-Test)	No.	Tests	Unit	Abbr.	Rate (JD-Test)
1	Leg. Hydrogen Concentration.....	SU	pH	1.50	28	Total phosphorus.....	mg/L	T-P	15.00
2	Electrical Conductivity.....	us/cm	EC	1.50	29	Cyanide (Direct).....	mg/L	CN	9.00
3	Temperature.....	C	T	1.00	30	Cyanide (Distillation).....	mg/L	CN-dis	30.00
4	Dissolved Oxygen (Probe Analysis).....	mg/L	DO	3.00	31	Chemical Oxygen Demand.....	mg/L	CO <sub>2</sub>	20.50
5	Dissolved Oxygen (By Titration).....	mg/L	DO	7.50	32	Biochemical Oxygen Demand.....	mg/L	BOD	22.50
6	Carbon Dioxide.....	mg/L	CO <sub>2</sub>	7.50	33	Potassium Permanganate Value.....	mg/L	PV	10.00
7	Bicarbonate.....	mg/L	HCO <sub>3</sub>	7.50	34	Methylene Blue Active Substances, Detergents.....	mg/L	MBAS	15.00
8	Chlorine.....	mg/L	Cl <sub>2</sub>	3.00	35	Fat Oil and Grease (Gravimetry).....	mg/L	FOG	15.00
9	Hydrogen Sulfide (Colorimetry).....	mg/L	H <sub>2</sub> S	3.00	36	Fluoride.....	mg/L	F	7.50
10	Color.....	PCU	Col.	3.00	37	Turbidity.....	mg/L	Cl	7.50
11	Turbidity.....	NTU	Turb.	3.00	38	Bromide.....	mg/L	Br	12.50
12	Acidity.....	mg/L	Acid.	7.50	39	Sulfate.....	mg/L	SO <sub>4</sub>	7.50
13	Alkalinity.....	mg/L	Alk.	7.50	40	Boron.....	mg/L	B	12.00
SOLIDS:					41	Sample Digestion for metal analysis (For one sample).....	-	SD	25.00
14	Total Dissolved Solids.....	mg/L	TDS	8.00	42	Metals Analysis (By AAS), each.....	mg/L	M	8.00
15	Total Suspended Solids.....	mg/L	TSS	8.00	43	Total Organic Halogens (By Coulomat).....	ug/L	TOX	30.00
16	Total Volatile Solids.....	mg/L	TVS	8.00	44	Polychlorinated Biphenyls, in transformer oil.....	ug/L	PCBS	36.00
17	Total Volatile Suspended Solids.....	mg/L	TVSS	8.00	45	Phenols (Total by Colorimetry).....	ug/L	Ph.	20.00
18	Total Fixed Solids.....	mg/L	TFS	8.00	46	Phenols (10 Compounds by GC/FID).....	ug/L	Ph.	70.00
19	Total Fixed Suspended Solids.....	mg/L	TFSS	8.00	47	Trihalomethanes (GC/HECD).....	ug/L	THMs	50.00
20	Calcium.....	mg/L	Ca	7.50	48	Chlorinated Pesticides (11 Compounds by GC/ECD).....	ug/L	CP	130.00
21	Magnesium.....	mg/L	Mg	7.50	49	Polycyclic Aromatic Hydrocarbons (16 Compounds by GC/FID).....	ug/L	PAHs	100.00
22	Total Hardness (as CaCO <sub>3</sub> ).....	mg/L	TH	7.50	50	Petroleum Aliphatics (total and representative individual compounds by GC/FID).....	ug/L	PATC	100.00
23	Ammonia.....	mg/L	NH <sub>3</sub>	7.50	51	Distilled Water (JD/L).....	-	DW	1.00
24	Nitrite.....	mg/L	NO <sub>2</sub>	7.50	52	Deionized Water (JD/L).....	-	DZW	2.00
25	Nitrate.....	mg/L	NO <sub>3</sub>	9.00					
26	Total Nitrogen (Kjeldahl).....	mg/L	T-K-N	24.00					
27	Phosphate.....	mg/L	PO <sub>4</sub>	7.50					

A. Other Abbreviations:

CFU/mL= Colony Forming Unit per mL, mL = milliliter, MPN=Most Probable Number, E/L = Eggs per Liter.  
 SU= Standard Unit, us/cm= Microsiemens/centimeter, C=Degrees centigrade, mg/L= milligram per liter, PCU= Platinum Cobalt Unit,  
 NTU= Nephelometric Turbidity Unit, u=Micro, ug/L = microgram/liter, L= Liter, AAS=Atomic Absorption Spectroscopy, JD= Jordan Dinar.  
 GC = Gas Chromatography, FID = Flame Ionization Detector, ECD = Electron Capture Detector, HECD= Hall Electrolytic Conductivity Detector.

