

3 - Bridges : -

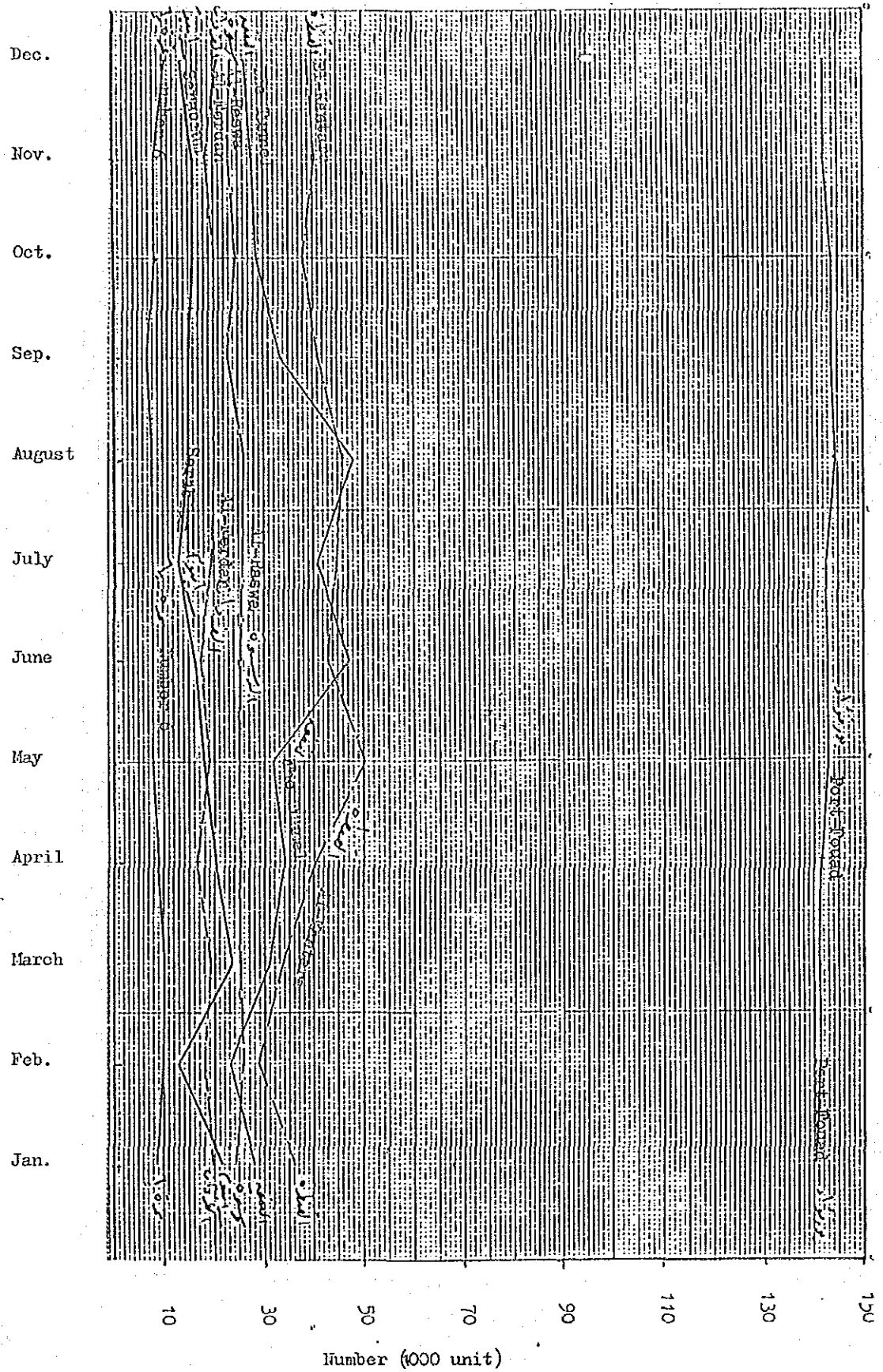
3/1 - Advantages of bridges : -

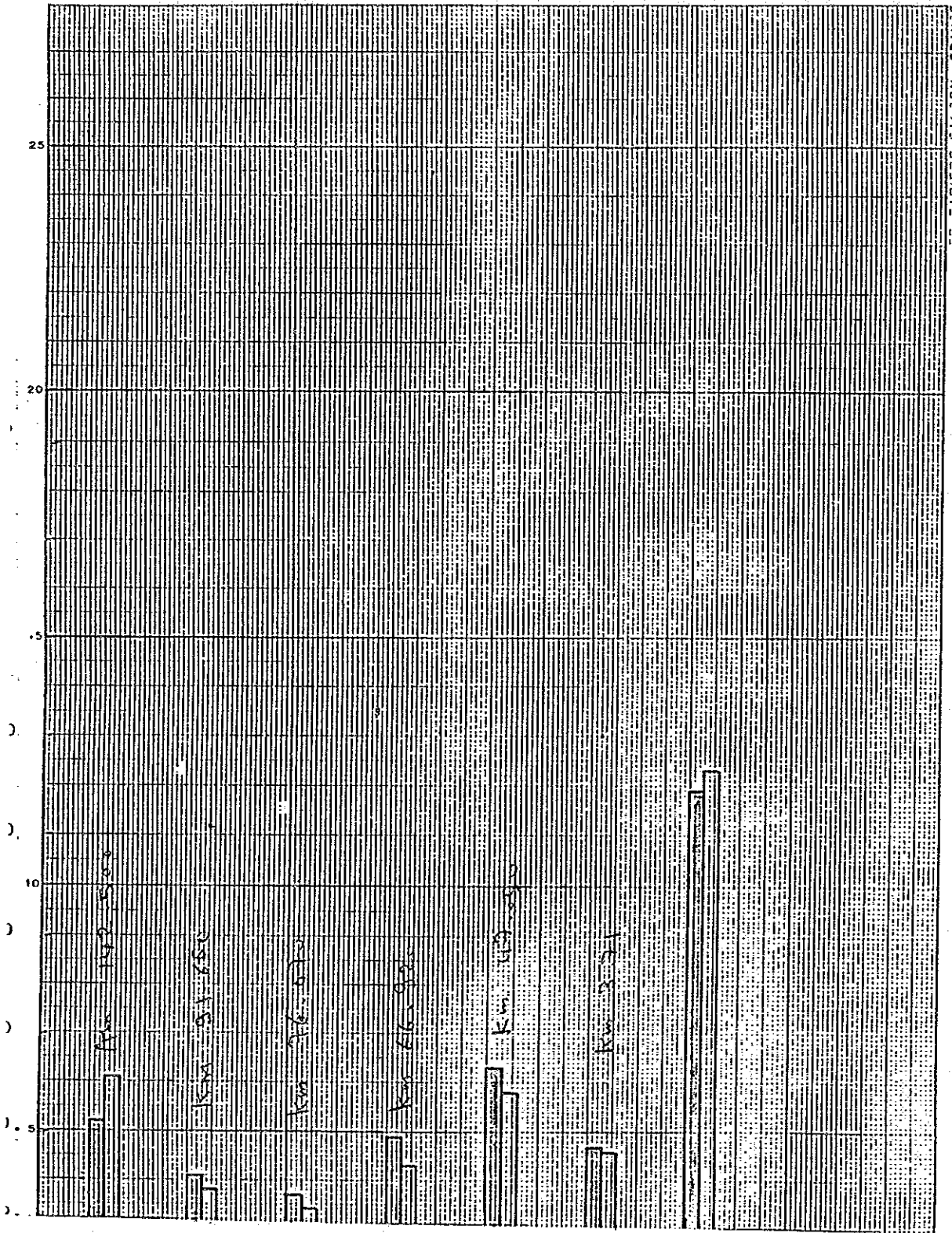
- Crossing capacity per hour is very high if it is compared with other means, and the passage goes on all the time without being affected by navigation.
- Operating costs are very low.
- Maintenance expenses are greatly less than maintenance expenses of tunnels.

