

# Glasgow Cranes: the Japanese Connection

The Scottish Diaspora


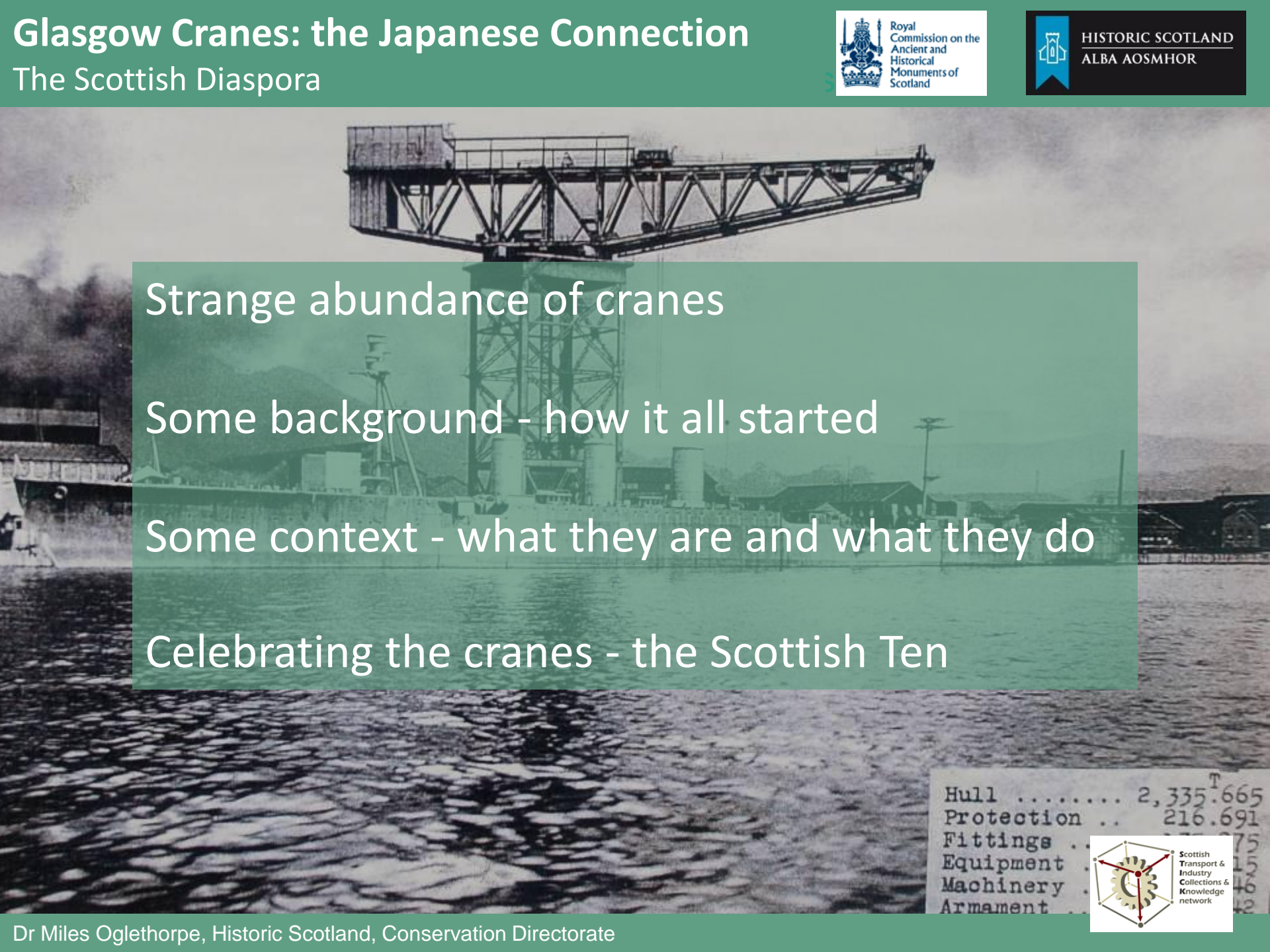


Strange abundance of cranes

Some background - how it all started

Some context - what they are and what they do

Celebrating the cranes - the Scottish Ten ☐



Hull .....	2,335.665
Protection ..	216.691
Fittings ..	175
Equipment ..	15
Machinery ..	46
Armament ..	48



