THE TERNEUZEN-GHENT CANAL — A LIVING LINE TO THE SEA

by

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ABSTRACT

The article gives a brief description of the history and development of the connection of the port of Ghent to the sea. Attention is paid to the status of the present canal, which runs through two states as well as to the design of the canal. Traffic figures are given, which show the rapid growth of the port of Ghent. The influence of the use of ships of increasing dimensions has been determined in trials and by consequence improvements of the canal are being designed. Foreseen developments in future are described.

KEYWORDS

Canal. Lock. International regulations. Transport. Safety.

SOMMAIRE

L'article donne une description succincte de l'histoire et du développement de la connection du port de Gand vers la Mer.
L'attention est attirée sur la situation du canal actuel qui s'étend sur le territoire de deux états. Il évoque des chiffres du trafic sur celui-ci et la rapide évolution du Port de Gand. Les essais de passage de navires de grandes dimensions ont eu pour conséquence les améliorations du canal. L'article décrit enfin les projets de développement dans le futur.

MOTS CLEFS

Canal. Ecluse. Règlements internationaux. Transport. Sécurité.

1. INTRODUCTION

1.1. HISTORY

The town of Ghent has struggled to secure a passage to the sea ever since its foundation in the 10th century. By the end of the century it was connected to the sea by a waterway called "le Torrent des Châtelains en le Braeckman" which ran in nothern direction through the present-day municipalities of Kluizen, Ertvelde and Boekhoute. Heavy floods caused this waterway to silt up. Between 1228 and 1231 the people of Ghent began to dig a canal along the bed of the Oude Lieve river between Ghent and Damme which was to flow into the river Zwin. This canal was completed in 1322 under the rule of Louis of Flanders and Nevers, but it too gradually silted up.

On 26 August 1329 the people of Ghent obtained the concession for the waterway known as the "Pêcherie des Châtelains", or that section of the old Sas van Gent canal between Ghent and Rodenhuize, which connected with the Braakman. In 1540 the Holy Roman Emperor, Charles V, put an end to navigation on the canal, expropriating it by right. As trade and industry began to decline however, the Emperor returned the canal to the people of Ghent, bestowing it on them by an order dated 1 October 1547. When Flanders was once again ravaged by severe floods, causing the complete silting up of the Lieve and the Braakman, Ghent, the great medieval centre of trade, felt that its success and prosperity were threatened; in 1547 the town was granted permission to dig a canal from Rodenhuize via

Sas van Gent to the sea dyke of the Braakman. This canal was completed in 1561, at the same time as the work to deepen the "Pêcherie des Châtelains."

In 1613 the States of Flanders were empowered to dig a section of the canal from Ghent to Bruges between Ghent and St. Joris. These works were twice abandoned, being resumed in 1664 and 1724 respectively. Although not fully completed, this canal provided a direct link between Ghent and Bruges, where the route had previously followed the Lieve and the canal from Damme to Bruges. In 1751 Empress Maria Theresa ordered that the Ghent-Bruges canal be broadened and deepened to provide Ghent with a passage to the sea. The "Coupure" in Ghent was then dug to connect the Leie with the Brugse Vaart waterway.

Since 1795 only inland vessels had been able to use the Sasse Vaart waterway. A plan was therefore drawn up in 1817 to re-dig the Sas van Gent canal and extend it as far as the Scheldt at Terneuzen. Work began on 1 May 1825 and the canal, comprising two reaches, with locks at Sas van Gent and Terneuzen, was opened to shipping on 18 November 1827.

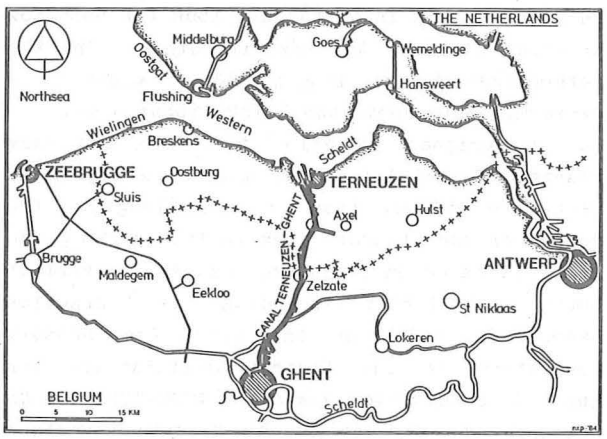

Fig. 1 - Situation of the Ghent region.

1.2. STATUS

The Terneuzen-Ghent Canal was planned and dug during the period when the present Benelux countries formed a single kingdom (1815-1830). When this kingdom broke up in 1830 and the Netherlands and Belgium became separate states, it meant that the canal ran through two states. Sound agreements on mutual rights and obligations were therefore necessary. In the treaty of 1839, regulating the definitive separation of the Netherlands and Belgium, it was laid down that the people of both countries would have free access to the Ghent-Terneuzen Canal. Details of the arrangements were later elaborated in separate treaties, notably with regard to that part of the waterway which belongs to the Netherlands.

