"(تقرير عسكري عن منطقة حقول نفط شركة النفط الأنجلو-إيرانية (في جنوب إيران"

المؤسسة المالكة	المكتبة البريطانية: أوراق خاصة وسجلات من مكتب الهند
المرجع	IOR/L/MIL/17/15/24
التاريخ/ التواريخ	١٩٤٠ (ميلادي)
لغة الكتابة	الإنجليزية في اللاتينية
الحجم والشكل	مجلد واحد (٦٩ ورقة)
حق النشر	رخصة حكومة مفتوحة

حول هذا السجلّ

تقرير عسكري جُمع في الأركان العامة، مقر قيادة الجيش، الهند، وطبعه في شيملا مدير مطبعة حكومة الهند، ١٩٤٠.

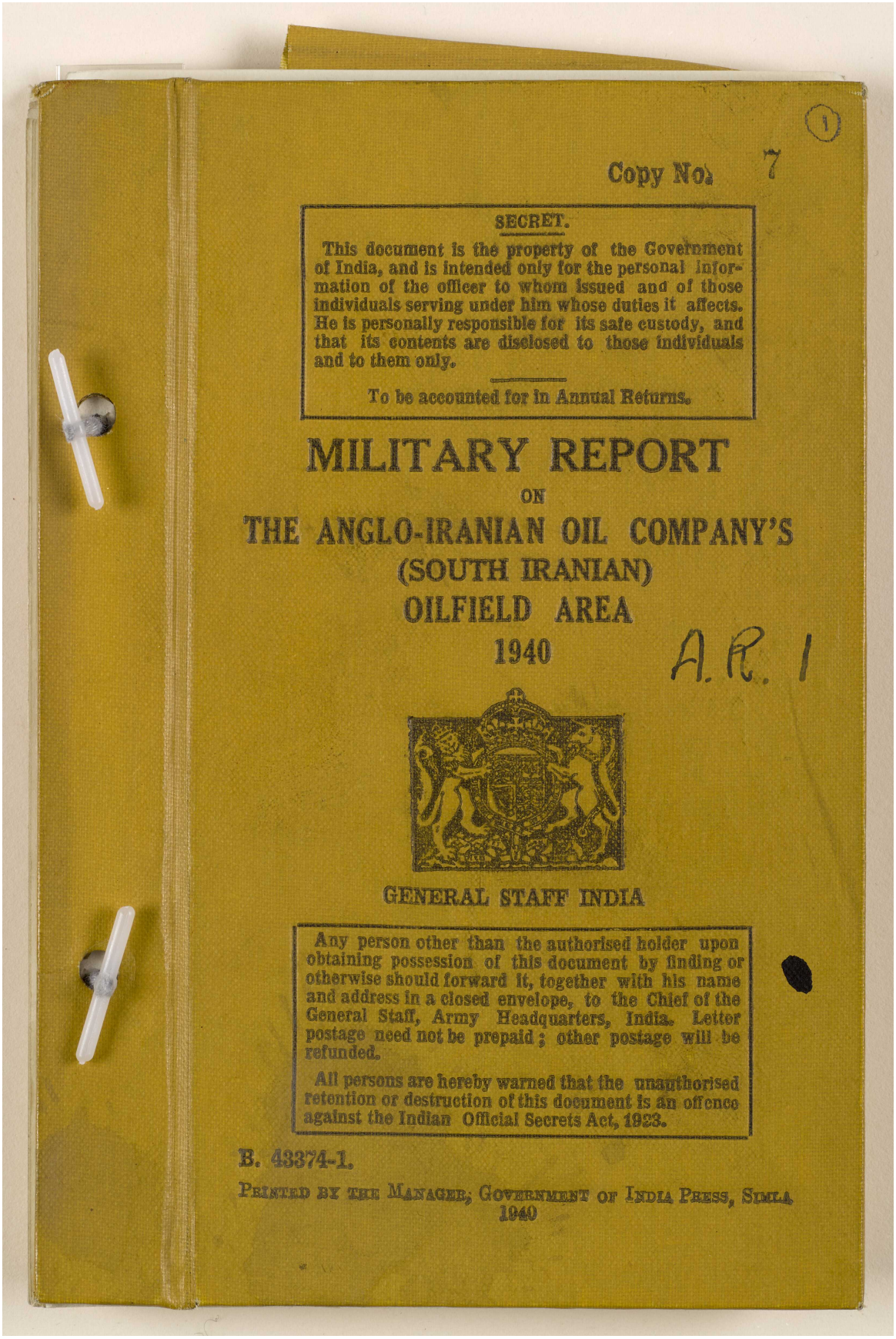
يبدأ المجلّد بمقدمة (الورقة ٣) تتضمن ملاحظات عن الجهات التي تمت استشارتها لإعداد التقرير.
بقية التقرير مقسمة إلى تسعة فصول (I-IX) يغطي كل منها موضوعًا مختلفًا بالإضافة إلى ملاحق، كما يلي:

- الفصل I: وصف عام للمنطقة
- الفصل II: المناخ

توجد في جيب في نهاية المجلّد الخرائط والجداول التالية:

إحدى الخرائط الواردة في المحتويات مفقودة: "خريطة شركة النفط الأنجلو-إيرانية في المناطق الوسطى والجنوبية تُظهر حقول النفط، خطوط أنابيب النفط، خطوط الهاتف والتلغراف".

"تقرير عسكري عن منطقة حقول نفط شركة النفط الأنجلو-إيرانية (في جنوب إيران)" [أمامي] (١٥٠/١)



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MILITARY REPORT

ON

THE ANGLO-IRANIAN OIL COMPANY'S (SOUTH IRANIAN) OILFIELD AREA

1940

A.R. 1

GENERAL STAFF INDIA

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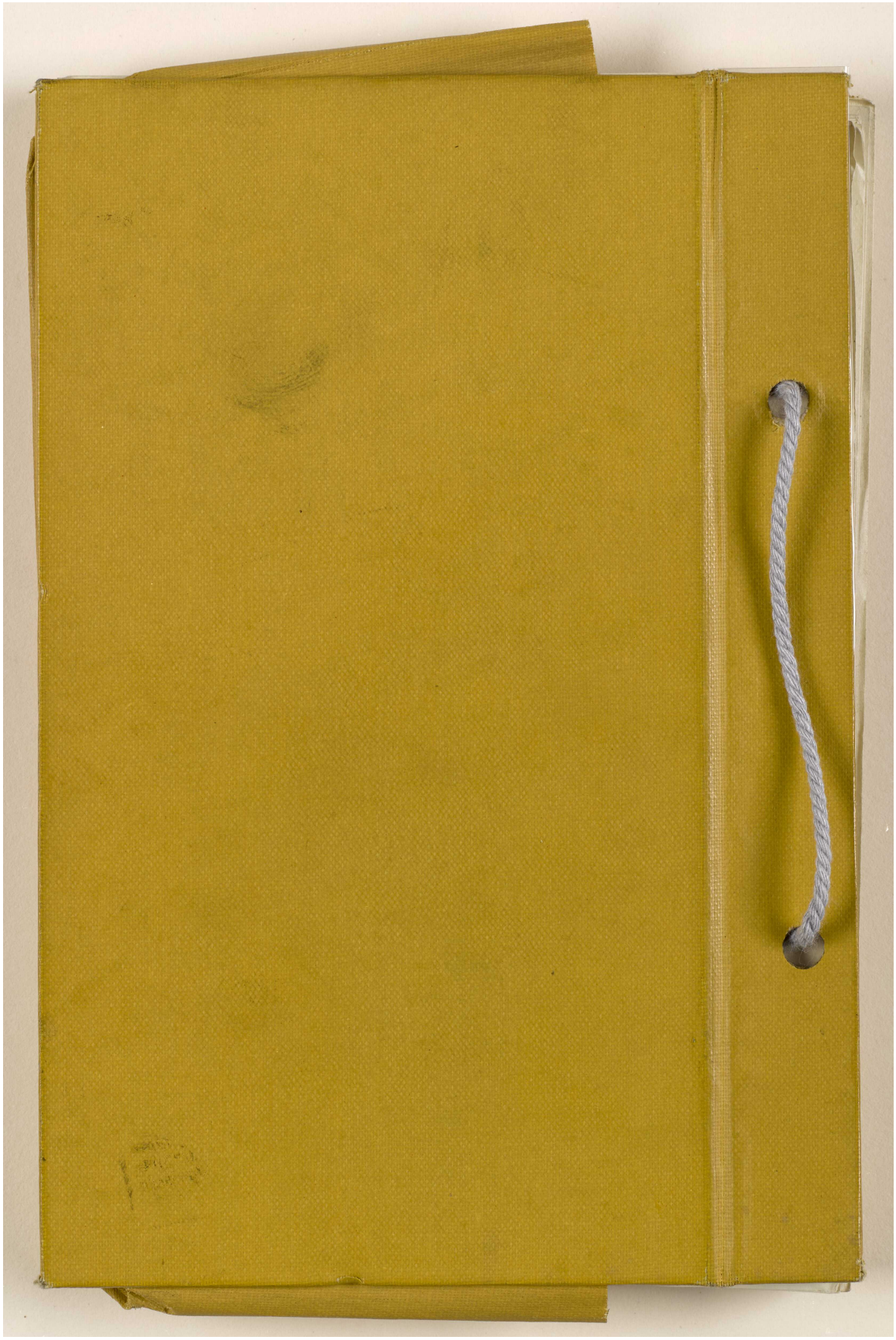

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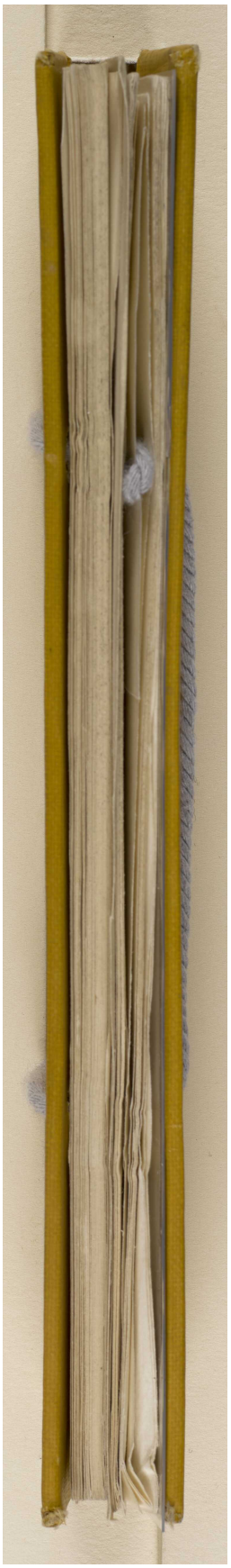

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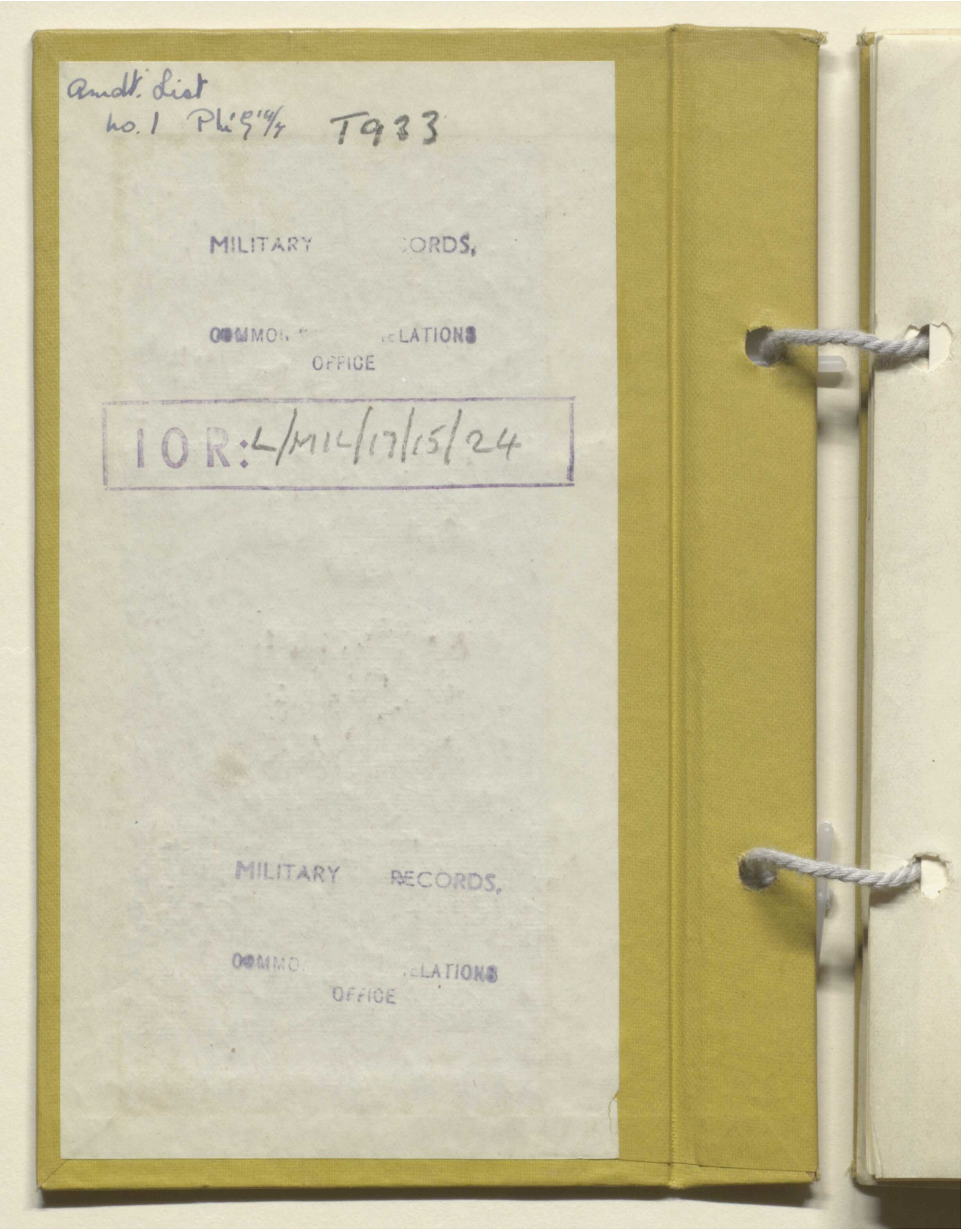
"تقرير عسكري عن منطقة حقول نفط شركة النفط الأنجلو-إيرانية (في جنوب إيران)" [أمامي-داخلي] (١٥٠/٧)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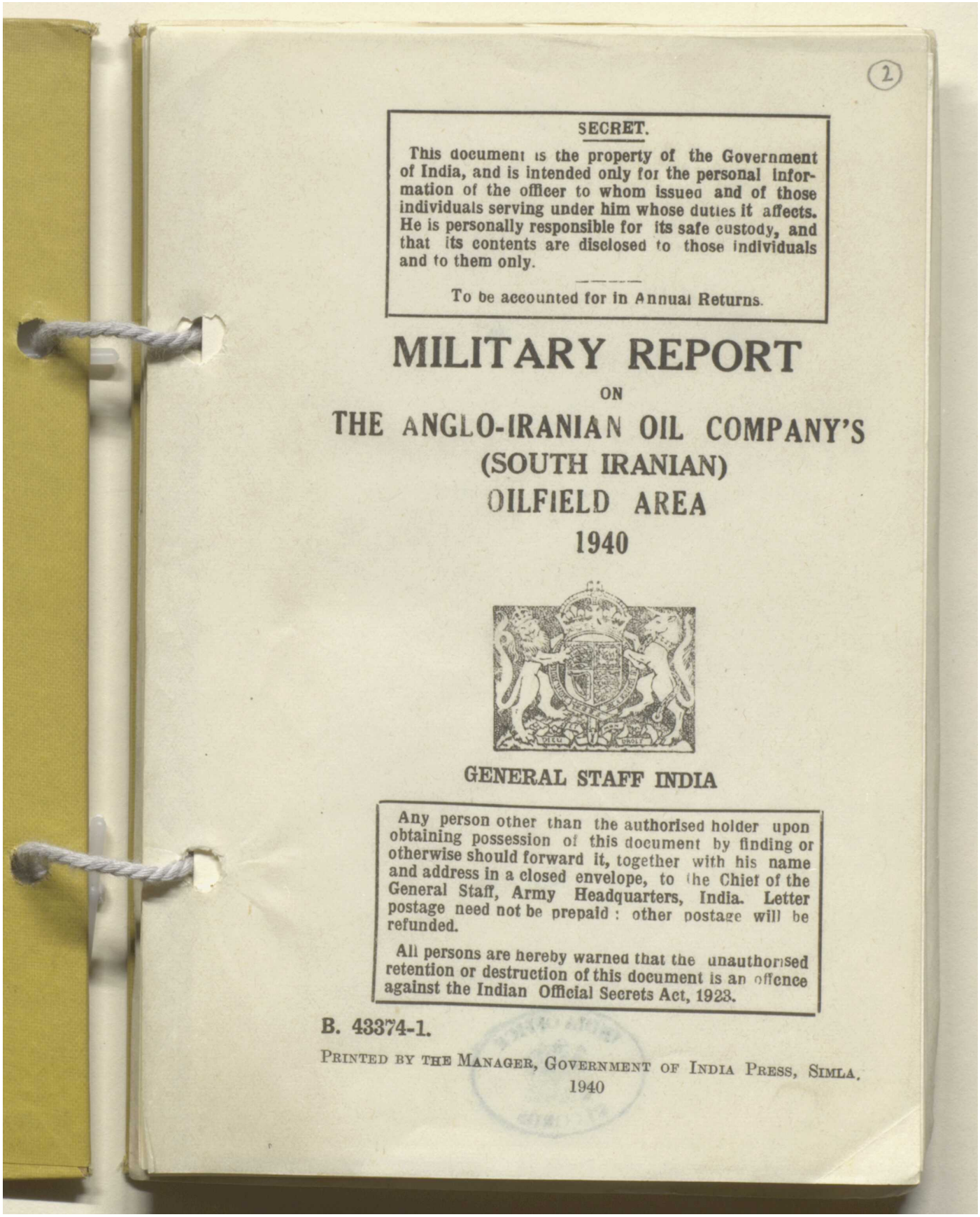

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MILITARY REPORT

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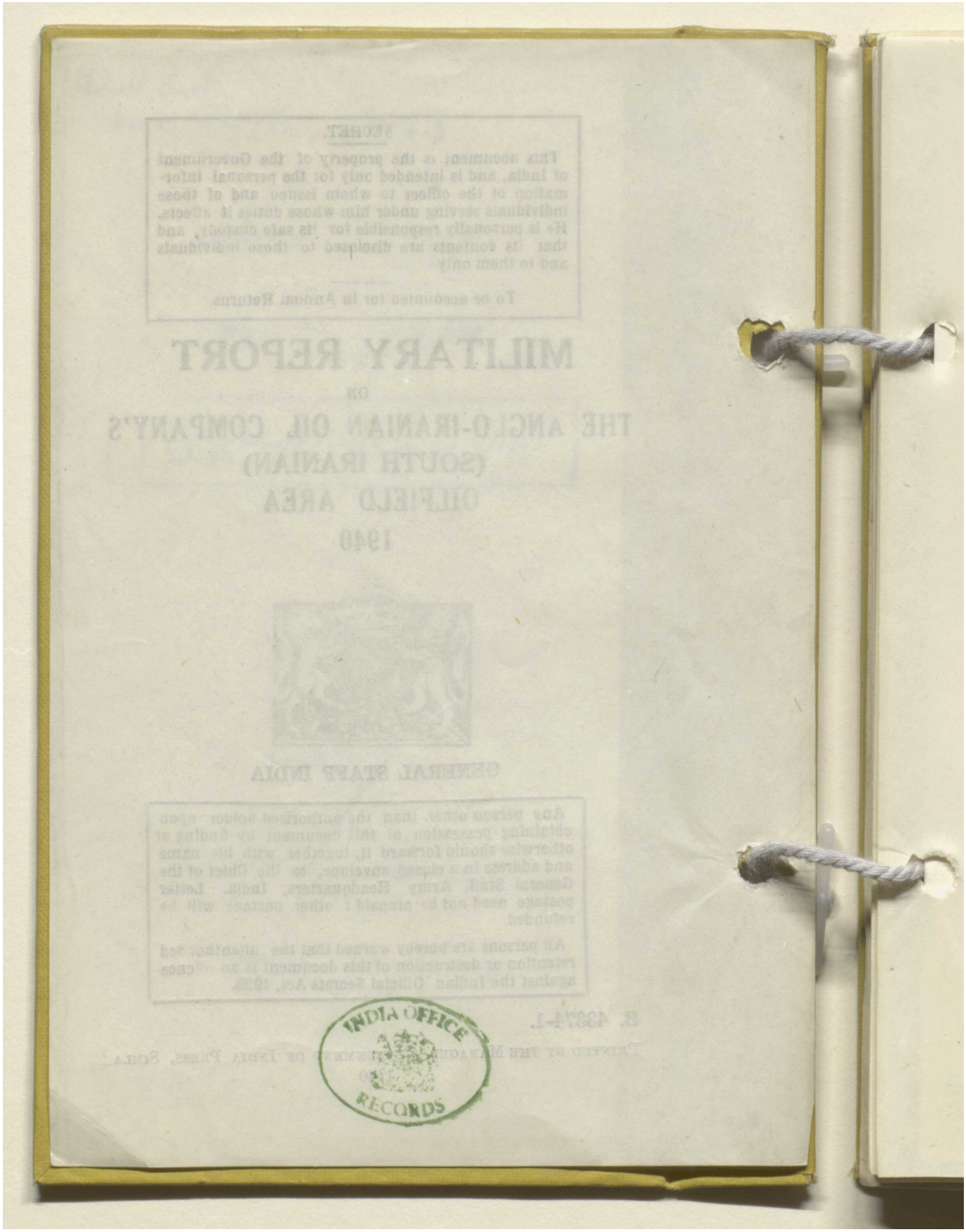

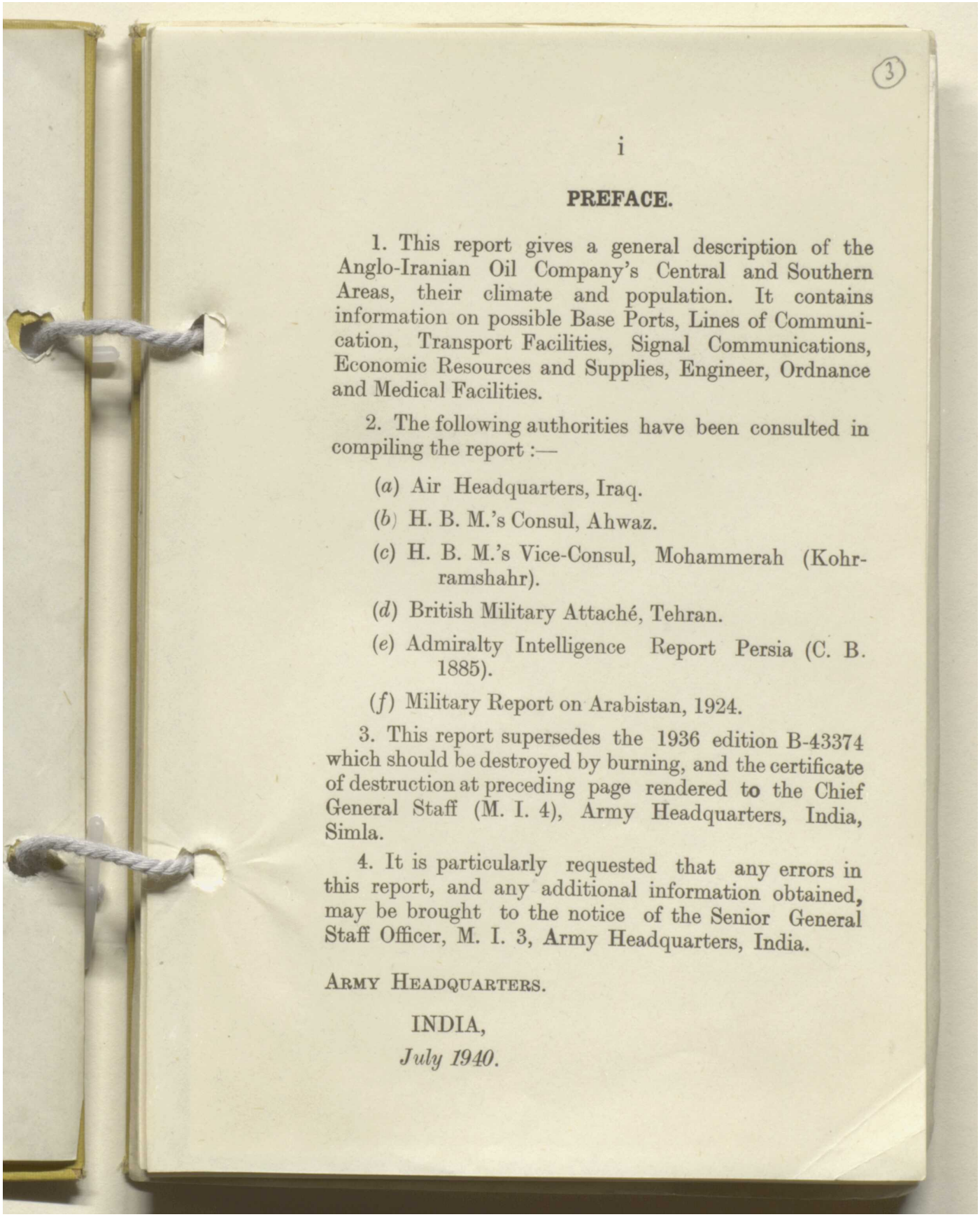

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i

PREFACE.

1. This report gives a general description of the Anglo-Iranian Oil Company's Central and Southern Areas, their climate and population. It contains information on possible Base Ports, Lines of Communication, Transport Facilities, Signal Communications, Economic Resources and Supplies, Engineer, Ordnance and Medical Facilities.

2. The following authorities have been consulted in compiling the report :—

(*a*) Air Headquarters, Iraq.

(*b*) H. B. M.'s Consul, Ahwaz.

(*c*) H. B. M.'s Vice-Consul, Mohammerah (Kohrramshahr).

(*d*) British Military Attaché, Tehran.

(*e*) Admiralty Intelligence Report Persia (C. B. 1885).

(*f*) Military Report on Arabistan, 1924.

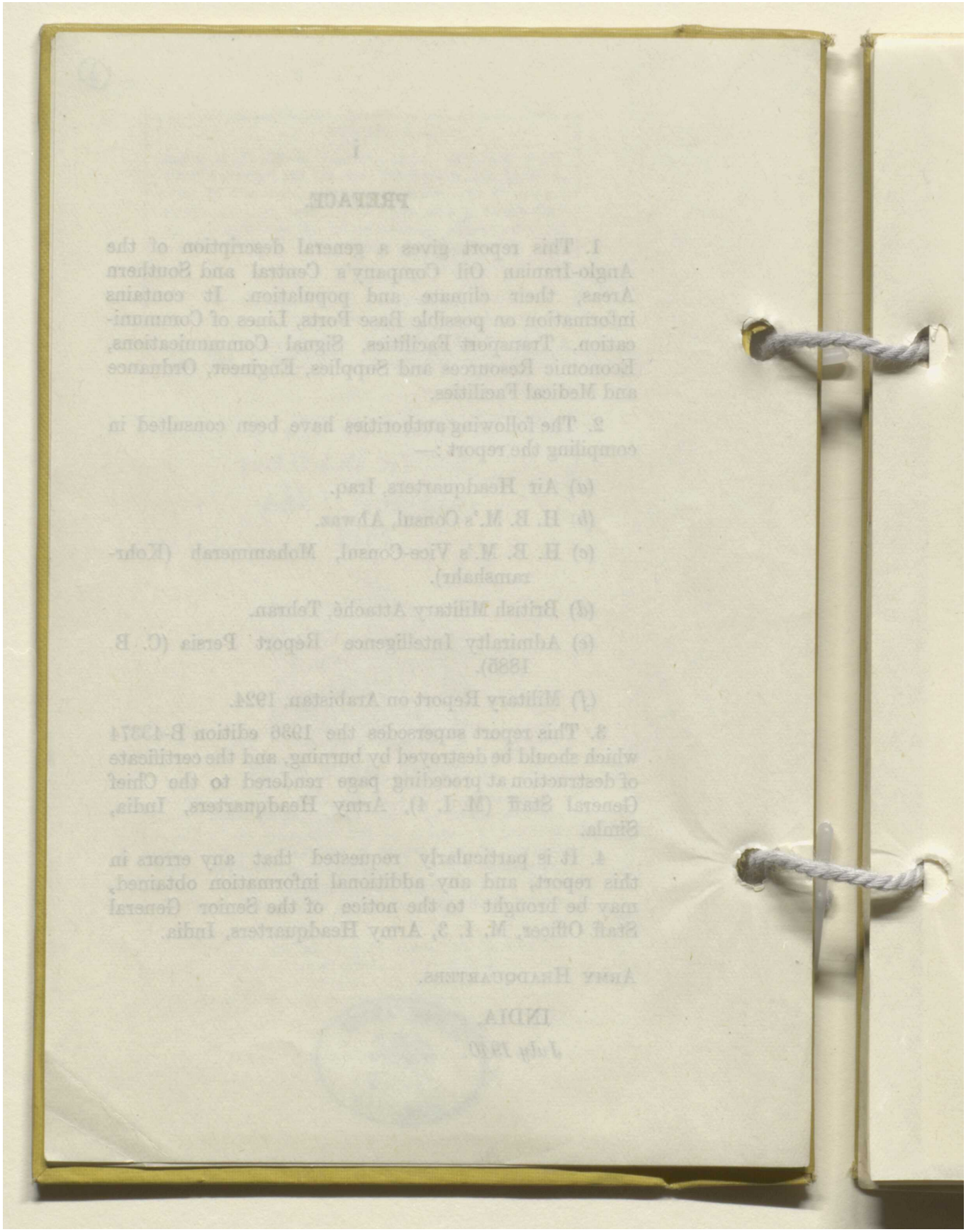
3. This report supersedes the 1936 edition B-43374 which should be destroyed by burning, and the certificate of destruction at preceding page rendered to the Chief General Staff (M. I. 4), Army Headquarters, India, Simla.

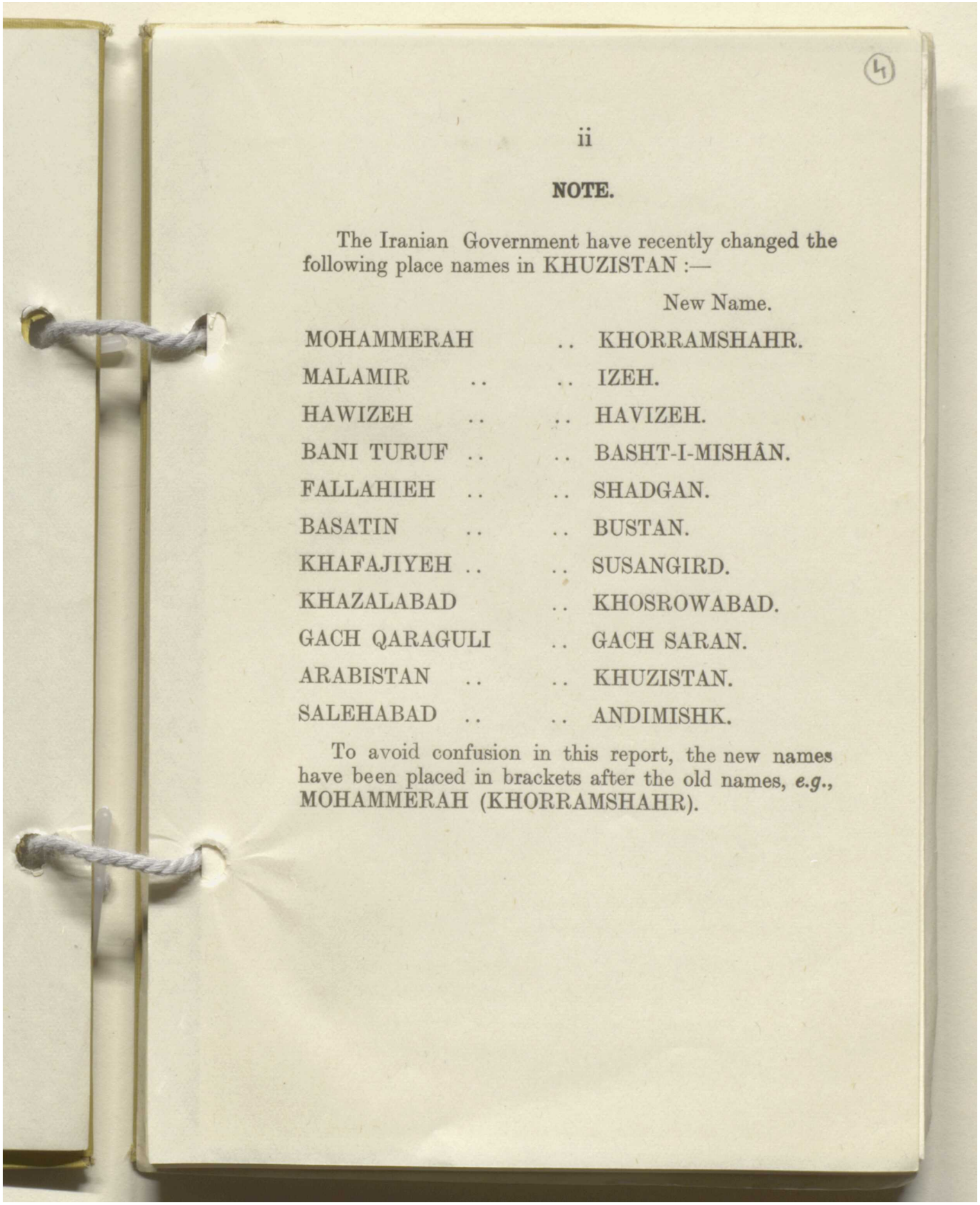
4. It is particularly requested that any errors in this report, and any additional information obtained, may be brought to the notice of the Senior General Staff Officer, M. I. 3, Army Headquarters, India.

ARMY HEADQUARTERS.

INDIA,

July 1940.





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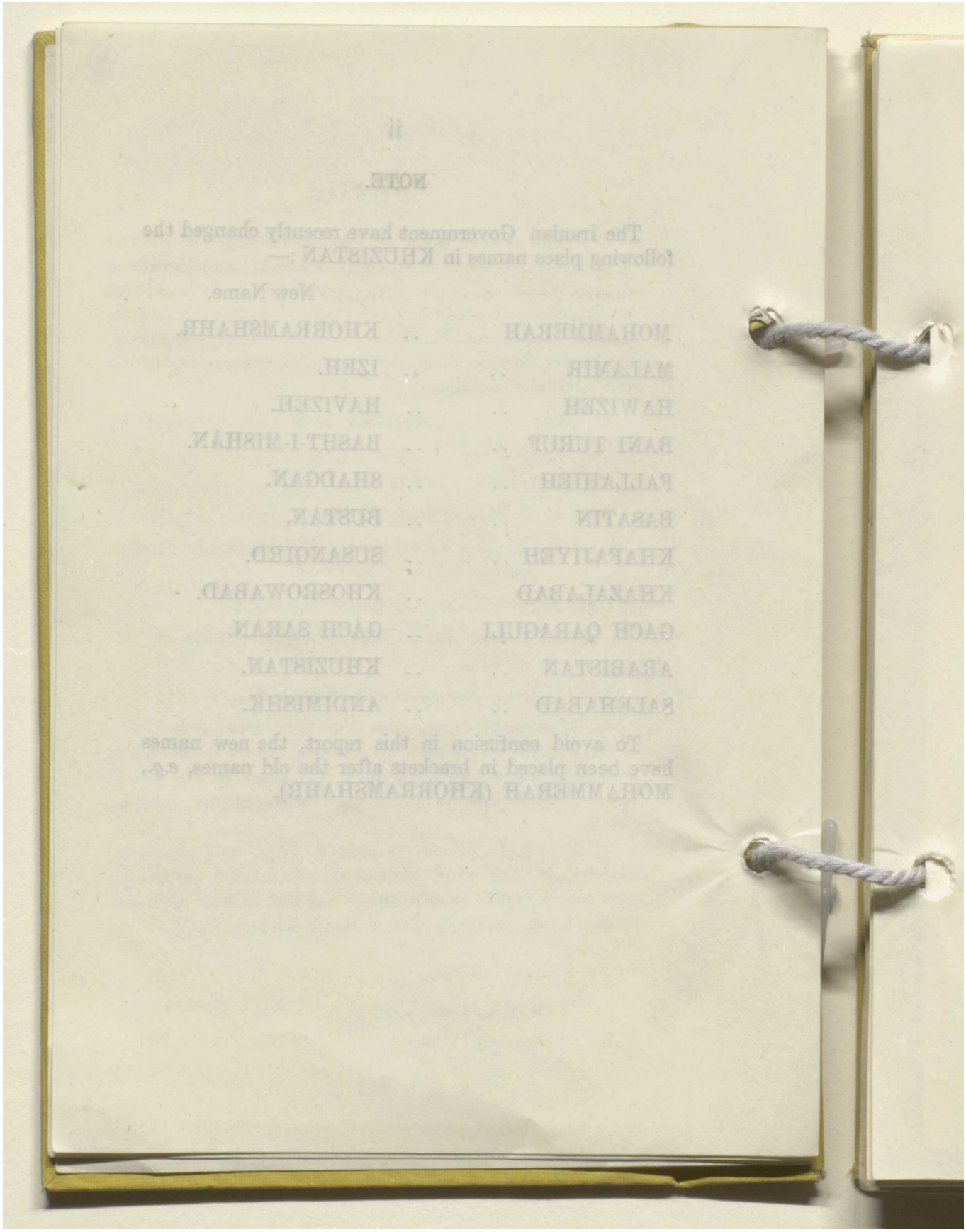
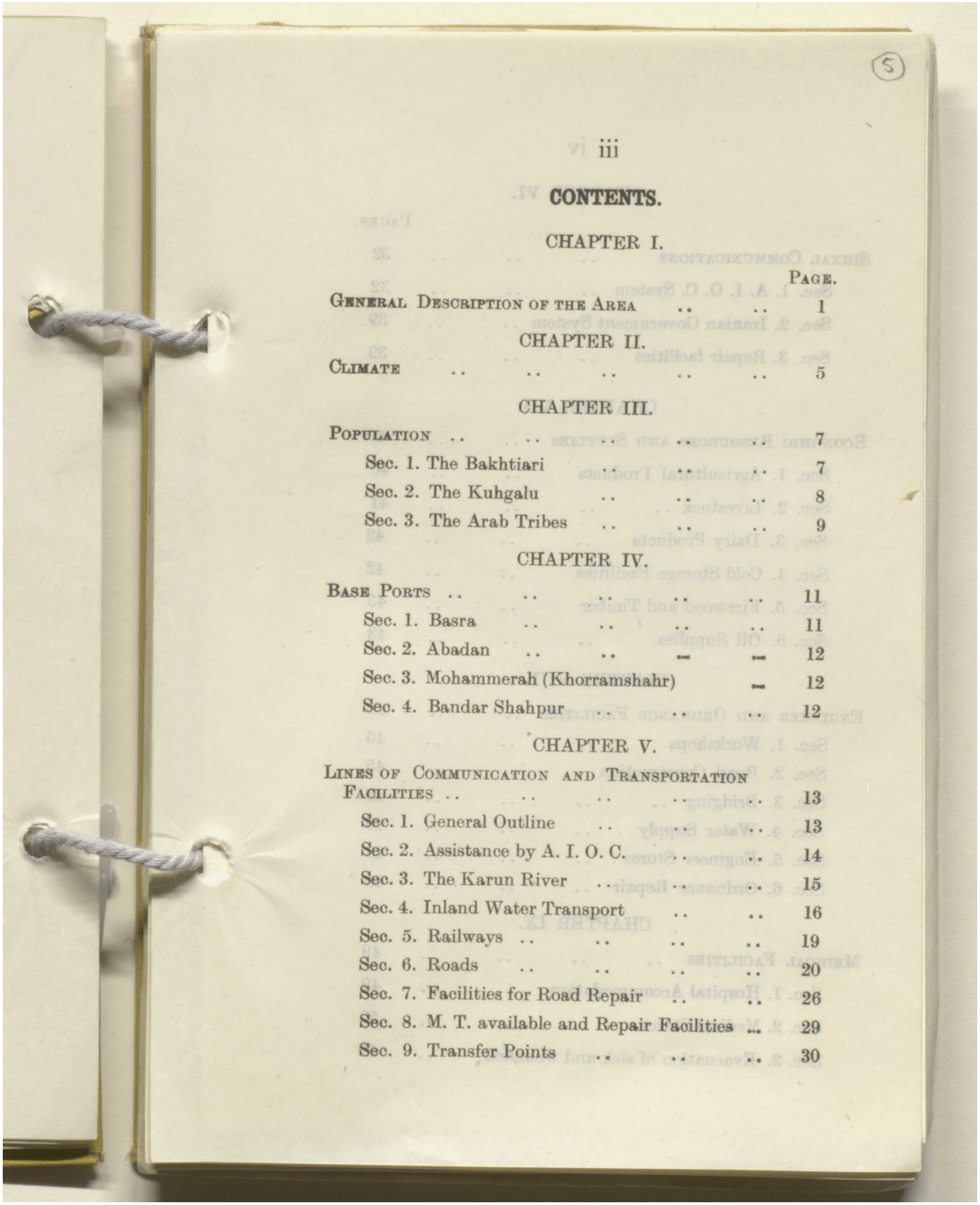
NOTE.

The Iranian Government have recently changed the following place names in KHUZISTAN :—

	New Name.
MOHAMMERAH ..	.. KHORRAMSHAHR.
MALAMIR ..	.. IZEH.
HAWIZEH ..	.. HAVIZEH.
BANI TURUF ..	.. BASHT-I-MISHÂN.
FALLAHIEH ..	.. SHADGAN.
BASATIN ..	.. BUSTAN.
KHAFAJIYEH ..	.. SUSANGIRD.
KHAZALABAD	.. KHOSROWABAD.
GACH QARAGULI	.. GACH SARAN.
ARABISTAN ..	.. KHUZISTAN.
SALEHABAD ..	.. ANDIMISHK.

To avoid confusion in this report, the new names have been placed in brackets after the old names, *e.g.*, MOHAMMERAH (KHORRAMSHAHR).





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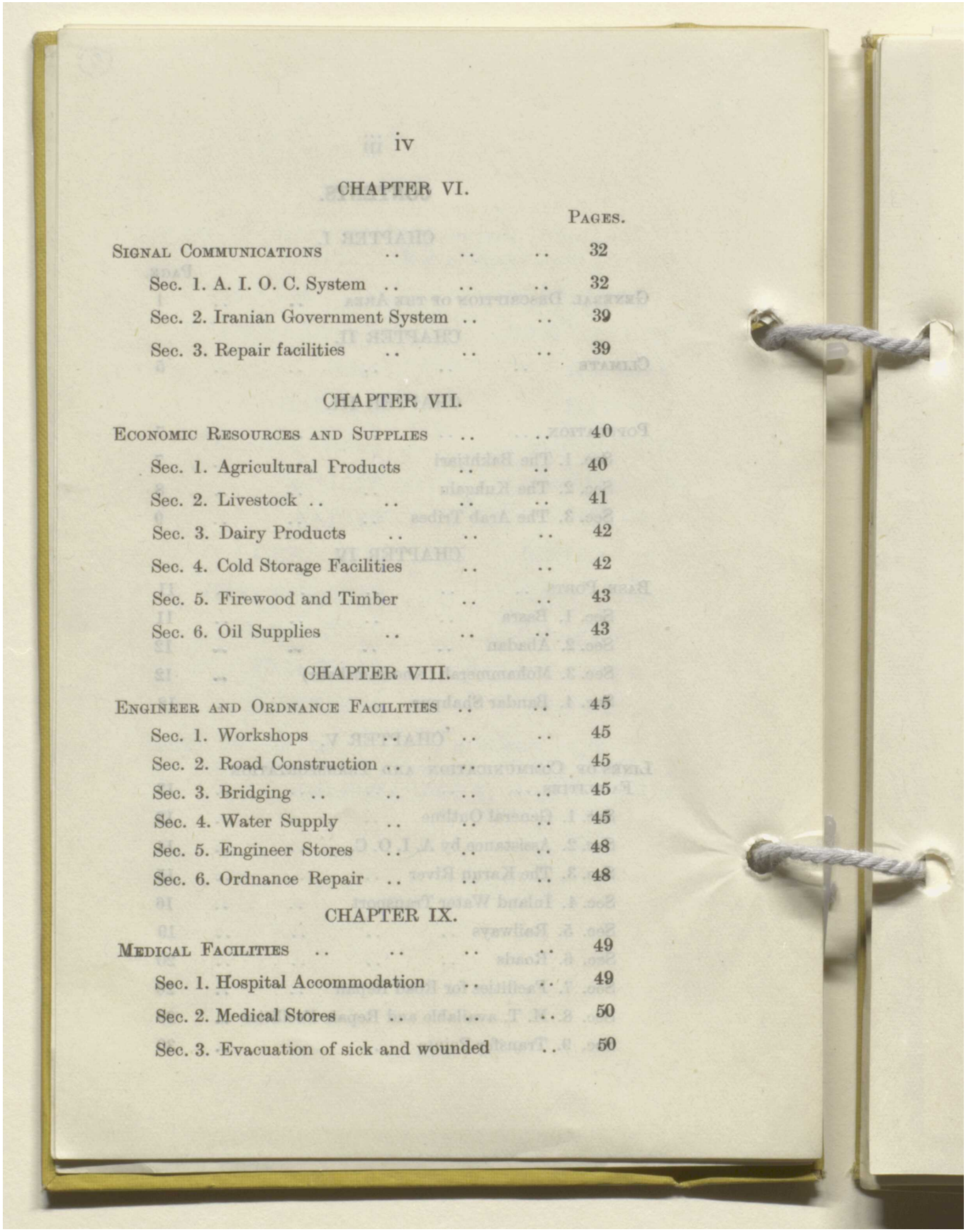

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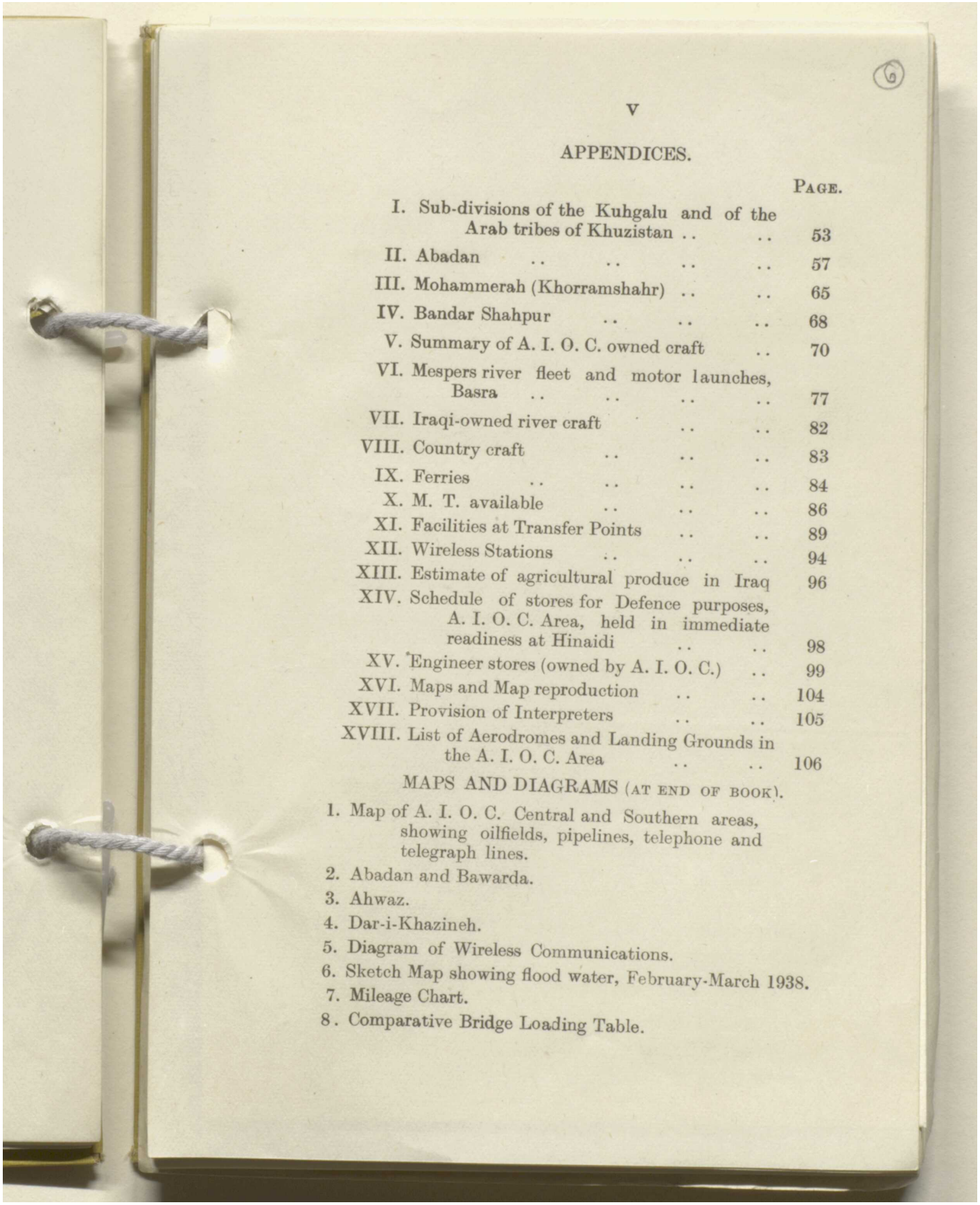
CHAPTER VI.

CHAPTER VII.

CHAPTER VIII.

CHAPTER IX.



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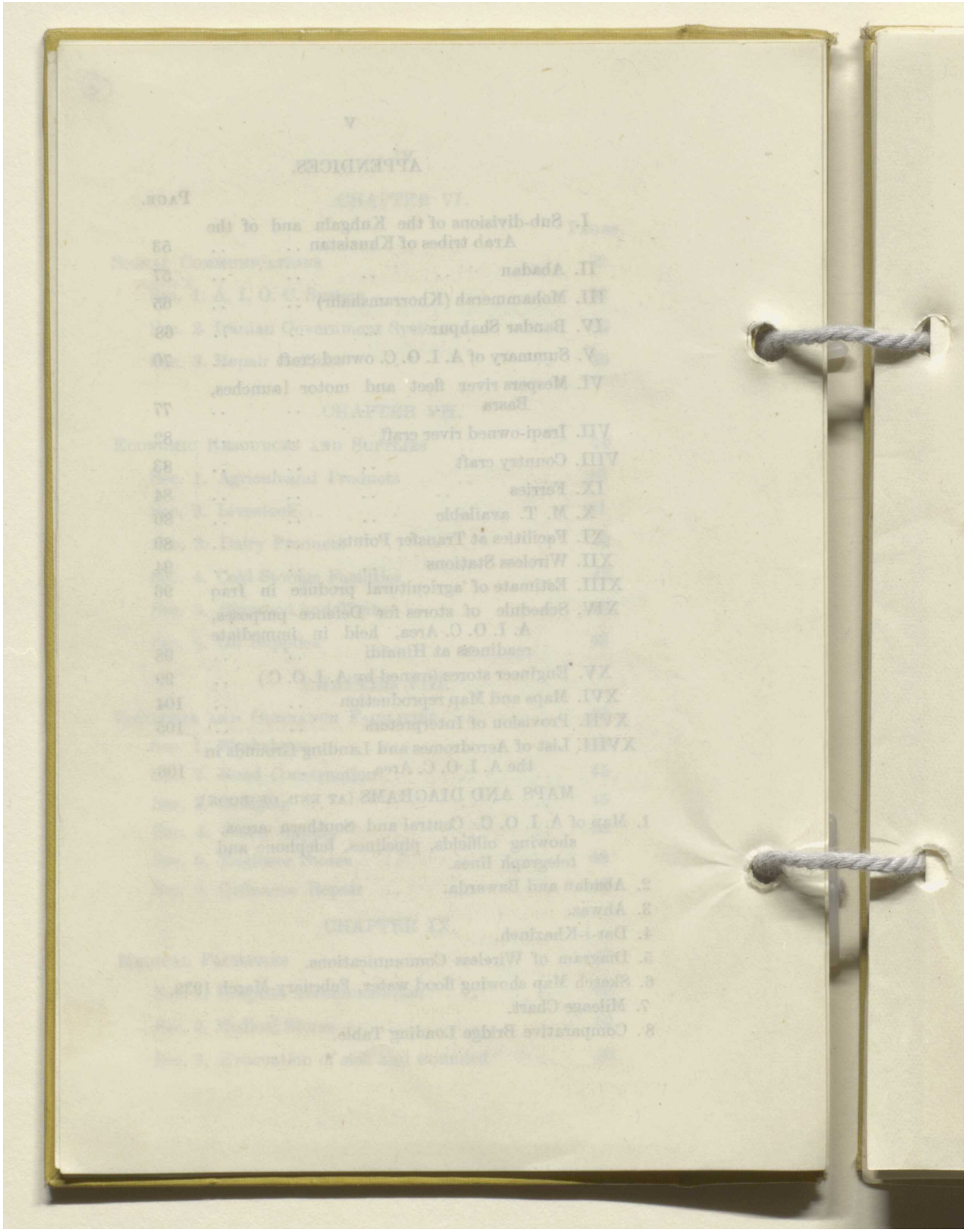
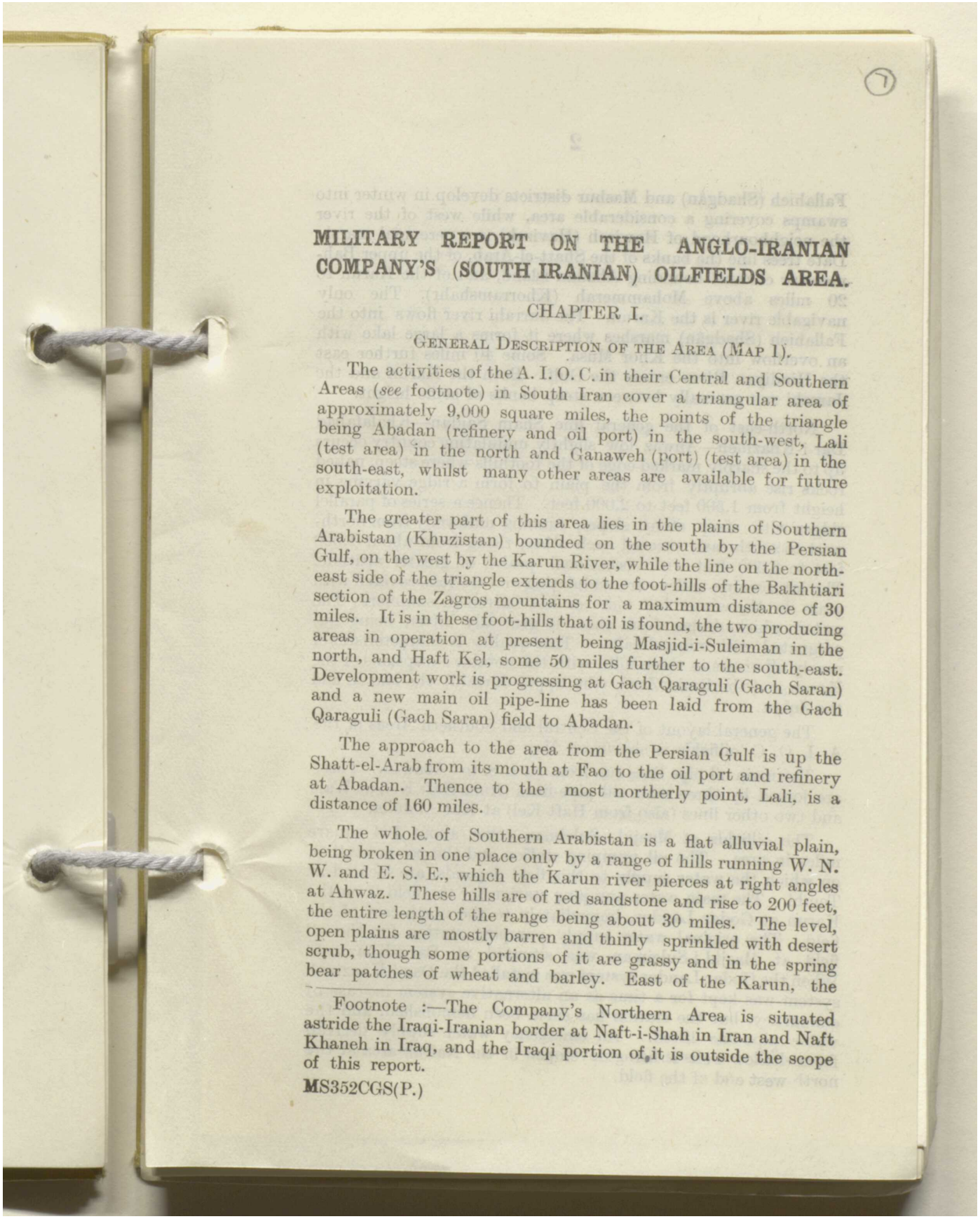
APPENDICES.

MAPS AND DIAGRAMS (AT END OF BOOK).





MILITARY REPORT ON THE ANGLO-IRANIAN COMPANY'S (SOUTH IRANIAN) OILFIELDS AREA.

CHAPTER I.

General Description of the Area (Map 1).

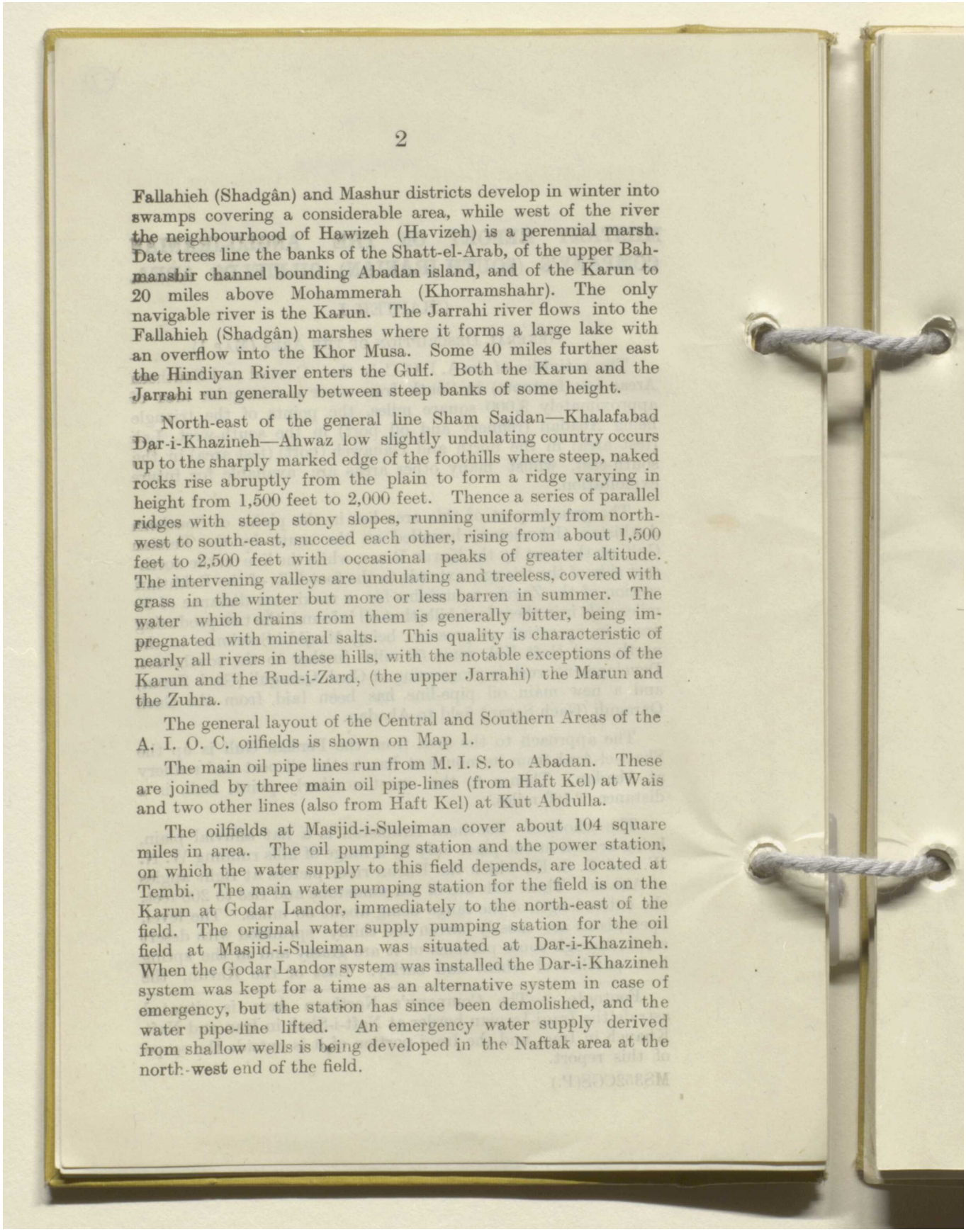
The activities of the A. I. O. C. in their Central and Southern Areas (*see* footnote) in South Iran cover a triangular area of approximately 9,000 square miles, the points of the triangle being Abadan (refinery and oil port) in the south-west, Lali (test area) in the north and Ganaweh (port) (test area) in the south-east, whilst many other areas are available for future exploitation.

The greater part of this area lies in the plains of Southern Arabistan (Khuzistan) bounded on the south by the Persian Gulf, on the west by the Karun River, while the line on the north-east side of the triangle extends to the foot-hills of the Bakhtiari section of the Zagros mountains for a maximum distance of 30 miles. It is in these foot-hills that oil is found, the two producing areas in operation at present being Masjid-i-Suleiman in the north, and Haft Kel, some 50 miles further to the south-east. Development work is progressing at Gach Qaraguli (Gach Saran) and a new main oil pipe-line has been laid from the Gach Qaraguli (Gach Saran) field to Abadan.

The approach to the area from the Persian Gulf is up the Shatt-el-Arab from its mouth at Fao to the oil port and refinery at Abadan. Thence to the most northerly point, Lali, is a distance of 160 miles.

The whole of Southern Arabistan is a flat alluvial plain, being broken in one place only by a range of hills running W. N. W. and E. S. E., which the Karun river pierces at right angles at Ahwaz. These hills are of red sandstone and rise to 200 feet, the entire length of the range being about 30 miles. The level, open plains are mostly barren and thinly sprinkled with desert scrub, though some portions of it are grassy and in the spring bear patches of wheat and barley. East of the Karun, the

Footnote :—The Company's Northern Area is situated astride the Iraqi-Iranian border at Naft-i-Shah in Iran and Naft Khaneh in Iraq, and the Iraqi portion of it is outside the scope of this report.



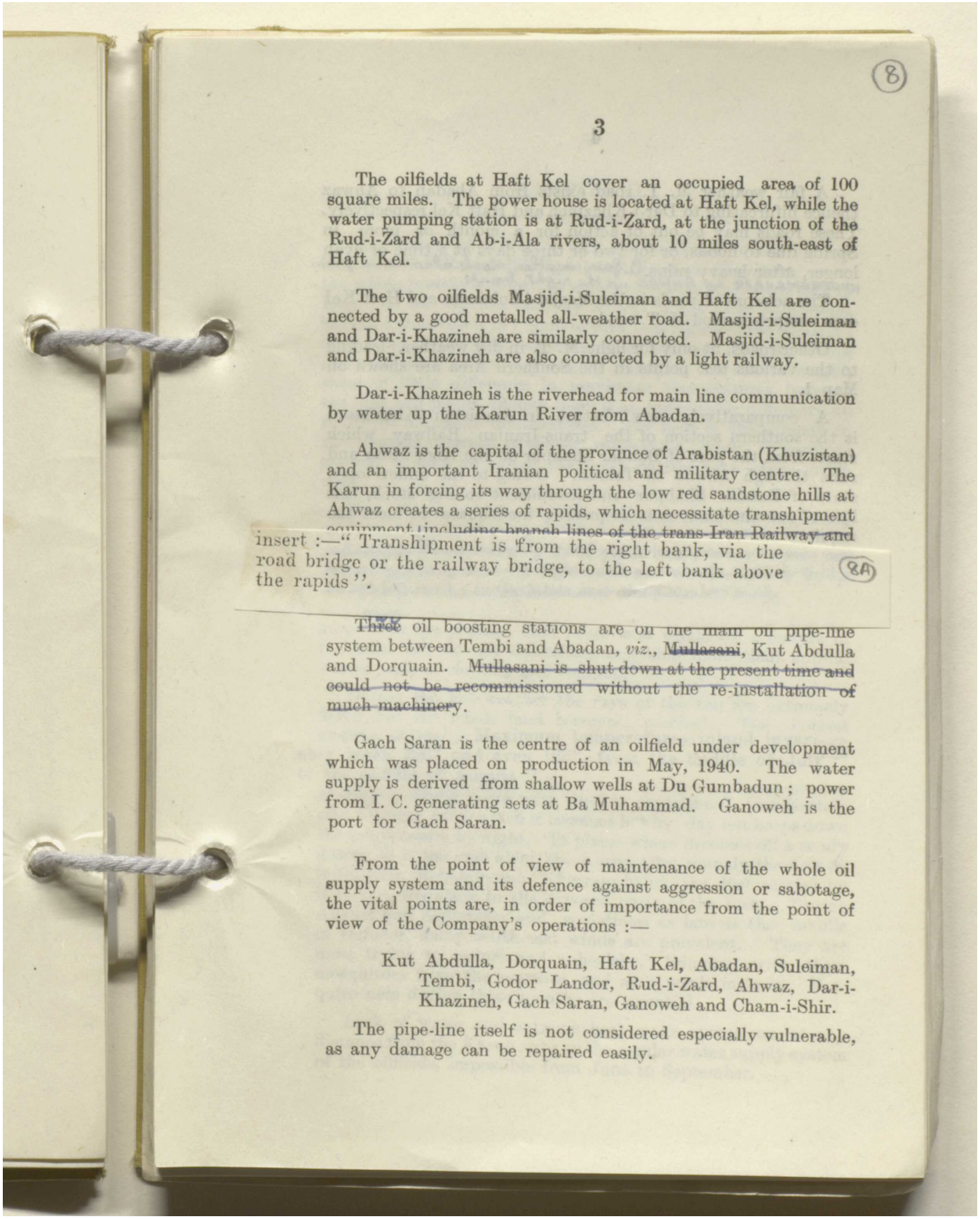
Fallahieh (Shadgân) and Mashur districts develop in winter into swamps covering a considerable area, while west of the river the neighbourhood of Hawizeh (Havizeh) is a perennial marsh. Date trees line the banks of the Shatt-el-Arab, of the upper Bahmanshir channel bounding Abadan island, and of the Karun to 20 miles above Mohammerah (Khorramshahr). The only navigable river is the Karun. The Jarrahi river flows into the Fallahieh (Shadgân) marshes where it forms a large lake with an overflow into the Khor Musa. Some 40 miles further east the Hindiyan River enters the Gulf. Both the Karun and the Jarrahi run generally between steep banks of some height.

North-east of the general line Sham Saidan—Khalafabad Dar-i-Khazineh—Ahwaz low slightly undulating country occurs up to the sharply marked edge of the foothills where steep, naked rocks rise abruptly from the plain to form a ridge varying in height from 1,500 feet to 2,000 feet. Thence a series of parallel ridges with steep stony slopes, running uniformly from north-west to south-east, succeed each other, rising from about 1,500 feet to 2,500 feet with occasional peaks of greater altitude. The intervening valleys are undulating and treeless, covered with grass in the winter but more or less barren in summer. The water which drains from them is generally bitter, being impregnated with mineral salts. This quality is characteristic of nearly all rivers in these hills, with the notable exceptions of the Karun and the Rud-i-Zard, (the upper Jarrahi) the Marun and the Zuhra.

The general layout of the Central and Southern Areas of the A. I. O. C. oilfields is shown on Map 1.

The main oil pipe lines run from M. I. S. to Abadan. These are joined by three main oil pipe-lines (from Haft Kel) at Wais and two other lines (also from Haft Kel) at Kut Abdulla.

The oilfields at Masjid-i-Suleiman cover about 104 square miles in area. The oil pumping station and the power station, on which the water supply to this field depends, are located at Tembi. The main water pumping station for the field is on the Karun at Godar Landor, immediately to the north-east of the field. The original water supply pumping station for the oil field at Masjid-i-Suleiman was situated at Dar-i-Khazineh. When the Godar Landor system was installed the Dar-i-Khazineh system was kept for a time as an alternative system in case of emergency, but the station has since been demolished, and the water pipe-line lifted. An emergency water supply derived from shallow wells is being developed in the Naftak area at the north-west end of the field.



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The oilfields at Haft Kel cover an occupied area of 100 square miles. The power house is located at Haft Kel, while the water pumping station is at Rud-i-Zard, at the junction of the Rud-i-Zard and Ab-i-Ala rivers, about 10 miles south-east of Haft Kel.

The two oilfields Masjid-i-Suleiman and Haft Kel are connected by a good metalled all-weather road. Masjid-i-Suleiman and Dar-i-Khazineh are similarly connected. Masjid-i-Suleiman and Dar-i-Khazineh are also connected by a light railway.

Dar-i-Khazineh is the riverhead for main line communication by water up the Karun River from Abadan.

Ahwaz is the capital of the province of Arabistan (Khuzistan) and an important Iranian political and military centre. The Karun in forcing its way through the low red sandstone hills at Ahwaz creates a series of rapids, which necessitate transhipment equipment including branch lines of the trans-Iran Railway and

insert :—" Transhipment is from the right bank, via the road bridge or the railway bridge, to the left bank above the rapids ".

(8A)

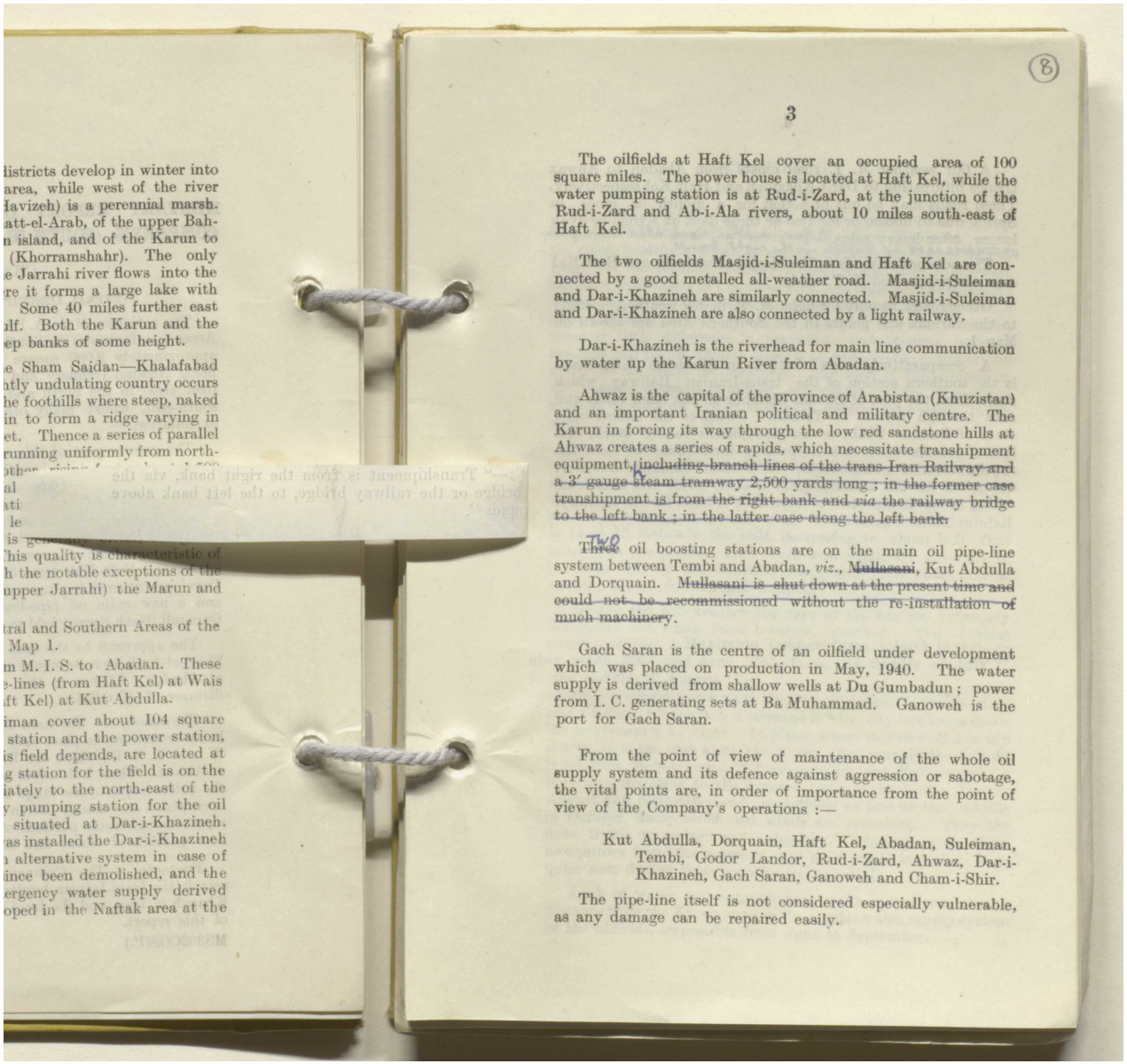
Three oil boosting stations are on the main oil pipe-line system between Tembi and Abadan, *viz.*, Mullasani, Kut Abdulla and Dorquain. Mullasani is shut down at the present time and could not be recommissioned without the re-installation of much machinery.

Gach Saran is the centre of an oilfield under development which was placed on production in May, 1940. The water supply is derived from shallow wells at Du Gumbadun ; power from I. C. generating sets at Ba Muhammad. Ganoweh is the port for Gach Saran.

From the point of view of maintenance of the whole oil supply system and its defence against aggression or sabotage, the vital points are, in order of importance from the point of view of the Company's operations :—

Kut Abdulla, Dorquain, Haft Kel, Abadan, Suleiman, Tembi, Godor Landor, Rud-i-Zard, Ahwaz, Dar-i-Khazineh, Gach Saran, Ganoweh and Cham-i-Shir.

The pipe-line itself is not considered especially vulnerable, as any damage can be repaired easily.