B. Remarks:

Min. No. of samples for (GC) analysis = 3; otherwise the rate will triple for analysis of only one sample.  
 Rates do not include collection of samples, evaluation of results and report writing. If requested; extra cost will be added.

C. Rate could be reduced for sizable & continuous work.



付属資料 N ローカルの価格等に関する資料



1. タイピスト  
400JD/月
2. 人 夫  
200JD/月
3. 車 輛：資料N-1を参照のこと
4. 複写機：資料N-2を参照のこと
5. パソコン：資料N-3を参照のこと
6. 管網解析用ソフトの例：資料N-4を参照のこと

## Transjordan Trading Co., L.L.

Mitsubishi Motors Corp. Distributors



MESSRS JICA STUDY TEAM  
AMMAN - JORDAN

OFFER NO.: 149-94  
DATE: 9.5.1994

ATTN: MR. SAEIKE

AS PER YOUR FAX REF. NO. 2359 PLEASE FIND HEREUNDER OUR OFFER.

## QTY DESCRIPTION

- 1 MODEL 1993 MITSUBISHI PAJERO 4 DOORS 4WD, 3000CC. GLS (V43WGNXL) SEMI - HIGH ROOF WAGON OF JAPANESE ORIGIN. LEFT HAND DRIVE  
ENGINE: 3000CC. 6 CYLINDER, PETROL, STEERING POWER, TRANSMISSION: 5 SPEED MANUAL+REVERSE SUPER SELECT 4WD  
WHEEL BASE: 2725 MM G.V.W: 2500KG. KERR WEIGHT 1930 KG.  
SEATING CAPACITY: 7SEATS INCLUDING DRIVER,  
MAX OUT PUT: 148 PS/RPM 5000 BATTERY: 12 VOLTS  
FUEL TANK CAP: 92 LITRES, FUEL SYSTEM: ECI MULTI,  
CLUTCH: SINGLE DRY PLATE WITH HYDRAULIC ACTUATION  
HEAVY DUTY SUSPENSION: FRONT: INDEPENDENT DOUBLE WISH-BONE & TORISON BAR REAR: 3-LINK & COIL  
LTD SLIP DIFFERENTIAL, REMOTE CONTROL VARIABLE SHOCK ABSORBERS  
BRAKES BOOSTER VACUM 8"+ 9" FRONT: VENTILATED DISC 15" REAR: DRUM IN DISC  
TYRES: FRONT & REAR 31-10.5/R15, REAR SLEEP, FRONT SEAT BELTS, FRONT SEATS HEADRESTS, ELECTRIC CONTROL DOOR MIRRORS, DIGITAL QUARTZ CLOCK, AM/FM ETR WITH RADIO CASSETTE STEREO MOTOR ANTENNA, REAR WINDOW DEMISTER, AIR CONDITIONER FRONT W/HEATER REAR PINZLE HOOK, SPARE TIRE COVER, SPARE FUEL TANK AND CARRIER, SIDE STEPS, HALOGEN HEADLAMPS BLUE TINTED GLASS, SUSPENSION SEAT, HEAD LAMP WASHERS, CENTER DOOR LOCK & POWER WINDOWS, REAR INTERMITTENT WIPER, REAR HEATER, TACHOMETER, MULTI METER. SUNROOF (SLIDING TYPE),  
OVERALL DIMENSIONS  
LENGTH 4735 MM WIDTH 1785 MM HEIGHT 1880 MM

PRICE: JD.20500.000 EACH UNIT (TWENTY THOUSAND FIVE HUNDRED JORDAN DINARS).  
WITHOUT CUSTOMS DUTY FEES.  
WITHOUT REGISTRATION, LICENSING AND INSURANCE FEES.  
OUR SAID PRICE DOES NOT INCLUDE ANY SALES TAX WILL OCCURE LATER.