The works on Dutch territory are the property of the Dutch State which is obliged to ensure their maintenance and operation.
Each state lays down the necessary regulations for its own territory, but not without prior consultation with the other.
Proposals to improve or renovate the works are always discussed by both countries. In addition, arrangements have been made regarding thhe drainage of Belgian land into the canal, the quality of the water near the Dutch border and the desired salt content of the canal water. Belgium pays the Netherlands a fixed annual sum towards the cost of operating the canal.
At the beginning of this century this sum still represented a substantial contribution towards the costs involved but inflation and other factors have reduced its value to less than 1 % of the total costs.

Issues concerning the use, maintenance and improvement of the canal works necessitate constant consultation between the Dutch and Belgian Governments. A permanent committee of Dutch and Belgian civil servants, the Scheldt Technical Committee, has therefore been set up to advise both governments and regular conferences are held between the ministers concerned. Generally speaking, these talks have produced solutions that are acceptable to both countries, although certain wishes remain unfulfilled on both sides. Belgium would particularly like to see the canal opened to larger vessels while the Netherlands is not wholly satisfied about maintenance costs and water quality.

1.3. THE PRESENT CANAL

Since it was dug in 1827 the Ghent-Terneuzen Canal has been improved on three occasions, in 1885, 1910 and 1968 respectively. The pre-1968 works have now largely disappeared or have fallen into disuse, with the exception of the sea lock dating from 1910 which now serves as a reserve lock (netto length 140 m, width 18 m, min. depth above the banks 6,5 m).

The process of negotiating and planning the works which were completed in 1968, began shortly after the Second World War. The intended dimensions of the new sea lock and the improved canal were originally calculated by comparison with other existing locks and waterways. Thus the dimensions of the sea lock were

based on those of the Van Cauwelaerts Lock at Antwerp (270 x 35 m) and the locks in the Panama Canal (304,6 x 33,5 m) while the profile of the canal was to correspond to that of the North Sea Canal as it was then (see fig. 2).

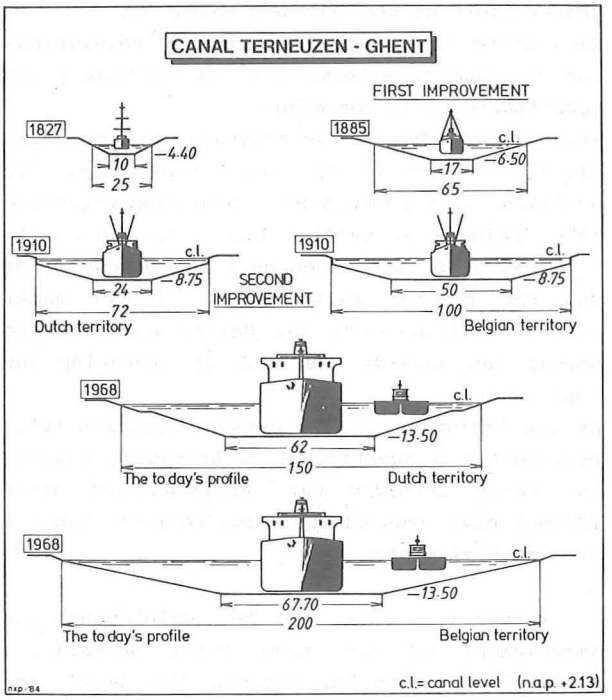

Fig. 2 - Development profile Terneuzen-Ghent Canal.

It was on this basis that the initial plans for the works were drawn up. Only at a later stage was it realised that the canal would have to cater for much larger ships than was first anticipated. In the early 50s it was assumed that the largest ships would have a capacity of approximately 30,000 d.w.t. By 1960 this figure was much higher in view of the visible upward trend in the size of ships in the world fleet. The new canal would have to afford passage on occasion to ships of up to 50,000 d.w.t. This requirements only affected the dimensions of the lock which was originally to have an effective length of 290 m and a width of 35 m. The latter was not considered sufficient for ships of approximately 50,000 d.w.t. On the basis of a rule of thumb stating that the width of the lock should equal 1.2 x the width of the vessel, it was estimated that the necessary effective width of the lock for a ship 32 m wide was 38 m. Excluding the floating wooden beams, the distance between the concrete sides of the lock is 40 m. The lock was fitted with short guide walls, designed on the assumption that the largest ships using it would have a capacity of 30,000 d.w.t.

