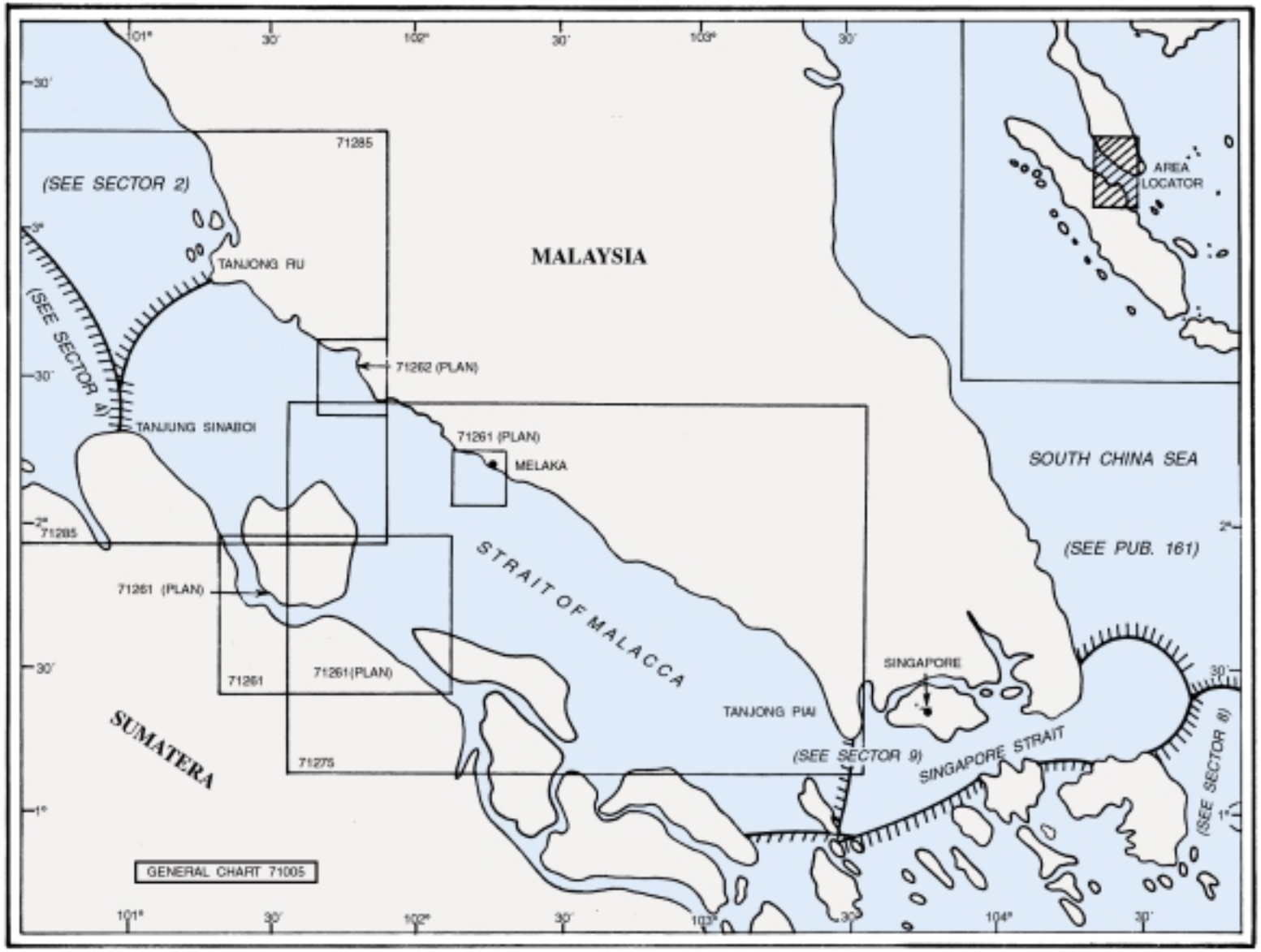

Additional chart coverage may be found in CATP2, Catalog of Nautical Charts.

SECTOR **5** — CHART INFORMATION

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SECTOR 5

STRAIT OF MALACCA—TANJUNG SINABOI AND TANJUNG RU TO SINGAPORE STRAIT

Plan.—This sector describes the S and N coasts of the Strait of Malacca between Tanjung Sinaboi and Tanjung Ru to Singapore Strait. The descriptive sequence is SE.

General Remarks

5.1 The S coast of the Strait of Malacca between Tanjung Sinaboi and Tanjung Medang, the N point of Pulau Medang about 37 miles ESE, is fronted by numerous mudbanks, which are a continuation of South Sands. Some of these banks dry and are marked by occasional breakers.

Pulau Medang and Pulau Rupat are separated from the Sumatera coast to the W and S by Sulat Rupat, a deep passage with the petroleum port of Dumai on its S side. Super tankers can be accommodated alongside the berths at this port.

Between Pulau Medang and Pulau Bengkalis, about 25 miles SE, the coast is bordered by mudbanks which extend up to 23 miles offshore.

Selat Bengkalis passes through these banks and forms the E entrance channel leading W to the oil port of Dumai.

The other branch of the channel extends SE and E for about 100 miles and then about 32 miles NE to join the E end of the Strait of Malacca.

Pulau Bengkalis, Padang, Merbau, Rangsang and Tebing Tinggi are separated from the coast of Sumatera by Selat Bengkalis, Selat Lalang and Selat Pandjang and from each other by narrow channels.

The E end of Pulau Bengkalis and the N coast of Pulau Rangsang are fronted by several long, narrow ridges of mud and sand, which lie up to 19 miles offshore, N of Pulau Rangsang.

The main fairway leading into and out of the Strait of Malacca lies between Long Bank and Fair Channel Bank about 7 miles to the N.

The high mountain ranges inland are sometimes visible early in the morning at certain times of the year. Some of the peaks of these ranges are useful marks to the navigator. The navigational aids along this stretch of coast are few and far between.

The N coast of the Strait of Malacca between Tanjung Ru and Tanjung Piai, about 166 miles SE, is only slightly indented. Most of the shoal areas which lie off this section of coast are contained within these bights N of a line drawn between the salient points.

Port Dickson and Melaka Road are the only two ports of any commercial importance to shipping.

Many of the salient points and off-lying dangers found along this section of coast are usually well marked by navigational aids. Some of these points have been reported to be radar conspicuous. When visible, the high peaks of the mountain ridges inland serve as good navigational aids for position fixing.

See Sector 4, under General Remarks, for information on winds, weather, tides, and currents.

Caution.—It has been reported that certain vessels carrying hazardous cargo have been exhibiting an all round red light.

Additionally, vessels with low freeboard use security lights underway which mask running lights by their brilliance. The security lights are used due to the increased potential of pirating activity in the Straits.

Although such lighting schemes are a violation of the regulations, vessels transiting the straits should be aware of the practice and take the necessary precautions and plan accordingly.

5.2 **South Sands** (2˚35'N., 101˚08'E.), similar to North Sands to the NNW, extends about 50 miles SE from a 7.4m patch about 8 miles SW of One Fathom Bank Lighthouse and terminate between Pyramid Shoal and the Sumatera coast to the S. These shoals extend over halfway across the strait from the Sumatera coast and are separated by fairly deep channels. None of these dangers are marked by navigational aids.

Pyramid Shoal (2˚27'N., 101˚30'E.), which lies on the N side of the SE end of South Sands, has a least depth of 3.4m, hard sand, and is the most dangerous shoal in the area because of its depth and protrusion into the fairway. Bambeck Shoal, the nearest shoal on the NE side lies on the NE side of the fairway.

A lighted buoy is moored about 7 miles SE of Pyramid Shoal. A depth of about 10m is charted between this buoy and the shoal. A depth of 13.6m was reported in 2˚23'N, 101˚41'E.

Shoal patches of sandwave formation extend into the fairway NE of Pyramid Shoal, the most important being depths of 12.4 and 13.1m lying about 8 miles NW of Pyramid Shoal. These shoals reduce the width of the fairway at this point to about 7 miles and should be avoided by deep-draft vessels. A depth of 17.6m was reported in the fairway 9 miles NNW of Pyramid Shoal and there is a depth of 19.8m 5 miles NNE of the shoal.