DELIVERY PERIOD: 5-7 DAYS FROM DATE OF RECEIVING YOUR CONFIRMED APPROVAL, AND EXEMPTION PERMIT FOR CUSTOMS AND PAYMENT.

VALIDITY OF OFFER: 10 DAYS FROM DATE OF THIS OFFER.

PAYMENT: CASH.

TRANSJORDAN TRADING CO. L.L.C.

Tel. 62233 - 645402  
618177 - 618178

TELEX: 22190 TITCO JO  
CABLE ADR TITCO AMMAN, FAX: 962 - 6 - 649385

P.O. BOX 129  
AMMAN, J11118 - H.K. OF JORDAN



شركة التجهيزات المكتبية العالمية  
International Office Suppliers



Ref. 8414/94

May 8, 1994

Messrs. Jica Study Team  
Attn. Mr. Saeike  
Amman-Jordan

Dear Sir,

It is our great pleasure to inform you that Konica Business Machines won the coveted Manufacturer of the Year Award for 1992 from the National Office Dealers Association in the USA, by winning six gold and three silver medals in nine categories.

That is proof that Konica works as hard as its copiers!

Konica's full range of copiers meets the demands of end users, no matter how diverse their copying needs. In fact, Konica have consistently been rated number one in reliability and consumer tests.

We are pleased to enclose catalogue, specifications and special features of KONICA 115 Z KONICA 1020 . We believe will offer full support for your growing office needs.

For any further information please do not hesitate to contact us.

Sincerely yours,  
INTERNATIONAL OFFICE SUPPLIERS

Ghassan Bitar  
Account Executive

---

**Specifications and Options for Konica U-Bix 115Z**

1. **A3-Size Fixed Platen**

The A3-Sized Platen remains stationary , while the cover is hinged to accommodate thick originals such as books or other three dimensional objects .

2. **Book Copy Mode**

Allows to copy a catalogue or a book producing precise copy of one page of the open book then copying the second page on a separate sheet .

3. **Frame Erasure and Fold Erasure**

Copying from open books usually leaves distracting gradations of gray to black around the edges and down the middle , The Frame and Fold Erasure functions to solve this problem with the touch of one button .

4. **Image Shift**

Problems of reading multipage documents , hole punching and binding are put to an end with the Image Shift function which moves the margin of the copy 10mm to the right .

5. **Zoom Enlargement / Reduction**

Konica 115Z offers a wide enlargement and reduction range from 50% to 200% of the original in precise 1% increments , along with a preset of the four most common ratios .

6. **Automatic Exposure (AE)**

Each document is analysed to obtain optimum reproduction , even with difficult-to-copy originals , thanks to sophisticated photo sensors of the Konica 115Z AE system .

7. **Mono Color Copying**

The optional Mono - Color copying adds attention - grabbing color to important charts . Self-contained , quick to change mono-color toner units that come in red , blue or green .

8. **Single - Sheet Bypass Paper Feed**

To copy on special papers such as OHP films , labels , offset masters , size from B4 to postcard-sizes.

And to allow you to manually make two-sided or two-sided copies.

9. **Multi-Sheet Bypass Tray**

You can now copy onto letterheads , transparencies and even on labels using the increasingly popular Multi-Sheet Bypass copy surface that takes up to 50 sheets .

10. **Cassette Modules**

You can expand Konica 115Z paper capacity by adding either one or two optional paper Cassette modules .

11. **The Sorter**

The optional 10 bin Sorter makes multi-page copying a much easier and more efficient task on the Konica 115Z .



Jica Study Team

REF.8414/94

---

DESCRIPTION OF ITEM

UNITPRICE/DUTY FREE

MACHINE

KONICA U-BIX 115Z PLAIN  
PAPER COPIER WITH A4,A3  
CASSETTE .

2300.000

DISCOUNT : Discount 10%

GUARANTEE : We would like to confirm that KONICA U-BIX 115Z is guaranteed for one year from date of installation , including free maintenance and replacement of spare parts if necessary .

SUPPLIES : KONICA U-BIX 115Z will be delivered to you with a drum for 60.000 copies size A4 and developer for 30.000 and toner for 2500 copies size A4 .

VALIDITY : One month only.