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Two

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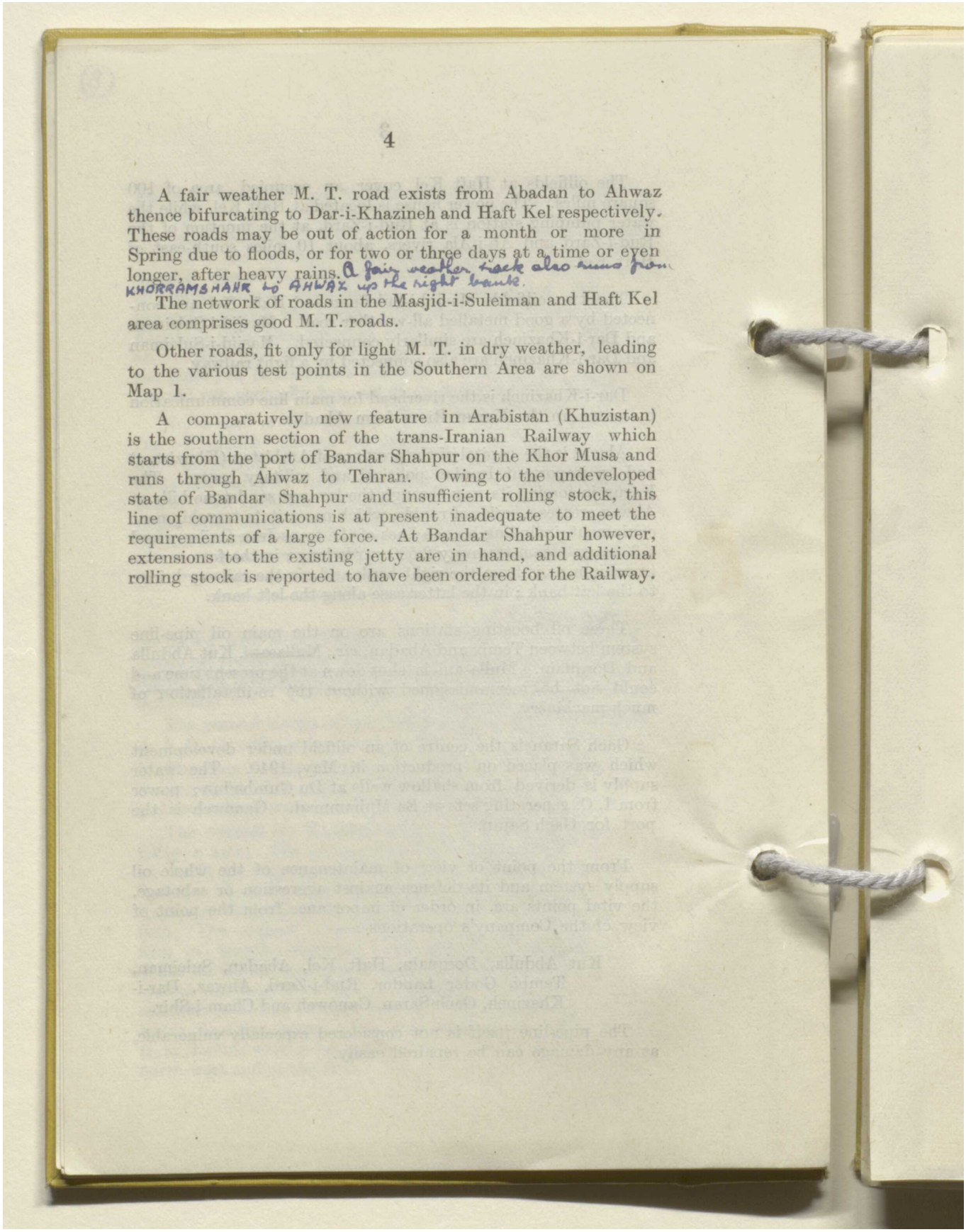

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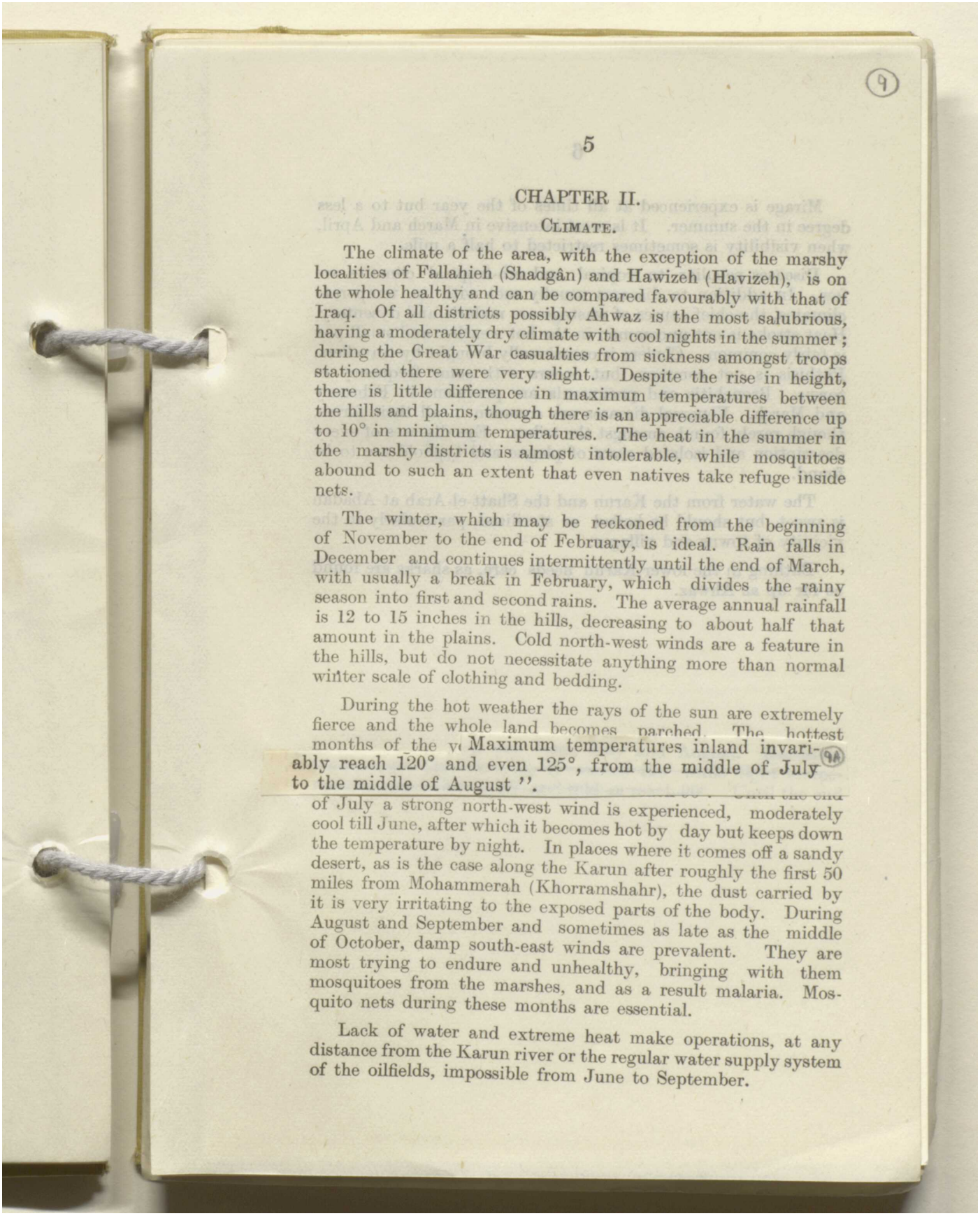
A fair weather M. T. road exists from Abadan to Ahwaz thence bifurcating to Dar-i-Khazineh and Haft Kel respectively. These roads may be out of action for a month or more in Spring due to floods, or for two or three days at a time or even longer, after heavy rains. A fair weather track also runs from KHORRAMSHAHR to AHWAZ up the right bank.

The network of roads in the Masjid-i-Suleiman and Haft Kel area comprises good M. T. roads.

Other roads, fit only for light M. T. in dry weather, leading to the various test points in the Southern Area are shown on Map 1.

A comparatively new feature in Arabistan (Khuzistan) is the southern section of the trans-Iranian Railway which starts from the port of Bandar Shahpur on the Khor Musa and runs through Ahwaz to Tehran. Owing to the undeveloped state of Bandar Shahpur and insufficient rolling stock, this line of communications is at present inadequate to meet the requirements of a large force. At Bandar Shahpur however, extensions to the existing jetty are in hand, and additional rolling stock is reported to have been ordered for the Railway.



CHAPTER II.

Climate.

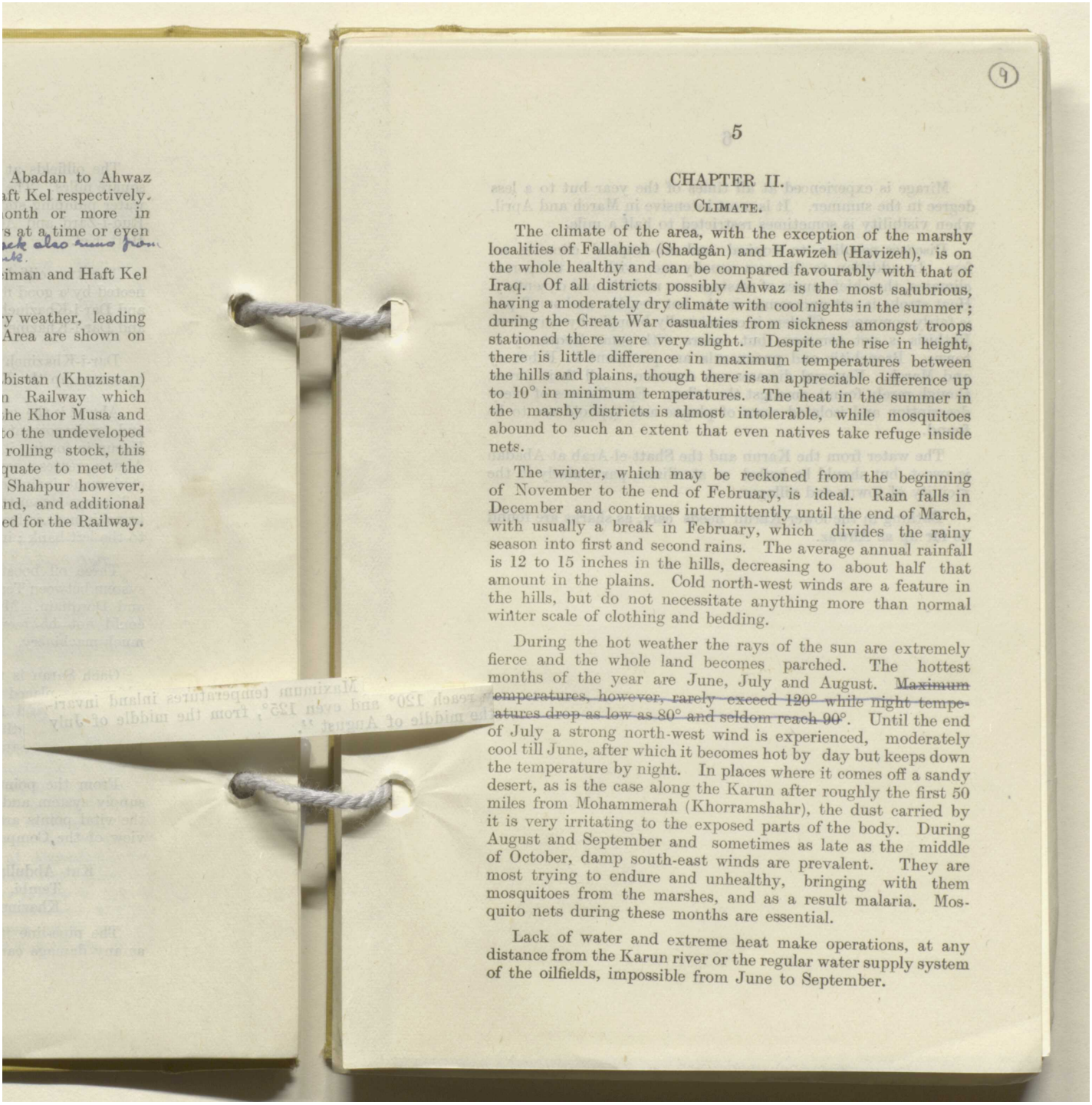
The climate of the area, with the exception of the marshy localities of Fallahieh (Shadgân) and Hawizeh (Havizeh), is on the whole healthy and can be compared favourably with that of Iraq. Of all districts possibly Ahwaz is the most salubrious, having a moderately dry climate with cool nights in the summer; during the Great War casualties from sickness amongst troops stationed there were very slight. Despite the rise in height, there is little difference in maximum temperatures between the hills and plains, though there is an appreciable difference up to 10° in minimum temperatures. The heat in the summer in the marshy districts is almost intolerable, while mosquitoes abound to such an extent that even natives take refuge inside nets.

The winter, which may be reckoned from the beginning of November to the end of February, is ideal. Rain falls in December and continues intermittently until the end of March, with usually a break in February, which divides the rainy season into first and second rains. The average annual rainfall is 12 to 15 inches in the hills, decreasing to about half that amount in the plains. Cold north-west winds are a feature in the hills, but do not necessitate anything more than normal winter scale of clothing and bedding.

During the hot weather the rays of the sun are extremely fierce and the whole land becomes parched. The hottest months of the y[illegible] Maximum temperatures inland invariably reach 120° and even 125°, from the middle of July to the middle of August ".

of July a strong north-west wind is experienced, moderately cool till June, after which it becomes hot by day but keeps down the temperature by night. In places where it comes off a sandy desert, as is the case along the Karun after roughly the first 50 miles from Mohammerah (Khorramshahr), the dust carried by it is very irritating to the exposed parts of the body. During August and September and sometimes as late as the middle of October, damp south-east winds are prevalent. They are most trying to endure and unhealthy, bringing with them mosquitoes from the marshes, and as a result malaria. Mosquito nets during these months are essential.

Lack of water and extreme heat make operations, at any distance from the Karun river or the regular water supply system of the oilfields, impossible from June to September.



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CHAPTER II.

Climate.

The climate of the area, with the exception of the marshy localities of Fallahieh (Shadgân) and Hawizeh (Havizeh), is on the whole healthy and can be compared favourably with that of Iraq. Of all districts possibly Ahwaz is the most salubrious, having a moderately dry climate with cool nights in the summer; during the Great War casualties from sickness amongst troops stationed there were very slight. Despite the rise in height, there is little difference in maximum temperatures between the hills and plains, though there is an appreciable difference up to 10° in minimum temperatures. The heat in the summer in the marshy districts is almost intolerable, while mosquitoes abound to such an extent that even natives take refuge inside nets.

The winter, which may be reckoned from the beginning of November to the end of February, is ideal. Rain falls in December and continues intermittently until the end of March, with usually a break in February, which divides the rainy season into first and second rains. The average annual rainfall is 12 to 15 inches in the hills, decreasing to about half that amount in the plains. Cold north-west winds are a feature in the hills, but do not necessitate anything more than normal winter scale of clothing and bedding.

During the hot weather the rays of the sun are extremely fierce and the whole land becomes parched. The hottest months of the year are June, July and August. ~~Maximum temperatures, however, rarely exceed 120° while night temperatures drop as low as 80° and seldom reach 90°~~. Until the end of July a strong north-west wind is experienced, moderately cool till June, after which it becomes hot by day but keeps down the temperature by night. In places where it comes off a sandy desert, as is the case along the Karun after roughly the first 50 miles from Mohammerah (Khorramshahr), the dust carried by it is very irritating to the exposed parts of the body. During August and September and sometimes as late as the middle of October, damp south-east winds are prevalent. They are most trying to endure and unhealthy, bringing with them mosquitoes from the marshes, and as a result malaria. Mosquito nets during these months are essential.

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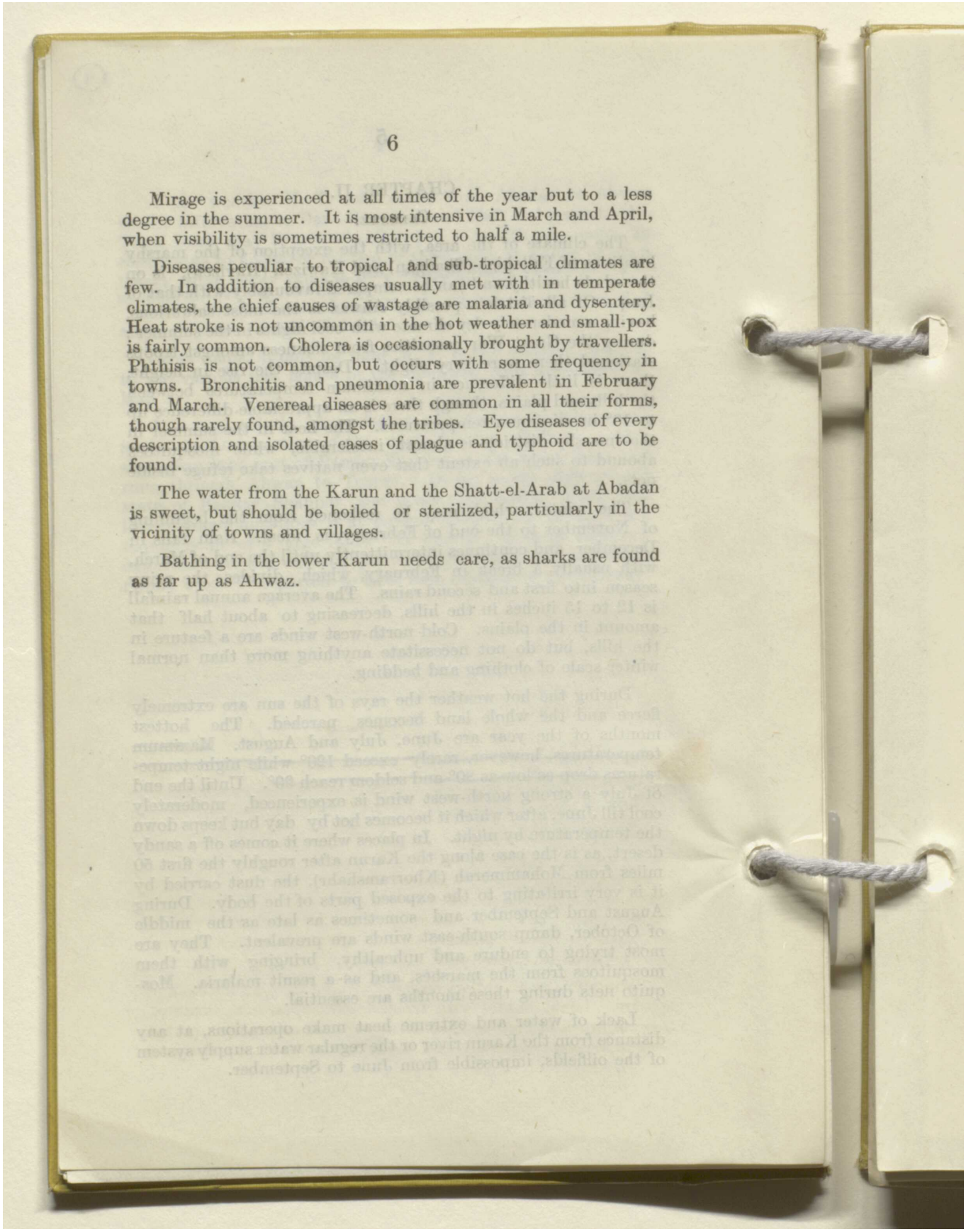
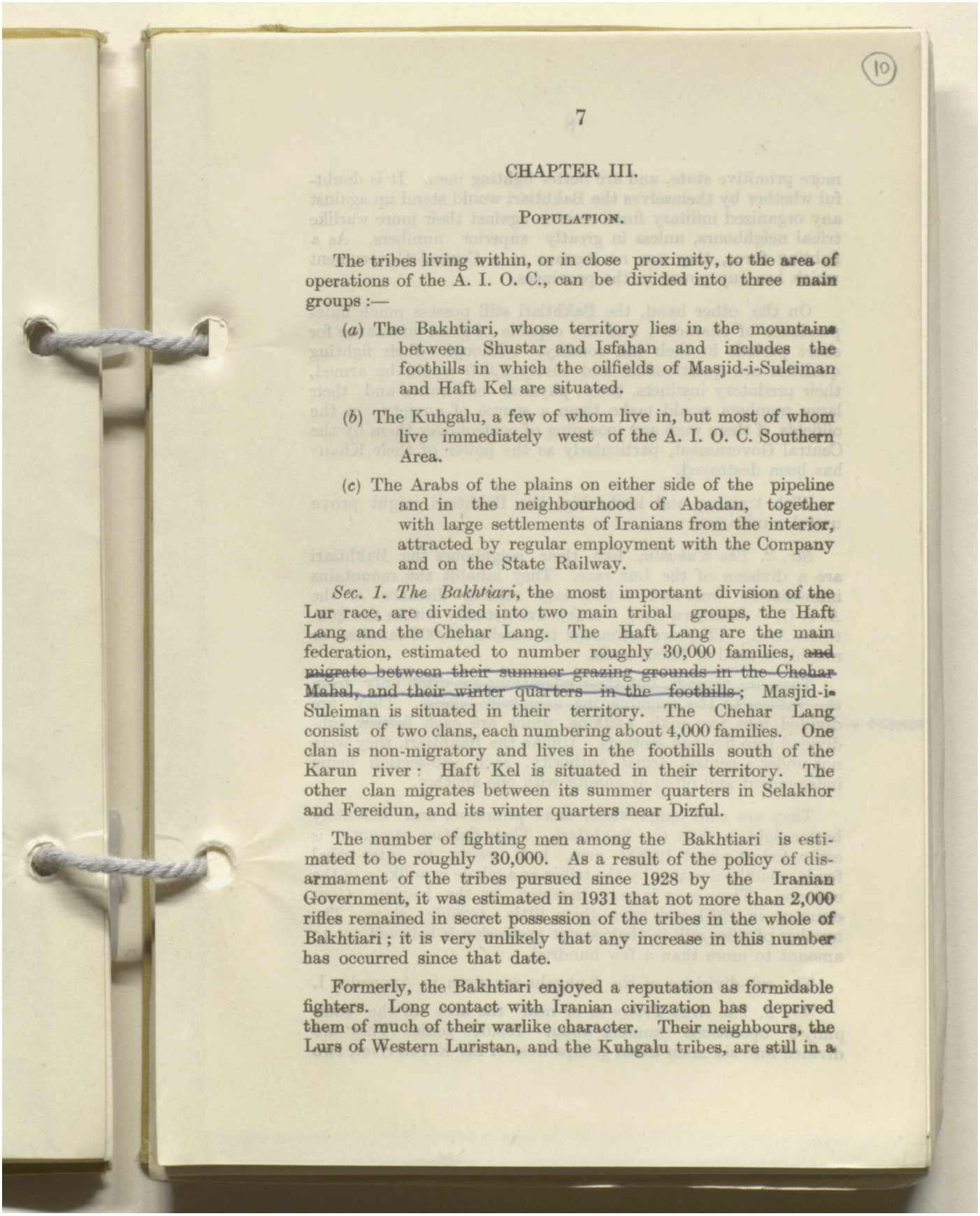


Mirage is experienced at all times of the year but to a less degree in the summer. It is most intensive in March and April, when visibility is sometimes restricted to half a mile.

Diseases peculiar to tropical and sub-tropical climates are few. In addition to diseases usually met with in temperate climates, the chief causes of wastage are malaria and dysentery. Heat stroke is not uncommon in the hot weather and small-pox is fairly common. Cholera is occasionally brought by travellers. Phthisis is not common, but occurs with some frequency in towns. Bronchitis and pneumonia are prevalent in February and March. Venereal diseases are common in all their forms, though rarely found, amongst the tribes. Eye diseases of every description and isolated cases of plague and typhoid are to be found.

The water from the Karun and the Shatt-el-Arab at Abadan is sweet, but should be boiled or sterilized, particularly in the vicinity of towns and villages.

Bathing in the lower Karun needs care, as sharks are found as far up as Ahwaz.



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CHAPTER III.

Population.

The tribes living within, or in close proximity, to the area of operations of the A. I. O. C., can be divided into three main groups :—

(*a*) The Bakhtiari, whose territory lies in the mountains between Shustar and Isfahan and includes the foothills in which the oilfields of Masjid-i-Suleiman and Haft Kel are situated.

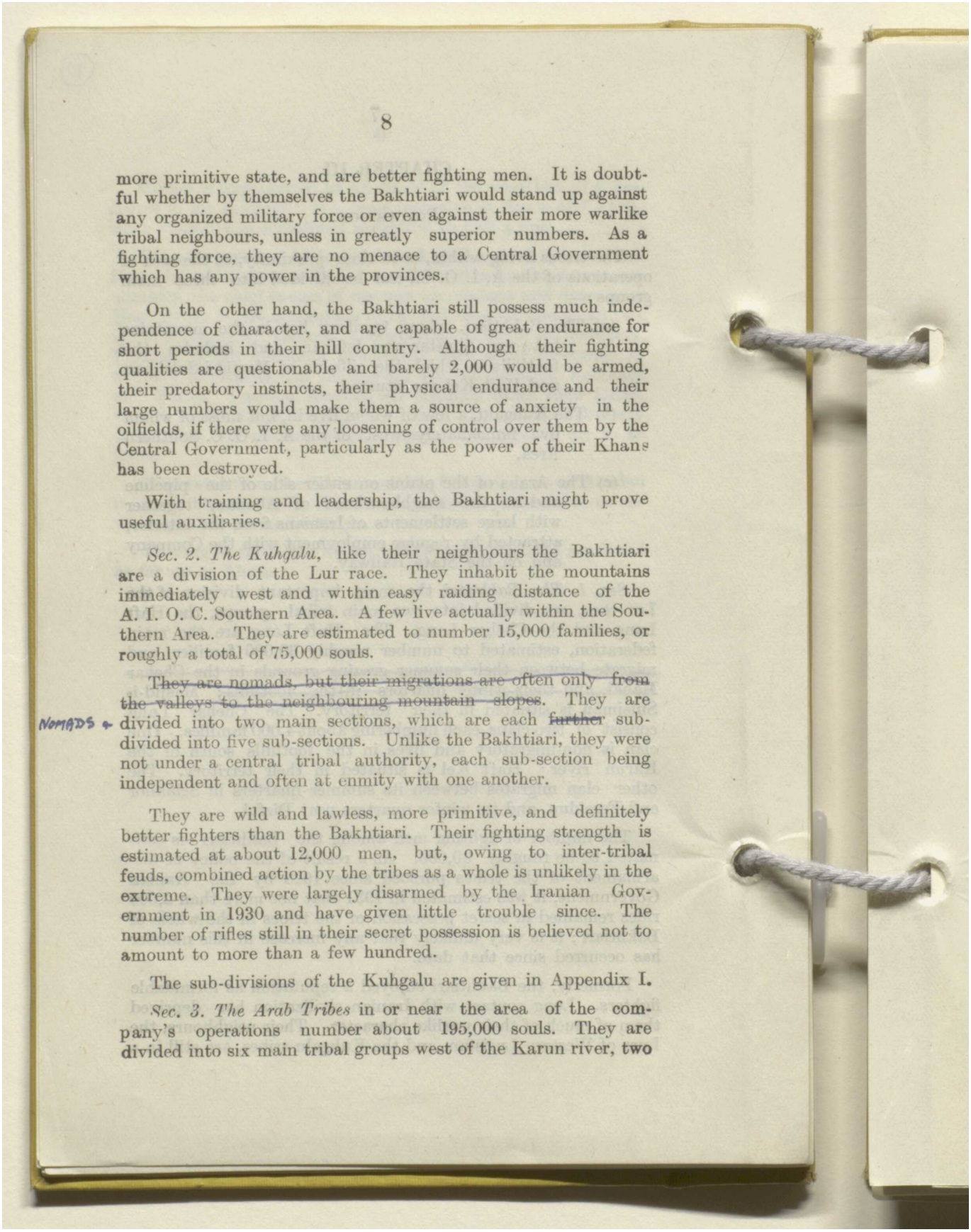
(*b*) The Kuhgalu, a few of whom live in, but most of whom live immediately west of the A. I. O. C. Southern Area.

(*c*) The Arabs of the plains on either side of the pipeline and in the neighbourhood of Abadan, together with large settlements of Iranians from the interior, attracted by regular employment with the Company and on the State Railway.

Sec. 1. The Bakhtiari, the most important division of the Lur race, are divided into two main tribal groups, the Haft Lang and the Chehar Lang. The Haft Lang are the main federation, estimated to number roughly 30,000 families, and migrate between their summer grazing grounds in the Chehar Mahal, and their winter quarters in the foothills; Masjid-i-Suleiman is situated in their territory. The Chehar Lang consist of two clans, each numbering about 4,000 families. One clan is non-migratory and lives in the foothills south of the Karun river: Haft Kel is situated in their territory. The other clan migrates between its summer quarters in Selakhor and Fereidun, and its winter quarters near Dizful.

The number of fighting men among the Bakhtiari is estimated to be roughly 30,000. As a result of the policy of disarmament of the tribes pursued since 1928 by the Iranian Government, it was estimated in 1931 that not more than 2,000 rifles remained in secret possession of the tribes in the whole of Bakhtiari; it is very unlikely that any increase in this number has occurred since that date.

Formerly, the Bakhtiari enjoyed a reputation as formidable fighters. Long contact with Iranian civilization has deprived them of much of their warlike character. Their neighbours, the Lurs of Western Luristan, and the Kuhgalu tribes, are still in a



more primitive state, and are better fighting men. It is doubtful whether by themselves the Bakhtiari would stand up against any organized military force or even against their more warlike tribal neighbours, unless in greatly superior numbers. As a fighting force, they are no menace to a Central Government which has any power in the provinces.

On the other hand, the Bakhtiari still possess much independence of character, and are capable of great endurance for short periods in their hill country. Although their fighting qualities are questionable and barely 2,000 would be armed, their predatory instincts, their physical endurance and their large numbers would make them a source of anxiety in the oilfields, if there were any loosening of control over them by the Central Government, particularly as the power of their Khans has been destroyed.

With training and leadership, the Bakhtiari might prove useful auxiliaries.

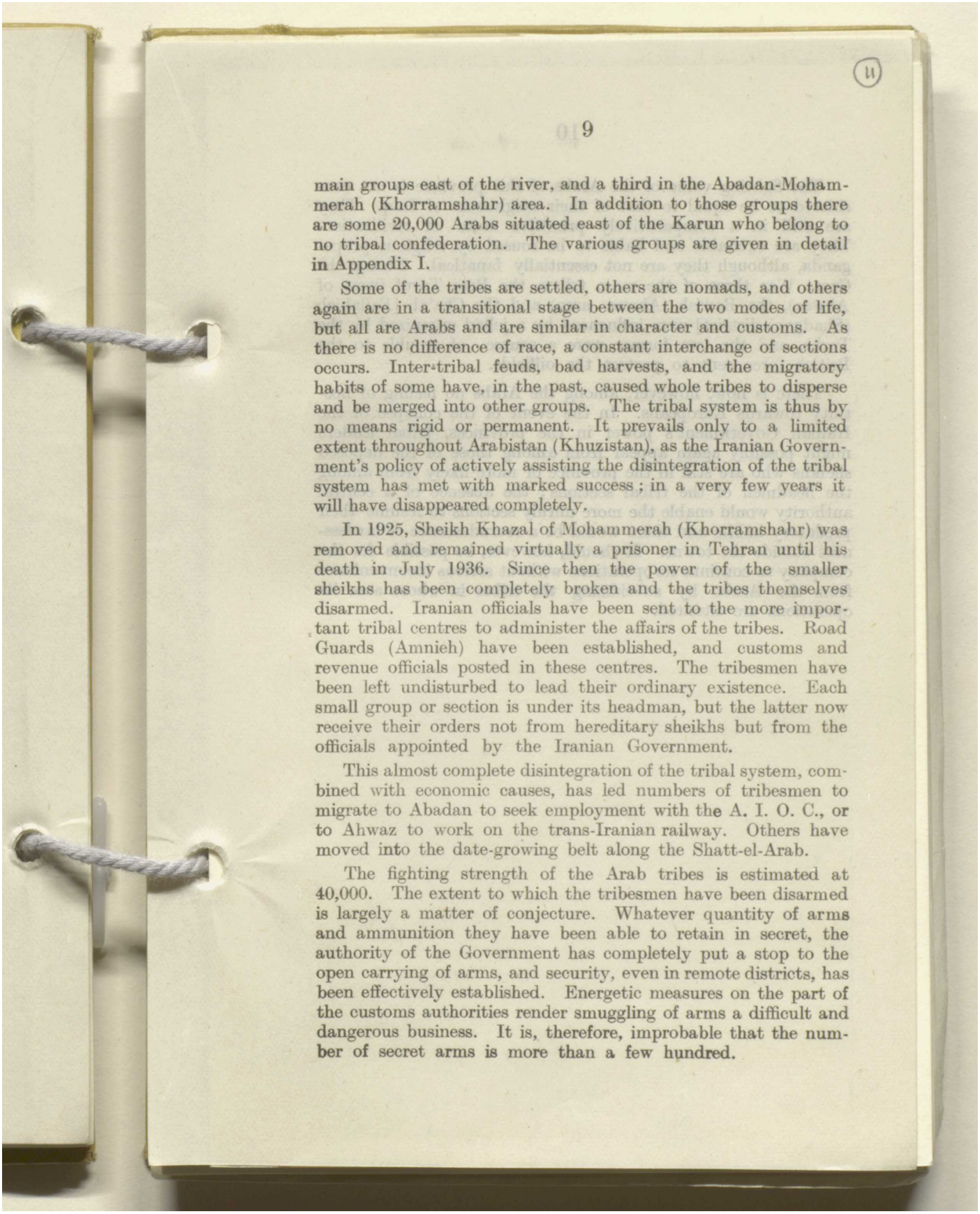
Sec. 2. The Kuhgalu, like their neighbours the Bakhtiari are a division of the Lur race. They inhabit the mountains immediately west and within easy raiding distance of the A. I. O. C. Southern Area. A few live actually within the Southern Area. They are estimated to number 15,000 families, or roughly a total of 75,000 souls.

~~They are nomads, but their migrations are often only from the valleys to the neighbouring mountain slopes.~~ They are NOMADS + divided into two main sections, which are each ~~further~~ subdivided into five sub-sections. Unlike the Bakhtiari, they were not under a central tribal authority, each sub-section being independent and often at enmity with one another.

They are wild and lawless, more primitive, and definitely better fighters than the Bakhtiari. Their fighting strength is estimated at about 12,000 men, but, owing to inter-tribal feuds, combined action by the tribes as a whole is unlikely in the extreme. They were largely disarmed by the Iranian Government in 1930 and have given little trouble since. The number of rifles still in their secret possession is believed not to amount to more than a few hundred.

The sub-divisions of the Kuhgalu are given in Appendix I.

Sec. 3. The Arab Tribes in or near the area of the company's operations number about 195,000 souls. They are divided into six main tribal groups west of the Karun river, two



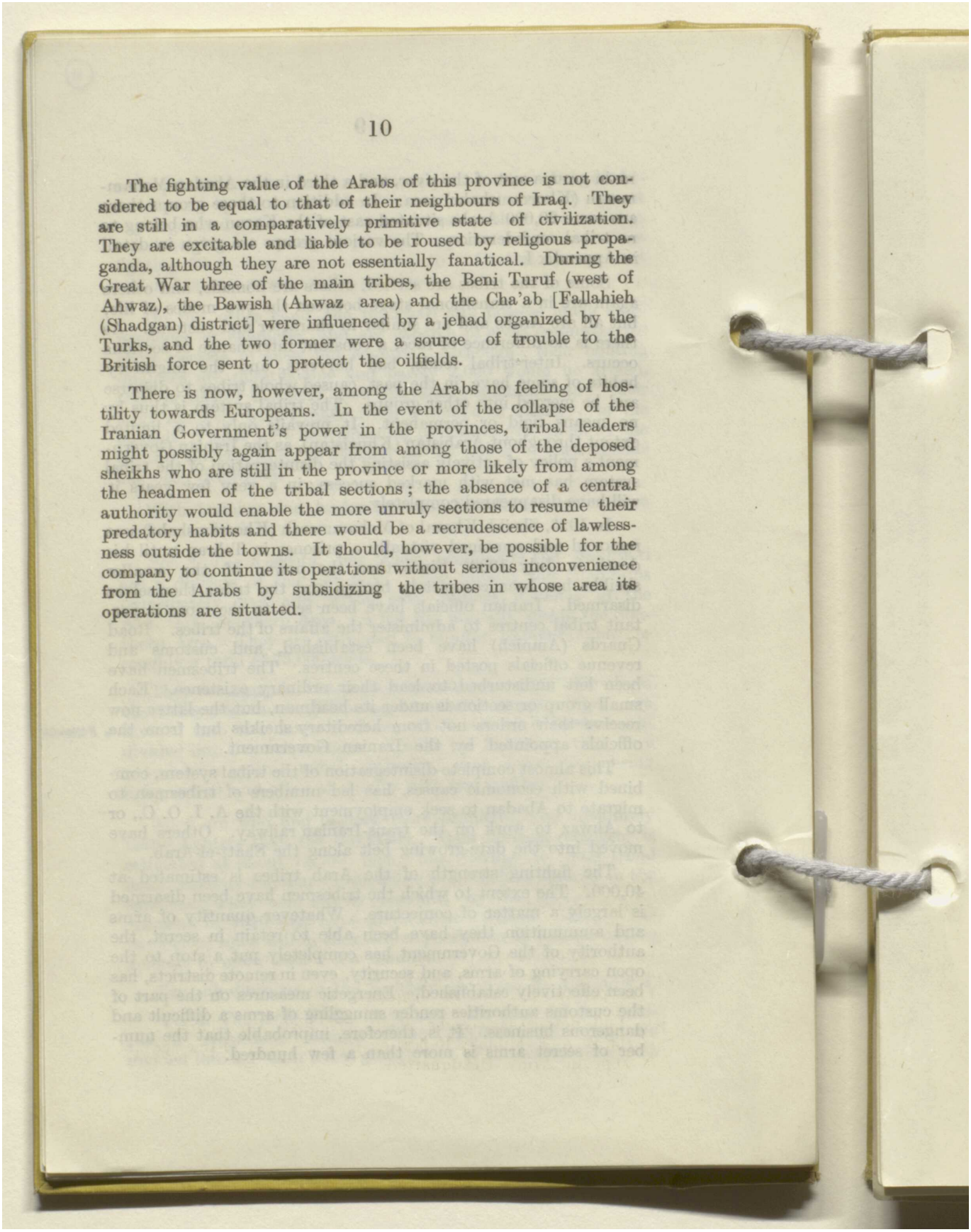
main groups east of the river, and a third in the Abadan-Mohammerah (Khorramshahr) area. In addition to those groups there are some 20,000 Arabs situated east of the Karun who belong to no tribal confederation. The various groups are given in detail in Appendix I.

Some of the tribes are settled, others are nomads, and others again are in a transitional stage between the two modes of life, but all are Arabs and are similar in character and customs. As there is no difference of race, a constant interchange of sections occurs. Inter-tribal feuds, bad harvests, and the migratory habits of some have, in the past, caused whole tribes to disperse and be merged into other groups. The tribal system is thus by no means rigid or permanent. It prevails only to a limited extent throughout Arabistan (Khuzistan), as the Iranian Government's policy of actively assisting the disintegration of the tribal system has met with marked success; in a very few years it will have disappeared completely.

In 1925, Sheikh Khazal of Mohammerah (Khorramshahr) was removed and remained virtually a prisoner in Tehran until his death in July 1936. Since then the power of the smaller sheikhs has been completely broken and the tribes themselves disarmed. Iranian officials have been sent to the more important tribal centres to administer the affairs of the tribes. Road Guards (Amnieh) have been established, and customs and revenue officials posted in these centres. The tribesmen have been left undisturbed to lead their ordinary existence. Each small group or section is under its headman, but the latter now receive their orders not from hereditary sheikhs but from the officials appointed by the Iranian Government.

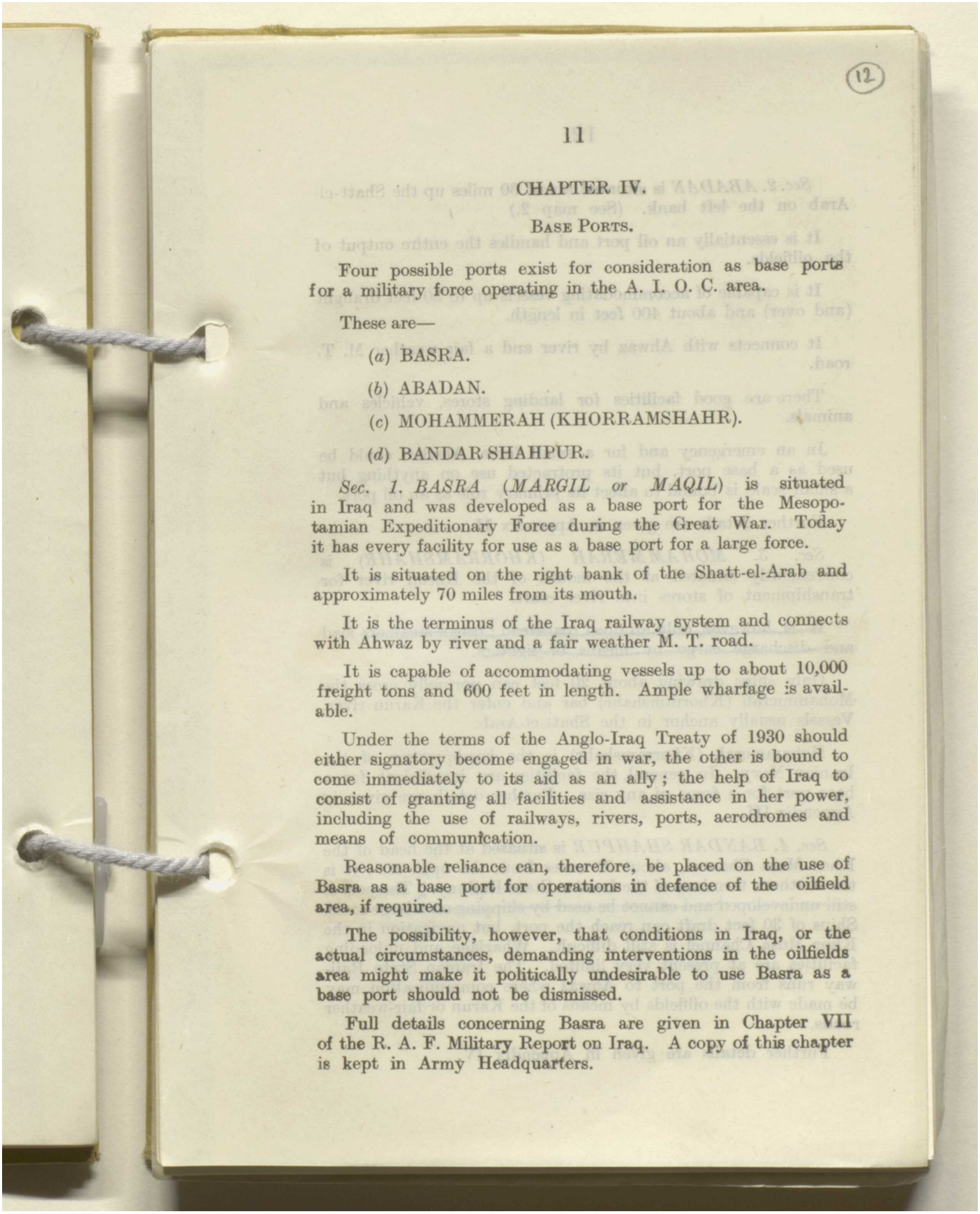
This almost complete disintegration of the tribal system, combined with economic causes, has led numbers of tribesmen to migrate to Abadan to seek employment with the A. I. O. C., or to Ahwaz to work on the trans-Iranian railway. Others have moved into the date-growing belt along the Shatt-el-Arab.

The fighting strength of the Arab tribes is estimated at 40,000. The extent to which the tribesmen have been disarmed is largely a matter of conjecture. Whatever quantity of arms and ammunition they have been able to retain in secret, the authority of the Government has completely put a stop to the open carrying of arms, and security, even in remote districts, has been effectively established. Energetic measures on the part of the customs authorities render smuggling of arms a difficult and dangerous business. It is, therefore, improbable that the number of secret arms is more than a few hundred.



The fighting value of the Arabs of this province is not considered to be equal to that of their neighbours of Iraq. They are still in a comparatively primitive state of civilization. They are excitable and liable to be roused by religious propaganda, although they are not essentially fanatical. During the Great War three of the main tribes, the Beni Turuf (west of Ahwaz), the Bawish (Ahwaz area) and the Cha'ab [Fallahieh (Shadgan) district] were influenced by a jehad organized by the Turks, and the two former were a source of trouble to the British force sent to protect the oilfields.

There is now, however, among the Arabs no feeling of hostility towards Europeans. In the event of the collapse of the Iranian Government's power in the provinces, tribal leaders might possibly again appear from among those of the deposed sheikhs who are still in the province or more likely from among the headmen of the tribal sections; the absence of a central authority would enable the more unruly sections to resume their predatory habits and there would be a recrudescence of lawlessness outside the towns. It should, however, be possible for the company to continue its operations without serious inconvenience from the Arabs by subsidizing the tribes in whose area its operations are situated.



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CHAPTER IV.

Base Ports.

Four possible ports exist for consideration as base ports for a military force operating in the A. I. O. C. area.

These are—

(*a*) BASRA.

(*b*) ABADAN.

(*c*) MOHAMMERAH (KHORRAMSHAHR).

(*d*) BANDAR SHAHPUR.

Sec. 1. BASRA (MARGIL or MAQIL) is situated in Iraq and was developed as a base port for the Mesopotamian Expeditionary Force during the Great War. Today it has every facility for use as a base port for a large force.

It is situated on the right bank of the Shatt-el-Arab and approximately 70 miles from its mouth.

It is the terminus of the Iraq railway system and connects with Ahwaz by river and a fair weather M. T. road.

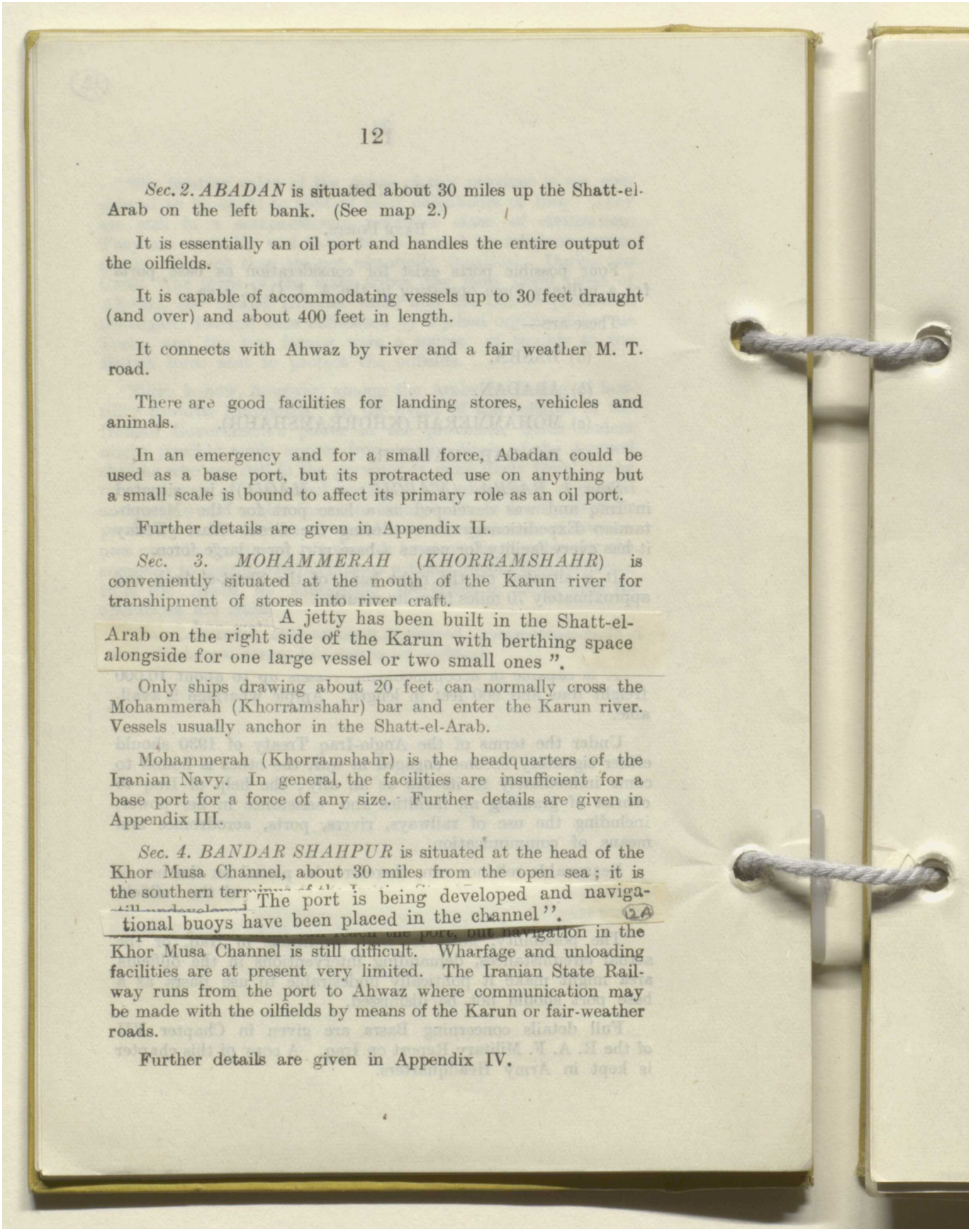
It is capable of accommodating vessels up to about 10,000 freight tons and 600 feet in length. Ample wharfage is available.

Under the terms of the Anglo-Iraq Treaty of 1930 should either signatory become engaged in war, the other is bound to come immediately to its aid as an ally; the help of Iraq to consist of granting all facilities and assistance in her power, including the use of railways, rivers, ports, aerodromes and means of communication.

Reasonable reliance can, therefore, be placed on the use of Basra as a base port for operations in defence of the oilfield area, if required.

The possibility, however, that conditions in Iraq, or the actual circumstances, demanding interventions in the oilfields area might make it politically undesirable to use Basra as a base port should not be dismissed.

Full details concerning Basra are given in Chapter VII of the R. A. F. Military Report on Iraq. A copy of this chapter is kept in Army Headquarters.



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Sec. 2. ABADAN is situated about 30 miles up the Shatt-el-Arab on the left bank. (See map 2.)

It is essentially an oil port and handles the entire output of the oilfields.

It is capable of accommodating vessels up to 30 feet draught (and over) and about 400 feet in length.

It connects with Ahwaz by river and a fair weather M. T. road.

There are good facilities for landing stores, vehicles and animals.

In an emergency and for a small force, Abadan could be used as a base port, but its protracted use on anything but a small scale is bound to affect its primary role as an oil port.

Further details are given in Appendix II.

Sec. 3. MOHAMMERAH (KHORRAMSHAHR) is conveniently situated at the mouth of the Karun river for transhipment of stores into river craft.

A jetty has been built in the Shatt-el-Arab on the right side of the Karun with berthing space alongside for one large vessel or two small ones ".

Only ships drawing about 20 feet can normally cross the Mohammerah (Khorramshahr) bar and enter the Karun river. Vessels usually anchor in the Shatt-el-Arab.

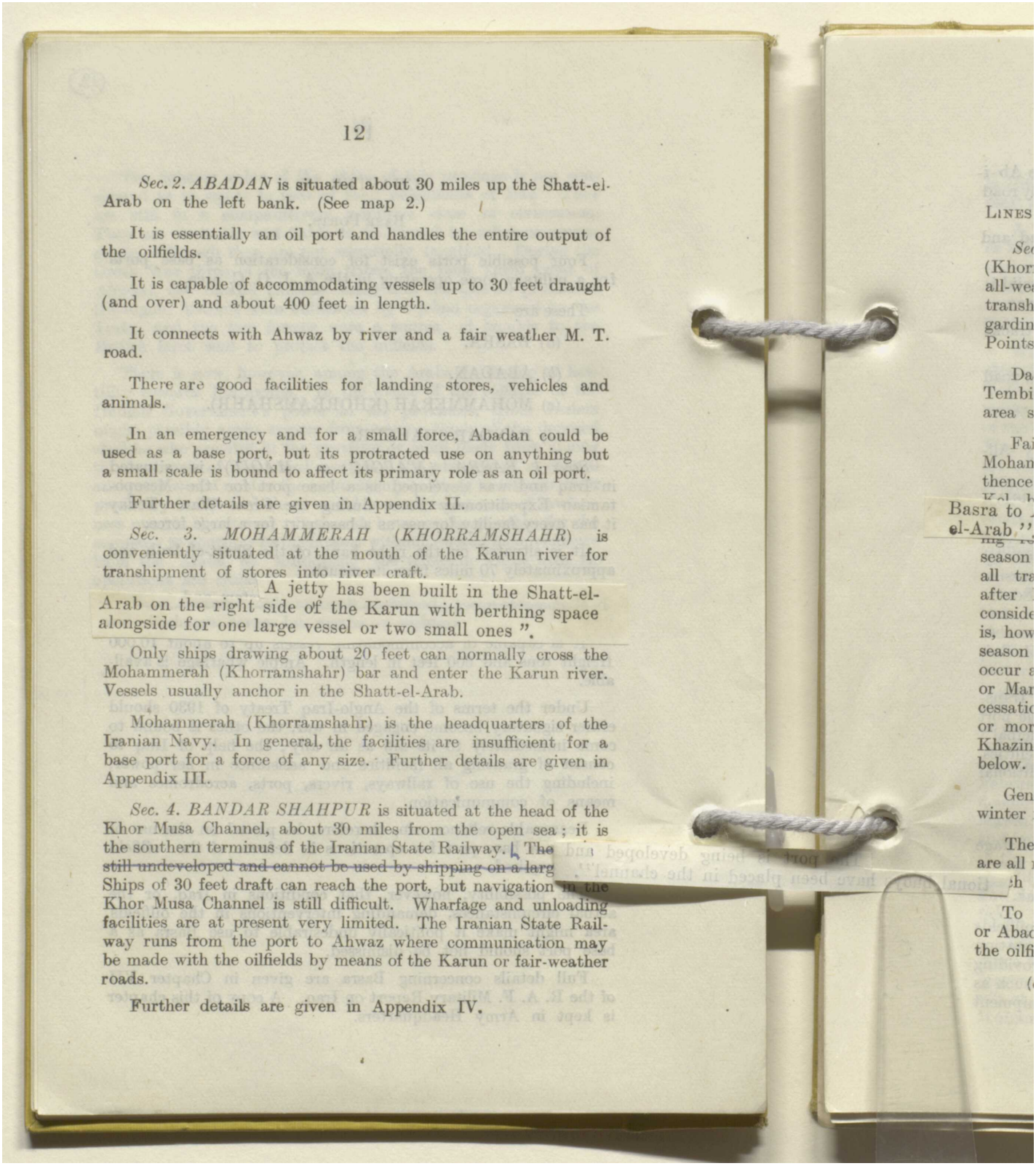
Mohammerah (Khorramshahr) is the headquarters of the Iranian Navy. In general, the facilities are insufficient for a base port for a force of any size. Further details are given in Appendix III.

Sec. 4. BANDAR SHAHPUR is situated at the head of the Khor Musa Channel, about 30 miles from the open sea; it is the southern terminus of the [illegible] railway.

The port is being developed and navigational buoys have been placed in the channel".

Khor Musa Channel is still difficult. Wharfage and unloading facilities are at present very limited. The Iranian State Railway runs from the port to Ahwaz where communication may be made with the oilfields by means of the Karun or fair-weather roads.

Further details are given in Appendix IV.



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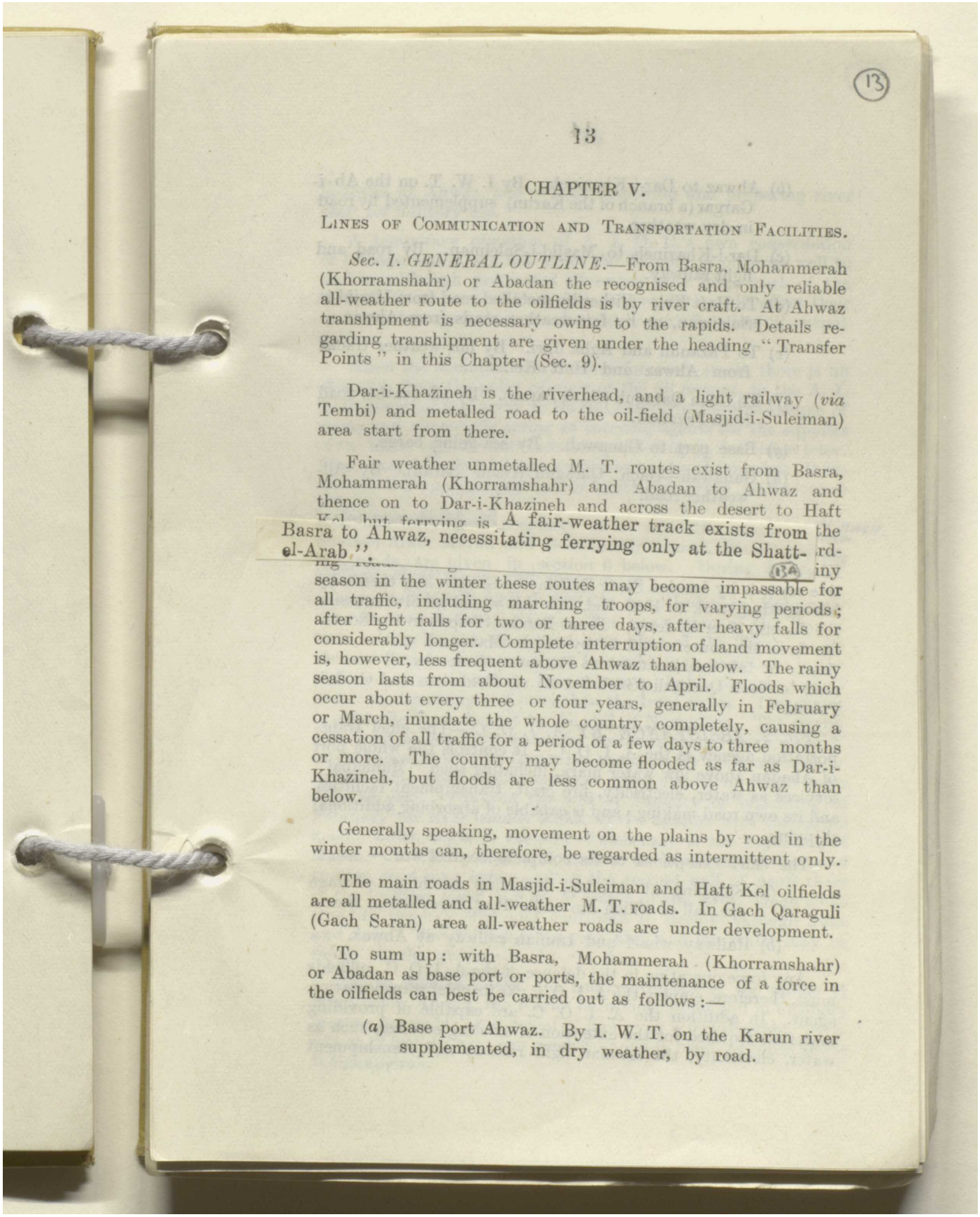

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CHAPTER V.

LINES OF COMMUNICATION AND TRANSPORTATION FACILITIES.

Sec. 1. GENERAL OUTLINE.—From Basra, Mohammerah (Khorramshahr) or Abadan the recognised and only reliable all-weather route to the oilfields is by river craft. At Ahwaz transhipment is necessary owing to the rapids. Details regarding transhipment are given under the heading "Transfer Points" in this Chapter (Sec. 9).

Dar-i-Khazineh is the riverhead, and a light railway (*via* Tembi) and metalled road to the oil-field (Masjid-i-Suleiman) area start from there.

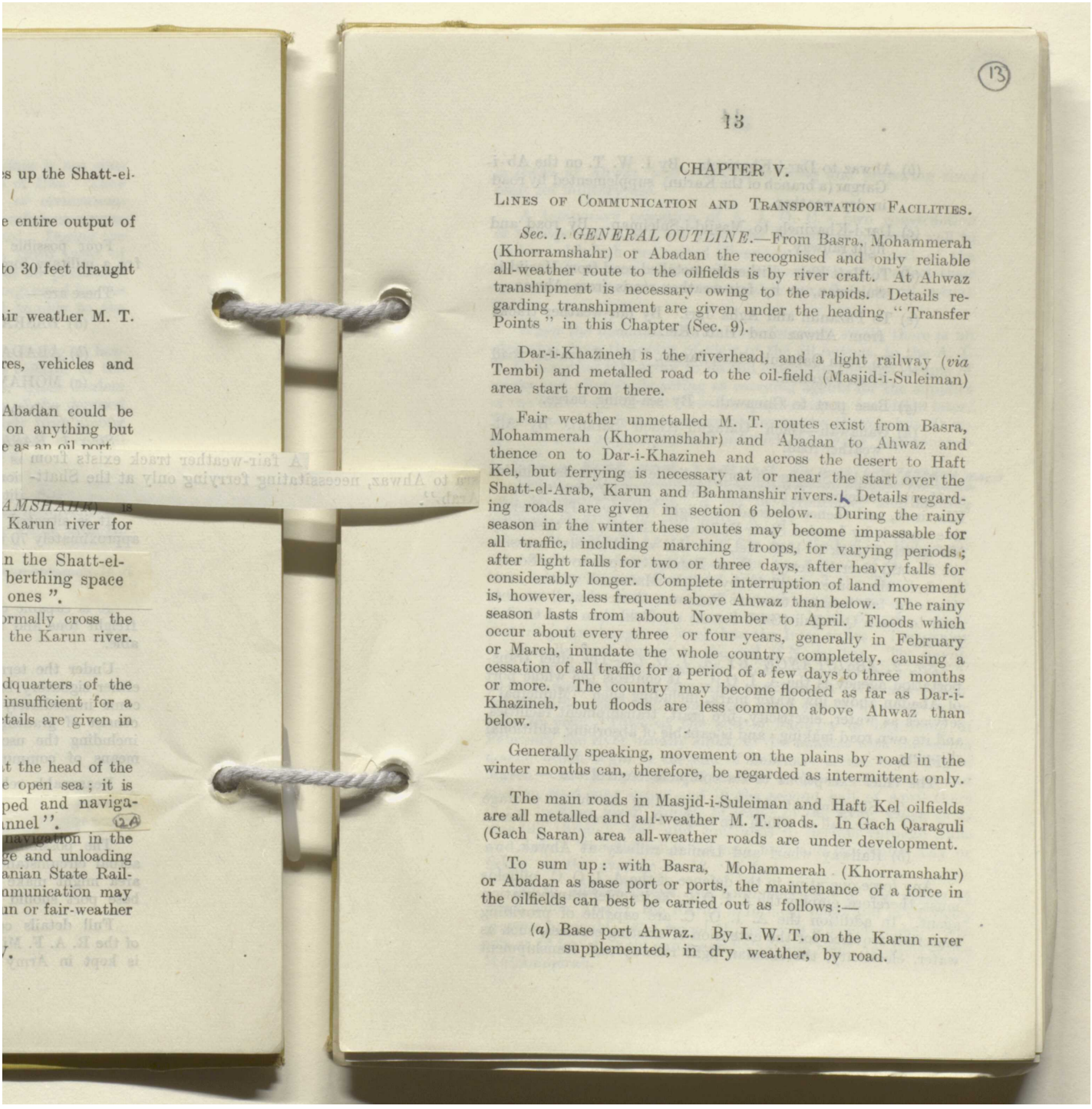
Fair weather unmetalled M. T. routes exist from Basra, Mohammerah (Khorramshahr) and Abadan to Ahwaz and thence on to Dar-i-Khazineh and across the desert to Haft Kel, but ferrying is A fair-weather track exists from the Basra to Ahwaz, necessitating ferrying only at the Shatt-el-Arab." rd-iny season in the winter these routes may become impassable for all traffic, including marching troops, for varying periods; after light falls for two or three days, after heavy falls for considerably longer. Complete interruption of land movement is, however, less frequent above Ahwaz than below. The rainy season lasts from about November to April. Floods which occur about every three or four years, generally in February or March, inundate the whole country completely, causing a cessation of all traffic for a period of a few days to three months or more. The country may become flooded as far as Dar-i-Khazineh, but floods are less common above Ahwaz than below.

Generally speaking, movement on the plains by road in the winter months can, therefore, be regarded as intermittent only.

The main roads in Masjid-i-Suleiman and Haft Kel oilfields are all metalled and all-weather M. T. roads. In Gach Qaraguli (Gach Saran) area all-weather roads are under development.

To sum up: with Basra, Mohammerah (Khorramshahr) or Abadan as base port or ports, the maintenance of a force in the oilfields can best be carried out as follows:—

(*a*) Base port Ahwaz. By I. W. T. on the Karun river supplemented, in dry weather, by road.



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(*a*) Base port Ahwaz. By I. W. T. on the Karun river supplemented, in dry weather, by road.

(*b*) Ahwaz to Dar-i-Khazineh. By I. W. T. on the Ab-i-Gargar (a branch of the Karun) supplemented by road in dry weather.

(*c*) Dar-i-Khazineh to Masjid-i-Suleiman. By road and light railway.

(*d*) To Haft Kel. Either by metalled road from Masjid-i-Suleiman, or by fair-weather roads from Ahwaz.

(*e*) To Pazanun and Agha Jari. By fair-weather tracks from Ahwaz and Haft Kel.

(*f*) To Gach Qaraguli (Gach Saran). By all-weather road from Pazanun.

(*g*) Base port to Ganawah. By sea-going barge.

(*h*) Ganawah—Gach Qaraguli (Gach Saran). By All-weather road.

From Bandar Shapur the only reliable route to the oilfields at Masjid-i-Suleiman is by rail to Ahwaz, and by river to Dar-i-Khazineh, and thence by road and light railway. The alternative route is by Iranian State Railway to Gorgor, and thence by fair-weather track to Haft Kel, but this would involve crossing the Jarrahi river by ferry. From Bandar Shapur to the Southern Area the route would be by rail to Mansurah station, and thence by fair weather track to Pazanun, thence by all-weather road to Gach Qaraguli (Gach Saran) *via* Behbehan and Gach-i-Pokak.

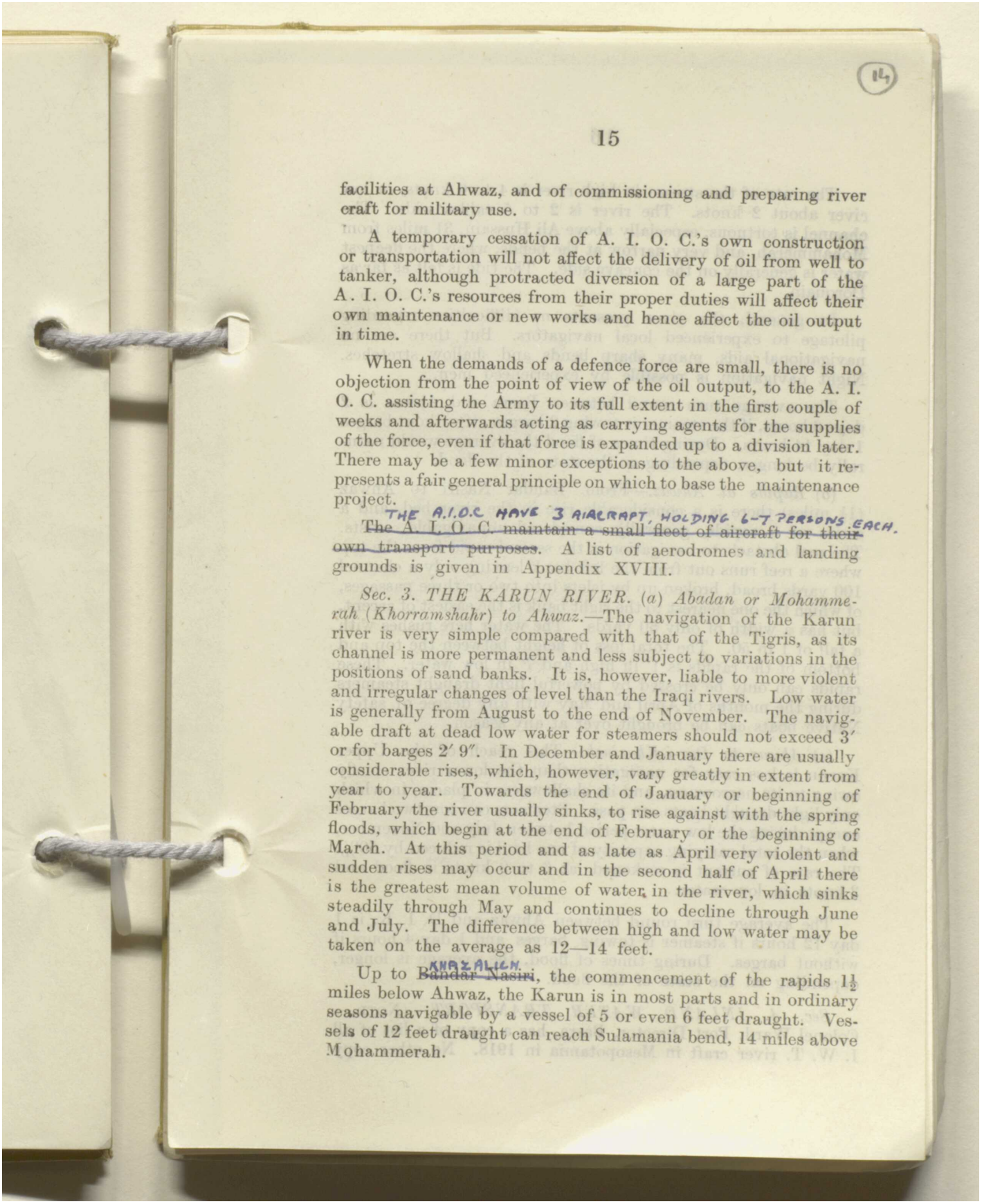
Sec. 2. ASSISTANCE BY A. I. O. C.—The chief transportation agency is the A. I. O. C. It controls the whole port of Abadan above low water mark, including such "Municipal" services as water, electricity, fire craft, transhipment facilities, and its own road making; and is capable of absorbing additional shipping.

The chief exceptions to its complete control are:—

(*a*) Shipping at Abadan, including berthing, pilotage etc., all of which are under Port Directorate, Basra.

(*b*) Railway wharf and Iranian railway at Ahwaz.

Any force operating in the defence of the A. I. O. C., oilfields must, therefore, employ the A. I. O. C., as its chief transportation agent. In addition the A. I. O. C. are capable of providing materials required for the extension of existing services, such as water, electricity, the Abadan light railway and transhipment



facilities at Ahwaz, and of commissioning and preparing river craft for military use.

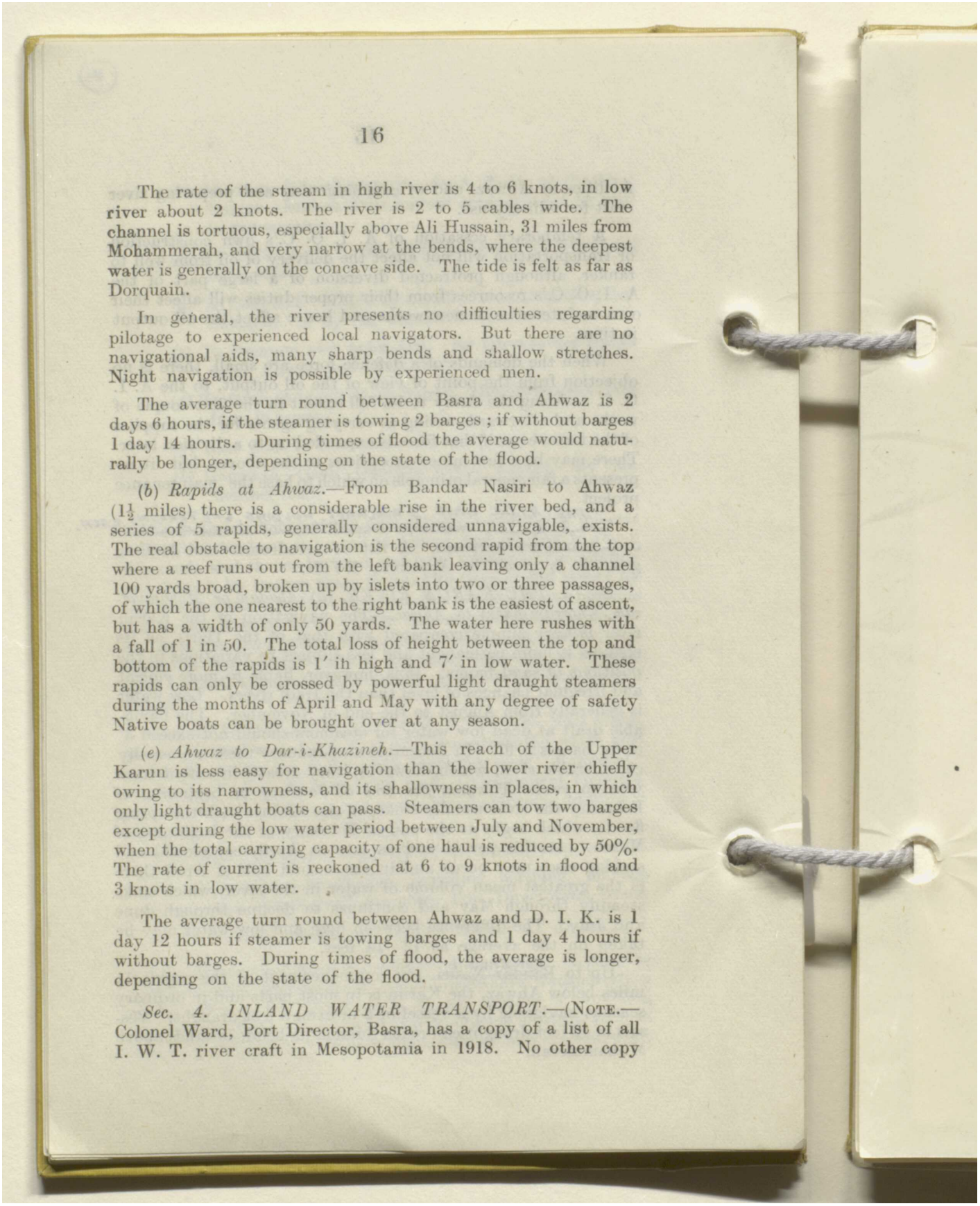
A temporary cessation of A. I. O. C.'s own construction or transportation will not affect the delivery of oil from well to tanker, although protracted diversion of a large part of the A. I. O. C.'s resources from their proper duties will affect their own maintenance or new works and hence affect the oil output in time.

When the demands of a defence force are small, there is no objection from the point of view of the oil output, to the A. I. O. C. assisting the Army to its full extent in the first couple of weeks and afterwards acting as carrying agents for the supplies of the force, even if that force is expanded up to a division later. There may be a few minor exceptions to the above, but it represents a fair general principle on which to base the maintenance project.

THE A.I.O.C HAVE 3 AIRCRAFT, HOLDING 6-7 PERSONS EACH.
~~The A. I. O. C. maintain a small fleet of aircraft for their own transport purposes.~~ A list of aerodromes and landing grounds is given in Appendix XVIII.

Sec. 3. THE KARUN RIVER. (a) Abadan or Mohammerah (Khorramshahr) to Ahwaz.—The navigation of the Karun river is very simple compared with that of the Tigris, as its channel is more permanent and less subject to variations in the positions of sand banks. It is, however, liable to more violent and irregular changes of level than the Iraqi rivers. Low water is generally from August to the end of November. The navigable draft at dead low water for steamers should not exceed 3′ or for barges 2′ 9″. In December and January there are usually considerable rises, which, however, vary greatly in extent from year to year. Towards the end of January or beginning of February the river usually sinks, to rise against with the spring floods, which begin at the end of February or the beginning of March. At this period and as late as April very violent and sudden rises may occur and in the second half of April there is the greatest mean volume of water in the river, which sinks steadily through May and continues to decline through June and July. The difference between high and low water may be taken on the average as 12—14 feet.

Up to ~~Bandar Nasiri~~ KHAZALICH, the commencement of the rapids 1½ miles below Ahwaz, the Karun is in most parts and in ordinary seasons navigable by a vessel of 5 or even 6 feet draught. Vessels of 12 feet draught can reach Sulamania bend, 14 miles above Mohammerah.



The rate of the stream in high river is 4 to 6 knots, in low river about 2 knots. The river is 2 to 5 cables wide. The channel is tortuous, especially above Ali Hussain, 31 miles from Mohammerah, and very narrow at the bends, where the deepest water is generally on the concave side. The tide is felt as far as Dorquain.

In general, the river presents no difficulties regarding pilotage to experienced local navigators. But there are no navigational aids, many sharp bends and shallow stretches. Night navigation is possible by experienced men.

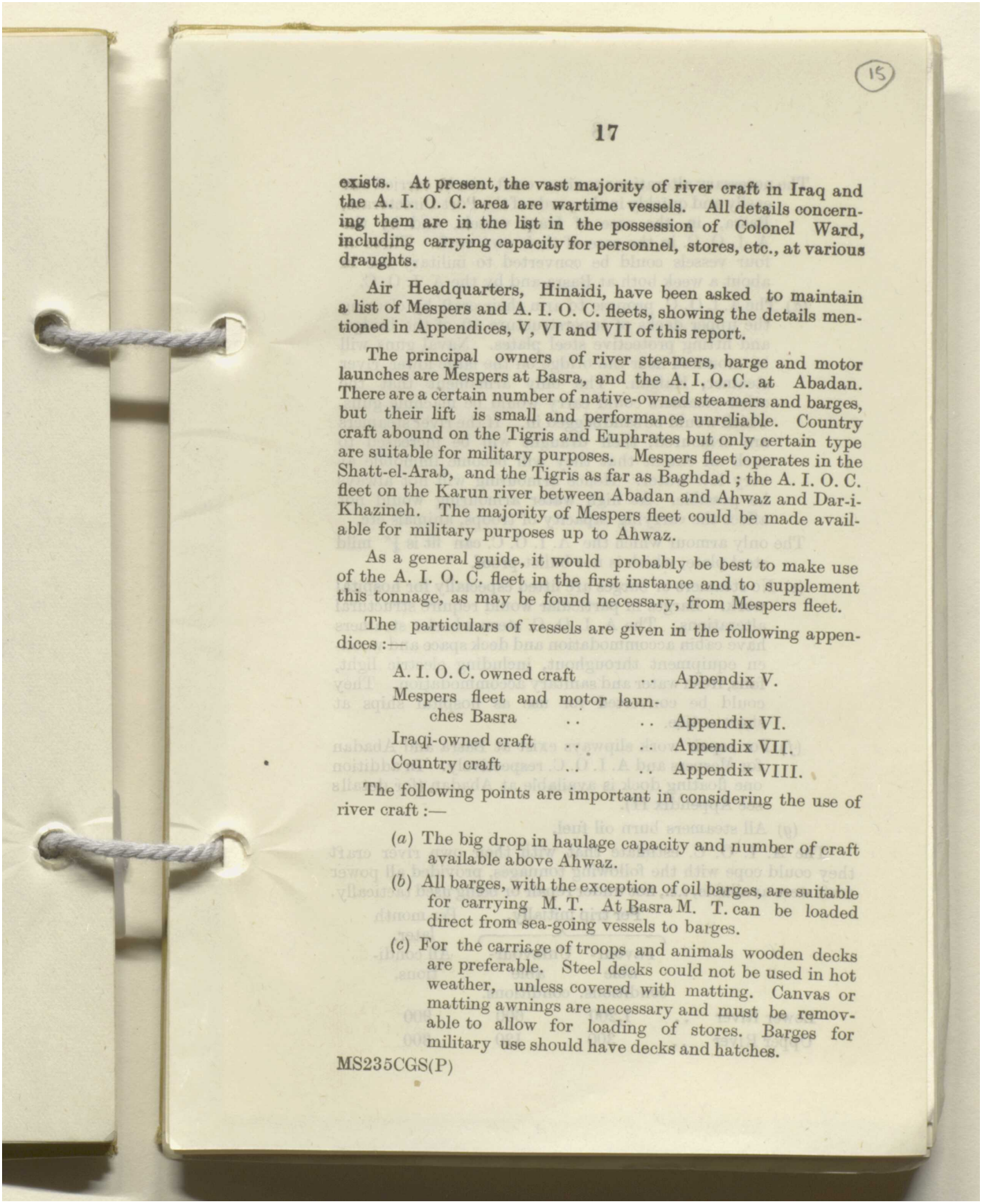
The average turn round between Basra and Ahwaz is 2 days 6 hours, if the steamer is towing 2 barges ; if without barges 1 day 14 hours. During times of flood the average would naturally be longer, depending on the state of the flood.