3/2 - Disadvantages of bridges : -

- The rising of construction costs in comparison with tunnels, since the bridge should not be less than 65 meters high to allow giant ships to transit the Canal, consequently it requires extension of the entries of the bridge up to 2 km. on both sides.
- The cost of construction is approximately doubled in case of constructing the bridge to allow future plans of doubling the Canal.
- The bridge will be an obstacle against oil rigs, and the enclosed table shows an outline of oil rigs that recently transited the Suez Canal.
- Due to the transit of oil tankers and liquified gas carriers, there should be a kind of protection against the fall of inflammable liquids from the bridge on these types of ships and this will be an additional cost.

(1990)



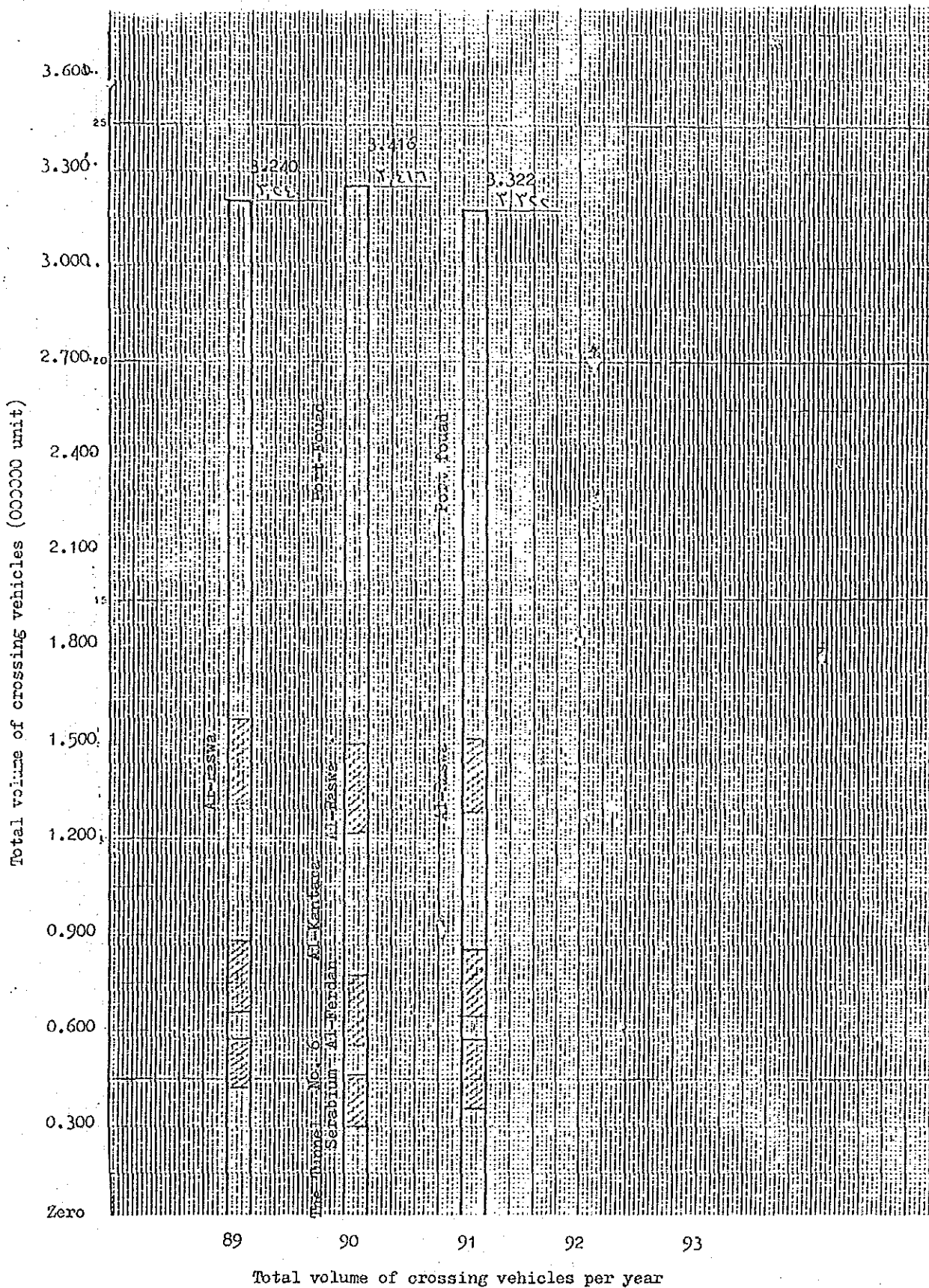


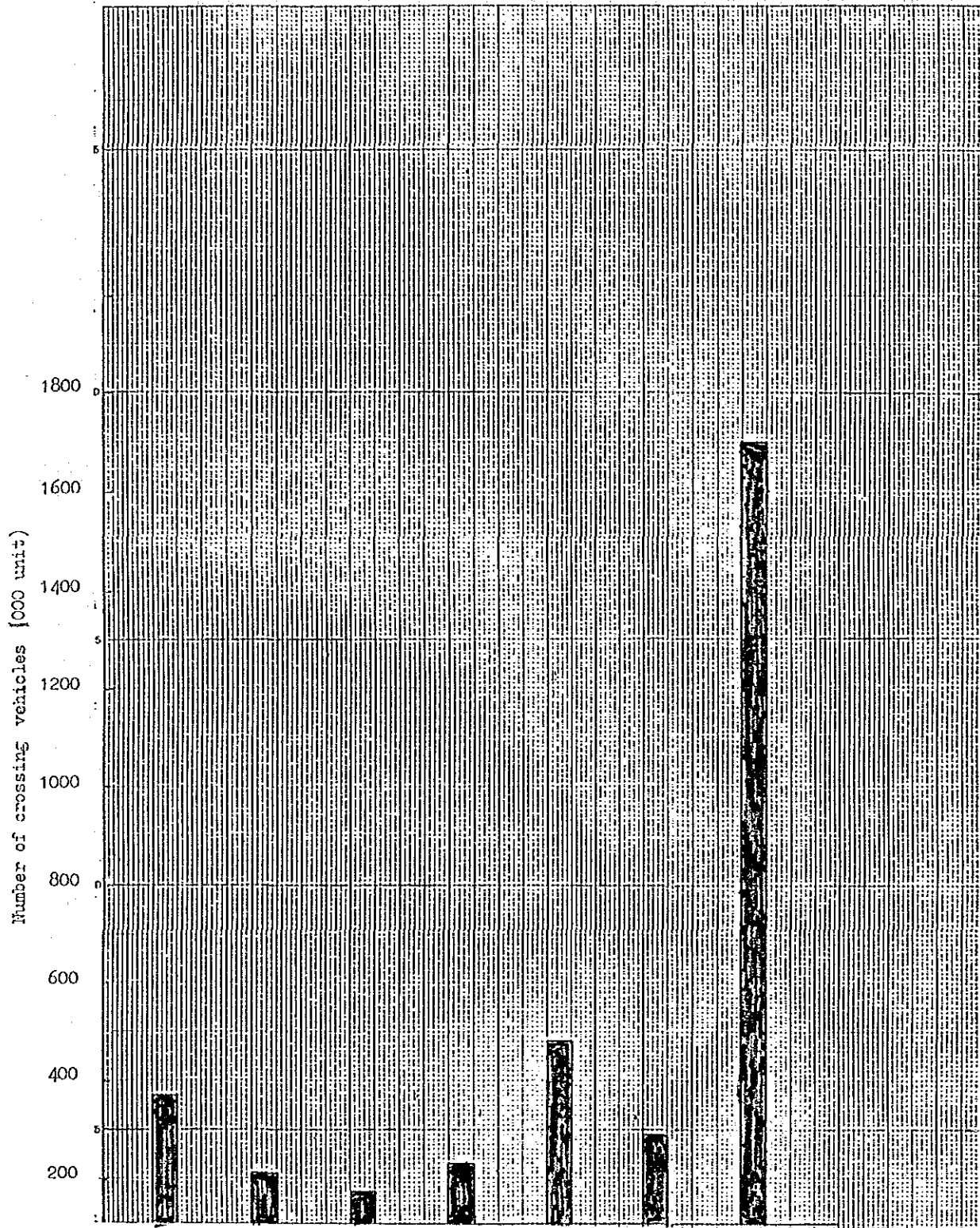
The Tunnel Serabium Number 6 Al-Ferdan Al-Kantara Al-Raswa (Port-Fouad city)