A wreck with a depth of 10m, whose charted position is approximate, lies 6 miles SSE of **Tanjung Tuan** (2˚24'N., 101˚51'E.). An 8.5m patch lies about 8 miles SE of the same point.

5.3 **Raleigh Shoal** (2˚07'N., 101˚53'E.), about 4 miles long in a NW to SE direction with a least depth of 4.8m, lies centered about 15 miles E of **Tanjung Medang** (2˚08'N., 101˚39'E.).

A shoal, with a depth of 19.4m, was reported to lie 3.5 miles NNW of Raleigh Shoal.

A lighted buoy is moored on the S side of the shoal.

Rob Roy Bank (1˚55'N., 102˚03'E.), a ridge about 15 miles long in a NW to SE direction with a least depth of 2.1m, lies about 27 miles SE of Tanjung Medang. A patch with a depth of 2.4m lies about 1.5 E of the 2.1m depth. The bank is steep-to on its NE and SW sides.

A lighted beacon, exhibiting a racon, stands in the middle of the bank.

A wreck, the exact depth which is unknown but which is considered to have a safe clearance of 15m, and whose charted

position is only approximate, lies about 11 miles E of Rob Roy Bank.

Another wreck, with a depth of 17m, was reported to lie 1.5 miles, farther SE. Another dangerous wreck lies in an approximate position about 10 miles NE of the bank.

Vowler Bank (1˚50'N., 102˚12'E.), with depths of less than 20m, lies with its NW end about 5 miles SE of the 2.4m depth on Rob Roy Bank. A 9.1m patch lies near the NW end of the bank and a similar depth lies s about 3 miles SE.

Clark Bank (1˚45'N., 102˚20'E.) consists of two narrow ridges, about 2 miles apart, extending in a NW to SE direction, which lies about 4 miles SE of Vowler Bank. Depths over these ridges range from 15.5 to 18.5m.

Between these banks and the shoals extending from the coast of Sumatera there is a deep channel with a least width of 3 miles.

5.4 **Fair Channel Bank** (1˚33'N., 103˚03'E.) consists of two narrow ridges with depths of less than 18.3m and about 3 miles apart, lying almost parallel with the coast. The bank extends about 22 miles NW from a position about 14 miles WNW of **Pulau Kukup** (1˚19'N., 103˚25'E.).

A wreck, with a swept depth of 25.5m, lies about 20 miles WNW of Pulau Kukup and a wreck, with a depth of 23m, lies about 10 miles WNW of the same islet.

A long narrow shoal about 8 miles long in a NW to SE direction with a least depth of 9.1m, lies with its SE end about 12 miles W of Pulau Kukup.

Southwestward of Long Bank are numerous similar banks lying parallel with it, extending to within a short distance of the banks fringing the Sumatera side of the strait.

Tanjung Sinaboi to Little Karimun Island

5.5 **Tanjung Sinaboi** (2˚17'N., 101˚02'E.) is low and thickly wooded, in the NE extremity of the peninsula separating the Sungai Rokan from Selat Rupat. Pulau Sinaboi, a small light-colored islet, lies close NW of Tanjung Sinaboi and shows up well against the darker growth of the mainland.

The coast between Tanjung Sinaboi and Tanjung Ketam, about 23 miles SE, is uniformly low and overgrown with mangroves. Good anchorage can be taken in the channel off this coast.

Between the inshore channel off the coast between Tanjung Sinaboi and Tanjung Ketam and the fairway of the Strait of Malacca, there are many mudbanks which are a continuation SE of South Sands, as far as, and S of Pyramid Shoal.

Bakal Iba Bank (2˚05'N., 101˚18'E.) lies parallel to and about 1 mile offshore close NW of Tanjung Ketam; it dries at its SE end, and has depths of 0.3 to 1.8m, hard sand, over the remainder. In the channel between the bank and the coast there is a least depth of 8.8m at its SE end.

Tides—Currents.—Along the edge of the coastal bank W of Pulau Sinaboi and in the channel between Tanjung Sinaboi and Tanjung Ketam, the currents set generally fair with the channel, setting SE at a maximum rate of 2 knots, and NW at 3 knots. The currents turn about 3 hours after H and LW along the shore. About 7 to 9 miles NW of Pulau Rupat, the currents set from E to ENE and from W to NW at a rate of 2 knots.

The irregular outline of the shoals, however, causes deflections of the current, so that caution is very necessary.

The current turns about 3 hours after H and LW along the shore.

Near the banks off the N entrance of Selat Rupat, the currents set diagonally across, from and to Bakal Tua Bank.

5.6 **Pulau Medang** (2˚05'N., 101˚40'E.) and Pulau Rupat are separated from each other by a narrow, winding strait of no importance to navigation. Both islands are heavily wooded.

Pulau Rupat is separated from the coast of Sumatera by Selat Rupat.

Foul ground, with numerous drying patches, extends about 7 miles offshore from the N side of Pulau Rupat and the NW side of Pulau Medang.

A shoal with a depth of 14.7m lies 6.5 miles NNE of Tanjung Medang.

Between Tanjung Medang and Tanjung Mambul, the E entrance point of the N end of Selat Rupat, about 11 miles WSW, the tree-covered coast is bordered by a series of shoals which extend up to 5.2 miles offshore.

The NE side of Pulau Medang is tree covered and marked by some native villages. A conspicuous house with a red roof is situated about 4 miles SE of Tanjung Medang.

A detached bank, which dries on its outer side, lies about 2 miles offshore, about 6 miles SE of Tanjung Medang.

Selat Rupat (Selat Dumai) (2˚03'N., 101˚21'E.) separates Pulau Rupat from the mainland of Sumatera. Tanjung Ketam the W entrance point of the N end of Selat Rupat is low and sandy and is marked by some houses and coconut trees.

Pulau Ketam, a small islet, stands 7 miles SSE of Tanjung Ketam and Pulau Atung, Mampu, Payung, Rampang and Mentelier stand up to 8.5 miles farther SSE.

All of these islets are low but tree-covered. The entire S shore of the strait is densely wooded.

A prominent village stands on the N side of the strait about 4 miles E of Tanjung Kapal, the SW extremity of Pulau Rupat.

The port of Dumai stands on the S side of the strait directly opposite Tanjung Kapal.

Dumai (1˚41'N., 101˚27'E.)

World Port Index No. 50785

5.7 The port of Dumai is situated on the S side of Selat Rupat, on the mainland coast of Sumatera. Dumai is an important oil loading terminal, with facilities for loading general cargo.

Tides—Currents.—The average range of the spring tides is about 2.4m and the average range of the neap tides is 1.7m.

The current sets parallel to the faces of the wharves with the flood setting to the E at a rate of 3 knots and the ebb setting to the W at a maximum rate of 2 knots. There is no slack period at springs and neaps. Tidal signals are displayed from the oil wharf at the port of Dumai.

Two fixed red lights horizontally disposed indicate an E current, two fixed white lights horizontally disposed indicate a W current. Red and white balls are used in lieu of the lights during the day time.

Depths—Limitations.—The Dumai port area can be reached by deep-draft vessels by proceeding from the Strait of

PORT FACILITIES—DUMAI				
Berth	Max. Size	Length	Draft	Least Depth at LWS
Pertomina Berth				
No. 1	100,000 dwt	275m	17.2m	18.0m
No. 2	10,500 dwt	135m	13.0m	15.0m
No. 3	35,000 dwt	200m	16.4m	16.0m
No. 4	25,000 dwt	154m	16.0m	15.0m
No. 5	35,000 dwt	200m	15.6m	16.0m
No. 6	3,000 dwt	90m	16.1m	15.0m
C. P. I. Oil Wharf				
No. 1	150,000 dwt	285m	17.7m	18.6m
No. 2	150,000 dwt	350m	17.7m	18.0m
No. 3	100,000 dwt	260m	17.7m	
No. 4	55,000 dwt	210m	15.3m	
Government Cargo Wharf				
No. 1	10,000 dwt			
No. 2	23,000 dwt			

Malacca into Selat Bengkalis and following a buoyed channel on a S course for about 22 miles to the junction of Selat Rupat.

Vessels must make a turn of about 180˚ to enter Selat Rupat and then follow a W course for a distance of 33 miles to Dumai. The Selat Bengkalis and the Selat Rupat fairways have been wire-dragged to a depth of 24m and 18.3m, respectively.