(*b*) *Rapids at Ahwaz.*—From Bandar Nasiri to Ahwaz (1½ miles) there is a considerable rise in the river bed, and a series of 5 rapids, generally considered unnavigable, exists. The real obstacle to navigation is the second rapid from the top where a reef runs out from the left bank leaving only a channel 100 yards broad, broken up by islets into two or three passages, of which the one nearest to the right bank is the easiest of ascent, but has a width of only 50 yards. The water here rushes with a fall of 1 in 50. The total loss of height between the top and bottom of the rapids is 1′ in high and 7′ in low water. These rapids can only be crossed by powerful light draught steamers during the months of April and May with any degree of safety Native boats can be brought over at any season.

(*c*) *Ahwaz to Dar-i-Khazineh.*—This reach of the Upper Karun is less easy for navigation than the lower river chiefly owing to its narrowness, and its shallowness in places, in which only light draught boats can pass. Steamers can tow two barges except during the low water period between July and November, when the total carrying capacity of one haul is reduced by 50%. The rate of current is reckoned at 6 to 9 knots in flood and 3 knots in low water.

The average turn round between Ahwaz and D. I. K. is 1 day 12 hours if steamer is towing barges and 1 day 4 hours if without barges. During times of flood, the average is longer, depending on the state of the flood.

Sec. 4. INLAND WATER TRANSPORT.—(NOTE.—Colonel Ward, Port Director, Basra, has a copy of a list of all I. W. T. river craft in Mesopotamia in 1918. No other copy



(15)

exists. At present, the vast majority of river craft in Iraq and the A. I. O. C. area are wartime vessels. All details concerning them are in the list in the possession of Colonel Ward, including carrying capacity for personnel, stores, etc., at various draughts.

Air Headquarters, Hinaidi, have been asked to maintain a list of Mespers and A. I. O. C. fleets, showing the details mentioned in Appendices, V, VI and VII of this report.

The principal owners of river steamers, barge and motor launches are Mespers at Basra, and the A. I. O. C. at Abadan. There are a certain number of native-owned steamers and barges, but their lift is small and performance unreliable. Country craft abound on the Tigris and Euphrates but only certain type are suitable for military purposes. Mespers fleet operates in the Shatt-el-Arab, and the Tigris as far as Baghdad ; the A. I. O. C. fleet on the Karun river between Abadan and Ahwaz and Dar-i-Khazineh. The majority of Mespers fleet could be made available for military purposes up to Ahwaz.

As a general guide, it would probably be best to make use of the A. I. O. C. fleet in the first instance and to supplement this tonnage, as may be found necessary, from Mespers fleet.

The particulars of vessels are given in the following appendices :—

A. I. O. C. owned craft ..	Appendix V.
Mespers fleet and motor launches Basra	Appendix VI.
Iraqi-owned craft	Appendix VII.
Country craft	Appendix VIII.

The following points are important in considering the use of river craft :—

(*a*) The big drop in haulage capacity and number of craft available above Ahwaz.

(*b*) All barges, with the exception of oil barges, are suitable for carrying M. T. At Basra M. T. can be loaded direct from sea-going vessels to barges.

(*c*) For the carriage of troops and animals wooden decks are preferable. Steel decks could not be used in hot weather, unless covered with matting. Canvas or matting awnings are necessary and must be removable to allow for loading of stores. Barges for military use should have decks and hatches.

MS235CGS(P)

The necessary alterations to river craft can be carried out easily and quickly in the yards of the Port Directorate, Basra, in the case of Iraqi vessels, and by the A. I. O. C. in the case of their own craft. Three or four vessels could be converted to military use in about a week both at Basra and by the A. I. O. C.

(*d*) The A. I. O. C. propose to arm their craft by clearing the upper decks of superstructure aft of the bridge, and fitting protective steel plates. Naval guns will be mounted near the bridge on the large lower river steamer, Kalgah. The only armament that the other steamers could carry would be machine guns, which would be sandbagged in. If the river steamers are armoured, their draught will be increased to such an extent that they will become immobile at very low water. Hence armouring will not always be possible. At high water armouring would not affect the carrying capacity of troops, animals etc.

The only armour which the A. I. O. C. can fit is $\frac{1}{4}''$ mild steel plate, which is not bullet-proof.

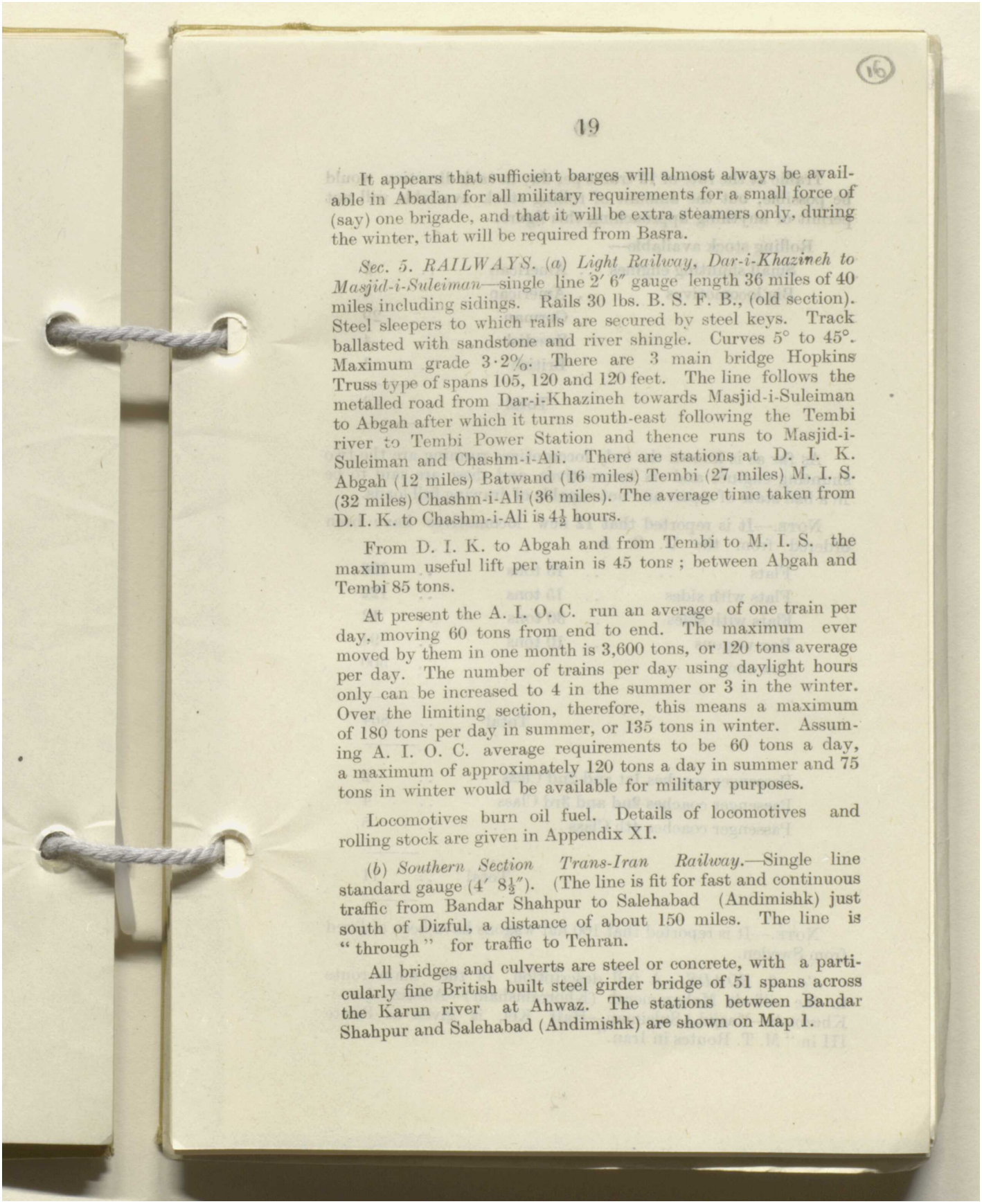
(*e*) No steamers or barges are fitted especially for hospital work. Barges in particular would require structural alterations. The A. I. O. C. stern-wheeler steamers have cabin accommodation and deck space and wooden equipment throughout, including electric light, fans, fresh water and sanitary accommodation. They could be converted for use as hospital ships at short notice.

(*f*) For repair work slipways exist at Basra and Abadan for Mespers and A. I. O. C. respectively. In addition one floating dock is available at Abadan (for details see Appendix II).

(*g*) All steamers burn oil fuel.

The A. I. O. C. estimate that with their own river craft they could cope with the following tonnages, provided all power craft were available, *i.e.*, not under repair or being used tactically.

	Per trip initially.		Per month later.
	Favourable conditions.	Unfavourable conditions.	All conditions.
Lower River ..	1,200	600	900
Upper River ..	300	120	300



It appears that sufficient barges will almost always be available in Abadan for all military requirements for a small force of (say) one brigade, and that it will be extra steamers only, during the winter, that will be required from Basra.

Sec. 5. RAILWAYS. (a) Light Railway, Dar-i-Khazineh to Masjid-i-Suleiman—single line 2′ 6″ gauge length 36 miles of 40 miles including sidings. Rails 30 lbs. B. S. F. B., (old section). Steel sleepers to which rails are secured by steel keys. Track ballasted with sandstone and river shingle. Curves 5° to 45°. Maximum grade 3·2%. There are 3 main bridge Hopkins Truss type of spans 105, 120 and 120 feet. The line follows the metalled road from Dar-i-Khazineh towards Masjid-i-Suleiman to Abgah after which it turns south-east following the Tembi river to Tembi Power Station and thence runs to Masjid-i-Suleiman and Chashm-i-Ali. There are stations at D. I. K. Abgah (12 miles) Batwand (16 miles) Tembi (27 miles) M. I. S. (32 miles) Chashm-i-Ali (36 miles). The average time taken from D. I. K. to Chashm-i-Ali is 4½ hours.

From D. I. K. to Abgah and from Tembi to M. I. S. the maximum useful lift per train is 45 tons; between Abgah and Tembi 85 tons.

At present the A. I. O. C. run an average of one train per day, moving 60 tons from end to end. The maximum ever moved by them in one month is 3,600 tons, or 120 tons average per day. The number of trains per day using daylight hours only can be increased to 4 in the summer or 3 in the winter. Over the limiting section, therefore, this means a maximum of 180 tons per day in summer, or 135 tons in winter. Assuming A. I. O. C. average requirements to be 60 tons a day, a maximum of approximately 120 tons a day in summer and 75 tons in winter would be available for military purposes.

Locomotives burn oil fuel. Details of locomotives and rolling stock are given in Appendix XI.

(b) Southern Section Trans-Iran Railway.—Single line standard gauge (4′ 8½″). (The line is fit for fast and continuous traffic from Bandar Shahpur to Salehabad (Andimishk) just south of Dizful, a distance of about 150 miles. The line is "through" for traffic to Tehran.

All bridges and culverts are steel or concrete, with a particularly fine British built steel girder bridge of 51 spans across the Karun river at Ahwaz. The stations between Bandar Shahpur and Salehabad (Andimishk) are shown on Map 1.

Traffic at the rate of 12 trains per day in each direction would be possible, but the amount of rolling stock available will not permit of anything approaching this figure.

Rolling stock available—

Small shunting engines	American	..	2
Big locomotives	American	..	4
	German	..	29
	Swedish	..	4
	British	..	3
	Total	..	42

As far as is known the only locomotives running are the two shunting engines and six locomotives, and these are said to be in a bad state of repair and not capable of drawing full loads.

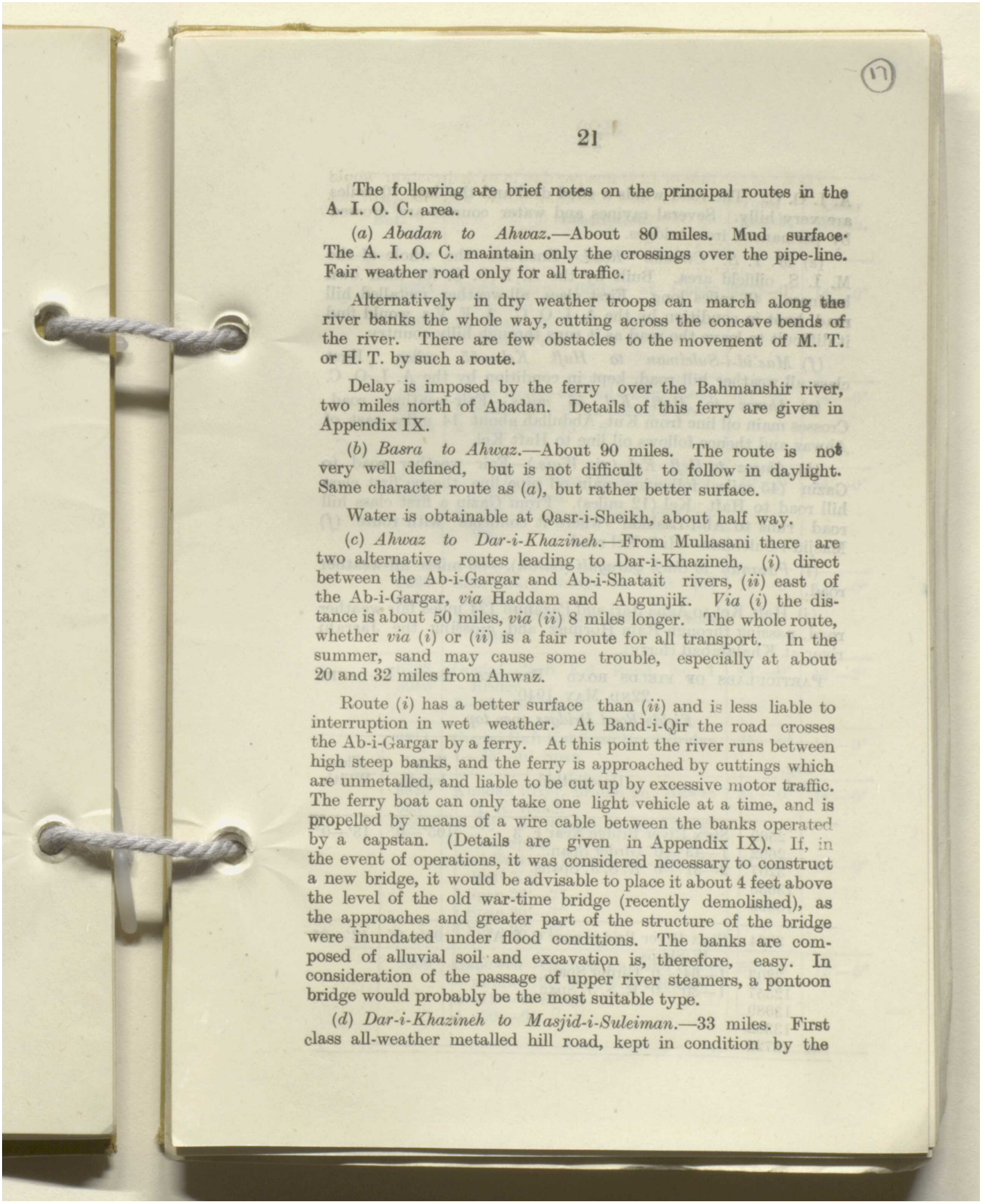
NOTE.—It is reported that 12 new locomotives have been ordered from the U. S. A.

Flats	15 tons	..	136
Flats with sides	15 tons	..	122
Flats with sides	30 tons	..	12
Box wagons	10 tons	..	94
Box cars		..	500
	Total	..	864

Passenger coaches 1st and 2nd Class	..	2
Passenger coaches 2nd and 3rd Class	..	4
Passenger coaches 4th Class	..	5
Total	..	11

NOTE.—It is reported that 100 flat wagons have been ordered from Sweden.

Sec. 6. ROADS.—A full description of the main route to the oilfieds Mohammerah (Khorramshahr)—Ahwaz—Dar-i-Khezineh—Masjid-i-Suleiman—Haft Kel, is given as Route III in "M. T. Routes in Iran."



The following are brief notes on the principal routes in the A. I. O. C. area.

(*a*) *Abadan to Ahwaz.*—About 80 miles. Mud surface. The A. I. O. C. maintain only the crossings over the pipe-line. Fair weather road only for all traffic.

Alternatively in dry weather troops can march along the river banks the whole way, cutting across the concave bends of the river. There are few obstacles to the movement of M. T. or H. T. by such a route.

Delay is imposed by the ferry over the Bahmanshir river, two miles north of Abadan. Details of this ferry are given in Appendix IX.

(*b*) *Basra to Ahwaz.*—About 90 miles. The route is not very well defined, but is not difficult to follow in daylight. Same character route as (*a*), but rather better surface.

Water is obtainable at Qasr-i-Sheikh, about half way.

(*c*) *Ahwaz to Dar-i-Khazineh.*—From Mullasani there are two alternative routes leading to Dar-i-Khazineh, (*i*) direct between the Ab-i-Gargar and Ab-i-Shatait rivers, (*ii*) east of the Ab-i-Gargar, *via* Haddam and Abgunjik. *Via* (*i*) the distance is about 50 miles, *via* (*ii*) 8 miles longer. The whole route, whether *via* (*i*) or (*ii*) is a fair route for all transport. In the summer, sand may cause some trouble, especially at about 20 and 32 miles from Ahwaz.

Route (*i*) has a better surface than (*ii*) and is less liable to interruption in wet weather. At Band-i-Qir the road crosses the Ab-i-Gargar by a ferry. At this point the river runs between high steep banks, and the ferry is approached by cuttings which are unmetalled, and liable to be cut up by excessive motor traffic. The ferry boat can only take one light vehicle at a time, and is propelled by means of a wire cable between the banks operated by a capstan. (Details are given in Appendix IX). If, in the event of operations, it was considered necessary to construct a new bridge, it would be advisable to place it about 4 feet above the level of the old war-time bridge (recently demolished), as the approaches and greater part of the structure of the bridge were inundated under flood conditions. The banks are composed of alluvial soil and excavation is, therefore, easy. In consideration of the passage of upper river steamers, a pontoon bridge would probably be the most suitable type.

(*d*) *Dar-i-Khazineh to Masjid-i-Suleiman.*—33 miles. First class all-weather metalled hill road, kept in condition by the

A. I. O. C. The road winds a good deal and the last 10 miles are very hilly. Several ravines and water courses are crossed by permanent iron bridges.

(*e*) *M. I. S. Circular Road.*—Encircles the whole of the M. I. S. oilfield area. Built by the A. I. O. C. for their own business. 45 miles long. First class all-weather metalled hill road, kept in condition by the A. I. O. C. A. F. V.s would find it difficult to leave the road as it runs through hilly country.

(*f*) *Mas'id-i-Suleiman to Haft Kel.*—55 miles. First class all-weather hill road, kept in condition by the A. I. O. C.

(*g*) *Ahwaz to Haft Kel 55 miles.*—Fair-weather road. Crosses main oil line from Kut Abdullah about 14 miles east of Ahwaz and thence follows oil line to Haft Kel.

(*h*) *Ahwaz to Heft Kel* (via *Wais.*)—Fair weather road to Gazin (45 miles) following main oil pipe line, thence first class hill road to Haft Kel (12 miles). From Gazin a first class hill road runs to Ab-i-Lashkar where it connects with route (*f*) Masjid-i-Suleiman—Haft Kel road.

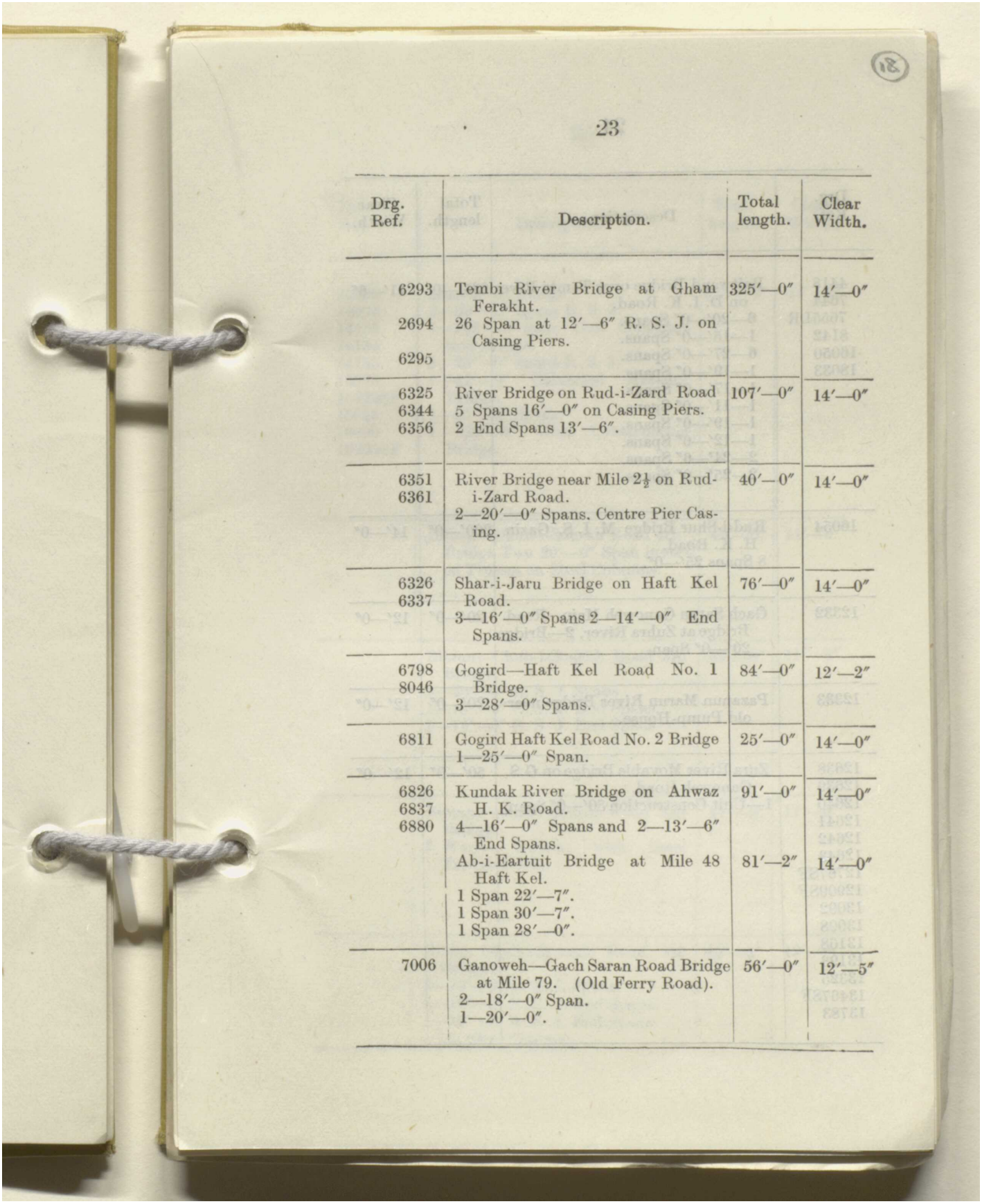
(*i*) *Pazanun to Gach Qaraguli* (*Saran*).—86 miles all-weather road.

(*j*) Haft Kel to Agha Jari and Pazanun 124 miles fair weather road, passing through Ram Hormuz and crossing the Jarrahi river at Khalafabad (ferry).

PARTICULARS OF FIELDS ROAD BRIDGES. ISSUE I—DATED 22ND MAY 1940.

Fields Road Bridges open top.

Drg. Ref.	Description.	Total length.	Clear Width.
2569 2692 3207 13635 16699	Styx River Bridge Near F. 3 .. 1—43′—0″ Girder Span. 2—31′—0″ R. S. J. Spans.	105′—0″	13′—0″
3064 3203 12557 13089 13382 13722	Styx River Bridge near C. I. A. W/Shops. 1—64′—0″ Girder Span. 1—30′—0″ R. S. J. Span.	94′—0″	12′—0″



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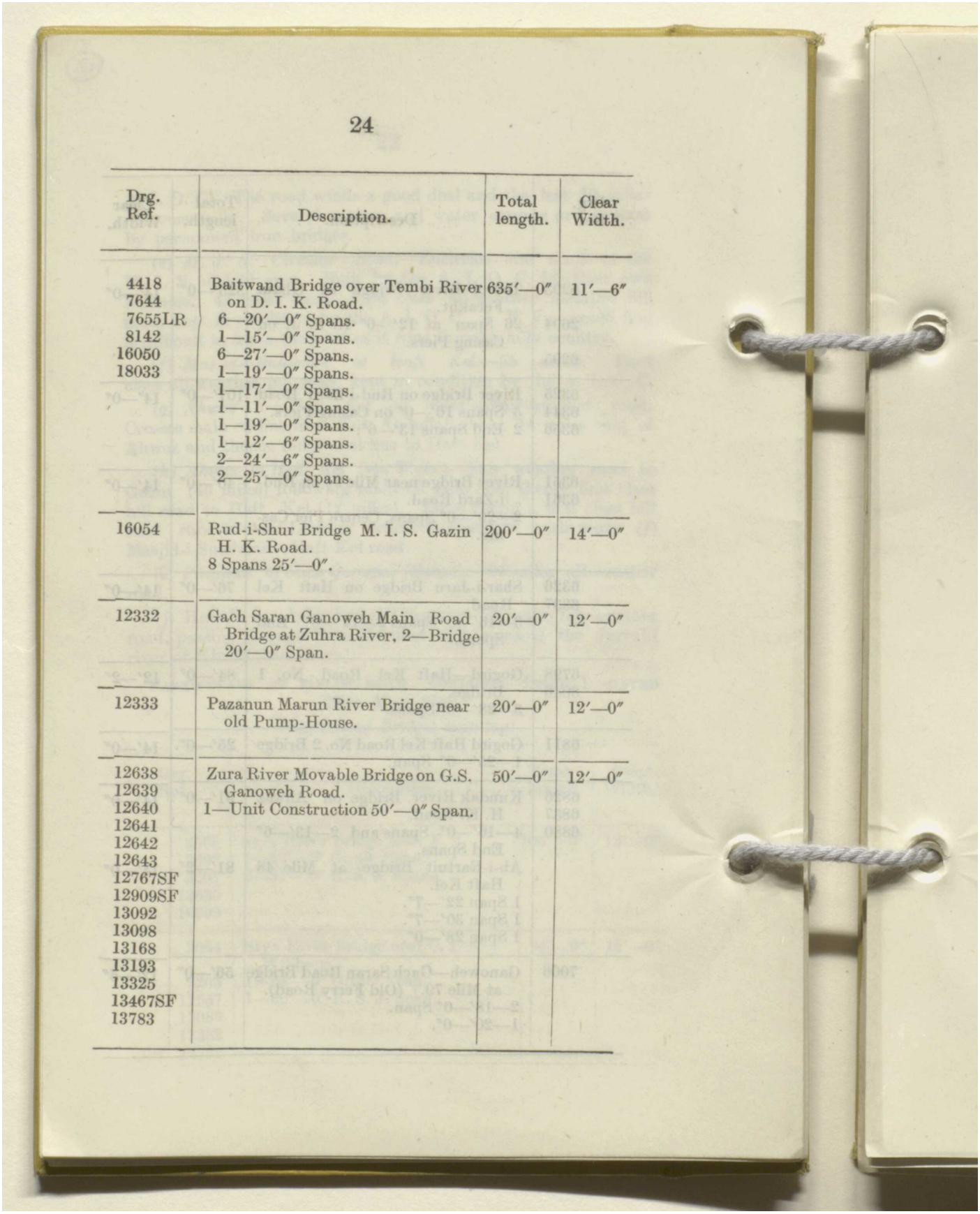
Drg. Ref.	Description.	Total length.	Clear Width.
6293 2694 6295	Tembi River Bridge at Gham Ferakht. 26 Span at 12′—6″ R. S. J. on Casing Piers.	325′—0″	14′—0″
6325 6344 6356	River Bridge on Rud-i-Zard Road 5 Spans 16′—0″ on Casing Piers. 2 End Spans 13′—6″.	107′—0″	14′—0″
6351 6361	River Bridge near Mile 2½ on Rud-i-Zard Road. 2—20′—0″ Spans. Centre Pier Casing.	40′—0″	14′—0″
6326 6337	Shar-i-Jaru Bridge on Haft Kel Road. 3—16′—0″ Spans 2—14′—0″ End Spans.	76′—0″	14′—0″
6798 8046	Gogird—Haft Kel Road No. 1 Bridge. 3—28′—0″ Spans.	84′—0″	12′—2″
6811	Gogird Haft Kel Road No. 2 Bridge 1—25′—0″ Span.	25′—0″	14′—0″
6826 6837 6880	Kundak River Bridge on Ahwaz H. K. Road. 4—16′—0″ Spans and 2—13′—6″ End Spans.	91′—0″	14′—0″
	Ab-i-Eartuit Bridge at Mile 48 Haft Kel. 1 Span 22′—7″. 1 Span 30′—7″. 1 Span 28′—0″.	81′—2″	14′—0″
7006	Ganoweh—Gach Saran Road Bridge at Mile 79. (Old Ferry Road). 2—18′—0″ Span. 1—20′—0″.	56′—0″	12′—5″



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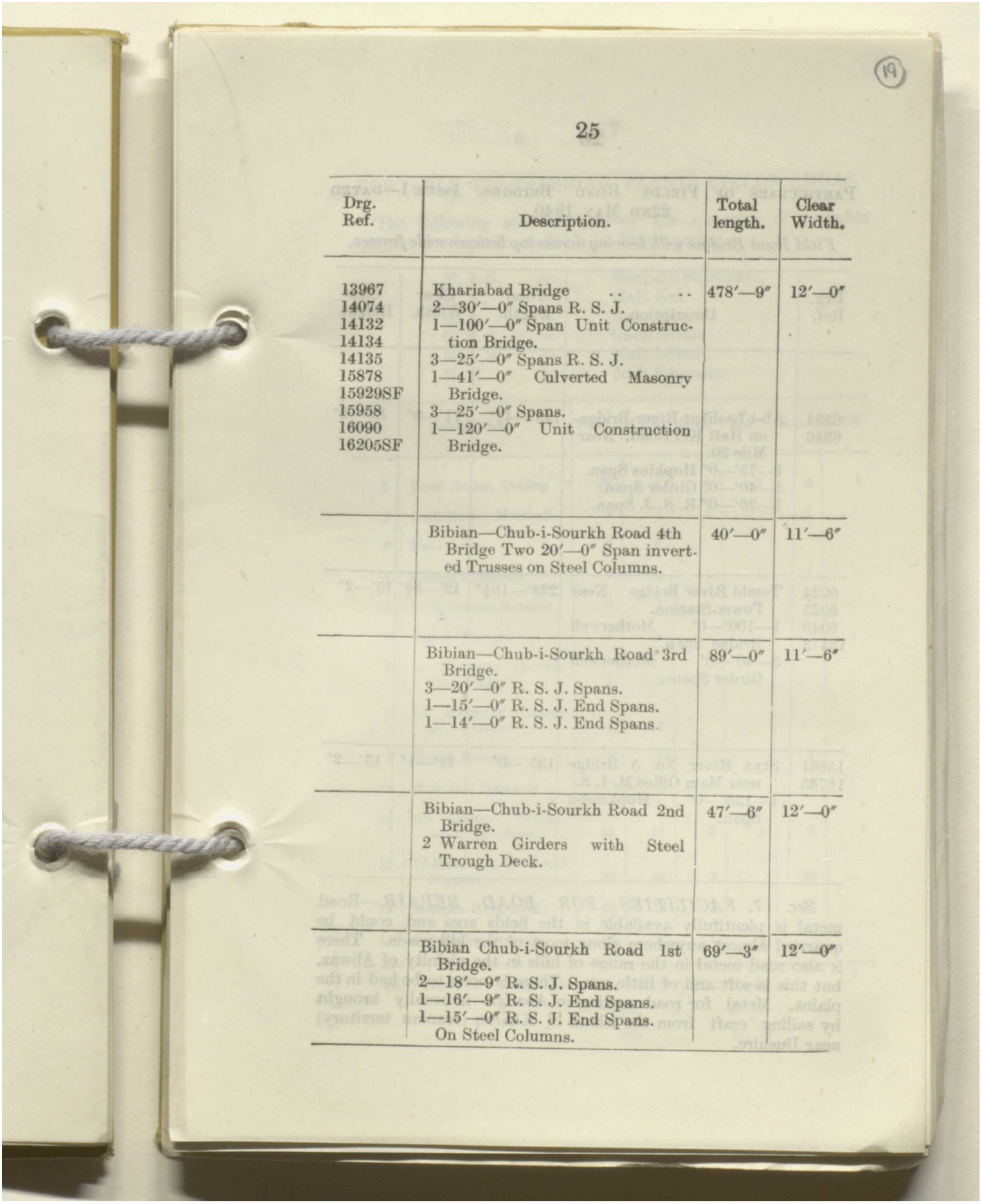
Drg. Ref.	Description.	Total length.	Clear Width.
4418 7644 7655LR 8142 16050 18033	Baitwand Bridge over Tembi River on D. I. K. Road. 6—20′—0″ Spans. 1—15′—0″ Spans. 6—27′—0″ Spans. 1—19′—0″ Spans. 1—17′—0″ Spans. 1—11′—0″ Spans. 1—19′—0″ Spans. 1—12′—6″ Spans. 2—24′—6″ Spans. 2—25′—0″ Spans.	635′—0″	11′—6″
16054	Rud-i-Shur Bridge M. I. S. Gazin H. K. Road. 8 Spans 25′—0″.	200′—0″	14′—0″
12332	Gach Saran Ganoweh Main Road Bridge at Zuhra River, 2—Bridge 20′—0″ Span.	20′—0″	12′—0″
12333	Pazanun Marun River Bridge near old Pump-House.	20′—0″	12′—0″
12638 12639 12640 12641 12642 12643 12767SF 12909SF 13092 13098 13168 13193 13325 13467SF 13783	Zura River Movable Bridge on G.S. Ganoweh Road. 1—Unit Construction 50′—0″ Span.	50′—0″	12′—0″



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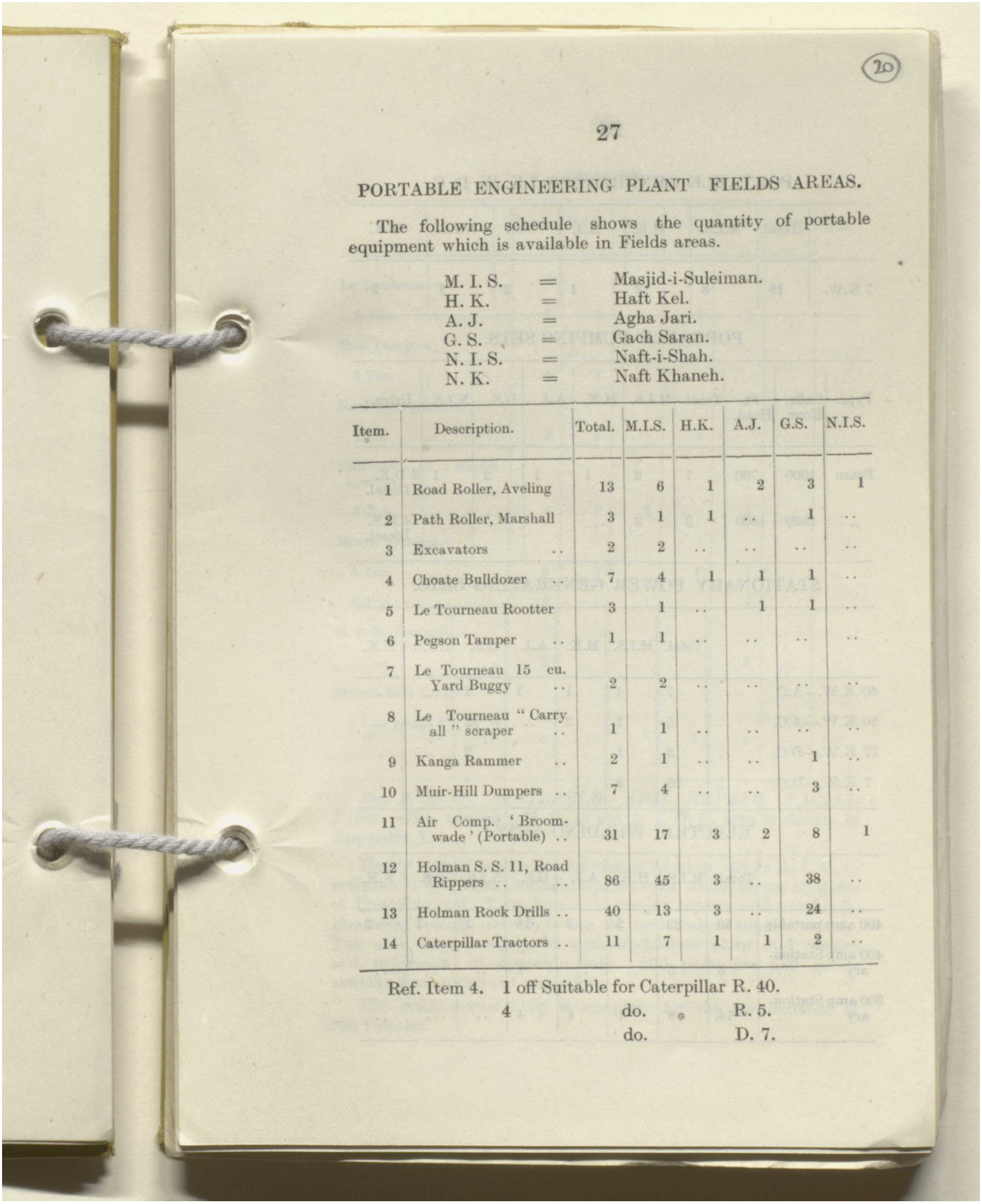
Drg. Ref.	Description.	Total length.	Clear Width.
13967 14074 14132 14134 14135 15878 15929SF 15958 16090 16205SF	Khariabad Bridge .. .. 2—30′—0″ Spans R. S. J. 1—100′—0″ Span Unit Construction Bridge. 3—25′—0″ Spans R. S. J. 1—41′—0″ Culverted Masonry Bridge. 3—25′—0″ Spans. 1—120′—0″ Unit Construction Bridge.	478′—9″	12′—0″
	Bibian—Chub-i-Sourkh Road 4th Bridge Two 20′—0″ Span inverted Trusses on Steel Columns.	40′—0″	11′—6″
	Bibian—Chub-i-Sourkh Road 3rd Bridge. 3—20′—0″ R. S. J. Spans. 1—15′—0″ R. S. J. End Spans. 1—14′—0″ R. S. J. End Spans.	89′—0″	11′—6″
	Bibian—Chub-i-Sourkh Road 2nd Bridge. 2 Warren Girders with Steel Trough Deck.	47′—6″	12′—0″
	Bibian Chub-i-Sourkh Road 1st Bridge. 2—18′—9″ R. S. J. Spans. 1—16′—9″ R. S. J. End Spans. 1—15′—0″ R. S. J. End Spans. On Steel Columns.	69′—3″	12′—0″

PARTICULARS OF FIELDS ROAD BRIDGES. ISSUE I—DATED 22ND MAY 1940.

Field Road Bridges with bracing across top between wide frames.

Drg. Ref.	Description.	Total length.	Clear Width.	Clear Height.
6334 6346	Ab-i-Lashkar River Bridge on Haft Kel Road. Near Mile 30. 1—75′—0″ Hopkins Span. 1—40′—0″ Girder Span. 1—26′—0″ R. S. J. Span.	143′—4½″	11′—9″	15′—2″
6024 6025 6049 13473	Tembi River Bridge Near Power Station. 1—100′—0″ Motherwell Bridge Span. 3—40′—0″ Motherwell Girder Spans.	228′—10½″	12′—0¾″	15′—2″
15861 16765	Styx River No. 5 Bridge near Main Office M. I. S. 1—135′—0″ Hopkinson Span.	135′—0″	11′—1″	15′—2″

Sec. 7. FACILITIES FOR ROAD REPAIR.—Road metal is plentifully available in the fields area and could be quarried almost anywhere along most of the hill roads. There is also road metal in the range of hills in the vicinity of Ahwaz, but this is soft and of little use. There is none to be had in the plains. Metal for road making in Abadan is usually brought by sailing craft from the island of Kharaq (Iranian territory) near Bushire.



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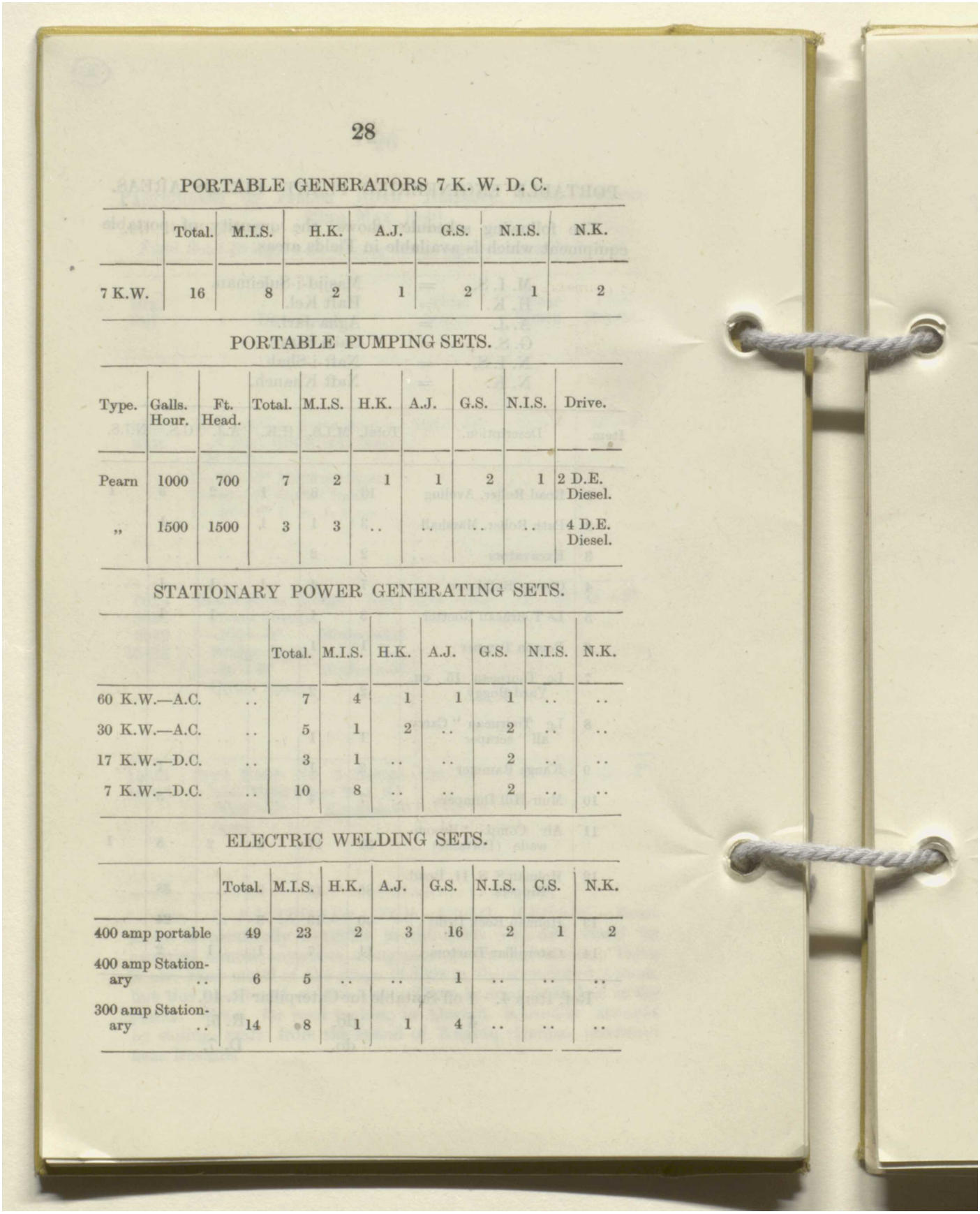
PORTABLE ENGINEERING PLANT FIELDS AREAS.

The following schedule shows the quantity of portable equipment which is available in Fields areas.

M. I. S. = Masjid-i-Suleiman.
H. K. = Haft Kel.
A. J. = Agha Jari.
G. S. = Gach Saran.
N. I. S. = Naft-i-Shah.
N. K. = Naft Khaneh.

Item.	Description.	Total.	M.I.S.	H.K.	A.J.	G.S.	N.I.S.
1	Road Roller, Aveling	13	6	1	2	3	1
2	Path Roller, Marshall	3	1	1	..	1	..
3	Excavators ..	2	2	..	..	..	..
4	Choate Bulldozer ..	7	4	1	1	1	..
5	Le Tourneau Rootter	3	1	..	1	1	..
6	Pegson Tamper ..	1	1	..	..	..	..
7	Le Tourneau 15 cu. Yard Buggy ..	2	2	..	..	..	..
8	Le Tourneau " Carry all " scraper ..	1	1	..	..	..	..
9	Kanga Rammer ..	2	1	..	..	1	..
10	Muir-Hill Dumpers ..	7	4	..	..	3	..
11	Air Comp. 'Broom-wade' (Portable) ..	31	17	3	2	8	1
12	Holman S. S. 11, Road Rippers	86	45	3	..	38	..
13	Holman Rock Drills ..	40	13	3	..	24	..
14	Caterpillar Tractors ..	11	7	1	1	2	..

Ref. Item 4. 1 off Suitable for Caterpillar R. 40.
4 do. R. 5.
do. D. 7.



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PORTABLE GENERATORS 7 K. W. D. C.

	Total.	M.I.S.	H.K.	A.J.	G.S.	N.I.S.	N.K.
7 K.W.	16	8	2	1	2	1	2

PORTABLE PUMPING SETS.

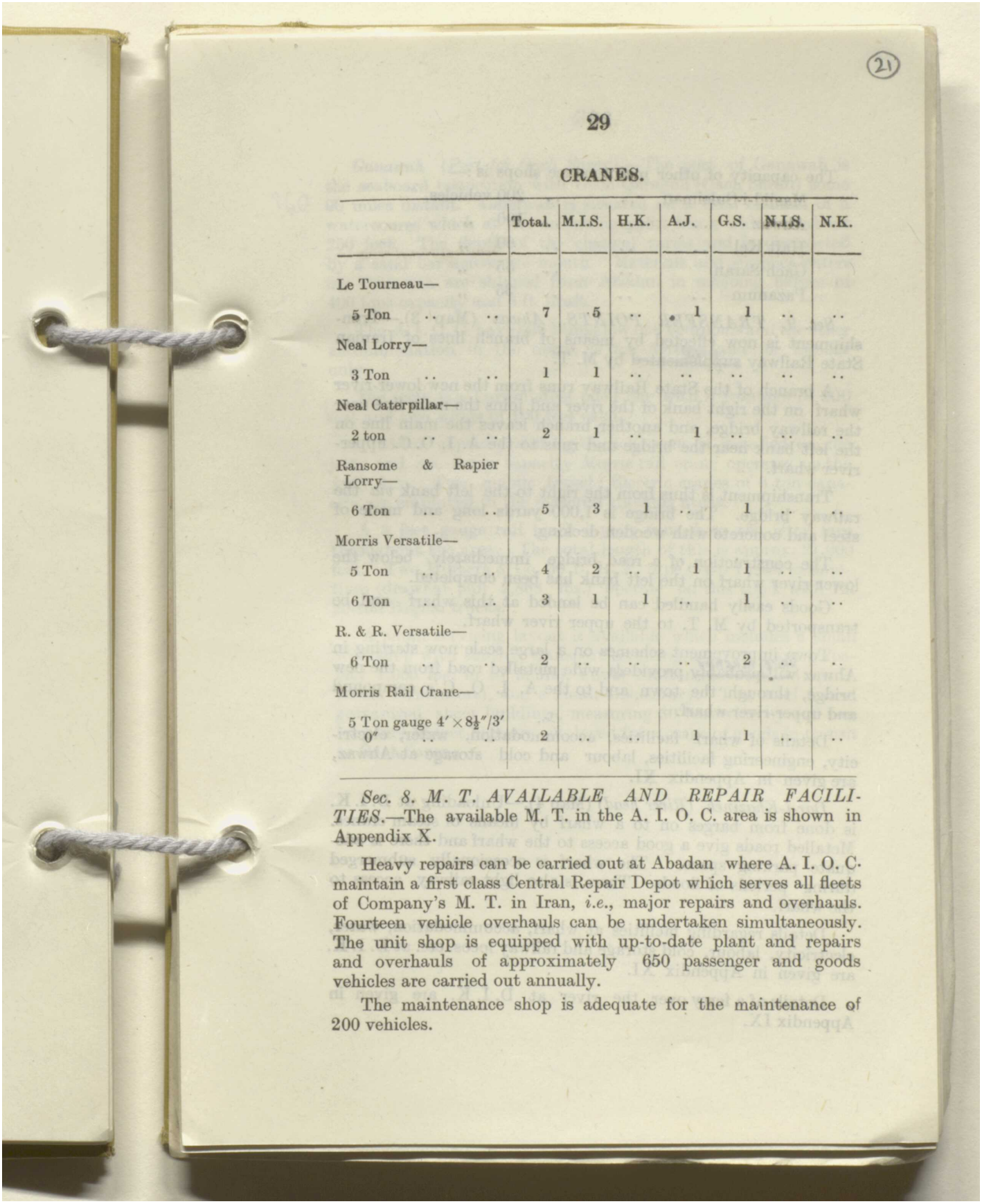
Type.	Galls. Hour.	Ft. Head.	Total.	M.I.S.	H.K.	A.J.	G.S.	N.I.S.	Drive.
Pearn	1000	700	7	2	1	1	2	1	2 D.E. Diesel.
,,	1500	1500	3	3	..	..	..	..	4 D.E. Diesel.

STATIONARY POWER GENERATING SETS.

	Total.	M.I.S.	H.K.	A.J.	G.S.	N.I.S.	N.K.
60 K.W.—A.C. ..	7	4	1	1	1	..	..
30 K.W.—A.C. ..	5	1	2	..	2	..	..
17 K.W.—D.C. ..	3	1	..	..	2	..	..
7 K.W.—D.C. ..	10	8	..	..	2	..	..

ELECTRIC WELDING SETS.

	Total.	M.I.S.	H.K.	A.J.	G.S.	N.I.S.	C.S.	N.K.
400 amp portable	49	23	2	3	16	2	1	2
400 amp Stationary ..	6	5	..	..	1	..	..	..
300 amp Stationary ..	14	8	1	1	4	..	..	..



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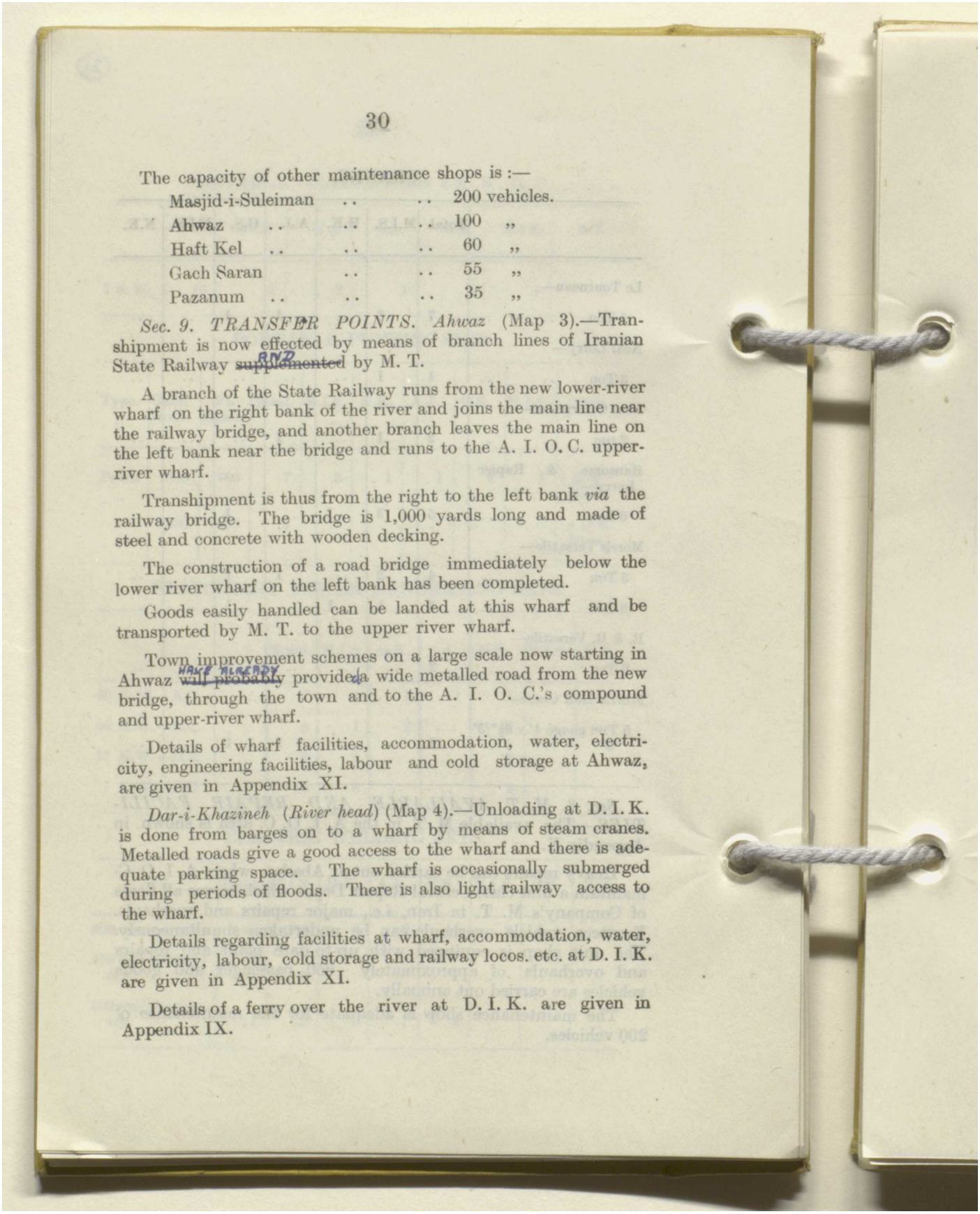
CRANES.

	Total.	M.I.S.	H.K.	A.J.	G.S.	N.I.S.	N.K.
Le Tourneau—							
5 Ton	7	5	..	1	1	..	..
Neal Lorry—							
3 Ton	1	1	..	..	..	..	..
Neal Caterpillar—							
2 ton	2	1	..	1	..	..	..
Ransome & Rapier Lorry—							
6 Ton	5	3	1	..	1	..	..
Morris Versatile—							
5 Ton	4	2	..	1	1	..	..
6 Ton	3	1	1	..	1	..	..
R. & R. Versatile—							
6 Ton	2	..	..	..	2	..	..
Morris Rail Crane—							
5 Ton gauge 4′ × 8½″/3′ 0″	2	..	..	1	1	..	..

Sec. 8. M. T. AVAILABLE AND REPAIR FACILITIES.—The available M. T. in the A. I. O. C. area is shown in Appendix X.

Heavy repairs can be carried out at Abadan where A. I. O. C. maintain a first class Central Repair Depot which serves all fleets of Company's M. T. in Iran, *i.e.*, major repairs and overhauls. Fourteen vehicle overhauls can be undertaken simultaneously. The unit shop is equipped with up-to-date plant and repairs and overhauls of approximately 650 passenger and goods vehicles are carried out annually.

The maintenance shop is adequate for the maintenance of 200 vehicles.



The capacity of other maintenance shops is :—

Masjid-i-Suleiman	.. ..	200 vehicles.
Ahwaz	..	100 ,,
Haft Kel	..	60 ,,
Gach Saran	.. ..	55 ,,
Pazanum	..	35 ,,

Sec. 9. TRANSFER POINTS. Ahwaz (Map 3).—Transhipment is now effected by means of branch lines of Iranian State Railway supplemented by M. T.

A branch of the State Railway runs from the new lower-river wharf on the right bank of the river and joins the main line near the railway bridge, and another branch leaves the main line on the left bank near the bridge and runs to the A. I. O. C. upper-river wharf.

Transhipment is thus from the right to the left bank *via* the railway bridge. The bridge is 1,000 yards long and made of steel and concrete with wooden decking.

The construction of a road bridge immediately below the lower river wharf on the left bank has been completed.

Goods easily handled can be landed at this wharf and be transported by M. T. to the upper river wharf.

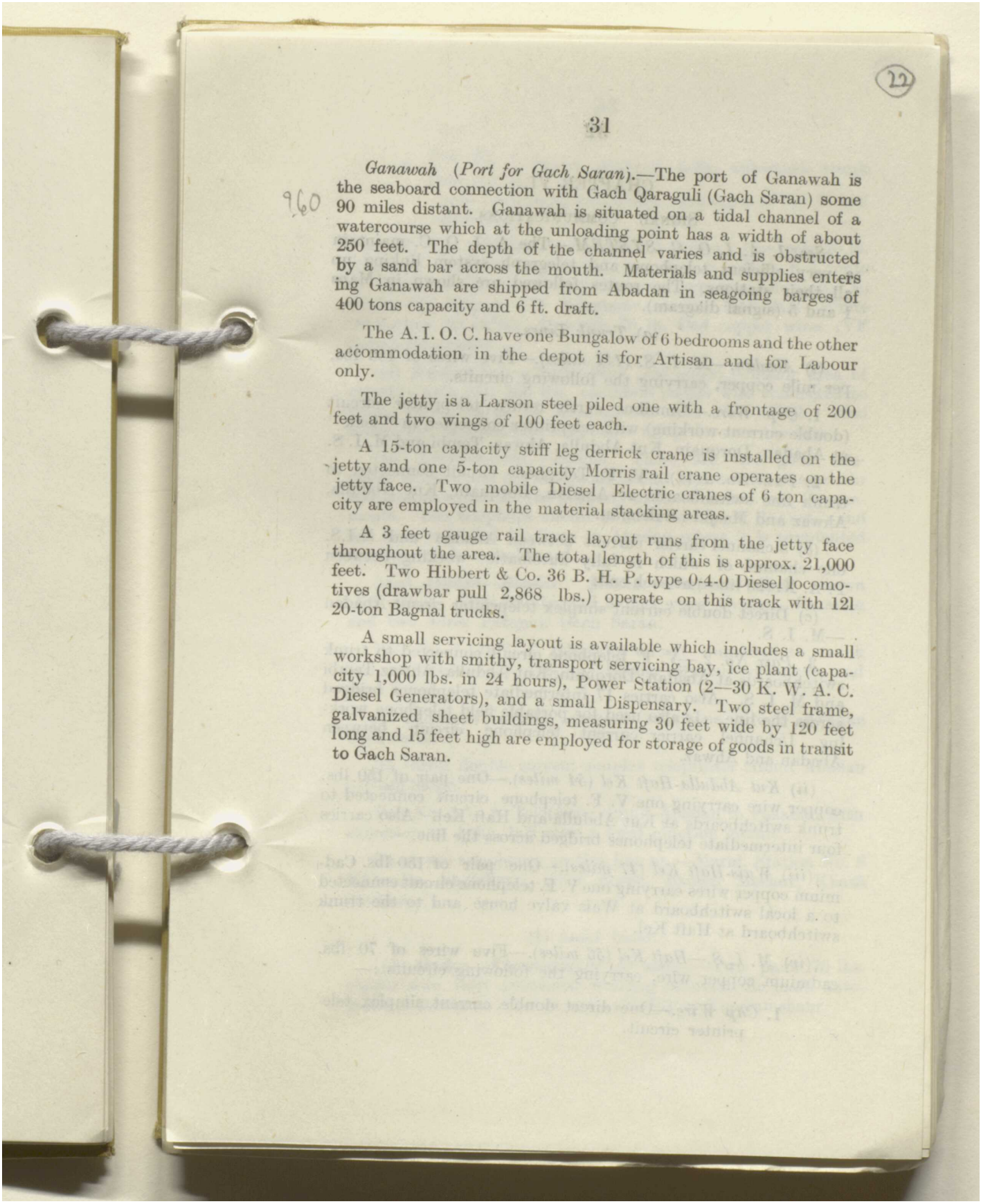
Town improvement schemes on a large scale now starting in Ahwaz will probably provide a wide metalled road from the new bridge, through the town and to the A. I. O. C.'s compound and upper-river wharf.

Details of wharf facilities, accommodation, water, electricity, engineering facilities, labour and cold storage at Ahwaz, are given in Appendix XI.

Dar-i-Khazineh (*River head*) (Map 4).—Unloading at D. I. K. is done from barges on to a wharf by means of steam cranes. Metalled roads give a good access to the wharf and there is adequate parking space. The wharf is occasionally submerged during periods of floods. There is also light railway access to the wharf.

Details regarding facilities at wharf, accommodation, water, electricity, labour, cold storage and railway locos. etc. at D. I. K. are given in Appendix XI.

Details of a ferry over the river at D. I. K. are given in Appendix IX.



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Ganawah (*Port for Gach Saran*).—The port of Ganawah is the seaboard connection with Gach Qaraguli (Gach Saran) some 90 miles distant. Ganawah is situated on a tidal channel of a watercourse which at the unloading point has a width of about 250 feet. The depth of the channel varies and is obstructed by a sand bar across the mouth. Materials and supplies enters ing Ganawah are shipped from Abadan in seagoing barges of 400 tons capacity and 6 ft. draft.

The A. I. O. C. have one Bungalow of 6 bedrooms and the other accommodation in the depot is for Artisan and for Labour only.

The jetty is a Larson steel piled one with a frontage of 200 feet and two wings of 100 feet each.

A 15-ton capacity stiff leg derrick crane is installed on the jetty and one 5-ton capacity Morris rail crane operates on the jetty face. Two mobile Diesel Electric cranes of 6 ton capacity are employed in the material stacking areas.

A 3 feet gauge rail track layout runs from the jetty face throughout the area. The total length of this is approx. 21,000 feet. Two Hibbert & Co. 36 B. H. P. type 0-4-0 Diesel locomotives (drawbar pull 2,868 lbs.) operate on this track with 121 20-ton Bagnal trucks.

A small servicing layout is available which includes a small workshop with smithy, transport servicing bay, ice plant (capacity 1,000 lbs. in 24 hours), Power Station (2—30 K. W. A. C. Diesel Generators), and a small Dispensary. Two steel frame, galvanized sheet buildings, measuring 30 feet wide by 120 feet long and 15 feet high are employed for storage of goods in transit to Gach Saran.

CHAPTER VI.

Signal Communications.

Sec. 1. A. I. O. C. SYSTEM.—The A. I. O. C. maintain a very efficient telephone and telegraph system linking up all their stations. The routes followed are shown in Maps 1 and 5 (signal diagram).

(*a*) *Trunk Lines.*

(*i*) *Abadan.—M. I. S.* (*142 miles*).—Five wires of 150 lbs. per mile copper, carrying the following circuits.

1. *Cap Wire.*—Omnibus earth return teleprinter circuit (double current working) with teleprinter connected in " leak " at Abadan, Dorquain, Kut Abdulla, Ahwaz, Tembi and M. I. S.

2. *Pair No. 1* (*a*).—V. F. Telephone circuit connected to trunk line switchboards at Abadan, Dorquain, Kut Abdulla, Ahwaz and Masjid-i-Suleiman.

(*b*) 3 channel carrier current between Abadan and M.I.S. one channel of which is fully automatic working between P. A. X. (25 lines) at each end.

(*c*) Direct double current simplex teleprinter circuit Abadan —M. I. S.

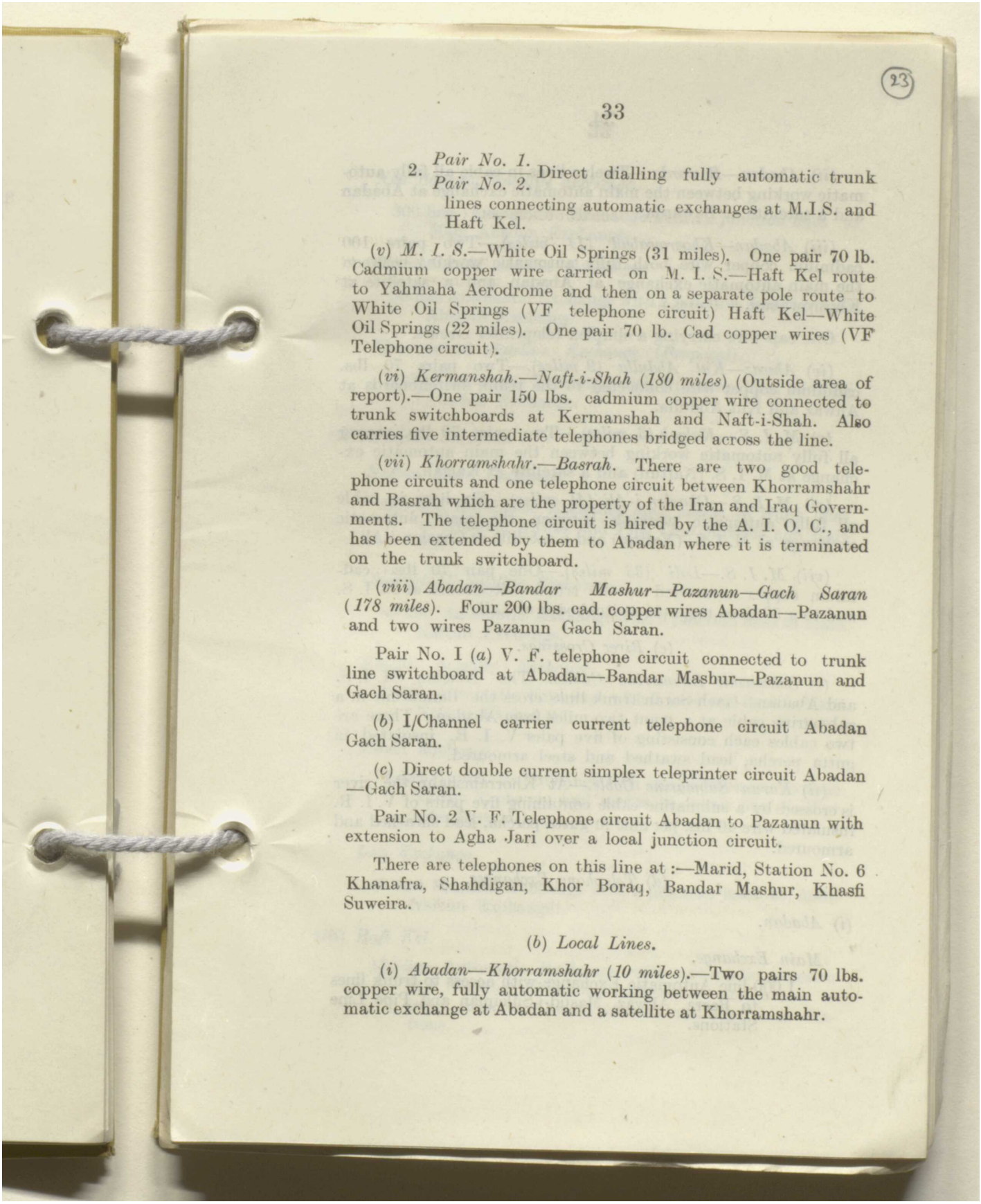
3. *Pair No. 2.*—V. F. telephone circuit connected to trunk switchboards at Abadan, Dorquain, Kut Abdulla, Ahwaz Tembi and M. I. S. Also carries 17 intermediate telephones bridged across the line. Is also used for portable field telephone working. I/channel carrier current telephone circuit between Abadan and Ahwaz.

(*ii*) *Kut Abdulla-Haft Kel* (*54 miles*).—One pair of 150 lbs. copper wire carrying one V. F. telephone circuit connected to trunk switchboards at Kut Abdulla and Haft Kel. Also carries four intermediate telephones bridged across the line.

(*iii*) *Wais-Haft Kel* (*47 miles*).—One pair of 150 lbs. Cadmium copper wires carrying one V. F. telephone circuit connected to a local switchboard at Wais valve house and to the trunk switchboard at Haft Kel.

(*iv*) *M. I. S.—Haft Kel* (*56 miles*).—Five wires of 70 lbs. cadmium copper wire, carrying the following circuits :—

1. *Cap Wire.*—One direct double current simplex teleprinter circuit.



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2. *Pair No. 1.* / *Pair No. 2.* Direct dialling fully automatic trunk lines connecting automatic exchanges at M.I.S. and Haft Kel.

(*v*) *M. I. S.*—White Oil Springs (31 miles). One pair 70 lb. Cadmium copper wire carried on M. I. S.—Haft Kel route to Yahmaha Aerodrome and then on a separate pole route to White Oil Springs (VF telephone circuit) Haft Kel—White Oil Springs (22 miles). One pair 70 lb. Cad copper wires (VF Telephone circuit).

(*vi*) *Kermanshah.—Naft-i-Shah (180 miles)* (Outside area of report).—One pair 150 lbs. cadmium copper wire connected to trunk switchboards at Kermanshah and Naft-i-Shah. Also carries five intermediate telephones bridged across the line.

(*vii*) *Khorramshahr.—Basrah.* There are two good telephone circuits and one telephone circuit between Khorramshahr and Basrah which are the property of the Iran and Iraq Governments. The telephone circuit is hired by the A. I. O. C., and has been extended by them to Abadan where it is terminated on the trunk switchboard.

(*viii*) *Abadan—Bandar Mashur—Pazanun—Gach Saran (178 miles).* Four 200 lbs. cad. copper wires Abadan—Pazanun and two wires Pazanun Gach Saran.

Pair No. I (*a*) V. F. telephone circuit connected to trunk line switchboard at Abadan—Bandar Mashur—Pazanun and Gach Saran.

(*b*) I/Channel carrier current telephone circuit Abadan Gach Saran.

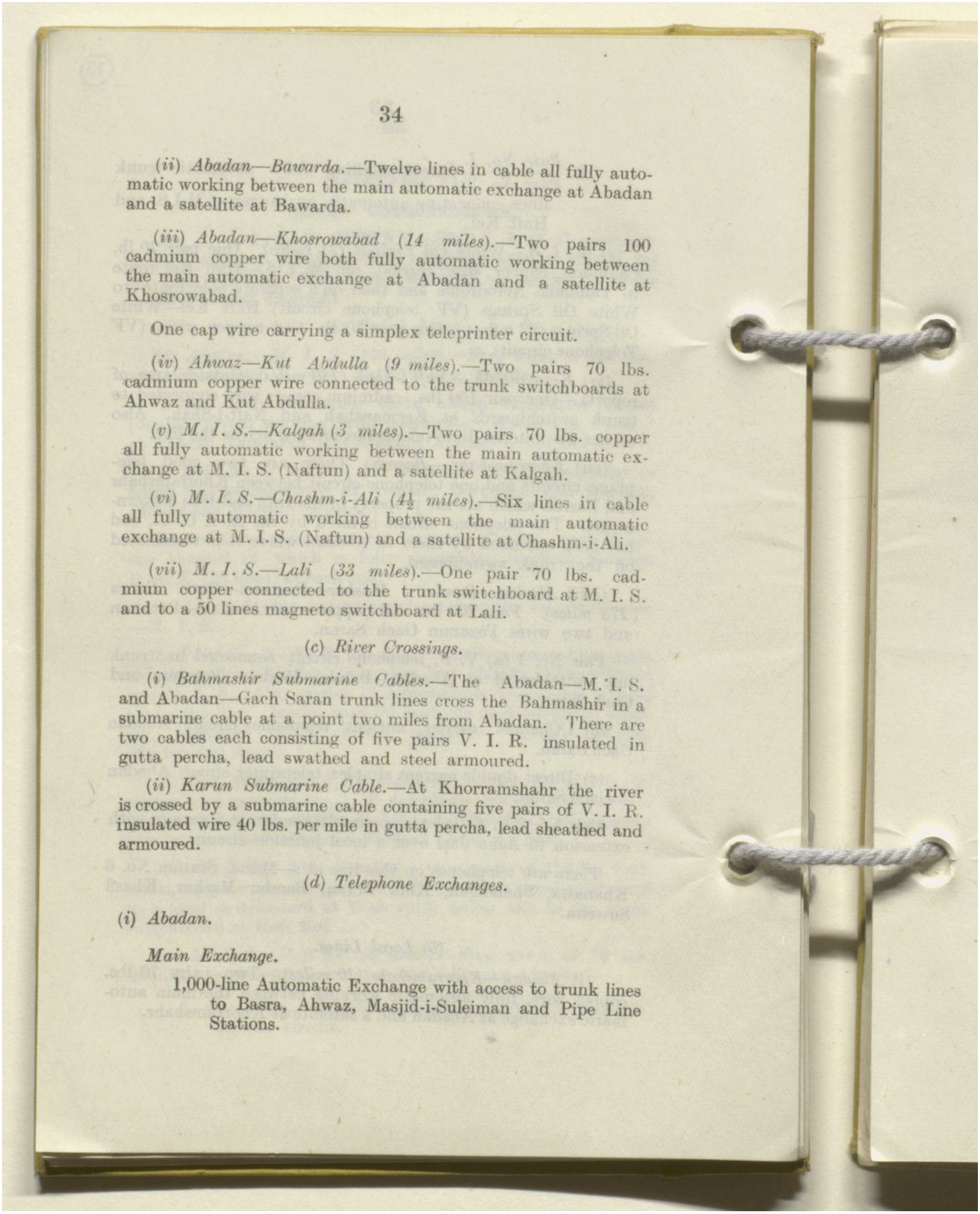
(*c*) Direct double current simplex teleprinter circuit Abadan —Gach Saran.

Pair No. 2 V. F. Telephone circuit Abadan to Pazanun with extension to Agha Jari over a local junction circuit.

There are telephones on this line at :—Marid, Station No. 6 Khanafra, Shahdigan, Khor Boraq, Bandar Mashur, Khasfi Suweira.

(*b*) *Local Lines.*

(*i*) *Abadan—Khorramshahr (10 miles).*—Two pairs 70 lbs. copper wire, fully automatic working between the main automatic exchange at Abadan and a satellite at Khorramshahr.



(*ii*) *Abadan—Bawarda.*—Twelve lines in cable all fully automatic working between the main automatic exchange at Abadan and a satellite at Bawarda.

(*iii*) *Abadan—Khosrowabad (14 miles).*—Two pairs 100 cadmium copper wire both fully automatic working between the main automatic exchange at Abadan and a satellite at Khosrowabad.

One cap wire carrying a simplex teleprinter circuit.

(*iv*) *Ahwaz—Kut Abdulla (9 miles).*—Two pairs 70 lbs. cadmium copper wire connected to the trunk switchboards at Ahwaz and Kut Abdulla.

(*v*) *M. I. S.—Kalgah (3 miles).*—Two pairs 70 lbs. copper all fully automatic working between the main automatic exchange at M. I. S. (Naftun) and a satellite at Kalgah.

(*vi*) *M. I. S.—Chashm-i-Ali (4½ miles).*—Six lines in cable all fully automatic working between the main automatic exchange at M. I. S. (Naftun) and a satellite at Chashm-i-Ali.

(*vii*) *M. I. S.—Lali (33 miles).*—One pair 70 lbs. cadmium copper connected to the trunk switchboard at M. I. S. and to a 50 lines magneto switchboard at Lali.

(*c*) *River Crossings.*

(*i*) *Bahmashir Submarine Cables.*—The Abadan—M. I. S. and Abadan—Gach Saran trunk lines cross the Bahmashir in a submarine cable at a point two miles from Abadan. There are two cables each consisting of five pairs V. I. R. insulated in gutta percha, lead swathed and steel armoured.

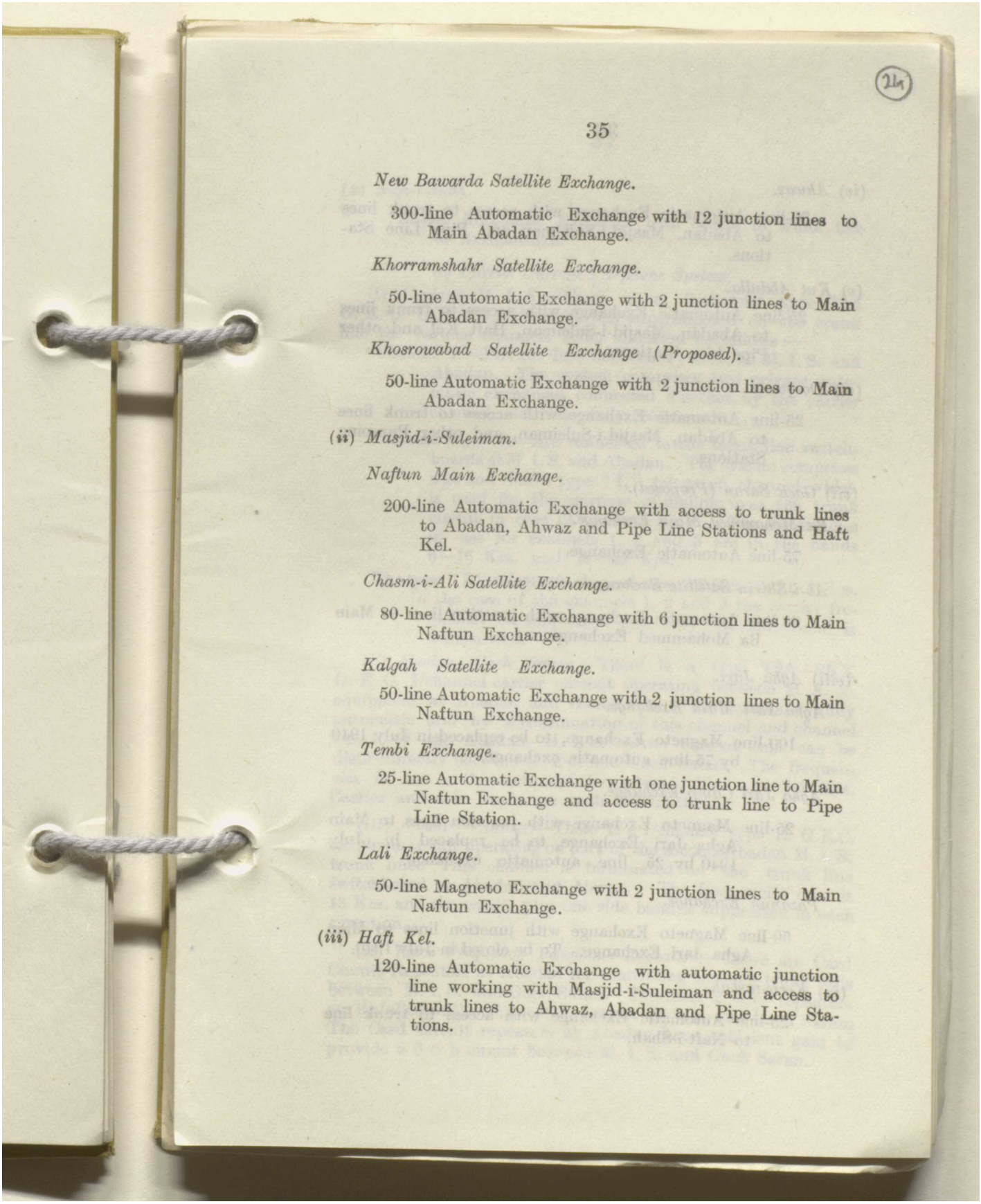
(*ii*) *Karun Submarine Cable.*—At Khorramshahr the river is crossed by a submarine cable containing five pairs of V. I. R. insulated wire 40 lbs. per mile in gutta percha, lead sheathed and armoured.