No research of any kind was carried out into how safely and easily a ship of 50,000 d.w.t. could pass through the lock and canal, given the above specifications. This was quite the reverse of the case in respect of other canal improvements being planned at bout this time (including the Panama, Suez and North Sea canals). The action of the lock was, however, extensively tested at the Hydraulics Laboratory in Delft, particular attention being devoted to the system whereby saltwater intruding into the canal via the canal would be returned to the Scheldt. For this purpose the canal bed immediately adjacent to the lock was deepened, creating a basin where the saltwater collects. At low tide it runs under its own momentum through the lock culverts and back into the Scheldt. The amount of salt intruding into the canal each time the lock is operated can thus be limited.
Research was also carried out at the Hydraulics Laboratory into the best shape for the outer approach harbour form the point of view of shipping, the maintenance work which would have to be carried out there in the form of dredging, and the problem of waves penetrating the approach harbour.

Apart form the lock for maritime shipping a further lock was constructed for inland shipping. This is a standard lock for push-tow traffic similar to several others in the Netherlands (netto length 280 m, width 24 m minimum, depth above the brinks about 5 m).
It is designed to allow the safe and easy passage of push-tow barges measuring 22,8 m in width and no more than 193 m in length. The design of the standard lock including the guide walls is based on extensive research at various Dutch laboratories including the Hydraulics Laboratory and the Institute for Sensory Perception of the Central Organisation for Applied Scientific Research (TNO-IZF). No research was carried out to ascertain whether the specifications for the profile of the canal would facilitate the safe and rapid passage of the expected level of inland traffic. Looked at in retrospect, the profile of the canal is virtually identical to that of canals for push-tow traffic designed at a later date and involving extensive research, such as the Scheldt-Rhine Canal and the Amsterdam-Rhine Canal, the only difference being that the maximum depth of the water is obviously far greater than is necessary for inland shipping.

Construction and maintenance costs

The improvement work cost approximately Fl. 350 million at early 1960s prices, this being

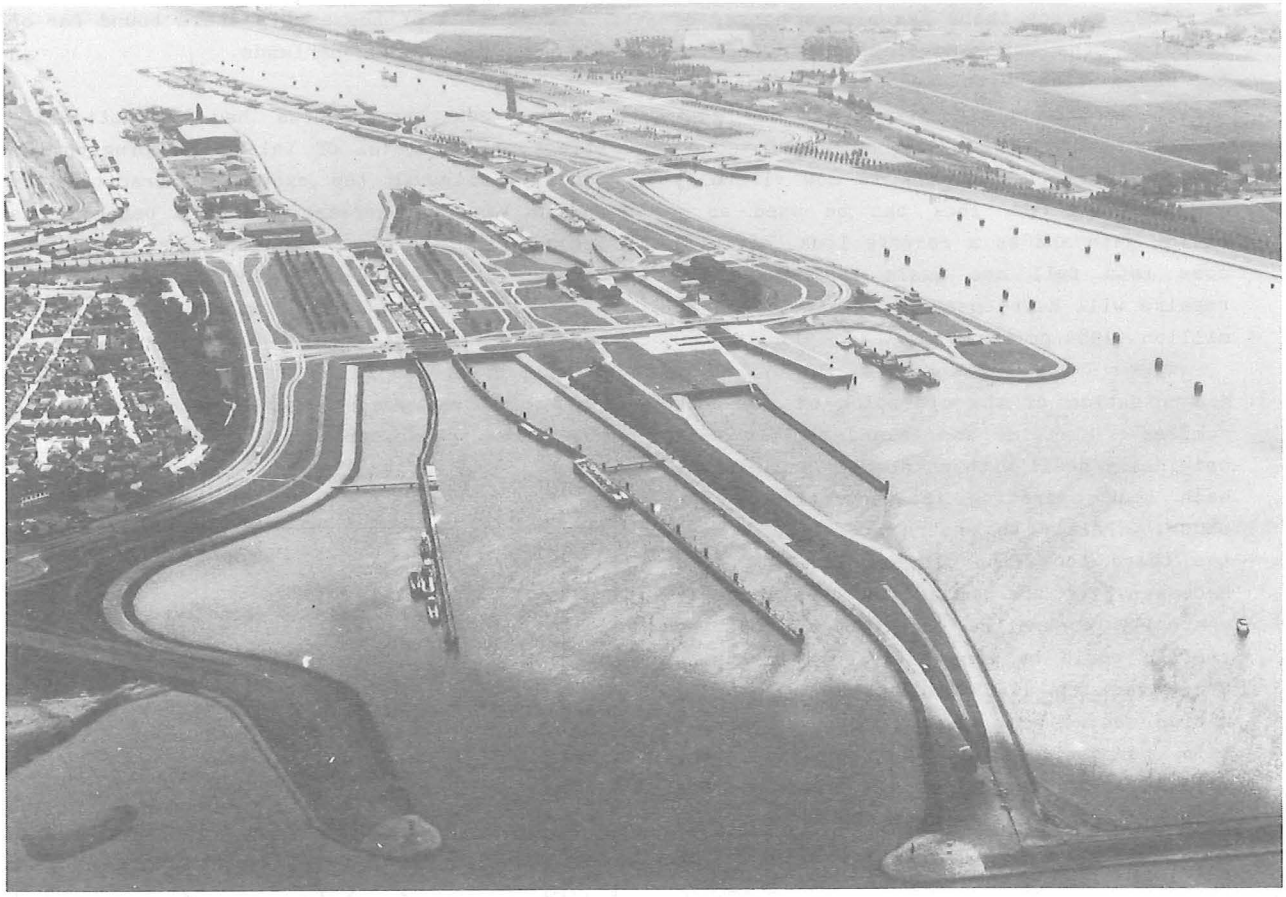

Fig. 3 - View of the locks at Terneuzen.