Incoming ships are assigned berths in accordance with time of arrival, product to be loaded, size of vessels, and loaded draft.

There are many wharves available at Dumai. One wharf is Pertamina-owned and consists of 2 berths. A new wharf is also Pertamina-owned and consists of four berths. The other four wharves are C.P.I. owned and operated.

The accompanying table above lists the berthing facilities at the port.

Pilotage.—Pilotage for the Rupat and Bengkalis Straits is compulsory and is available 24 hours. The pilot boards in 1˚54.5'N, 101˚51.3'E, near the fairway light buoy. Vessels should send ETA through Dumai (PKP) 96 and 24 hours in advance, notifying changes of over 3 hours immediately.

State if proceeding through Singapore and send amended ETA upon leaving there. Vessels should contact Morong Pilot Station on channel 16 requesting a pilot at the Fairway Buoy.

Harbor pilotage is compulsory for all vessels entering the inner harbor at Dumai. Send ETA 6 hours in advance. Harbor pilots are available 24 hours.

Pilots will board vessels at the cargo (berthing) anchorage in 1˚42.5'N, 101˚26.0'E, or on arrival at buoy "18" if a berth is available. Harbor pilotage is performed by government pilots.

All vessels proceeding to Dumai should hoist the International Code Flag "H" or "PT" when passing buoy "17" and call C.P.I. via radiotelephone (VHF) on channel 12. At this time the vessel will be notified if pilots are available; if not then the vessel may proceed directly to Dumai Harbor Anchorage Area.

Regulations.—The Rupat-Bengkalis Strait area has been designated as a restricted maritime zone by Indonesia. A partial exemption from the requirement to secure special Indonesian Consular clearance prior to entering this zone has been granted by the Indonesian navy to tankers bound for Dumai from any port in the world except Singapore.

Vessels require only normal clearance from their last port to obtain entry at Dumai. Vessels diverted at sea need only normal clearance from the last port and the diversion cable.

All vessels inbound to Dumai from abeam of Raleigh Bank Lighted Buoy until anchored off Dumai must display the International Code Flag hoist "CAL" flown from the signal yard, by day; and a red light, 1.8m above a white light, by night.

Anchorage.—The Dumai general anchorage is N and W of the oil wharves. The least depth in this area is 14.6m. Holding ground at these anchorages is good, with clay bottom.

It is reported that this area is sufficient enough for ease of maneuvering and will provide swinging room for several vessels of the size that are accommodated at the oil wharves.

5.8 Selat Bengkalis (1˚39'N., 101˚56'E.) lies between the SW side of Pulau Bengkalis and Sumatera and is entered W of Tanjung Jati, the W extremity of Pulau Bengkalis, which stands about 19 miles SE of Tanjung Masim. The N approach is deep and presents no difficulty if the buoyed channel is followed.

The W shore of the approach, from the NE extremity of Pulau Rupat to Tanjung Masim is covered with low trees and covered at HW. Tall trees stand inland.

Shoals, with depths from 3 to 11m, extend up to 20 miles N and NW from Tanjung Jati.

A shoal, with a depth of 7.2m, lies about 4 miles WNW of Tanjung Jati. A shoal, with a depth of 10.6m, lies on the SW side of the strait about 4.7 miles SW of the same point.

Southward of Tanjung Balai, about 17 miles SE of Tanjung Jati, Selat Bengkalis becomes Selat Lalang.

Selat Lalang leads into Selat Pandjang and this strait has considerable depths for about 60 miles but is then fouled by islets and shoals.

Sungai Siak (1˚14'N., 102˚10'E.) branches off in a S direction at Tanjung Lajang 9 miles S of Tanjung Balaidalam.

Pulau Bengkalis (1˚29'N., 102˚16'E.) is uniformly covered with vegetation. Its N coast is fronted by shallow ridges running parallel to it and separated by deeper channels. The village of Bantantengah lies about midway between Tanjung Jati and Tanjung Parit, the NE end of the island. During May and November numerous fishing boats frequent the waters N of the island.

A shoal, with a depth of 3.9m, lies on a ridge about 7 miles N of Bantantengah.

The E coast of Pulau Bengkalis is fringed by a steep-to bank of mud and sand extending about 0.3 mile offshore. A river discharges into the strait about 2 miles S of Tanjung Senekip, which lies 3.75 miles SSE of Tanjung Parit.

A shoal, with a depth of 8.5m, lies 2.5 miles offshore 4.5 miles SE of Tanjung Senekip.

A shoal, with depths of less than 10m, lies centered 1.5 miles offshore between Tanjung Senekip and Tanjung Pulau Kandar.

5.9 Tanjung Palau Kandar (1˚15'N., 102˚30'E.), with the village of Sekadi on it, is the SE extremity of Pulau Bengkalis. A spit, with a depth of 0.5m, extends 0.5 mile S, and a 4.8m depth lies about 1 mile SW of the point.

Between the E coast of Pulau Bengkalis and Long Bank, about 29 miles to the E, there are several narrow sand ridges separated by channels with greater depths.

Tides—Currents.—The tidal currents set along the N side of Pulau Bengkalis and Pulau Rangsang, to the SE, in an E to ESE direction at a rate of 2 knots at springs, and from W to NW at a rate of 3 knots.

At neaps both currents are weak off Pulau Bengkalis but have a rate of from 1 to 1.5 knots off Pulau Rangsang.

In the bight between these two islands the current sets in and out.

In Selat Bengkalis, the SE current begins to make about 2 hours after LW along the shore, and may attain a rate of more than 2 knots. The NW current makes 2 hours after HW, and at times attains a rate of 3 knots.

Bengkalis Settlement (1˚28'N., 102˚06'E.) (World Port Index No. 50790) stands on the NE side of Selat Bengkalis, about 11 miles SE of Tanjung Jati.

Pulabuhan Bengkalis is a small trading post with two small piers. The commercial pier, 30m long, has a usable length of 50m with depths of 4m alongside. Vessels up to 500 grt are accepted.

Government Pier, lying approximately 0.6 mile SE, is 10m long. A dangerous wreck (PD) lies off the pier.

Anchorage can be made anywhere in the approach channel from NW, or off the settlement, with good holding ground of mud, sand, and stiff clay.

Sungaipakning (1˚20'N., 102˚10'E.) (World Port Index No. 50805) stands about 2 miles S of Tanjung Balaidalam. A radio mast, painted red and white, stands in the town.

A shoal, with a least charted depth of 8m, extends about 3 miles SE from a point about 1 mile NE of the charted light in 1˚20.7'N, 102˚09.5'E.

Depths—Limitations.—Wharf No. 1, is reported capable of accommodating tankers up to 259m in length with a depth of 14.5m alongside extends from the shore at Sungai Pakning.

The T-head is 305m and is connected to the shore by a long causeway. Tankers up to 61,000 dwt, with a maximum length of 220m, can be accommodated.

Wharf No. 2, which stands 0.5 mile S of Wharf No. 1, is 55m long and 12m wide and is capable of handling two tankers simultaneously but vessels up to 85,000 dwt have been successively loaded alongside.

The wharf is flanked by two large mooring dolphins; the outer dolphins are detached but the inner dolphins are connected to the loading platform by catwalks.

Anchorage.—The recommended anchorage lies about 1 mile NNE of Wharf No. 1, in a depth of 20 to 40m, clay, good holding ground, but mariners are cautioned that the tidal currents are strong.

5.10 Lalang Marine Terminal (1˚11'N., 102˚13'E.) consists of an SPM, to which is secured a 141,000 ton storage barge, in a depth of 22.7m. There is a limiting depth of 17m in the approach. Vessels over 140,000 dwt and with a draft greater than 16.7m on departure will not be accepted without prior agreement with the terminal. Pilotage is compulsory; the pilot boards E of **Selat Morong** (1˚56'N., 101˚51'E.).

Sungai Siak, which stands about 9 miles S of Tanjung Balai, is about 1 mile wide at its entrance and is navigable only by small craft with local knowledge. Above Siak, about 40 miles above the entrance, the navigation of the river is difficult for vessels exceeding 60m in length.

Islands and Channels

5.11 Selat Padang (1˚25'N., 102˚13'E.), the channel between Pulau Bengkalis and Pulau Padang to the S, is in frequent use by small craft trading between Singapore and Bengkalis. The channel is almost 1 mile wide with depths of 6 to 14m in the fairway. The channel is contracted to a width of 0.3 mile at its SE entrance by the extending shoal which has a least depth of 4.8m.