DELIVERY : Ten days after receiving from you all related documents for duty free exemptions.

---

## Specifications and Options for Konica 1020

1. **Front Loading**

With the Front loading system, you have easy access to Two paper supply trays for loading paper. 550 copies in a single run can be made with the additional capacity of the Multi sheet Bypass.

2. **Multi sheet Bypass**

You can now copy onto letterheads , transparencies and even on labels using the increasingly popular Multi - sheet Bypass copy surface that takes up to 50 sheets.

3. **Single sheet Bypass**

- To copy on special papers such as OHP films, Labels, offset masters, size from A3 - A6.
- And to allow you to manually make two - sided or two- sided copies.

4. **Auto Reset / Auto Shut - off**

Auto Reset takes care to ensure it's used efficiently by automatically shifting the 1020 to a standard copy condition if no modes are selected 90 seconds after copying.

If no copies are made during the 90 seconds after copying the Auto shut - off Automatically shuts off after 2, 6, or 10 minutes for maximum energy conservation.

5. **Job Memory**

Job Memory stores frequently - used copy patterns for quick recall and application .

6. **Zoom**

With the precision of 1% increments in a range from 50% to 200%, the Zoom function allows you to tailor copies to the exact specifications required.

7. **Automatic Paper Selection (APS)**

With APS you will choose the correct copy paper size every time. Just select the desired enlargement / reduction ratio and the APS will determine the correct copy paper size by using a built-in microcomputer.

8. **Automatic Magnification Selection (AMS)**

With the AMS, copies are always set in proportion to the original. The AMS automatically sets the correct zoom ratio for the desired copy size.

9. **Book Copying**

Konica 1020 lets you copy two open pages of a book or catalogue onto two separate copies in a fraction of the conventional method time.

10. **Image shift & Frame / Fold Erasure**

Image shift automatically provides a 10mm margin on the copy, making multi-page documents easy to bind.

And with the Frame / Fold Erasure function, you can erase unsightly shadows from copy edges and centers.

---

**Options for Konica 1020**

11. **Drawer Base Unit (DBU)**

The DBU-301 combines a desk ; an Automatic Duplex Unit (ADU) for copying on both sides and a Paper Feed Unit (PFU) that holds up to 500 sheets ; for more efficient continuous copying .

12. **Sorter and Stapler**

Konica 1020 takes the task of sorting in up to 20 bins and stapling copies out of your hands by handling it automatically .

13. **Reversible Automatic Document Feeder (RADF)  
and Automatic Duplex Unit (ADU)**

The optional RADF is an Automatic Document Feeder that sets up to 50 originals for quality two sided copies of each . For greater convenience and efficiency , when the optional RADF is used in combination with the optional ADU , you can make 2 sided copies from 1 or 2 sided originals .

14. **Mono Color Copying**

The optional Mono - Color copying adds attention - grabbing color to important charts. Self-contained quick to change mono-color toner units that come in red , blue or green .



Jica Study Team

REF.8414/94

DESCRIPTION OF ITEM

UNIT PRICE/DUTY FREE

MACHINE

KONICA 1020 PLAIN PAPER COPIER  
WITH DRUM & TWO PAPER TRAYS  
EACH CAN TAKE 250 SHEET .

JD 3250.00

DISCOUNT : Discount 10% .

GUARANTEE : We would like to confirm that KONICA 1020 is guaranteed for one year from date of installation including free maintenance and replacement of spare parts if necessary.

SUPPLIES : KONICA 1020 will be delivered to you with a drum for 60.000 copies A4 , Developer for 30.000 copies A4 , and Toner for 2.500 copies A4.

VALIDITY : One month only .

DELIVERY : Duty Free : Ten days after receiving from you all related documents for duty free exemptions.

SCIENTIFIC & MEDICAL SUPPLIES CO.