equivalent to a replacement value of arround Fl. 10^3 million at 1984 prices. 80 % of the initial construction costs were borne by Belgium and 20 % by the Netherlands, the latter being wholly responsible for financing the maintenance and operation of the canal which costs on average some Fl. 14 million per year (1984 prices), approximately one half of which is provided by the Dutch Government.

1.4. DEVELOPMENTS SINCE 1968

Since the canal came into use in 1968 a number of improvement and renovation schemes have been carried out by the Dutch without any financial contribution from Belgium. No talks were held to discuss the schemes because they did not concern changes requested by Belgium. The three schemes are outlined below :

1. Construction of a traffic control center at Terneuzen (completed in 1979) to control shipping entering and leaving the canal. In practice, the point at which the canal joined the busy Western Scheldt proved to be dangerous without regulation of the traffic. The construction costs amounted to approximately Fl. 7 million (1984 prices); the annual operating costs are about Fl. 2 million.

Fig. 4 - Traffic Center Terneuzen.

2. Renovation and modernisation of the old sea lock built in 1910. The lock had become dilapidated and was completely closed down

in 1969. Since there was also a danger of flooding, the Dutch Government decided not to waste time with negotiations but to undertake the repairs itself. The lock equipment and guide walls were improved at the same time. The work is now virtually complete and the lock can be used as a sluice gate and as a reserve lock. It will come into full use again in 1987. The repairs will have cost approximately Fl. 60 million (1984 prices).

3. Modernisation of the operation of the lock complex. Maritime and inland traffic were originally dealt with completely separately, each lock operating independently of the other. Partly to ensure effective use of the third lock (the old sea lock), it was necessary for the whole lock complex to be centrally controlled so that the waiting traffic could be more efficiently distributed over the available locks. A coordination centre has recently been opened for this purpose. At the same time, the operation of each lock was improved by installing a central operating system and introducing more efficient methods of data collection and communication. The project, which will have cost approximately Fl. 6 million (1984 prices), will be completed in 1986.

2. FREIGHT TRAFFIC

The opening in 1968 of the new West Lock at Terneuzen and the modified canal to Ghent for maritime shipping gave a strong initial boost to the volume of maritime freight traffic, which has continued to grow steadily ever since. For many years prior to 1969 the gross tonnage of the registered ships passing Terneuzen had remained at about 7 million G.R.T. per year.
By 1983 this figure had risen to approximately 45 million G.R.T. At the same time the number of larger ships has continued to increase. The table below shows the number and size of the ships which passed Terneuzen in 1981 :

TABLE 1. **DISTRIBUTION IN SIZE-CATEGORIES OF SHIPS AT TERNEUZEN LOCKS.**

Gross tonnage (G.R.T.)	Number of ships
999	3,875
1,000 - 2,999	1,860
3,000 - 7,999	860
8,000 - 14,999	570
15,000 - 29,000	360
30,000	360
Total	8,100

Some 10 % of these ships were bound for or had come from the Netherlands.

The new canal works had no noticeable effect on the level of inland shipping on the canal. Although the extent of transport by inland vessels increased sharply between the Second World War and the late 60s, from 1968 onwards the level of inland traffic on the canal rose by an annual average of approximately 1 % only, reaching a total capacity of 44 million tonnes in 1983. Once again, roughly 10 % of these vessels were bound for or had come frome the Netherlands.