(*d*) *Telephone Exchanges.*

(*i*) *Abadan.*

Main Exchange.

1,000-line Automatic Exchange with access to trunk lines to Basra, Ahwaz, Masjid-i-Suleiman and Pipe Line Stations.



New Bawarda Satellite Exchange.

300-line Automatic Exchange with 12 junction lines to Main Abadan Exchange.

Khorramshahr Satellite Exchange.

50-line Automatic Exchange with 2 junction lines to Main Abadan Exchange.

Khosrowabad Satellite Exchange (Proposed).

50-line Automatic Exchange with 2 junction lines to Main Abadan Exchange.

(*ii*) *Masjid-i-Suleiman.*

Naftun Main Exchange.

200-line Automatic Exchange with access to trunk lines to Abadan, Ahwaz and Pipe Line Stations and Haft Kel.

Chasm-i-Ali Satellite Exchange.

80-line Automatic Exchange with 6 junction lines to Main Naftun Exchange.

Kalgah Satellite Exchange.

50-line Automatic Exchange with 2 junction lines to Main Naftun Exchange.

Tembi Exchange.

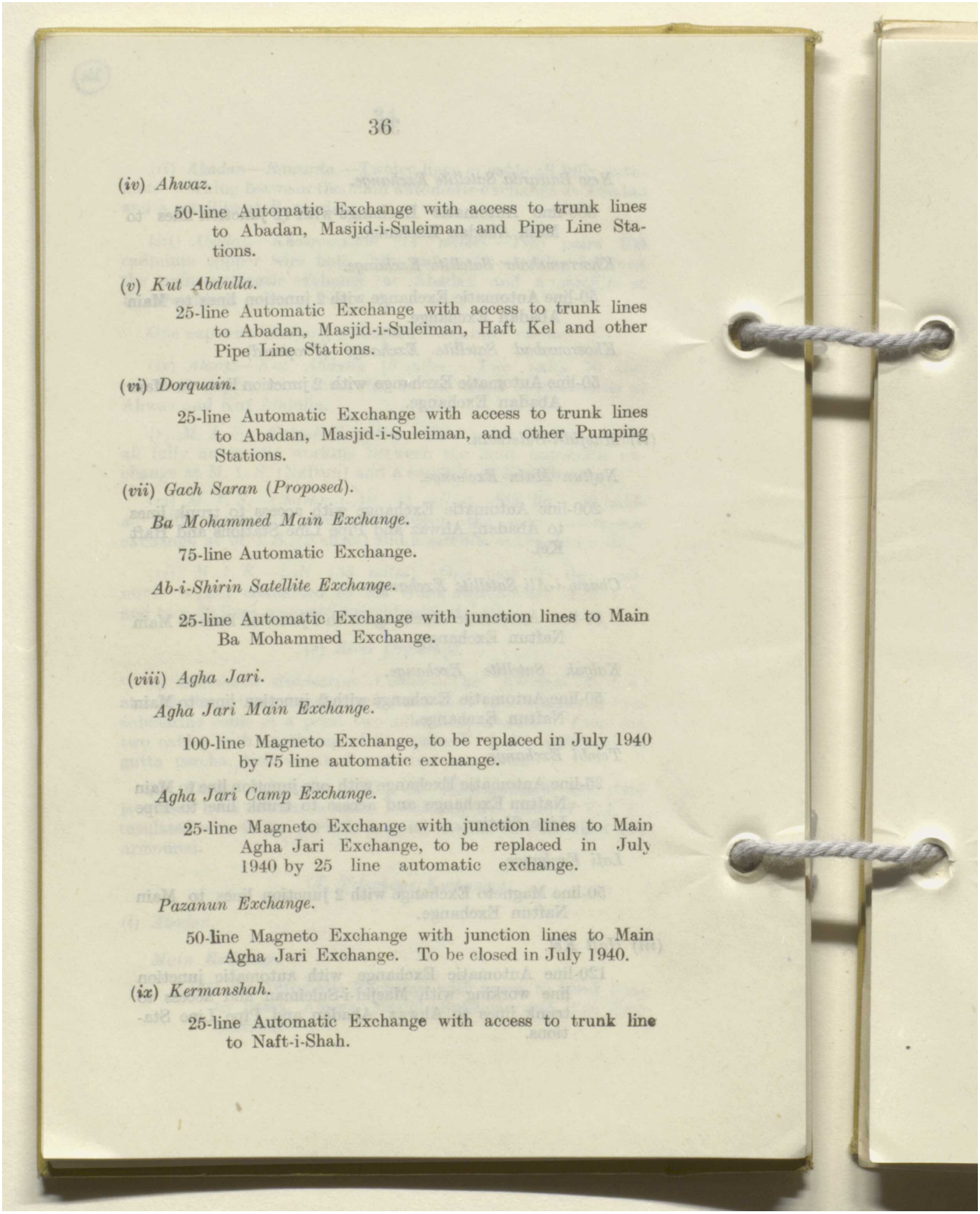
25-line Automatic Exchange with one junction line to Main Naftun Exchange and access to trunk line to Pipe Line Station.

Lali Exchange.

50-line Magneto Exchange with 2 junction lines to Main Naftun Exchange.

(*iii*) *Haft Kel.*

120-line Automatic Exchange with automatic junction line working with Masjid-i-Suleiman and access to trunk lines to Ahwaz, Abadan and Pipe Line Stations.



(*iv*) *Ahwaz.*

50-line Automatic Exchange with access to trunk lines to Abadan, Masjid-i-Suleiman and Pipe Line Stations.

(*v*) *Kut Abdulla.*

25-line Automatic Exchange with access to trunk lines to Abadan, Masjid-i-Suleiman, Haft Kel and other Pipe Line Stations.

(*vi*) *Dorquain.*

25-line Automatic Exchange with access to trunk lines to Abadan, Masjid-i-Suleiman, and other Pumping Stations.

(*vii*) *Gach Saran (Proposed).*

Ba Mohammed Main Exchange.

75-line Automatic Exchange.

Ab-i-Shirin Satellite Exchange.

25-line Automatic Exchange with junction lines to Main Ba Mohammed Exchange.

(*viii*) *Agha Jari.*

Agha Jari Main Exchange.

100-line Magneto Exchange, to be replaced in July 1940 by 75 line automatic exchange.

Agha Jari Camp Exchange.

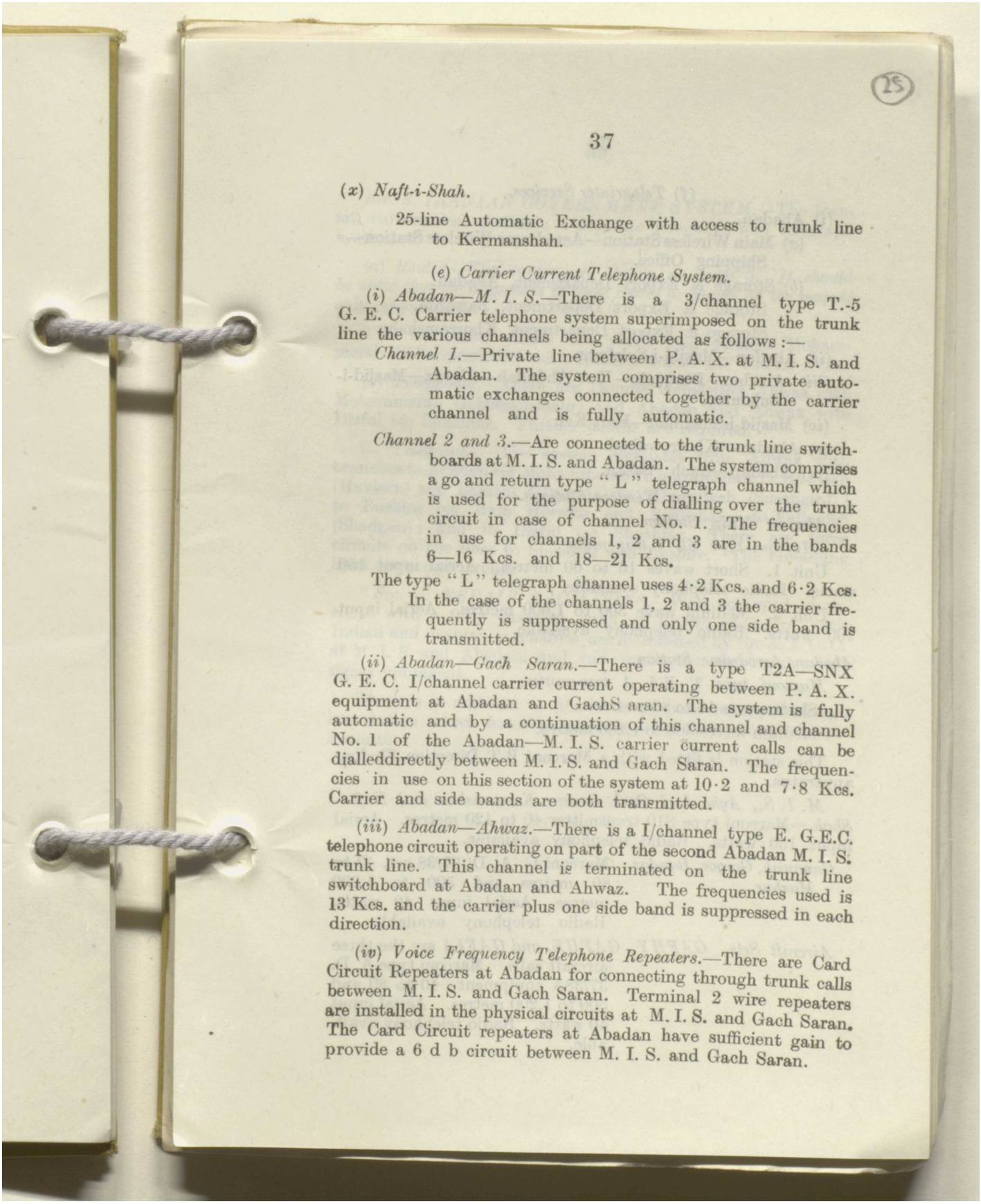
25-line Magneto Exchange with junction lines to Main Agha Jari Exchange, to be replaced in July 1940 by 25 line automatic exchange.

Pazanun Exchange.

50-line Magneto Exchange with junction lines to Main Agha Jari Exchange. To be closed in July 1940.

(*ix*) *Kermanshah.*

25-line Automatic Exchange with access to trunk line to Naft-i-Shah.



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(*x*) *Naft-i-Shah.*

25-line Automatic Exchange with access to trunk line to Kermanshah.

(*e*) *Carrier Current Telephone System.*

(*i*) *Abadan—M. I. S.*—There is a 3/channel type T.-5 G. E. C. Carrier telephone system superimposed on the trunk line the various channels being allocated as follows :—

Channel 1.—Private line between P. A. X. at M. I. S. and Abadan. The system comprises two private automatic exchanges connected together by the carrier channel and is fully automatic.

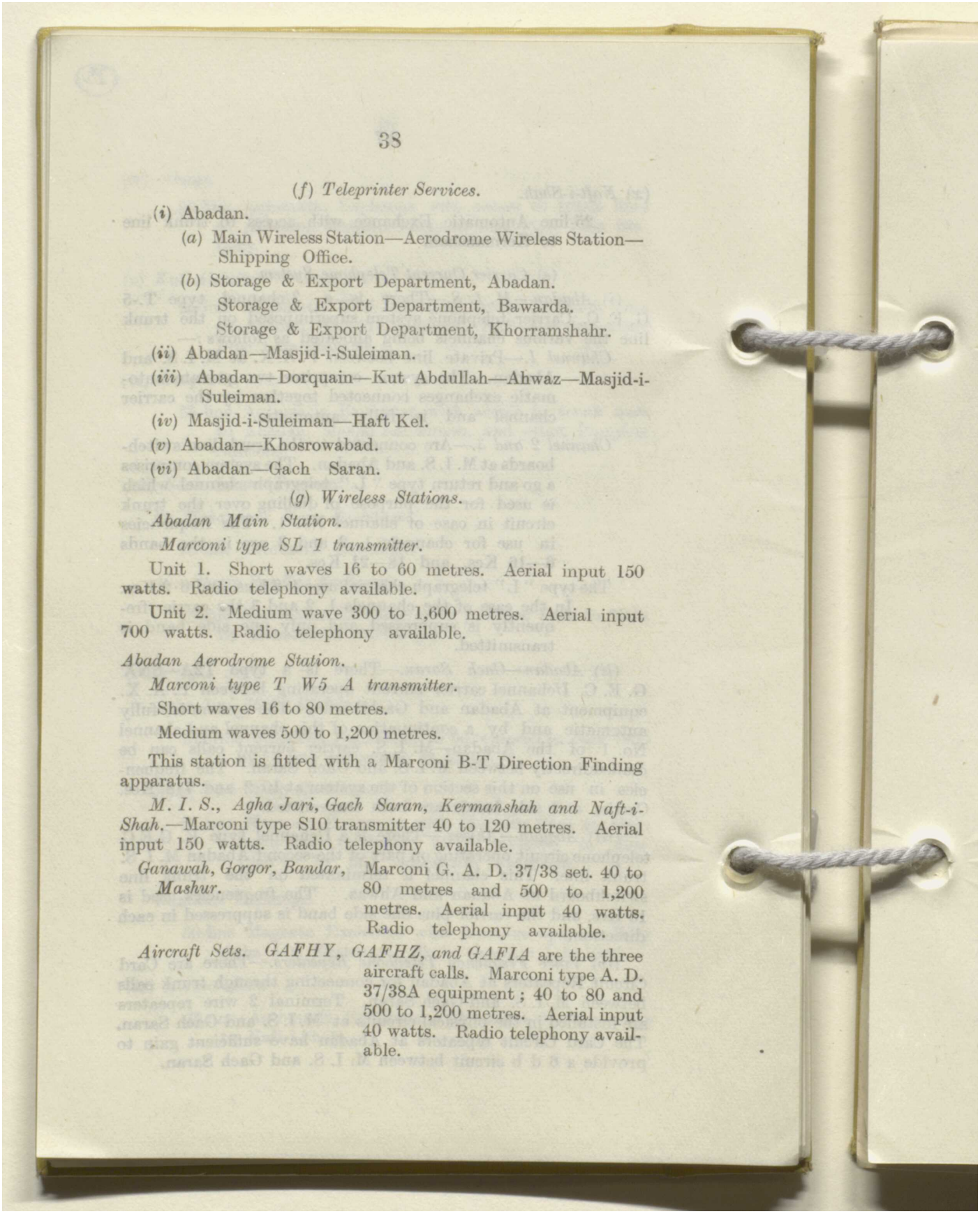
Channel 2 and 3.—Are connected to the trunk line switchboards at M. I. S. and Abadan. The system comprises a go and return type "L" telegraph channel which is used for the purpose of dialling over the trunk circuit in case of channel No. 1. The frequencies in use for channels 1, 2 and 3 are in the bands 6—16 Kcs. and 18—21 Kcs.

The type "L" telegraph channel uses 4·2 Kcs. and 6·2 Kcs. In the case of the channels 1, 2 and 3 the carrier frequently is suppressed and only one side band is transmitted.

(*ii*) *Abadan—Gach Saran.*—There is a type T2A—SNX G. E. C. I/channel carrier current operating between P. A. X. equipment at Abadan and GachS aran. The system is fully automatic and by a continuation of this channel and channel No. 1 of the Abadan—M. I. S. carrier current calls can be dialleddirectly between M. I. S. and Gach Saran. The frequencies in use on this section of the system at 10·2 and 7·8 Kcs. Carrier and side bands are both transmitted.

(*iii*) *Abadan—Ahwaz.*—There is a I/channel type E. G.E.C. telephone circuit operating on part of the second Abadan M. I. S. trunk line. This channel is terminated on the trunk line switchboard at Abadan and Ahwaz. The frequencies used is 13 Kcs. and the carrier plus one side band is suppressed in each direction.

(*iv*) *Voice Frequency Telephone Repeaters.*—There are Card Circuit Repeaters at Abadan for connecting through trunk calls between M. I. S. and Gach Saran. Terminal 2 wire repeaters are installed in the physical circuits at M. I. S. and Gach Saran. The Card Circuit repeaters at Abadan have sufficient gain to provide a 6 d b circuit between M. I. S. and Gach Saran.



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(*f*) *Teleprinter Services.*

(*i*) Abadan.

(*a*) Main Wireless Station—Aerodrome Wireless Station—Shipping Office.

(*b*) Storage & Export Department, Abadan.
Storage & Export Department, Bawarda.
Storage & Export Department, Khorramshahr.

(*ii*) Abadan—Masjid-i-Suleiman.

(*iii*) Abadan—Dorquain—Kut Abdullah—Ahwaz—Masjid-i-Suleiman.

(*iv*) Masjid-i-Suleiman—Haft Kel.

(*v*) Abadan—Khosrowabad.

(*vi*) Abadan—Gach Saran.

(*g*) *Wireless Stations.*

Abadan Main Station.

Marconi type SL 1 transmitter.

Unit 1. Short waves 16 to 60 metres. Aerial input 150 watts. Radio telephony available.

Unit 2. Medium wave 300 to 1,600 metres. Aerial input 700 watts. Radio telephony available.

Abadan Aerodrome Station.

Marconi type T W5 A transmitter.

Short waves 16 to 80 metres.

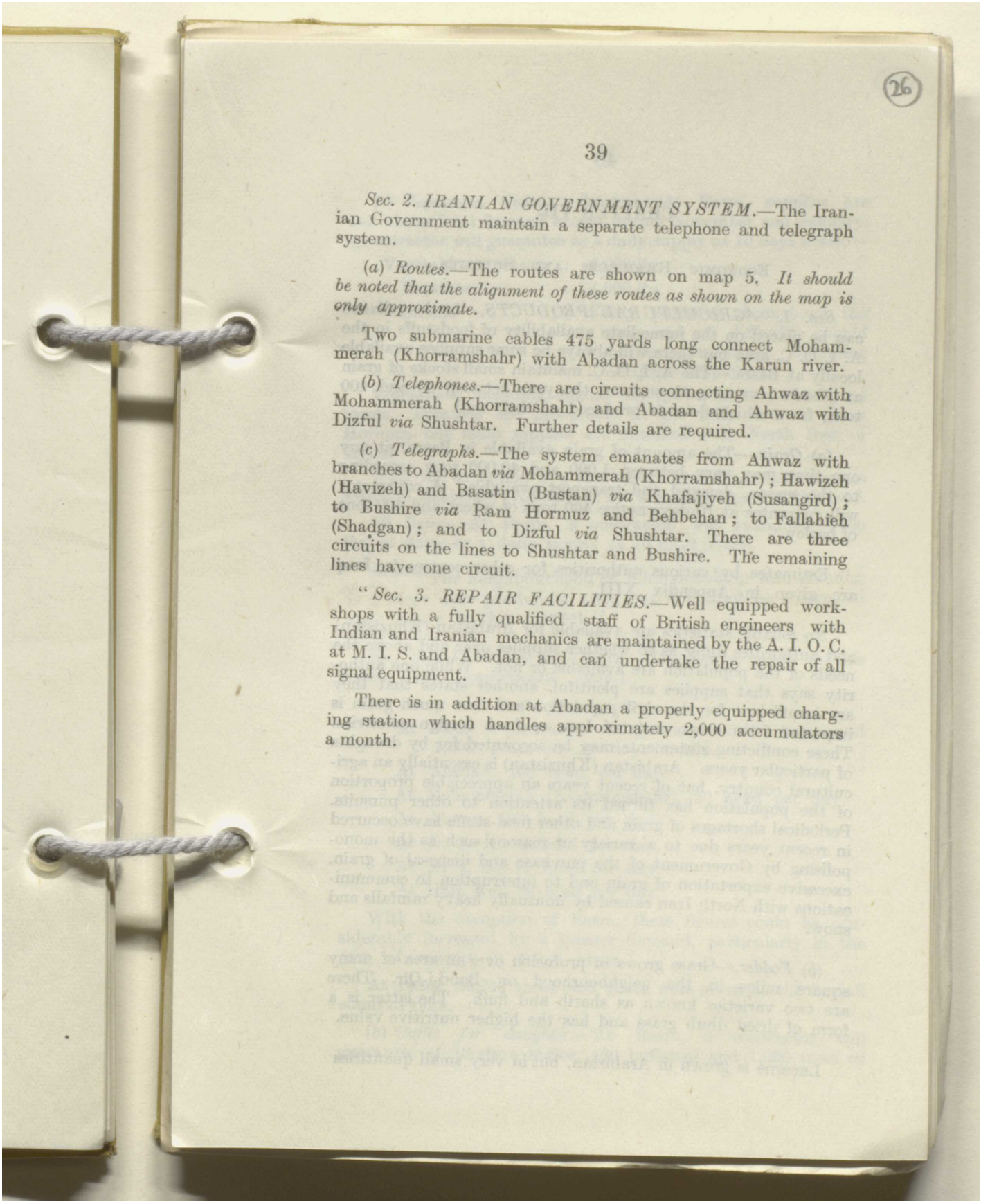
Medium waves 500 to 1,200 metres.

This station is fitted with a Marconi B-T Direction Finding apparatus.

M. I. S., Agha Jari, Gach Saran, Kermanshah and Naft-i-Shah.—Marconi type S10 transmitter 40 to 120 metres. Aerial input 150 watts. Radio telephony available.

Ganawah, Gorgor, Bandar, Mashur. Marconi G. A. D. 37/38 set. 40 to 80 metres and 500 to 1,200 metres. Aerial input 40 watts. Radio telephony available.

Aircraft Sets. *GAFHY, GAFHZ, and GAFIA* are the three aircraft calls. Marconi type A. D. 37/38A equipment; 40 to 80 and 500 to 1,200 metres. Aerial input 40 watts. Radio telephony available.



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Sec. 2. IRANIAN GOVERNMENT SYSTEM.—The Iranian Government maintain a separate telephone and telegraph system.

(*a*) *Routes.*—The routes are shown on map 5. *It should be noted that the alignment of these routes as shown on the map is only approximate.*

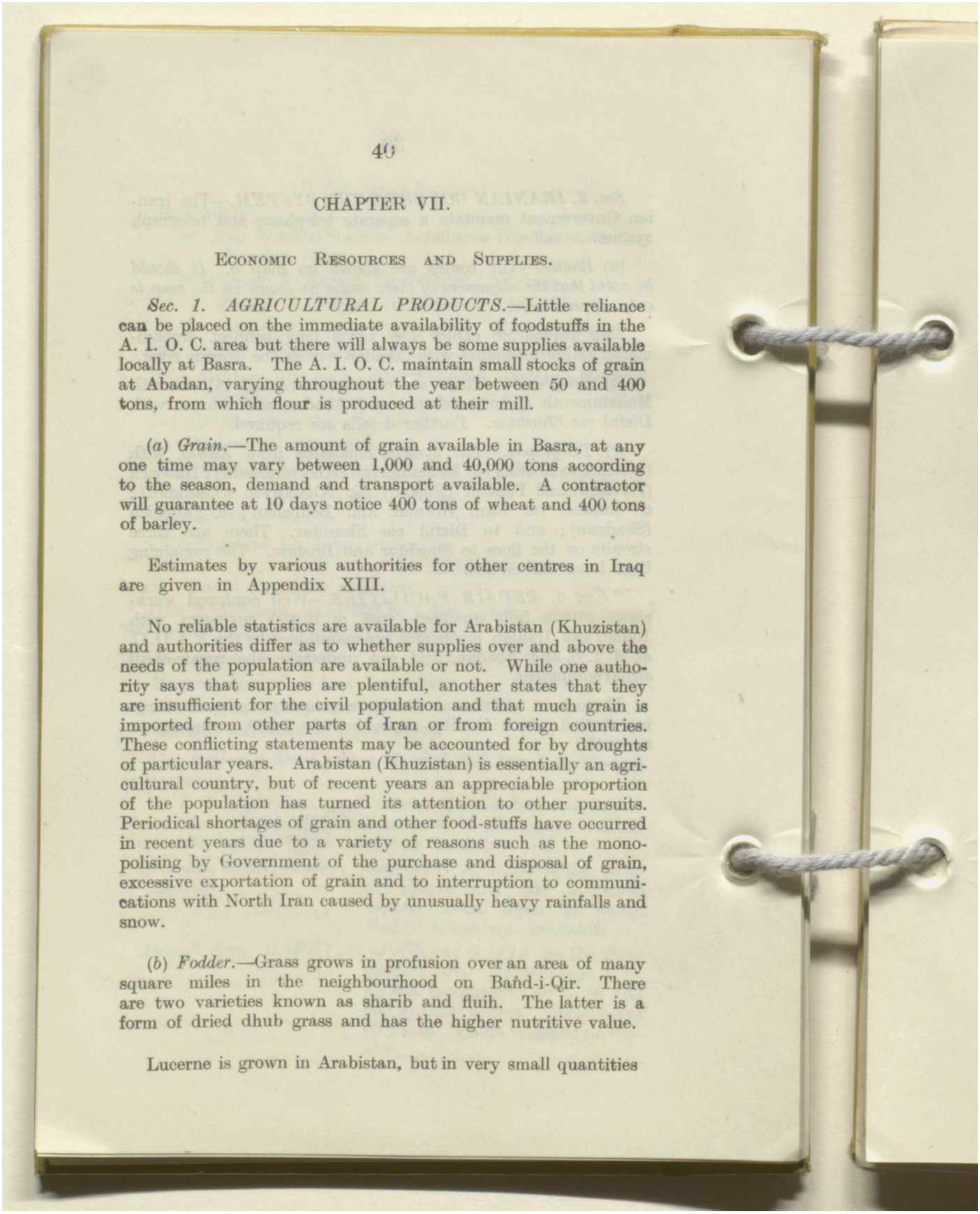
Two submarine cables 475 yards long connect Mohammerah (Khorramshahr) with Abadan across the Karun river.

(*b*) *Telephones.*—There are circuits connecting Ahwaz with Mohammerah (Khorramshahr) and Abadan and Ahwaz with Dizful *via* Shushtar. Further details are required.

(*c*) *Telegraphs.*—The system emanates from Ahwaz with branches to Abadan *via* Mohammerah (Khorramshahr); Hawizeh (Havizeh) and Basatin (Bustan) *via* Khafajiyeh (Susangird); to Bushire *via* Ram Hormuz and Behbehan; to Fallahieh (Shadgan); and to Dizful *via* Shushtar. There are three circuits on the lines to Shushtar and Bushire. The remaining lines have one circuit.

"*Sec. 3. REPAIR FACILITIES.*—Well equipped workshops with a fully qualified staff of British engineers with Indian and Iranian mechanics are maintained by the A. I. O. C. at M. I. S. and Abadan, and can undertake the repair of all signal equipment.

There is in addition at Abadan a properly equipped charging station which handles approximately 2,000 accumulators a month.



CHAPTER VII.

Economic Resources and Supplies.

Sec. 1. AGRICULTURAL PRODUCTS.—Little reliance can be placed on the immediate availability of foodstuffs in the A. I. O. C. area but there will always be some supplies available locally at Basra. The A. I. O. C. maintain small stocks of grain at Abadan, varying throughout the year between 50 and 400 tons, from which flour is produced at their mill.

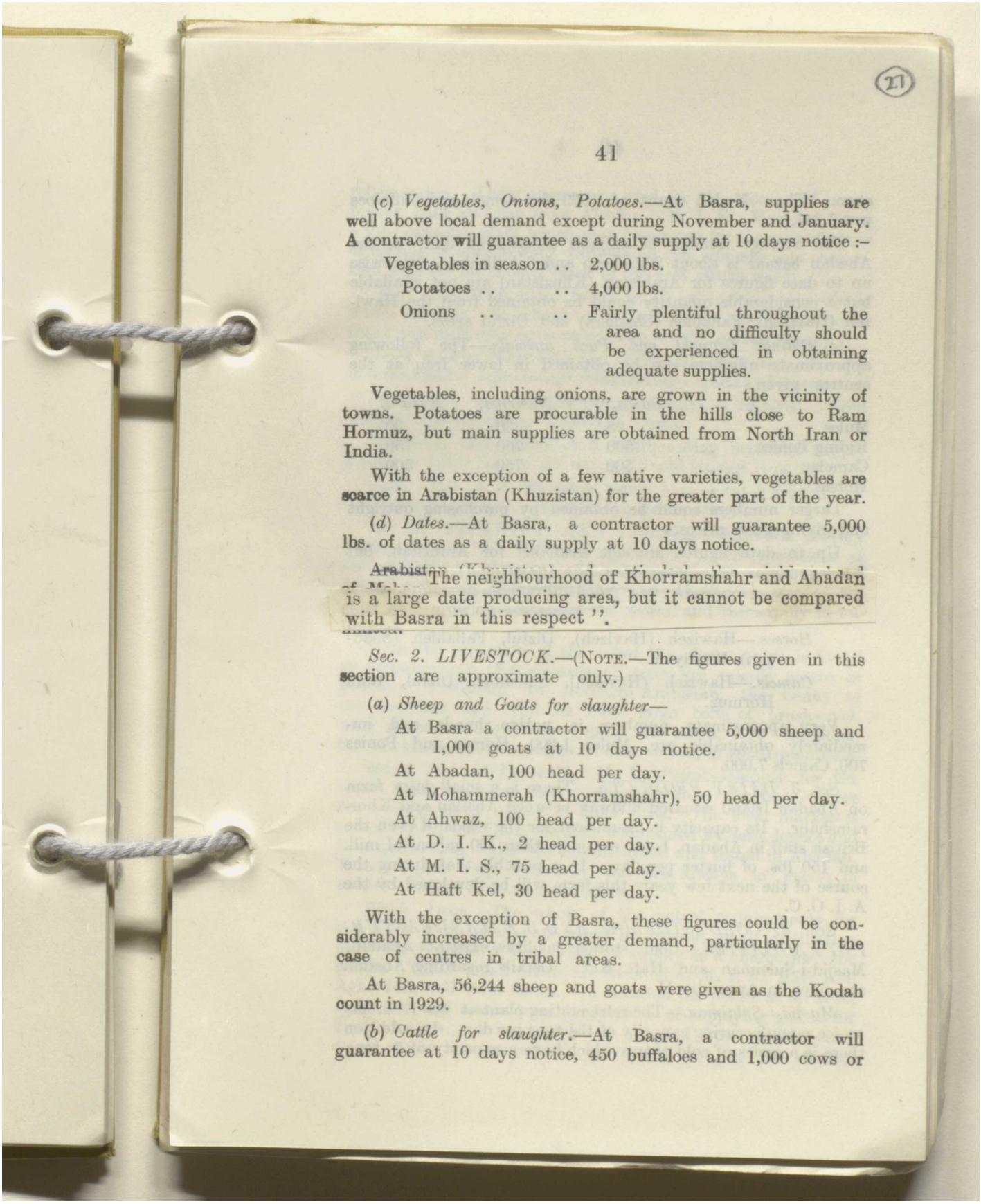
(*a*) *Grain.*—The amount of grain available in Basra, at any one time may vary between 1,000 and 40,000 tons according to the season, demand and transport available. A contractor will guarantee at 10 days notice 400 tons of wheat and 400 tons of barley.

Estimates by various authorities for other centres in Iraq are given in Appendix XIII.

No reliable statistics are available for Arabistan (Khuzistan) and authorities differ as to whether supplies over and above the needs of the population are available or not. While one authority says that supplies are plentiful, another states that they are insufficient for the civil population and that much grain is imported from other parts of Iran or from foreign countries. These conflicting statements may be accounted for by droughts of particular years. Arabistan (Khuzistan) is essentially an agricultural country, but of recent years an appreciable proportion of the population has turned its attention to other pursuits. Periodical shortages of grain and other food-stuffs have occurred in recent years due to a variety of reasons such as the monopolising by Government of the purchase and disposal of grain, excessive exportation of grain and to interruption to communications with North Iran caused by unusually heavy rainfalls and snow.

(*b*) *Fodder.*—Grass grows in profusion over an area of many square miles in the neighbourhood on Band-i-Qir. There are two varieties known as sharib and fluih. The latter is a form of dried dhub grass and has the higher nutritive value.

Lucerne is grown in Arabistan, but in very small quantities



(c) *Vegetables, Onions, Potatoes.*—At Basra, supplies are well above local demand except during November and January. A contractor will guarantee as a daily supply at 10 days notice :–

Vegetables in season ..	2,000 lbs.
Potatoes	4,000 lbs.
Onions	Fairly plentiful throughout the area and no difficulty should be experienced in obtaining adequate supplies.

Vegetables, including onions, are grown in the vicinity of towns. Potatoes are procurable in the hills close to Ram Hormuz, but main supplies are obtained from North Iran or India.

With the exception of a few native varieties, vegetables are scarce in Arabistan (Khuzistan) for the greater part of the year.

(d) *Dates.*—At Basra, a contractor will guarantee 5,000 lbs. of dates as a daily supply at 10 days notice.

Arabistan ... The neighbourhood of Khorramshahr and Abadan is a large date producing area, but it cannot be compared with Basra in this respect ".

Sec. 2. LIVESTOCK.—(NOTE.—The figures given in this section are approximate only.)

(a) *Sheep and Goats for slaughter*—

At Basra a contractor will guarantee 5,000 sheep and 1,000 goats at 10 days notice.

At Abadan, 100 head per day.

At Mohammerah (Khorramshahr), 50 head per day.

At Ahwaz, 100 head per day.

At D. I. K., 2 head per day.

At M. I. S., 75 head per day.

At Haft Kel, 30 head per day.

With the exception of Basra, these figures could be considerably increased by a greater demand, particularly in the case of centres in tribal areas.

At Basra, 56,244 sheep and goats were given as the Kodah count in 1929.

(b) *Cattle for slaughter.*—At Basra, a contractor will guarantee at 10 days notice, 450 buffaloes and 1,000 cows or

oxen. The Kodah count of 1929 for camels and buffaloes was 7,841.

The average number of animals slaughtered daily in the Abadan bazaar is about 200 sheep and 8 bullocks. Otherwise up to date figures for Arabistan (Khuzistan) are not available but a considerable quantity could be obtained from the Hawizeh (Havizeh), Fallahieh (Shadgan) and Dizful areas.

(c) *Riding, Draught and Pack animals.*—The following approximate numbers can be obtained in lower Iraq at the centres given :—

	Basra.	*Nasiriya.*	*Aurara.*
Mules	25	30	30
Riding Ponies ..	500	750	750
Camels	500	750	500
Horses	..	..	..

Larger numbers could be obtained by purchasing outright and giving good prices.

Up to date figures are not available for Arabistan, but the principal centres are, in order of importance :—

Mules.—Dizful, Fallahieh (Shadgan), Shushtar, Ram Hormuz.

Horses.—Hawizeh (Havizeh), Dizful, Fallahieh (Shadgan), Hindiyan.

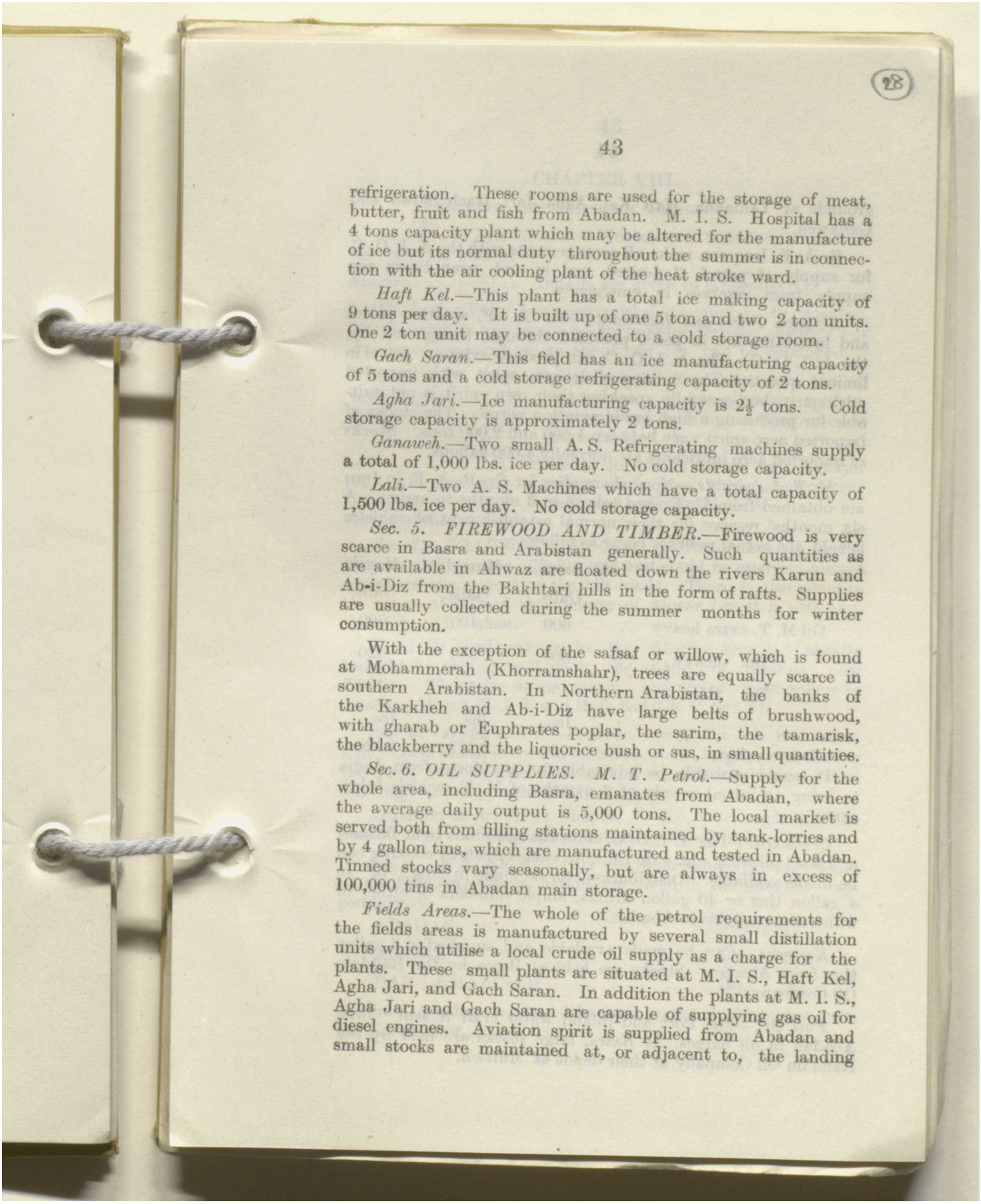
Camels.—Hawizeh (Havizeh), Shushtar, Dizful, Ram Hormuz.

Very approximate numbers in native hands and immediately obtainable are, Mules 1,200, Horses and Ponies 700, Camels 7,000.

Sec. 3. DAIRY PRODUCTS.—There is a small dairy farm on Abadan Island situated midway between Abadan and Khorramshahr. Its capacity is insufficient for the needs of even the British staff in Abadan, being not more than 100 gallons of milk and 150 lbs. of butter per day. It is possible that during the course of the next few years this farm will be developed by the A. I. O. C.

Sec. 4. COLD STORAGE AND ICE MANUFACTURING FACILITIES.—Cold storage facilities exist at Abadan, Masjid-i-Suleiman and Haft Kel. Details regarding Abadan are given in Appendix II.

Masjid-i-Sulaiman.—The refrigerating plant at M. I. S. has an ice manufacturing capacity of 15½ tons per day. In addition there is a series of cold rooms which have a capacity of 5 tons



refrigeration. These rooms are used for the storage of meat, butter, fruit and fish from Abadan. M. I. S. Hospital has a 4 tons capacity plant which may be altered for the manufacture of ice but its normal duty throughout the summer is in connection with the air cooling plant of the heat stroke ward.

Haft Kel.—This plant has a total ice making capacity of 9 tons per day. It is built up of one 5 ton and two 2 ton units. One 2 ton unit may be connected to a cold storage room.

Gach Saran.—This field has an ice manufacturing capacity of 5 tons and a cold storage refrigerating capacity of 2 tons.

Agha Jari.—Ice manufacturing capacity is $2\frac{1}{2}$ tons. Cold storage capacity is approximately 2 tons.

Ganaweh.—Two small A. S. Refrigerating machines supply a total of 1,000 lbs. ice per day. No cold storage capacity.

Lali.—Two A. S. Machines which have a total capacity of 1,500 lbs. ice per day. No cold storage capacity.

Sec. 5. FIREWOOD AND TIMBER.—Firewood is very scarce in Basra and Arabistan generally. Such quantities as are available in Ahwaz are floated down the rivers Karun and Ab-i-Diz from the Bakhtari hills in the form of rafts. Supplies are usually collected during the summer months for winter consumption.

With the exception of the safsaf or willow, which is found at Mohammerah (Khorramshahr), trees are equally scarce in southern Arabistan. In Northern Arabistan, the banks of the Karkheh and Ab-i-Diz have large belts of brushwood, with gharab or Euphrates poplar, the sarim, the tamarisk, the blackberry and the liquorice bush or sus, in small quantities.

Sec. 6. OIL SUPPLIES. M. T. Petrol.—Supply for the whole area, including Basra, emanates from Abadan, where the average daily output is 5,000 tons. The local market is served both from filling stations maintained by tank-lorries and by 4 gallon tins, which are manufactured and tested in Abadan. Tinned stocks vary seasonally, but are always in excess of 100,000 tins in Abadan main storage.

Fields Areas.—The whole of the petrol requirements for the fields areas is manufactured by several small distillation units which utilise a local crude oil supply as a charge for the plants. These small plants are situated at M. I. S., Haft Kel, Agha Jari, and Gach Saran. In addition the plants at M. I. S., Agha Jari and Gach Saran are capable of supplying gas oil for diesel engines. Aviation spirit is supplied from Abadan and small stocks are maintained at, or adjacent to, the landing

grounds at Yahmaha, Haft Kel, Agha Jari, Gach Saran and Ganaweh.

R. A. F. Iraq can make all arrangements with the A. I. O. C. for supply of petrol, if desired, and in and near Basra can supply from reserves in emergency.

Aviation Petrol and Lubricants.—R. A. F. aviation petrol and lubricants are in peace provided through, though not by, the A. I. O. C. The A. I. O. C. can produce aviation petrol in limited quantities by mixing their own spirit with imported miri spirit, but generally speaking their own spirit is not suitable for producing a high grade aviation petrol. The stocks of imported aero spirit vary between 1,500 and 2,000 tons. Stocks of imported aero lubricants are normally 4,000 gallons.

M. T. Lubricants.—Normal supplies for the R. A. F. in Iraq are obtained from U. K. and take 2 to 3 months to arrive. A six months' reserve for their normal establishment of vehicles is held, the actual reserves being as follows :—

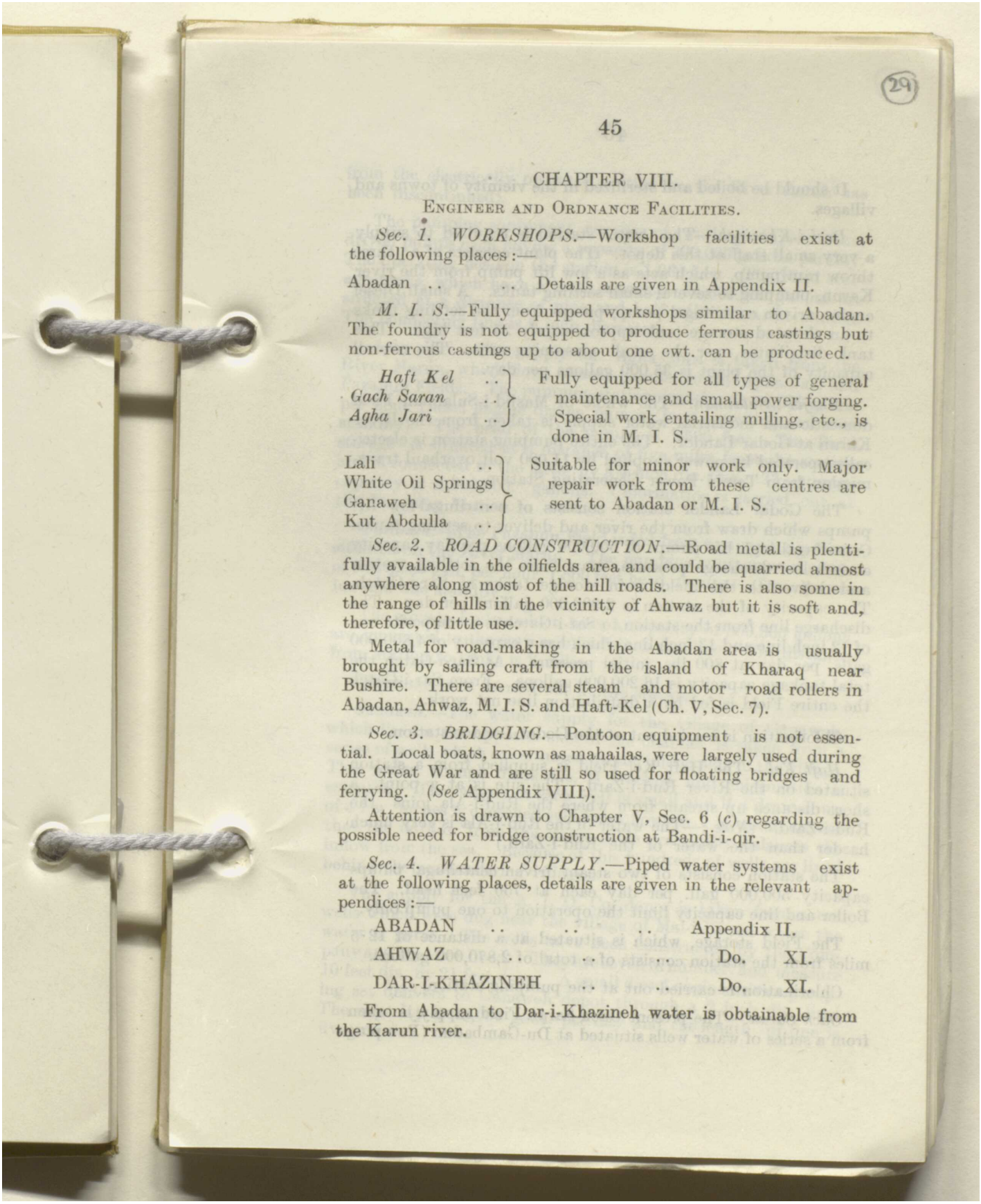
	Basra.	Hinaidi.	Mosul.
	Galls.	Galls.	Galls.
Oil M. T. extra heavy ..	600	2,100	500
Do. heavy ..	500	580	120
Do. thin ..	150	500	100
	lbs.	lbs.	lbs.
Grease yellow	720	3,212	1,120

It would probably be advisable for any force from India to bring an initial supply of 2 months of M. T. vehicle lubricants.

Crude Oil.—The A. I. O. C. state that 400 tons light furnace or Diesel oil with adequate calorific values for field cooking can be made available. Distribution can be made in bulk, or in 4 gallon tins or 40 gallon drums, ample numbers of either of which are available in Abadan.

Kerosene.—Can be made available and supplied in 4 gallon tins from Abadan. Stocks are held at Basra by the Rafidain Oil Company.

Fuel Oil.—For Port and inland water craft is sent from Abadan in oil barges. At Basra, large stocks are held by the Rafidain Oil Company at their depot at Muftieh.



CHAPTER VIII.

Engineer and Ordnance Facilities.

Sec. 1. WORKSHOPS.—Workshop facilities exist at the following places :—

Abadan .. .. Details are given in Appendix II.

M. I. S.—Fully equipped workshops similar to Abadan. The foundry is not equipped to produce ferrous castings but non-ferrous castings up to about one cwt. can be produced.

Haft Kel .. }
Gach Saran .. } Fully equipped for all types of general maintenance and small power forging. Special work entailing milling, etc., is done in M. I. S.
Agha Jari .. }

Lali .. }
White Oil Springs } Suitable for minor work only. Major repair work from these centres are sent to Abadan or M. I. S.
Ganaweh .. }
Kut Abdulla .. }

Sec. 2. ROAD CONSTRUCTION.—Road metal is plentifully available in the oilfields area and could be quarried almost anywhere along most of the hill roads. There is also some in the range of hills in the vicinity of Ahwaz but it is soft and, therefore, of little use.

Metal for road-making in the Abadan area is usually brought by sailing craft from the island of Kharaq near Bushire. There are several steam and motor road rollers in Abadan, Ahwaz, M. I. S. and Haft-Kel (Ch. V, Sec. 7).

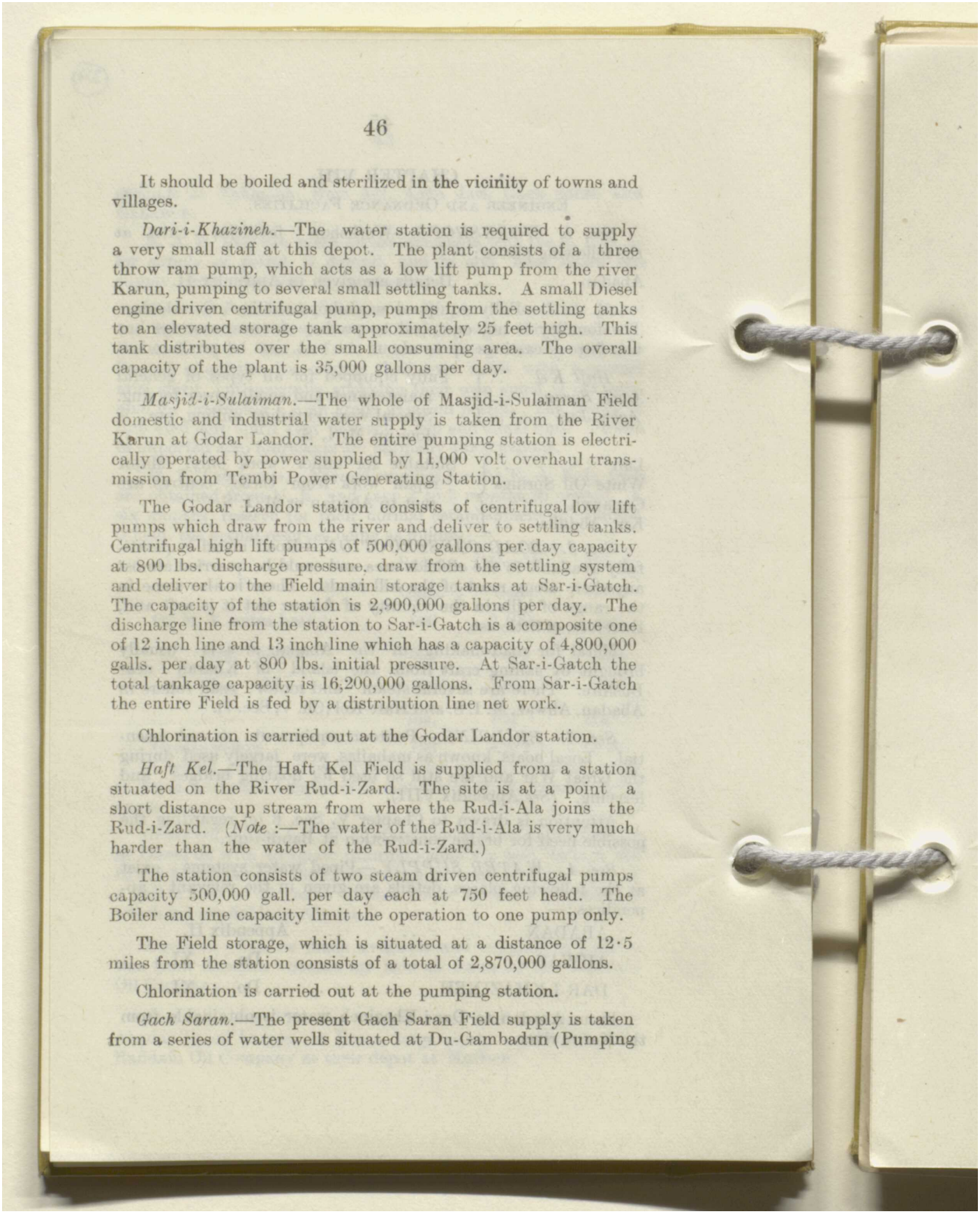
Sec. 3. BRIDGING.—Pontoon equipment is not essential. Local boats, known as mahailas, were largely used during the Great War and are still so used for floating bridges and ferrying. (*See* Appendix VIII).

Attention is drawn to Chapter V, Sec. 6 (*c*) regarding the possible need for bridge construction at Bandi-i-qir.

Sec. 4. WATER SUPPLY.—Piped water systems exist at the following places, details are given in the relevant appendices :—

ABADAN	Appendix II.	
AHWAZ	Do.	XI.
DAR-I-KHAZINEH	Do.	XI.

From Abadan to Dar-i-Khazineh water is obtainable from the Karun river.



It should be boiled and sterilized in the vicinity of towns and villages.

Dari-i-Khazineh.—The water station is required to supply a very small staff at this depot. The plant consists of a three throw ram pump, which acts as a low lift pump from the river Karun, pumping to several small settling tanks. A small Diesel engine driven centrifugal pump, pumps from the settling tanks to an elevated storage tank approximately 25 feet high. This tank distributes over the small consuming area. The overall capacity of the plant is 35,000 gallons per day.

Masjid-i-Sulaiman.—The whole of Masjid-i-Sulaiman Field domestic and industrial water supply is taken from the River Karun at Godar Landor. The entire pumping station is electrically operated by power supplied by 11,000 volt overhaul transmission from Tembi Power Generating Station.

The Godar Landor station consists of centrifugal low lift pumps which draw from the river and deliver to settling tanks. Centrifugal high lift pumps of 500,000 gallons per day capacity at 800 lbs. discharge pressure, draw from the settling system and deliver to the Field main storage tanks at Sar-i-Gatch. The capacity of the station is 2,900,000 gallons per day. The discharge line from the station to Sar-i-Gatch is a composite one of 12 inch line and 13 inch line which has a capacity of 4,800,000 galls. per day at 800 lbs. initial pressure. At Sar-i-Gatch the total tankage capacity is 16,200,000 gallons. From Sar-i-Gatch the entire Field is fed by a distribution line net work.

Chlorination is carried out at the Godar Landor station.

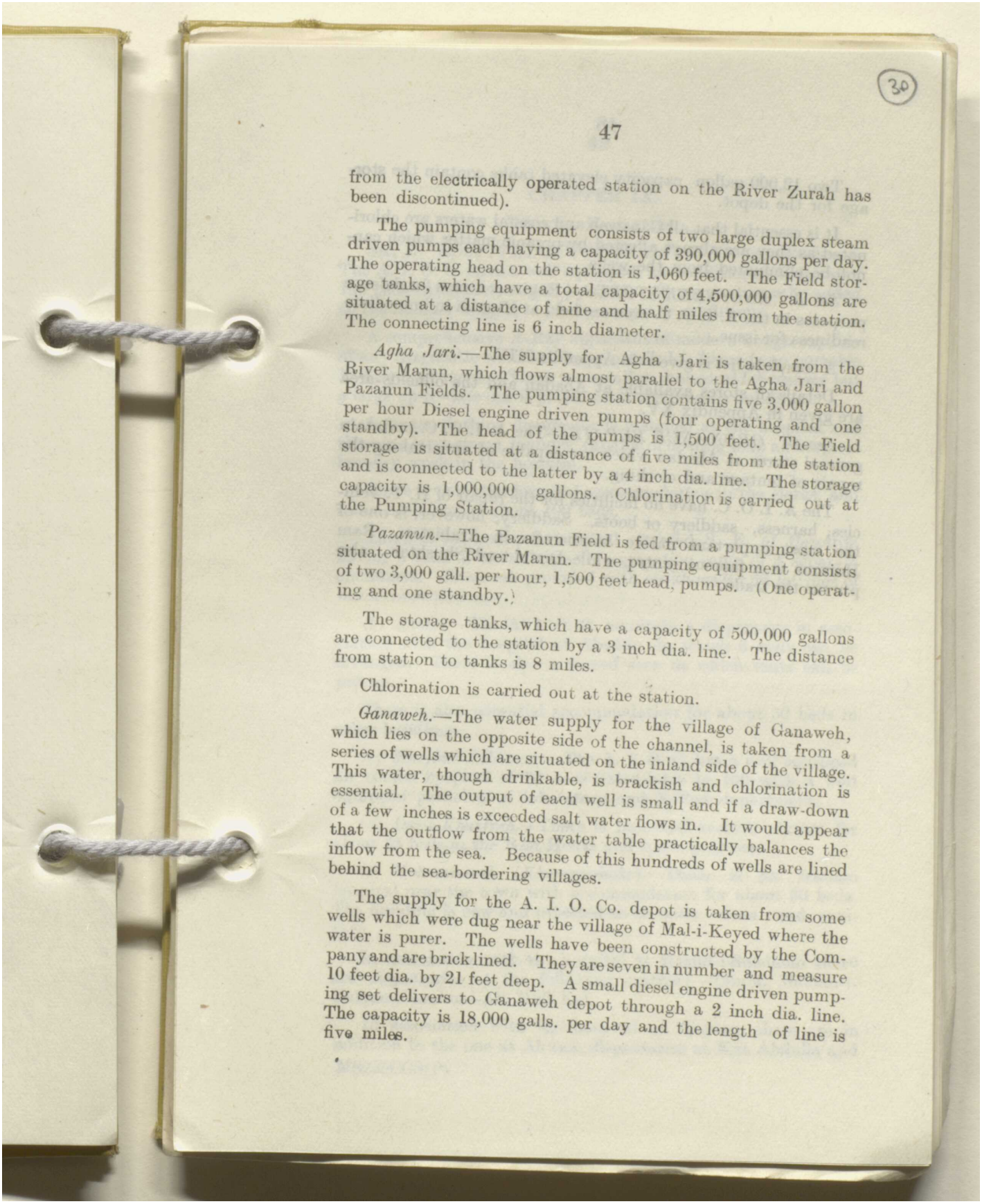
Haft Kel.—The Haft Kel Field is supplied from a station situated on the River Rud-i-Zard. The site is at a point a short distance up stream from where the Rud-i-Ala joins the Rud-i-Zard. (*Note* :—The water of the Rud-i-Ala is very much harder than the water of the Rud-i-Zard.)

The station consists of two steam driven centrifugal pumps capacity 500,000 gall. per day each at 750 feet head. The Boiler and line capacity limit the operation to one pump only.

The Field storage, which is situated at a distance of 12·5 miles from the station consists of a total of 2,870,000 gallons.

Chlorination is carried out at the pumping station.

Gach Saran.—The present Gach Saran Field supply is taken from a series of water wells situated at Du-Gambadun (Pumping



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from the electrically operated station on the River Zurah has been discontinued).

The pumping equipment consists of two large duplex steam driven pumps each having a capacity of 390,000 gallons per day. The operating head on the station is 1,060 feet. The Field storage tanks, which have a total capacity of 4,500,000 gallons are situated at a distance of nine and half miles from the station. The connecting line is 6 inch diameter.

Agha Jari.—The supply for Agha Jari is taken from the River Marun, which flows almost parallel to the Agha Jari and Pazanun Fields. The pumping station contains five 3,000 gallon per hour Diesel engine driven pumps (four operating and one standby). The head of the pumps is 1,500 feet. The Field storage is situated at a distance of five miles from the station and is connected to the latter by a 4 inch dia. line. The storage capacity is 1,000,000 gallons. Chlorination is carried out at the Pumping Station.

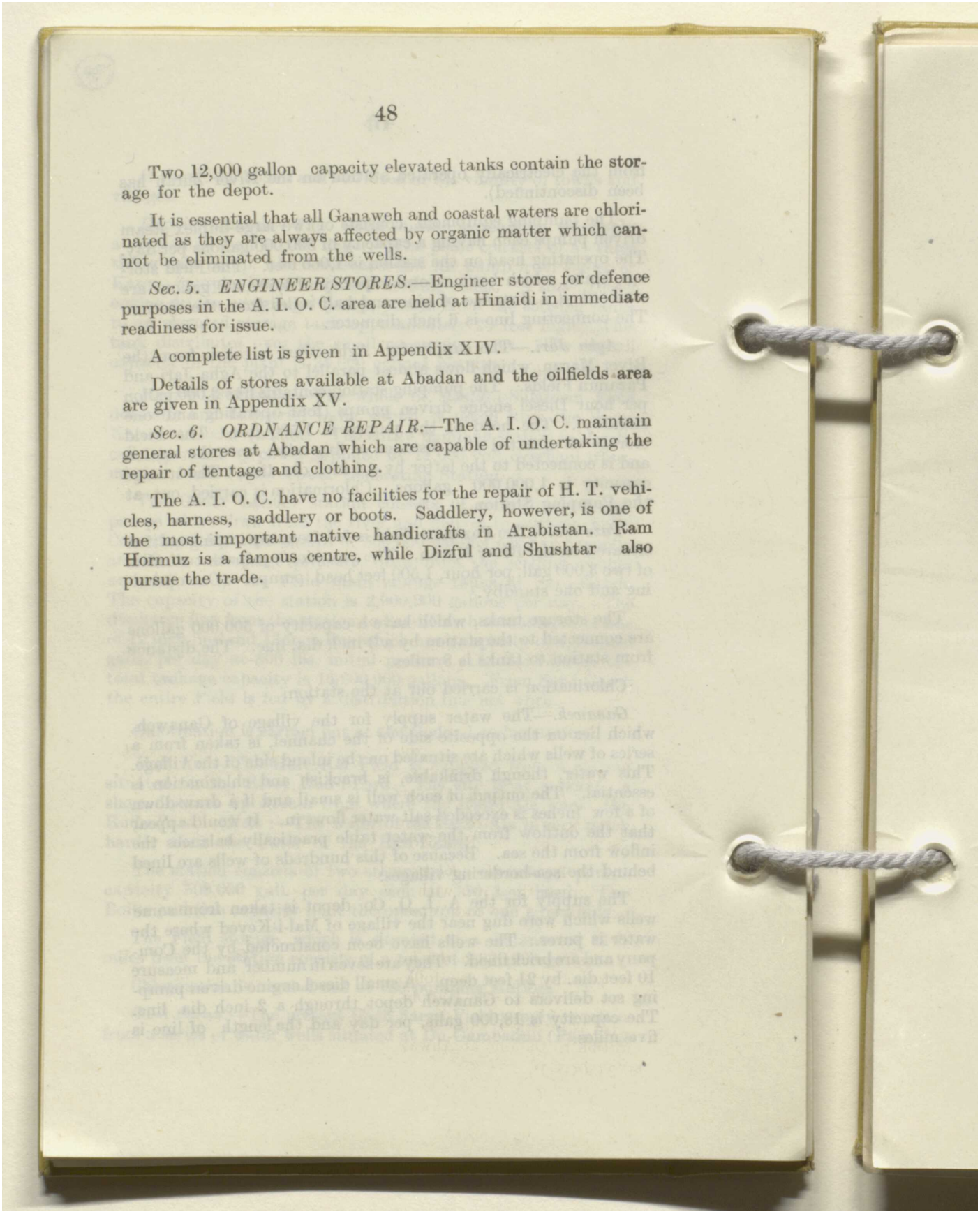
Pazanun.—The Pazanun Field is fed from a pumping station situated on the River Marun. The pumping equipment consists of two 3,000 gall. per hour, 1,500 feet head, pumps. (One operating and one standby.)

The storage tanks, which have a capacity of 500,000 gallons are connected to the station by a 3 inch dia. line. The distance from station to tanks is 8 miles.

Chlorination is carried out at the station.

Ganaweh.—The water supply for the village of Ganaweh, which lies on the opposite side of the channel, is taken from a series of wells which are situated on the inland side of the village. This water, though drinkable, is brackish and chlorination is essential. The output of each well is small and if a draw-down of a few inches is exceeded salt water flows in. It would appear that the outflow from the water table practically balances the inflow from the sea. Because of this hundreds of wells are lined behind the sea-bordering villages.

The supply for the A. I. O. Co. depot is taken from some wells which were dug near the village of Mal-i-Keyed where the water is purer. The wells have been constructed by the Company and are brick lined. They are seven in number and measure 10 feet dia. by 21 feet deep. A small diesel engine driven pumping set delivers to Ganaweh depot through a 2 inch dia. line. The capacity is 18,000 galls. per day and the length of line is five miles.



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Two 12,000 gallon capacity elevated tanks contain the storage for the depot.

It is essential that all Ganaweh and coastal waters are chlorinated as they are always affected by organic matter which cannot be eliminated from the wells.

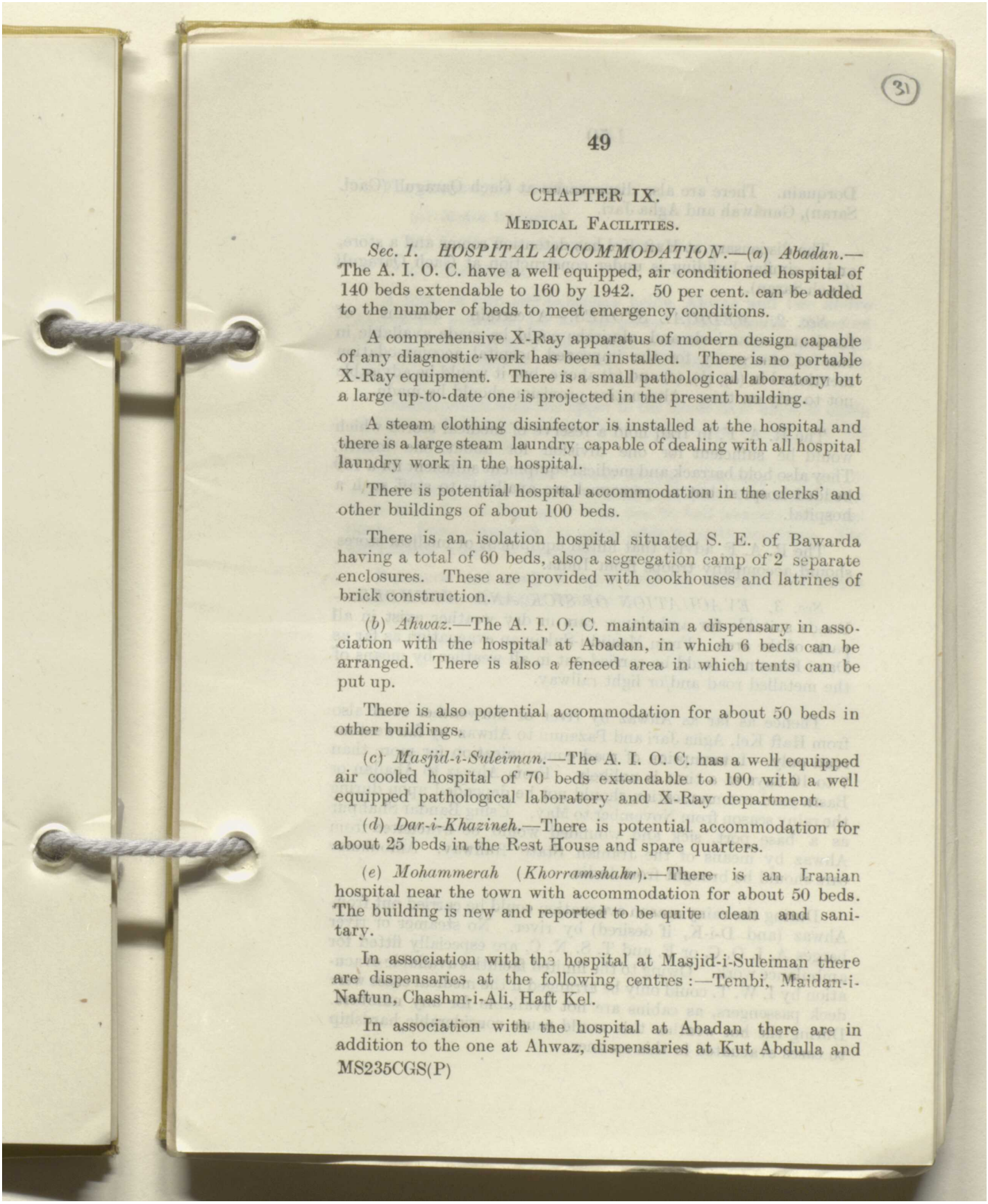
Sec. 5. ENGINEER STORES.—Engineer stores for defence purposes in the A. I. O. C. area are held at Hinaidi in immediate readiness for issue.

A complete list is given in Appendix XIV.

Details of stores available at Abadan and the oilfields area are given in Appendix XV.

Sec. 6. ORDNANCE REPAIR.—The A. I. O. C. maintain general stores at Abadan which are capable of undertaking the repair of tentage and clothing.

The A. I. O. C. have no facilities for the repair of H. T. vehicles, harness, saddlery or boots. Saddlery, however, is one of the most important native handicrafts in Arabistan. Ram Hormuz is a famous centre, while Dizful and Shushtar also pursue the trade.



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CHAPTER IX.

Medical Facilities.

Sec. 1. HOSPITAL ACCOMMODATION.—(*a*) *Abadan.*—The A. I. O. C. have a well equipped, air conditioned hospital of 140 beds extendable to 160 by 1942. 50 per cent. can be added to the number of beds to meet emergency conditions.

A comprehensive X-Ray apparatus of modern design capable of any diagnostic work has been installed. There is no portable X-Ray equipment. There is a small pathological laboratory but a large up-to-date one is projected in the present building.

A steam clothing disinfector is installed at the hospital and there is a large steam laundry capable of dealing with all hospital laundry work in the hospital.

There is potential hospital accommodation in the clerks' and other buildings of about 100 beds.

There is an isolation hospital situated S. E. of Bawarda having a total of 60 beds, also a segregation camp of 2 separate enclosures. These are provided with cookhouses and latrines of brick construction.

(*b*) *Ahwaz.*—The A. I. O. C. maintain a dispensary in association with the hospital at Abadan, in which 6 beds can be arranged. There is also a fenced area in which tents can be put up.

There is also potential accommodation for about 50 beds in other buildings.

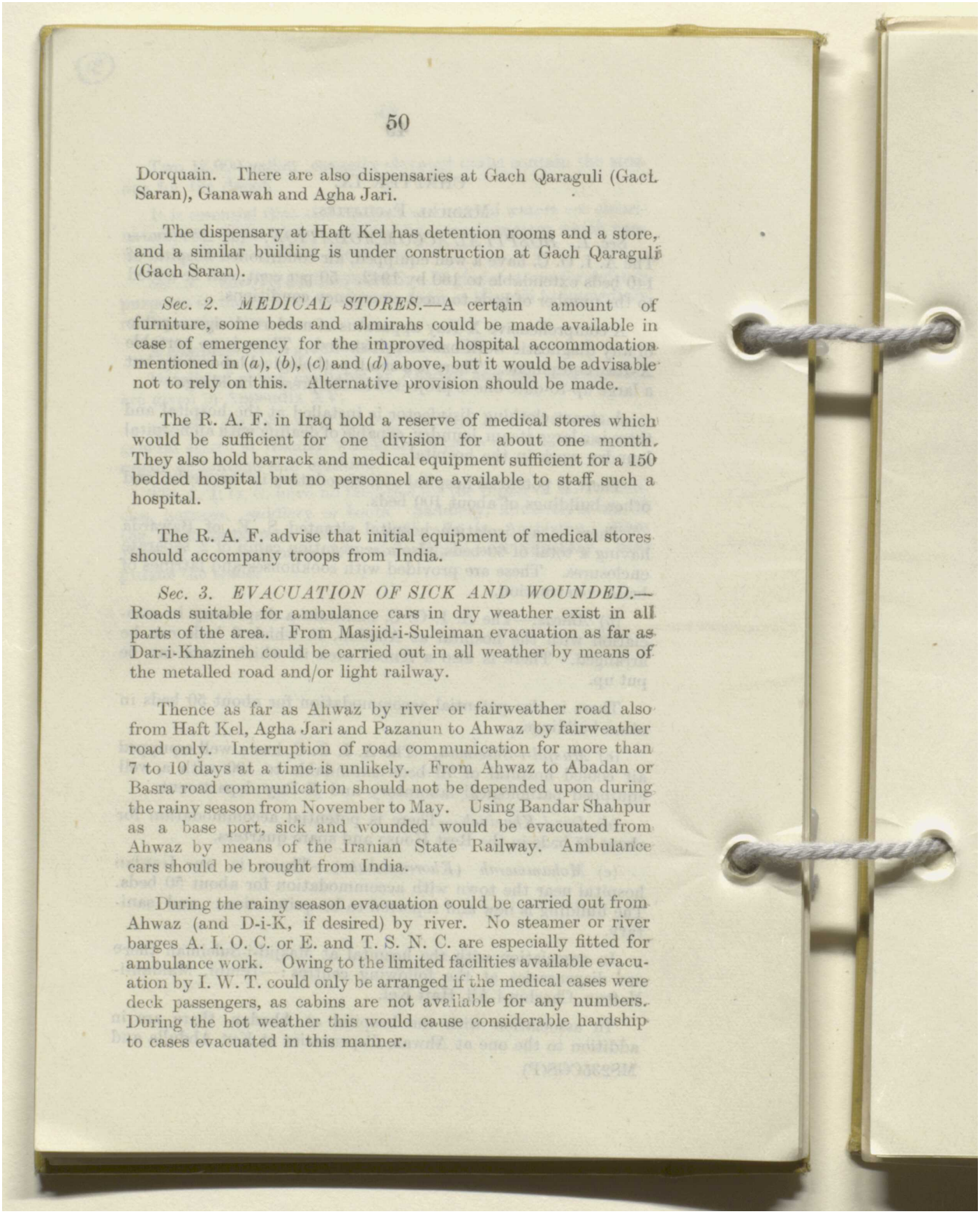
(*c*) *Masjid-i-Suleiman.*—The A. I. O. C. has a well equipped air cooled hospital of 70 beds extendable to 100 with a well equipped pathological laboratory and X-Ray department.

(*d*) *Dar-i-Khazineh.*—There is potential accommodation for about 25 beds in the Rest House and spare quarters.

(*e*) *Mohammerah* (*Khorramshahr*).—There is an Iranian hospital near the town with accommodation for about 50 beds. The building is new and reported to be quite clean and sanitary.

In association with the hospital at Masjid-i-Suleiman there are dispensaries at the following centres:—Tembi, Maidan-i-Naftun, Chashm-i-Ali, Haft Kel.

In association with the hospital at Abadan there are in addition to the one at Ahwaz, dispensaries at Kut Abdulla and



Dorquain. There are also dispensaries at Gach Qaraguli (Gach Saran), Ganawah and Agha Jari.

The dispensary at Haft Kel has detention rooms and a store, and a similar building is under construction at Gach Qaraguli (Gach Saran).

Sec. 2. MEDICAL STORES.—A certain amount of furniture, some beds and almirahs could be made available in case of emergency for the improved hospital accommodation mentioned in (*a*), (*b*), (*c*) and (*d*) above, but it would be advisable not to rely on this. Alternative provision should be made.