شركة اللوازم العلمية والطبية

Date : May 8 , 1994  
Ref No. : CD/990 /94

Messrs,  
JICA STUDY TEAM  
Fax # 699344  
-----

Dear Sirs,

Thank you for giving us the opportunity to quote your good-self on our products. Attached please find our offer # CD/990/94. When reading our offer please take into consideration the following points:

- A: Our offer is calculated in Jordanian Dinars delivered and installed.
- B: Delivery will be x-stock unless items are sold before confirmation, then delivery time will be 4 to 8 weeks.
- C: Prices shown below include installation, maintenance & warranty for a period of twelve months from the date of installation.
- D: This offer is valid for Thirty days from its date.
- E: Payment is 100% upon delivery & installation.
- F: All prices in this offer are calculated on the basis of the exchange rate of Jordanian Dinar on the date stated above. Prices are also calculated on the basis of the customs laws & regulations valid on this date. Any changes in the exchange rate of the Jordanian Dinar by 5% or greater, or change in customs duties, or imposition of a sales or consumption tax will render this offer void.

Contd../2

P.O. BOX 1387 AMMAN 11118 JORDAN  
TEL: (962-6) 624907 (10 lines)  
FAX: (962-6) 628258

SCIENTIFIC & MEDICAL SUPPLIES CO.



شركة اللوازم العلمية والطبية

\*\* 2 \*\*

*G: After warranty period, a maintenance contract will be signed. The value of the contract will not exceed 10% (with spare parts) or 5% (without spare parts) of total hardware value.*

*We trust that you will find our products & prices very competitive & cost effective for your applications.*

*If you have any queries or need further assistance, please feel free to contact us.*

*Sincerely Yours  
Scientific & Medical Supplies Co.*

A handwritten signature in black ink, appearing to read 'Nidal Hamdan', is written over a horizontal line.

*Nidal Hamdan  
Sales Manager - PC Division*

**CC: Baha' Al Zibdeh/ Sales Representative**

**S.Z**

P.O. BOX: 1382 AMMAN 11118 JORDAN  
TEL: (962-6) 624907 (101 lines)  
FAX: (962-6) 628258

Offer CD/990/94

PRODUCT DESCRIPTION	U.PRICE	QTY.	T.PRICE
1. <u>DELL NETPLEX 466/P PC</u>	3500.000	2	7000.000

**PROCESSOR:**

- Intel 486 DX2/66 Processor
- 66 MHz Internal Clock Speed
- 33 MHz System Clock Speed
- Integrated Math Coprocessor
- 8 KB Internal Cache Memory

**MEMORY:**

- 8 MB Memory
- Expandable to 32 MB Total

**FLOPPY DRIVES:**

- One 3.5" (1.44 MB)

**MASS STORAGE:**

- 340 MB IDE Disk Drive
- Integrated IDE Disk Controller
- Three Mass Storage Shelves

**EXPANSION SLOTS:**

- Three ISA 16-bit Slots

**INTERFACES:**

- Two Serial & One Parallel Ports
- Keyboard & Mouse Ports

**VIDEO & MONITOR:**

- Accelerated Local Bus Video Adapter
- 512 KB Standard Video Memory
- 17" Ultra Scan Color Monitor (.26mm / NI)

**KEYBOARD:**

- 101 Enhanced Arabic/Latin Keyboard
- Dell Mouse

**OPERATING SYSTEM:**

- Original MS-DOS 6.0
- Original Microsoft Windows 3.1
- Security Features

**PACKAGE:**

- Slim-size Desktop
- Dimensions: 15.1" x 15.6" x 4"

Offer CD/990/94

PRODUCT DESCRIPTION	U.PRICE	QTY.	T.PRICE
2. LASERMASTER UNITY 1200-XLT	8450.000	1	8450.000

**PRINTING METHOD:**

- Laser Electro-Photography

**PRINTING SPEED:**

- 8 Pages per Minute (A4)
- 4 Pages per Minute (A3)

**MEMORY:**

- 21 MB Standard Memory
- Expandable to 48 MB Total

**HARD DISK:**

- 40 MB Standard Internal Drive
- Optional 80 or 200 MB External

**RESOLUTION:**

- 1200 x 1200 Turbo Res
- 600 x 600 Proof Printing

**PAGE DESCRIPTION LANGUAGES:**

- LaserMaster Enhanced TrueImage
- HP PCL-4 Interpreter
- Adobe Postscript Interpreter

**FONTS & TYPEFACES:**

- 135 Resident Type 1 Typefaces
- 6 HP PCL Bitmap Fonts

**PAPER SIZES:**

- Adjustable Cassettes
- A4, A3, B4, and B5 Sizes

**PAPER HANDLING:**

- Standard Cassette (250 Sheets)
- Optional Second Cassette (250 Sheets)
- Optional Multi-purpose Sheet Feeder