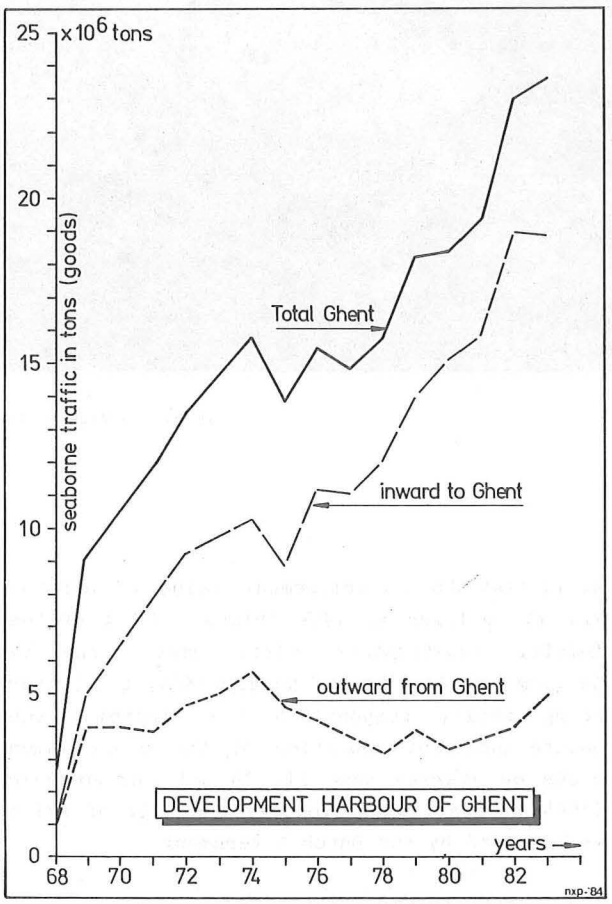

Fig. 5 - Development harbour of Ghent.

In 1983, 3,764 maritime freigth vessels with a tonnage of 19,532,870 G.R.T. and carrying a total cargo of 23,923,595 tonnes, entered the port of Ghent, representing a further increase in the upward trend in port activities. -These figures should of course be assessed in the light of the general economic recession.- This rising trend is without a doubt the result of progressive diversification in the range of goods attracted to the port and the accompanying expansion and adaptation of the port facilities and infrastructure.

Of the maritime ships which entered the port of Ghent in 1983, 709 had a tonnage of more than 10,000 d.w.t. 104 of these had a tonnage of between 60 and 70 d.w.t. while 82 had a tonnage greater than 70,000 d.w.t. In total, 109 of the maritime vessels had the maximum permitted draught of 12,25 m.

The freight traffic handled in 1983 can be divided into the following categories :

TABLE 2. SEABORNE TRAFFIC OF GOODS TO AND FROM GHENT AND TERNEUZEN

Type of goods	Percentage of freight traffic in 1983	
	Ghent	Terneuzen (incl. outer Scheldt harbours)
Agriculturel products	23.6	0.0
Foodstuffs	10.4	0.0
Solid fuels	8.6	19.7
Petroleum products	17.6	24.5
Ores and minerals	24.3	4.8
Metal products	6.1	0.1
Minerals	2.6	2.3
Fertilisers	3.1	14.3
Chemical products	1.6	26.3
Miscellaneous	2.1	8.0
Total quantity of imported and exported goods	23.9 million tonnes	7.9 million tonnes

Classifying these goods according to the manner in which they were handled, the following figures are obtained for Ghent : dry bulk goods - 77 %; liquids - 11 %; conventional general cargo - 10 %; and goods carried by roll-on/roll-off and container vessels - 2 %.

The ships which entered the port of Ghent in 1983 came from 55 countries, and 48 separate countries of destination were recorded. The main countries are shown in the table below :

TABLE 3. PORT OF GHENT; MAIN IMPORT AND EXPORT COUNTRIES

Imports		Exports	
Country	Thousands of tonnes	Country	Thousands of tonnes
U.S.A.	5,762	U.K.	1,034
Brazil	2,416	U.S.S.R.	968
Sweden	1,227	Sweden	529
Algeria	986	Saudia Arabia	452
Venezuela	985	Algeria	256
Norway	862	Italy	194
U.K.	762	Egypt	143

These statistics clearly illustrate the varied activities of the seaport of Ghent with respect to maritime trade.

Without doubt a significant factor in the constant growth of the port of Ghent is its favourable location in the "golden delta" of the Rhine, Maas and Scheldt and the unlimited range of transport facilities it offers to the hinterland. Thanks to the town's location at the confluence of the Leie and the Scheldt and the route along the Scheldt-Rhine Canal, for example, inland shipping has access to the whole European waterways network. The railway network has been extended along both sides of the canal for maritime vessels and also serves all quays and docks, making a rapid transfer onto the Belgian and European network possible. Transport from and to the port of Ghent by road is equally trouble-free thanks to the excellent direct connections with the E3 (Lisbon-Stockholm) and the E5 (London - Ostend-Istanbul) motorways.

3. MAKING OPTIMUM USE OF THE CANAL

3.1. MAXIMUM VESSEL SIZE

The question of maximum vessel size was raised soon after the canal came into use, owing to the establishment of several firms whose activities necessistated the large-scale bulk transport of grain, ores, coal and oil. There were no provisions governing maximum vessel size in the treaty between the Netherlands and Belgium regulating the construction of the canal. As the canal was intended for ships of up to 50,000 d.w.t., the maximum permitted dimensions were originally fixed by the Dutch authorities to correspond with a vessel of that size. Belgium, however, continued to insist that larger ships be permitted. A few ships for the transport of ore were even built especially for use on the canal although they were larger than was then allowed. In order to obtain permission for their use, laboratory tests were conducted on the ships to demonstrate how they would fare on the canal.

As the ships proved to be extremely manoeuvrable, mainly due to their exceptionally large rudders, permission was granted.