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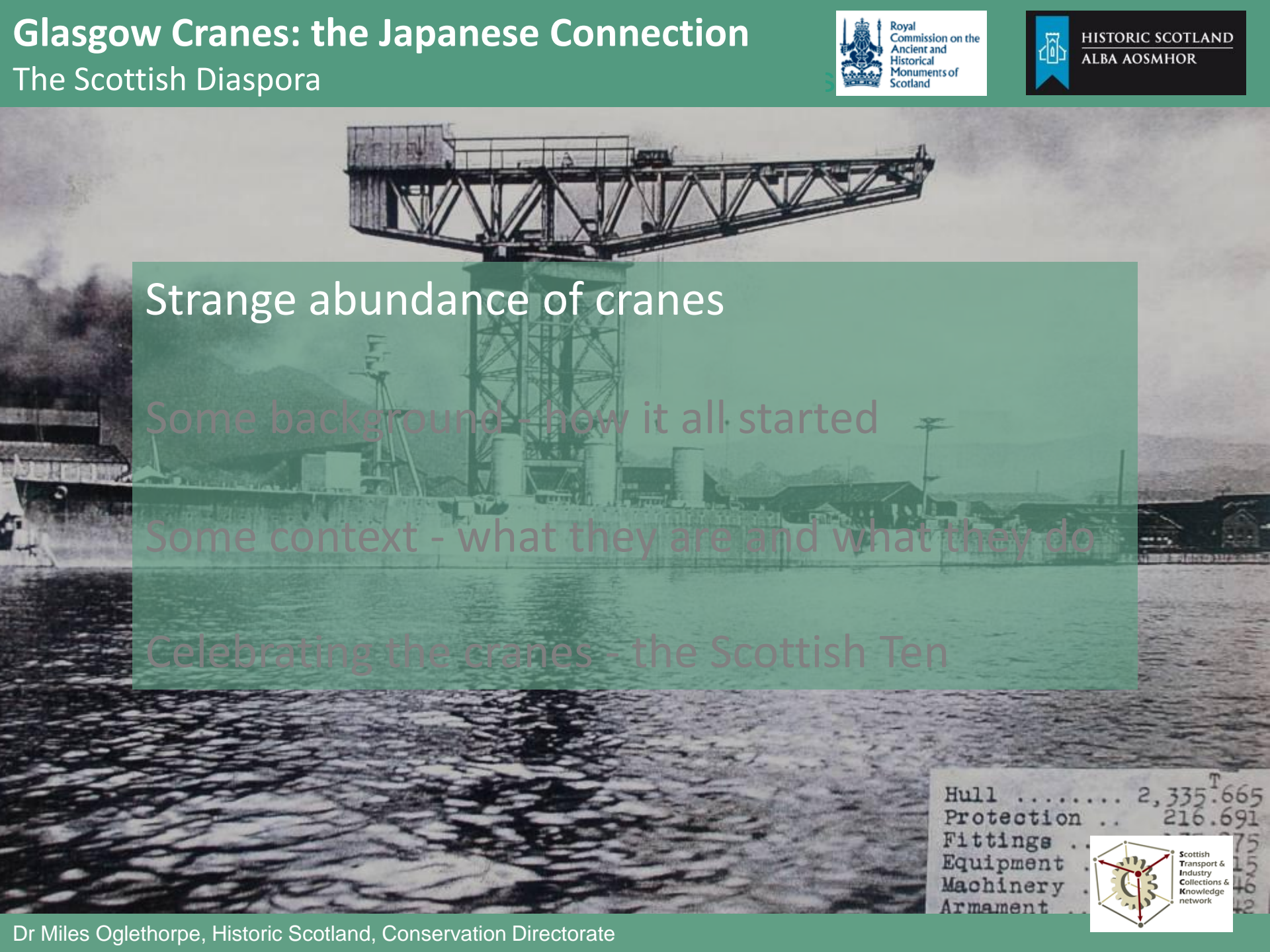


Strange abundance of cranes

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Celebrating the cranes - the Scottish Ten ☐



A large, dark, industrial crane stands prominently in the foreground, its lattice structure extending across the upper half of the frame. In the background, a shipyard is visible with various buildings, including a large white structure on the left and several smaller buildings on the right. The scene is set in a harbor or river, with water visible in the lower half of the image. The overall tone is historical and industrial.