Daily average of crossing vehicles

■ August 1990

▨ May 1990





The Tunnel Sarabium Number 6 Al-Ferdan Al-Kantara Al-Raswa Port-Fouad

Total volume of crossing vehicles (1990)

4
Distribution of Vessels by Size & Type

Table (2)

(Number of vessels)

Type \ Size	Tanker	Bulk C.	Comb. C.	Gen. Cargo	Cont.	Inst.	Ro Ro	Car C.	Passenger	War Ships	Others	TOTAL
(000 tons)												
S.C.N.T.												
Up to 5	355	7	-	1,082	36	-	59	-	19	173	799	2,530
5 - 10	327	179	-	2,292	296	6	263	3	16	74	224	3,680
10 - 15	549	907	-	942	416	1	90	4	10	35	8	2,962
15 - 20	556	802	-	1,111	700	31	73	12	6	13	-	2,304
20 - 25	157	456	8	15	282	-	87	28	2	15	-	1,050
25 - 30	130	146	29	2	175	2	92	55	-	39	2	672
30 - 40	180	373	30	-	453	69	109	161	3	38	-	1,416
40 - 50	358	13	68	-	453	35	36	409	-	42	-	1,414
50 - 60	118	13	52	-	266	-	3	88	-	1	-	541
60 - 70	200	33	26	-	-	1	1	-	-	-	-	261
70 - 80	179	20	23	-	-	-	-	-	-	9	-	231
80 - 90	51	10	14	-	-	-	-	-	-	2	-	77
90 - 100	1	-	1	-	-	-	-	-	-	-	-	2
100 - 120	102	-	2	-	-	-	-	-	-	-	-	104
Over 120	419	-	1	-	-	-	-	-	-	-	-	420
TOTAL	3,682	2,959	254	4,444	3,077	145	813	760	56	441	1,033	17,664

- 86 -

Question No. 6

Table (3) Number and Net Tonnage by Classes of Vessels (January 1 - December 31)

Laden Vessels:	NUMBER		TOTAL	NET TONNAGE (In thousand tons)		
	North	South		North	South	TOTAL
Tankers	818	1 396	2 214	12 204	41 411	53 615
Bulk Carriers	1 575	1 213	2 788	28 815	26 573	55 388
C Combined Carr.	66	125	191	2 879	6 562	9 441
General Cargo	2 316	1 737	4 053	18 410	14 536	32 946
Container Ships	1 535	1 469	3 004	41 062	39 666	80 728
Lash Ships	69	62	131	2 210	2 041	4 251
Ro-on/Ro-off	423	259	682	7 375	5 220	12 595
Car Carriers	229	422	651	9 684	17 786	27 470
Passenger Ships	10	20	30	93	312	405
Warships	270	214	484	4 091	1 264	5 355
Others	498	362	860	1 732	980	2 712
TOTAL	7 809	7 179	14 988	128 555	156 301	284 856
In Ballast Vessels:						
Tankers	1 184	284	1 468	101 093	3 947	105 040
Bulk Carriers	57	114	171	2 543	2 155	4 698
Combined Carr.	52	11	63	3 025	489	3 514
General Cargo	47	344	391	231	2 088	2 319
Container Ships	14	59	73	156	822	978
Lash Ships	2	12	14	41	257	294
Ro-on/Ro-off	3	128	131	26	1 960	1 986
Car Carriers	101	8	109	3 949	177	4 126
Passenger Ships	14	12	26	87	77	164
War Ship	-	57	57	-	1 639	1 639
Others	47	126	173	154	554	708
TOTAL	1 521	1 155	2 676	111 305	14 161	125 466
TOTAL	9 330	8 334	17 664	239 860	170 462	410 322

Table (4) Distribution of Vessels by Size (S. C. N. T.) & Type (Jun. 1 - December 31) 1990

TYPE SIZE	Tankers	Bulk C.	Comb. C.	General C.	Cont.	Lash	Ro/Ro	Car C.	Passenger	War Ships	Others	TOTAL
Up to 5	1 072	22	.	3 093	134	.	217	.	63	377	1 629	6 607
5 - 10	2 530	1 534	.	18 500	2 287	45	1 927	210	126	538	1 644	29 341
10 - 15	6 998	12 020	.	11 387	5 274	10	1 086	55	126	437	94	37 487
15 - 20	9 327	14 015	.	1 895	12 206	586	1 289	323	103	201	.	39 945
20 - 25	3 554	10 039	188	339	6 431	.	1 973	649	42	338	.	23 553
25 - 30	3 576	3 957	827	51	4 865	54	2 528	1 442	.	1 114	53	18 467
30 - 40	6 427	12 662	1 133	.	15 868	2 278	3 741	5 749	109	1 368	.	49 335
40 - 50	15 804	574	3 038	.	20 789	1 508	1 601	18 641	.	1 721	.	63 676
50 - 60	6 524	745	2 806	.	13 852	.	158	4 527	.	54	.	28 666
60 - 70	12 844	2 146	1 655	.	.	64	61	.	.	683	.	17 453
70 - 80	13 543	1 480	1 706	.	.	.	.	.	.	163	.	16 892
80 - 90	4 232	842	1 157	.	.	.	.	.	.	.	.	6 231
90 - 100	97	.	93	.	.	.	.	.	.	.	.	190
100 - 120	11 308	.	230	.	.	.	.	.	.	.	.	11 538
Over 120	60 819	.	122	.	.	.	.	.	.	.	.	60 941
TOTAL	158 655	60 036	12 955	35 265	81 706	4 545	14 581	31 596	569	6 994	3 420	410 322

ARAB REPUBLIC OF EGYPT
SUEZ CANAL AUTHORITY

Tamallin, September 4, 1991

Dept : of Works

No : _____

Re : _____

Telephone : 064-220050/9 Ismailia

Fax. | 064 | 220784
 | | 220783



資料-9 (2)
جمهورية مصر العربية
مصلحة قناة السويس

19 _____ من I.Ka/S.R.
إدارة _____
رقم القيد _____
رقم الملف _____
عدد المرات _____

FAX 719076 JICA - Cairo

Sent to : Mr. OHTSUKA
From : Dr. Eng. Isis A. Kamel
Total number of pages : 1 (one)
Date : - September 4, 1991

Dear Sir,

With reference to the project for rehabilitation Work of Ahmed Hamdy Tunnel, you find herein the information you have asked concerning the El-Shat Ferry-boat under construction.

El-Shat Ferry-Boat

Date of begining of implementation : Oct. 1990

Date of handover : April 1991

Costs

* Civil work	5 x 10 ⁶	L.E.
* Ferry boats (150 T)	9 x 10 ⁶	L.E.
	<hr/>	
TOTAL	14 x 10 ⁶	L.E.
others	1 x 10 ⁶	L.E.
	<hr/>	
Total cost	15 x 10 ⁶	L.E.

Whilst thanking you for your kind cooperation,
Please accept my best regards.

Dr. Eng.
Isis A. Kamel
4
(Isis A. Kamel)

付属資料一 10

アハムド・ハムディ・トンネル通行量 (1988~1991)

Month	Year 1988/1989					Year 1989/1990					Year 1990/1991				
	Cars Private/taxi	Pick up buses Lorries	Trucks & equipment	Cars exempted	Total	Cars Private/taxi	Pick up buses Lorries	Trucks & equipment	Cars exempted	Total	Cars Private/taxi	Pick up buses Lorries	Trucks & equipment	Cars exempted	Total
JULY	26668	16432	2882	3474	49456	28359	16249	2516	3035	50159	30883	18626	2695	1487	53691
AUGUST	25163	16894	3529	2973	48559	27769	16055	2895	2428	49147	27198	19425	3306	2143	52072
SEPTEMBER	18198	15756	3349	3310	40613	18112	15467	2971	2542	39092	17039	13826	2982	2339	36186
OCTOBER	14497	13847	3389	2571	34304	16153	12642	2818	2508	34121	13817	12719	2277	2054	30867
NOVEMBER	11677	12937	4165	3053	31832	12772	12563	3010	2227	30572	13131	12728	2416	1134	29409
DECEMBER	11672	12394	4968	2900	31934	12529	12576	3643	2193	30941	12382	12737	2205	1228	28552
JANUARY	12533	12215	4482	2408	31638	14806	12738	3170	2624	33338	13698	12979	2358	2651	31686
FEBRUARY	10422	11618	3916	2476	28432	11249	11772	3467	2081	28569	10612	10259	2166	1904	24941
MARCH	14566	14225	4029	2994	35814	14002	14061	4067	2185	34315	14490	12445	1964	865	29764
APRIL	13499	12923	4519	2159	33100	17200	13744	3166	1754	35864	18948	13409	1725	425	34507
MAY	18935	13707	3162	2302	38106	14129	14797	3189	2335	34450	12959	14122	2543	1825	31449
JUNE	23190	15258	3081	4023	45552	23113	15866	2950	2936	44865	20322	16133	2451	1379	40285
Annual Total	201020	168206	45471	34643	449340	210193	168530	37862	28848	445433	205479	169408	29088	19434	423409
Proportion	%44.74	%37.43	%10.12	%7.71	%100	%47.19	%37.84	%8.49	%6.48	%100	%48.53	%40.01	%6.87	%4.59	%100

The Total of transiting Vehicles through
Ahmed Hamdy Tunnel

statement.