From **Tanjung Padang** (1˚25'N., 102˚12'E.), the S entrance point of the W end of the strait, a spit with a depth of 1.8m at its outer end, extends 2.5 miles W from the point. The spit dries up to 1 mile W of the point.

Dedap, a wooded islet, lies on a sandbank which extends about 0.2 mile offshore from the SW side of the strait about 11 miles SE of Tanjung Padang.

In Selat Padang the E current has a maximum rate of 2 knots and makes about 2 hours after LW. The W current has a maximum rate of about 3 knots and makes about 2 hours after HW. Toward neaps the currents are very weak but the W current predominates.

Selat Asam (1˚09'N., 102˚29'E.), which lies between Pulau Padang to the W, and Pulau Merbau and Pulau Tebing Tinggi

to the E, has a least width of about 1 mile and a least depth of about 12m in its N approach.

The shores are steep-to, except off the N entrance point at its S end where it joins Selat Lalang and Selat Pandjang. A spit, with a depth of 8m at its outer end, extends about 1 mile S from this point. A village stands on the SE extremity of Pulau Padang.

Selat Lalang is about 2.2 to 4 miles wide and has a least depth of 11m in the fairway but there is a ridge with a depth of 8m near the middle of the strait abreast Makapan Settlement which stands on the W bank about 15 miles S of Tanjung Lajang.

5.12 Selat Pandjang (0˚50'N., 102˚25'E.) has a width of 1.5 to 3.2 miles, except where it is fouled by shoals and islets.

The above passages are only used by local vessels and are of little commercial importance.

Tides—Currents.—In Selat Lalang and Selat Pandjang the currents turn from 2 to 2.5 hours after H and LW along the shore.

The SE and E currents have a maximum rate of 3.5 knots, and set along the coast of Sumatera into Sungi Kampar, about 14 miles SE of the E entrance of Selat Pandjang.

The W and NW currents have a maximum rate of 4 knots, being stronger near the E end of Selat Pandjang.

Selat Ringgit (1˚00'N., 102˚36'E.), between the SE side of Pulau Merbau and the NW end of Pulau Tebing Tinggi, has a least width of about 46m, and depths are reported to be from about 5 to 12m. Vessels should favor the N side of the fairway at both ends of the strait.

Directions.—A vessel bound for Bengkalis Settlement from the Strait of Malacca may pass close along the E side of Pulau Bengkalis, round its SE end, taking care to avoid the spit which extends from it, and then proceed through Selat Padang.

5.13 Pulau Merbau (1˚03'N., 102˚32'E.), separated from the adjacent islands by Selat Asam and Selat Ringgit, is bordered by a shoal bank on its NE side which extends about 12 miles offshore. The inner part of this bank dries.

Between this bank and the bank which extends from the NW side of Pulau Rangsang is the W fairway leading into Selat Kungkung which in turn leads into Selat Ajer Hitam.

Several narrow banks lying in a N to S direction, with depths of 1.2 to 5.5m lie in the N part of this fairway.

The N and NE coasts of Pulau Rangsang are fringed by a mud bank which dries out up to 1 mile offshore. A village stands on the NE side of the island 8 miles SE of Tanjung Kedabu, the NE point.

Numerous fishing stakes may be encountered up to 5 miles offshore between Tanjung Kedabu and **Tanjung Medang Kaluwar** (0˚53'N., 103˚10'E.).

Selat Kungkung (1˚00'N., 102˚40'E.), entered between Pulau Merbau and the W end of Pulau Rangsang, should not be used by vessels without local knowledge, as the approaches for 20 miles to the N are fouled by long shoal ridges some of which have depths of less than 1.2m and they are not buoyed.

A drying bank extends up to 1 mile from the NW coast of Pulau Rangsang.

At **Tanjung Majan** (1˚01'N., 102˚44'E.), about 7 miles E of Tanjung Ajung, Selat Kungkung leads into Selat Ajer Hitam, which separates Pulau Rangsang from the N side of Pulau Tebing Tinggi.

Close to the SE end of Pulau Tebing Tinggi there is a narrow channel, with a least depth of 3.5m, leading into the E end of Selat Pandjang.

Sungai Sudur (1˚02'N., 102˚47'E.) and Sungai Suwir flow into the N and S sides, respectively, of the NW end of Selat Ajer Hitam.

Tides—Currents.—In Selat Kungkung and Selat Ajer Hitam, the SE current commences about 2 hours after LW, and the NW current about 2 hours after HW, at rates of 2.5 and 4 knots, respectively, at springs. Both currents are weak at neaps, the NW current being the stronger.

5.14 Selatpandjang Settlement (1˚01'N., 102˚42'E.) stands on the S shore about 5 miles E of the W entrance of Selat Kungkung. A T-head pier, with a depth of about 6m alongside, extends from the shore abreast of the settlement. A light is shown on the pier.

Pulau Manggung (0˚49'N., 103˚05'E.), Pulau Topang, Pulau Lebu, Pulau Serapung, and Pulau Mendol, which stand off the entrances of both Selat Ajer Hitam and Selat Pandjang, are low, thickly wooded islands. A pier extends from the SW side of Pulau Mendol.

Serapung Village, on the E side of the island of the same name, may be easily identified by the red roof of the customs station. Local knowledge of the channels can be obtained here.

A shoal area with depths of less than 5.2m extends about 3 miles E from the NE extremity of Pulau Manggung and then curves S and SW to the S extremity of Pulau Topang. There is a least depth of 0.9m over this shoal.

A similar shoal area, with a depth of less than 0.6m extends from a position about 3 miles E of the SE extremity of Pulau Topang to Pulau Burung.

The least charted depth in the channel between the two shoal areas is about 5.3m.

Pulau Lalang (0˚50'N., 103˚17'E.), rocky, hilly, and overgrown with brush, stands 3.75 miles SE of Pulau Burung.

It is a small reef-fringed islet surrounded by numerous rocks and shoals within 1 mile N, S, and W its sides. Detached reefs lie about 1.2 miles E, 1 mile SSE, and 1.5 miles SSE, respectively of Pulau Lalang.

Pulau Rusah (0˚44'N., 103˚16'E.), a rock topped by tall trees, stands in the fairway of the channel leading W and S of Pulau Kundur into Selat Durian. Pulau Turus and Batu Lanjang, awash, lie 1 mile and 2.75 miles SSE, respectively, of Pulau Rusah.

Between Pulau Turus and Batu Lanjang to the W, and Pulau Kundur to the E, there is a drying shoal. It extends about 3 miles NW from a position about 2 miles E of Batu Lanjang.

Two drying rocks, and a scrub covered rocky islet, lie about l.5, 2, and 3 miles SE of Batu Lanjang.

A clear passage, with a least depth of 5.8m in mid-channel, lies between these dangers and the NE side of Pulau Mendol.

Tides—Currents.—In the strait between as well as outside these islands the flood sets to the SE, and the ebb to the NW; the ebb current being the stronger.

The current near the E coast of Pulau Bengkalis has a rate of almost 2 knots and increases to a rate of 3.5 knots near Pulau Belembang and Pulau Burung.

Selat Kampur (0˚28'N., 103˚08'E.), which rises in the mountain ranges in W Sumatera, discharges on both sides of Pulau Mendol but the main channel passes E of this island.

Small local vessels navigate this river up to 18 miles above the entrance but local knowledge is essential.

5.15 Pulau Burung (0˚51'N., 103˚14'E.), which stands about 5 miles SE of Tanjung Medang Kaluwar, the E extremity of Pulau Rangsang, is high, densely wooded, and fringed by above and below-water rocks.

Pulau Belembang (0˚53'N., 103˚14'E.) stands 1.5 miles N of Pulau Burung and is also surrounded by above and below-water rocks. The islet is low and covered with brush.

Drying rocks lie close NE and about 1 mile NE, respectively, of Pulau Belembang. A 4.4m patch lies about 2 miles NE of the islet.

Pulau Kempaan (Kenipaan) (0˚54'N., 103˚20'E.), about 2 miles in length, stands 6 miles ENE of Pulau Belembang and 2 miles W of the N extremity of Pulau Kundur. The bottom between this island and Pulau Kundur is foul. Above and below-water rocks lie in Selat Gelam between Pulau Kempaan and Pulau Babi. Pulau Nipah, close N of Pulau Kempaan, is the only uninhabited islet.