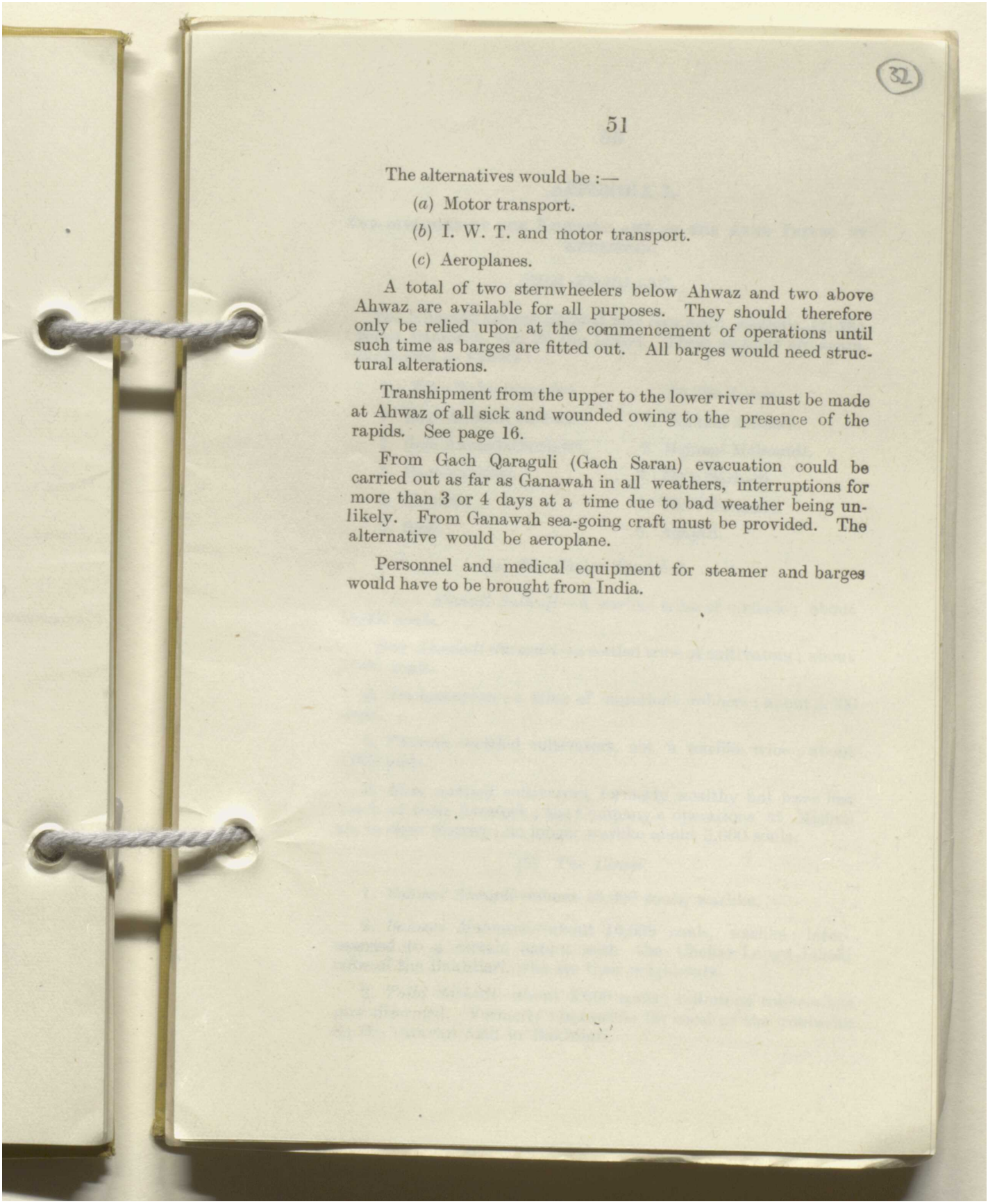
The R. A. F. in Iraq hold a reserve of medical stores which would be sufficient for one division for about one month. They also hold barrack and medical equipment sufficient for a 150 bedded hospital but no personnel are available to staff such a hospital.

The R. A. F. advise that initial equipment of medical stores should accompany troops from India.

Sec. 3. EVACUATION OF SICK AND WOUNDED.—Roads suitable for ambulance cars in dry weather exist in all parts of the area. From Masjid-i-Suleiman evacuation as far as Dar-i-Khazineh could be carried out in all weather by means of the metalled road and/or light railway.

Thence as far as Ahwaz by river or fairweather road also from Haft Kel, Agha Jari and Pazanun to Ahwaz by fairweather road only. Interruption of road communication for more than 7 to 10 days at a time is unlikely. From Ahwaz to Abadan or Basra road communication should not be depended upon during the rainy season from November to May. Using Bandar Shahpur as a base port, sick and wounded would be evacuated from Ahwaz by means of the Iranian State Railway. Ambulance cars should be brought from India.

During the rainy season evacuation could be carried out from Ahwaz (and D-i-K, if desired) by river. No steamer or river barges A. I. O. C. or E. and T. S. N. C. are especially fitted for ambulance work. Owing to the limited facilities available evacuation by I. W. T. could only be arranged if the medical cases were deck passengers, as cabins are not available for any numbers. During the hot weather this would cause considerable hardship to cases evacuated in this manner.



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The alternatives would be :—

(*a*) Motor transport.

(*b*) I. W. T. and motor transport.

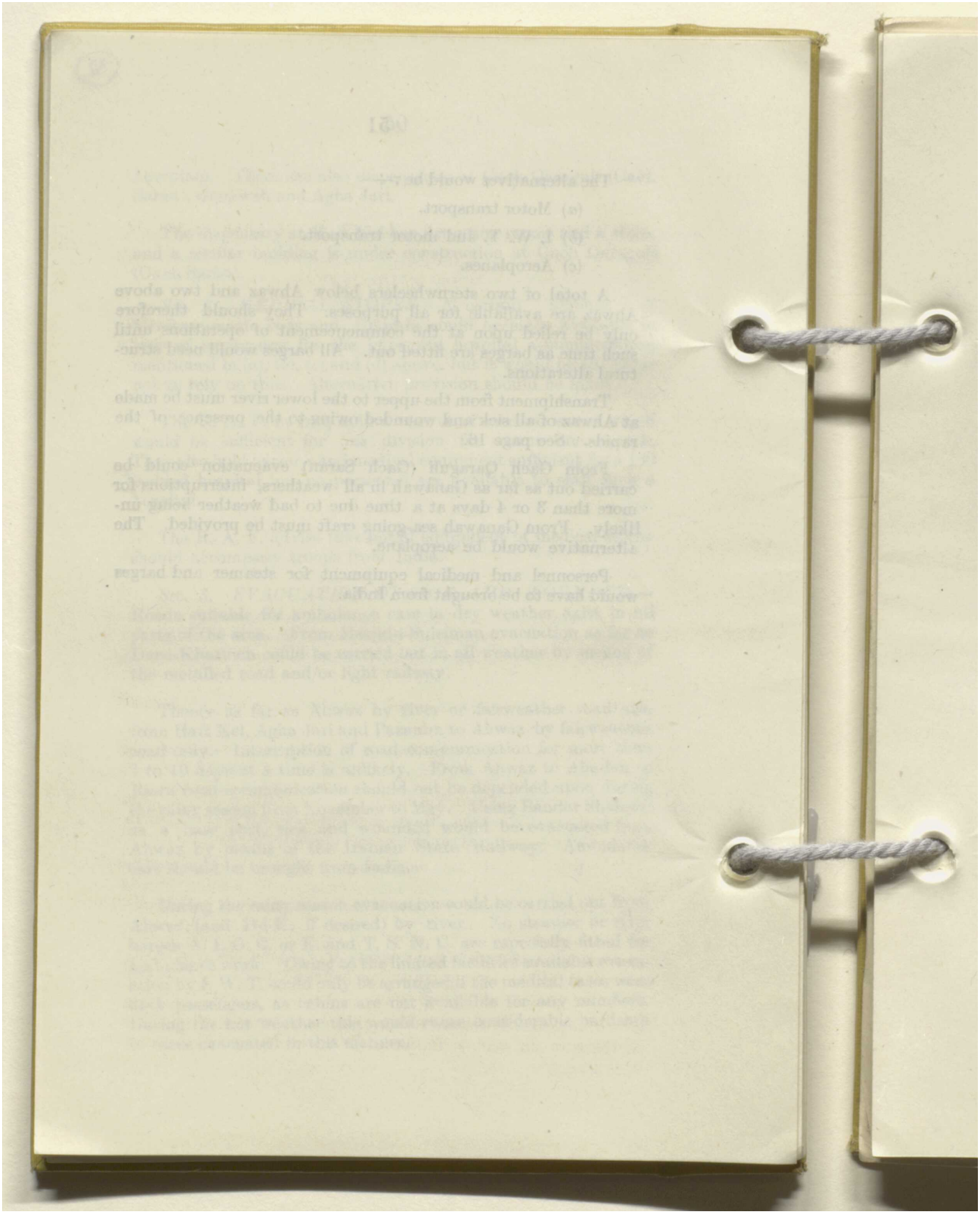
(*c*) Aeroplanes.

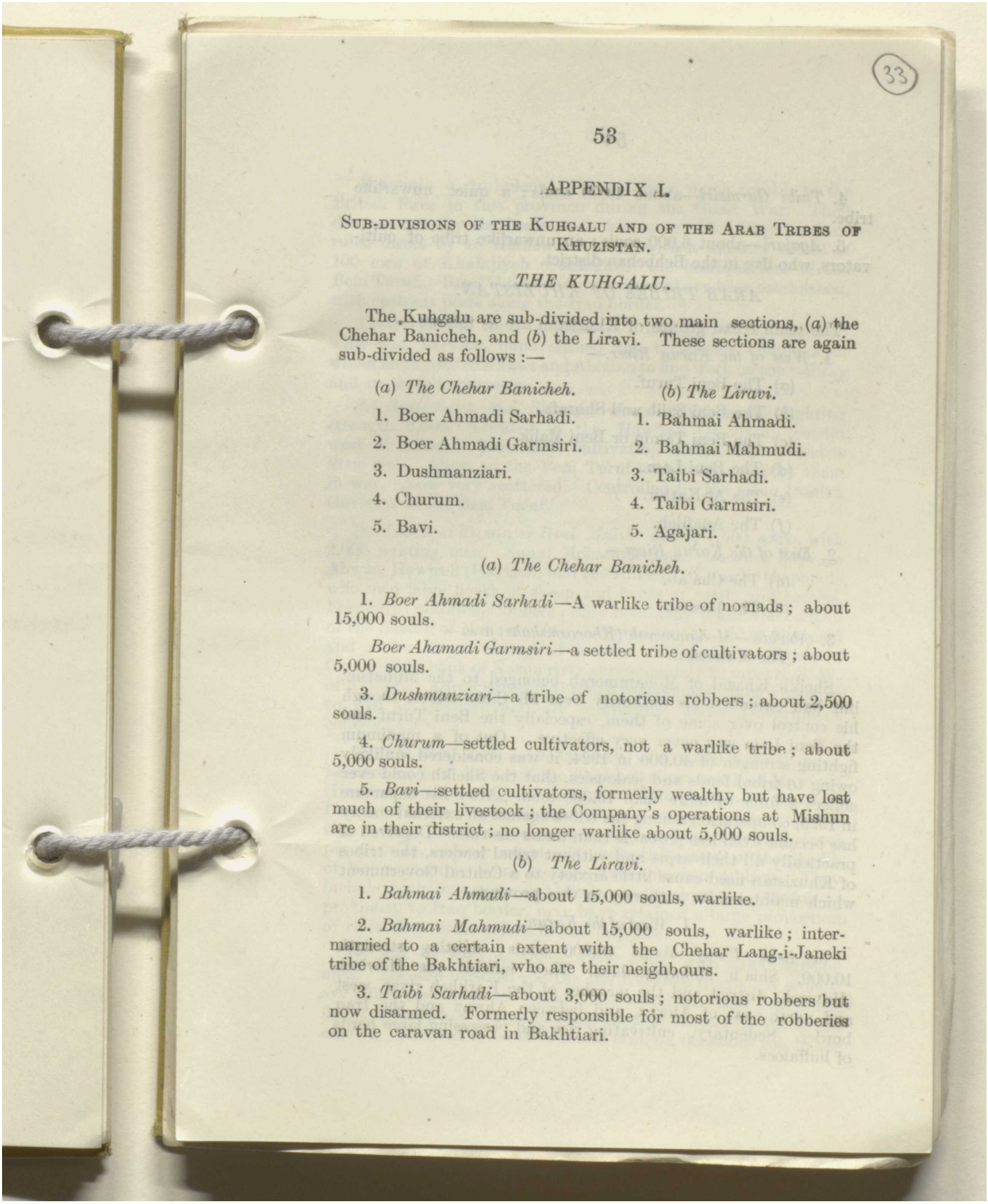
A total of two sternwheelers below Ahwaz and two above Ahwaz are available for all purposes. They should therefore only be relied upon at the commencement of operations until such time as barges are fitted out. All barges would need structural alterations.

Transhipment from the upper to the lower river must be made at Ahwaz of all sick and wounded owing to the presence of the rapids. See page 16.

From Gach Qaraguli (Gach Saran) evacuation could be carried out as far as Ganawah in all weathers, interruptions for more than 3 or 4 days at a time due to bad weather being unlikely. From Ganawah sea-going craft must be provided. The alternative would be aeroplane.

Personnel and medical equipment for steamer and barges would have to be brought from India.





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APPENDIX I.

Sub-divisions of the Kuhgalu and of the Arab Tribes of Khuzistan.

THE KUHGALU.

The Kuhgalu are sub-divided into two main sections, (*a*) the Chehar Banicheh, and (*b*) the Liravi. These sections are again sub-divided as follows :—

(*a*) *The Chehar Banicheh.*	(*b*) *The Liravi.*
1. Boer Ahmadi Sarhadi.	1. Bahmai Ahmadi.
2. Boer Ahmadi Garmsiri.	2. Bahmai Mahmudi.
3. Dushmanziari.	3. Taibi Sarhadi.
4. Churum.	4. Taibi Garmsiri.
5. Bavi.	5. Agajari.

(*a*) *The Chehar Banicheh.*

1. *Boer Ahmadi Sarhadi*—A warlike tribe of nomads ; about 15,000 souls.

Boer Ahamadi Garmsiri—a settled tribe of cultivators ; about 5,000 souls.

3. *Dushmanziari*—a tribe of notorious robbers ; about 2,500 souls.

4. *Churum*—settled cultivators, not a warlike tribe ; about 5,000 souls.

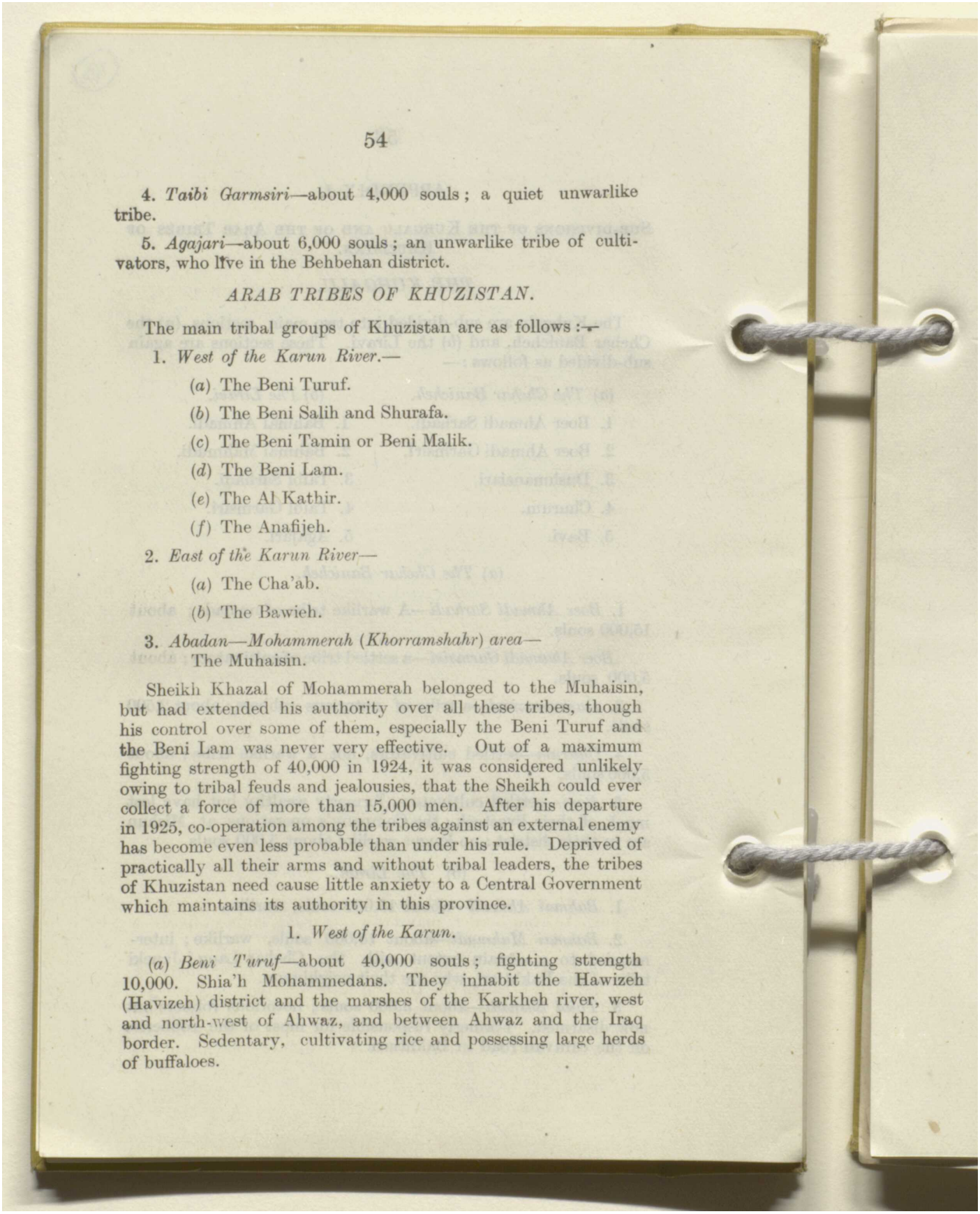
5. *Bavi*—settled cultivators, formerly wealthy but have lost much of their livestock ; the Company's operations at Mishun are in their district ; no longer warlike about 5,000 souls.

(*b*) *The Liravi.*

1. *Bahmai Ahmadi*—about 15,000 souls, warlike.

2. *Bahmai Mahmudi*—about 15,000 souls, warlike ; inter-married to a certain extent with the Chehar Lang-i-Janeki tribe of the Bakhtiari, who are their neighbours.

3. *Taibi Sarhadi*—about 3,000 souls ; notorious robbers but now disarmed. Formerly responsible for most of the robberies on the caravan road in Bakhtiari.



4. *Taibi Garmsiri*—about 4,000 souls; a quiet unwarlike tribe.

5. *Agajari*—about 6,000 souls; an unwarlike tribe of cultivators, who live in the Behbehan district.

ARAB TRIBES OF KHUZISTAN.

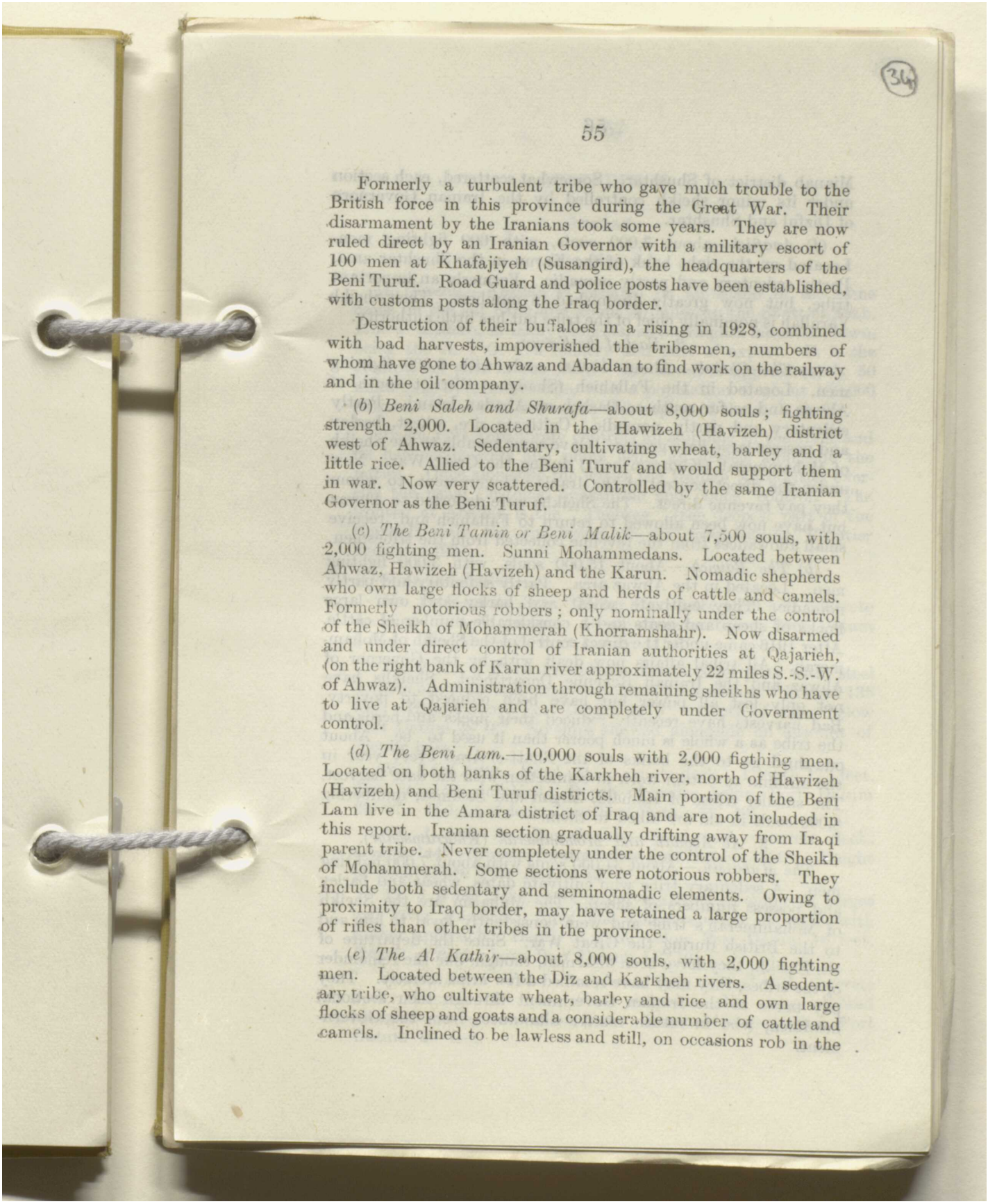
The main tribal groups of Khuzistan are as follows:—

1. *West of the Karun River.*—
   - (*a*) The Beni Turuf.
   - (*b*) The Beni Salih and Shurafa.
   - (*c*) The Beni Tamin or Beni Malik.
   - (*d*) The Beni Lam.
   - (*e*) The Al Kathir.
   - (*f*) The Anafijeh.
2. *East of the Karun River*—
   - (*a*) The Cha'ab.
   - (*b*) The Bawieh.
3. *Abadan—Mohammerah (Khorramshahr) area*—
   The Muhaisin.

Sheikh Khazal of Mohammerah belonged to the Muhaisin, but had extended his authority over all these tribes, though his control over some of them, especially the Beni Turuf and the Beni Lam was never very effective. Out of a maximum fighting strength of 40,000 in 1924, it was considered unlikely owing to tribal feuds and jealousies, that the Sheikh could ever collect a force of more than 15,000 men. After his departure in 1925, co-operation among the tribes against an external enemy has become even less probable than under his rule. Deprived of practically all their arms and without tribal leaders, the tribes of Khuzistan need cause little anxiety to a Central Government which maintains its authority in this province.

1. *West of the Karun.*

(*a*) *Beni Turuf*—about 40,000 souls; fighting strength 10,000. Shia'h Mohammedans. They inhabit the Hawizeh (Havizeh) district and the marshes of the Karkheh river, west and north-west of Ahwaz, and between Ahwaz and the Iraq border. Sedentary, cultivating rice and possessing large herds of buffaloes.



Formerly a turbulent tribe who gave much trouble to the British force in this province during the Great War. Their disarmament by the Iranians took some years. They are now ruled direct by an Iranian Governor with a military escort of 100 men at Khafajiyeh (Susangird), the headquarters of the Beni Turuf. Road Guard and police posts have been established, with customs posts along the Iraq border.

Destruction of their buffaloes in a rising in 1928, combined with bad harvests, impoverished the tribesmen, numbers of whom have gone to Ahwaz and Abadan to find work on the railway and in the oil company.

(*b*) *Beni Saleh and Shurafa*—about 8,000 souls; fighting strength 2,000. Located in the Hawizeh (Havizeh) district west of Ahwaz. Sedentary, cultivating wheat, barley and a little rice. Allied to the Beni Turuf and would support them in war. Now very scattered. Controlled by the same Iranian Governor as the Beni Turuf.

(*c*) *The Beni Tamin or Beni Malik*—about 7,500 souls, with 2,000 fighting men. Sunni Mohammedans. Located between Ahwaz, Hawizeh (Havizeh) and the Karun. Nomadic shepherds who own large flocks of sheep and herds of cattle and camels. Formerly notorious robbers; only nominally under the control of the Sheikh of Mohammerah (Khorramshahr). Now disarmed and under direct control of Iranian authorities at Qajarieh, (on the right bank of Karun river approximately 22 miles S.-S.-W. of Ahwaz). Administration through remaining sheikhs who have to live at Qajarieh and are completely under Government control.

(*d*) *The Beni Lam.*—10,000 souls with 2,000 figthing men. Located on both banks of the Karkheh river, north of Hawizeh (Havizeh) and Beni Turuf districts. Main portion of the Beni Lam live in the Amara district of Iraq and are not included in this report. Iranian section gradually drifting away from Iraqi parent tribe. Never completely under the control of the Sheikh of Mohammerah. Some sections were notorious robbers. They include both sedentary and seminomadic elements. Owing to proximity to Iraq border, may have retained a large proportion of rifles than other tribes in the province.

(*e*) *The Al Kathir*—about 8,000 souls, with 2,000 fighting men. Located between the Diz and Karkheh rivers. A sedentary tribe, who cultivate wheat, barley and rice and own large flocks of sheep and goats and a considerable number of cattle and camels. Inclined to be lawless and still, on occasions rob in the

Mianab district of Shushtar. Somewhat scattered, each section under its minor sheikh controlled by the Iranian Governors of Dizful and Shushtar.

(*f*) *Anafijeh*—about 3,000 souls, with 600 fighting men. Located on the right bank of the Karun in the Shushtar area. Partly sedentary and partly nomadic. Formerly an important tribe, but now greatly diminished in numbers. Their Sheikh Yarullah is nominally chief of the tribe but has little authority.

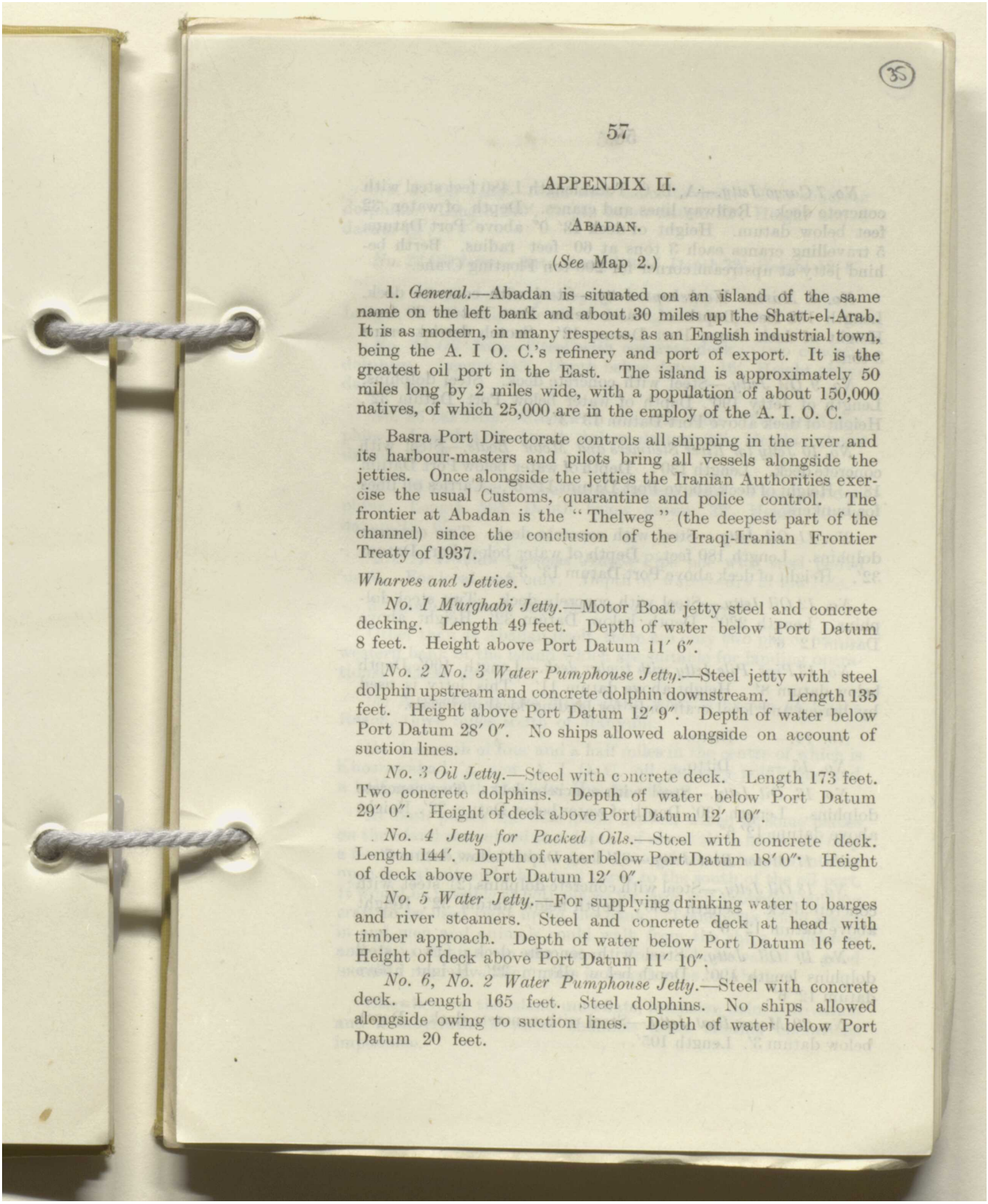
2. *East of the Karun.*

(*a*) *The Cha'ab.*—About 40,000 souls with 8,000 fighting men. Located in the Fallahieh (Shadgan) district south of Ahwaz and as far south as Qasbeh on Abadan Island. Partly sedentary and partly nomadic. Cultivate rice, wheat, barley and possess large date groves. Gave some trouble to the Sheikh of Mohammerah (Khorramshahr) during the Great War. Now under the direct control of the Iranian Government, to whom they pay revenue direct. The Sheikhs were deported to Ahwaz but have now been allowed to return to Fallahieh and receive small allowances from the revenue collected from the tribesmen.

(*b*) *The Bawieh.*—About 15,000 souls, with 3,000 fighting men. Located in the Ahwaz area. Partly sedentary and partly nomadic. They cultivate wheat and barley and own large flocks of sheep and goats and a considerable number of cattle. After 1916 came under the direct control of the Sheikh of Mohammerah. All tribal affairs now dealt with by the Governor of Ahwaz and the Iranian Revenue Department. Sheikhs have not only lost all power but have been reduced to poverty. Bad harvests have recently reduced their flocks and herds and the tribe as a whole is much poorer than it used to be. About one-third go to the banks of the Shatt-el-Arab every year in the autumn to obtain work in connection with the date harvest. The smaller tribes of Hamaid, Zirgan and Salamat, numbering 8,000 souls in all, are allied to them.

3. *At Abadan and Mohammerah (Khorramshahr).*

The Muhaisin.—About 34,000 souls with about 7,000 fighting men. A sedentary tribe who cultivate dates, wheat and barley and possess numbers of sheep. The Muhaisin are the Sheikh of Mohammerah's tribe and were consistently loyal to him and to the British during the Great War. Since the departure of the Sheikh, they have been disarmed, though, like the remainder of the tribes, they may have retained a few arms secretly. They pay taxes to the Iranian Government through their sectional headmen, who in return receive allowances from the Government.



APPENDIX II.

ABADAN.

(*See* Map 2.)

1. *General.*—Abadan is situated on an island of the same name on the left bank and about 30 miles up the Shatt-el-Arab. It is as modern, in many respects, as an English industrial town, being the A. I O. C.'s refinery and port of export. It is the greatest oil port in the East. The island is approximately 50 miles long by 2 miles wide, with a population of about 150,000 natives, of which 25,000 are in the employ of the A. I. O. C.

Basra Port Directorate controls all shipping in the river and its harbour-masters and pilots bring all vessels alongside the jetties. Once alongside the jetties the Iranian Authorities exercise the usual Customs, quarantine and police control. The frontier at Abadan is the "Thelweg" (the deepest part of the channel) since the conclusion of the Iraqi-Iranian Frontier Treaty of 1937.

Wharves and Jetties.

No. 1 Murghabi Jetty.—Motor Boat jetty steel and concrete decking. Length 49 feet. Depth of water below Port Datum 8 feet. Height above Port Datum 11′ 6″.

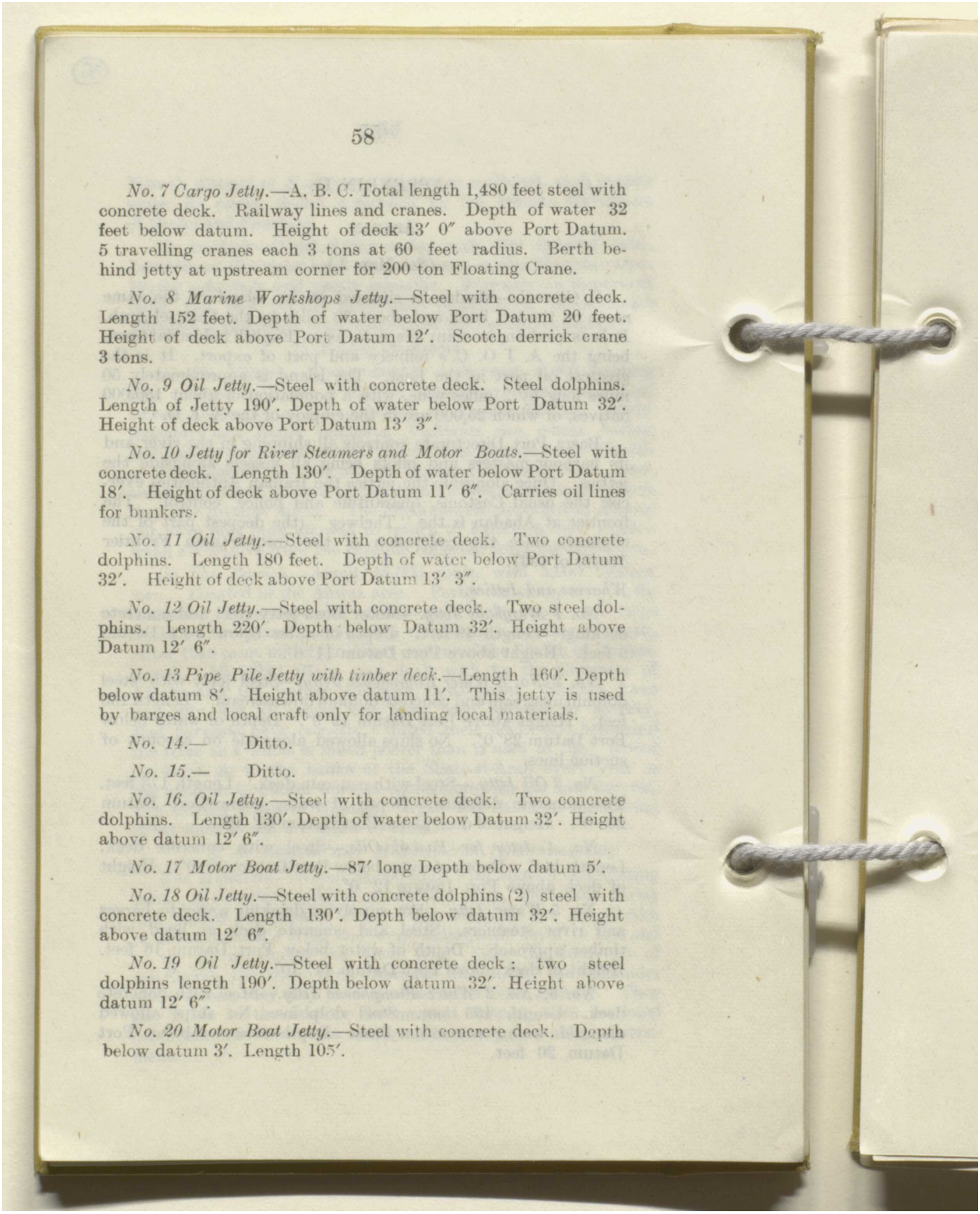
No. 2 No. 3 Water Pumphouse Jetty.—Steel jetty with steel dolphin upstream and concrete dolphin downstream. Length 135 feet. Height above Port Datum 12′ 9″. Depth of water below Port Datum 28′ 0″. No ships allowed alongside on account of suction lines.

No. 3 Oil Jetty.—Steel with concrete deck. Length 173 feet. Two concrete dolphins. Depth of water below Port Datum 29′ 0″. Height of deck above Port Datum 12′ 10″.

No. 4 Jetty for Packed Oils.—Steel with concrete deck. Length 144′. Depth of water below Port Datum 18′ 0″. Height of deck above Port Datum 12′ 0″.

No. 5 Water Jetty.—For supplying drinking water to barges and river steamers. Steel and concrete deck at head with timber approach. Depth of water below Port Datum 16 feet. Height of deck above Port Datum 11′ 10″.

No. 6, No. 2 Water Pumphouse Jetty.—Steel with concrete deck. Length 165 feet. Steel dolphins. No ships allowed alongside owing to suction lines. Depth of water below Port Datum 20 feet.



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No. 7 Cargo Jetty.—A. B. C. Total length 1,480 feet steel with concrete deck. Railway lines and cranes. Depth of water 32 feet below datum. Height of deck 13′ 0″ above Port Datum. 5 travelling cranes each 3 tons at 60 feet radius. Berth behind jetty at upstream corner for 200 ton Floating Crane.

No. 8 Marine Workshops Jetty.—Steel with concrete deck. Length 152 feet. Depth of water below Port Datum 20 feet. Height of deck above Port Datum 12′. Scotch derrick crane 3 tons.

No. 9 Oil Jetty.—Steel with concrete deck. Steel dolphins. Length of Jetty 190′. Depth of water below Port Datum 32′. Height of deck above Port Datum 13′ 3″.

No. 10 Jetty for River Steamers and Motor Boats.—Steel with concrete deck. Length 130′. Depth of water below Port Datum 18′. Height of deck above Port Datum 11′ 6″. Carries oil lines for bunkers.

No. 11 Oil Jetty.—Steel with concrete deck. Two concrete dolphins. Length 180 feet. Depth of water below Port Datum 32′. Height of deck above Port Datum 13′ 3″.

No. 12 Oil Jetty.—Steel with concrete deck. Two steel dolphins. Length 220′. Depth below Datum 32′. Height above Datum 12′ 6″.

No. 13 Pipe Pile Jetty with timber deck.—Length 160′. Depth below datum 8′. Height above datum 11′. This jetty is used by barges and local craft only for landing local materials.

No. 14.— Ditto.

No. 15.— Ditto.

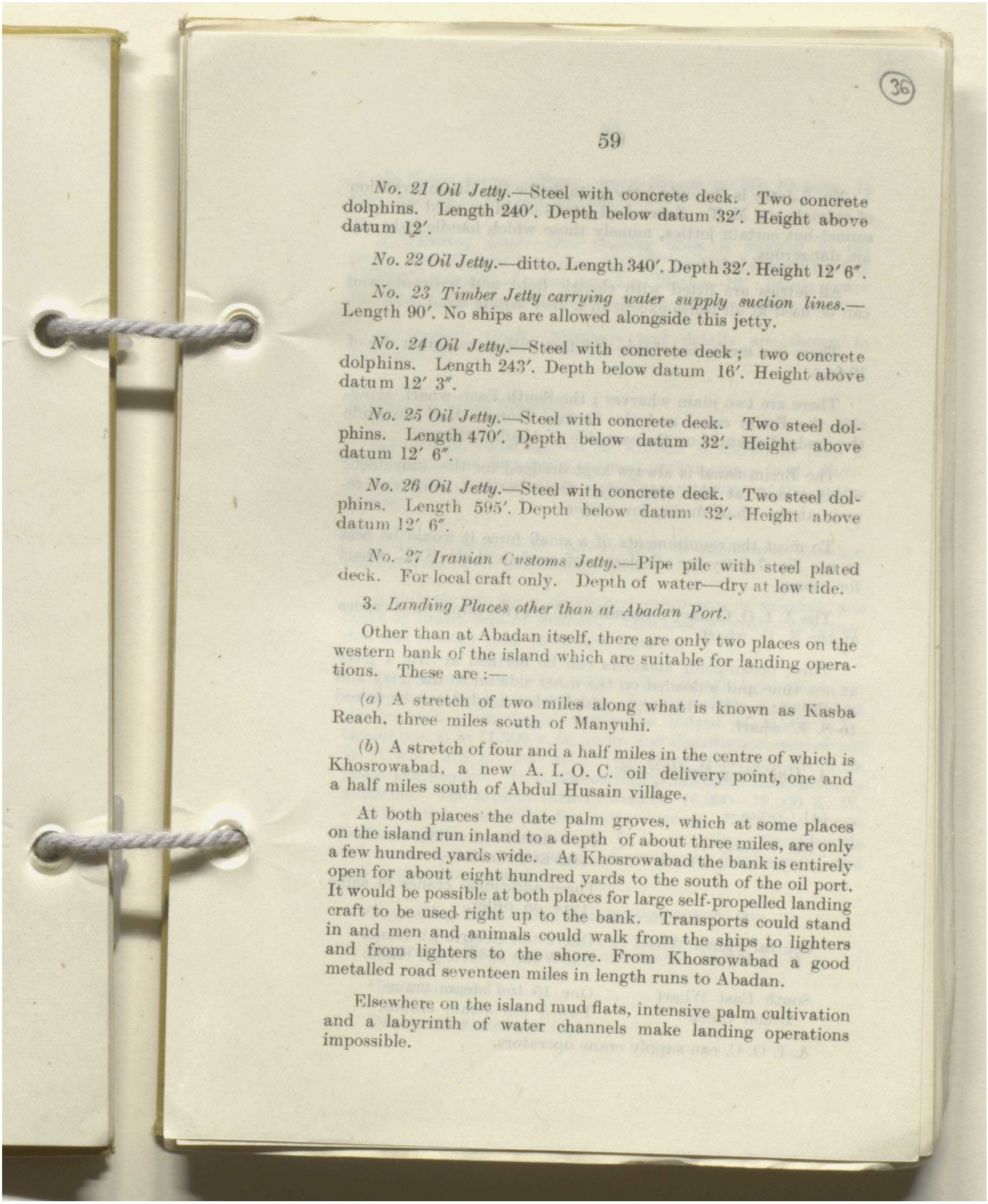
No. 16. Oil Jetty.—Steel with concrete deck. Two concrete dolphins. Length 130′. Depth of water below Datum 32′. Height above datum 12′ 6″.

No. 17 Motor Boat Jetty.—87′ long Depth below datum 5′.

No. 18 Oil Jetty.—Steel with concrete dolphins (2) steel with concrete deck. Length 130′. Depth below datum 32′. Height above datum 12′ 6″.

No. 19 Oil Jetty.—Steel with concrete deck: two steel dolphins length 190′. Depth below datum 32′. Height above datum 12′ 6″.

No. 20 Motor Boat Jetty.—Steel with concrete deck. Depth below datum 3′. Length 105′.



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No. 21 Oil Jetty.—Steel with concrete deck. Two concrete dolphins. Length 240′. Depth below datum 32′. Height above datum 12′.

No. 22 Oil Jetty.—ditto. Length 340′. Depth 32′. Height 12′ 6″.

No. 23 Timber Jetty carrying water supply suction lines.—Length 90′. No ships are allowed alongside this jetty.

No. 24 Oil Jetty.—Steel with concrete deck; two concrete dolphins. Length 243′. Depth below datum 16′. Height above datum 12′ 3″.

No. 25 Oil Jetty.—Steel with concrete deck. Two steel dolphins. Length 470′. Depth below datum 32′. Height above datum 12′ 6″.

No. 26 Oil Jetty.—Steel with concrete deck. Two steel dolphins. Length 595′. Depth below datum 32′. Height above datum 12′ 6″.

No. 27 Iranian Customs Jetty.—Pipe pile with steel plated deck. For local craft only. Depth of water—dry at low tide.

3. *Landing Places other than at Abadan Port.*

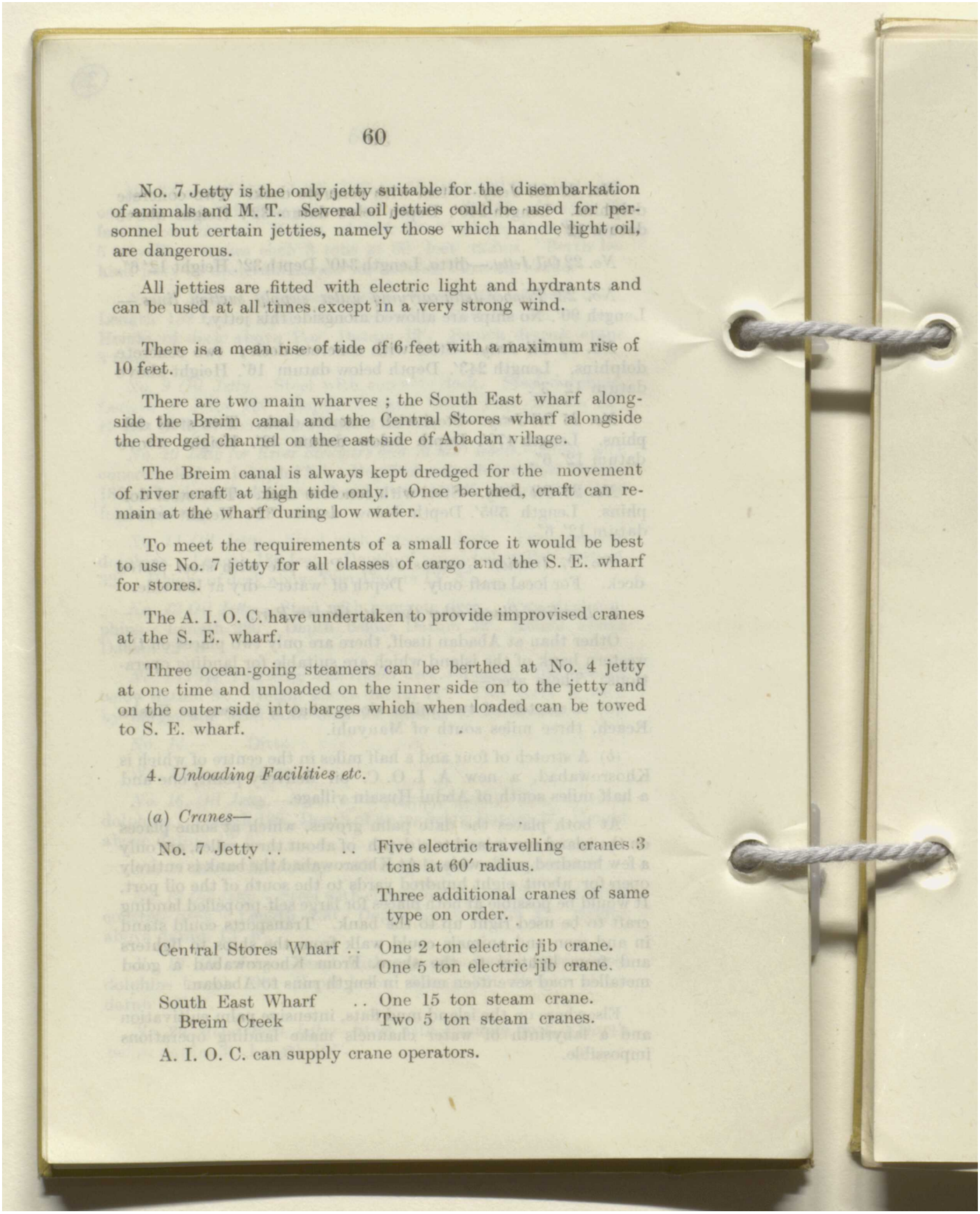
Other than at Abadan itself, there are only two places on the western bank of the island which are suitable for landing operations. These are :—

(*a*) A stretch of two miles along what is known as Kasba Reach, three miles south of Manyuhi.

(*b*) A stretch of four and a half miles in the centre of which is Khosrowabad, a new A. I. O. C. oil delivery point, one and a half miles south of Abdul Husain village.

At both places the date palm groves, which at some places on the island run inland to a depth of about three miles, are only a few hundred yards wide. At Khosrowabad the bank is entirely open for about eight hundred yards to the south of the oil port. It would be possible at both places for large self-propelled landing craft to be used right up to the bank. Transports could stand in and men and animals could walk from the ships to lighters and from lighters to the shore. From Khosrowabad a good metalled road seventeen miles in length runs to Abadan.

Elsewhere on the island mud flats, intensive palm cultivation and a labyrinth of water channels make landing operations impossible.



No. 7 Jetty is the only jetty suitable for the disembarkation of animals and M. T. Several oil jetties could be used for personnel but certain jetties, namely those which handle light oil, are dangerous.

All jetties are fitted with electric light and hydrants and can be used at all times except in a very strong wind.

There is a mean rise of tide of 6 feet with a maximum rise of 10 feet.

There are two main wharves ; the South East wharf alongside the Breim canal and the Central Stores wharf alongside the dredged channel on the east side of Abadan village.

The Breim canal is always kept dredged for the movement of river craft at high tide only. Once berthed, craft can remain at the wharf during low water.

To meet the requirements of a small force it would be best to use No. 7 jetty for all classes of cargo and the S. E. wharf for stores.

The A. I. O. C. have undertaken to provide improvised cranes at the S. E. wharf.

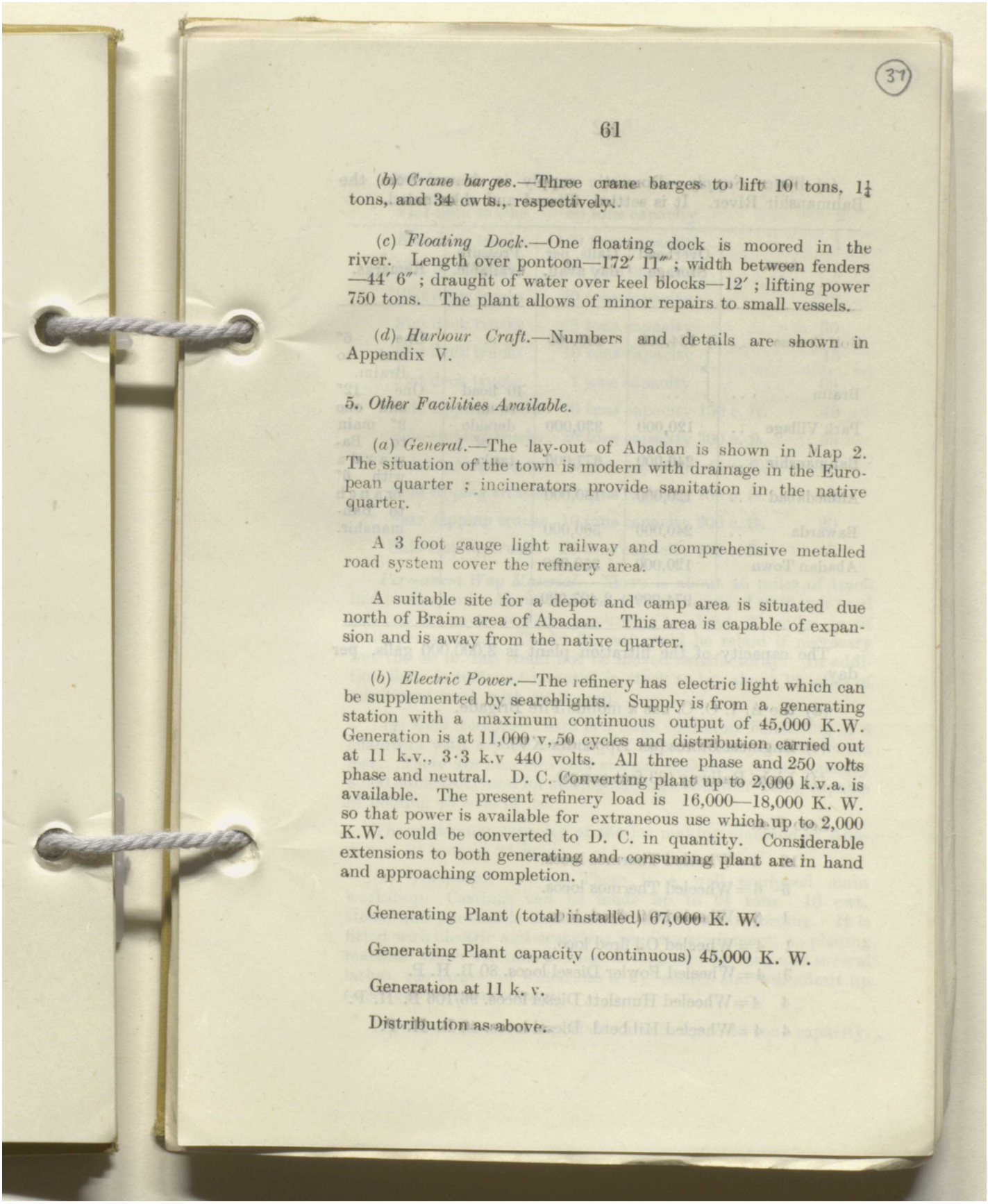
Three ocean-going steamers can be berthed at No. 4 jetty at one time and unloaded on the inner side on to the jetty and on the outer side into barges which when loaded can be towed to S. E. wharf.

4. *Unloading Facilities etc.*

(*a*) *Cranes*—

No. 7 Jetty	..	Five electric travelling cranes 3 tons at 60′ radius.
		Three additional cranes of same type on order.
Central Stores Wharf	..	One 2 ton electric jib crane.
		One 5 ton electric jib crane.
South East Wharf Breim Creek	..	One 15 ton steam crane.
		Two 5 ton steam cranes.

A. I. O. C. can supply crane operators.



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(*b*) *Crane barges.*—Three crane barges to lift 10 tons, 1¼ tons, and 34 cwts., respectively.

(*c*) *Floating Dock.*—One floating dock is moored in the river. Length over pontoon—172′ 11″; width between fenders —44′ 6″; draught of water over keel blocks—12′; lifting power 750 tons. The plant allows of minor repairs to small vessels.

(*d*) *Harbour Craft.*—Numbers and details are shown in Appendix V.

5. *Other Facilities Available.*

(*a*) *General.*—The lay-out of Abadan is shown in Map 2. The situation of the town is modern with drainage in the European quarter; incinerators provide sanitation in the native quarter.

A 3 foot gauge light railway and comprehensive metalled road system cover the refinery area.

A suitable site for a depot and camp area is situated due north of Braim area of Abadan. This area is capable of expansion and is away from the native quarter.

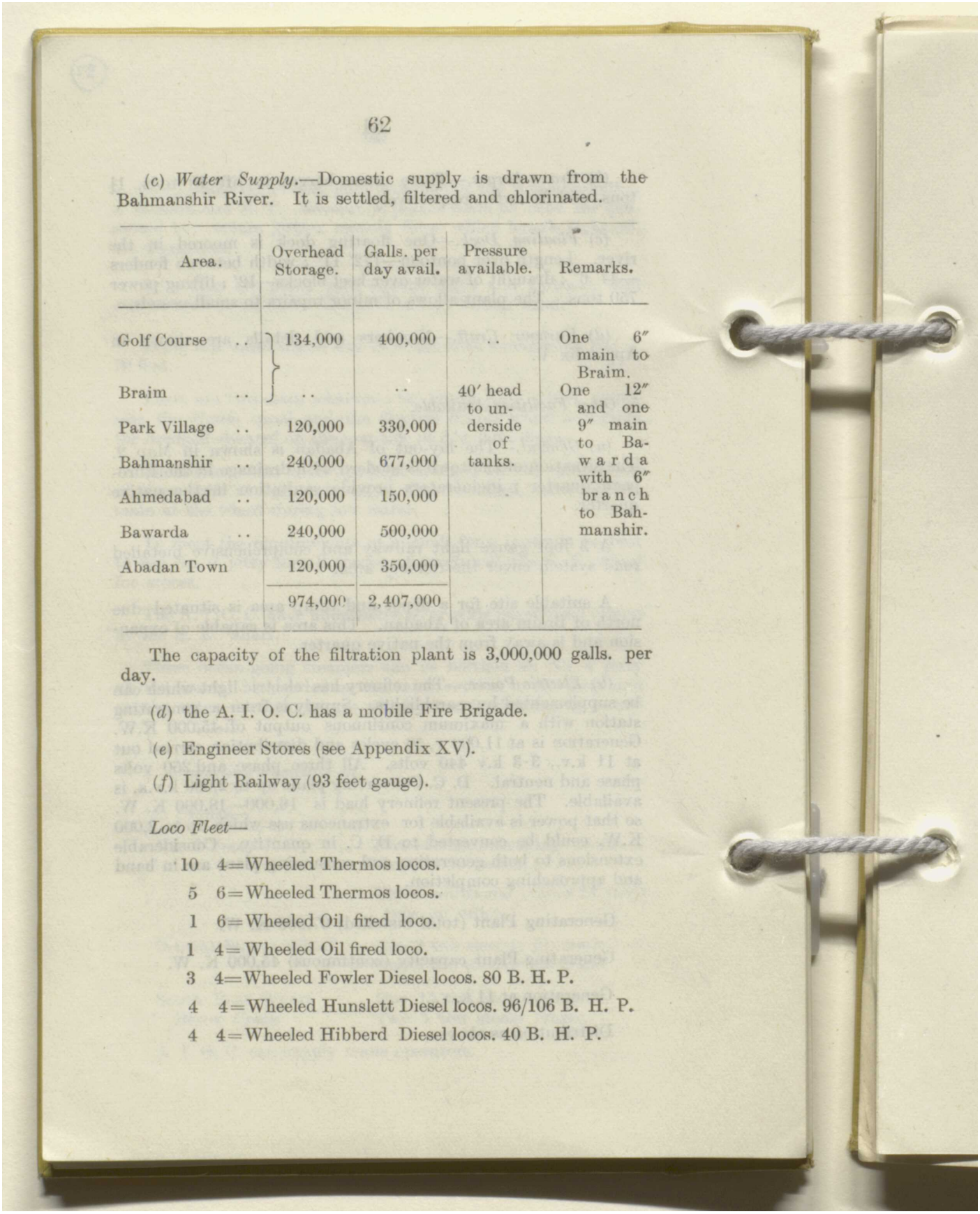
(*b*) *Electric Power.*—The refinery has electric light which can be supplemented by searchlights. Supply is from a generating station with a maximum continuous output of 45,000 K.W. Generation is at 11,000 v. 50 cycles and distribution carried out at 11 k.v., 3·3 k.v 440 volts. All three phase and 250 volts phase and neutral. D. C. Converting plant up to 2,000 k.v.a. is available. The present refinery load is 16,000—18,000 K. W. so that power is available for extraneous use which up to 2,000 K.W. could be converted to D. C. in quantity. Considerable extensions to both generating and consuming plant are in hand and approaching completion.

Generating Plant (total installed) 67,000 K. W.

Generating Plant capacity (continuous) 45,000 K. W.

Generation at 11 k. v.

Distribution as above.



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(c) *Water Supply.*—Domestic supply is drawn from the Bahmanshir River. It is settled, filtered and chlorinated.

Area.	Overhead Storage.	Galls. per day avail.	Pressure available.	Remarks.
Golf Course ..	134,000	400,000	..	One 6″ main to Braim.
Braim ..	..	..	40′ head to underside of tanks.	One 12″ and one 9″ main to Bawarda with 6″ branch to Bahmanshir.
Park Village ..	120,000	330,000		
Bahmanshir ..	240,000	677,000		
Ahmedabad ..	120,000	150,000		
Bawarda ..	240,000	500,000		
Abadan Town	120,000	350,000		
	974,000	2,407,000		

The capacity of the filtration plant is 3,000,000 galls. per day.

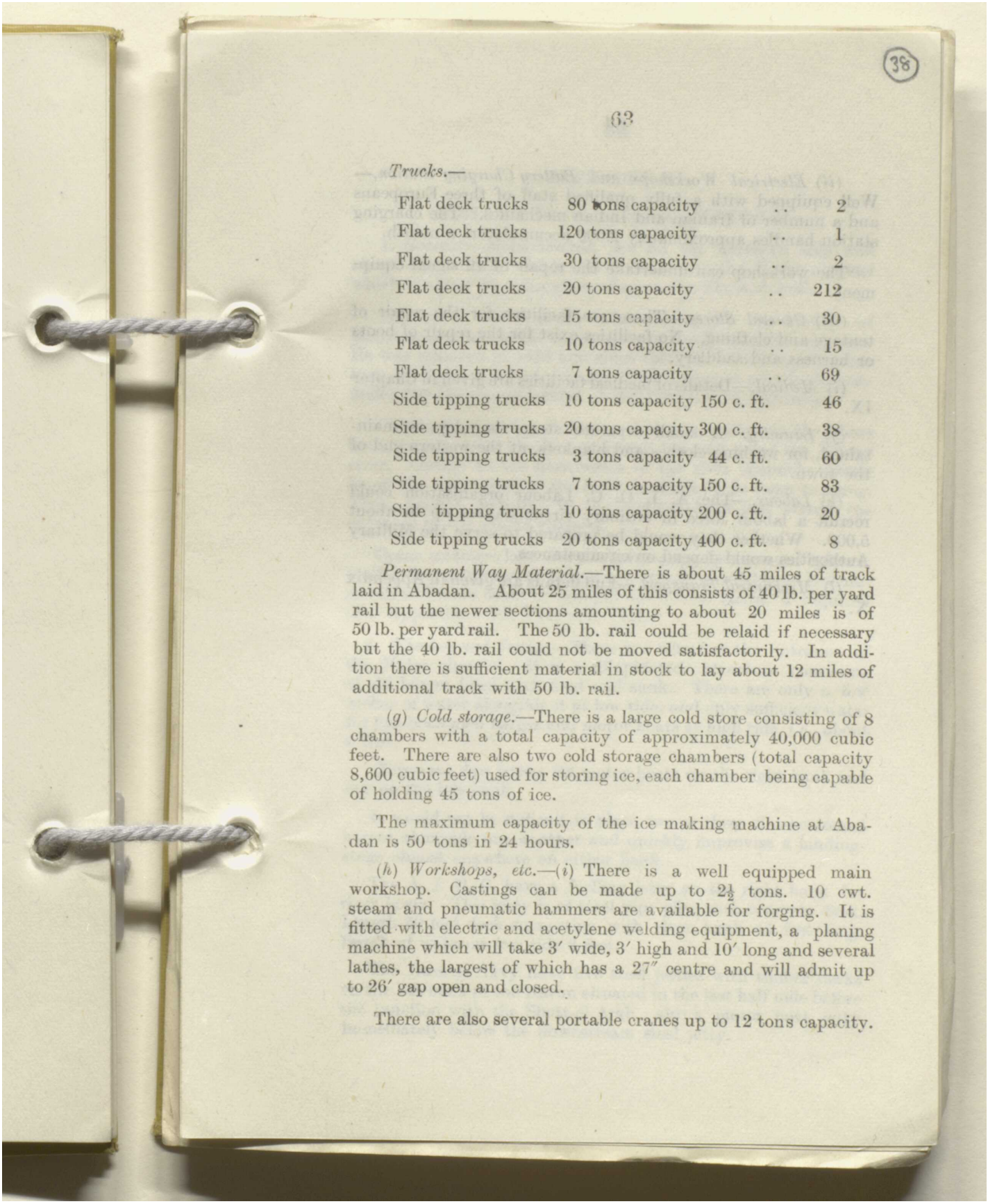
(d) the A. I. O. C. has a mobile Fire Brigade.

(e) Engineer Stores (see Appendix XV).

(f) Light Railway (93 feet gauge).

Loco Fleet—

10 4=Wheeled Thermos locos.
5 6=Wheeled Thermos locos.
1 6=Wheeled Oil fired loco.
1 4=Wheeled Oil fired loco.
3 4=Wheeled Fowler Diesel locos. 80 B. H. P.
4 4=Wheeled Hunslett Diesel locos. 96/106 B. H. P.
4 4=Wheeled Hibberd Diesel locos. 40 B. H. P.



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Trucks.—

Flat deck trucks	80 tons capacity ..	2
Flat deck trucks	120 tons capacity ..	1
Flat deck trucks	30 tons capacity ..	2
Flat deck trucks	20 tons capacity ..	212
Flat deck trucks	15 tons capacity ..	30
Flat deck trucks	10 tons capacity ..	15
Flat deck trucks	7 tons capacity ..	69
Side tipping trucks	10 tons capacity 150 c. ft.	46
Side tipping trucks	20 tons capacity 300 c. ft.	38
Side tipping trucks	3 tons capacity 44 c. ft.	60
Side tipping trucks	7 tons capacity 150 c. ft.	83
Side tipping trucks	10 tons capacity 200 c. ft.	20
Side tipping trucks	20 tons capacity 400 c. ft.	8

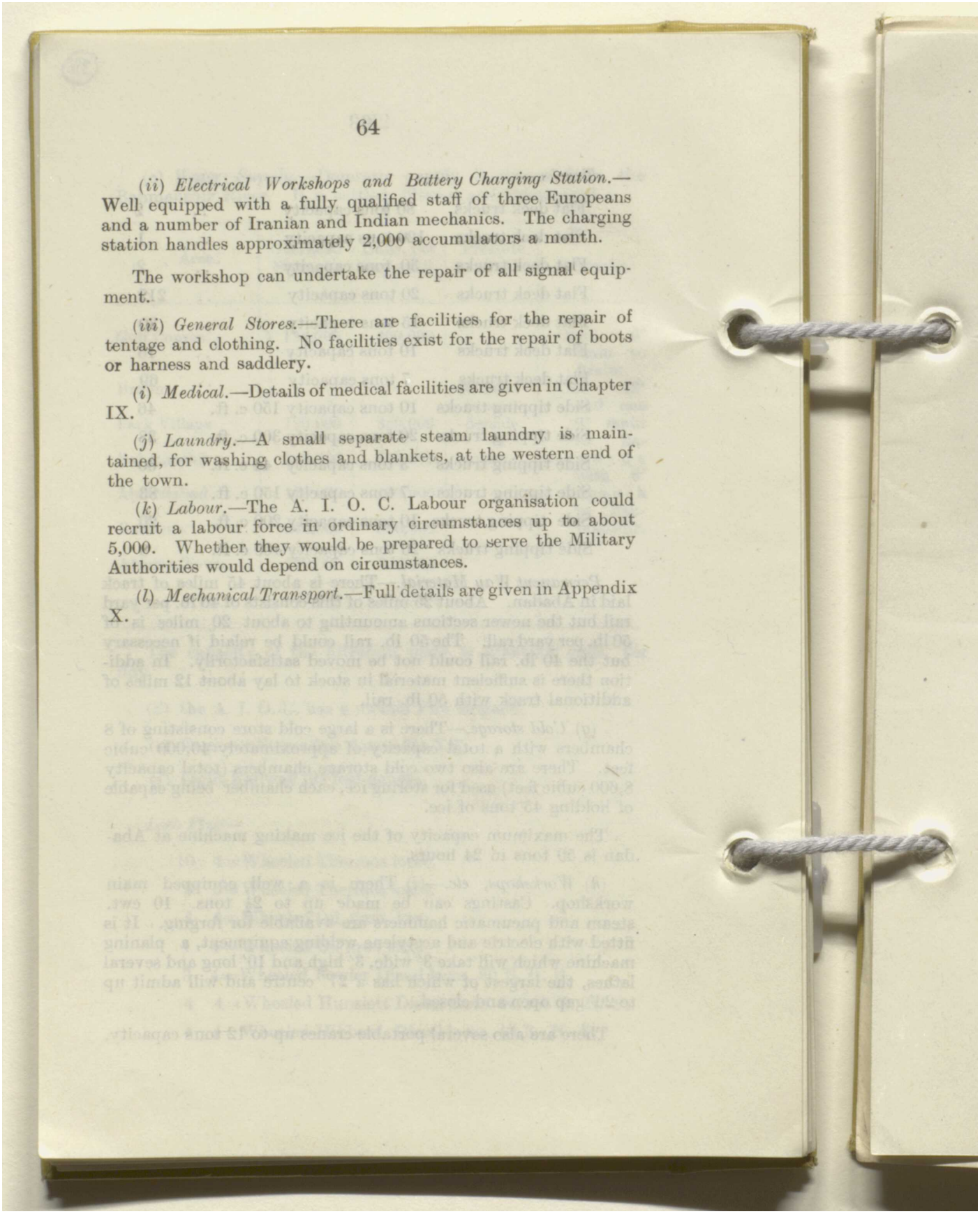
Permanent Way Material.—There is about 45 miles of track laid in Abadan. About 25 miles of this consists of 40 lb. per yard rail but the newer sections amounting to about 20 miles is of 50 lb. per yard rail. The 50 lb. rail could be relaid if necessary but the 40 lb. rail could not be moved satisfactorily. In addition there is sufficient material in stock to lay about 12 miles of additional track with 50 lb. rail.

(*g*) *Cold storage.*—There is a large cold store consisting of 8 chambers with a total capacity of approximately 40,000 cubic feet. There are also two cold storage chambers (total capacity 8,600 cubic feet) used for storing ice, each chamber being capable of holding 45 tons of ice.

The maximum capacity of the ice making machine at Abadan is 50 tons in 24 hours.

(*h*) *Workshops, etc.*—(*i*) There is a well equipped main workshop. Castings can be made up to 2½ tons. 10 cwt. steam and pneumatic hammers are available for forging. It is fitted with electric and acetylene welding equipment, a planing machine which will take 3′ wide, 3′ high and 10′ long and several lathes, the largest of which has a 27″ centre and will admit up to 26′ gap open and closed.

There are also several portable cranes up to 12 tons capacity.



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(*ii*) *Electrical Workshops and Battery Charging Station.*—Well equipped with a fully qualified staff of three Europeans and a number of Iranian and Indian mechanics. The charging station handles approximately 2,000 accumulators a month.

The workshop can undertake the repair of all signal equipment.

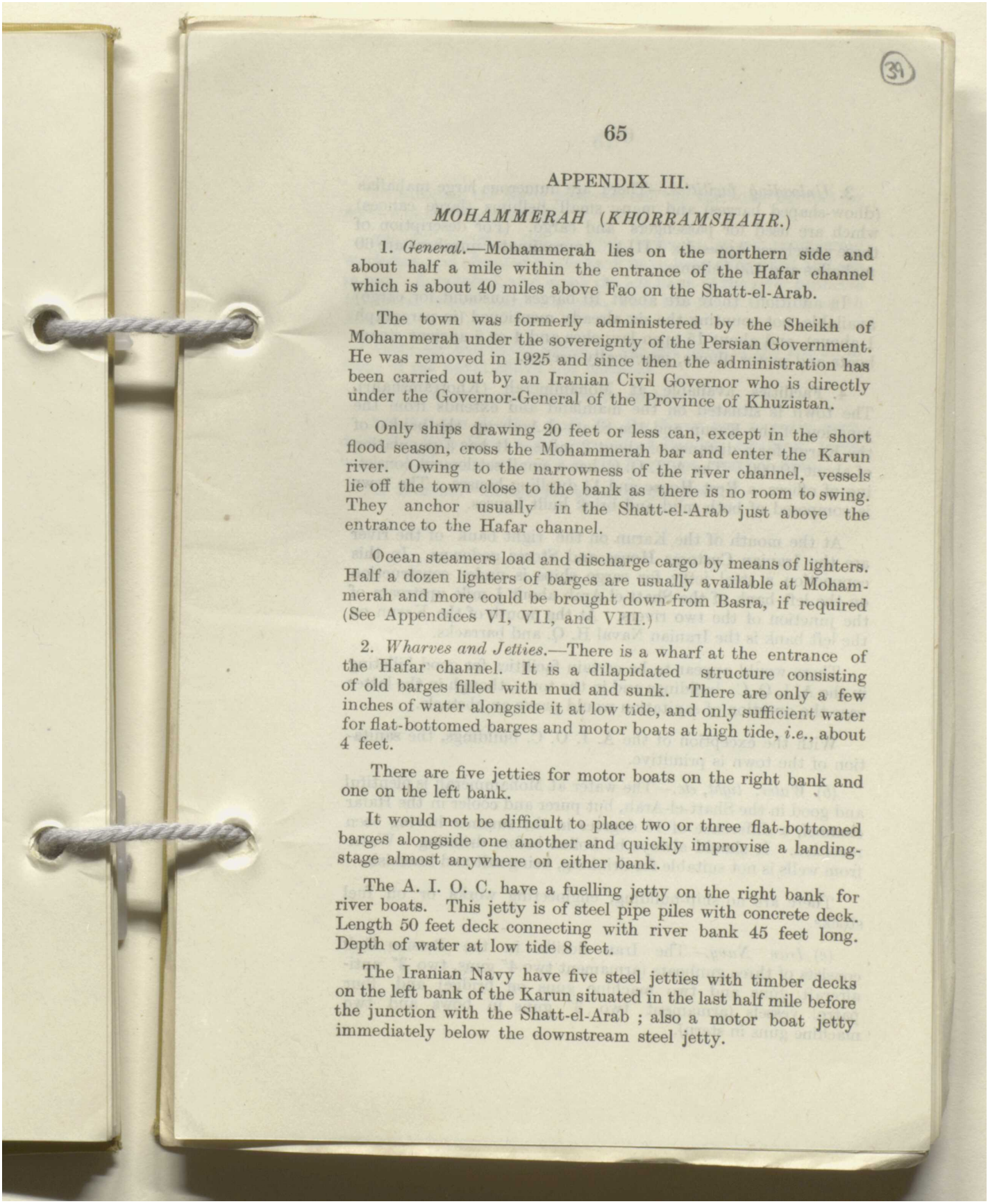
(*iii*) *General Stores.*—There are facilities for the repair of tentage and clothing. No facilities exist for the repair of boots or harness and saddlery.

(*i*) *Medical.*—Details of medical facilities are given in Chapter IX.

(*j*) *Laundry.*—A small separate steam laundry is maintained, for washing clothes and blankets, at the western end of the town.

(*k*) *Labour.*—The A. I. O. C. Labour organisation could recruit a labour force in ordinary circumstances up to about 5,000. Whether they would be prepared to serve the Military Authorities would depend on circumstances.

(*l*) *Mechanical Transport.*—Full details are given in Appendix X.



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APPENDIX III.

MOHAMMERAH (KHORRAMSHAHR.)

1. *General.*—Mohammerah lies on the northern side and about half a mile within the entrance of the Hafar channel which is about 40 miles above Fao on the Shatt-el-Arab.

The town was formerly administered by the Sheikh of Mohammerah under the sovereignty of the Persian Government. He was removed in 1925 and since then the administration has been carried out by an Iranian Civil Governor who is directly under the Governor-General of the Province of Khuzistan.

Only ships drawing 20 feet or less can, except in the short flood season, cross the Mohammerah bar and enter the Karun river. Owing to the narrowness of the river channel, vessels lie off the town close to the bank as there is no room to swing. They anchor usually in the Shatt-el-Arab just above the entrance to the Hafar channel.

Ocean steamers load and discharge cargo by means of lighters. Half a dozen lighters of barges are usually available at Mohammerah and more could be brought down from Basra, if required (See Appendices VI, VII, and VIII.)

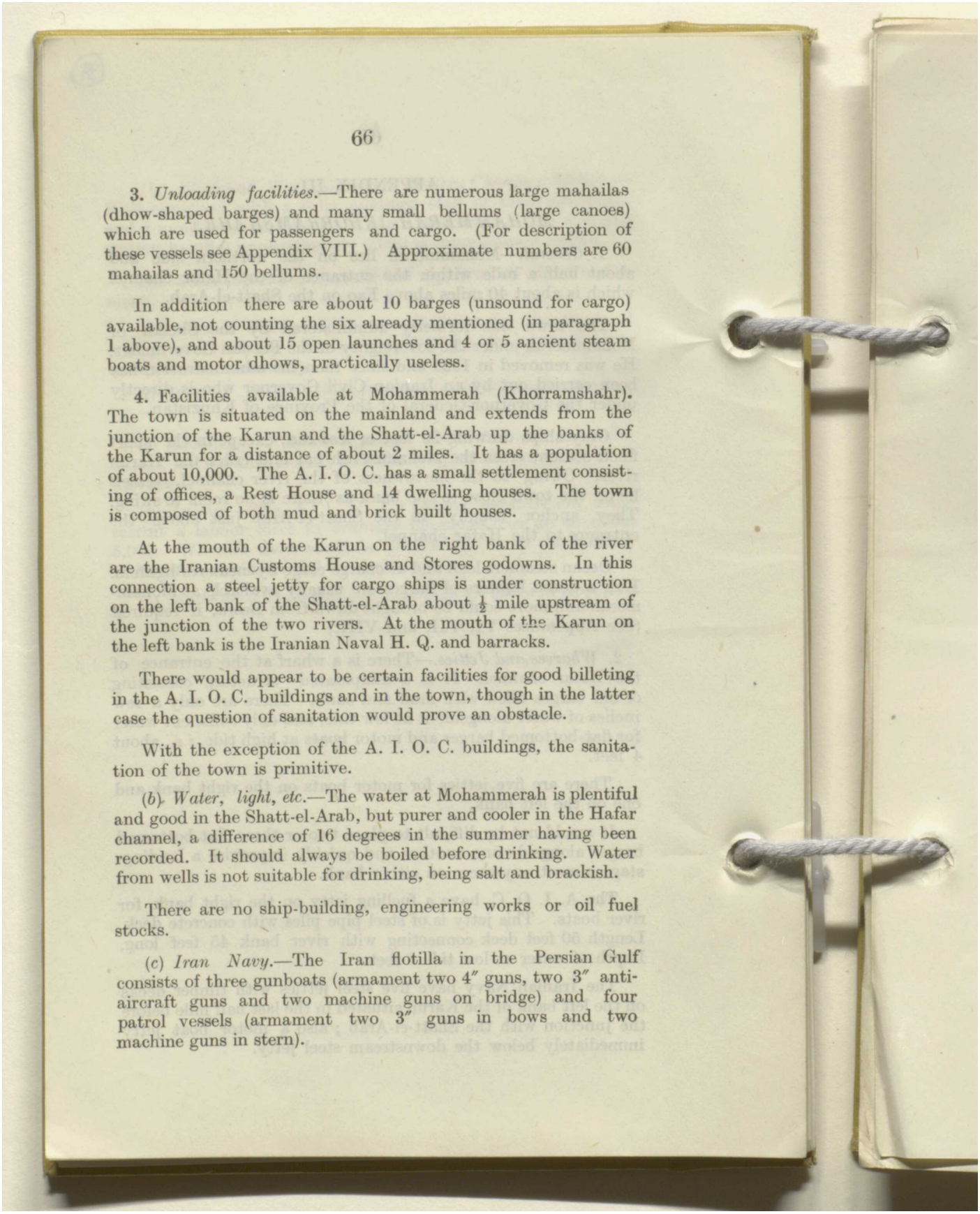
2. *Wharves and Jetties.*—There is a wharf at the entrance of the Hafar channel. It is a dilapidated structure consisting of old barges filled with mud and sunk. There are only a few inches of water alongside it at low tide, and only sufficient water for flat-bottomed barges and motor boats at high tide, *i.e.*, about 4 feet.