	Year 1988/1989		Year 1989/1990		Year 1990/1991	
	No.	Prop. %	No.	Prop. %	No.	%

CARS. Private. taxi	201020	%44.74	210193	%47.71	205479	%48.5
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Pickup. Lorries and bases	168206	37.43	168530	37.84	169408	40.0
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Trucks and equipment	45471	10.12	37862	8.49	29088	6.87
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Exempted cars	34643	7.71	28848	6.78	19434	4.59
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Total

	449346	100	445433	100	423409	100
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Daily average car/day	1231	1220	1160
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付属資料一 1.1

水道関連資料

- (1) S. C. A. 水道局関係者との打合せ内容 (1991年8月12日議事録)
- (2) トンネル内既設水道管の情報
- (3) S. C. A. ダクタイル鋳鉄管
- (4) エジプト現地パイプ工場の現地調査
- (5) 水道管ルートと比較表 (S. C. A. 案 対 J I C A案)

MINUTES OF MEETING

Re : Present Conditions of the Water Supply Pipes through the Tunnel

Date : Monday August 12, 1991

Place : Office of Suez Canal Authority in the Tunnel site

At Monday August 12, 1991 there were a field visit to the treatment plant (west of the Tunnel) and the two 500mm ductile cast iron mains inside the Tunnel by :

Eng. Naim M. Ramadan	Suez Canal Authority	<i>Naim Ramadan</i>
Eng. Emad Abdel Wahab	Suez Canal Authority	<i>Emad Abdel Wahab</i>
Eng. Mona Badawy	Suez Canal Authority	<i>Mona Badawy</i>
Eng. Mohamed Nashat	Suez Canal Authority	<i>Mohamed Nashat</i>

And Eng. Fekry Ahmed Shaheen manager of the water treatment plant (west of the Tunnel) from Ministry of Housing and Reconstruction.

Eng. Takayosi Ohtsuka	Basic Design Study Team	<i>T. Ohtsuka</i>
Eng. Iwao Tsunashima	Basic Design Study Team	<i>Iwao Tsunashima</i>
Eng. Yusuke Doi	Basic Design Study Team	

We found the following :

- 1- There is a water treatment plant under erection with a design capacity of 400 lit./sec. - west of the tunnel - owned by Ministry of Housing and Reconstruction. At the same site there is a compact unit under operation with a design capacity of 150 lit./sec. (5 units with a capacity of 30 lit./sec. for each unit) owned by Ministry of Housing and Reconstruction too. The treatment plant compact unit pumps its water to the East of the Canal through two mains crossing in the Tunnel.
- 2- From the operation documents of the treatment plant we found :
 - a- During Summer the operation start at 6 A.M. and stop at 11 P.M. by other way, there are 17 working hours a day during Summer.
 - b- There are 4 units under operation (4 x 100 = 400 m³/h)

- c- The treated water are pumped by one pump with a design capacity of $324 \text{ m}^3/\text{h}$ and a delivery head of 8 bar, there are no way to measure the discharge of the treatment plant. The only way is by estimating the discharge of the pump and the working hours.
- d- During Winter the operation start at 6 A.M. and stop at 4 P.M. by other way, there are 10 working hours a day during Winter with the same discharge and the head ($Q = 324 \text{ m}^3/\text{h}$, $H = 8 \text{ bar}$).
- e- Engineer Fekry (Manager of the treatment plant) informed that this treatment plant pump its water to Raas Cidre, Mesalla and Malab in Sinai, and he informed too that there are water reservoirs in Sinai to feed the served areas during the unworking hours of the treatment plant.
- 3- During our field visit to the delivery mains inside the Tunnel, we found that there are two main pipes from Ductile Cast Iron 500mm diameter Spigot-socket push-on type with rubber gaskets, but elbows and special parts are flanged-type Connected together by bolts. The pipes are in a very good case and new. We believe that the removal of the push-on pipes are not easy because of the unwide place and they need special tools and big forces for removal, and may be some of the pipes will be damaged during the removal. All the gaskets must be changed by new ones from the same kind which were used with the pipes during re-erection. But the elbows and special parts it is easy to remove them safely, just we may use new flat gaskets during re-erection and it is easy to find them, may be need new bolts.
- 4- After the field visit we had a meeting with the Japanese Consultants at Engineer Refaat's office (the chief of tunnel) and we gave the Consultants all the informations above. The Consultants requested to have an analysis for the treated water from the treatment plant (west of the tunnel) and a quantity of treated water as a specimen. We gave them the specimen which were taken by the chemist of Suez Canal treatment plant of Suez and we had a quantity of treated water to

make the chemical analysis of it in Suez treatment plant. They requested also to have a specimen of treated water and a chemical analysis from Suez treatment plant.

Engineer Emad (the chief of water sector in Suez) promised to prepare the specimen and chemical analysis through two days.

- 5- Engineer Refaat informed that Suez Canal Authority are responsible of the maintenance of the two main pipes inside the Tunnel from the valves room 500 ms west of the Tunnel to valves room 250 ms east of the Tunnel. And he informed also that it can be put one of the two pipes in operation and the second out of operation by controlling the valves at the west and at the east, and make any maneuvering without problems.
- 6- The Japanese Consultants asked about the estimated consumption of treated water during the coming four years in the areas which are served with water from these two mains. Engineer Fekry informed that this information is at the Sinai Reconstruction Organization. From my own opinion I made a quick estimation to find the capacity of one main line 500mm in diameter, supposing that the velocity of the water inside the pipe line is 1.2 m/sec. Then the discharge in the main pipe will be about 848 m³/h. And if we increase the working hours of the treatment plant to 24 hours a day instead of 17 hours a day during Summer. Therefore if the future consumption increased four times, then one pipe line 500mm in diameter is adequate. They also asked about the name of pipe manufacturer and his citizen Engineer Fekry informed that this information is at the Sinai Reconstruction Organization.
- 7- The Japanese Consultants informed that the first study will be finished at the end of this month, and another engineers will join the study until the middle of September in Egypt. The total study including in Japan will be finished at the end of this November. And they expect to start the rehabilitation work October 1992 (not a fixed time).

Draft by Eng. Naim Ramadan

in Sinai

Aug 28, 41

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(1/2)

NAME

DISTANCE

CAPACITY

REMARKS

SHATI

Km 17.600

500 m³

High

Moussa

Km 26.800

500 m³

High

Massala

Km 36.100

5000 m³

Land

Sadr

Km 62.