Pulau Babi (0˚57'N., 103˚22'E.), 2.5 miles NNE of Pulau Kempaan, rises to a height of 79.9m.

Pulau Tambelas (0˚59'N., 103˚13'E.), 80m high, stands about 4 miles NNW of Pulau Kempaan, in the fairway between Selat Gelam and the channels between the islands SW of it. The island has three peaks and from a distance appears as two islands.

The Karimun Islands consist of Great Karimun (Pulau Karimunbesar), Little Karimun (Pulau Karimun Ketjil), and a number of off-lying islets. They differ in character from the low marshy islands of the E coast of Sumatera, being hilly with fertile soil, and are well-populated. They are surrounded by reefs and shoals, many of which are wholly or partly dry.

Those islands in the Karimun group N of Selat Gelam are described in this sector. Those S of Selat Gelam are described in paragraph 8.61.

5.16 Great Karimun (1˚04'N., 103˚21'E.) is mountainous at its N end, the principal peaks being Betina, 416m high standing 1.75 miles SW of the N extremity, and Djantan, 453m high, about 1.25 miles S of Betina. The S end of the island, except near Tanjung Balai, consists of low, swampy ground. The surrounding islets are rocky and thickly overgrown.

On the E side of Great Karimun, a bay is formed between Tanjung Bula Kasap, the NE point of the island, and Tanjung Sebatak, about 5 miles SSE. This bay is fouled by a shallow mud bank which extends about 1 mile offshore, out to the line of its entrance points.

During the SW monsoon good anchorage can be taken off the E side of Great Karimun, to the SE of Little Karimun, over a bottom of stiff gray mud with good holding ground. The depths over the bank fronting this anchorage range from 8.2 to 9.1m and have to be crossed to get to the anchorage area.

Selat Gelam (0˚58'N., 103˚26'E.), the passage between the S end of Great Karimun and the N end of Pulau Kondur, is used by local craft trading between Singapore and the islands to the SW. The passage at its E end is about 3 miles wide but about 6 miles to the W the channel is divided into two channels by Pulau Babi. The S channel has greater depths but it is fouled by more shoals. Neither channel is buoyed.

Assan and Mudu, rocky and thickly overgrown islands, 83 and 65m high, respectively, lie about 1.2 miles off the NW side of Great Karimun. Sajuda, an above-water rock, lies 0.5 mile N of Assan and Seal Rock lies about 0.5 mile NE of Sajuda. Tokong Belanda, a low rock, lies about 1 mile WNW of the NW extremity of Assan.

Mudu (1˚06'N., 103˚17'E.) lies about 1 mile SSW of Assan. Reefs extend about 0.5 mile from its NW and W sides. A 5.7m patch lies about 1.2 miles W of the N extremity of Mudu. A drying reef extends about 0.7 mile SSW from the island.

5.17 Little Karimun (1˚09'N., 103˚24'E.), separated from the NE side of Great Karimun by a deep channel, about 0.5 mile wide, is a bold island 377m high.

In the NW approach to the channel between Great Karimun and Little Karimun are two islets, **Nangoi** (1˚10'N., 103˚22'E.), 39m high, about 1.2 miles W of the NW end of Little Karimun, and Tantun, a fairly steep-to islet, about 1 mile SW of Nangoi.

In the channel close to the SW side of Little Karimun is an above-water rock, which narrows the channel to about 0.3 mile. Petera, an islet about 9.1m high, stands in mid-channel at the S end of the channel.

A bank, with depths of 5.5m and a least depth of 1.5m, extends about 1.2 miles SSE from the S side of Little Karimun. This bank continues in the same direction, parallel with the coast of Great Karimun, for an additional 15 miles with depths of less than 10m. A 0.9m depth is near its middle.

In the passage between Great and Little Karimun, the tidal current attains a rate of 4 knots at springs.

Pulau Iyu Besar (1˚11'N., 103˚21'E.) and Pulau Iyu Kecil, each 45m high, lie about 3 miles N of Little Karimun. Pulau Iyu Kecil lies 0.5 mile NE of Pulau Iyu Besar. The islets are known as The Brothers.

A rock, with a depth of 2m, lies 0.3 mile NE of Pulau Iyu Kecil, and a rock, with a depth of 2.5m, lies 0.2 mile N of the same islet. A rock, awash, lies 0.2 mile NW of Pulau Iyu Kecil, and a rock, with a depth of 6.1m, lies 0.5 mile S of the same islet. All of these rocks are steep-to.

Tanjong Ru to Tanjong Piai

5.18 Taluong Ru (2˚51'N., 101˚17'E.) stands on the E side of the approach to Selat Kelang. The coast between Tanjong Ru and Tanjong Gabang, about 15 miles SE, is indented about midway along its length by Kaula Langat. This shallow river is not frequented by any but small local craft.

The coastal bank, which extends about 2 miles from Kuala Langat, is steep-to and shoals rapidly from a depth of 27.4m to 0.3m, with numerous patches which dry, between the edge of the bank and the river entrance.

Bukit Jugra (2˚51'N., 101˚25'E.), a thickly wooded, conspicuous hill 240m high, stands about 3 miles NNE of the river entrance.

This hill is the only hill near the coast and is easily identified; when seen from the NW or W it appears as an oblong shape at both ends, but from the S it appears conical.

Kampong Morib (2˚45'N., 101˚27'E.) which is conspicuous, stands 3.75 miles SSE of the entrance of Kuala Langat. All of the buildings in the town are clearly visible from the offing. A drying sand bank extends up to 1.75 miles off Kampong Morib, the depths then increasing rapidly about 0.5 mile farther offshore. The edge of this bank is difficult to see and should be given a wide berth.

Taluong Gabang (2˚42'N., 101˚29'E.), about 4 miles SSE of Kampong Morib, is not easily identified. Kampong Batu Laut stands at the mouth of a small river about 2 miles SE of the point and is clearly visible from the offing. A steep-to mudbank extends 0.3 mile offshore at the village.

Between Tanjong Gabang and the entrance of the Sungai Sepang Besar, about 16 miles ESE, the thickly wooded coast is fringed by a sand and mudbank which extends up to 0.5 mile offshore. A conspicuous tree stands about 5 miles SE of Tanjong Gabang.

Tides—Currents.—Off the coastal bank SW of Kuala Langat the SE current begins from 4 hours 30 minutes to 4 hours before HW at the shore. At springs the rate is 1.75 knots and 0.5 knot at neaps. The NNW current begins from 1 hour 30 minutes to 2 hours after HW by the shore. At springs the rate is 2 knots and 1 knot at neaps.

Sungai Sepang Besar (2˚36'N., 101˚43'E.) is navigable by small craft with a draft of about 1.8m at HW for a distance of about 4 miles. Sungai Sepang Kechil discharges into the strait about 2 miles WNW of Sungai Sepang Besar but is available only to small craft. A chimney, almost obscured by trees but noticeable at times by its smoke, stands 1.25 miles N of the entrance of the Sungai Sepang Kechil.

Sungai Lukut Besar (2˚34'N., 101˚47'E.), which discharges about 5 miles E of Sungai Sepang Besar, is shallow. A village stands on the bank at the river entrance. A 19m high hill stands close W of the entrance of Sungai Lukut Besar. It makes a good landmark on an otherwise featureless stretch of coast.

Tanjong Kamuning (2˚31'N., 101˚48'E.) is steep-to with depths of 11m about 0.5 mile SW of it. Pulau Borong, a low, densely wooded islet, rock fringed and surrounded by a shallow bank, stands 1.5 miles N of the point.

5.19 Bambek Shoal (2˚33'N., 101˚40'E.), about 4 miles offshore, lies SW of the mouth of the Sungai Sepang Besar. It has a depth of 0.3m near its center and is composed of hard sand. Its NW and SE sides are steep-to with depths increasing to over 15m. A bank with a least charted depth of 4.8m lies between Bambek Shoal and the coast. A deep channel lies between this bank and the coast.

Several detached banks, with depths of 11 to 18.3m, lie W and NW of Bambek Shoal. The W patch, with a depth of 18.7m, lies about 6 miles WNW of the shallowest part of Bambek Shoal.