There are five jetties for motor boats on the right bank and one on the left bank.

It would not be difficult to place two or three flat-bottomed barges alongside one another and quickly improvise a landing-stage almost anywhere on either bank.

The A. I. O. C. have a fuelling jetty on the right bank for river boats. This jetty is of steel pipe piles with concrete deck. Length 50 feet deck connecting with river bank 45 feet long. Depth of water at low tide 8 feet.

The Iranian Navy have five steel jetties with timber decks on the left bank of the Karun situated in the last half mile before the junction with the Shatt-el-Arab ; also a motor boat jetty immediately below the downstream steel jetty.



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3. *Unloading facilities.*—There are numerous large mahailas (dhow-shaped barges) and many small bellums (large canoes) which are used for passengers and cargo. (For description of these vessels see Appendix VIII.) Approximate numbers are 60 mahailas and 150 bellums.

In addition there are about 10 barges (unsound for cargo) available, not counting the six already mentioned (in paragraph 1 above), and about 15 open launches and 4 or 5 ancient steam boats and motor dhows, practically useless.

4. Facilities available at Mohammerah (Khorramshahr). The town is situated on the mainland and extends from the junction of the Karun and the Shatt-el-Arab up the banks of the Karun for a distance of about 2 miles. It has a population of about 10,000. The A. I. O. C. has a small settlement consisting of offices, a Rest House and 14 dwelling houses. The town is composed of both mud and brick built houses.

At the mouth of the Karun on the right bank of the river are the Iranian Customs House and Stores godowns. In this connection a steel jetty for cargo ships is under construction on the left bank of the Shatt-el-Arab about ½ mile upstream of the junction of the two rivers. At the mouth of the Karun on the left bank is the Iranian Naval H. Q. and barracks.

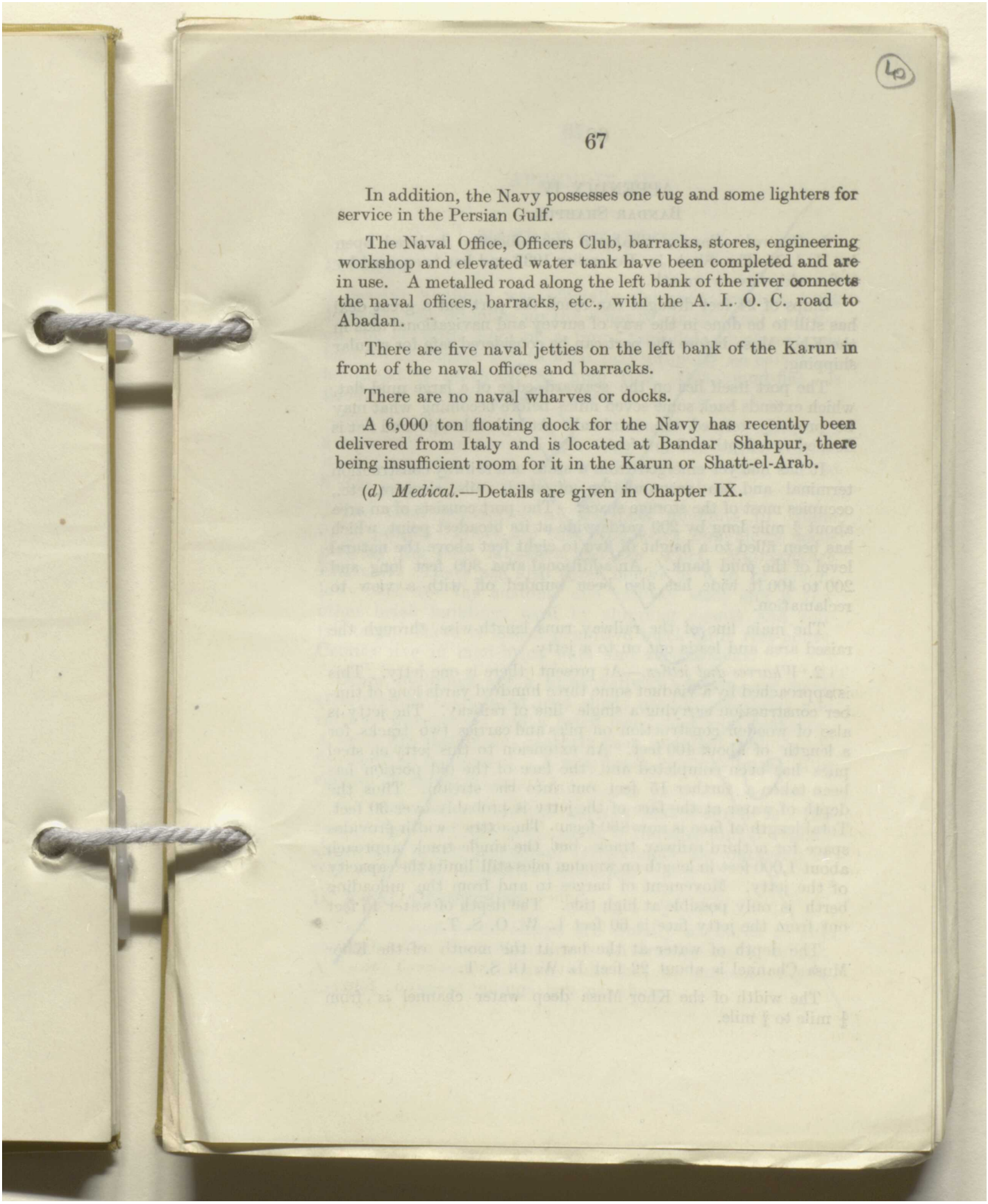
There would appear to be certain facilities for good billeting in the A. I. O. C. buildings and in the town, though in the latter case the question of sanitation would prove an obstacle.

With the exception of the A. I. O. C. buildings, the sanitation of the town is primitive.

(*b*) *Water, light, etc.*—The water at Mohammerah is plentiful and good in the Shatt-el-Arab, but purer and cooler in the Hafar channel, a difference of 16 degrees in the summer having been recorded. It should always be boiled before drinking. Water from wells is not suitable for drinking, being salt and brackish.

There are no ship-building, engineering works or oil fuel stocks.

(*c*) *Iran Navy.*—The Iran flotilla in the Persian Gulf consists of three gunboats (armament two 4″ guns, two 3″ anti-aircraft guns and two machine guns on bridge) and four patrol vessels (armament two 3″ guns in bows and two machine guns in stern).



In addition, the Navy possesses one tug and some lighters for service in the Persian Gulf.

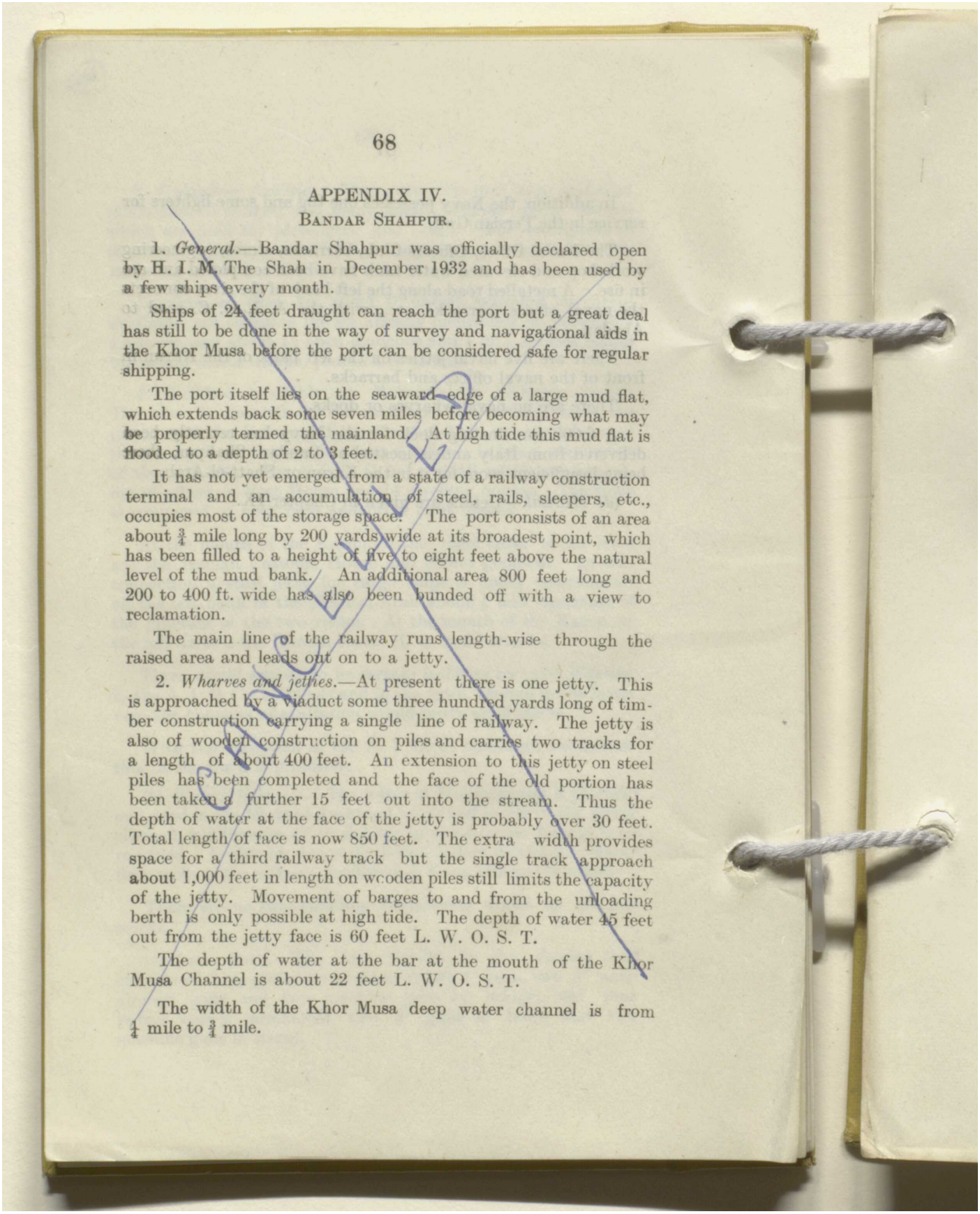
The Naval Office, Officers Club, barracks, stores, engineering workshop and elevated water tank have been completed and are in use. A metalled road along the left bank of the river connects the naval offices, barracks, etc., with the A. I. O. C. road to Abadan.

There are five naval jetties on the left bank of the Karun in front of the naval offices and barracks.

There are no naval wharves or docks.

A 6,000 ton floating dock for the Navy has recently been delivered from Italy and is located at Bandar Shahpur, there being insufficient room for it in the Karun or Shatt-el-Arab.

(*d*) *Medical.*—Details are given in Chapter IX.



APPENDIX IV.

Bandar Shahpur.

1. *General.*—Bandar Shahpur was officially declared open by H. I. M. The Shah in December 1932 and has been used by a few ships every month.

Ships of 24 feet draught can reach the port but a great deal has still to be done in the way of survey and navigational aids in the Khor Musa before the port can be considered safe for regular shipping.

The port itself lies on the seaward edge of a large mud flat, which extends back some seven miles before becoming what may be properly termed the mainland. At high tide this mud flat is flooded to a depth of 2 to 3 feet.

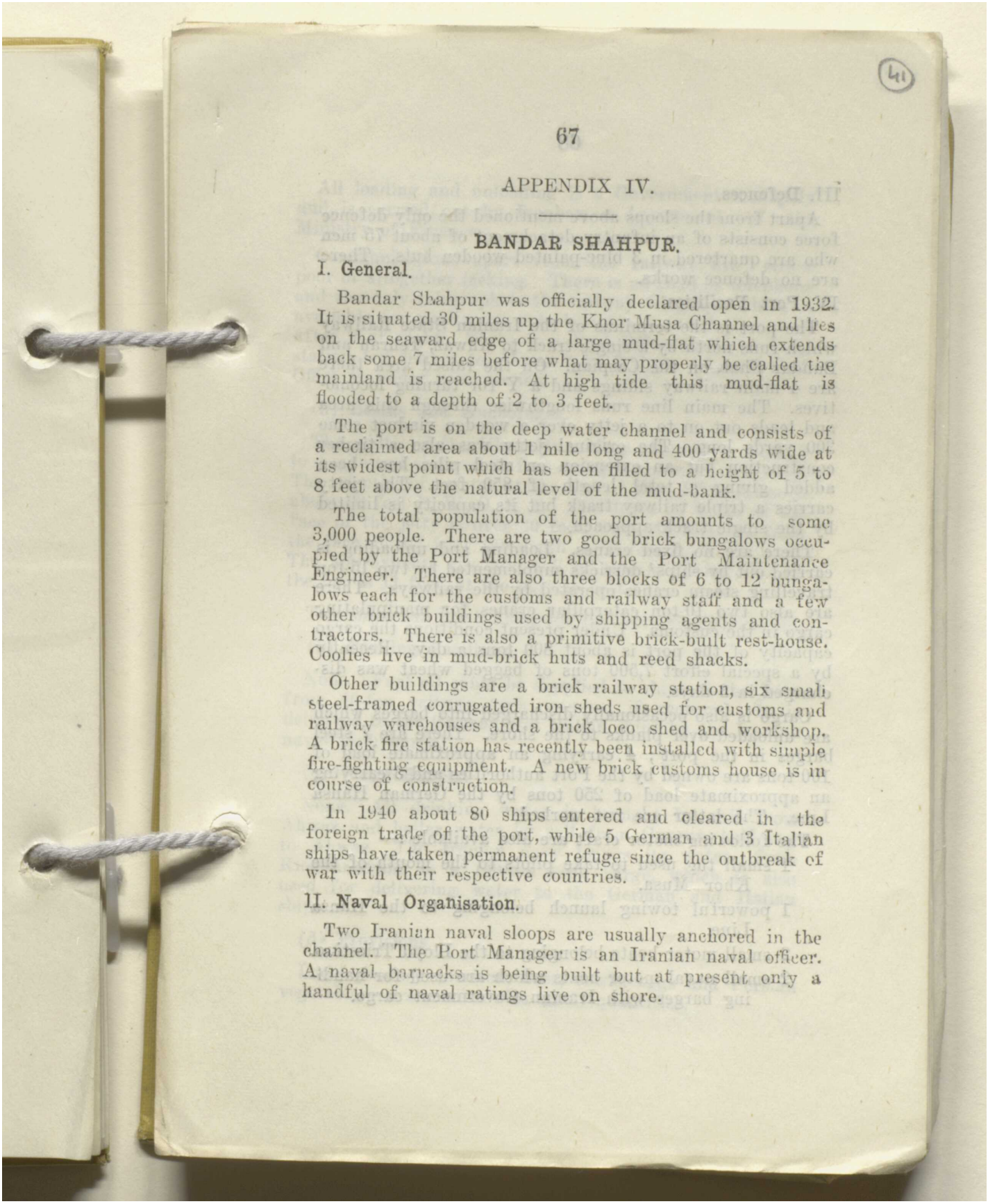
It has not yet emerged from a state of a railway construction terminal and an accumulation of steel, rails, sleepers, etc., occupies most of the storage space. The port consists of an area about ¾ mile long by 200 yards wide at its broadest point, which has been filled to a height of five to eight feet above the natural level of the mud bank. An additional area 800 feet long and 200 to 400 ft. wide has also been bunded off with a view to reclamation.

The main line of the railway runs length-wise through the raised area and leads out on to a jetty.

2. *Wharves and jetties.*—At present there is one jetty. This is approached by a viaduct some three hundred yards long of timber construction carrying a single line of railway. The jetty is also of wooden construction on piles and carries two tracks for a length of about 400 feet. An extension to this jetty on steel piles has been completed and the face of the old portion has been taken a further 15 feet out into the stream. Thus the depth of water at the face of the jetty is probably over 30 feet. Total length of face is now 850 feet. The extra width provides space for a third railway track but the single track approach about 1,000 feet in length on wooden piles still limits the capacity of the jetty. Movement of barges to and from the unloading berth is only possible at high tide. The depth of water 45 feet out from the jetty face is 60 feet L. W. O. S. T.

The depth of water at the bar at the mouth of the Khor Musa Channel is about 22 feet L. W. O. S. T.

The width of the Khor Musa deep water channel is from ¼ mile to ¾ mile.



APPENDIX IV.

BANDAR SHAHPUR.

I. General.

Bandar Shahpur was officially declared open in 1932. It is situated 30 miles up the Khor Musa Channel and lies on the seaward edge of a large mud-flat which extends back some 7 miles before what may properly be called the mainland is reached. At high tide this mud-flat is flooded to a depth of 2 to 3 feet.

The port is on the deep water channel and consists of a reclaimed area about 1 mile long and 400 yards wide at its widest point which has been filled to a height of 5 to 8 feet above the natural level of the mud-bank.

The total population of the port amounts to some 3,000 people. There are two good brick bungalows occupied by the Port Manager and the Port Maintenance Engineer. There are also three blocks of 6 to 12 bungalows each for the customs and railway staff and a few other brick buildings used by shipping agents and contractors. There is also a primitive brick-built rest-house. Coolies live in mud-brick huts and reed shacks.

Other buildings are a brick railway station, six small steel-framed corrugated iron sheds used for customs and railway warehouses and a brick loco shed and workshop. A brick fire station has recently been installed with simple fire-fighting equipment. A new brick customs house is in course of construction.

In 1940 about 80 ships entered and cleared in the foreign trade of the port, while 5 German and 3 Italian ships have taken permanent refuge since the outbreak of war with their respective countries.

II. Naval Organisation.

Two Iranian naval sloops are usually anchored in the channel. The Port Manager is an Iranian naval officer. A naval barracks is being built but at present only a handful of naval ratings live on shore.

III. **Defences.**

Apart from the sloops above mentioned the only defence force consists of an infantry detachment of about 75 men who are quartered in 3 blue-painted wooden huts. There are no defence works.

IV. **Port Facilities.**

The port is the terminus of the Iranian State Railway which runs north by a single track to Ahwaz, Tehran and Bandar Shah on the Caspian. On the raised area there are 4 main railway sidings and a Y for turning locomotives. The main line runs lengthwise through this area and leads out on to a jetty over a wooden viaduct some 300 yards long. The original jetty was also a timber construction but an extension on steel piles has been added giving a total length of 850 feet. The jetty carries a triple railway track but its capacity is limited by the single track approach.

There are no fixed cranes. Loading and unloading is carried out by ships' derricks supplemented by two 15-ton travelling steam cranes operated by the railways. There are also two 10-ton caterpillar cranes for manipulating cargo in the customs. Under present conditions the cargo capacity of the port is about 800 tons a day. Recently by a special effort 7,500 tons of bagged wheat was discharged in 8 days.

Cargo is also occasionally discharged into barges which are unloaded over planks to the shore. There are 7 steel barges in the port; 4 carrying an approximate load of 100 tons are owned by the Port authorities and 3 carrying an approximate load of 250 tons by the German Hansa Line. The latter are not worked.

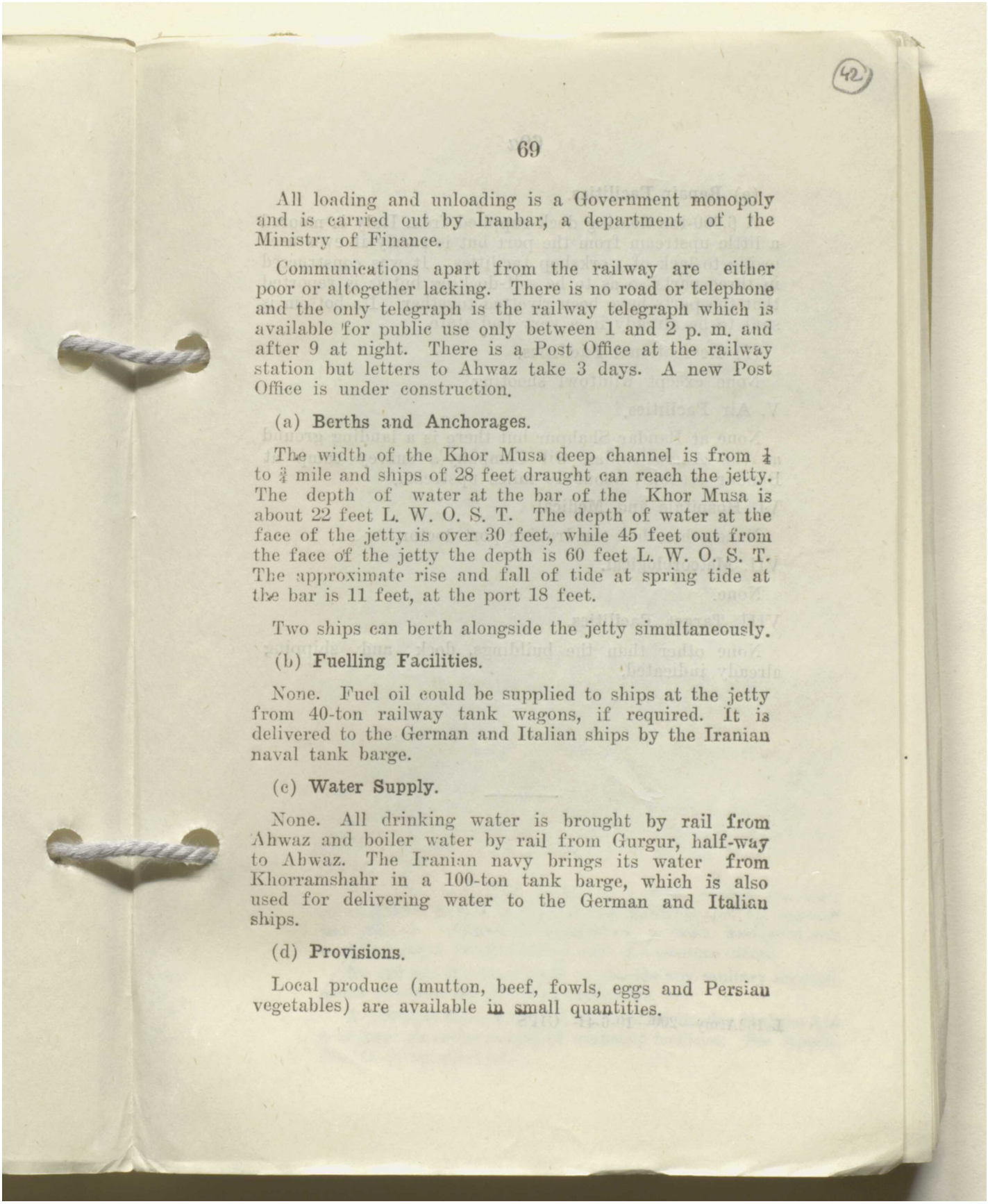
The following motor craft are also available :—

1 small tug used to take pilots to the mouth of the Khor Musa.

1 powerful towing launch belonging to the Hansa Line.

2 small motor boats belonging to the Lloyd Triestino.

2 small naval motor boats which are used for handling barges with Iranian Government cargo.



All loading and unloading is a Government monopoly and is carried out by Iranbar, a department of the Ministry of Finance.

Communications apart from the railway are either poor or altogether lacking. There is no road or telephone and the only telegraph is the railway telegraph which is available for public use only between 1 and 2 p. m. and after 9 at night. There is a Post Office at the railway station but letters to Ahwaz take 3 days. A new Post Office is under construction.

(a) **Berths and Anchorages.**

The width of the Khor Musa deep channel is from ¼ to ¾ mile and ships of 28 feet draught can reach the jetty. The depth of water at the bar of the Khor Musa is about 22 feet L. W. O. S. T. The depth of water at the face of the jetty is over 30 feet, while 45 feet out from the face of the jetty the depth is 60 feet L. W. O. S. T. The approximate rise and fall of tide at spring tide at the bar is 11 feet, at the port 18 feet.

Two ships can berth alongside the jetty simultaneously.

(b) **Fuelling Facilities.**

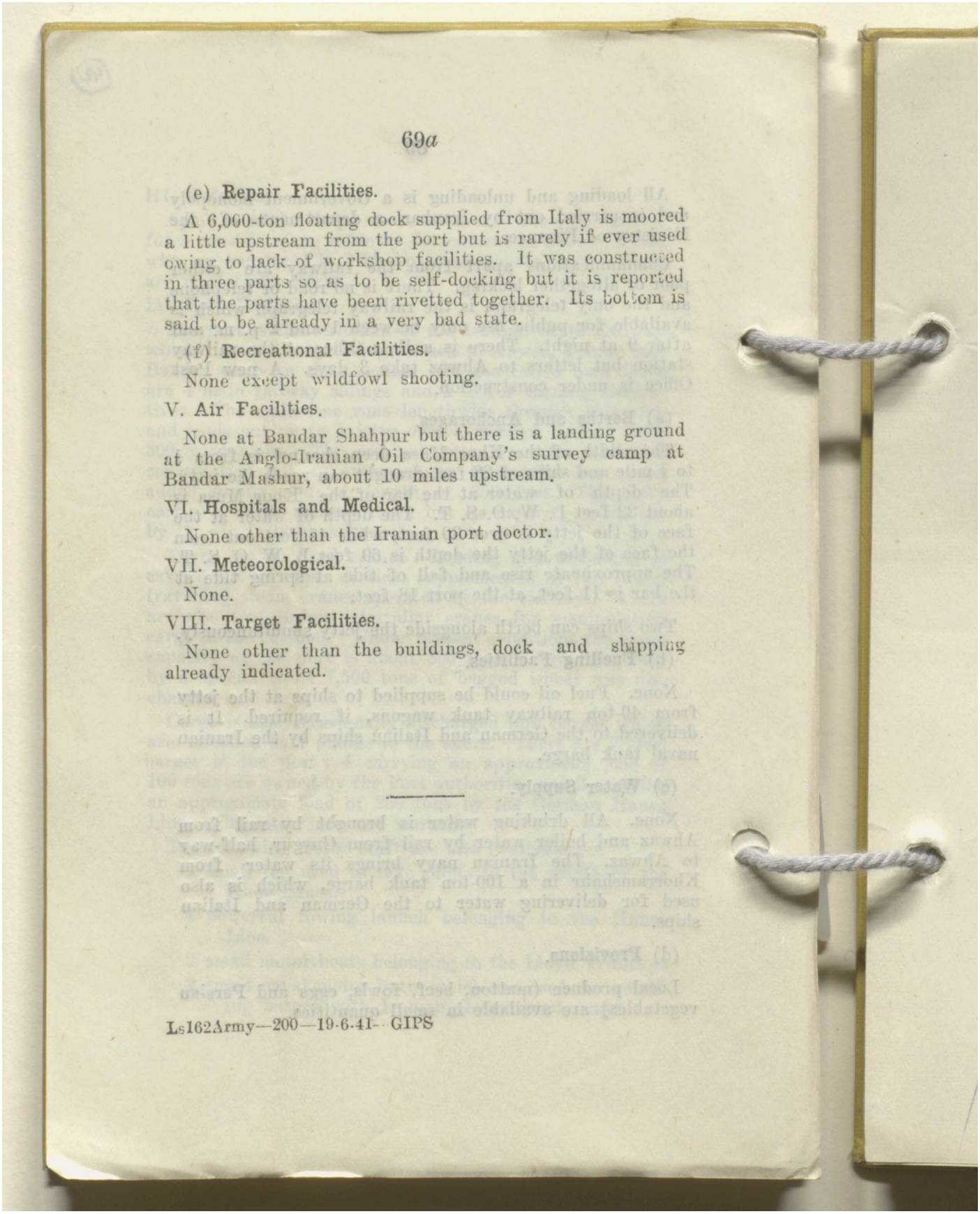
None. Fuel oil could be supplied to ships at the jetty from 40-ton railway tank wagons, if required. It is delivered to the German and Italian ships by the Iranian naval tank barge.

(c) **Water Supply.**

None. All drinking water is brought by rail from Ahwaz and boiler water by rail from Gurgur, half-way to Ahwaz. The Iranian navy brings its water from Khorramshahr in a 100-ton tank barge, which is also used for delivering water to the German and Italian ships.

(d) **Provisions.**

Local produce (mutton, beef, fowls, eggs and Persian vegetables) are available in small quantities.



(e) **Repair Facilities.**

A 6,000-ton floating dock supplied from Italy is moored a little upstream from the port but is rarely if ever used owing to lack of workshop facilities. It was constructed in three parts so as to be self-docking but it is reported that the parts have been rivetted together. Its bottom is said to be already in a very bad state.

(f) **Recreational Facilities.**

None except wildfowl shooting.

V. **Air Facilities.**

None at Bandar Shahpur but there is a landing ground at the Anglo-Iranian Oil Company's survey camp at Bandar Mashur, about 10 miles upstream.

VI. **Hospitals and Medical.**

None other than the Iranian port doctor.

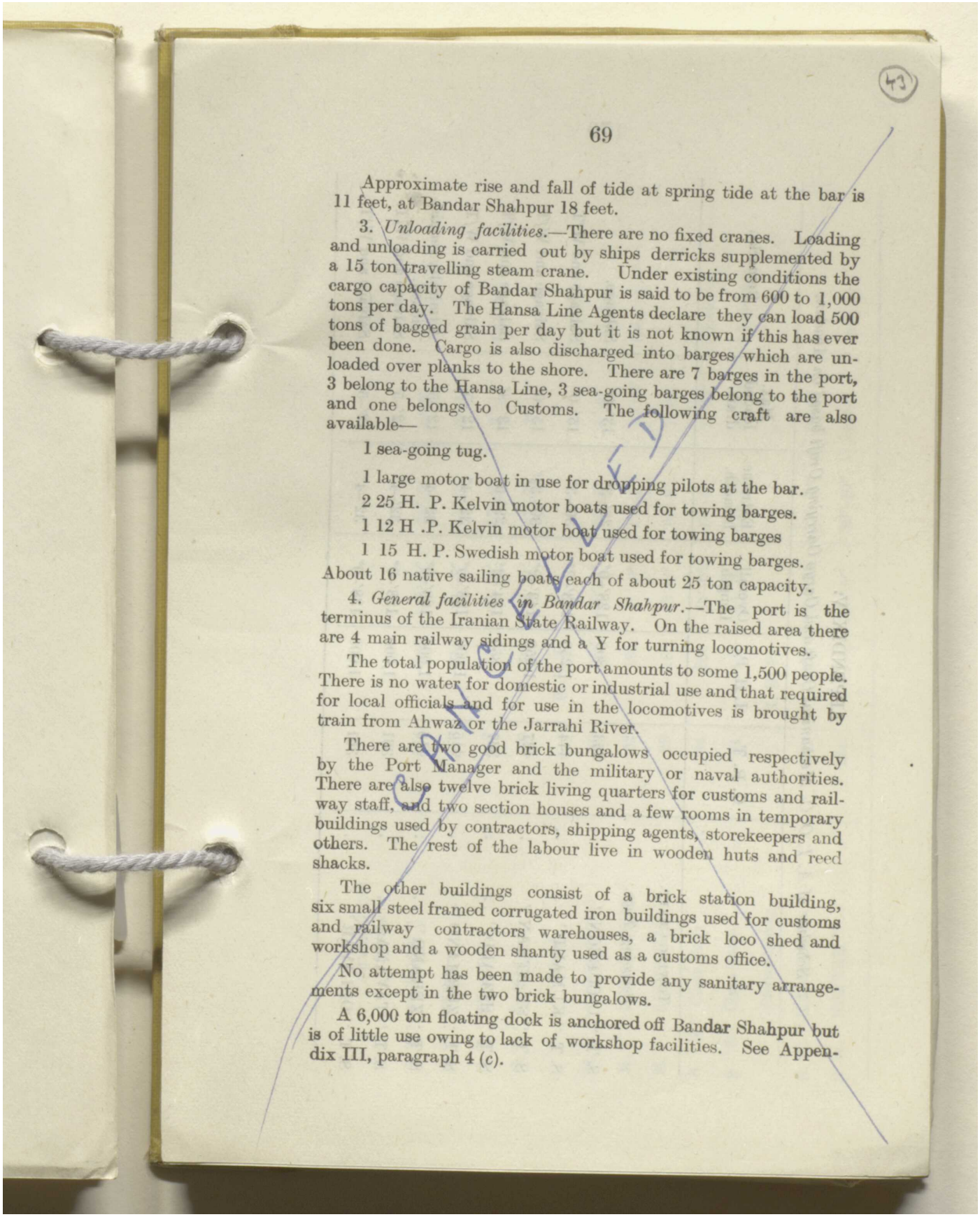
VII. **Meteorological.**

None.

VIII. **Target Facilities.**

None other than the buildings, dock and shipping already indicated.

Ls162Army—200—19·6·41—GIPS



Approximate rise and fall of tide at spring tide at the bar is 11 feet, at Bandar Shahpur 18 feet.

3. *Unloading facilities.*—There are no fixed cranes. Loading and unloading is carried out by ships derricks supplemented by a 15 ton travelling steam crane. Under existing conditions the cargo capacity of Bandar Shahpur is said to be from 600 to 1,000 tons per day. The Hansa Line Agents declare they can load 500 tons of bagged grain per day but it is not known if this has ever been done. Cargo is also discharged into barges which are unloaded over planks to the shore. There are 7 barges in the port, 3 belong to the Hansa Line, 3 sea-going barges belong to the port and one belongs to Customs. The following craft are also available—

1 sea-going tug.

1 large motor boat in use for dropping pilots at the bar.

2 25 H. P. Kelvin motor boats used for towing barges.

1 12 H .P. Kelvin motor boat used for towing barges

1 15 H. P. Swedish motor boat used for towing barges.

About 16 native sailing boats each of about 25 ton capacity.

4. *General facilities in Bandar Shahpur.*—The port is the terminus of the Iranian State Railway. On the raised area there are 4 main railway sidings and a Y for turning locomotives.

The total population of the port amounts to some 1,500 people. There is no water for domestic or industrial use and that required for local officials and for use in the locomotives is brought by train from Ahwaz or the Jarrahi River.

There are two good brick bungalows occupied respectively by the Port Manager and the military or naval authorities. There are also twelve brick living quarters for customs and railway staff, and two section houses and a few rooms in temporary buildings used by contractors, shipping agents, storekeepers and others. The rest of the labour live in wooden huts and reed shacks.

The other buildings consist of a brick station building, six small steel framed corrugated iron buildings used for customs and railway contractors warehouses, a brick loco shed and workshop and a wooden shanty used as a customs office.

No attempt has been made to provide any sanitary arrangements except in the two brick bungalows.

A 6,000 ton floating dock is anchored off Bandar Shahpur but is of little use owing to lack of workshop facilities. See Appendix III, paragraph 4 (*c*).

APPENDIX V.

Schedule of A. I. O. C. Mechanical Craft and Cargo Carrying Craft based on Abadan.

—	G. R. T.	I. H. P.	Overall Length.	Extreme breadth.	Max. loaded draft.	Remarks.
TOWING CRAFT.						
Seagoing Tugs.						
S. T. "L. CURZON" ..	253	800	128′–0″	26′–3″	13′–0″	Salvage.
S. T. "KUMAKI" ..	444	1,250	143′–2″	30′–3″	15′–0″	Salvage and W/T.
S. T. "ST. ATHAN" ..	427	1,250	143′–2″	30′–3½″	15′–0″	Salvage and W/T.
S. T. "HERALD" ..	367	850	134′–2″	29′–6″	13′–8″	Salvage and W/T.
S. T. "ZURMAND" ..	415	1,000	128′–0″	32′–4″	12′–5″	Salvage and W/T.
S. T. "ZERANG" ..	415	1,000	128′–0″	32′–4″	12′–5″	Admiralty requisitioned.
S. T. "TAVANA" ..	361	1,000	128′–0″	32′–4″	12′–5″	Salvage and W/T.
S. T. "DELAVAR" ..	361	1,000	128′–0″	32′–4″	12′–5″	Salvage and W/T.

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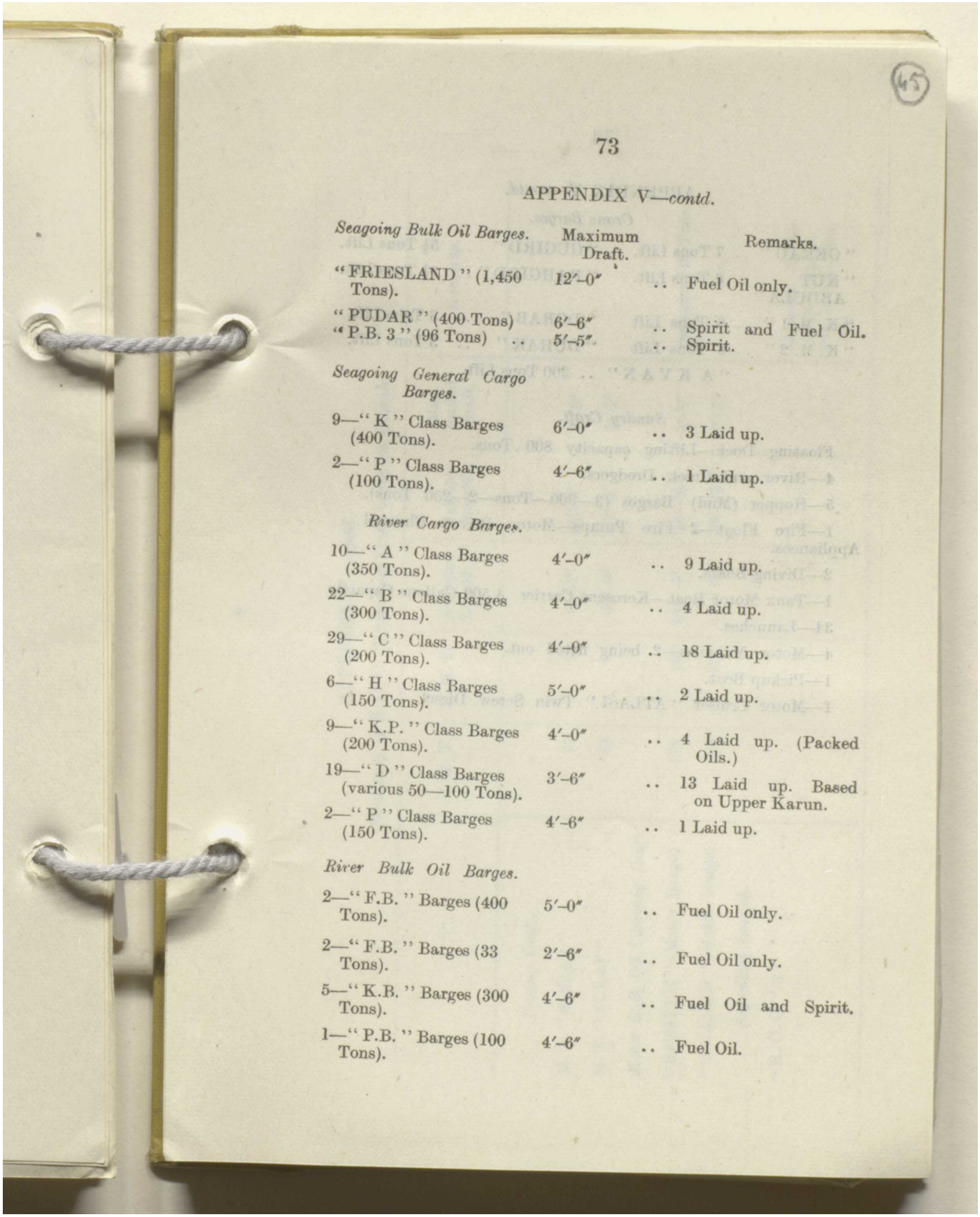
River Tugs.						
Steam.						
S. T. "THEGON" ..	174	500	116′–0″	23′–0″	8′–8″	
S. T. "TIB"	52	250	81′–9″	17′–2″	3′–11″	
S. T. "TIGRIS" ..	52	250	81′–9″	17′–2″	3′–11″	Laid up.
S. T. "DIYALA" ..	60	250	81′–9″	17′–2″	3′–11″	
		B. H. P.				
Diesel.						
M. V. "MIHRABAD" ..	79	260	80′–0″	16′–6″	4′–6″	
M. V. "EUPHRATES" ..	62	192	81′–9″	17′–2″	2′–10″	Laid up.
M. V. "SOODMAND" ..	39	180	62′–0″	16′–6″	7′–3″	
6 "N" Class Tugs ..	84	260	85′–0″	18′–4″	2′–11″	3 Laid up.
9 "S" Class Tugs ..	81	192	82′–0″	18′–4″	2′–8½″	6 Laid up.
		I. H. P.				
Sternwheelers.						
S. W. "KALGAH" ..	293	500	150′–0″	33′–10″	3′–6″	
S. W. "NAFTAK" ..	224	250	150′–0″	32′–10″	3′–0″	Laid up.

APPENDIX V—*contd.*

Schedule of A. I. O. C. Mechanical Craft and Cargo Carrying Craft based on Abadan—contd.

	G. R. T.	I. H. P.	Overall Length.	Extreme breadth.	Max. loaded draft.	Remarks.
S. W. "BIBIAN"	96	190	106′-6″	21′-6″	2′-9″	.. } Based on Upper Laid up { Karun River.
S. W. "AMINIYEH" ..	96	190	106′-6″	21′-6″	2′-9″	(Machinery not in running condition. Used as floating accommodation at Bandar Mashur.)
S. W. "MESHED"	Approx. 480	500	174′-6″	35′-3″	3′-9″	
Seagoing Cargo Vessels.						
S. S. "KHUZISTAN" ..	589	600	186′-0″	32′-9″	14′-3″	
T. S. S. "TARAQQI" ..	388	450	148′-0″	39′-0″	6′-6″	
SUNDRY CRAFT. *Self-Propelled.*						
Water Barge "BETWAND"	117	160	106′-0″	21′-5″	6′-9″	(Approx. 150 Tons)
Stores Barge "ANBAR" ..	177	B. H. P. 192	110′-0″	23′-0″	6′-0″	Laid up.



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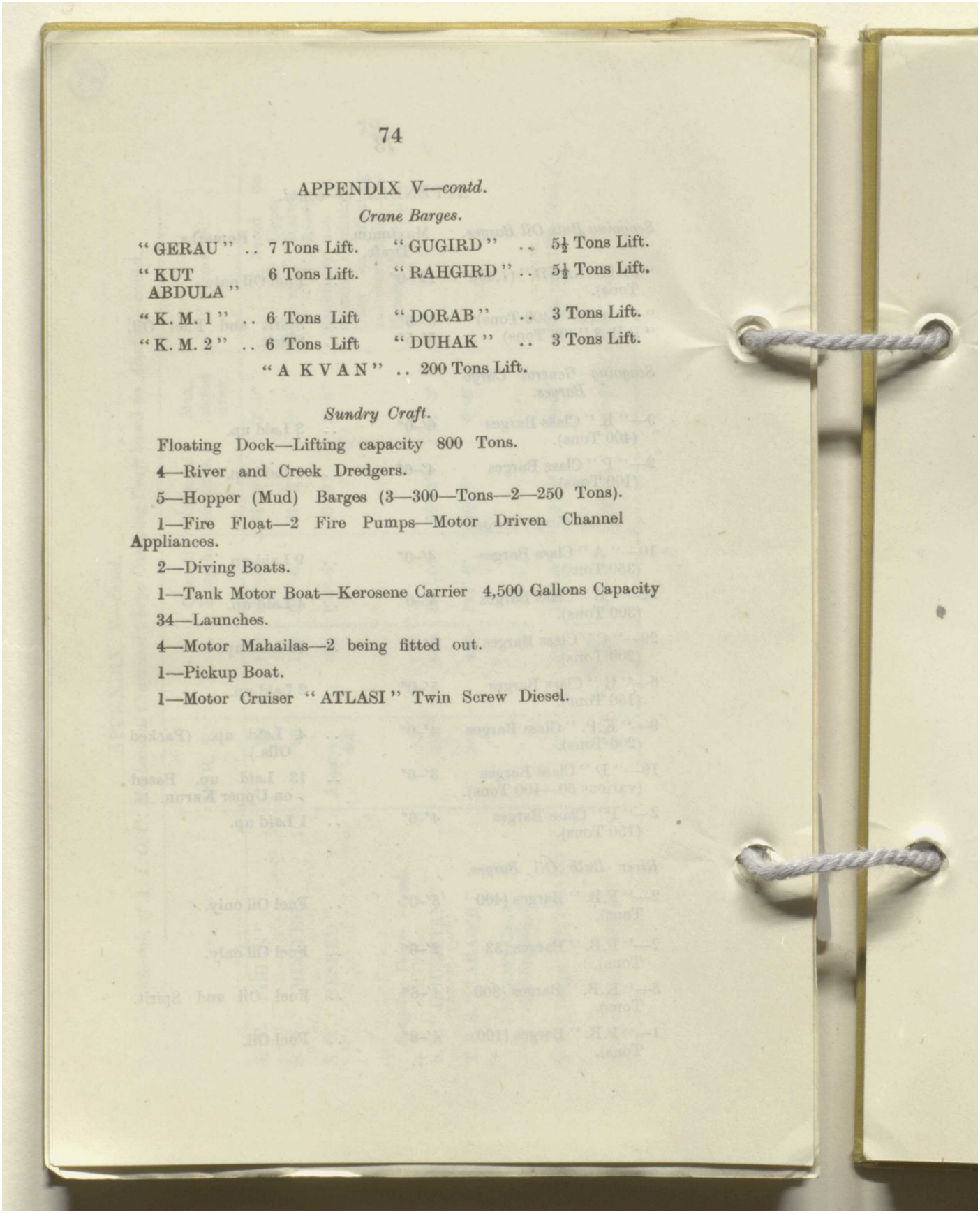
APPENDIX V—*contd.*

Seagoing Bulk Oil Barges.	Maximum Draft.	Remarks.
"FRIESLAND" (1,450 Tons).	12′–0″	.. Fuel Oil only.
"PUDAR" (400 Tons)	6′–6″	.. Spirit and Fuel Oil.
"P.B. 3" (96 Tons) ..	5′–5″	.. Spirit.
Seagoing General Cargo Barges.		
9—"K" Class Barges (400 Tons).	6′–0″	.. 3 Laid up.
2—"P" Class Barges (100 Tons).	4′–6″	.. 1 Laid up.
River Cargo Barges.		
10—"A" Class Barges (350 Tons).	4′–0″	.. 9 Laid up.
22—"B" Class Barges (300 Tons).	4′–0″	.. 4 Laid up.
29—"C" Class Barges (200 Tons).	4′–0″	.. 18 Laid up.
6—"H" Class Barges (150 Tons).	5′–0″	.. 2 Laid up.
9—"K.P." Class Barges (200 Tons).	4′–0″	.. 4 Laid up. (Packed Oils.)
19—"D" Class Barges (various 50—100 Tons).	3′–6″	.. 13 Laid up. Based on Upper Karun.
2—"P" Class Barges (150 Tons).	4′–6″	.. 1 Laid up.
River Bulk Oil Barges.		
2—"F.B." Barges (400 Tons).	5′–0″	.. Fuel Oil only.
2—"F.B." Barges (33 Tons).	2′–6″	.. Fuel Oil only.
5—"K.B." Barges (300 Tons).	4′–6″	.. Fuel Oil and Spirit.
1—"P.B." Barges (100 Tons).	4′–6″	.. Fuel Oil.



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APPENDIX V—*contd.*

Crane Barges.

"GERAU" ..	7 Tons Lift.	"GUGIRD" ..	5½ Tons Lift.
"KUT ABDULA"	6 Tons Lift.	"RAHGIRD" ..	5½ Tons Lift.
"K. M. 1" ..	6 Tons Lift	"DORAB" ..	3 Tons Lift.
"K. M. 2" ..	6 Tons Lift	"DUHAK" ..	3 Tons Lift.
		"A K V A N" ..	200 Tons Lift.

Sundry Craft.

Floating Dock—Lifting capacity 800 Tons.

4—River and Creek Dredgers.

5—Hopper (Mud) Barges (3—300—Tons—2—250 Tons).

1—Fire Float—2 Fire Pumps—Motor Driven Channel Appliances.

2—Diving Boats.

1—Tank Motor Boat—Kerosene Carrier 4,500 Gallons Capacity

34—Launches.

4—Motor Mahailas—2 being fitted out.

1—Pickup Boat.

1—Motor Cruiser "ATLASI" Twin Screw Diesel.

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APPENDIX V—*contd.*

Summary of R. O. C. Mechanical Craft based on Basrah.

—	G. R. T.	B. H. P.	Extreme Length.	Extreme Breadth.	Max. loaded draft.	Remarks.
Towing Craft.						
M. T. "SINJAR"	37	92	60′-0″	13′-2″	3′-3″	
M. T. "SULAF"	37	92	60′-0″	13′-2″	3′-3″	
Motor Bulk Oil Carrying Craft.						
"SAFIYEH" (Motor Barge)	176	192	143′-0″	26′-7¼″	3′-3″	Capacity 120 Tons.
"SALIMEH" (Motor Barge)	176	192	143′-0″	26′-7¼″	3′-3″	Do.
Refuelling Launch.						
"R. O. C." 3″	..	..	..	..	..	Capacity 2,350 Gallons Spirit. 250 Gallons Lub. Oil.

APPENDIX V—*concld.*

—	G. R. T.	B. H. P.	Extreme Length.	Extreme Breadth.	Max. loaded draft.	Remarks.
Bulk Oil Barges.						
" F. B. 28 " (700 Tons) ..	..	..	..	..	6'-0"	Fuel Oil.
" B. S. D. 303 " (100 Tons) ..	..	..	..	..	3'-3"	Spirit or Fuel.
" B. S. D. 307 " (100 Tons) ..	..	..	..	..	3'-3"	Do.
Sundry.						
1—Motor Tank Launch ..	..	..	..	..	..	4,500 Gallons Capacity.

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APPENDIX VI.

Mespers River Fleet, and Motor Launches, Basra.

(a) Steamers and Towing Vessels (Mespers).

Serial No.	Name of craft.	Number of days to commission.	Dead weight* carrying capacity in tons.	Towing capacity.	Troop carrying capacity. Officers. O. Rs. EMPTY.		Troop carrying capacity. Officers. O. Rs. LOADED†.	
1	(PS. 59) ZENOBIA ..	14	160	2 barges—1,000 tons ..	16	I 477 II 318 III 159	16	477 318 159
2	(PS. 54) ZOBAIDA ..	14	160	Do. ..	12	Do.	12	Do.
3	(S. 16) BLOSSELYNCH ..	14	60	2 barges—800 tons ..	12	I 235 II 156 III 78	10	235 156 78
4	(HS. 13) TIGRIS	2 months	*Nil*	Do. ..	11	Do.	11	Do.
5	(S. 14) EJIDIEH	Do.	60	Do. ..	10	Do.	10	Do.
6	(S. 47) IHSAN	10	50	2 barges—600 tons ..	8	I 258 II 172 III 86	8	258 172 86

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APPENDIX VI—*contd.*

Serial No.	Name of craft.	Number of days to commission.	Dead weight* carrying capacity in tons.	Towing capacity.	Troop carrying capacity. officers. O. Rs. EMPTY.	Troop carrying capacity. Officers. O. Rs. LOADED†.
7	(S. 55) EL-KADRI ..	10	50	2 barges—600 tons ..	8 III 86	8 86
8	(—) KHALIFAH ..	10	100	Do. ..	10 I 427 II 284 III 142	10 427 284 142
9	(—) MALAMIR ..	10	50	2 barges—500 tons ..	5 I 258 II 172 III 86	5 258 Motor 172 Paddle 86 Vessel.
10	(PT. 12) TAAZA ..	10	*Nil*	2 barges—1,000 tons ..	*Nil* *Nil*	*Nil* *Nil* Steam tug (Paddle).
11	(PT. 13) TOWFEEK ..	10	,,	Do. ..	,, ,,	,, ,, ,,
12	(PT. 1) SHATTRAH ..	10	,,	2 barges—800 tons ..	,, ,,	,, ,, ,,
13	(PT. 2) ADHAIM ..	10	,,	Do. ..	,, ,,	,, ,, ,,
14	(PT. 3) ZAB ..	10	,,	Do. ..	,, ,,	,, ,, ,,
15	(T. 19) SUMANA ..	10	,,	2 barges—500 tons ..	,, ,,	,, ,, Motor tug.

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16	(—) SOURIYA	..	..	10	,,	Do.	..	,,	,,	,,
17	(T. 31) SHAMAL	..	..	10	,,	Do.	..	,,	,,	,,
18	(T. 74) SHADI	..	..	10	,,	Do.	..	,,	,,	,,
19	(—) SHUHRUR	..	..	10	,,	Do.	..	,,	,,	,,
20	(—) SHIHAB	..	..	10	,,	Do.	..	,,	,,	,,
21	(—) SARATAN	..	..	10	,,	Do.	..	,,	,,	,,
22	(—) SHIRIN	..	..	10	,,	2 barges—300 tons	..	,,	,,	,,

NOTE.—The TIGRIS and MEJIDIEH require major hull repairs and may be broken up.

I.—Native Passengers.

II.—Indian Troops.

III.—British Troops.

*Estimated for low water.

†Load capacity is reduced by equivalent of weight of troops carried.

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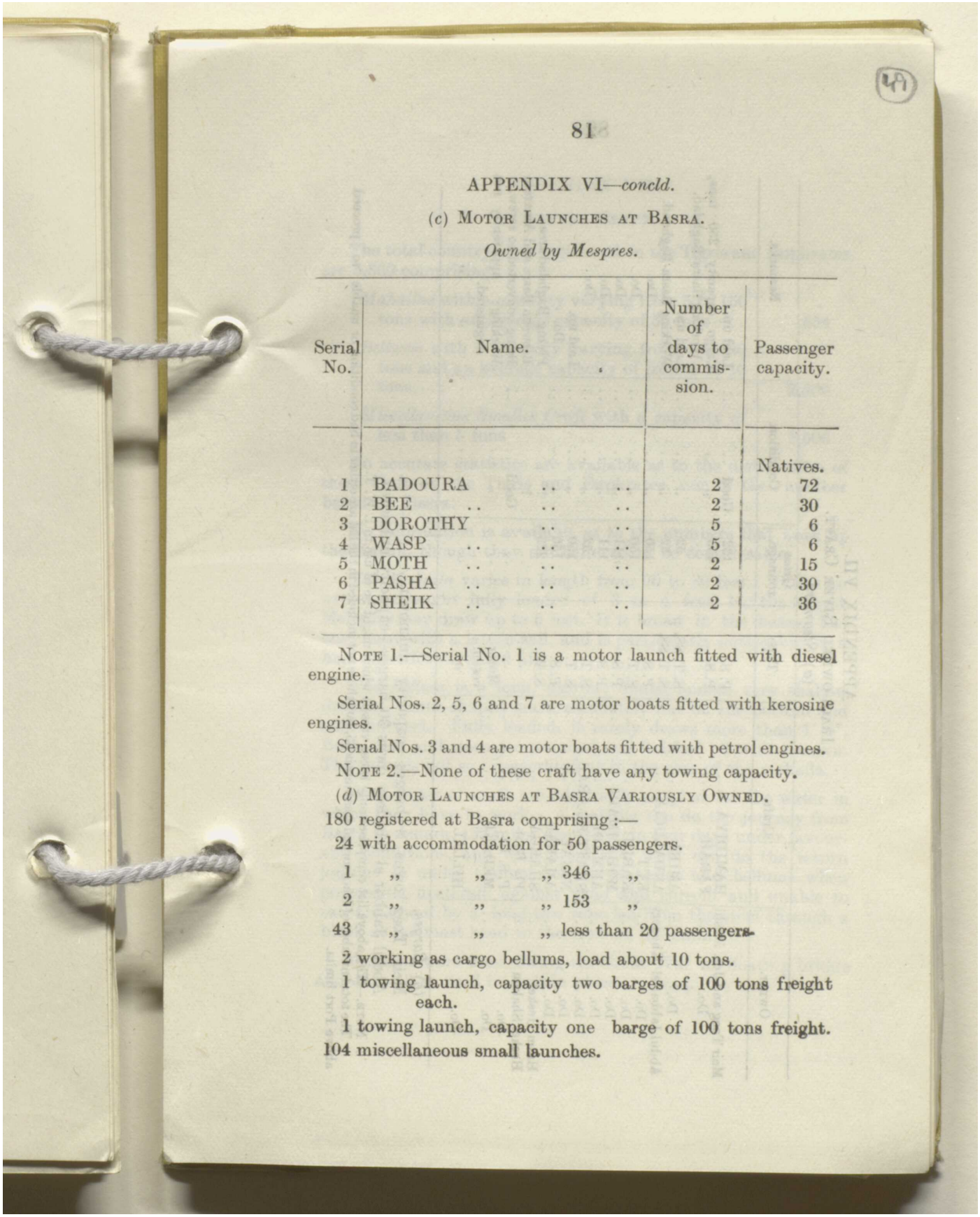
APPENDIX VI—*contd.*

(*b*) *Barges* (*Mespers*).

Serial No.	Class.	Number available.	Dead weight capacity stores at 3' 0" draft. Tons.	Oil or Petrol at 3' 0" draft. Tons.	Troop carrying capacity. Officers.	Troop carrying capacity. Other ranks.	No. of days to commission.
1/4	"A"	4	1/2 190	..	*Nil*	*Nil*	1/20
			3/4 220	..	,,	,,	
6/27	"B"	22	6/12 210	..	,,	,,	1/5
			13 173				
			14/17 190				
			19/27 173				
30/59	"C"	30	141	..	,,	,,	1/5
62/63	"OA"	2	..	217	,,	,,	1/5
64/68	"OB"	5	..	64 192	,,	,,	1/5
				65/66 217			
				67/68 192			
69/70	"CO"	2	..	151	,,	,,	1/5
71/72	"OD"	2	..	65	,,	,,	1/10
73	"OE"	1	..	75	,,	,,	1/10
75	HULK	1	*Nil*	*Nil*	,,	500	20



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APPENDIX VI—*concld.*

(*c*) MOTOR LAUNCHES AT BASRA.

Owned by Mespres.

Serial No.	Name.	Number of days to commission.	Passenger capacity.
			Natives.
1	BADOURA	2	72
2	BEE	2	30
3	DOROTHY	5	6
4	WASP	5	6
5	MOTH	2	15
6	PASHA	2	30
7	SHEIK	2	36

NOTE 1.—Serial No. 1 is a motor launch fitted with diesel engine.

Serial Nos. 2, 5, 6 and 7 are motor boats fitted with kerosine engines.

Serial Nos. 3 and 4 are motor boats fitted with petrol engines.

NOTE 2.—None of these craft have any towing capacity.

(*d*) MOTOR LAUNCHES AT BASRA VARIOUSLY OWNED.

180 registered at Basra comprising :—

24 with accommodation for 50 passengers.

1 ,, ,, ,, 346 ,,

2 ,, ,, ,, 153 ,,

43 ,, ,, ,, less than 20 passengers.

2 working as cargo bellums, load about 10 tons.

1 towing launch, capacity two barges of 100 tons freight each.

1 towing launch, capacity one barge of 100 tons freight.

104 miscellaneous small launches.

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APPENDIX VII.

Iraqi-owned River Craft.

(a) *Steamers.*

Owner.	Craft.	Type.	Gross tonnage.	Condition.	Remarks.
Meir Toeg and Jos. Moshi	HAMIDIYA	P. S.	132	Good	Laid up.
Do.	FARAH	P. S.	455	,,	Cargo capacity 250 tons, Working Basra-Baghdad.
Do.	AMIRI	S. T. SS.	52	,,	Laid up.
Abdul Jabbar el Khedery	ANDALUCIA	S. T. SS.	52	,,	Working Basra-Baghdad.
Do.	KUT	P. S.	150	,,	Do.
Do.	KARIMI	S. T.	150	,,	Do.
Do.	MOHAMMADI	P. S.	111	,,	Do.
Do.	AHMADI	P. S.	111	,,	Do.
Do.	SHATT-EL-ARAB	S. T.	52	,,	Do.
Do.	NAJAF	S. T.	150	,,	Laid up.
Do.	AMARAH	P. S.	150	,,	Do.
Haim Heskel	SHARGAT	S. W.	223	?	Plying Baghdad area.
Heskel Shalom	Fly Boat	..	..	?	Between Basra and Amarah.
Do.	P. S. 10	..	..	Good	Being converted to screw.
Do.	MEDANI	Motor vessel.	..	,,	Working; apparently not registered.
Do.	HILLAL	,,	..	,,	,, ,,

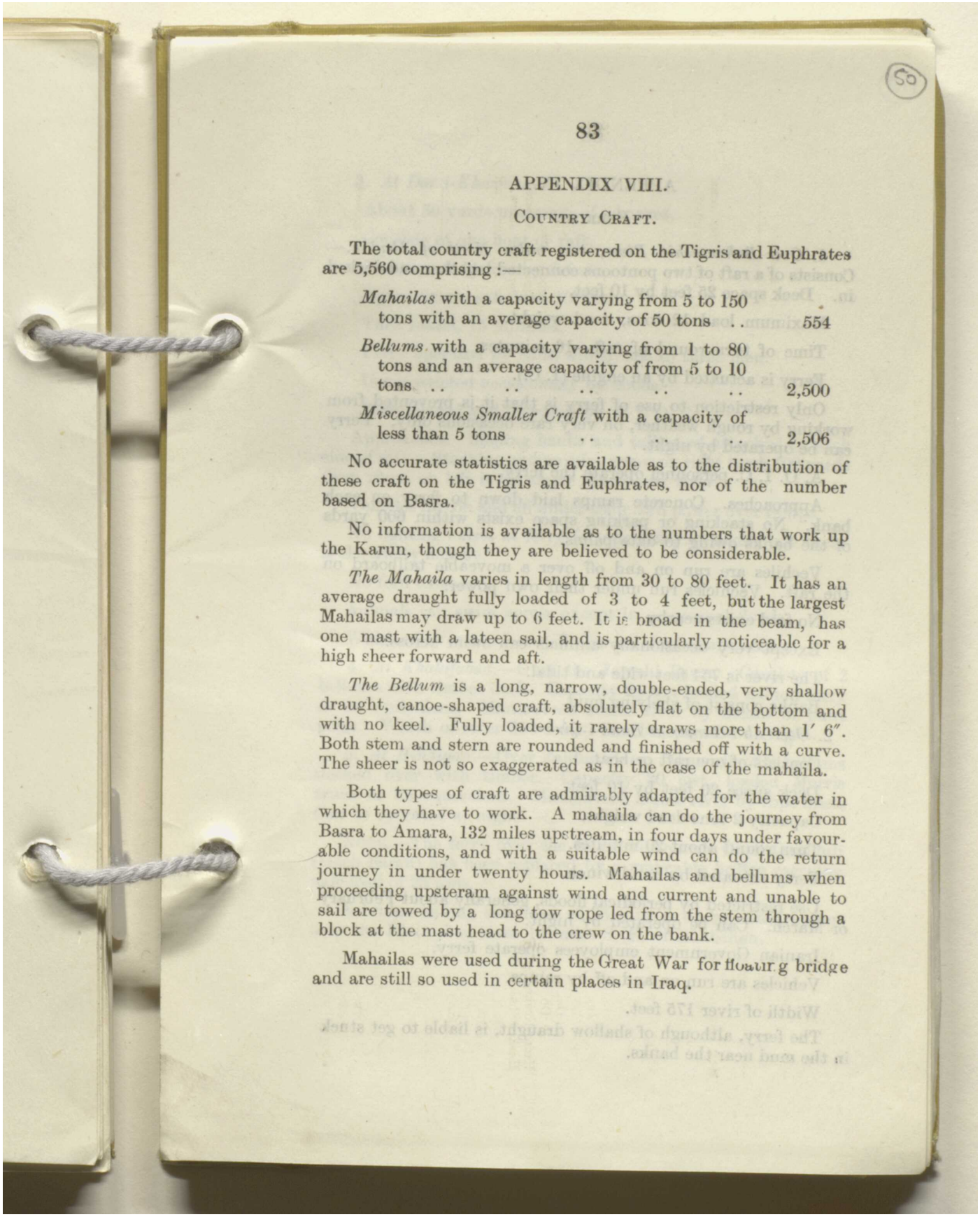
(b) *Barges.*

Meir Toeg owns 8 barges—capacity unknown.

Abdul Jabbar el Khedery owns 30 barges—capacity unknown.

Note.—The above list comprises only those vessels which might be of use to I. W. T.

The total number of Iraqi owned steamers is 35, but those not included in the list are either in bad condition or unable to proceed above Port limits.



APPENDIX VIII.

Country Craft.

The total country craft registered on the Tigris and Euphrates are 5,560 comprising :—

Mahailas with a capacity varying from 5 to 150 tons with an average capacity of 50 tons ..	554
Bellums with a capacity varying from 1 to 80 tons and an average capacity of from 5 to 10 tons	2,500
Miscellaneous Smaller Craft with a capacity of less than 5 tons	2,506

No accurate statistics are available as to the distribution of these craft on the Tigris and Euphrates, nor of the number based on Basra.

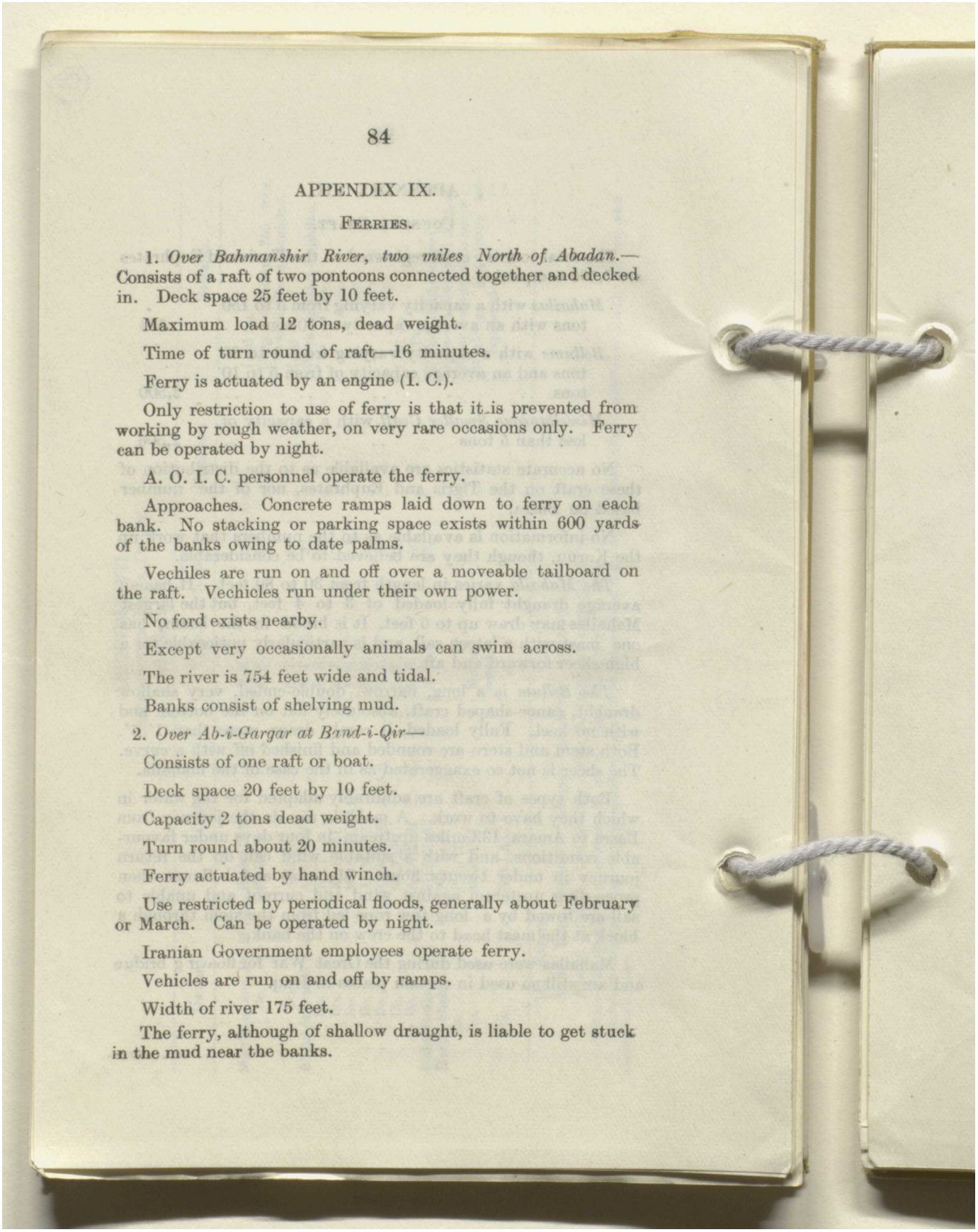
No information is available as to the numbers that work up the Karun, though they are believed to be considerable.

The Mahaila varies in length from 30 to 80 feet. It has an average draught fully loaded of 3 to 4 feet, but the largest Mahailas may draw up to 6 feet. It is broad in the beam, has one mast with a lateen sail, and is particularly noticeable for a high sheer forward and aft.

The Bellum is a long, narrow, double-ended, very shallow draught, canoe-shaped craft, absolutely flat on the bottom and with no keel. Fully loaded, it rarely draws more than 1′ 6″. Both stem and stern are rounded and finished off with a curve. The sheer is not so exaggerated as in the case of the mahaila.

Both types of craft are admirably adapted for the water in which they have to work. A mahaila can do the journey from Basra to Amara, 132 miles upstream, in four days under favourable conditions, and with a suitable wind can do the return journey in under twenty hours. Mahailas and bellums when proceeding upsteram against wind and current and unable to sail are towed by a long tow rope led from the stem through a block at the mast head to the crew on the bank.

Mahailas were used during the Great War for flouring bridge and are still so used in certain places in Iraq.



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APPENDIX IX.

FERRIES.

1. *Over Bahmanshir River, two miles North of Abadan.*—Consists of a raft of two pontoons connected together and decked in. Deck space 25 feet by 10 feet.

Maximum load 12 tons, dead weight.

Time of turn round of raft—16 minutes.

Ferry is actuated by an engine (I. C.).

Only restriction to use of ferry is that it is prevented from working by rough weather, on very rare occasions only. Ferry can be operated by night.

A. O. I. C. personnel operate the ferry.

Approaches. Concrete ramps laid down to ferry on each bank. No stacking or parking space exists within 600 yards of the banks owing to date palms.

Vechiles are run on and off over a moveable tailboard on the raft. Vechicles run under their own power.

No ford exists nearby.

Except very occasionally animals can swim across.

The river is 754 feet wide and tidal.

Banks consist of shelving mud.

2. *Over Ab-i-Gargar at Band-i-Qir*—

Consists of one raft or boat.

Deck space 20 feet by 10 feet.

Capacity 2 tons dead weight.

Turn round about 20 minutes.

Ferry actuated by hand winch.

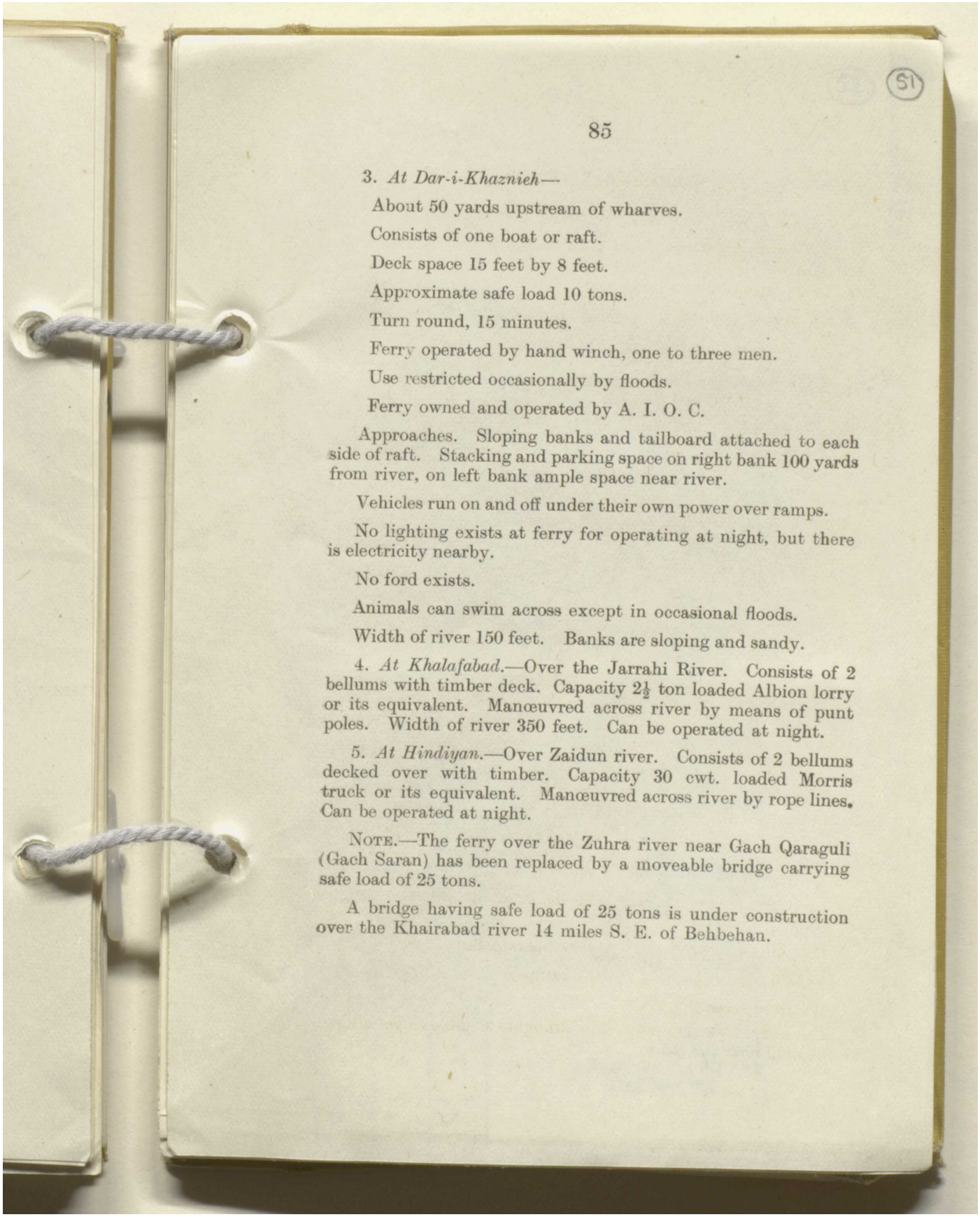
Use restricted by periodical floods, generally about February or March. Can be operated by night.

Iranian Government employees operate ferry.

Vehicles are run on and off by ramps.

Width of river 175 feet.

The ferry, although of shallow draught, is liable to get stuck in the mud near the banks.



3. *At Dar-i-Khaznieh*—

About 50 yards upstream of wharves.

Consists of one boat or raft.

Deck space 15 feet by 8 feet.

Approximate safe load 10 tons.

Turn round, 15 minutes.

Ferry operated by hand winch, one to three men.

Use restricted occasionally by floods.

Ferry owned and operated by A. I. O. C.

Approaches. Sloping banks and tailboard attached to each side of raft. Stacking and parking space on right bank 100 yards from river, on left bank ample space near river.

Vehicles run on and off under their own power over ramps.

No lighting exists at ferry for operating at night, but there is electricity nearby.

No ford exists.

Animals can swim across except in occasional floods.

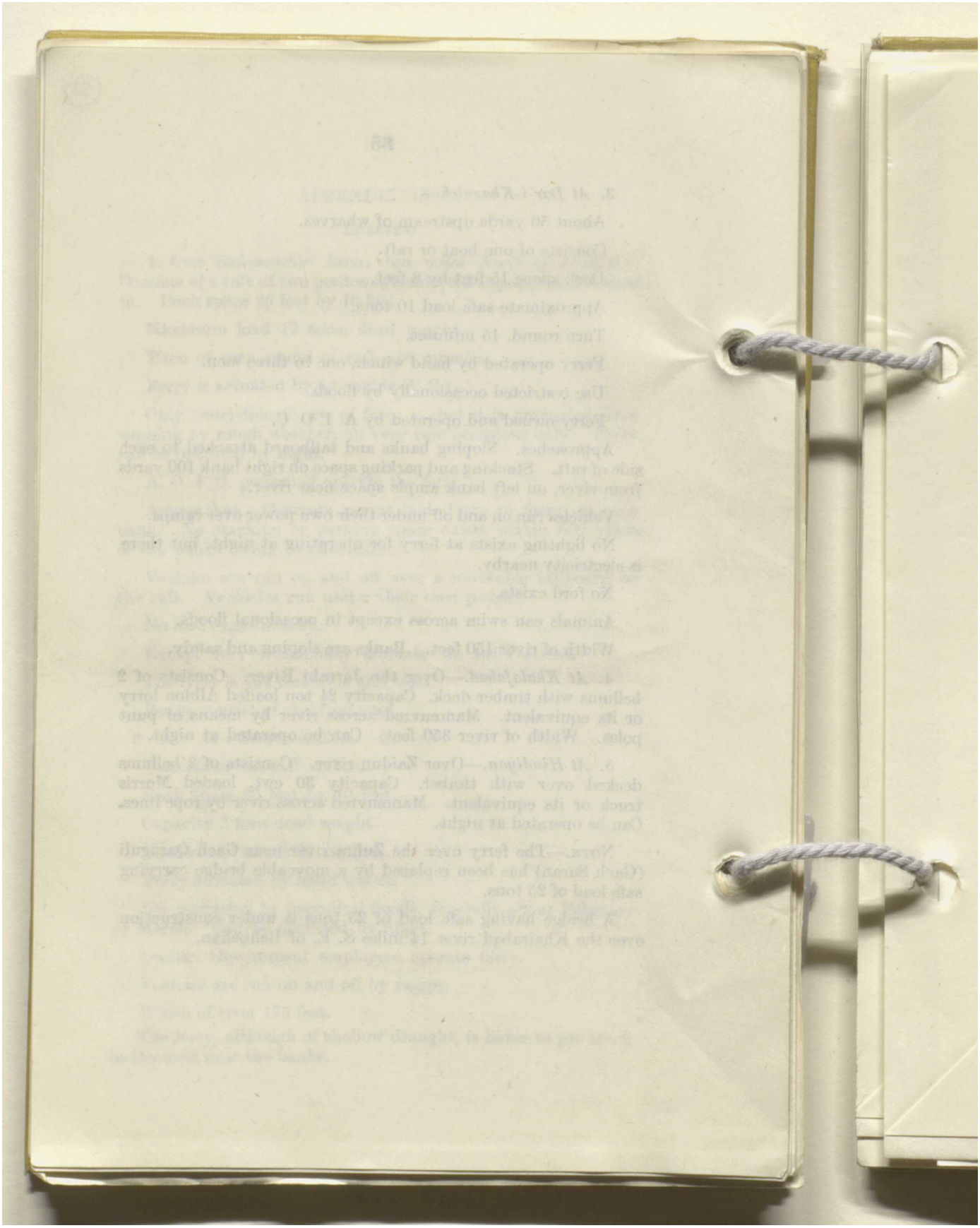
Width of river 150 feet. Banks are sloping and sandy.