1000 m³

High

Sadat

Km 64.100

500 m³

High

Sawera

Km 67

500 m³

High

EL-Geibs

Km 106

500 m³

High

Mallaab

Km 114

5000 m³

Land

Kemama

Km 134

500 m³

Land

Kaser

Km 137

2500 m³

Land

Zeneima

Km 145

1000 m³

High

ABO- Reideis

Km 168

1000 m³

High

12/11/2018 KHA

Pipe Line

TUNNEL - SAMAI

<u>Diameter</u>	<u>Distance (Length)</u>
600 mm Diam.	63 Km
500 mm Diam	20 Km / 83
450 mm Diam	53 Km / 136
350 mm Diam	35 Km / 17

(3) S. C. A ダクタイル鋳鉄管

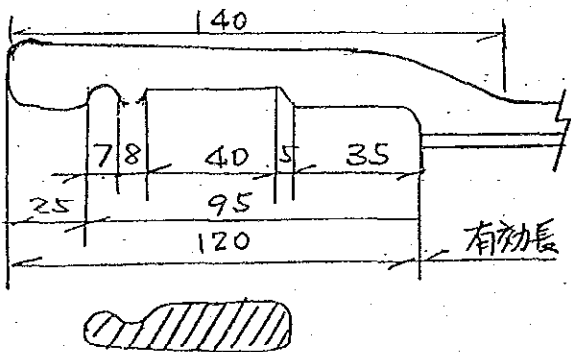
1) 目的

A. H. Tunnel内既設2本ばらびに同トンネル改修に伴うS. C. A 支給管の諸元の把握を目的とした。

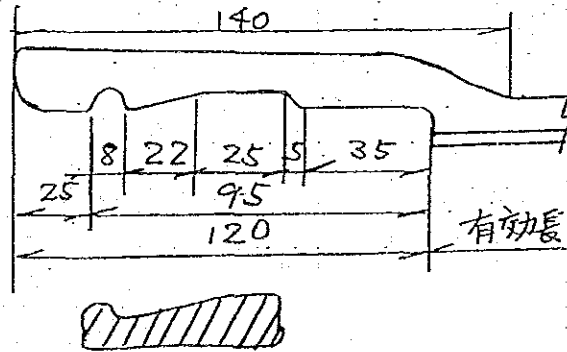
2) 諸元

既設管ならびに支給予定管の諸元は次の通りである。

諸元	既設管	支給管	備考
<ul style="list-style-type: none"> ・日時 ・寸法 (口径×長さ mm) ・規格 ・数量 (本/延長 m) ・継手ジョイント/ジョイント (ネオプレンゴム) ・その他 (1) 現物 	1991年8月18日 500 ^{NID} × 5,500 BS 4772 Class K9. 25 bar PN 580/3,190 下図(1)参照 TYTON型 A. H. トンネル内	1991年9月2日 500 ^{NID} × 5,500 AWWA C1* (91)/500 下図(2)参照 TYTON型 S. C. A Ataka(Suez) ヤード内 (ref. Eng. Said Dawed) Presented by USA	C1-A-82
(2) その他	P. O. 1276/9006 of 12th Feb 1980		



図(1) - BS 4772 K9 (mm)
(日本分類T形)



図(2) - AWWA C1 (mm)
(日本分類T形)

(4) エジプト現地パイプ工場の現場調査

1) 目的

現地のパイプの製造能力を調査し、現地調達が可能かどうかについて調べることを目的とした。

2) 訪問をした工場

ダクタイル鋳鉄管工場ならびにスパイラル管製造工場。

3) 調査内容

A. ダクタイル鋳鉄管工場

・名称; EL NASR CASTINGS COMPANY

・製造能力; 74,000 tonnes (1987年実績)

・技術提携; Thyssen Rheinstahl Technik (ドイツ)

・製造規格; DIN 28610

ISO 2531 (1986年)

・鉄管径; 100~1000 mm 製造可能

・納期; 1ヶ月にて納入可能

・視察結果; 工場管理者との面談ならびに製造工程の見学を通じて、最も単純で一般的な差し込み型 (Spigot Joint) のダクタイル鋳鉄 (直管) の現地調達は、一見可能であると考えられた。しかし、S. C. Aの関係者によると当工場の製品は水漏れを生じるとの意見もあり、本パイプの構造を見る限り継手部のガスケットの品質を含めた、製造精度ならびに現場施工時の品質管理に起因するものであろう。

生産量から見て、当国内で相当量の当工場の製品が使われているものと思われるが、現在のところS. C. Aへの納品対象工場になっていないこと、本工事の口径が500mmと大口径であり使用水圧も比較的無こと、しかもシナイ半島に飲料水を供給する代替の出来ない大切な供給路であること等を考えると、水漏れの恐れのある品質に対して100パーセント保認のできない製品の使用は、この際避けるべきものと思われる。

B. スパイラル溶接鋼管工場

- ・名称；EL NASR STEEL PIPES & FITTING, CO.
- ・製造能力；縦継手，スパイラルによる溶接鋼管の製造であり、1962年創業
- ・技術能力；AMERICAN PETROLEUM INSTITUTE の品質証明のある工場
- ・鋼管径；170～1220mm 製造可能
- ・視察結果；アメリカの石油協会の品質証明のある工場であるので、ある水準の品質を保持した工場であることは推察される。

しかし、本製品を今回計画のスエズ運河横断用の水道管に使用する場合には、水道管使用に対する適性、運河横断施工法と材質パイプ強度特性等について、さらに入念な調査・検討を要するものと思われる。

資料 11 - (5)

Fresh Water Supply Pipeline

Route Study,

Solution (1) & (2)

/ ZA/B

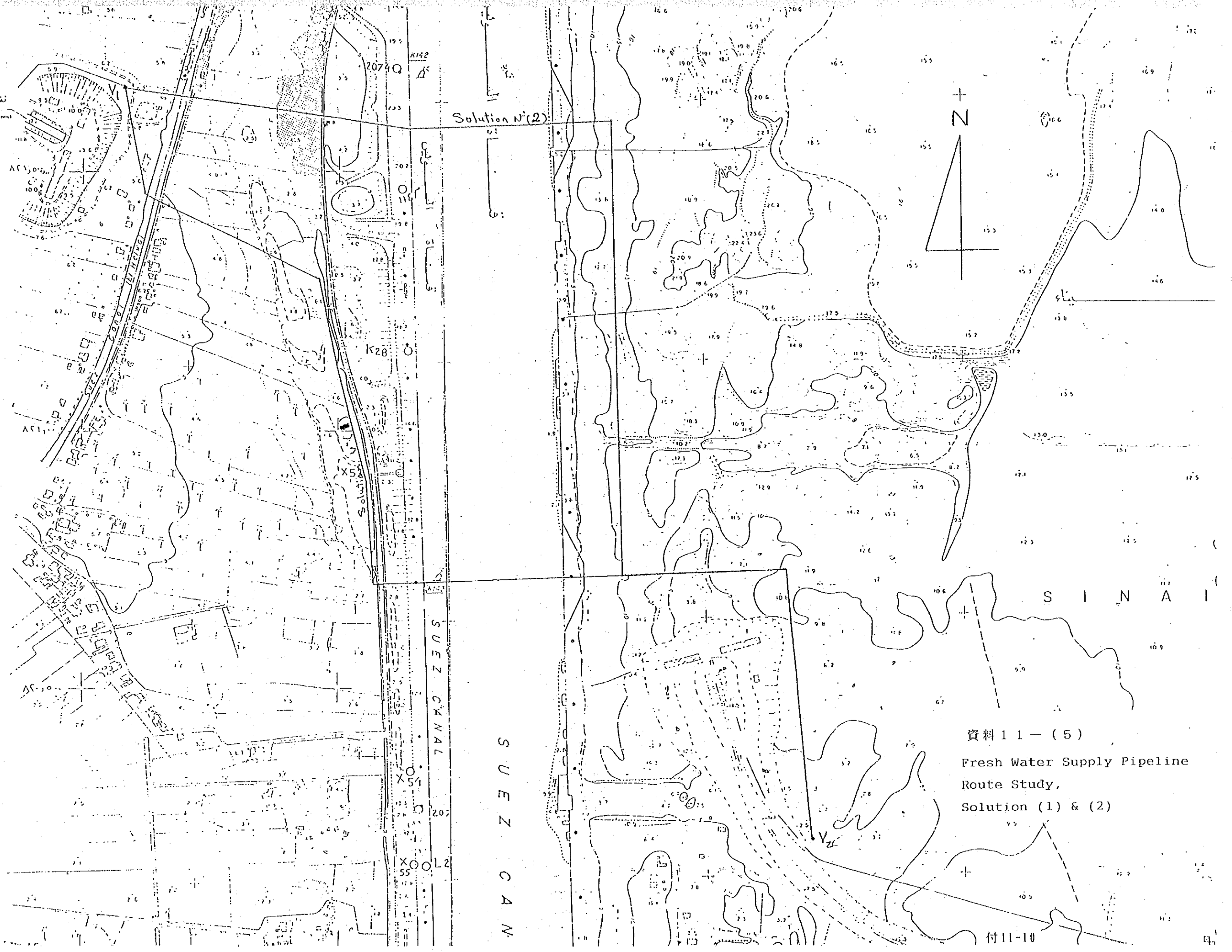
THE REQUIRED WORKS FOR LAYING OF SIPHON
AT KM. 192.130/143.00 AND OBSTRUCTIONS (SOLUTION (1) ,(2))