Under persistent pressure from the Belgians, policy regarding the admission of ships has since been broadened, most recently in 1978 when ships with a length of 256 m, a width of 34 m and a draught of 12,25 m were permitted on a trial basis, a definitive decision being made at the end of the trial period.

Fig. 6 - View port of Ghent.

3.2. THE TRIAL VOYAGES

During the most recent trial period, which lasted from spring 1978 until the summer of 1982, data was collected on the use of ships measuring 245 m l_o.a 256 m in length and 33 m b 34 m in width with a maximum draught of 12,25 m. During this time some 70 permits were issued to vessels of this size -none of which had a width of more than 33 m- allowing them to travel to the ports of Ghent an Terneuzen.

A number of these ships were selected as "test vessels" and a wide range of data including position, course, propeller speed (r.p.m.) and angle of ruder as a function of time, were recorded by the measuring teams. In addition, after each trial voyage the pilot who had been on board a particular vessel completed a written questionnaire about its behaviour. Most of the ships involved were laden although a few were in ballast. None were involved in accidents. In all but one case the pilots questioned were satisfied that the vessel concerned was suitable for navigation on the canal.

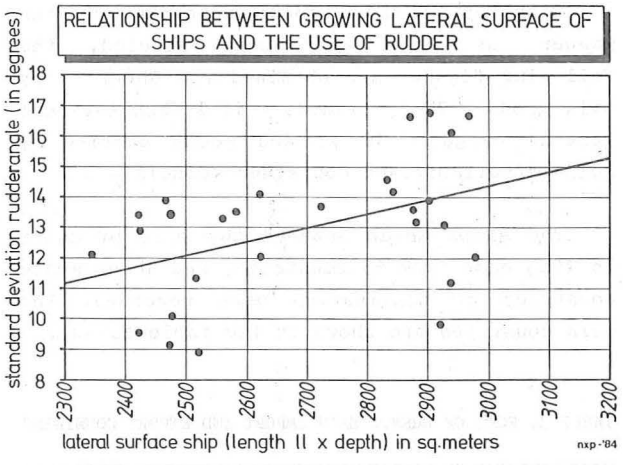

Fig. 7 - Relation lateral surface of the ship and size.

The measurements recorded were used to try to establish whether there was a relationship between the increasing dimensions of the ships and the behaviour of the rudder when under way. It was in fact discovered (see figure 7) that the greater the lateral surface of the ship,

the more use is made of the rudder and the more frequently it is used at its maximum angle. The same was found to apply as the blockage factor increased. Taking an average over all the ships in the said length category, the rudder had to be used at an angle greater than 15° for about 15 % of the time; on some stretches of the canal this figure rose to 30 % of the time. Ships in ballast were able to steer with far greater ease so that less demand was made of the rudder which was rarely used at an angle of over 15°. Admittedly, if a new canal were being designed these figures would not be accepted, but does that necessarily mean that the admission of vessels of this size is not acceptable either ? After all, no accidents occurred. The question which should be answered is whether the level of traffic safety on the canal is comparable with that on other maritime shipping canals and whether large ships are comparatively dangerous.

3.3. TRAFFIC SAFETY ON THE CANAL

A study was recently carried out by the Dutch authorities of all the accidents involving ships which took place in the Dutch section of the canal from 1969 to 1981. Two-thirds of all the accidents along this 15 km stretch of canal, from Terneuzen to Sas van Gent, occurred in or near the locks.
The lock complex apart, the safety level in respect of inland shipping on the canal is equivalent to that on other inland waterways of the same class in the Netherlands (without locks). About 16 accidents occur per 10^6 vessel-km. Relatively more accidents occur amongst maritime vessels; outside the lock complex an average of 94 accidents take place per 10^6 vessel-km. This figure is noticeably higher than in the Western Scheldt and considerably higher than on the New Waterway to Rotterdam. The same picture emerges if serious accidents only are considered.

Past analyses of accidents on various waterways have all shown that large vessels on average run a distinctly greater risk of being involved in an accident than small vessels.
The same has been found to apply to the maritime vessels of over 30,000 G.R.T. on the Ghent-Terneuzen Canal. From the relatively small number of trial voyages undertaken by extra large ships however, little can be deduced as to whether or not there would be an increased risk of their being involved in an accident. The number of vessel-kilometers covered by such ships is simply too low for such a purpose.