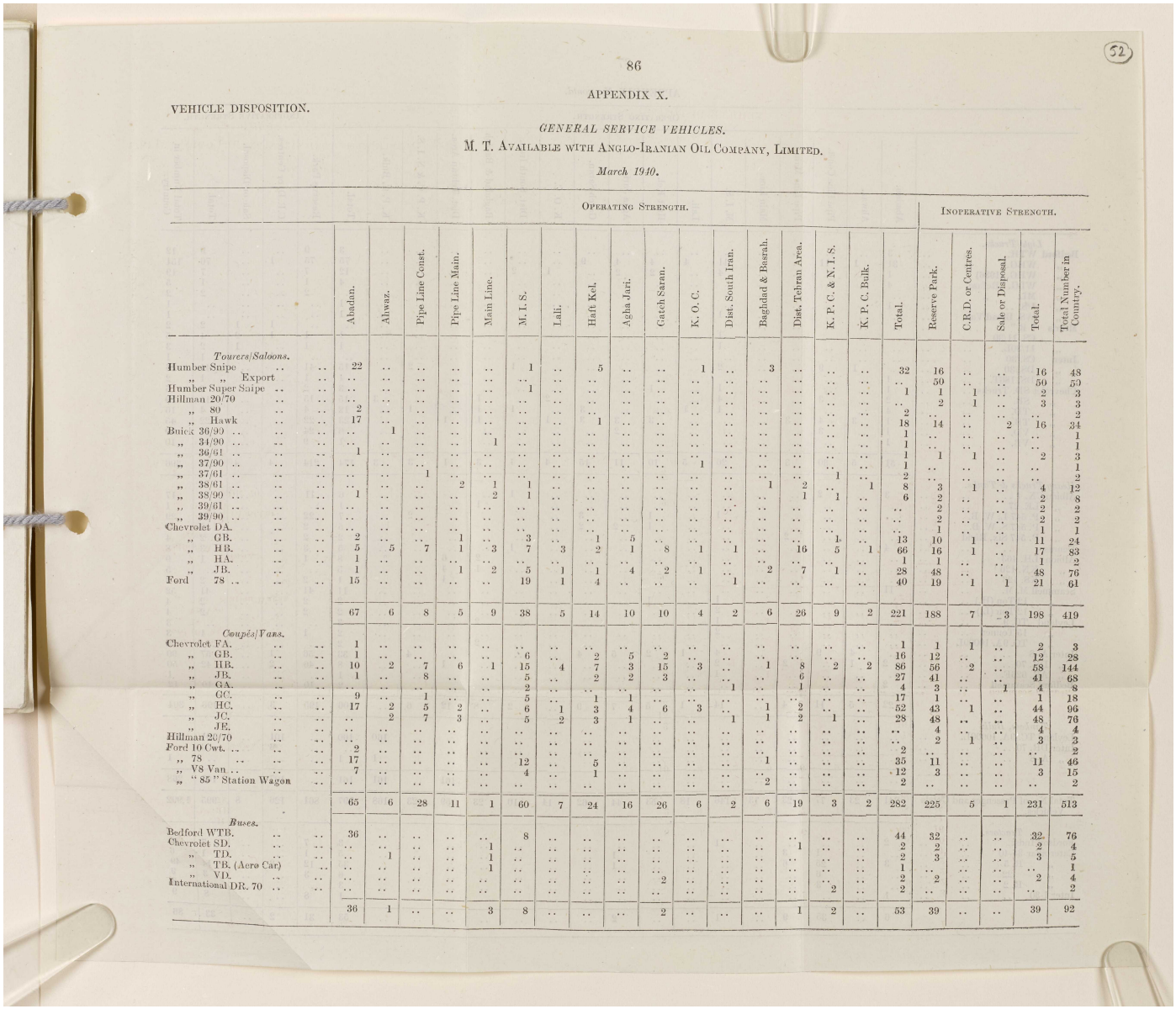
4. *At Khalafabad.*—Over the Jarrahi River. Consists of 2 bellums with timber deck. Capacity 2½ ton loaded Albion lorry or its equivalent. Manœuvred across river by means of punt poles. Width of river 350 feet. Can be operated at night.

5. *At Hindiyan.*—Over Zaidun river. Consists of 2 bellums decked over with timber. Capacity 30 cwt. loaded Morris truck or its equivalent. Manœuvred across river by rope lines. Can be operated at night.

NOTE.—The ferry over the Zuhra river near Gach Qaraguli (Gach Saran) has been replaced by a moveable bridge carrying safe load of 25 tons.

A bridge having safe load of 25 tons is under construction over the Khairabad river 14 miles S. E. of Behbehan.





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APPENDIX X.

VEHICLE DISPOSITION.

GENERAL SERVICE VEHICLES.

M. T. AVAILABLE WITH ANGLO-IRANIAN OIL COMPANY, LIMITED.

March 1940.

	Operating Strength.																	Inoperative Strength.				
	Abadan.	Ahwaz.	Pipe Line Const.	Pipe Line Main.	Main Line.	M. I. S.	Lali.	Haft Kel.	Agha Jari.	Gatch Saran.	K. O. C.	Dist. South Iran.	Baghdad & Basrah.	Dist. Tehran Area.	K. P. C. & N. I. S.	K. P. C. Bulk.	Total.	Reserve Park.	C.R.D. or Centres.	Sale or Disposal.	Total.	Total Number in Country.
Tourers/Saloons.																						
Humber Snipe	22	..	..	..	..	1	..	5	..	..	1	..	3	..	..	..	32	16	..	..	16	48
„ „ Export	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	50	..	..	50	50
Humber Super Snipe	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	1	1	..	2	3
Hillman 20/70	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	3	3
„ 80	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	2
„ Hawk	17	..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	18	14	..	2	16	34
Buick 36/90	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
„ 34/90	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
„ 36/61	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	..	2	3
„ 37/90	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	1	..	..	..	..	1
„ 37/61	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	2	..	..	..	..	2
„ 38/61	..	..	..	2	1	1	..	..	..	..	..	..	1	2	..	1	8	3	1	..	4	12
„ 38/90	1	..	..	..	2	1	..	..	..	..	..	..	..	1	1	..	6	2	..	..	2	8
„ 39/61	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	2	2
„ 39/90	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	2	2
Chevrolet DA.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	1
„ GB.	2	..	..	1	..	3	..	1	5	..	..	..	..	..	1	..	13	10	1	..	11	24
„ HB.	5	5	7	1	3	7	3	2	1	8	1	1	..	16	5	1	66	16	1	..	17	83
„ HA.	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	2
„ JB.	1	..	..	1	2	5	1	1	4	2	1	..	2	7	1	..	28	48	..	..	48	76
Ford 78	15	..	..	..	..	19	1	4	..	..	..	1	..	..	..	..	40	19	1	1	21	61
	67	6	8	5	9	38	5	14	10	10	4	2	6	26	9	2	221	188	7	3	198	419
Coupés/Vans.																						
Chevrolet FA.	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1	..	2	3
„ GB.	1	..	..	..	..	6	..	2	5	2	..	..	..	..	..	..	16	12	..	..	12	28
„ HB.	10	2	7	6	1	15	4	7	3	15	3	..	1	8	2	2	86	56	2	..	58	144
„ JB.	1	..	8	..	..	5	..	2	2	3	..	..	..	6	..	..	27	41	..	..	41	68
„ GA.	..	..	..	..	..	2	..	..	..	..	..	1	..	1	..	..	4	3	..	1	4	8
„ GC.	9	..	1	..	..	5	..	1	1	..	..	..	..	..	..	..	17	1	..	..	1	18
„ HC.	17	2	5	2	..	6	1	3	4	6	3	..	1	2	..	..	52	43	1	..	44	96
„ JC.	..	2	7	3	..	5	2	3	1	..	..	1	1	2	1	..	28	48	..	..	48	76
„ JE.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	..	..	4	4
Hillman 20/70	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	1	..	3	3
Ford 10 Cwt.	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	2
„ 78	17	..	..	..	..	12	..	5	..	..	..	..	..	1	..	..	35	11	..	..	11	46
„ V8 Van	7	..	..	..	..	4	..	1	..	..	..	..	..	..	..	..	12	3	..	..	3	15
„ "85" Station Wagon	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	2	..	..	..	..	2
	65	6	28	11	1	60	7	24	16	26	6	2	6	19	3	2	282	225	5	1	231	513
Buses.																						
Bedford WTB.	36	..	..	..	..	8	..	..	..	..	..	..	..	..	..	..	44	32	..	..	32	76
Chevrolet SD.	..	..	..	..	1	..	..	..	..	..	..	..	..	1	..	..	2	2	..	..	2	4
„ TD.	..	1	..	..	1	..	..	..	..	..	..	..	..	..	..	..	2	3	..	..	3	5
„ TB. (Aero Car)	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
„ VD.	..	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	2	2	..	..	2	4
International DR. 70	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	2	..	..	..	..	2
	36	1	..	..	3	8	..	..	..	2	..	..	..	1	2	..	53	39	..	..	39	92

"تقرير عسكري عن منطقة حقول نفط شركة النفط الأنجلو-إيرانية (في جنوب إيران)" [٥٢ظ] (١١٣/١٥٠)

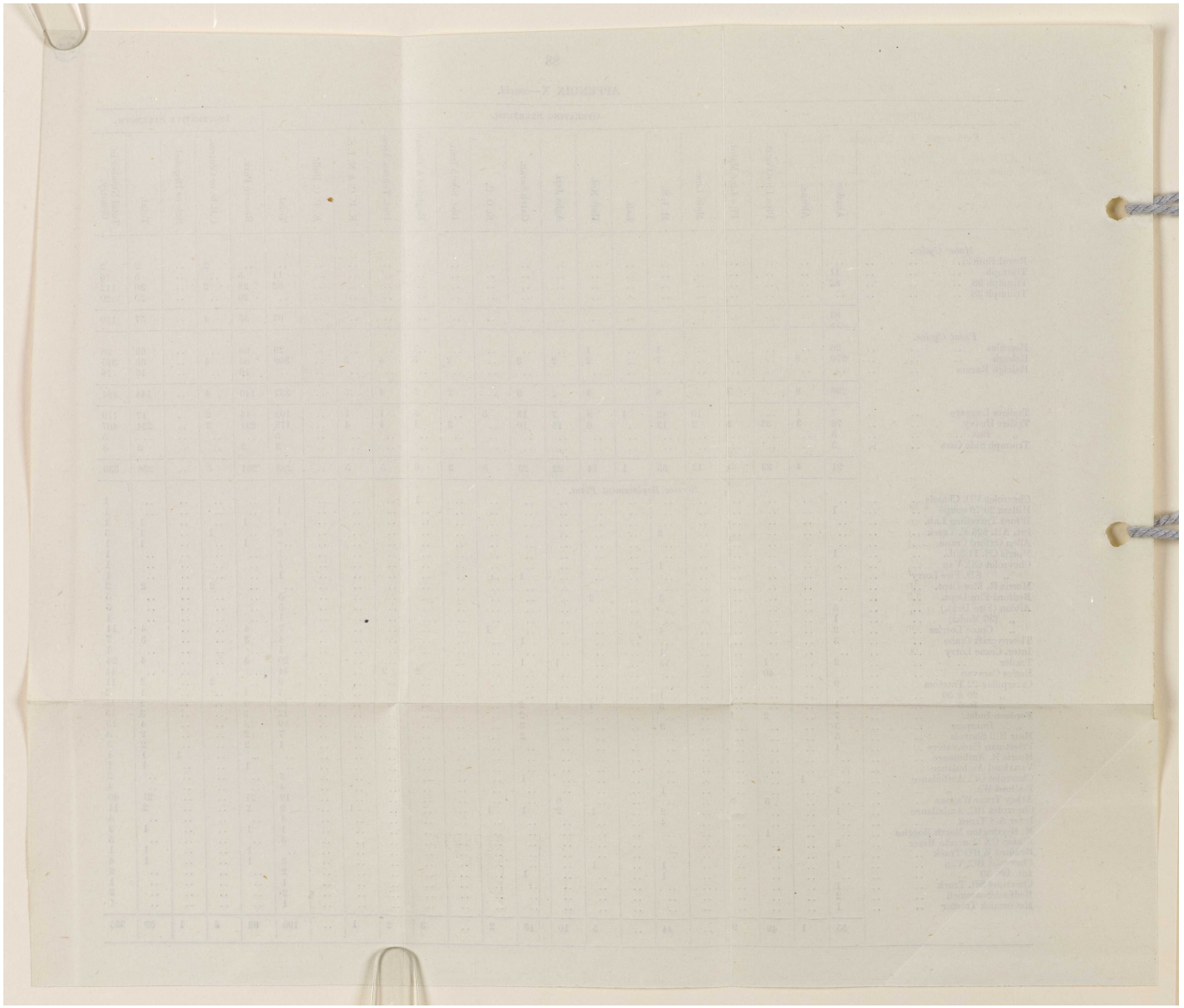
APPENDIX X—*contd.*

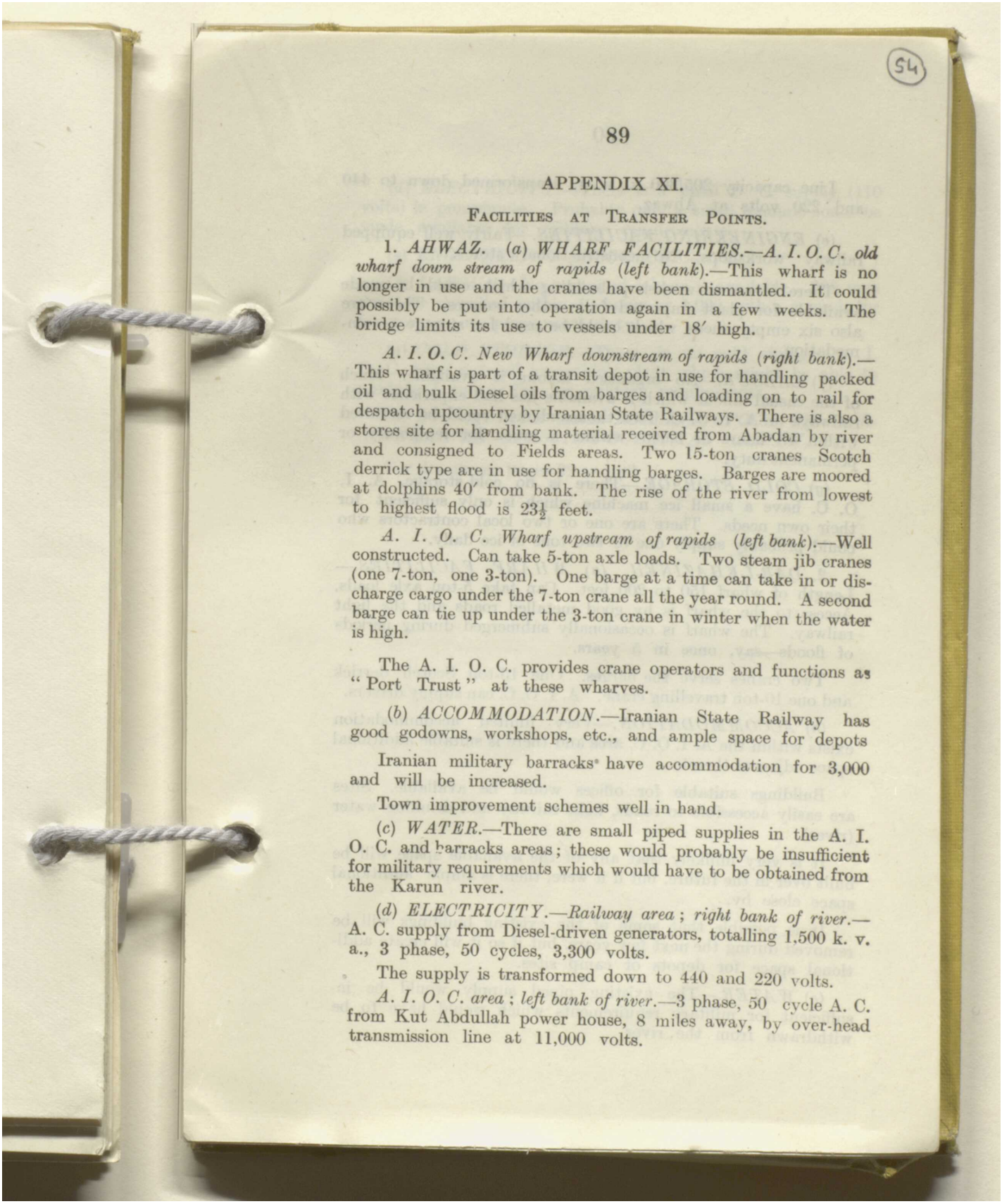
	Operating Strength.																	Inoperative Strength.				
	Abadan.	Ahwaz.	Pipe Line Const.	Pipe Line Main.	Main Line.	M. I. S.	Lali.	Haft Kel.	Agha Jari.	Gatch Saran.	K. O. C.	Dist. South Iran.	Baghdad & Basrah.	Dist. Tehran Area.	K. P. C. & N. L. S.	K. P. C. Bulk.	Total.	Reserve Park.	C.R.D. or Centres.	Sale or Disposal.	Total.	Total Number in Country.
Light Trucks.																						
Bedford WTH.	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	9	..	..	9	12
„ WHG.	31	1	11	..	..	11	4	4	4	9	..	..	..	..	..	..	75	75	1	..	76	151
„ WHG. (1936)	1	..	..	..	..	4	..	2	2	..	1	2	..	..	..	..	12	7	..	..	7	19
„ WLG. Refuse	4	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	4	1	..	..	1	5
„ ML. „	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	2	2
„ MS.	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
„ WS. Bread Van	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
Morris "R" ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	2	2
„ CS. 11/30 ..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	1	1	2	4	5
„ 11/30L. ..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	1	..	1	2	3
Inter CS./30 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	1	1
„ DS./30 ..	..	1	9	..	..	2	..	..	..	..	..	1	..	..	2	..	15	41	..	..	41	56
„ DS.186T. ..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	2
Chevrolet SD. Trucks ..	1	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	3	2	..	..	2	5
„ SB. ..	2	..	3	..	..	4	..	..	..	..	2	..	1	..	..	3	15	15	..	..	15	30
„ TD. ..	4	..	..	..	..	1	3	..	..	3	..	1	1	..	1	..	12	4	..	..	4	16
„ TB. ..	1	3	4	3	..	..	..	3	3	3	1	..	1	1	..	..	23	22	..	..	22	45
„ VD. ..	1	..	3	..	..	..	..	..	2	..	..	..	..	..	..	..	6	24	..	..	24	30
„ VB. ..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	9	..	..	9	10
	51	5	30	3	..	26	5	10	11	15	4	4	3	1	3	3	174	214	4	4	222	396
Heavy Trucks & Tanks.																						
Albion CX. 4	3	..	2	..	..	..	..	..	..	..	..	1	..	..	..	..	6	11	..	..	11	17
„ LE. 27 ..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	1
„ P. 547 L. W. B. ..	..	..	..	..	..	1	..	1	..	3	..	..	..	..	2	..	7	22	..	..	22	29
„ P. 547 S. W. B. ..	..	..	..	..	..	..	..	1	2	2	..	..	..	..	..	..	5	2	..	..	2	7
„ P. 547 Six, Rigid ..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	..	..	2	2	..	..	2	4
Dennis	4	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	5	3	..	..	3	8
Albion LH. 463 ..	..	..	..	..	..	..	..	..	..	..	..	..	2	6	..	..	8	1	..	..	1	9
„ KN. 126 ..	..	..	..	..	..	..	..	..	..	..	..	..	1	4	..	..	5	..	..	..	..	5
„ KS. 126 ..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	2	..	..	2	3
Scammell M. M. ..	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	41	..	..	41	52
„ 12 Ton (H.) ..	..	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	2	2	..	..	2	4
„ 12 Ton (L.) ..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	2	2	..	..	2	4
Leyland TC. 9 ..	..	..	..	..	..	1	..	..	..	..	..	..	2	..	..	..	3	..	..	..	..	3
„ 15 Tonner ..	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	2	1	..	..	1	3
„ TC. 9A. 10000L ..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	2	..	..	..	..	2
Inter A.-8	..	4	9	..	..	4	1	2	5	4	..	..	..	..	4	..	33	56	1	..	57	90
„ DR. 70	2	1	..	2	..	2	..	..	..	..	..	..	..	1	..	..	8	40	2	..	42	50
„ AR. 626F. ..	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
Bedford Scammell	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	10	..	..	10	12
	22	5	11	4	..	14	1	5	7	9	..	2	8	12	6	..	106	195	3	..	198	304
Tankers, Bulk.																						
Leyland TC. 9A, 10000L. ..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	160	160	..	101	..	101	261
Inter DR. 70	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	6	..	6	6
„ A.-8	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	..	..	1
	..	..	..	..	..	..	..	..	..	..	..	..	..	161	..	161	161	..	107	..	107	268
Total No. of Passenger and Goods Vehicles.	241	23	77	23	13	146	18	53	44	62	14	10	23	59	23	168	997	861	126	8	995	1,992
Tractors.																						
Fordson Indst.	2	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	3	7	..	..	7	10
Caterpillar 35-40	..	..	1	3	..	..	..	..	1	..	..	..	..	..	..	..	5	1	..	..	1	6
„ R. 5	3	..	25	6	..	..	..	..	1	..	..	..	..	..	..	..	35	12	2	..	14	49
„ 22	..	..	6	..	..	..	..	..	..	..	..	..	..	..	..	..	6	3	..	..	3	9
„ R. 2	..	..	3	..	..	..	..	..	..	..	..	..	..	..	..	..	3	..	..	..	..	3
Inter 1-30	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	8	..	..	8	9
	6	..	35	9	..	1	..	..	2	..	..	..	..	..	..	..	53	31	2	..	33	86

"تقرير عسكري عن منطقة حقول نفط شركة النفط الأنجلو-إيرانية (في جنوب إيران)" [٥٣و] (١١٤/١٥٠)

APPENDIX X—*concld.*

	Operating Strength.																	Inoperative Strength.				
	Abadan.	Ahwaz.	Pipe Line Const.	Pipe Line Maint.	Main Line.	M. I. S.	Lali.	Haft Kel.	Agha Jari.	Gatch Saran.	K. O. C.	Dist. South Iran.	Baghdad & Basrah.	Dist. Tehran Area.	K. P. C. & N. I. S.	K. P. C. Bulk.	Total.	Reserve Park.	C.R.D. or Centres.	Sale or Disposal.	Total.	Total Number in Country.
Motor Cycles.																						
Royal Enfield	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	2	2
Triumph	11	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	11	5	..	..	5	16
Triumph 6S	82	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	82	28	2	..	30	112
Triumph 3S	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	20	..	..	20	20
	93	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	93	53	4	..	57	150
Pedal Cycles.																						
Hercules	26	..	..	1	..	1	..	1	..	..	..	..	..	..	..	..	29	69	..	..	69	98
Releigh	270	8	..	..	..	7	..	2	2	3	..	2	5	4	5	..	308	55	4	..	59	367
Raleigh Racers	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	16	..	..	16	16
	296	8	..	1	..	8	..	3	2	3	..	2	5	4	5	..	337	140	4	..	144	481
Trailers Luggage	7	1	..	1	10	42	1	8	7	13	5	..	5	1	1	..	102	15	2	..	17	119
Trailer Heavy	76	3	33	3	2	13	..	6	15	10	..	3	1	4	4	..	173	231	3	..	234	407
„ Bus	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	5
Triumph Side Cars	3	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	3	5	..	..	5	8
	91	4	33	4	12	55	1	14	22	23	5	3	6	5	5	..	283	251	5	..	256	539
Service Replacement Plant.																						
Chevrolet VD. Chassis	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	1	..	..	..	..	1
Hillam 20/70 coupé	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
B'ford Travelling Lab.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	1
Int. AR. 626 F. Truck	..	..	..	..	..	2	..	..	..	..	..	..	..	..	..	..	2	..	1	..	1	3
Allen Oxford Crane	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	1
Morris CS. 11/30L.	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
Chevrolet GC. Van	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
„ SD. Fire Lorry	..	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	1	..	..	..	..	1
Morris R. Fire Dept.	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	2	2
Bedford Fire Dept.	..	..	..	..	..	3	..	2	..	..	..	..	..	..	..	..	5	..	..	..	..	5
Albion (Fire Dept.)	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	5
„ (36 Model)	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
„ Crane Lorries	2	..	..	..	..	4	..	..	..	..	1	..	..	..	..	..	7	4	..	..	4	11
Thornycraft Crane	3	..	..	..	..	..	..	..	..	1	..	..	..	..	..	..	4	3	..	..	3	7
Inter. Crane Lorry	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
Trailer	2	..	1	..	..	15	..	..	1	1	..	..	..	..	..	..	20	4	..	..	4	24
Eccles Caravan	..	..	40	..	..	..	..	..	..	..	..	..	2	2	..	..	44	..	..	..	..	44
Caterpillar 22 Tractors	9	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	9	..	2	..	2	11
„ 20 & 50	..	..	..	..	..	1	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	2
„ R. 5	1	..	..	..	..	5	..	1	1	2	..	..	..	..	..	..	10	1	..	..	1	11
Fordson Indst.	7	..	2	1	..	..	..	..	..	2	..	..	..	..	..	..	12	3	..	..	3	15
„ Dumpers	3	..	..	..	..	3	..	..	..	3	..	..	..	..	..	..	9	4	..	..	4	13
Muir Hill Shovels	5	..	..	..	..	..	..	..	..	2	..	..	..	..	..	..	7	2	..	..	2	9
Priestman Excavators	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	2	..	..	2	3
Morris R. Ambulance	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	1
Vauxhaul Ambulance	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	1
Chevrolet GC. Ambulance	..	1	..	..	..	..	..	..	..	1	..	..	..	..	..	..	2	..	..	..	..	2
Bedford Ws. „	3	..	..	..	1	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	4
Athey Truss Wagons	..	..	5	8	..	..	..	..	6	..	..	..	..	..	..	..	19	21	..	..	21	40
Chevrolet HC. Ambulance	1	..	..	..	2	..	1	2	1	1	..	..	..	..	1	..	9	2	..	..	2	11
Inter A-8 Truck	..	..	..	..	4	..	..	..	..	..	..	..	..	..	..	..	4	..	..	..	..	4
M. Herrington Marsh Boggies	..	..	1	..	..	..	..	..	..	..	..	..	..	..	..	..	1	1	..	..	1	2
Albion CX Concrete Mixer	5	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	5	..	..	..	..	5
Bedford WHG Truck	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	1	1
Chevrolet HC. Van	1	..	..	..	..	1	..	1	..	..	..	..	..	..	..	..	3	1	..	..	1	4
Int. DS. 30	..	..	..	..	..	1	..	..	..	1	..	..	..	..	..	..	2	..	..	..	..	2
Chevrolet SB. Truck	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
Bedford/Scammell	2	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	2	..	..	..	..	2
McCormick Tractor	1	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1	..	..	..	..	1
	55	1	49	9	..	44	..	5	10	15	2	..	3	2	1	..	196	53	5	1	59	255





APPENDIX XI.

Facilities at Transfer Points.

1. *AHWAZ.* (*a*) *WHARF FACILITIES.—A. I. O. C. old wharf down stream of rapids* (*left bank*).—This wharf is no longer in use and the cranes have been dismantled. It could possibly be put into operation again in a few weeks. The bridge limits its use to vessels under 18′ high.

A. I. O. C. New Wharf downstream of rapids (*right bank*).—This wharf is part of a transit depot in use for handling packed oil and bulk Diesel oils from barges and loading on to rail for despatch upcountry by Iranian State Railways. There is also a stores site for handling material received from Abadan by river and consigned to Fields areas. Two 15-ton cranes Scotch derrick type are in use for handling barges. Barges are moored at dolphins 40′ from bank. The rise of the river from lowest to highest flood is 23½ feet.

A. I. O. C. Wharf upstream of rapids (*left bank*).—Well constructed. Can take 5-ton axle loads. Two steam jib cranes (one 7-ton, one 3-ton). One barge at a time can take in or discharge cargo under the 7-ton crane all the year round. A second barge can tie up under the 3-ton crane in winter when the water is high.

The A. I. O. C. provides crane operators and functions as "Port Trust" at these wharves.

(*b*) *ACCOMMODATION.*—Iranian State Railway has good godowns, workshops, etc., and ample space for depots

Iranian military barracks have accommodation for 3,000 and will be increased.

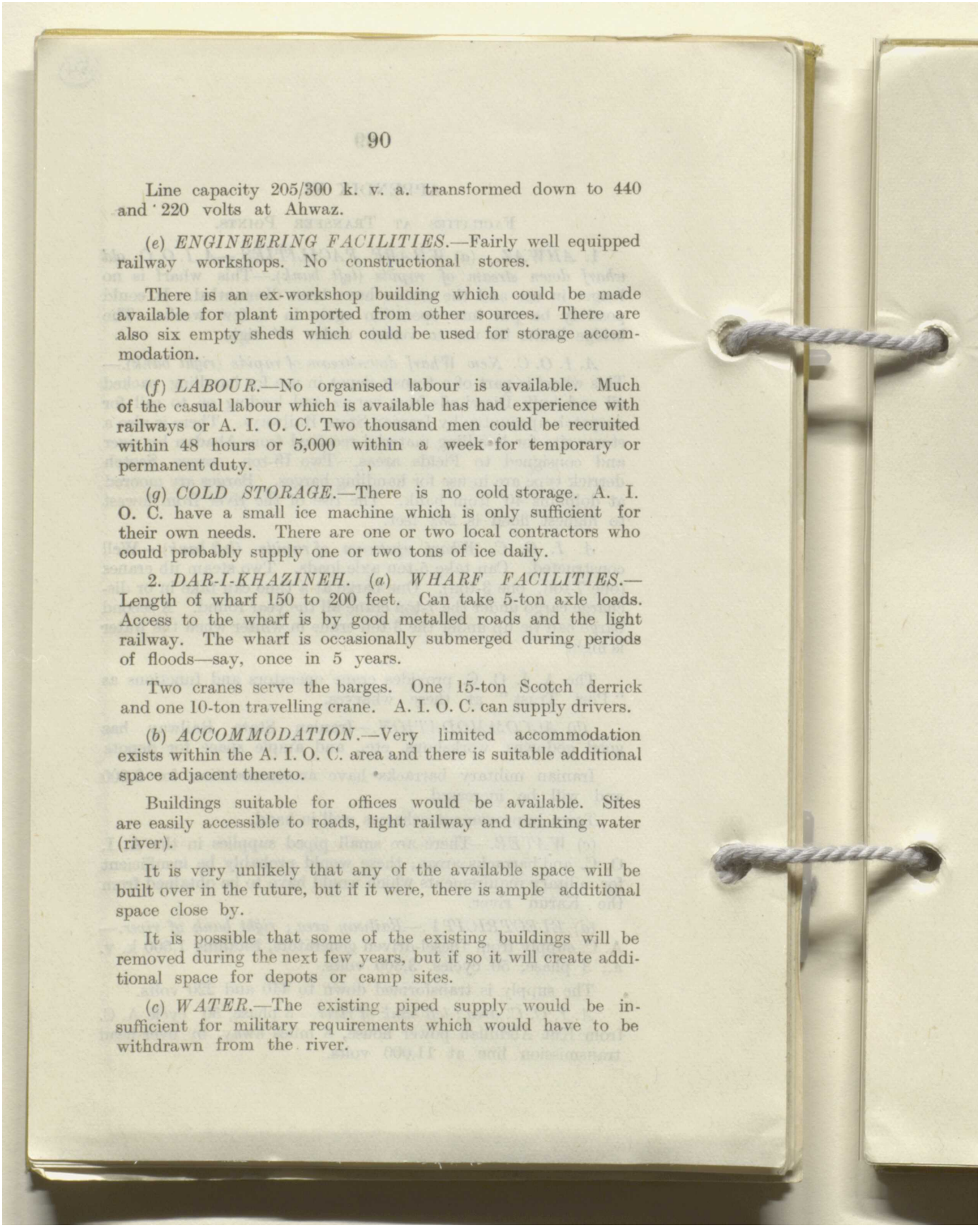
Town improvement schemes well in hand.

(*c*) *WATER.*—There are small piped supplies in the A. I. O. C. and barracks areas; these would probably be insufficient for military requirements which would have to be obtained from the Karun river.

(*d*) *ELECTRICITY.—Railway area; right bank of river.*—A. C. supply from Diesel-driven generators, totalling 1,500 k. v. a., 3 phase, 50 cycles, 3,300 volts.

The supply is transformed down to 440 and 220 volts.

A. I. O. C. area; left bank of river.—3 phase, 50 cycle A. C. from Kut Abdullah power house, 8 miles away, by over-head transmission line at 11,000 volts.



Line capacity 205/300 k. v. a. transformed down to 440 and 220 volts at Ahwaz.

(*e*) *ENGINEERING FACILITIES.*—Fairly well equipped railway workshops. No constructional stores.

There is an ex-workshop building which could be made available for plant imported from other sources. There are also six empty sheds which could be used for storage accommodation.

(*f*) *LABOUR.*—No organised labour is available. Much of the casual labour which is available has had experience with railways or A. I. O. C. Two thousand men could be recruited within 48 hours or 5,000 within a week for temporary or permanent duty.

(*g*) *COLD STORAGE.*—There is no cold storage. A. I. O. C. have a small ice machine which is only sufficient for their own needs. There are one or two local contractors who could probably supply one or two tons of ice daily.

2. *DAR-I-KHAZINEH.* (*a*) *WHARF FACILITIES.*—Length of wharf 150 to 200 feet. Can take 5-ton axle loads. Access to the wharf is by good metalled roads and the light railway. The wharf is occasionally submerged during periods of floods—say, once in 5 years.

Two cranes serve the barges. One 15-ton Scotch derrick and one 10-ton travelling crane. A. I. O. C. can supply drivers.

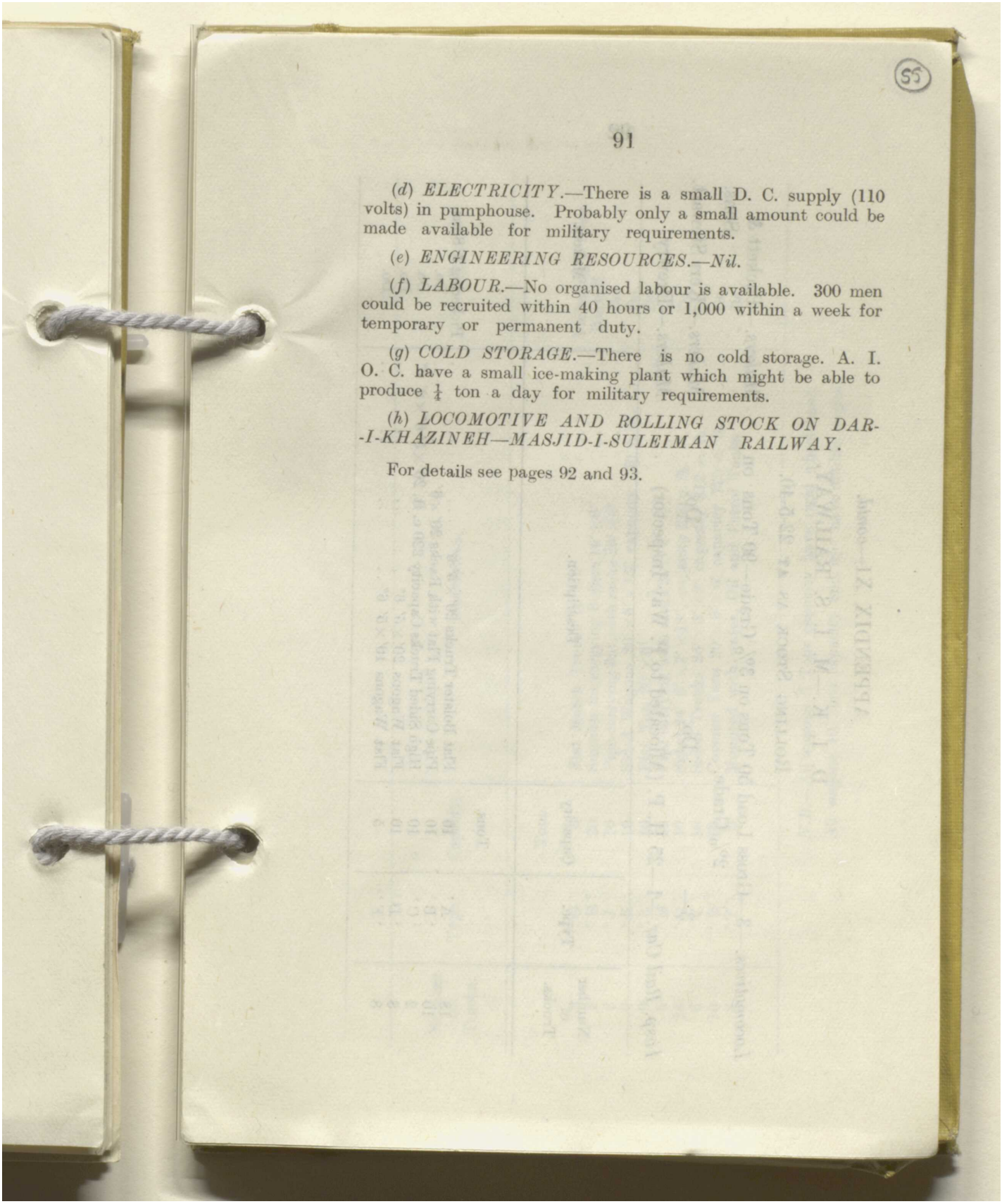
(*b*) *ACCOMMODATION.*—Very limited accommodation exists within the A. I. O. C. area and there is suitable additional space adjacent thereto.

Buildings suitable for offices would be available. Sites are easily accessible to roads, light railway and drinking water (river).

It is very unlikely that any of the available space will be built over in the future, but if it were, there is ample additional space close by.

It is possible that some of the existing buildings will be removed during the next few years, but if so it will create additional space for depots or camp sites.

(*c*) *WATER.*—The existing piped supply would be insufficient for military requirements which would have to be withdrawn from the river.



(*d*) *ELECTRICITY.*—There is a small D. C. supply (110 volts) in pumphouse. Probably only a small amount could be made available for military requirements.

(*e*) *ENGINEERING RESOURCES.—Nil.*

(*f*) *LABOUR.*—No organised labour is available. 300 men could be recruited within 40 hours or 1,000 within a week for temporary or permanent duty.

(*g*) *COLD STORAGE.*—There is no cold storage. A. I. O. C. have a small ice-making plant which might be able to produce ¼ ton a day for military requirements.

(*h*) *LOCOMOTIVE AND ROLLING STOCK ON DAR-I-KHAZINEH—MASJID-I-SULEIMAN RAILWAY.*

For details see pages 92 and 93.

APPENDIX XI—*contd.*

D. I. K.—M. I. S. RAILWAY.

ROLLING STOCK AS AT 22-5-40.

Locomotives.—3—Gross Load 50 Tons on 3% Grade—90 Tons on 2% Grade. *Makers.*—Packett & Sons.

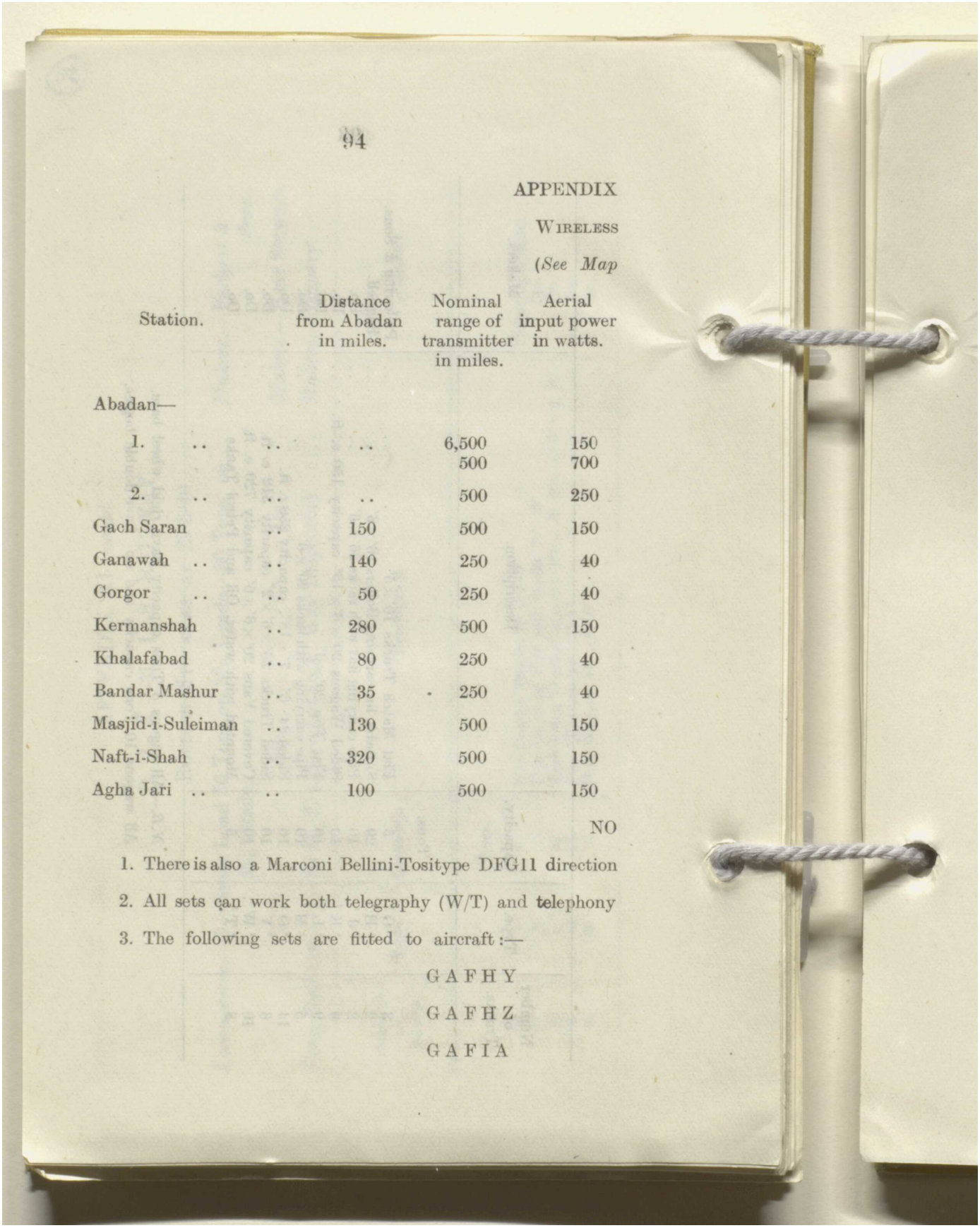
3— Do. Do. *Makers.*—Kerr Stewart.

Insp. Rail Car.—1—25 H. P. (Allocated to P. Way Inspector) . . *Makers.*—Drewry.

Number of Trucks.	Type.	Capacity.	Description.	Makers.
		Tons.		
18	'A'	10	Flat Bolster Trucks 20′×5′-6″	Pickering & Sons.
10	'B'	10	Pipe Carrying Flat with Racks 20′×6′	Do.
2	'C'	10	High Sided Trucks Capacity 220 c. ft. 20′×5′ 6″×2′ 6″	Do.
8	'D'	10	Flat Wagons 20′×5′ 6″	Do.
8	'F'	5	Flat Wagons 10′×5′ 6″	Do.

Number of Trucks.	Type.	Capacity. Tons.	Description.	Makers.
3	'G'	5	Flat Match Trucks 10′×5′ ..	Pickering & Sons.
2	'H'	20	Suitable for carrying Boilers 16′×6′ ..	Bagnell.
2	'J'	10	Pipe carrying flat with racks 26′×6′ ..	Do.
9	'K'	10	Sided Wagons 20′×6′×15″ capacity 150 c. ft.	Do.
9	'L'	10	Flat Top 20′×6′ ..	Do.
5	'M'	10	Pipe carrying with racks 20′×6′ ..	Do.
14	'O'	10	Sided 24′ 6″×7′×18″, capacity 250 c. ft. ..	Do.
6	'V'	10	Sided Trucks 26′×6′×2′ capacity 312 c. ft. ..	Do.
10	'W'.	10	Covered Vans 20′×6′×6′ capacity 720 c. ft. ..	Do.
8	'T'.	5	Mounted with water, Oil and Petrol Tanks ..	Do.

N.B.—All wagons 5 Tons capacity have rigid wheel base.
All wagons 10 Tons capacity and up have double bogies.



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APPENDIX

WIRELESS

(*See Map*

Station.	Distance from Abadan in miles.	Nominal range of transmitter in miles.	Aerial input power in watts.
Abadan—			
1.		6,500	150
		500	700
2.		500	250
Gach Saran ..	150	500	150
Ganawah	140	250	40
Gorgor	50	250	40
Kermanshah ..	280	500	150
Khalafabad ..	80	250	40
Bandar Mashur ..	35	250	40
Masjid-i-Suleiman ..	130	500	150
Naft-i-Shah ..	320	500	150
Agha Jari	100	500	150

NO

1. There is also a Marconi Bellini-Tositype DFG11 direction

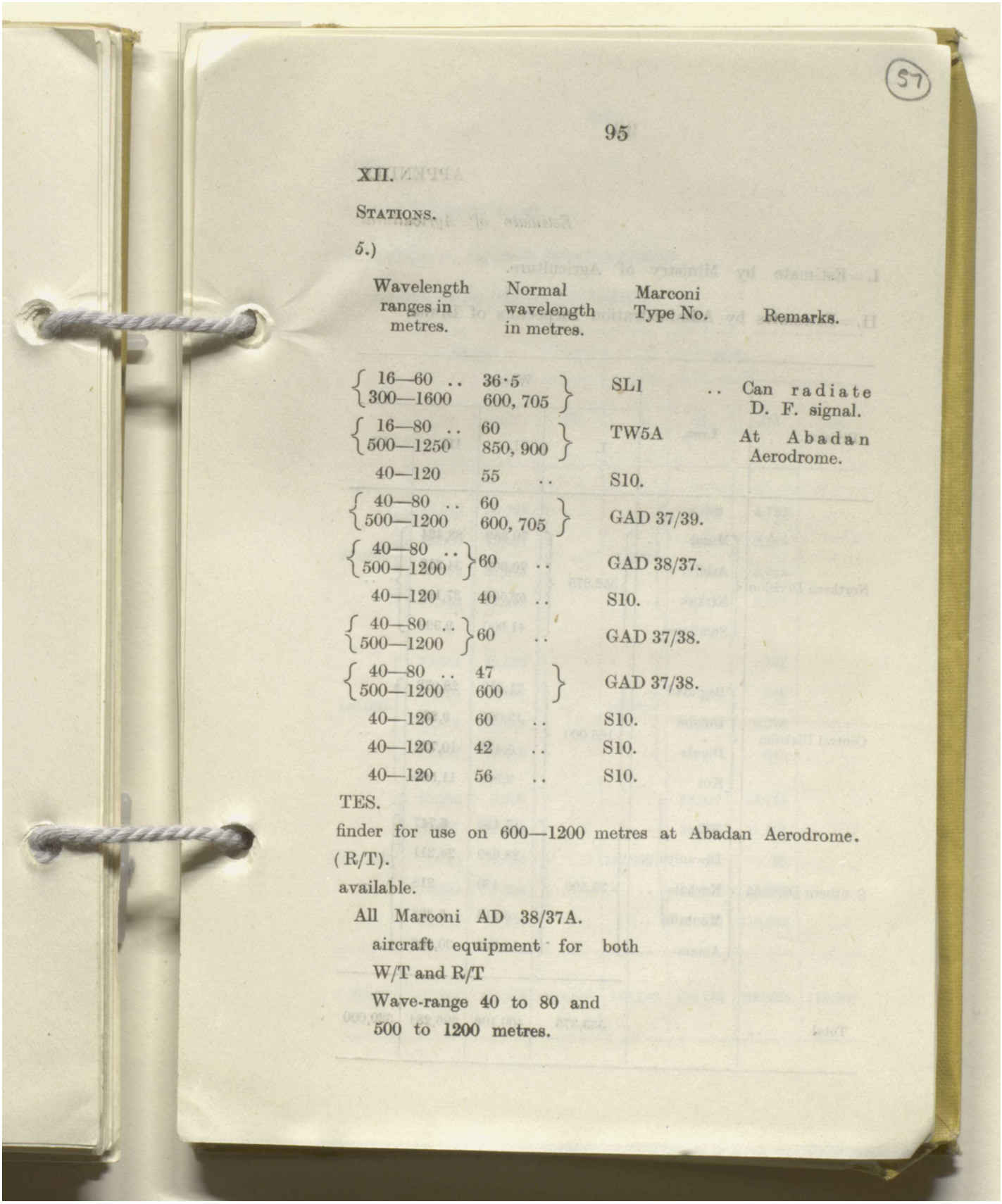
2. All sets can work both telegraphy (W/T) and telephony

3. The following sets are fitted to aircraft :—

G A F H Y

G A F H Z

G A F I A



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XII.

STATIONS.

5.)

Wavelength ranges in metres.	Normal wavelength in metres.	Marconi Type No.	Remarks.
16—60 .. 300—1600	36·5 600, 705	SL1 ..	Can radiate D. F. signal.
16—80 .. 500—1250	60 850, 900	TW5A	At Abadan Aerodrome.
40—120	55 ..	S10.	
40—80 .. 500—1200	60 600, 705	GAD 37/39.	
40—80 .. 500—1200	60 ..	GAD 38/37.	
40—120	40 ..	S10.	
40—80 .. 500—1200	60 ..	GAD 37/38.	
40—80 .. 500—1200	47 600	GAD 37/38.	
40—120	60 ..	S10.	
40—120	42 ..	S10.	
40—120	56 ..	S10.	

TES.

finder for use on 600—1200 metres at Abadan Aerodrome.

(R/T).

available.

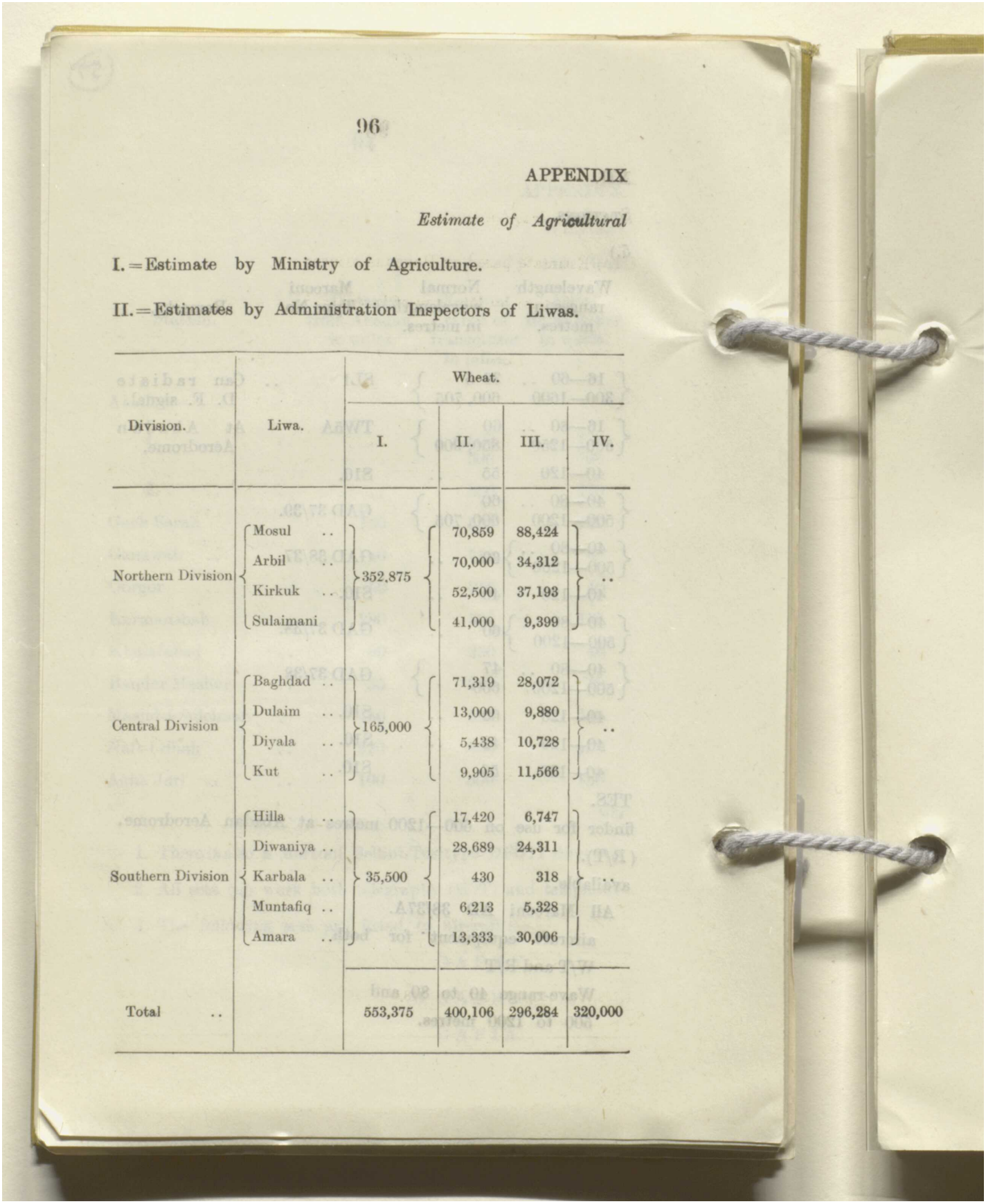
All Marconi AD 38/37A.

aircraft equipment for both

W/T and R/T

Wave-range 40 to 80 and

500 to 1200 metres.



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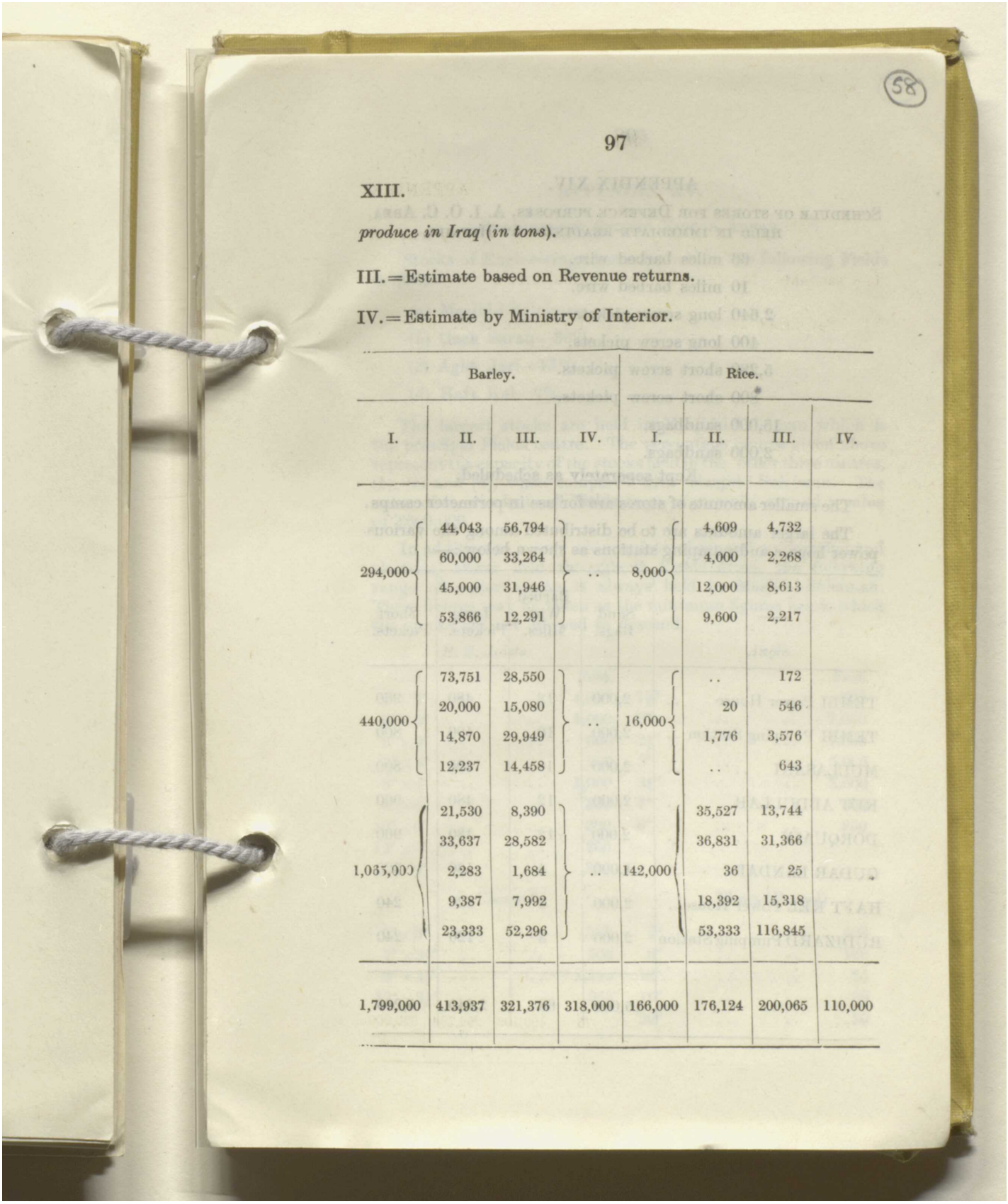
APPENDIX

Estimate of Agricultural

I.=Estimate by Ministry of Agriculture.

II.=Estimates by Administration Inspectors of Liwas.

Division.	Liwa.	Wheat. I.	II.	III.	IV.
Northern Division	Mosul ..	352,875	70,859	88,424	..
	Arbil ..		70,000	34,312	
	Kirkuk ..		52,500	37,193	
	Sulaimani		41,000	9,399	
Central Division	Baghdad ..	165,000	71,319	28,072	..
	Dulaim ..		13,000	9,880	
	Diyala ..		5,438	10,728	
	Kut ..		9,905	11,566	
Southern Division	Hilla ..	35,500	17,420	6,747	..
	Diwaniya ..		28,689	24,311	
	Karbala ..		430	318	
	Muntafiq ..		6,213	5,328	
	Amara ..		13,333	30,006	
Total ..		553,375	400,106	296,284	320,000



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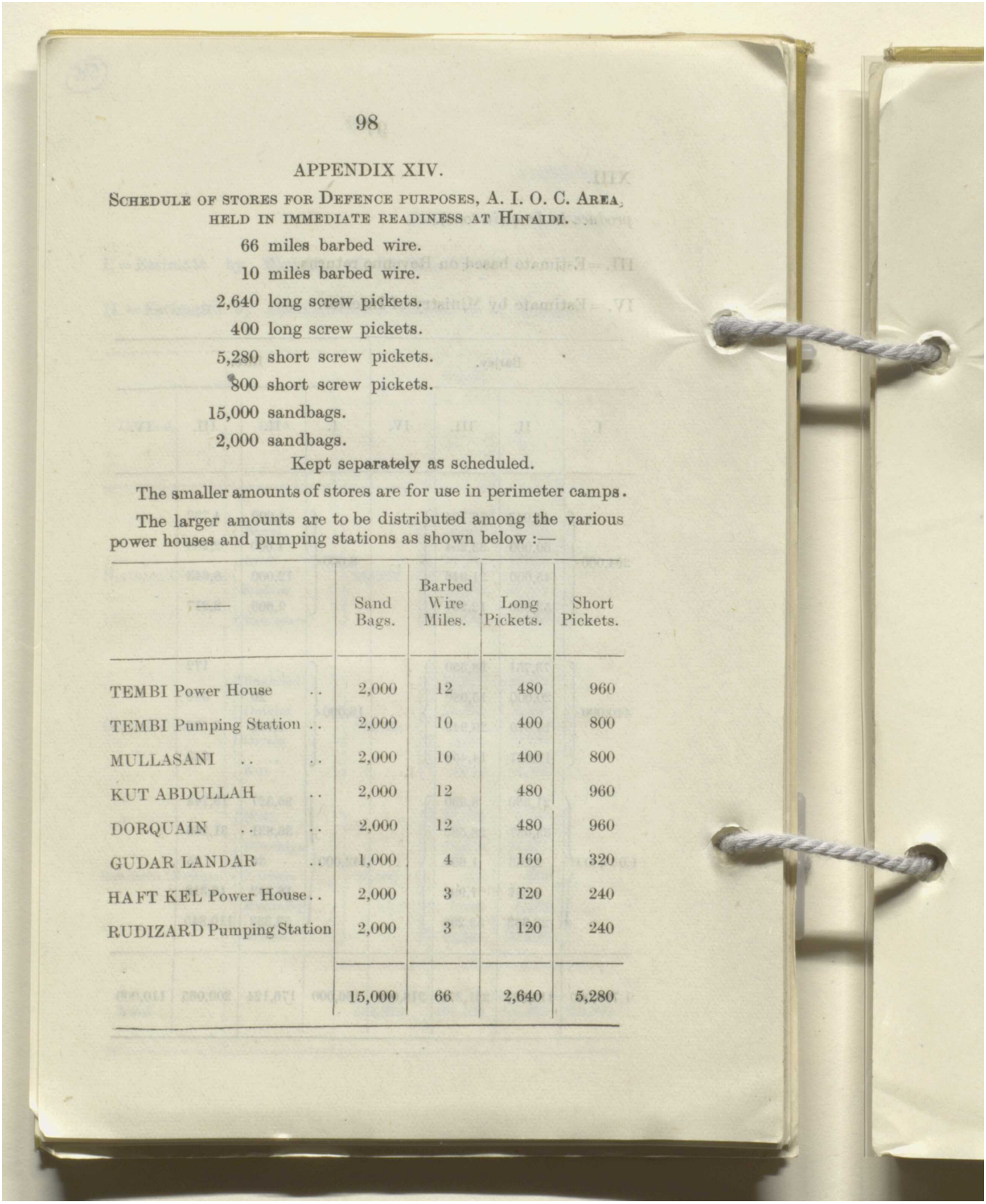
XIII.

produce in Iraq (in tons).

III.=Estimate based on Revenue returns.

IV.=Estimate by Ministry of Interior.

Barley.				Rice.			
I.	II.	III.	IV.	I.	II.	III.	IV.
294,000	44,043	56,794	..	8,000	4,609	4,732	
	60,000	33,264			4,000	2,268	
	45,000	31,946			12,000	8,613	
	53,866	12,291			9,600	2,217	
440,000	73,751	28,550	..	16,000	..	172	
	20,000	15,080			20	546	
	14,870	29,949			1,776	3,576	
	12,237	14,458			..	643	
1,035,000	21,530	8,390	..	142,000	35,527	13,744	
	33,637	28,582			36,831	31,366	
	2,283	1,684			36	25	
	9,387	7,992			18,392	15,318	
	23,333	52,296			53,333	116,845	
1,799,000	413,937	321,376	318,000	166,000	176,124	200,065	110,000



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APPENDIX XIV.

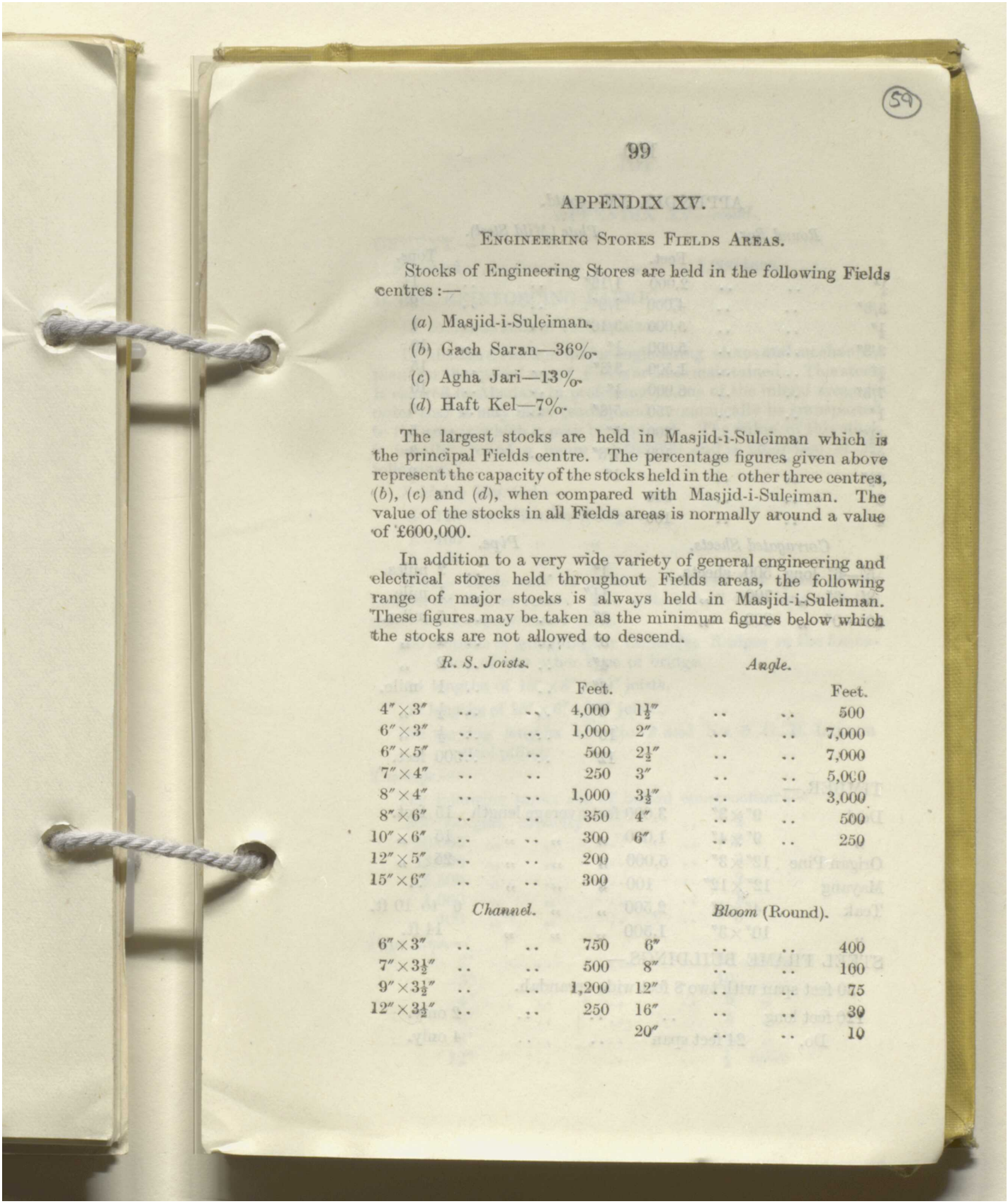
SCHEDULE OF STORES FOR DEFENCE PURPOSES, A. I. O. C. AREA, HELD IN IMMEDIATE READINESS AT HINAIDI.

66 miles barbed wire.
10 miles barbed wire.
2,640 long screw pickets.
400 long screw pickets.
5,280 short screw pickets.
800 short screw pickets.
15,000 sandbags.
2,000 sandbags.
Kept separately as scheduled.

The smaller amounts of stores are for use in perimeter camps.

The larger amounts are to be distributed among the various power houses and pumping stations as shown below :—

——	Sand Bags.	Barbed Wire Miles.	Long Pickets.	Short Pickets.
TEMBI Power House ..	2,000	12	480	960
TEMBI Pumping Station ..	2,000	10	400	800
MULLASANI	2,000	10	400	800
KUT ABDULLAH ..	2,000	12	480	960
DORQUAIN	2,000	12	480	960
GUDAR LANDAR ..	1,000	4	160	320
HAFT KEL Power House ..	2,000	3	120	240
RUDIZARD Pumping Station	2,000	3	120	240
	15,000	66	2,640	5,280



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APPENDIX XV.

Engineering Stores Fields Areas.

Stocks of Engineering Stores are held in the following Fields centres :—

(*a*) Masjid-i-Suleiman.

(*b*) Gach Saran—36%.

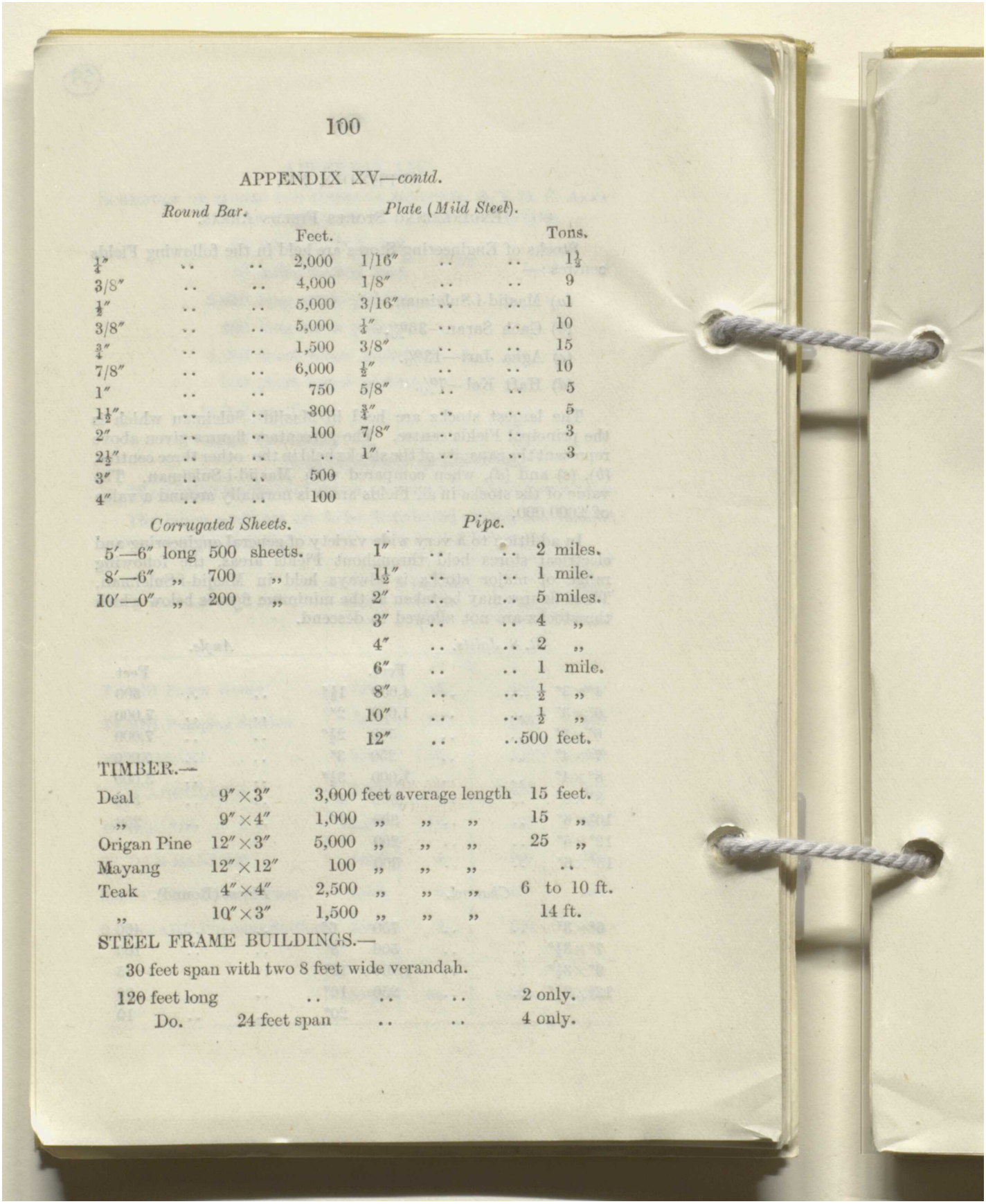
(*c*) Agha Jari—13%.

(*d*) Haft Kel—7%.

The largest stocks are held in Masjid-i-Suleiman which is the principal Fields centre. The percentage figures given above represent the capacity of the stocks held in the other three centres, (*b*), (*c*) and (*d*), when compared with Masjid-i-Suleiman. The value of the stocks in all Fields areas is normally around a value of £600,000.

In addition to a very wide variety of general engineering and electrical stores held throughout Fields areas, the following range of major stocks is always held in Masjid-i-Suleiman. These figures may be taken as the minimum figures below which the stocks are not allowed to descend.

R. S. Joists.	Feet.	*Angle.*	Feet.
4″×3″	4,000	1½″	500
6″×3″	1,000	2″	7,000
6″×5″	500	2½″	7,000
7″×4″	250	3″	5,000
8″×4″	1,000	3½″	3,000
8″×6″	350	4″	500
10″×6″	300	6″	250
12″×5″	200		
15″×6″	300		
Channel.		*Bloom* (Round).	
6″×3″	750	6″	400
7″×3½″	500	8″	100
9″×3½″	1,200	12″	75
12″×3½″	250	16″	30
		20″	10



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APPENDIX XV—*contd.*

Round Bar.

	Feet.
1/4″	2,000
3/8″	4,000
1/2″	5,000
3/8″	5,000
3/4″	1,500
7/8″	6,000
1″	750
1 1/2″	300
2″	100
2 1/2″	..
3″	500
4″	100

Plate (Mild Steel).

	Tons.
1/16″	1 1/2
1/8″	9
3/16″	1
1/4″	10
3/8″	15
1/2″	10
5/8″	5
3/4″	5
7/8″	3
1″	3

Corrugated Sheets.

5′—6″ long	500 sheets.
8′—6″ ,,	700 ,,
10′—0″ ,,	200 ,,

Pipe.

1″	2 miles.
1 1/2″	1 mile.
2″	5 miles.
3″	4 ,,
4″	2 ,,
6″	1 mile.
8″	1/2 ,,
10″	1/2 ,,
12″	500 feet.

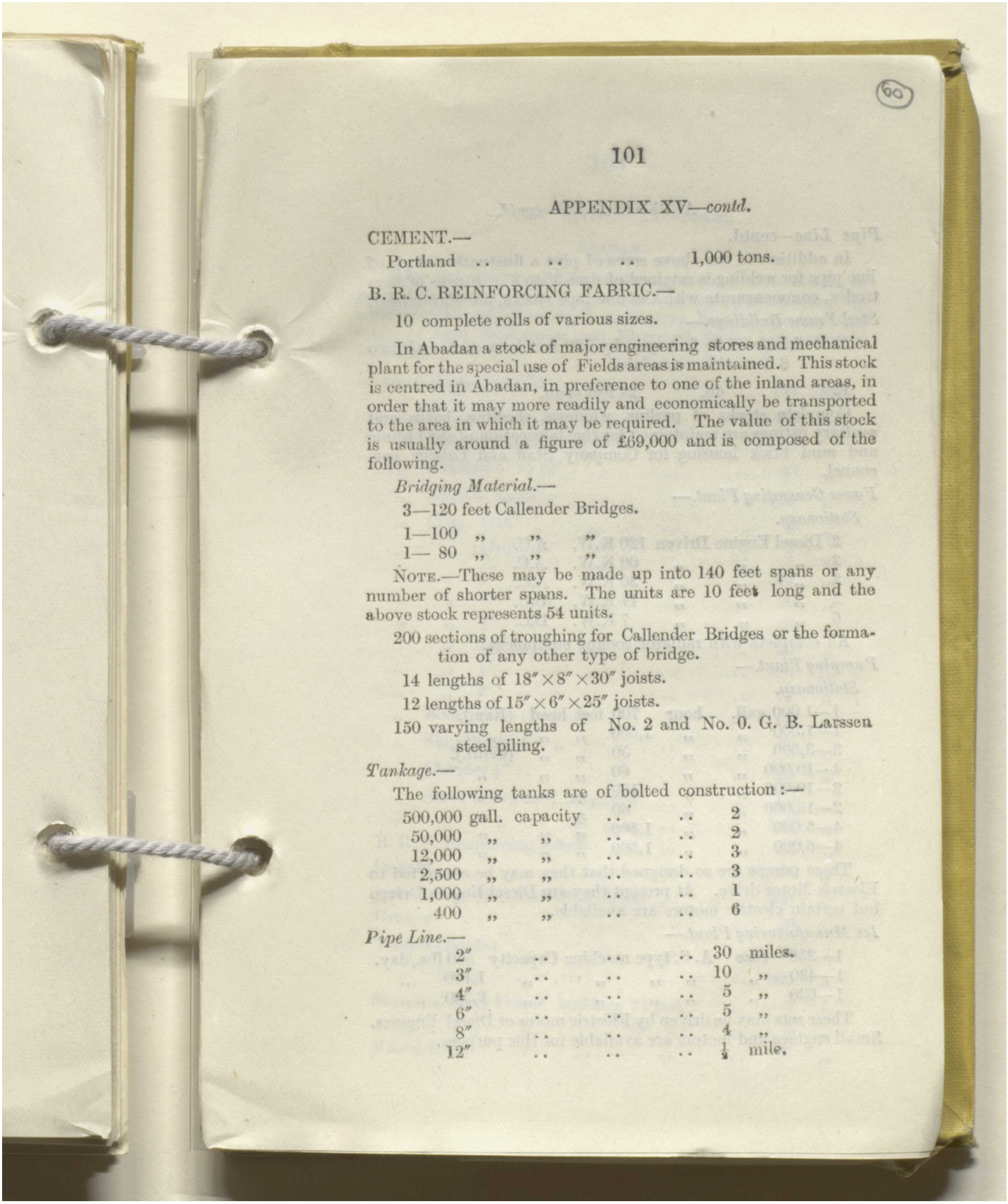
TIMBER.—

Deal	9″×3″	3,000 feet	average length	15 feet.
,,	9″×4″	1,000 ,,	,, ,,	15 ,,
Origan Pine	12″×3″	5,000 ,,	,, ,,	25 ,,
Mayang	12″×12″	100 ,,	,, ,,	..
Teak	4″×4″	2,500 ,,	,, ,,	6 to 10 ft.
,,	10″×3″	1,500 ,,	,, ,,	14 ft.