The NW extremity of a sand ridge, which extends about 10 miles SE toward Tanjong Tuan, lies about 3 miles E of the shallowest part of Bambek Shoal.

Two patches, each with depths of 1.2m, stand on the ridge about 2 miles S and 3.5 miles SE respectively, of Tanjong Kamuning. Between the N part of this ridge and the coast there is a channel about 0.5 mile wide with depths of 20.1 to 36.6m, suitable for large vessels, leading NW to the anchorage off Port Dickson.

A narrow channel 0.3 mile wide with depths of 11 to 23.8m, lies between the S part of the ridge and the coast and leads N to this anchorage from Tanjong Tuan. This channel is suitable only for small craft with local knowledge.

On the NE side of this S approach to Port Dickson there are several shoals and rocks, the most remarkable being a rock which dries 0.9m, which lies 1.75 miles SE of Pulau Arang Arang.

5.20 Port Dickson (2˚31'N., 101˚48'E.) (World Port Index No. 49960) is situated on the W coast of the Malaysian Peninsula facing the Strait of Malacca. The town stretches along the coast in the direction of Tanjung Tuan, located 8 miles SE.

Port Dickson is an important oil terminal operated by Shell and Esso, and is a minor port for general cargo.

Winds—Weather.—During the period from May through October vessels may experience Sumatras which usually blow from a SW to a NW direction. The average duration is between 1 hour and 4 hours with wind velocities between 40 and 50 knots, followed shortly thereafter by heavy rain.

During the SW monsoon there is a continual swell and rough sea at the anchorage. At other times an appreciable swell may also be experienced.

Tides—Currents.—Port Dickson tides are semi-diurnal. At the outer anchorage the tidal current sets SE from 3 hours 30 minutes before until 2 hours 45 minutes after HW, and NW 3 hours 25 minutes after until 4 hours 45 minutes before HW at Port Dickson.

In the inner anchorage the tidal current sets SE from 3 hours 45 minutes before until 3 hours 45 minutes after HW, and NW during the remaining period.

The tidal current close inshore on the W side of Tanjong Kamuning at times sets in an opposite direction to that of the outer anchorage, resulting in a confused tidal condition and eddies in the fairway S of Tanjong Kamuning.

Depths—Limitations.—There is a deep water approach channel from the NW, marked by lighted buoys, which presents no difficulties and is clear of dangers.

Port installations comprise the following:

The Railway Jetty, 182.9m long with a 46m face, is used by dry cargo vessels and LPG carriers drawing up to 7.9m. A small boat harbor that is contained in the curve of the stone approach to the Railway Jetty affords little shelter against S winds and dries out at LW.

Shell Jetty (2˚31.2'N., 101˚47.6'E.) is situated about 0.1 mile W of the Railway Jetty. It is a 213.4m long reinforced concrete jetty with a 51.8m x 10.9m T-head and four dolphins. The maximum distance between the outer dolphins is 304.8m.

Alongside depths of 7.9m allows vessels of 152.4m in length with a 6.4m draft and up to 18,000 dwt to berth.

Berthing maneuvers usually take place in daylight, and vessels over 121.9m in length requiring to swing are taken in on the flood only.

New Shell Jetty (2˚32'N., 101˚47'E.) is a 430m long T-head jetty with three berths. Berths 1 and 3, on its seaward face, can accommodate a vessel with a maximum draft of 10.5m.

Berth 2, on the SE landward face, can accommodate a vessel with a maximum draft of 7.5m.

Esso Jetty is situated about 0.5 mile NW of Shell Jetty. It consists of a reinforced concrete island, 64m x 7.3m, with a distance between the outer buoys of 219.5m. The approach depth is 12.2m. There is an alongside depth of 10.3m, which allows vessels up to 19,500 dwt, with a maximum length of 170.7m, to berth day or night.

Esso-Shell Single Buoy Mooring (2˚31.3'N., 101˚47.0'E.) is comprised of a yellow steel buoy, 10.7m in diameter, in a least depth of 27.4m, with a sand, mud, rock, and stone bottom. This facility will accommodate tankers up to 274m in length with a 14.3m draft or 90,000 dwt capacity.

Berthing is during daylight only but can be carried out on any state of tide for vessels up to 45,000 dwt. Vessels above this limit are berthed on the ebb only. A submarine oil pipeline is laid to the buoy from the shore, about 0.1 mile N of Tanjong Kamuning.

Two floating hoses marked by lights may extend up to 230m from the mooring buoy.

The head of a T-headed jetty extending about 1 mile WSW from the shore is situated about 1 mile N of the Esso-Shell SBM; a submarine pipeline connects the SBM and the pier.

Aspect.—A large power station, with three conspicuous chimneys, one 118m high and the other two 94m high, stands on reclaimed land 0.7 mile N of Tanjong Kamuning. A conspicuous chimney, 94m high, with a flare, about 0.1 mile ENE and another flare 1 mile further E, stands 1.25 miles NE of Tanjong Kamuning.

Pilotage.—Compulsory for vessels berthing/unberthing at Railway Jetty and for berthing/unberthing at the SBM. Private services are operated by Shell and Esso for vessels making use of their respective facilities.

The mooring master boards 1 mile N of the fairway buoy; vessels less than 30,000 dwt may be boarded at No. 1 Buoy.

The vessels ETA should be made, via Pinang or Singapore Radio, 96 and 24 hours in advance. Vessels should keep a listening watch on Shell Port Dixon Radio (channel 16), 2 hours before arrival.

Anchorage.—Temporary anchorage for large vessels may be obtained 1 mile N of Fairway Lighted Buoy, in a depth of 24m, or 1.25 miles WNW of No. 1 Lighted Buoy.

Small vessels may anchor NE of Palau Arang in depths of 7 to 9m, but holding ground is poor. A prohibited anchorage area is shown on the chart extending 1 mile W from Tanjung Kamuning and S around Palau Arang to the Railway Jetty.

5.21 Tanjong Tuan (Cape Rachado) (2˚25'N., 101˚51'E.), about 8 miles SSE of Port Dickson, is a steep bluffy headland covered with trees. It is easily distinguished because it is the highest hill in the vicinity.

From a distance the cape appears as an island. It has been reported that the cape is a good radar target at distances up to 27 miles. There are considerable depths about 1 mile off the cape.

Anchorage can be taken in a depth of 20m E of the lighthouse but care should be taken to avoid the charted 7.6m patch on Pedoman Shoal, 1.25 miles E of the light.

From Tanjong Tuan, the low wooded coast of Sumatera, about 20 miles distant, can be seen.

The Strait of Malacca is narrower here than at any other part NW of **Melaka** (2˚12'N., 102˚15'E.).

The bottom area between 1 and 12 miles SW of Tanjong Tuan and extending 10 miles in either direction along the axis of the fairway, consists almost entirely of sandwaves, some more than 9.1m from trough to crest, which gives rise to very irregular depths, many of which are a danger to vessels drawing more than 13.5m. The positions of these shoals can best be seen on the chart.

The main depths consist of a depth of 15.8m about 6 miles W of Tanjong Tuan; a line of shoals lying roughly along the axis of the fairway, with depths of between 14 and 18m from a position about 8 miles S of Tanjong Tuan; a patch of 14m 10.5 miles SSW of Tanjong Tuan; and a ridge with depths of between 14.3 and 17.1m between 6 and 7.75 miles SSE of Tanjong Tuan. A rock, with a least depth of 8.5m, lies 7.5 miles SE of Tanjong Tuan.

Off Tanjong Tuan the tidal currents set SE and NW at a rate of from 2 to 2.5 knots; the SE current begins from 3 to 4 hours after HW at Penang and runs for 6 hours.

The coast between Tanjong Tuan and the entrance of the Sungai Linggi, about 7 miles ESE, is indented by a shallow bay. The Sungai Linggi is navigable at HW by craft drawing 1.8m as far as **Pengkalan Kempas** (2˚26'N., 102˚01'E.).

A rock located between the entrance points of the river covers when there is a depth of 3m on the bar; this danger is marked by a beacon.

Batu Mandi, a rock awash marked by a beacon, lies about 2 miles SW of the S entrance point of the Sungai Linggi.

Good anchorage can be taken off the river entrance in a depth of 16.5m, mud, with Tanjong Tuan Lighthouse bearing 292˚ and the beacon in the entrance of the river bearing 075˚.