**CONTROLLER TYPE:**

- 33 MHz Pipeline Processor
- Floating Point Unit
- 40 KB Cache Memory

**STANDARD INTERFACES:**

- Centronics Parallel
- RS-232C Serial
- Apple LocalTalk
- Optional Network Slot

* Date Switch box with cables for two PC'S	100.000	1	100.000
--	---------	---	---------

*Offer CD/990/94*

<b>PRODUCT DESCRIPTION</b>	<b>U.PRICE</b>	<b>QTY.</b>	<b>T.PRICE</b>
----------------------------	----------------	-------------	----------------

***SOFTWARE :-***

<b>MS. Word</b>	<b>250,000</b>	<b>1</b>	<b>250,000</b>
<b>MS Excel 5.0 for Window</b>	<b>347,000</b>	<b>1</b>	<b>347,000</b>
<b>MS Access 2.00</b>	<b>347,000</b>	<b>1</b>	<b>347,000</b>

## 管網解析用ソフトの例

Fax Transmission from WRc plc  
 Frankland Road, Blagrove, Swindon SN5 8YF, UK  
 Telephone: (0793) 511711 International + 44 793 511711  
 Fax: (0793) 511712 International + 44 793 511712

# WRc

To (Organization):	<input type="text" value="Institute for International Cooperation"/>		
Fax No.:	<input type="text" value="0081-3-3269-6992"/>	No. of pages (including this one):	<input type="text" value="2"/>
For Attention of:	<input type="text" value="Mr Haruo Iwahori"/>		
From:	<input type="text" value="Stuart Ogle"/>	Telephone extension No.:	<input type="text" value="2078"/>
		Date:	<input type="text" value="12 May 94"/>

Dear Mr Iwahori

**WATNET NETWORK ANALYSIS PROGRAM**

Thank you for your letter of 9th May. I attach a reply, itemised as per your queries. If you need any further information please contact me.

- Our software WATNET we believe is suitable for your application.
- This is a p.c.-based (IBM-compatible) software package for network analysis of water supply systems.
- Flow and pressure are simulated directly and the costing module will calculate both power consumed and cost.
- There is an external interface which can be linked to telemetry systems to provide data for network simulation.
- There is extensive checking of user entered and other data with appropriate error messages.
- Simultaneous display of real and predicted data is not available.

For WRc internal use only:

Priority:	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
	Within 1 hour	0830-1300	1300-1730	Overnight
Confirmation of transmission:	<input type="checkbox"/>	Immediate	<input type="checkbox"/>	Internal Mail



SWINDON

- There is extensive graphical representation of modelled data including display of data on a network schematic diagram and time series graphs.
- Fixed and variable speed pumps, level controlled pumps, pressure controlling pumps, time switched pumps, pressure reducing valves, pressure sustaining valves, reflux valves, throttled valves, motorised valves, reservoir float valves (2 types) are all included.
- Tariff analysis and costing is provided by the costing module.
- Capable of modelling 3000 pipes and 800 nodes.
- All results throughout a simulation are stored and capable of rapid inspection on completion of the analysis.

#### WATQUAL 5

- Chlorine residual modelling is available in the WATQUAL module which can be added to WATNET. WATQUAL also provides water quality modelling of inert substances and calculates time of travel.

#### PRICE

A first copy of the software is priced:

£8625 for WATNET 5 (includes costing module)  
 £2500 for WATQUAL 5

This price includes both licence and one years support.

Second copies of the software are 60% of the above price.

Third and subsequent copies each cost 40% of the above price.

# WATNET

## 5 Hardware and Software Requirements.....

# WRc ..

December 1993

8311010FH

WATNET 5 is a program for IBM PC compatible computers using the MS-DOS operating system.

The computer must have:

- An 80286/80386/80486 processor.

This includes most PC's from the IBM AT onwards. However, if purchasing a new machine, we strongly recommend you purchase a fast 80486 machine to obtain good calculation and screen update performance.

- A maths coprocessor.

This would be the 80287 for 80286 machines, and the 80387 for 80386 machines. Most versions of the 80486 chip have the coprocessor built in but some versions of the 80486SX do not. Please check with your supplier.