3.4. EVALUATION OF THE TRIAL PERIOD

After considering the findings of various studies a specially appointed Dutch-Belgian committee concluded that the canal should be modified in a number of ways so as to permit those ships admitted during the trial period to be allowed to use it on a permanent basis. Alterations are necessary to the approach harbour, the lock entrance and the width available for the passage of vessels under the bridges. The committee further concluded that even longer ships of up to approximately 260 m could be permitted if the profile of the canal curves were altered. The precise changes necessary were not specified by the committee as research is still being conducted to establish what is required.

a. Improvement of the approach harbour

The approach harbour was designed to cater for ships entering it from the east. In practice, ships frequently approach from the sea in the west which means that the flood current sometimes leads to surprises, causing ships to run aground in the approach harbour. Research is currently being carried out, using a manoeuvre simulator, into various means of improving the situation. A model has been set up at the Hydraulics Laboratory in Borgerhout (Belgium) to determine the hydraulic parameters and obtain data relating to possible erosion at the foot of the water defences along the Western Scheldt and necessary maintenance work in the form of dredging. Research will be completed by the end of 1984.

b. Improvement of the lock entrance

Very large ships often encounter difficulties entering the lock, especially if they are unladen and there is a strong wind. The existing short guide walls were not designed for such large vessels and are therefore too fragile.
Simulation tests are currently being prepared by the Hydraulics Laboratory, Delft, the MARIN (Netherlands Maritime Research Institute) in Wageningen and the TNO-IZF in Soesterberg. The purpose of the experiments which are a combined effort on the part of the afore-mentioned institutes will be to identify the problems, make comparisons with smaller ships and consider ways of improving both the lock equipment and the procedure for entering the lock. Research will begin in 1985 and be completed in 1986.

c. Improvement of the passage of vessels under bridges

There are 2 swing bridges on the Dutch section of the canal, each with a single opening

60 m wide through which vessels pass. As this can lead to congestion and an increased risk of accidents, a second opening, 27 m wide, will be made on the other side of the central pivot of each bridge for inland shipping and smaller maritime vessels.

d. Improvements for the passage of car-carriers

The bridges for road traffic crossing both ends of the Terneuzen sea lock, proved to have a high risk for damage by passing car-carriers. This type of ships with a bow of much flare and very high deckhouses starting from the bow, will hit the bridge when entering the lock along the side wall with a little drift-angle. In the past 5 years such an incident occurred twice, which led as many times to a total loss of the bridge superstructure. Measures have been taken to prevent a further incident, using floating removable installations. These installations are used as a very strong and stiff fender, keeping the ship away from the bridge (see fig. 8).
The measures taken have proved to be satisfactory for the short term. Possible improvements for the long run are investigated.

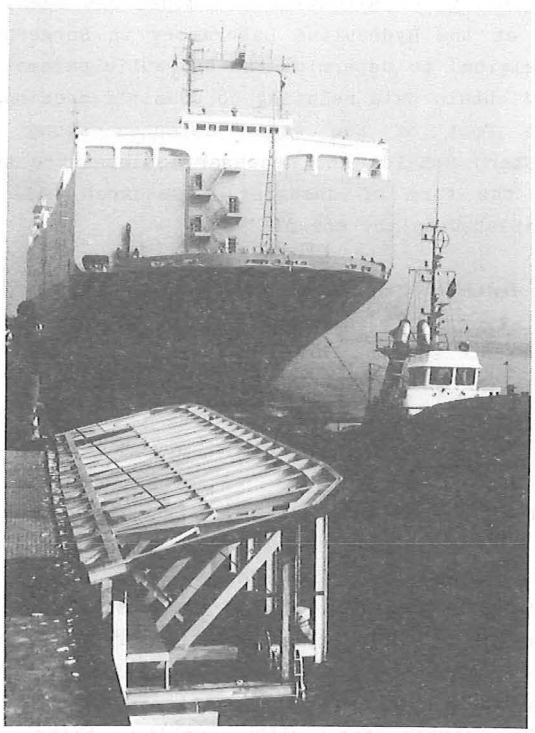

Fig. 8 - Floating installations to protect bridges at Terneuzen locks.

4. LOOKING TO THE FUTURE

By the time the new canal was in use in 1968, the Ghent authorities were already calling for a larger lock at Terneuzen; the size of maritime ships had continued to increase during the sixties and it was important that Ghent be able to compete with other seaports. Even at this early stage a port with a capacity to receive vessels of 125,000 d.w.t. was envisaged to compare with Dunkirk and Zeebrugge.

In late 1979 the town council of Ghent decided -independently of the Belgian and Dutch authorities- to entrust the whole question of the further development of the Ghent canal area to an ad hoc committee under the supervision of the Seminar for Surveying and Physical Planning of the University of Ghent (head : Prof. M. Anselin). The committee's final report contains the following conclusions and proposals.