SERIAL	KIND OF WORK	UNIT	SOLUTION (1) S.C.A Proposal		JICA Team SOLUTIONS (2) Proposal		REMARKS	
			QUANTITIES		QUANTITIES			
			WEST SIDE	EAST SIDE	WEST SIDE	EAST SIDE		TOTAL
1	Length of pipe line	m	1248+(498) ^{Canal}	972	595+(486) ^{Canal} +	1835	2916	
2	Dry Excavation	m ³	8000	65000	50000	82000	132000	
3	Dredging of Trench	m ³		25000	250000		250000	
4	Cut & fill for laying pipes	m	8000	6000	3000	24000	27000	
5	Removal of Revetment	m	20	210	20	210	230	
6	New Revetment	m	20	230	20	230	250	The shown volumes is roughly calcu- lated
7	Obstructions :							
	• Sweet water Canal		26 m	-	26 m	-	26	
	• Planted Land		164 m (This land is owned to S.C.A.)	-	272 (This land is not owned to S.C.A.)	-	272	
	• Drain		22 m	-	-	-	-	
	• Small Lake (v. shell-o)		33 m	-	-	-	-	

Dr. Eng. J. H. KAMEL

2.11.1961

نقشه السيد احمدى
11 Shohid Ahmad Ahmad Tumbal



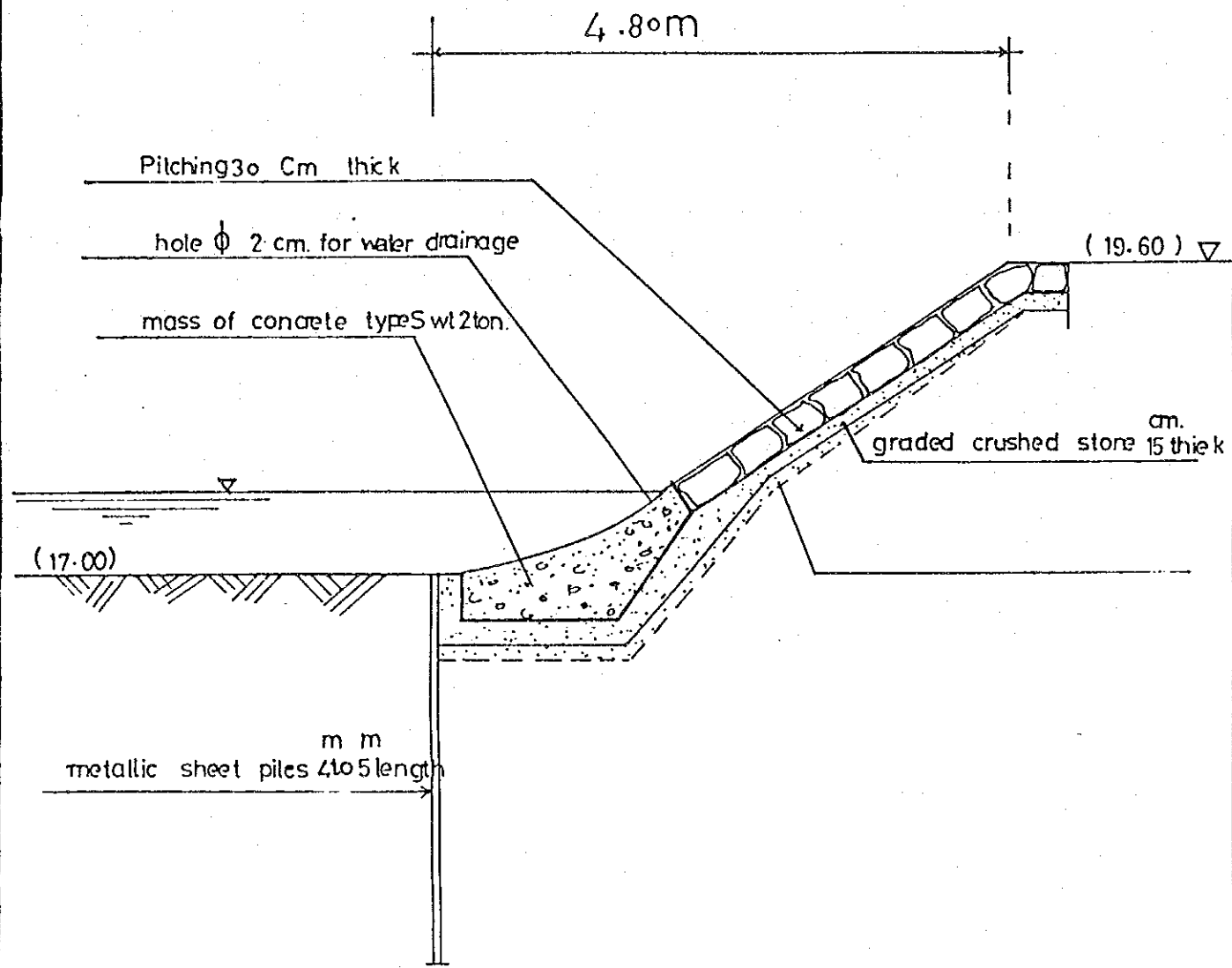
資料 11 - (5)
Fresh Water Supply Pipeline
Route Study,
Solution (1) & (2)

付 属 資 料 一 1 2

スエズ運河護岸資料

TYPE Of Revetment at East Bank k.m 142~143

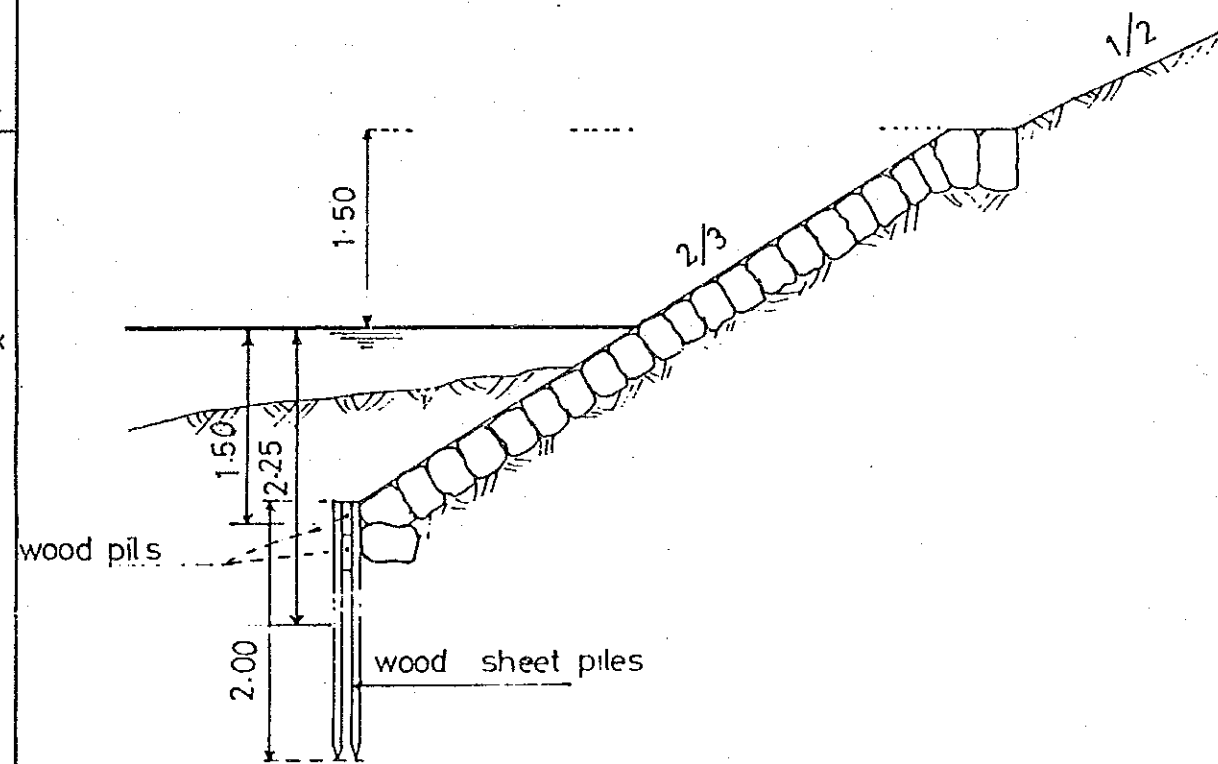
MODified S



Scale 1:50

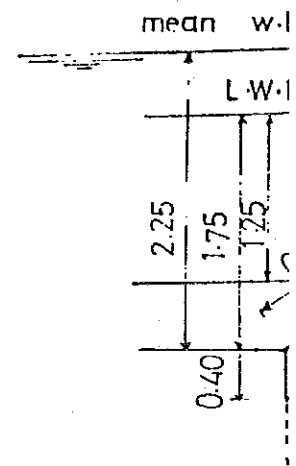
TYPE Of REVETMENT at WEST BANK KM 142.739 ~143