- 4 Mbytes of random access memory (RAM), for WATNET 5 or 8 Mbytes if purchasing WATQUAL.  
4 Mbytes should be regarded as a minimum for WATNET 5. Performance can be improved by purchasing 8 Mbytes and employing the spare space as a disk cache. A typical cost for a 4 Mbytes upgrade is currently about £150.
- EGA/VGA video display card and colour monitor.
- Microsoft or Summagraphics compatible mouse.
- MS-DOS operating system, versions from 3.2 to 5.x, excluding version 4.x. To run WATNET as a DOS application under Windows 3.1, MS-DOS 5.0 or later is required.

All manufacturers including IBM, Compaq, Elonex, etc. produce machines conforming to this specification, typically for running Windows based applications.

The disk space required to store the product is 8 Mbytes.

Any printer may be used for tabular output. A graphics printer supported by the DOS GRAPHICS command is particularly useful for rapid graphics screen copies, whether in colour or monochrome. The full list of supported printers is listed under GRAPHICS in your DOS manual, but includes HP's Laserjet, DeskJet, PaintJet, ThinkJet, the IBM Color Printer and their equivalents.

Colour plots are generated in HPGL (Hewlett Packard Graphics Language) protocol. Any plotter fully supporting this language should be suitable, although the Hewlett Packard models are the only ones on which we can guarantee correct operation.

If you would like more information on WRc's range of Water Supply Software please contact:

Stuart Ogle,  
WRc plc  
Frankland Road  
Blagrove  
Swindon  
Wiltshire  
SN5 8YF

Tel: (0793) 511711  
Fax: (0793) 511712



# WATNET

# Version 5.35..

# WRc

...

January 1994  
940101d/RH

## Overview

WATNET 5.35 is the latest version in the WATNET 5.3 series and continues our policy of making significant enhancements to the user interface and particularly to the schematic display.

## Computer Configuration

WATNET 5.35 can be run on a PC either from MSDOS or from Microsoft Windows 3.x. The program requires 4Mbytes of available memory. Therefore you can now run WATNET and Windows applications on the same machine without the need to set up a separate machine configuration for WATNET. A complete specification of hardware and software requirements is available.

## WATNET 5.35 Features

Using the very latest features of the WATNET 5.3 series you can

- Display any part of the network schematic at an appropriate scale with a fully-graphical PAN&ZOOM facility. This applies to the display of both network data and results.
- Select both network data and operational data by reference to a descriptive title. You may label your data in a meaningful way and see the label when making a selection. This will significantly aid data management.

Using other recent features you can

- Display pipes in different line thicknesses according to diameter ranges that you can choose.
- Display pipes in up to five different colours of your own choice, dependent on either pipe or nodal data values. The full range of displayable data is:
  - network data: diameter length, friction, height.
  - results data: availability, flowrate, velocity, available head, total head, headloss, headloss gradient.

Where appropriate for nodal values such as available head, colour limits are interpolated along the pipes.

- Plot the network schematic in colour using all of the above display features.

If you would like more information on  
WRc's range of Water Supply Software  
please contact:

Stuart Ogle,  
WRc plc  
Frankland Road  
Blagrove  
Swindon  
Wiltshire  
SN5 8YF

Tel: (0793) 511711  
Fax: (0793) 511712

Please turn over...



---

## ***Overview***

The use of colour coding and the above display facilities allows you to identify problem areas at a glance. You can then investigate further using numerical results displayed on the schematic, performance graphs for network features or selected tabular output.

### **Earlier Versions**

WATNET 5.35 retains all the features of WATNET 5.1 (June 1992) in particular:

- model capacity of up to 2000 nodes
- import and export of data, permitting links to GIS, data loggers, telemetry and spreadsheets.

WATNET 5.35 supersedes version 5.1 and other recent release, i.e. WATNET 5.3 (February 1993) and WATNET 5.32 (August 1993).

### **Water Quality Module**

There is a separately available water quality module, called WATQUAL, which can be run with WATNET 5.35. WATQUAL simulates the spread of both inert substances such as nitrate and decaying substances such as chlorine. Please ask for further details.