Consideration of prospective trends in the level and nature of traffic and the capacity of vessels has led to extensive diversifications. Similarly, future employment prospects in the port of Ghent are dependent on the construction of a larger lock and further deepening of the canal to Terneuzen so that larger ships are able to approach Ghent from the sea.
To improve the accessibility of the maritime approach to Ghent, the report proposes that the inner sill of the new sea lock at Terneuzen should lie 18 m below the normal canal level. The depth of the outer sill would be determined by taking into account a draught of up to 16 m (saltwater) and the lowest water level in the Western Scheldt at which the sea lock may be entered. (Terneuzen, the gateway to the port of Ghent, lies in one of the least problematic areas of the Western Scheldt). The report also suggests a maximum desirable size for vessels of roughly 300 m in length and 50 m in width. The proposed lock would be situated between the Dow Chemical plant and the existing lock complex with the axis of the new lock lying approximately 250 m to the west of the present West Lock. The draft plan proposes a length of 600 m between the outer gates and a width of 68 m between the chamber walls.
With regard to deepening and broadening the canal, its profile and course would as far as possible remain as they are at present. Whilst it is envisaged that the Dutch section of the canal would have sloping sides, giving a width of, for example, 360 m at the surface of the water and 180 m on the canal bed, and a depth of 18 m, the Belgian section would have a trough-like profile for its entire length, with a width of 270 m both at the water's surface and on the canal bed, and a depth of 18 m. A trough profile would also be used in the vicinity of the Dutch village of Sluiskil and in Terneuzen to minimise the expropriation of homes.

As part of the study Prof. W. Nonneman of U.F.S.I.A. (St Ignatius University, Antwerp) was commissioned to estimate the cost and the benefits of constructing the proposed new sea lock at Terneuzen and improving access along the canal, and to assess the macro-economic value of the scheme. The level of investment entailed by the project is put at around 50,000 million Belgian francs. Benefits would naturally arise from the fall in transport costs and the project would pay for itself within only a few years.

The favourable conclusion reached in the report means that fresh talks with the Dutch authorities should be set in motion very shortly in order to reach an agreement on the implementation of a programme to open up the port of Ghent to vessels of 125,000 d.w.t. The matters which will need to be discussed during these talks include the supply of water to the enlarged canal, the problem of dredging the approach harbour at Terneuzen and the new section of the canal, alterations to the road and railway network and the adjoining port and industrial areas and finally, the problem of the salination of the canal water.

RESUME

LE CANAL GAND-TERNEUZEN : UNE LIAISON ACTIVE VERS LA MER

Dans le passé, la ville de Gand n'a cessé à chercher une issue vers la mer.
Vu l'ensablement de l'accès septentrional vers le "Braakman" et la liaison vers "Het Zwin", les Gantois ont reçu, en 1547 la permission de creuser un canal de Rodenhuize, via "Sas van Gent", vers la digue du "Braakman". Ainsi le port de mer de Gand restait florissant.

En 1817, après des années de crises et de reprises économiques, les autorités délivraient une permission pour dresser un projet pour recreuser le canal de "Sas van Gent", direction Terneuzen.

Ces travaux ont été conçus et exécutés dans la période 1815-1830; les pays de l'actuel Benelux formaient encore un seul royaume. En 1830, le Royaume des Pays-Bas et la Belgique étaient des états souverains. La voie navigable parcourait les deux Royaumes (fig. 1).

La nécessité des conventions était née.

Les travaux exécutés sur le territoire des Pays-Bas deviennent, en principe, la propriété de l'Etat néerlandais, qui est seul responsable pour l'entretien et l'exploitation des ouvrages d'art.

Chaque Etat rédige sa réglementation, après entente préalable.
Les travaux d'amélioration et de rénovation feront toujours l'objet de pourparlers entre la Hollande et la Belgique, au sein d'une commission créée : "De Technische Scheldecommissie - La Commission Techniquue de l'Escaut."

La Belgique avance, comme desiderata, l'emploi du canal pour la navigation - la Hollande désire discuter les frais d'entretien et la qualité de l'eau.

Depuis 1827, le canal de Gand à Terneuzen a été agrandi et aménagé à trois reprises, notamment en 1885, 1910 et 1968 (fig. 2, 3 et 4).

De nos jours, la ville de Gand considère l'écluse maritime actuelle de Terneuzen comme insuffisante. En dérogation au dernier Traité, les autorités tiennent à définir le bâtiment de mer maximum admissible à pénétrer dans le port de mer de Gand.
Des voyages d'essai ont été réalisés par des bâtiments d'une longueur de 256 m, d'une largeur de 34 m et d'un tirant d'eau de 12,25 m en eau douce (fig. 7).

Les autorités ont créé une Commission Belgo-Néerlandaise, qui a pour but d'étudier, sur base de ces résultats d'essais, les travaux d'adaptation nécessaires, afin d'optimaliser le canal proportionnellement à la grandeur des bâtiments de mer.

On cherche déjà à construire une écluse maritime plus grande à Terneuzen, car le port de mer de Gand ne cesse de croître (fig. 5 et 6). Les projets tiennent compte de bâtiments de ca. 300 m de longueur, 50 m de largeur en un tirant d'eau de 16 m en eau salée. Il en résulte que prochainement des négociations nouvelles démarreront entre les autorités des deux pays, afin d'aboutir aux objectifs visés : un programme en vue de rendre le port maritime de Gand accessible à des bâtimennts de 125.000 tonnes.