TYPE D

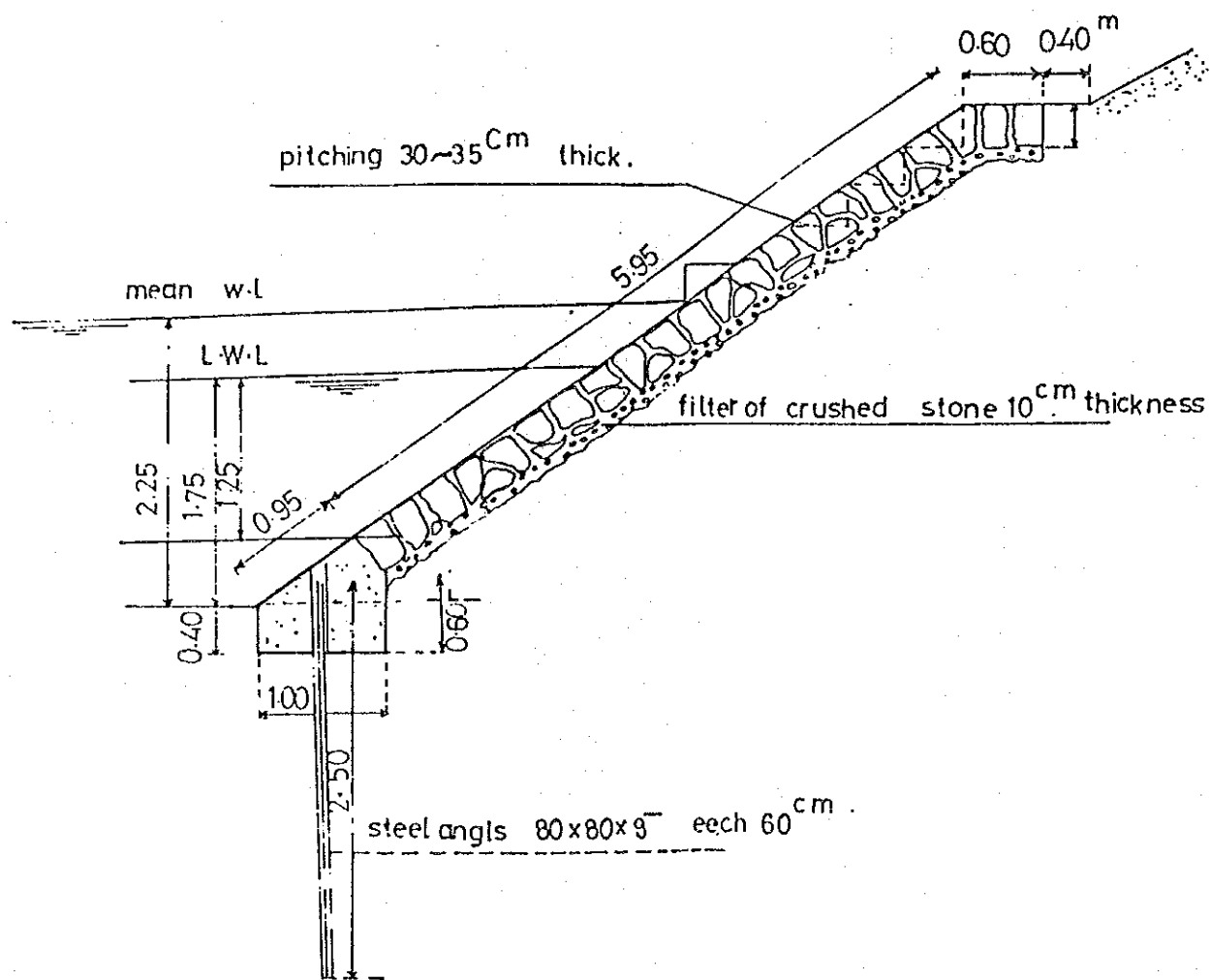


Scale 1:50

TYPE Of F



TYPE D₁



Scale 1:50

スエズ運河護岸資料

S.C.A. より入手 (1991年8月)

東岸 142-143Km (Type S)

西岸 142-142.739Km (Type D1)

142.739-142Km (Type D2)