Between the S entrance point of the Sungai Linggi and Tanjong Keling, about 15 miles SE, the coast consists of irregular rocky points interspersed with small sandy beaches.

Batu Tengah, marked by a light, consists of three rocks just above-water, lying about 2 miles SE of Batu Mandi and about 1 mile offshore. A shoal, with a depth of 14.3m lies about 6 miles SSW of Batu Mandi.

Pulau Batu Besar, 4.6m high, stands 1.25 miles offshore, 7 miles SE of Batu Tengah. A sandy ridge, with depths of 6.1 to 9.7m, lies from 0.5 to 2 miles NW of the rock.

A shoal with a depth of 16.3m, lies 3.5 miles WSW of Pulau Batu Besar.

Two white towers, each about 34m high, stand about 2 miles ENE of Pulau Batu Besar.

There is no safe passage for vessels without local knowledge between Pulau Batu Besar and the mainland as the area is fouled by rocks, some above-water.

The sea is discolored by rips which do not necessarily coincide with the shoals.

A rocky shoal, with a depth of 3.4m, lies almost 1 mile E of Pulau Batu Besar.

5.22 Tanjong Panchor (2˚16'N., 102˚06'E.) stands on the coast about 2 miles E of Pulau Batu Besar. Foul ground extends in a general SW direction from Tanjong Panchor for a distance of about 2 miles. The outermost danger, which has a depth of 3.4m, lies 1.25 miles SW of the point. The passages

between these dangers should only be attempted by small craft with local knowledge.

The coast between Tanjong Panchor and Tanjong Keling, about 5 miles SSE, is fringed by a bank of sand with depths of less than 5.5m which extends about 1 mile offshore. A rock which dries 0.9m lies near the outer edge of the bank almost 0.75 offshore and 1.5 miles SE of Tanjong Panchor.

Sungai Udang Port (2˚15'N., 102˚07'E.), a T-shaped jetty is situated about 3 miles NW of Tanjung Keling. There are seven berths, with alongside depths of 7.2 to 20m, on the seaward side of the jetty; a buoyed channel, dredged to 20m, leads to the center four berths.

Vessels up to 120,000 dwt, with a maximum draft of 17.3m, can be accommodated at the two deep water berths.

Pilotage is compulsory. Pilots board at the Fairway Lighted Buoy and should be requested, via the agent, 48 hours in advance. The vessel's ETA should be confirmed 72, 48, 24, and 12 hours before arrival.

Tanjung Keling (2˚13'N., 102˚09'E.), the NW limit of Melaka Road, is a low projecting point located near the site of the Melaka power station, a brick building flanked by palm trees which stands almost 1 mile NW of the point. Two tall black chimneys stand close NE of the power station. The chimneys can always be located by the smoke which constantly rises from them.

A detached rock, with a depth of 0.6m, lies 0.5 mile offshore almost 1 mile NW of the power station. A rocky 3.7m patch lies about 1 mile W of the station. A rock, which dries 0.9m, lies close S of the head of the boat landing pier.

Keling Shoals, several patches of sunken rocks with depths of 11m and considerably less over them, extend almost 1 mile S from Tanjong Keling. The shallowest rock has a depth of 1.2m and lies 0.3 mile SSW of the point.

The tanker berth consists of head and stern mooring buoys and can accommodate vessels of up to 10,000 dwt and 137m in length. Vessels approaching this berth should stem the tide, which may attain a rate of 4 knots at springs, and secure to the seaward mooring buoys ahead and astern, then maneuver into position using the remaining buoys; the flexible ends of the pipelines are marked by small buoys. A mooring boat is available to assist in berthing.

A depth of 13.1m exists in this berth but vessels are limited to a draft of 11m because of a detached 11.6m shoal patch.

Anchorage off Tanjong Keling, clear of Keling Shoals, is exposed but the holding ground of mud is good. The bottom is irregular and the water is discolored with numerous tide rips.

Melaka Road and Approaches

5.23 The town of Melaka stands on both banks of the Melaka River which discharges about 6 miles E of Tanjong Keling, the two parts being connected by several bridges. St. Paul's Hill, which is conspicuous, stands on the left bank of the river and is marked by the ruins of an ancient church, also the disused lighthouse. A slender pointed roof stands near the coast about 0.5 mile NW of St. Paul's Hill disused lighthouse.

It is conspicuous from the offing being the only structure which rises above the buildings in the town. A white cylindrical minaret with a pointed dome stands in a gap between the trees on the coast about 1.2 miles NW of the lighthouse.

Aspect.—Two tall buildings about 34.7m high stand about 1 mile ESE of St. Paul's Hill.

A conspicuous radio mast stands about 137m NNE of St. Paul's Hill disused lighthouse. St. John's Hill, with the ruins of an old battery on it, stands 1 mile E of St. Paul's Hill.

Bukti China, an almost bare, conspicuous hill, stands almost 0.75 mile NE of St. Paul's Hill. Bukti Bruang, an isolated hill 156m high, and Bukti Sebukor, about 64m high to the tops of the trees, stand about 3.7 and 2.5 miles, respectively, NNE of St. Paul's Hill. The country a few miles inland consists of undulating hills.

Gunong Ledang, which has a triple peak 1,275.3m high, stands about 24 miles NE of St. Paul's Hill. The coast near the town is low and wooded.

A stranded wreck is reported to lie about 0.1 mile off the breakwaters.

5.24 **Pulau Upeh** (2˚12'N., 102˚12'E.), a conspicuous, densely wooded islet, about 34m high to the tops of the trees, stands offshore about 3 miles W of St. Paul's Hill.

A ridge, over which there are depths of less than 5.5m, extends about 1 mile from the E and W sides of the island parallel with the coast.

A shoal, with a depth of 6.4m, lies almost 0.5 mile SW of Pulau Upeh. Little Shoal, with a depth of 3.3m, lies about 0.5 mile SSE of Pulau Upeh; about 0.2 mile SSE is a 5.2m patch.

An 8.2m patch is reported to lie about 2 miles SSE of the same islet.

Between Pulau Upeh and the mainland a bank runs parallel with the coast. Owens Rocks, which dry 1.5m, lie near it's NW end and about 0.3 mile N of Pulau Upeh.

Two patches which dry from about 0.3m to 0.6m lie near its SE end.

Pulau Panjang, a narrow, rocky flat almost covered at HW, lies 2 miles SSE of St. Paul's Hill, and is steep-to on its S side.

A stone beacon stands on its E end and a lighted beacon on its W end.

Foulerton Shoal, with a depth of 10.4m, lies about 0.7 mile SSE of the lighted beacon on Pulau Panjang. A small sandy shoal, with a depth of 4.6m, lies about 0.2 mile NNW of the beacon on the E end.

Pulau Jawa, consisting of two wooded islets nearly joined together, lies 0.75 mile S of St. Paul's Hill; the W islet is 18.3m high to the tops of the trees, and the E islet 6.1m high to the tops of the trees.

Batu Gelama (2˚10.4'N., 102˚14.9'E.), a rock which covers at HW, is marked by a light beacon.

A narrow ridge with depths of less than 5.5m extends about 1 mile WNW and 0.3 mile ESE of the beacon.

Two 4.9m patches lie between the NW end of this ridge and the ridge extending SE from Pulau Upeh.

Anchorage.—There is no designated area for vessels to anchor. Vessels should anchor as convenient from 1 to 2 miles offshore. A moderate sized vessel found the best berth about 2 miles offshore in a depth of about 11m with the disused light house on St. Paul's Hill bearing 038˚ and Pulau Panjang Lighted Beacon bearing 122˚, the holding ground is reported good. Small vessels usually anchor closer inshore.

Attention is drawn to a foul area 0.5 mile SW of the breakwater heads.

Anchorage is prohibited in the charted area extending nearly one mile SW of Tanjong Keling.

The charted quarantine anchorage is centered about one mile SE of Tanjong Keling.

The charted explosives anchorage lies SE of the quarantine anchorage, its NE corner being the S extremity of Pulau Upeh.

Reclamation within an area extending up to 0.5 mile from the shore and 1.75 miles WNW from the river mouth was reported in progress.

Directions.—A vessel approaching Melaka Road from the W should pass not less than 2 miles S of Tanjong Keling and 1 mile S of Pulau Upeh to clear the off-lying dangers, and course should not be altered until St. Paul's Hill bears less than 055˚.