## 付属資料 〇 調査用資機材



目的	機材名	仕様	数量	概算単価	概算金額	主なメーカー
配水調査 用流量計	超音波流量計	<p>1. 流量計 測定流体 種類：上水 濁度：10,000度以下 測定方法：超音波パルス伝搬時間差法 測定管 材質：銅管、ステンレス、鋳鉄、ダクタイル鋳鉄、塩ビ、FRP、FRPM 口径：φ400mm 測定精度：±1.0%FS(1m/S以上の場合) 本体 電源：220V AC 50Hz 構造：壁掛形、防曇形 検出器：1組 防曇形 結合箱：1個 2. 小型記録計：1ペン 3. 積算計 4. 指示計：110角 5. 屋内収納盤：700W×1800H×600D程度 6. 同軸ケーブル</p>	4台	5,500,000	22,000,000	日立、富士電機 横河、トキメック
	携帯用超音波流量計	<p>1. 本体 測定流体 種類：上水 濁度：10,000度以下 測定方法：超音波パルス伝搬時間差法 測定管 材質：銅管、ステンレス、鋳鉄、ダクタイル鋳鉄、塩ビ、FRP、FRPM 口径：50～500mm 測定精度：表示値の±1.5%(1m/S以上の場合) 7出力：瞬時流量 表示・記録内容：時刻、測定ゲージ(流量、流速、積算流量) 表示方式：液晶表示器 メモリ：瞬時流量、積算流量 パソコン接続機能付き センサ：1組 同軸ケーブル、取付金具付き AC電源コード：1本 3m以上</p>	4台 4台 4台 1面 400m	500,000 98,000 43,000 2,200	2,000,000 392,000 172,000 1,550,000 880,000	フジテコム トキメック

目的	機材名	仕様	数量	概算単価	概算金額	主なメーカー
		DC電源コード : 1本 3m以上 77出力コード : 1本 1m以上 プリントアウト : 1個 容量200mL以上 プリントアウト紙 : 2個 25m以上 時計電池 : 1個 ヒューズ : 2個 1A(AC電源用) ヒューズ : 2個 5A(DC電源用) 2. バッテリホルダ 3. 充電器 4. プリントアウト : 2m以上	4式 4台 4本 4台	43,000 43,000 33,000 350,000	172,000 172,000 132,000 1,400,000	フジテコム
	データロガ	1. 本体 : 2チャンネル 入力チャンネル数 測定精度 : 0.5%FS 電源 : Ni-Cd電池(9.6V) データ記憶形態 : メモリカードへの記憶 2. メモリカード : 128KB 3. Ni-Cd電池 : 9.6V 4. 充電器 5. 圧力センサー 6. カリブリガ 7. 携帯用超音波流量計用ケーブル 8. 分配器 9. 解折用ソフト	8枚 4式 4式 4式 4式 4本 4台 1式	350,000 35,000 512,800	350,000 70,000 1,538,400	フジテコム フジテコム 愛知時計電機
	直結式水圧測定器	フジテコム 地下式消火栓用 同等品	2台	35,000	70,000	フジテコム
	羽根車式流量計	1. 本体 : 上水 測定流体 : 電子式水道メータ (羽根車式) 方式 : よこ型 表示機能 : 積算流量、瞬時流量 表示方法 : 液晶表示 口径 : 150mm	3台	512,800	1,538,400	愛知時計電機

目的	機材名	仕様	数量	概算単価	概算金額	主なメーカー
漏水調査用 機材	羽根車式流量計	1. 本体 測定流体 方式 : 上水 : 電子式水道メータ (羽根車式) よこ型 表示機能 : 積算流量、瞬時流量 表示方法 : 液晶表示 口径 : 150mm	2台	512,800	1,025,600	愛知時計電機
	電子音聴棒	フジテコム サウンドバナー FSB-7D 同等品	3本	78,000	234,000	フジテコム
	漏水探知機	フジテコム 漏水探知機 HG-10 同等品	2組	498,000	996,000	フジテコム
	鉄管探知機	フジテコム 鉄管探知機 PL-801GX2 同等品	4台	600,000	2,400,000	フジテコム
	ボックスロケータ	フジテコム ボックスロケータ F-90 同等品	4台	185,000	740,000	フジテコム
	相関式漏水探知機	フジテコム ポータコナル LC-2100 同等品	1台	2,800,000	2,800,000	フジテコム
	計				47,824,000	

JICA