付属資料一 1 3

スエズ運河潮汐資料

RED SEA - SUEZ

LAT 29°56'N LONG 32°33'E

TIMES AND HEIGHTS OF HIGH AND LOW WATERS

YEAR 1990

TIME M

MAY		JUNE		JULY		AUGUST									
TIME	M	TIME	M	TIME	M	TIME	M								
1 0325	1.6	16 0325	1.6	1 0015	0.6	16 0434	1.5	1 0037	0.6	16 0456	1.4	1 0144	0.6	16 0114	0.4
1 1201	1.6	W 1551	1.6	F 1238	0.6	SA 1714	1.6	SU 1248	0.6	M 1745	1.6	W 1347	0.6	TH 1336	0.3
2 2324	0.6	2224	0.7	1906	1.7	2344	0.6	1928	1.5	2037	1.4	2037	1.4	1957	1.5
2 0542	1.8	17 0420	1.6	2 0120	0.6	17 0531	1.5	2 0136	0.6	17 0015	0.4	2 0237	0.6	17 0224	0.3
3 1523	1.7	TH 1651	1.6	SA 1339	0.6	SU 1013	1.6	M 0747	1.4	17 0603	1.4	2 0905	1.2	17 0831	1.4
		2324	0.7	2006	1.7			2023	1.5	1852	1.6	2121	1.4	F 1446	0.3
														2102	1.6
3 0543	1.8	18 0518	1.6	3 0218	0.6	18 0642	0.6	3 0230	0.7	18 0121	0.4	3 0320	0.5	18 0326	0.2
4 1523	1.7	TH 1752	1.6	SU 1432	0.7	M 1555	1.5	TU 1431	0.7	W 1338	0.3	F 0949	1.2	SA 0936	1.5
		1959	1.7	2058	1.7	1913	1.7	2111	1.5	2000	1.6	2159	1.4	SA 1546	0.2
														2158	1.7
4 0543	1.8	19 0622	0.7	4 0308	1.7	19 0741	0.5	4 0314	0.6	19 0226	0.3	4 0358	0.5	19 0420	0.1
5 1523	1.8	SA 1238	0.6	M 1516	0.7	TU 1355	0.4	W 1513	0.7	TH 1444	0.3	SA 1608	0.5	SU 1640	0.2
		1850	1.7	2143	1.7	2013	1.7	2152	1.5	2103	1.7	2231	1.5	SU 2249	1.7
5 0543	1.7	20 0118	0.6	5 0348	0.7	20 0339	0.4	5 0350	0.6	20 0327	0.2	5 0434	0.4	20 0507	0.1
6 1523	1.8	SU 1332	0.6	TU 1551	0.7	SA 1434	0.4	TH 1551	0.7	F 1547	0.2	SU 1645	0.4	M 1728	0.2
		2132	1.8	2221	1.6	2111	1.8	2227	1.5	2202	1.7	2300	1.5	2335	1.7
6 0543	1.8	21 0211	0.5	6 0420	0.7	21 0335	0.3	6 0424	0.6	21 0424	0.1	6 0509	0.3	21 0551	0.1
7 1523	1.8	M 1425	0.5	W 1621	0.8	TH 1553	0.3	F 1628	0.6	SA 1644	0.2	M 1723	0.4	TU 1812	0.2
		2039	1.8	2254	1.6	2208	1.9	2258	1.6	2256	1.8	O 2329	1.6		
7 0543	1.7	22 0302	0.5	7 0448	0.7	22 0430	0.2	7 0457	0.5	22 0517	0.1	7 0543	0.3	22 0019	1.7
8 1523	1.8	TH 1517	0.4	TH 1651	0.7	F 1650	0.3	SA 1706	0.6	SU 1738	0.2	TU 1801	0.3	W 1252	1.7
		2131	1.9	2322	1.6	2304	1.9	2327	1.5	2348	1.8			1854	0.3
8 0543	1.7	23 0351	0.4	8 0518	0.7	23 0524	0.2	8 0532	0.5	23 0606	0.1	8 0000	1.6	23 0100	1.7
9 1523	1.8	W 1608	0.4	F 1724	0.7	SA 1746	0.2	SU 1744	0.5	M 1829	0.2	W 1228	1.6	TH 1335	1.7
		2225	2.0	O 2349	1.6	2359	1.9	O 2356	1.6			1839	0.3	1934	0.3
9 0543	1.7	24 0443	0.3	9 0551	0.6	24 0516	0.2	9 0608	0.4	24 0038	1.8	9 0033	1.6	24 0140	1.6
10 1523	1.8	TH 1702	0.4	SA 1801	0.7	SU 1743	0.2	M 1824	0.5	TU 1313	1.7	TH 1303	1.6	F 1417	1.6
		2131	2.0							1919	0.2	1919	0.3	2014	0.4
10 0543	1.7	25 0531	0.3	10 0018	1.6	25 0554	1.9	10 0027	1.6	25 0127	1.7	10 0110	1.6	25 0220	1.5
11 1523	1.8	F 1757	0.3	SU 1236	1.6	M 1327	1.8	TU 1253	1.5	W 1403	1.7	F 0734	0.2	SA 0824	0.4
				1842	0.6	1939	0.3	1905	0.4	2008	0.3	2002	0.3	2056	0.5
11 0543	1.8	26 0629	0.3	11 0051	1.6	26 0149	1.8	11 0102	1.6	26 0215	1.7	11 0151	1.6	26 0301	1.4
12 1523	1.8	SA 1356	1.9	M 1312	1.6	TU 1425	1.8	W 1330	1.5	TH 1454	1.6	SA 1428	1.6	SU 1548	1.5
		1853	0.3	1926	0.6	2036	0.3	1947	0.4	2057	0.4	2049	0.4	2143	0.6
12 0543	1.7	27 0106	2.0	12 0120	1.6	27 0244	1.8	12 0139	1.6	27 0304	1.6	12 0237	1.6	27 0348	1.3
13 1523	1.7	SU 1335	1.9	TU 1352	1.6	W 1524	1.7	TH 1411	1.6	F 1546	1.6	SU 1519	1.6	M 1643	1.4
		1952	0.4	2012	0.6	2134	0.4	2032	0.4	2148	0.5	2143	0.4	2238	0.7
13 0543	1.7	28 0204	2.0	13 0208	1.6	28 0342	1.7	13 0220	1.6	28 0355	1.5	13 0330	1.5	28 0444	1.2
14 1523	1.8	M 1428	1.9	W 1437	1.6	TH 1624	1.7	F 1456	1.6	SA 1642	1.5	M 1618	1.5	TU 1748	1.3
		2054	0.4	2101	0.6	2233	0.5	2120	0.4	2242	0.6	2246	0.4	2343	0.7
14 0543	1.7	29 0306	1.9	14 0253	1.6	29 0441	1.6	14 0306	1.5	29 0450	1.3	14 0433	1.4	29 0604	1.2
15 1523	1.8	TU 1543	1.8	TH 1525	1.6	F 1726	1.6	SA 1546	1.6	SU 1741	1.4	TU 1728	1.5	W 1857	1.3
		2159	0.5	2153	0.6	2335	0.5	2212	0.5	2341	0.6	2358	0.4		
15 0543	1.7	30 0410	1.8	15 0341	1.6	30 0542	1.5	15 0358	1.5	30 0552	1.3	15 0550	1.3	30 0054	0.7
16 1523	1.8	SA 1652	1.7	F 1617	1.6	SA 1820	1.6	SU 1642	1.6	M 1843	1.4	W 1844	1.6	TH 1304	0.7
		2307	0.5	2347	0.6			2311	0.5					1957	1.4
		31 0517	1.7					31 0043	0.7			31 0156	0.6		
		1133	0.5					0701	1.2			0832	1.2		
		2350	1.7					TU 1247	0.6			F 1407	0.6		
								1943	1.4			2046	1.4		

RED SEA - SUEZ

LAT 29° 00' N LONG 32° 30' E

TIME ZONE -0200

TIMES AND HEIGHTS OF HIGH AND LOW TIDES

YEAR 1951

MAY				JUNE				JULY				AUGUST			
TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M	TIME	M
1 0102	1.8	16 0017	2.0	1 0138	1.7	16 0157	1.9	1 0137	1.6	16 0236	1.8	1 0213	1.5	16 0403	1.5
0658	0.7	0639	0.4	0742	0.6	0817	0.2	0753	0.4	0853	0.1	0840	0.3	1014	0.4
W 1315	1.7	TH 1241	1.9	SA 1359	1.6	SU 1433	1.8	M 1407	1.5	TU 1517	1.8	TH 1451	1.5	F 1652	1.6
1911	0.8	1902	0.4	2003	0.7	2050	0.3	2019	0.5	2124	0.3	2115	0.5	2301	0.5
2 0137	1.8	17 0111	2.0	2 0214	1.6	17 0257	1.8	2 0214	1.6	17 0352	1.7	2 0256	1.5	17 0510	1.4
0732	0.7	0732	0.4	0824	0.6	0916	0.2	0835	0.4	0951	0.2	0925	0.4	1118	0.5
TH 1349	1.7	F 1338	1.9	SU 1440	1.6	M 1537	1.8	TU 1447	1.5	W 1619	1.7	F 1538	1.5	SA 1800	1.5
1948	0.8	1959	0.4	2050	0.7	2153	0.3	2105	0.5	2232	0.3	2207	0.5		
3 0213	1.7	18 0208	1.9	3 0255	1.6	18 0400	1.8	3 0254	1.5	18 0437	1.6	3 0345	1.4	18 0014	0.6
0810	0.8	0829	0.4	0910	0.6	1018	0.3	0919	0.4	1052	0.3	1016	0.4	18 0627	1.3
F 1427	1.7	SA 1439	1.8	M 1625	1.6	TU 1643	1.8	W 1515	1.5	TH 1725	1.6	SA 1633	1.5	SU 1230	0.6
2031	0.8	2101	0.4	2142	0.7	2300	0.4	2155	0.6	2339	0.4	2306	0.5	1909	1.4
4 0253	1.7	19 0310	1.9	4 0341	1.6	19 0506	1.7	4 0339	1.5	19 0545	1.5	4 0444	1.3	19 0129	0.6
0854	0.8	0930	0.4	0959	0.6	1123	0.4	1006	0.5	1158	0.4	1117	0.4	19 0744	1.2
SA 1510	1.6	SU 1546	1.8	TU 1615	1.6	W 1751	1.7	TH 1619	1.5	F 1833	1.6	SU 1738	1.5	M 1341	0.6
2121	0.8	2209	0.5	2236	0.7			2247	0.6					2012	1.4
5 0340	1.6	20 0418	1.8	5 0430	1.5	20 0008	0.4	5 0428	1.4	20 0049	0.5	5 0012	0.5	20 0233	0.6
0944	0.8	1037	0.4	1051	0.6	0614	1.6	1057	0.5	0657	1.4	0554	1.3	0848	1.2
SU 1603	1.6	M 1658	1.8	W 1708	1.6	TH 1231	0.4	F 1713	1.5	SA 1307	0.5	M 1227	0.4	TU 1438	0.6
2217	0.8	2320	0.5	2331	0.7	1858	1.7	2344	0.6	1939	1.5	1848	1.5	2103	1.4