Approaching from the E, after passing Pulau Undan and Pulau Hanyut, the course should be altered to clear Foulerton Shoal and then altered for the anchorage. Small vessels frequently pass N of Pulau Besar and Pulau Panjang, but this route should not be used without local knowledge.

A depth of 19m was reported about 0.5 mile SW of Pulau Undan. There are numerous fishing stakes off the coast.

A vessel approaching from the SE at night should make Pulau Undan Light and after passing SW of it, and of Pulau Hanyut, should steer with the light bearing 135˚ astern, until the light on St. Paul's Hill conspicuous radio mast bears 038˚, when it should be steered for on that bearing which will lead to the anchorage. Alternatively, the breakwater head lights may be used as leading lights.

Pulau Undan Light will also be sighted when approaching the road from the NW, and may be steered for from abreast Tanjong Keling.

5.25 Melaka (2˚12'N., 102˚15'E.) (World Port Index No. 49970) is the seat of Government of the State of Melaka. The principal buildings stand around the base of St. Paul's Hill.

The harbormaster offices are located in a building along the quay. Melaka is a lighterage port where there is activity employing a total of 44 wooden lighters for the loading and discharging of ocean-going vessels.

The Tanjung Bruas jetty will accommodate vessels of up to 125m in length on the seaward side and vessels of 65m in length on the inner side. The depth alongside is 9m at LW.

Pilotage.—Pilotage is compulsory for all vessels. At least 4 hours notice should be given to the Melaka Port Authority.

Vessels coming from W are boarded 2.75 miles WSW of Tanjong Keling. Those from E are boarded 5 miles SSE of the same point.

The tidal current sets SE at a rate of 2.5 knots from 3 hours before to 3 hours after HW at One Fathom Bank; for the remaining 12 hours it sets to the NW at a rate of about 1.7 knots.

Between Melaka and Tanjong Seginting, about 46 miles SE, the low, thickly wooded coast is bordered by a mud bank which extends up to 2.5 miles offshore in places.

Anchorage.—In this open roadstead there is good anchorage in from 5.5 to 14.6m, about 1 to 2 miles offshore.

Quays that line both sides of the Melaka River just within the entrance are principally used by lighters loading or discharging cargo for vessels in Melaka Roads. The landing place is the Government jetty, a concrete public quay, on the E side of the river. The channel leading into the port area between two breakwaters has a least depth of 0.6m. Small vessels drawing up to 1.5m can enter the river at MHWN.

An area bordering the shore, NW of the NW breakwater is being reclaimed.

The spring range of the tide is 1.8m and the mean range is 1.3m.

Water Islands (2˚05'N., 102˚19'E.), centered about 8 miles SE of Melaka, consists of a group of six tree-covered islands of moderate height. Pulau Besar, the largest island, is 40m high and is separated from the coast to the N by a foul, rocky channel. The channel between Pulau Besar and Pulau Dodol, the next island to the S, is fouled by a rock with a depth of 0.9m, which lies 0.3 mile N of the latter island. The other channels between the islands are deep, but they should be avoided.

Sungai Muar (2˚03'N., 102˚33'E.), a shallow river available only to small craft, discharges into the strait about 14 miles ESE of Pulau Besar. The river is tortuous but small craft with drafts of 1.8m can ascend to Kepong Hill about 60 miles above the entrance. A radio mast stands on the E bank of the river close within the entrance.

5.26 Musr (Bandar Maharani**)** (2˚03'N., 102˚34'E.) (World Port Index No. 49980), the headquarters of the state commissioner, is the second port in importance in Johore Province and has a considerable trade. Ocean-going vessels work cargo at the anchorage. Small vessels and barges can be accommodated at the river wharves abreast the town. Depths alongside these wharves are about 2m. The entrance bar has a least depth of 1.2m.

Anchorage can be taken by small vessels in a depth of 4m off the mouth of the Sungai Muar. Larger vessels can anchor about 4 miles WSW of the lighthouse at the entrance in a depth of 7m, thick mud, good holding ground.

Bukit Mor (1˚59'N., 102˚41'E.), an isolated densely wooded hill, 235m high, stands about 8 miles SE of the town of Muar.

Tanjong Tohor (1˚52'N., 102˚41'E.), a low point covered with jungle growth, is located about 13 miles SE of Muar.

A 17.5m shoal lies near the main fairway about 11 miles W of Tanjong Tohor.

5.27 Formosa Bank (1˚46'N., 102˚48'E.) and its NW extension fronts the coast from Tanjong Tohor to Tanjong Seginting; off the latter point it merges into the 11m bank fronting the coast.

The bank has a least depth of 3.3m and is steep-to on its NW and SW sides.

Baker Patch, with a depth of 8.8m, lies on the NW extension of Formosa Bank. Between these banks and the coastal bank there is a deep clear channel.

The bank which lies between the SE end of Formosa Bank and the coastal bank is marked by numerous fishing stakes and vessels are advised to navigate in this vicinity during daylight only.

Sungai Batu Pahat (1˚49'N., 102˚53'E.) is fronted by a shallow flat which, extends up to 3 miles offshore. A depth of 0.3m exists on this flat near the river entrance at LW.

Within the entrance there are depths of 2.5 to 5m as far as the town of Batu Pahat (Bandar Penggaram) about 4 miles upstream.

The river is navigable by light-draft vessels for many miles but should only be entered by vessels that have local knowledge.

Pilotage is not compulsory. A local qualified pilot is not available, but an experienced guide can be obtained from the District Marine Office, Batu Pahat.

5.28 Bukit Banang (1˚49'N., 102˚57'E.), 470m high, is the summit of a range of rolling hills which terminate at Tanjong Seginting. Four radio masts stand on its summit.

Several bright white lights, visible for a considerable distance, are sometimes shown near the radio masts.

A light is reported to be shown from Tanjung Seginting and Pulau Sialu.

Anchorage can be taken in a depth of 7.3m, good holding ground, clear of the fishing stakes, about 2 miles SW of Pulau Sialu Lighthouse.

The coast between Tanjong Seginting and Tanjong Piai, about 50 miles SE, is low and thickly wooded and abreast Pulau Pisang recedes about 5 miles.

The coastal bank, as defined by the 10m curve, extends about 6 miles offshore in this bight and up to within 1 mile of Pulau Pisang.

Within a line joining Tanjong Seginting and Pulau Pisang the bottom is very uneven being marked by isolated depths of 5.5 to 14.6m.

5.29 Pulau Pisang (1˚28'N., 103˚16'E.), tree-covered and 134m high, stands about 19 miles NW of Tanjong Piai and can be seen for a considerable distance. The island has been reported to be a good radar target at distances up to 30 miles.

A bank, with depths of less than 10m, and a least depth of 4.8m about 4 miles within its outer end, extends about 7 miles NW from Pulau Pisang. A narrow steep-to spit, with a depth of 3m over its extremity, extends about 6 miles SE from Pulau Pisang. A channel about 0.7 mile wide with a least depth of 11m, lies between this spit and the coastal bank. This channel should not be used without local knowledge.

Sungai Benut, entered about 8 miles N of Pulau Pisang, is the largest river along this part of the coast. Only small vessels with local knowledge can be accommodated.

Sungai Pontian Besar and Sungai Pointian Kechil are entered 8 miles and 9.75 miles SE, respectively, of the lighthouse at the entrance of Sungai Benut. Both rivers are shallow and are available only to small craft.

A radio mast stands at the entrance of Sungai Pontian Kechil.

Fair Channel Bank and Long Bank, which lie in the strait adjacent to this section of coast, have been previously described.

A traffic separation scheme is entered 5 miles SW of Pulau Pisang. This scheme continues SE into Singapore Strait; and then E through Singapore Strait where S of Johor, there is a precautionary area, before continuing NE into South China Sea through the traffic separation scheme at Horsburgh light area.

5.30 Pulau Kukup (1˚19'N., 103˚25'E.), a low, flat-wooded island, lies within the coastal bank about 5.5 miles NW of Tanjong Piai. The trees on the NW side of the island are of a bright green color and those on the SE end are tall like those on the adjacent coast.

Caution.—In passing Pulau Kukup caution must be exercised because the E current sets strongly toward the shore and the W current toward Long Bank on the opposite side of the fairway.

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