STEEL FRAME BUILDINGS.—

30 feet span with two 8 feet wide verandah.

120 feet long	.. .. ..	2 only.
Do.	24 feet span	4 only.



APPENDIX XV—*contd.*

CEMENT.—

Portland .. .. .. 1,000 tons.

B. R. C. REINFORCING FABRIC.—

10 complete rolls of various sizes.

In Abadan a stock of major engineering stores and mechanical plant for the special use of Fields areas is maintained. This stock is centred in Abadan, in preference to one of the inland areas, in order that it may more readily and economically be transported to the area in which it may be required. The value of this stock is usually around a figure of £69,000 and is composed of the following.

Bridging Material.—

3—120 feet Callender Bridges.

1—100 „ „ „

1— 80 „ „ „

NOTE.—These may be made up into 140 feet spans or any number of shorter spans. The units are 10 feet long and the above stock represents 54 units.

200 sections of troughing for Callender Bridges or the formation of any other type of bridge.

14 lengths of 18″×8″×30″ joists.

12 lengths of 15″×6″×25″ joists.

150 varying lengths of No. 2 and No. 0. G. B. Larssen steel piling.

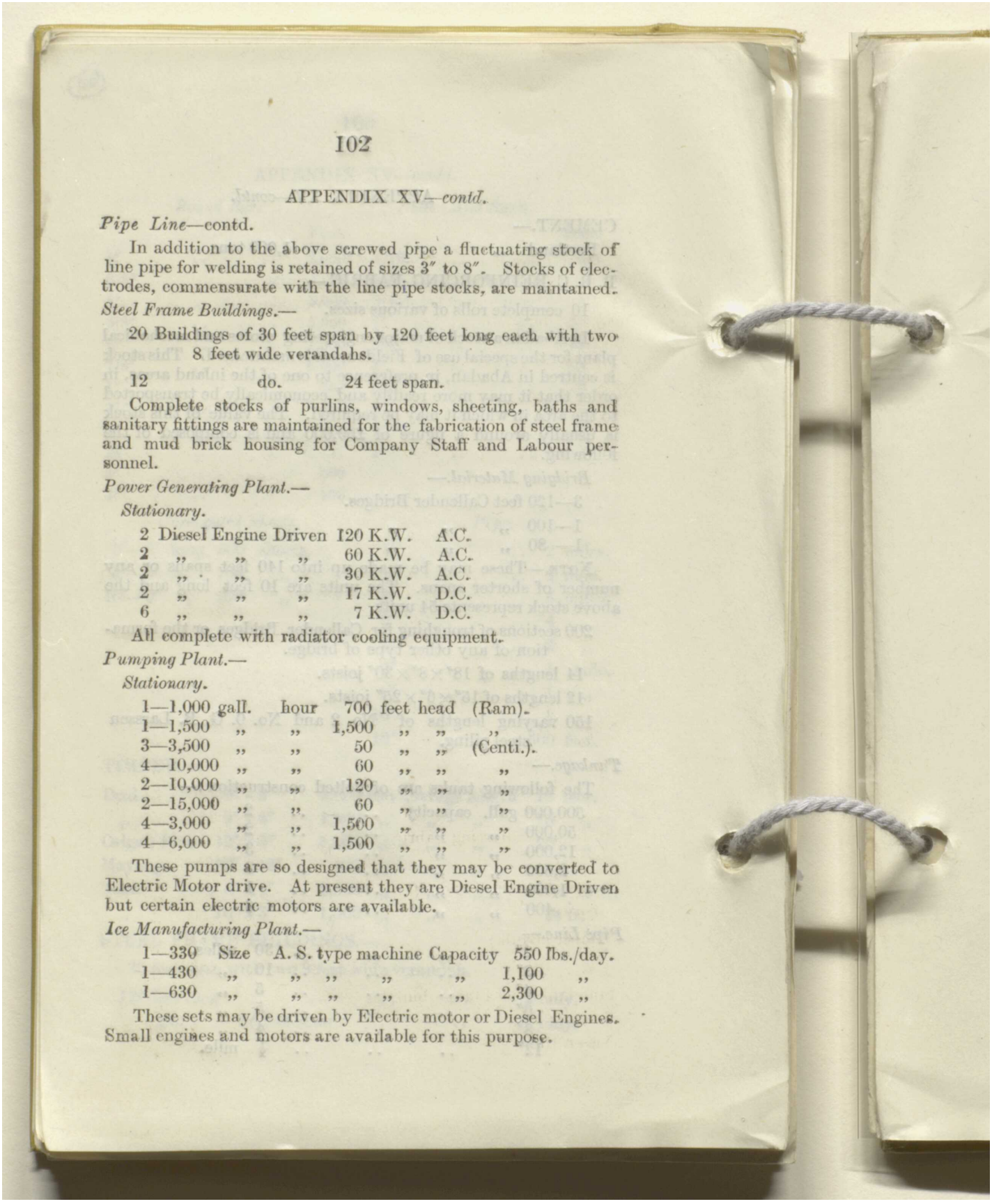
Tankage.—

The following tanks are of bolted construction:—

500,000 gall.	capacity	2
50,000 „	„	2
12,000 „	„	3
2,500 „	„	3
1,000 „	„	1
400 „	„	6

Pipe Line.—

2″	30	miles.
3″	10	„
4″	5	„
6″	5	„
8″	4	„
12″	½	mile.



APPENDIX XV—*contd.*

Pipe Line—contd.

In addition to the above screwed pipe a fluctuating stock of line pipe for welding is retained of sizes 3″ to 8″. Stocks of electrodes, commensurate with the line pipe stocks, are maintained.

Steel Frame Buildings.—

20 Buildings of 30 feet span by 120 feet long each with two 8 feet wide verandahs.

12 do. 24 feet span.

Complete stocks of purlins, windows, sheeting, baths and sanitary fittings are maintained for the fabrication of steel frame and mud brick housing for Company Staff and Labour personnel.

Power Generating Plant.—

Stationary.

2	Diesel Engine Driven	120 K.W.	A.C.
2	,, ,, ,,	60 K.W.	A.C.
2	,, ,, ,,	30 K.W.	A.C.
2	,, ,, ,,	17 K.W.	D.C.
6	,, ,, ,,	7 K.W.	D.C.

All complete with radiator cooling equipment.

Pumping Plant.—

Stationary.

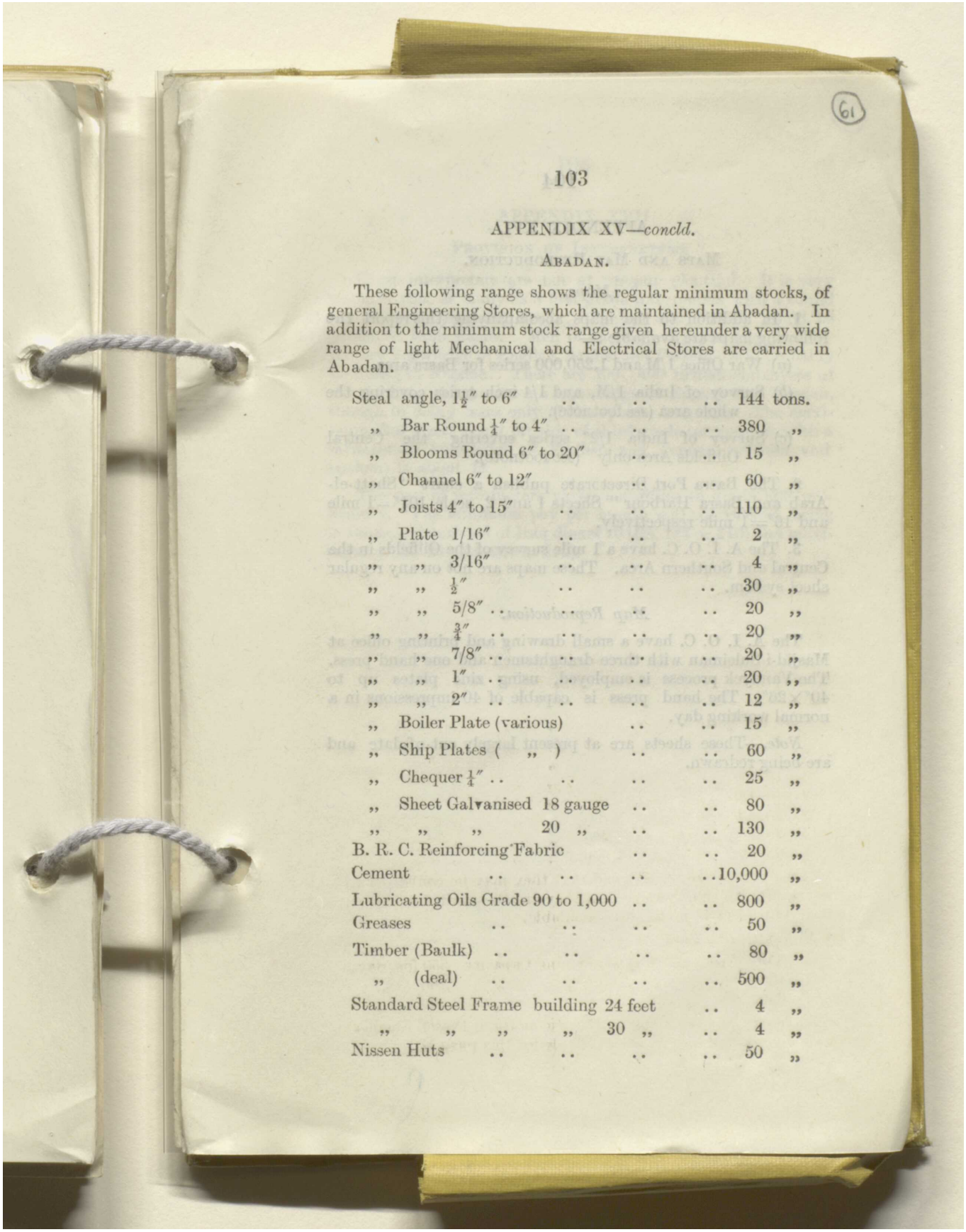
1—1,000	gall.	hour	700	feet head	(Ram).
1—1,500	,,	,,	1,500	,, ,,	,,
3—3,500	,,	,,	50	,, ,,	(Centi.).
4—10,000	,,	,,	60	,, ,,	,,
2—10,000	,,	,,	120	,, ,,	,,
2—15,000	,,	,,	60	,, ,,	,,
4—3,000	,,	,,	1,500	,, ,,	,,
4—6,000	,,	,,	1,500	,, ,,	,,

These pumps are so designed that they may be converted to Electric Motor drive. At present they are Diesel Engine Driven but certain electric motors are available.

Ice Manufacturing Plant.—

1—330	Size	A. S.	type	machine	Capacity	550 lbs./day.
1—430	,,	,,	,,	,,	,,	1,100 ,,
1—630	,,	,,	,,	,,	,,	2,300 ,,

These sets may be driven by Electric motor or Diesel Engines. Small engines and motors are available for this purpose.



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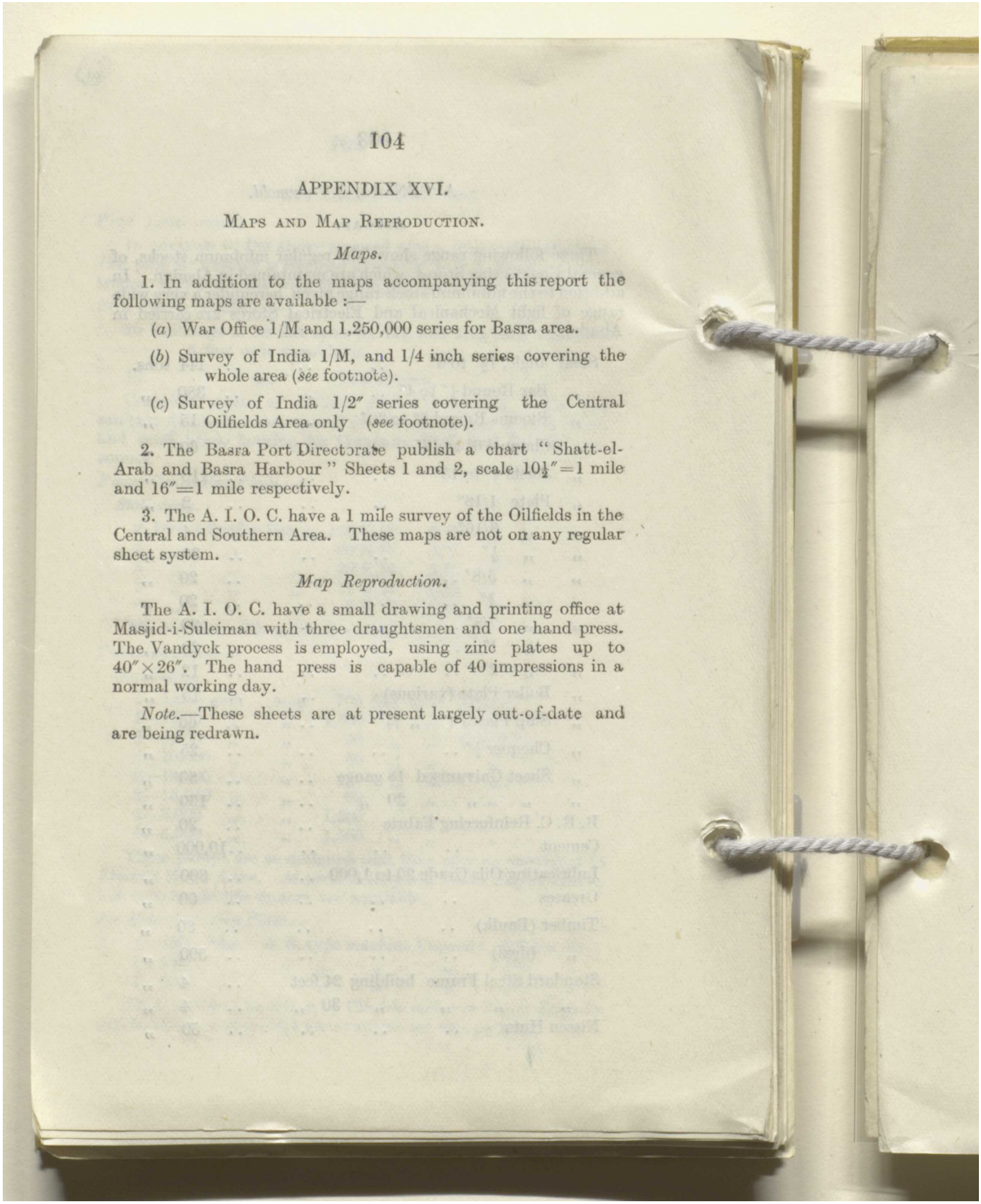
APPENDIX XV—*concld.*

ABADAN.

These following range shows the regular minimum stocks, of general Engineering Stores, which are maintained in Abadan. In addition to the minimum stock range given hereunder a very wide range of light Mechanical and Electrical Stores are carried in Abadan.

Steal angle, 1½″ to 6″	.. .. ..	144 tons.
,, Bar Round ¼″ to 4″	.. .. ..	380 ,,
,, Blooms Round 6″ to 20″	.. ..	15 ,,
,, Channel 6″ to 12″	.. ..	60 ,,
,, Joists 4″ to 15″	.. .. ..	110 ,,
,, Plate 1/16″	.. .. ..	2 ,,
,, ,, 3/16″	.. .. ..	4 ,,
,, ,, ½″	.. .. ..	30 ,,
,, ,, 5/8″ ..	.. .. ..	20 ,,
,, ,, ¾″ ..	.. .. ..	20 ,,
,, ,, 7/8″ ..	.. .. ..	20 ,,
,, ,, 1″ ..	.. .. ..	20 ,,
,, ,, 2″ ..	.. .. ..	12 ,,
,, Boiler Plate (various)	.. ..	15 ,,
,, Ship Plates (,,)	.. ..	60 ,,
,, Chequer ¼″ ..	.. .. ..	25 ,,
,, Sheet Galvanised 18 gauge	.. ..	80 ,,
,, ,, ,, 20 ,,	.. ..	130 ,,
B. R. C. Reinforcing Fabric	.. ..	20 ,,
Cement	..	10,000 ,,
Lubricating Oils Grade 90 to 1,000	.. ..	800 ,,
Greases	.. ..	50 ,,
Timber (Baulk)	.. ..	80 ,,
,, (deal)	.. ..	500 ,,
Standard Steel Frame building 24 feet	..	4 ,,
,, ,, ,, ,, 30 ,,	..	4 ,,
Nissen Huts	.. ..	50 ,,



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APPENDIX XVI.

MAPS AND MAP REPRODUCTION.

Maps.

1. In addition to the maps accompanying this report the following maps are available :—

(*a*) War Office 1/M and 1,250,000 series for Basra area.

(*b*) Survey of India 1/M, and 1/4 inch series covering the whole area (*see* footnote).

(*c*) Survey of India 1/2″ series covering the Central Oilfields Area only (*see* footnote).

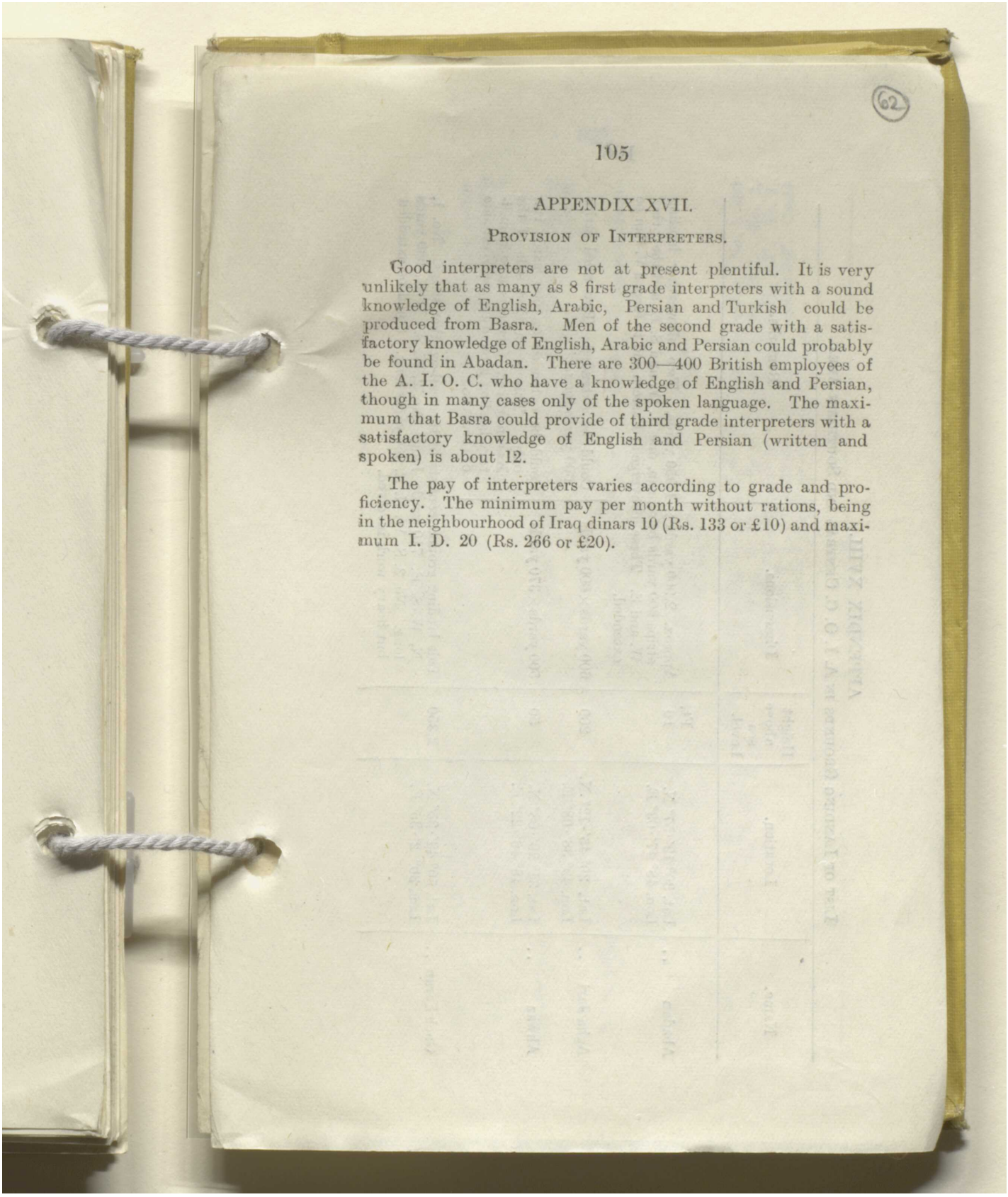
2. The Basra Port Directorate publish a chart "Shatt-el-Arab and Basra Harbour" Sheets 1 and 2, scale 10½″=1 mile and 16″=1 mile respectively.

3. The A. I. O. C. have a 1 mile survey of the Oilfields in the Central and Southern Area. These maps are not on any regular sheet system.

Map Reproduction.

The A. I. O. C. have a small drawing and printing office at Masjid-i-Suleiman with three draughtsmen and one hand press. The Vandyck process is employed, using zinc plates up to 40″×26″. The hand press is capable of 40 impressions in a normal working day.

Note.—These sheets are at present largely out-of-date and are being redrawn.



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APPENDIX XVII.

PROVISION OF INTERPRETERS.

Good interpreters are not at present plentiful. It is very unlikely that as many as 8 first grade interpreters with a sound knowledge of English, Arabic, Persian and Turkish could be produced from Basra. Men of the second grade with a satisfactory knowledge of English, Arabic and Persian could probably be found in Abadan. There are 300—400 British employees of the A. I. O. C. who have a knowledge of English and Persian, though in many cases only of the spoken language. The maximum that Basra could provide of third grade interpreters with a satisfactory knowledge of English and Persian (written and spoken) is about 12.

The pay of interpreters varies according to grade and proficiency. The minimum pay per month without rations, being in the neighbourhood of Iraq dinars 10 (Rs. 133 or £10) and maximum I. D. 20 (Rs. 266 or £20).

"تقرير عسكري عن منطقة حقول نفط شركة النفط الأنجلو-إيرانية (في جنوب إيران)" [٦٢ظ] (١٣٣/١٥٠)

APPENDIX XVIII.

LIST OF LANDING GROUNDS IN A. I. O. C. CENTRAL AND SOUTHERN AREA.

Name.	Location.	Height above sea Level.	Dimensions.	Remarks.
		Ft.		
Abadan ..	Lat. 30° 19′·57″ N. Lon. 48° 47′·03″ E.	10	Approx. 2,900 yards × 1,950 yards. Two strips 600 yards being run, one N. W. and S. E. and the other W. and E. These converge at Eastern end to form a V. Can be extended.	Two all-weather landing strips, one N. W. and S. E. and the other W. and E. These converge at Eastern end to form a V. Can be extended.
Agha Jari ..	Lat. 30° 45′·12″ N. Lon. 49° 38′·08″ E.	200	600 yards × 600 yards	Could be extended. Two oiled strips 600 yards long.
Ahwaz ..	Lat. 31° 20′·08″ N. Lon. 48° 46′·22″ E.	50	500 yards × 370 yards	Could be extended on 500 yards run only. This is on East side of the Karun River. There is also a military landing ground on the West side of the river.
Gach Saran ..	Lat. 50° 48′·35″ N. Lon. 30° 2′·35″ E.	2,350	This landing ground consists of three all-weather strips. No. 1, N. W.-S. E. 710 yards long. No. 2, W. S. E. N. 980 yards long. No. 3, S. W.-N. E. 860 yards long. Could be extended but heavy work involved.	

"تقرير عسكري عن منطقة حقول نفط شركة النفط الأنجلو-إيرانية (في جنوب إيران)" [٦٣و] (١٣٤/١٥٠)

Ganoweh ..	Lat. 29° 33′·30″ N. Lon. 50° 30′·28″ E.	6	545 yards × 545 yards	Could be extended.
Haft Kel ..	Lat. 31° 21′·05″ N. Lon. 49° 35′·40″ E.	1000	Approximately 730 yards × 725 yards.	Irregular in shape.
Hindiyan ..	Lat. 30° 4′·11″ N. Lon. 49° 43′·08″ E.	30	650 yards × 650 yards.	Could be extended. There are no permanent marks indicating this landing ground. It is not included in A. I. O. C. official list.
Khorramshahr	Lat. 30° 26′·0″ N. Lon. 48° 10′·47″ E.	10	870 yards × 270 yards	There is nothing to indicate position of this landing ground. It is not on the A. I. O. C. official list.
Kut Abdullah	Lat. 31° 14′·0″ N. Lon. 48° 26′·0″ E.	100	Approximately 710 yards × 1,350 yards.	Could be extended. Irregular in shape.
Mashur ..	Lat. 30° 34′·20″ N. Lon. 49° 12′ E.	20	Approximately 700 yards × 700 yards.	Could be extended.
Yamaha ..	Lat. 31° 45′·35″ N. Lon. 49° 22′·10″ E.	1,200	This landing ground consists of 3 all-weather strips. No. 1, 680 yards long × 64 yards wide on Compass bearing 162°. No. 2, 523 yards long × 64 yards wide on Compass bearing 117°. No. 3, 770 yards long × 64 yards wide on Compass bearing 252°. Could be extended but very heavy work involved.

APPENDIX XVIII—*concld.*

Name.	Location.	Height above sea Level.	Dimensions.	Remarks.
		Ft.		
Dorquain ..	5 miles south of Pumping Station. 1 mile N. E. of Pumping Station.	25	800 yards × 800 yards.	Could be extended.
		25	600 yards × 600 yards Irregular in shape.	

waz feet

NOTE.—1. The landing grounds at Abadan, Gach Saran, Agha Jari and Yamaha are all-weather. All the other landing grounds in the foregoing list are fair-weather only and are closed for varying periods after rain. Kut Abdulla dries very quickly.

2. The landing grounds at Abadan, Gach Saran, and Yamaha have limited supplies of petrol and oil always available. At all other landing grounds petrol and oil can be obtained on request or by telephone at about one hour's notice.

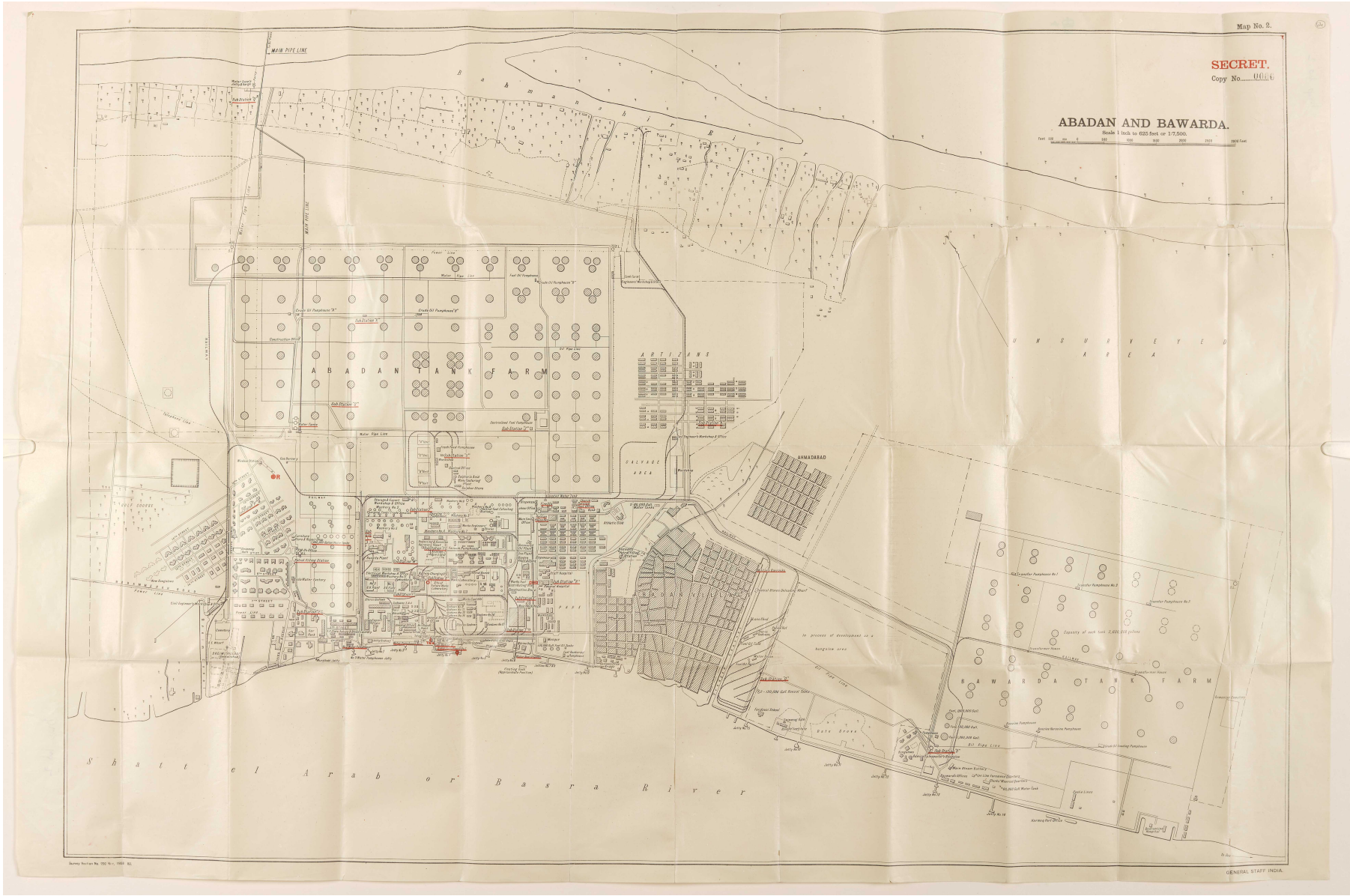
3. Hangar accommodation exists ~~only~~ at Abadan where there is one hangar 100 ~~yards~~ FEET × 100 ~~yards~~ FEET used for housing the three D. H. 89 A. Rapide machines maintained by the A. I. O. C.

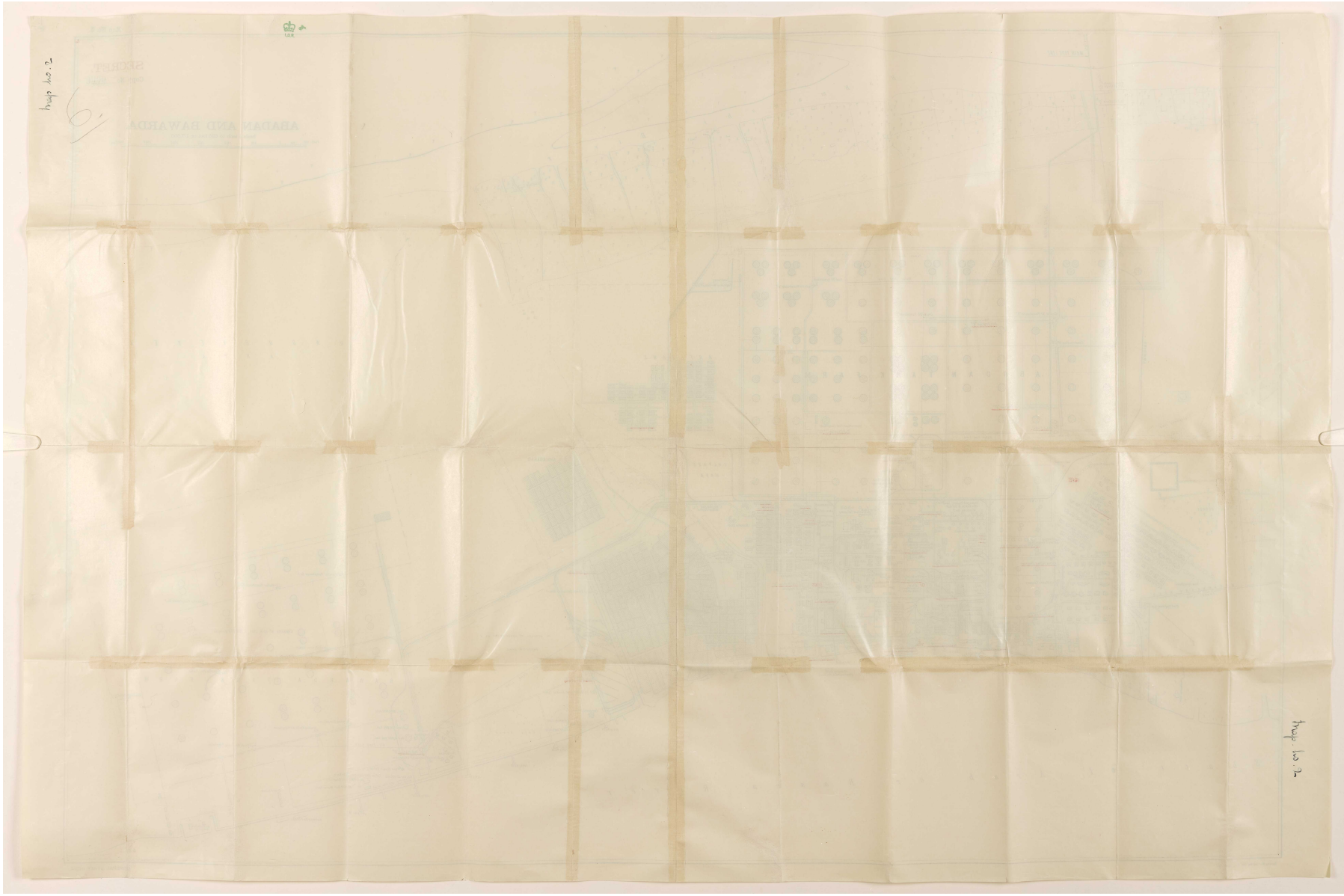
4. Full details of these landing grounds are held by Air Headquarters, Iraq.

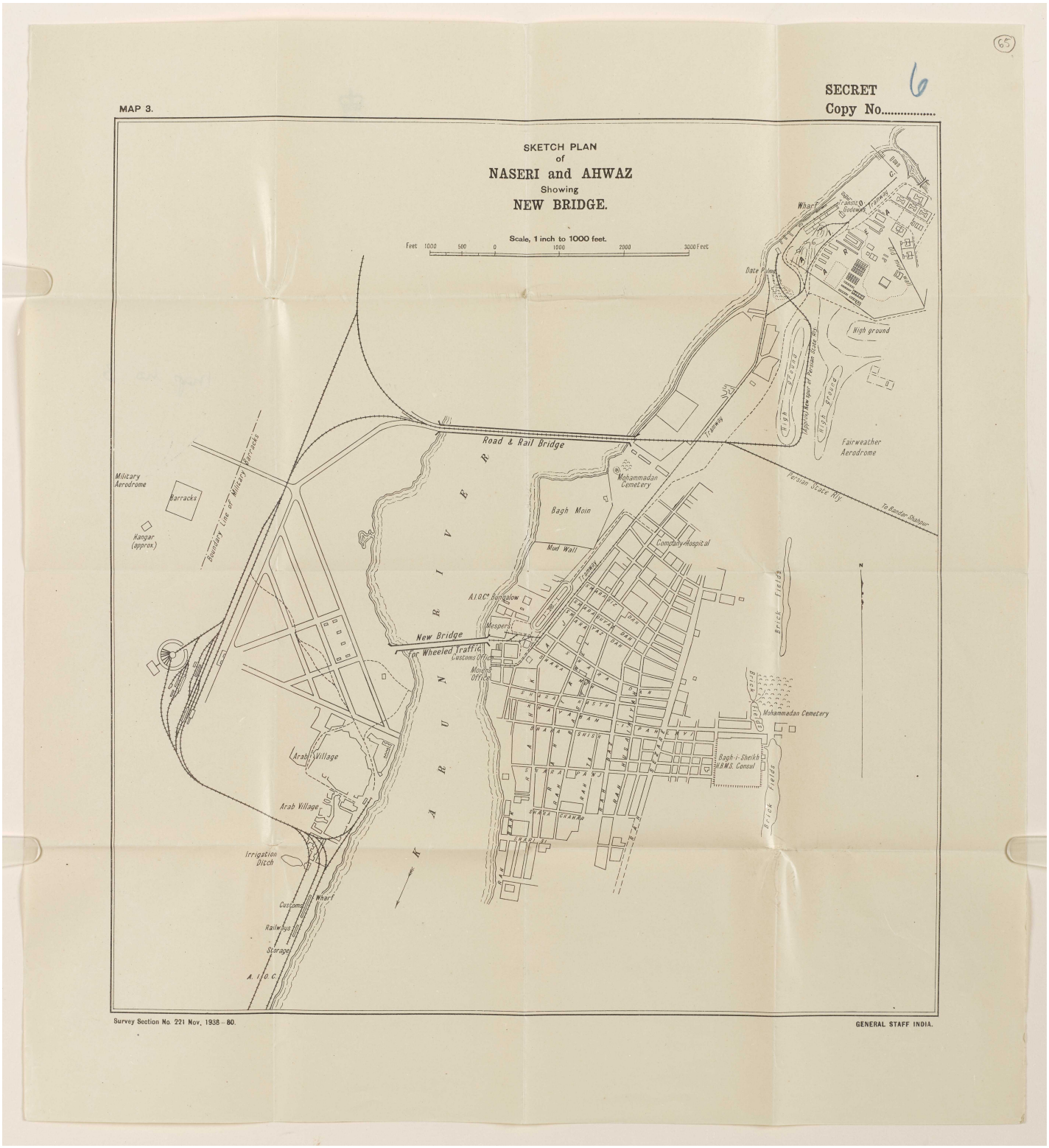
5. All landing grounds are marked with a circle, corner marks and a wind sock. Normally, four qualified ground engineers are at Abadan.

I.O.R.

MS235CGS(P)—200—9-8-40—GIPS






MAP 3.
SECRET
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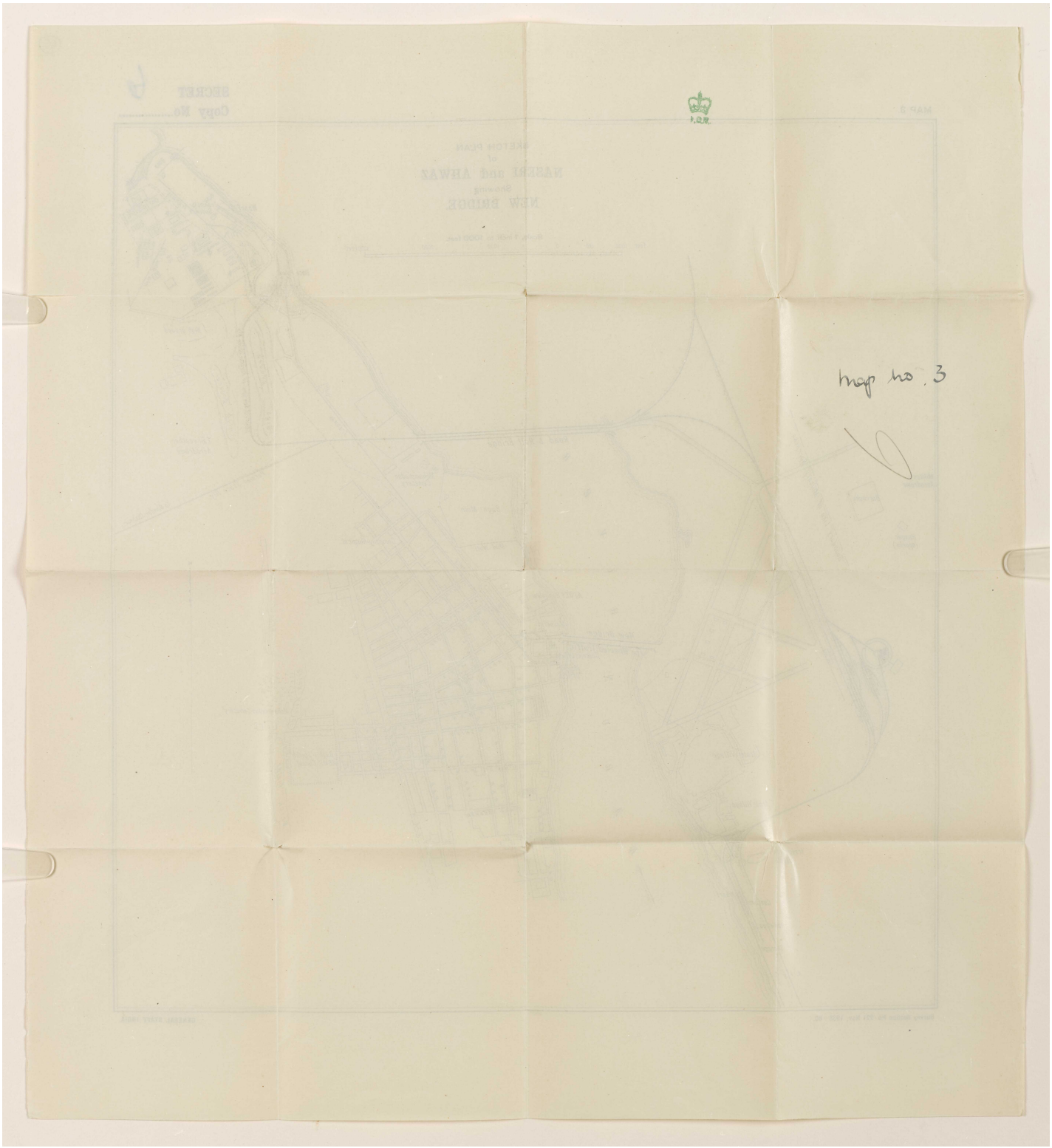
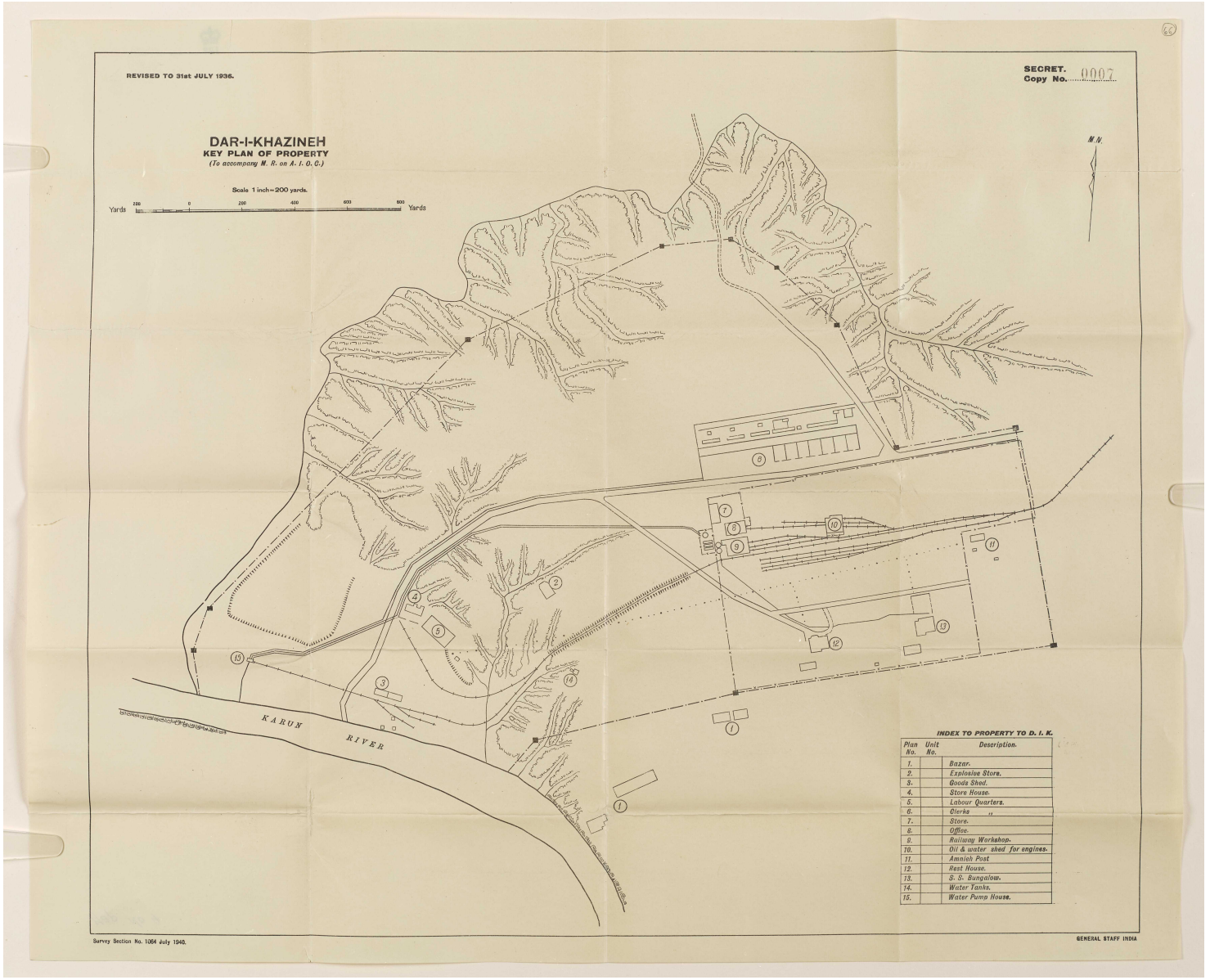
SKETCH PLAN
of
NASERI and AHWAZ
Showing
NEW BRIDGE.
Scale, 1 inch to 1000 feet.
Feet 1000 500 0 1000 2000 3000 Feet
Road & Rail Bridge
New Bridge
for Wheeled Traffic
Military Aerodrome
Barracks
Hangar (approx)
Boundary Line of Military Barracks
Mohammadan Cemetery
Bagh Moin
Mud Wall
Company Hospital
A.I.O.C. Bungalow
Mesperi
Customs Office
Marine Office
Arab Village
Arab Village
Irrigation Ditch
Customs
Wharf
Railway
Storages
A. I. O. C.
Wharf
Transit Godowns
Tramway
Date Plots
High ground
Fairweather Aerodrome
Persian State Rly
To Bandar-Shahpur
Brick Fields
Mohammadan Cemetery
Bagh-i-Sheikh
H.B.M.'s Consul
Survey Section No. 221 Nov. 1938 – 80.
GENERAL STAFF INDIA.

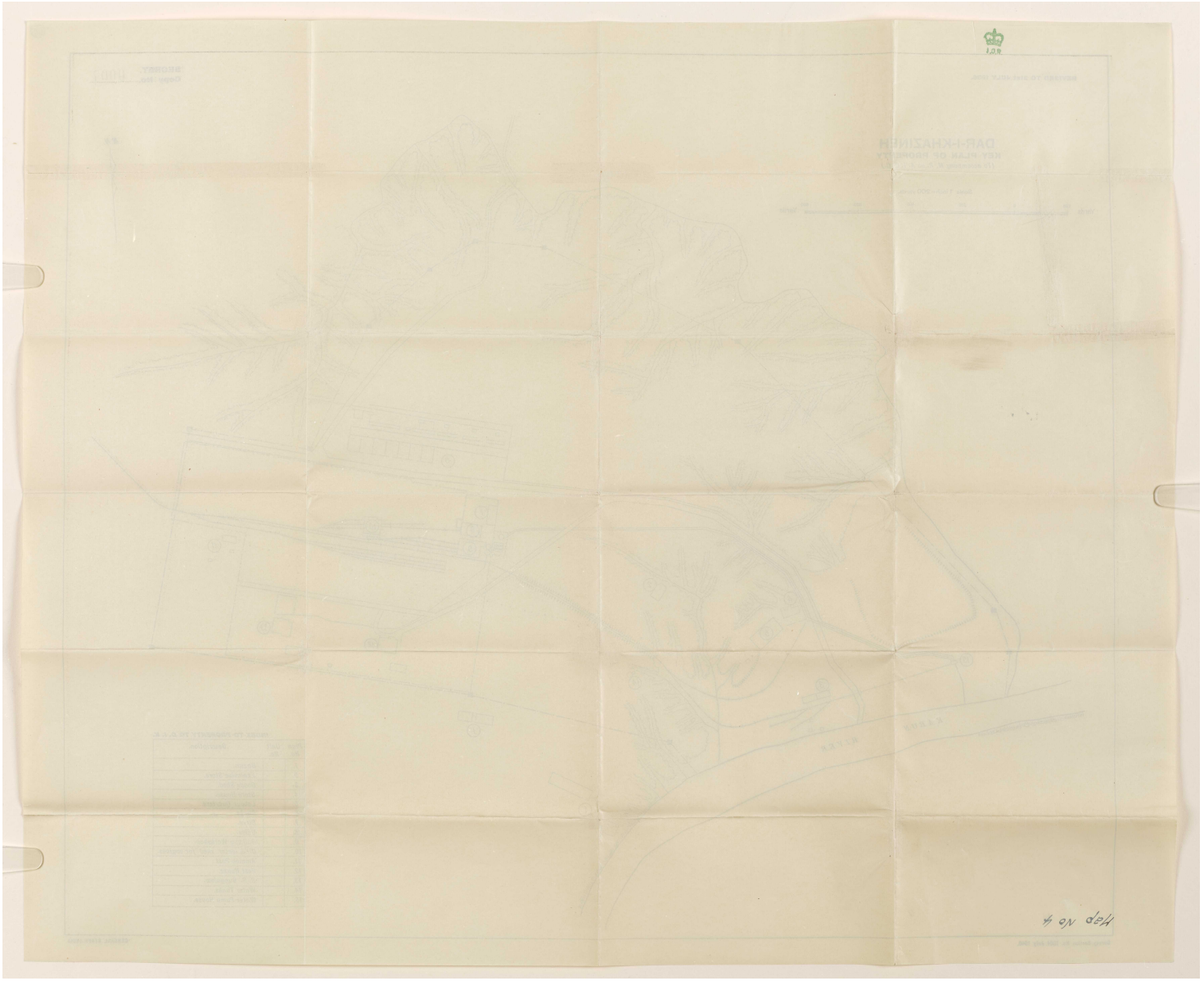
"خريطة مبدئية لناصري والأهواز تُظهر جسرًا جديدًا" [٦٥ظ] (٢/٢)



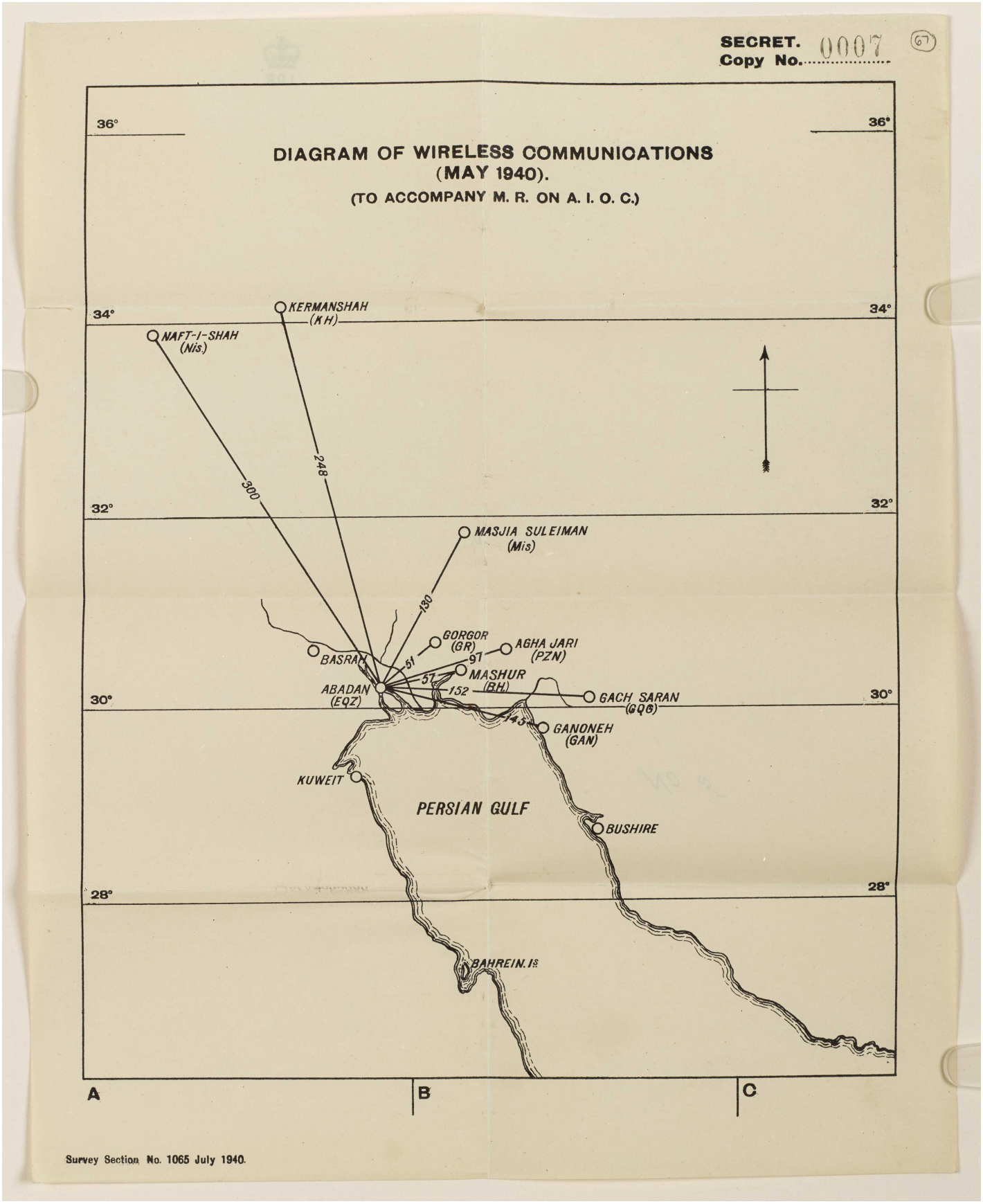
درخزينه، خريطة عقارات (لمرافقة تقرير عسكري عن شركة النفط الأنجلو-إيرانية)" [٦٦و] (٢/١)

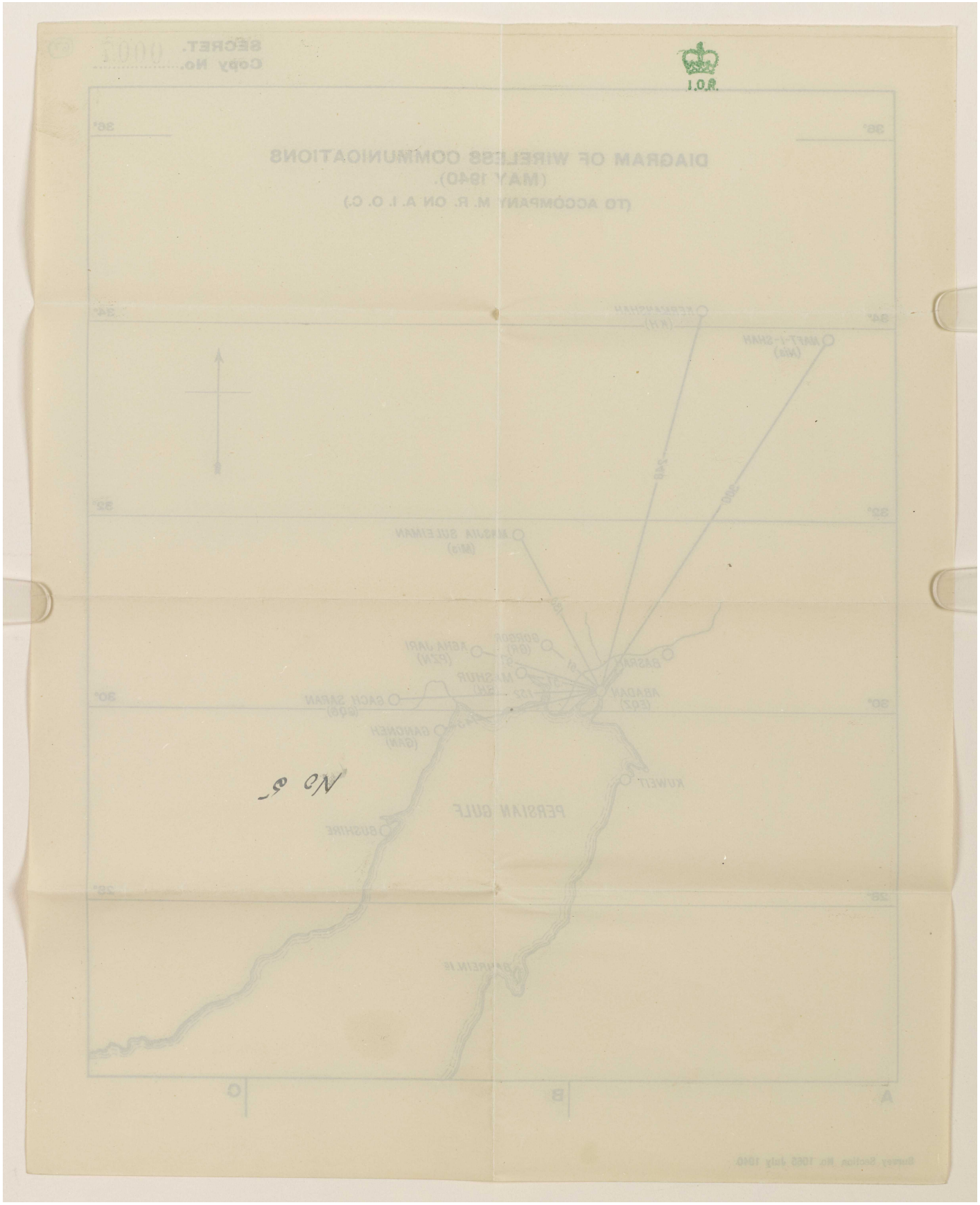


درخزينه، خريطة عقارات (لمرافقة تقرير عسكري عن شركة النفط الأنجلو-إيرانية)" [٦٦ظ] (٢/٢)

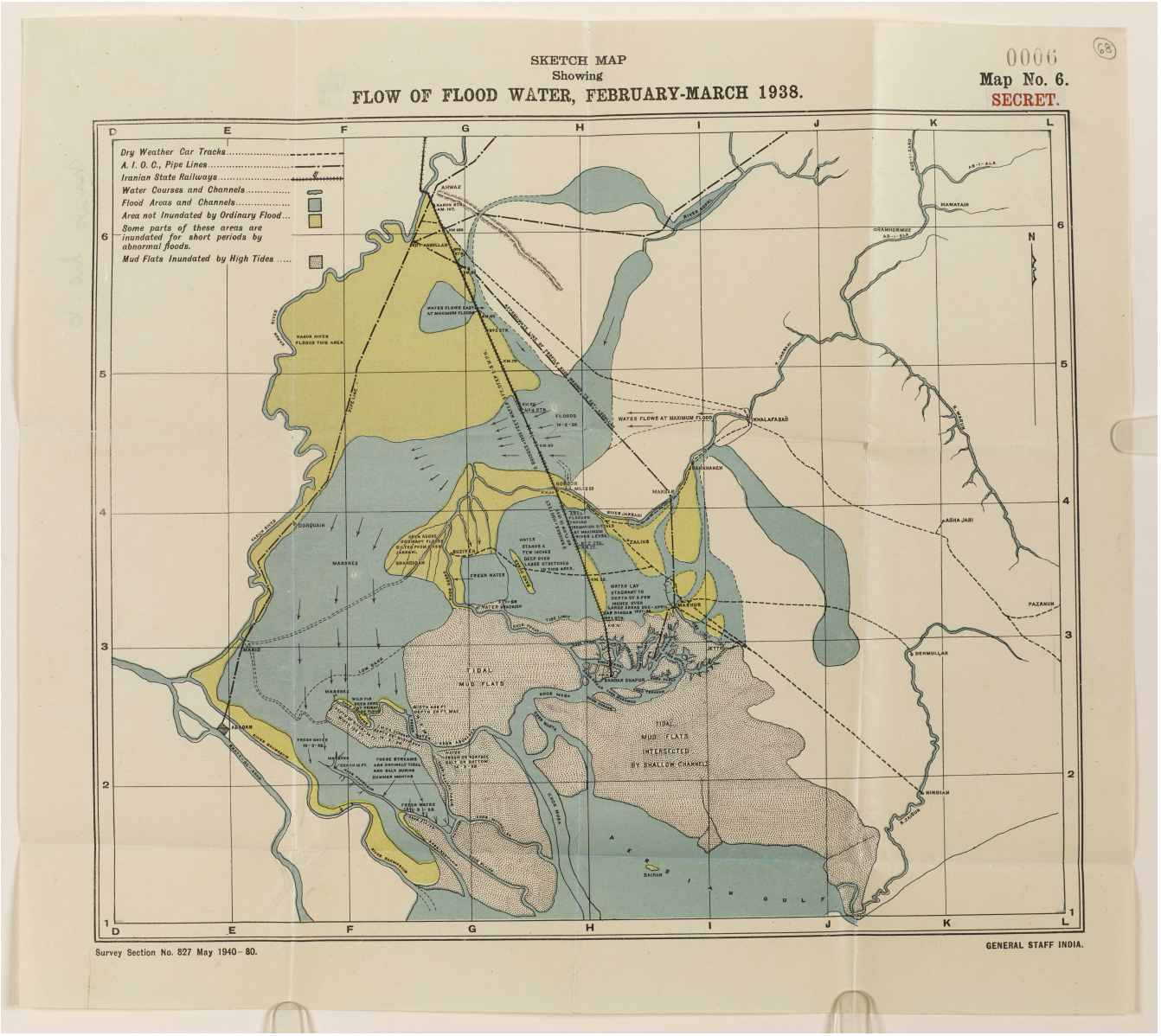


"رسم بياني للاتصالات اللاسلكية (مايو ١٩٤٠) (لمرافقة تقرير عسكري عن شركة النفط الأنجلو-إيرانية)" [٦٧و] (٢/١)

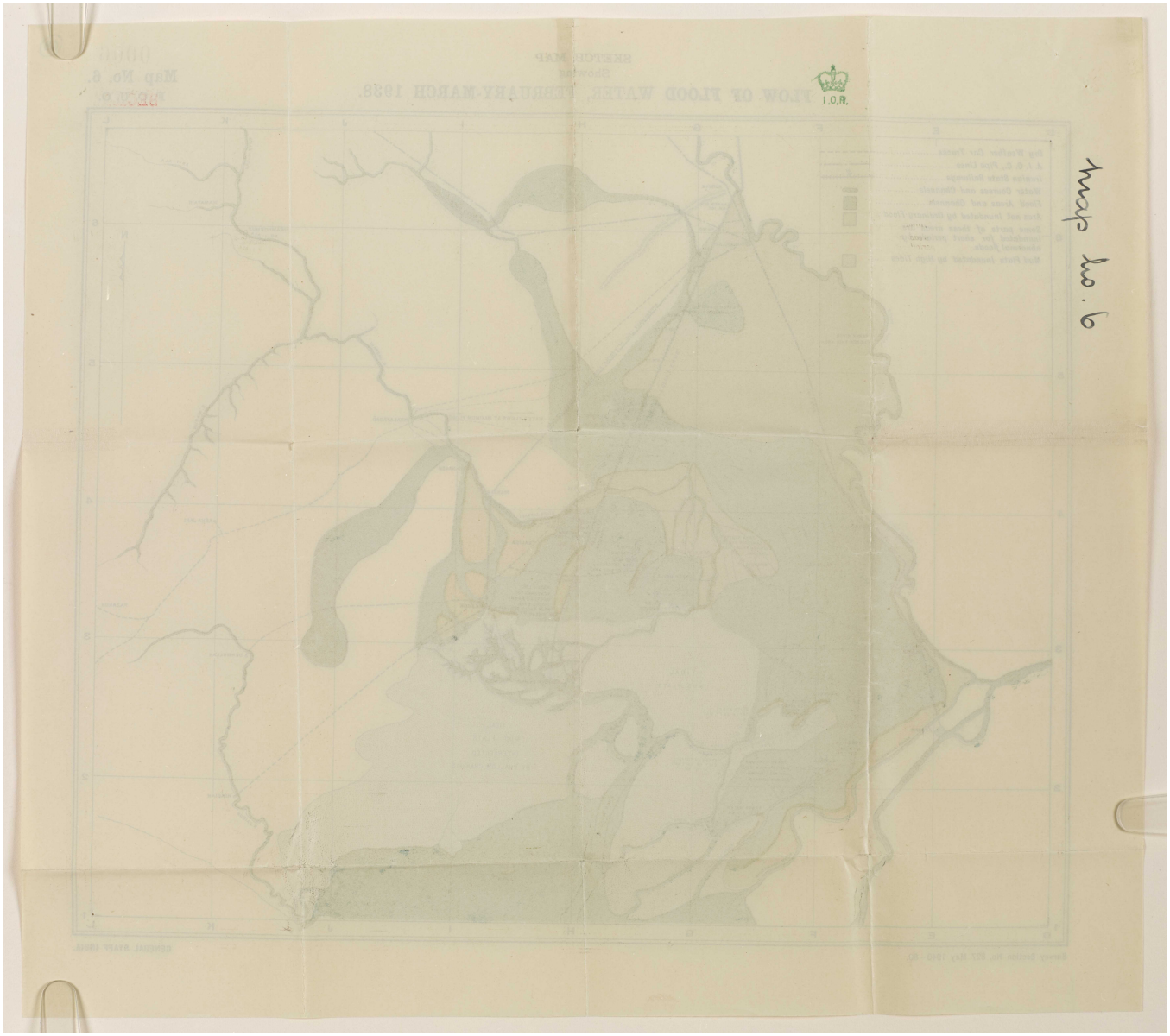




"خريطة مبدئية تُظهر اتجاهات تدفق مياه الفيضانات، فبراير-مارس ١٩٣٨" [٦٨و] (٢/١)



"خريطة مبدئية تُظهر اتجاهات تدفق مياه الفيضانات، فبراير-مارس ١٩٣٨" [٦٨ظ] (٢/٢)



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SECRET. 0007
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ROAD DISTANCE MILEAGE CHART.

(To accompany M. R. on A. I. O. C.)

ABADAN - MASJID-I.SULAIMAN.

	ABADAN	MARID	DORQUAIN	KHAZALI	KUT ABDULLAH	AHWAZ	WAIS	MULLASANI.	BAND-I-QIR	D-I-K.	M-I-S.
ABADAN.		14	34	50	71	80	96	104	108	130	163
MARID.	14		20	36	57	68	82	90	94	116	149
DORQUAIN.	34	20		16	37	46	62	70	74	96	129
KHAZALI.	50	36	16		21	30	46	54	58	80	113
KUT ABDULLAH.	71	57	37	21		9	25	33	37	59	92
AHWAZ.	80	66	46	30	9		16	24	28	50	83
WAIS.	96	82	62	46	25	16		8	12	34	67
MULLASANI.	104	90	70	54	33	24	8		4	26	59
BAND-I-QIR.	108	94	74	58	37	28	12	4		22	55
D-I-K.	130	116	96	80	59	50	34	26	22		33
M-I-S.	163	149	129	113	92	83	67	59	55	33	

MASJID-I-SULAIMAN - RAM HORMUZ-BUSHIRE.

	M-I-S.	HAFTKHEL	RAM HORMUZ	KHALAFABAD	HINDIAN	AMRI	MILE 22	GANAWEH	BANDAR RIG	MUHAMMADI	BUSHIRE.
M-I-S.		55	86	126	186	216	256	278	288	318	368
HAFTKEL.	55		31	71	131	161	201	223	233	263	313
RAM HORMUZ.	86	31		40	100	130	170	192	202	232	282
KHALAFABAD.	126	71	40		60	90	130	152	162	192	242
HINDIAN.	186	131	100	60		30	70	92	102	132	182
AMRI.	216	161	130	90	30		40	62	72	102	152
MILE 22 GANAWEH G.Q.G. Rd.	256	201	170	130	70	40		22	32	62	112
GANAWEH.	278	223	192	152	92	62	22		10	40	90
BANDAR RIG.	288	233	202	162	102	72	32	10		30	80
MUHAMMADI.	318	263	232	192	132	102	62	40	30		50
BUSHIRE.	368	313	282	242	182	152	112	90	80	50	

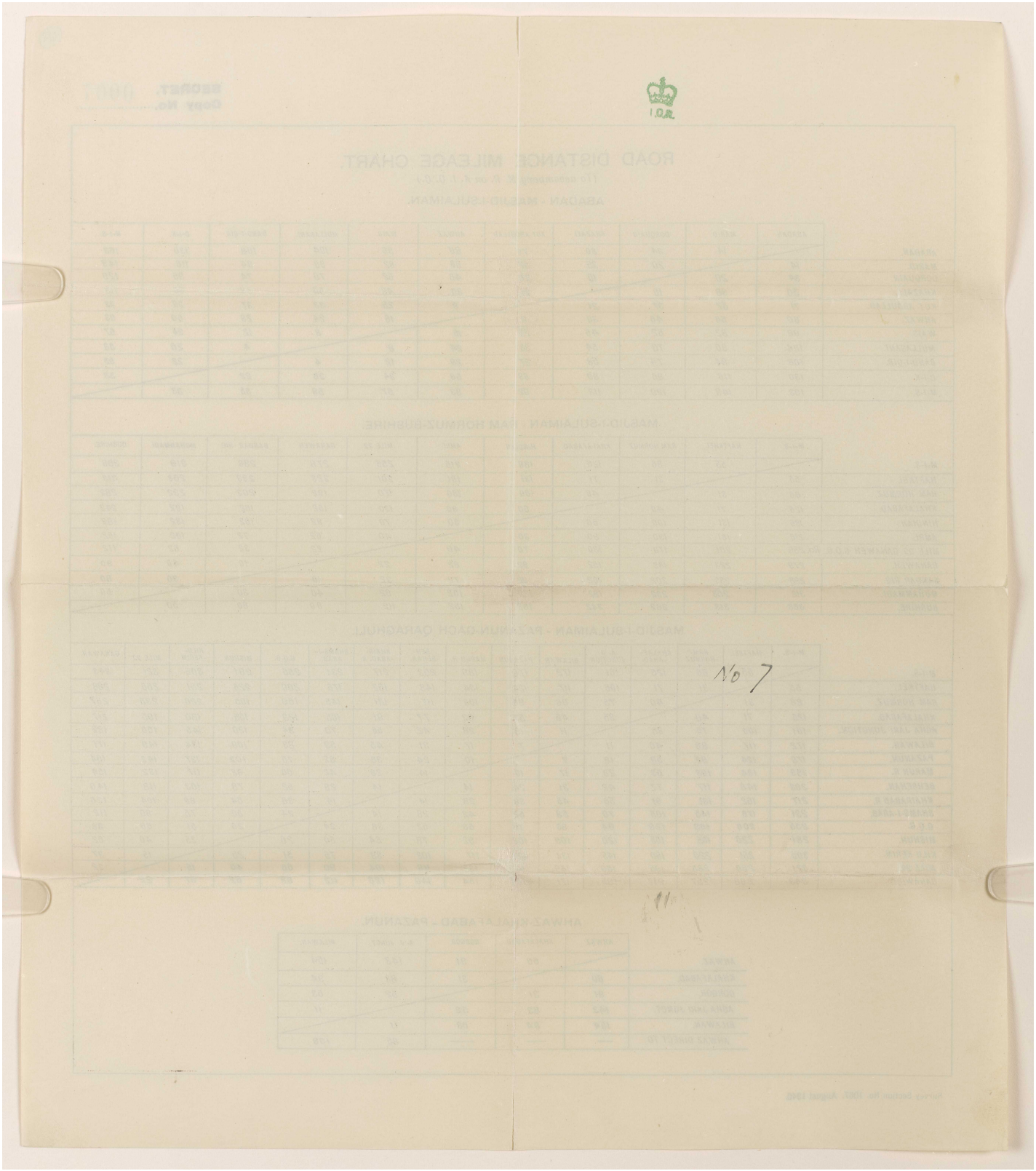
MASJID-I-SULAIMAN - PAZANUN-GACH QARAGHULI.

	M-I-S.	HAFTKEL	RAM-HORMUZ	KHALAF-ABAD.	A. J. JUNCTION	BILAWAN	PAZANUN	MARUN R.	BEH-BEHAN.	KHAIR-ABAD. R.	SHAMS-I-ARAB.	G.Q.G.	MISHUN	KILU-KERIM	MILE 22	GANAWAH.
M-I-S.		55	86	126	161	172	179	189	203	217	231	255	281	306	321	343
HAFTKEL.	55		31	71	106	117	124	134	148	162	176	200	226	251	266	288
RAM HORMUZ.	86	31		40	75	86	93	103	117	131	145	169	195	220	235	257
KHALAFABAD.	126	71	40		35	46	53	63	77	91	105	129	155	180	195	217
AGHA JARI JUNCTION.	161	106	75	35		11	18	28	42	56	70	94	120	145	160	182
BILAWAN.	172	117	86	46	11		7	17	31	45	59	83	109	134	149	171
PAZANUN.	179	124	93	53	18	7		10	24	38	52	76	102	127	142	164
MARUN R.	189	134	103	63	28	17	10		14	28	42	66	92	117	132	154
BEHBEHAN.	203	148	117	77	42	31	24	14		14	28	52	78	103	118	140
KHAIRABAD R.	217	162	131	91	56	45	38	28	14		14	38	64	89	104	126
SHAMS-I-ARAB.	231	176	145	105	70	59	52	42	28	14		24	50	75	90	112
G.Q.G.	255	200	169	129	94	83	76	66	52	38	24		26	51	66	88
MISHUN.	281	226	195	155	120	109	102	92	78	64	50	26		25	40	62
KILU KERIM.	306	251	220	180	145	134	127	117	103	89	75	51	25		15	37
MILE 22.	321	266	235	195	160	149	142	132	118	104	90	66	40	15		22
GANAWEH.	343	288	257	217	182	171	164	154	140	126	112	88	62	37	22	

AHWAZ-KHALAFABAD - PAZANUN.

	AHWAZ	KHALAFABAD	GORGOR	A. J. JUNCT.	BILAWAN.
AHWAZ.		60	91	143	154
KHALAFABAD.	60		31	83	94
GORGOR.	91	31		52	63
AGHA JARI JUNCT.	143	83	52		11
BILAWAN.	154	94	63	11	
AHWAZ DIRECT TO	—	—	—	95	108

Survey Section No. 1067. August 1940.



(70)

COMPARATIVE BRIDGE LOADING TABLE

(TO ACCOMPANY M. R. ON A. I. O. C.)

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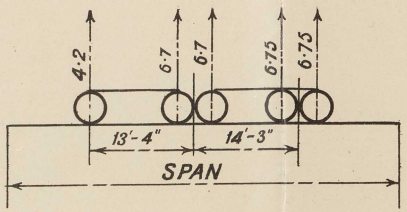

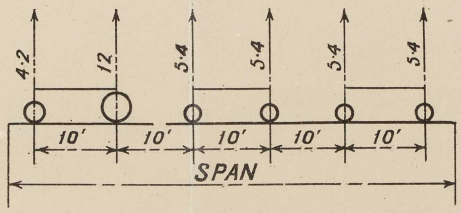

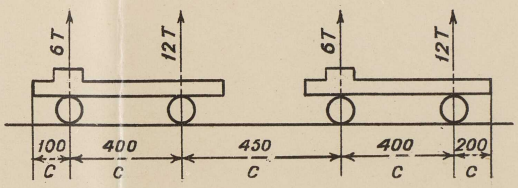

SPAN FEET.	LIVE LOAD A. I. O. C. LTD. LIVE LOADING.			B. E. S. LIVE LOADING (12 UNITS).			ONLY. IRAN GOVT: LIVE LOADING.		
	MAX. B. M. FT. TONS	MAX SHEAR. TONS.	EQUIV. U. D. LOAD TONS FT.	MAX. B. M. FT. TONS	MAX SHEAR. TONS.	EQUIV. U. D. LOAD TONS FT.	MAX. B. M. FT. TONS	MAX SHEAR. TONS.	EQUIV. U. D. LOAD TONS FT.
60	380	28·8	0·84	333	25·5	0·74	305	26·2	0·68
80	500	30·3	0·63	550	30·8	0·69	551	32·8	0·69
100	680	31·3	0·54	820	36·0	0·66	848	39·6	0·68
120	940	32·0	0·52	1140	43·5	0·63	1196	46·4	0·66
140	1100	32·3	0·45	1520	50·0	0·62	1634	57·7	0·67

NOTE :—
B. E. S. LOADING IS FOR 12 UNITS IN ALL CASES.

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