Hull .....	2,335.665
Protection ..	216.691
Fittings ..	15.075
Equipment ..	15.075
Machinery ..	46.075
Armament ..	48.075



Scottish Transport & Industry Collections & Knowledge network















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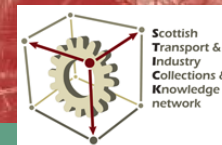
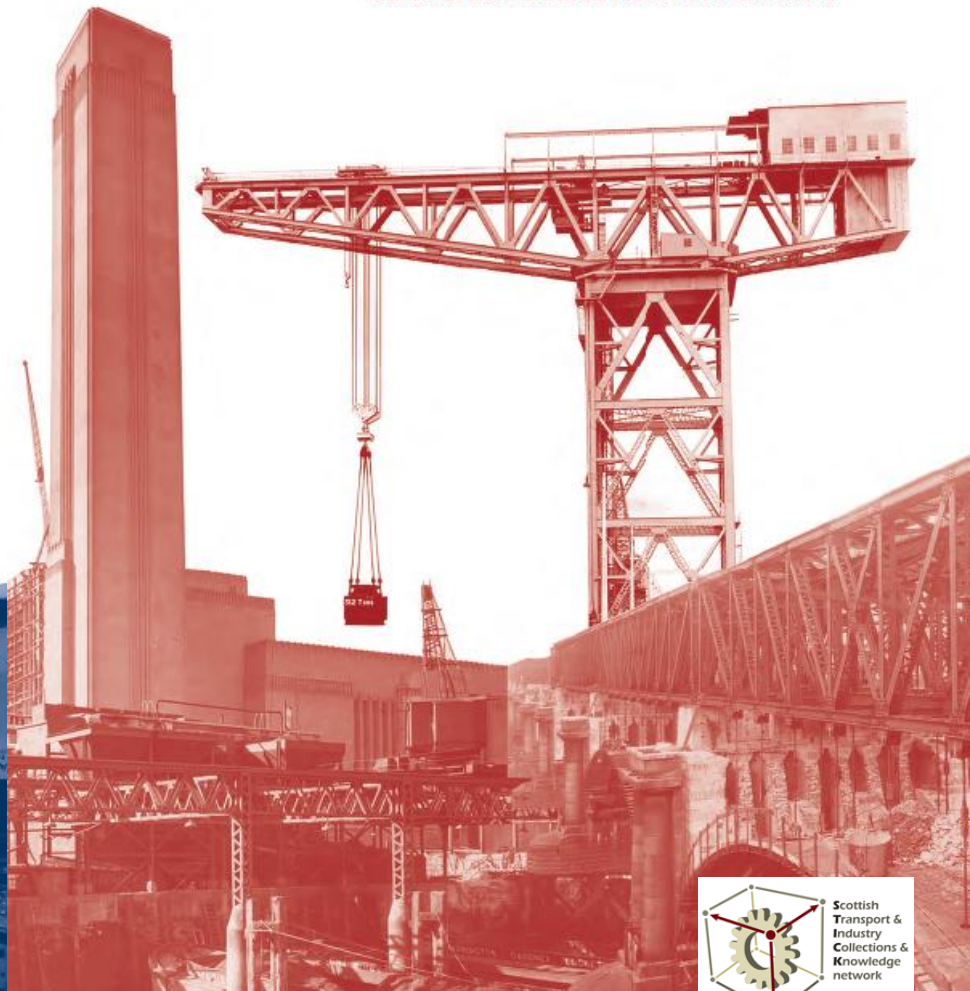
## The Sir William Arrol Collection

A Guide to the Scottish Material held in the National Monuments Record of Scotland



## The Sir William Arrol Collection

A Guide to the International Material held in the National Monuments Record of Scotland



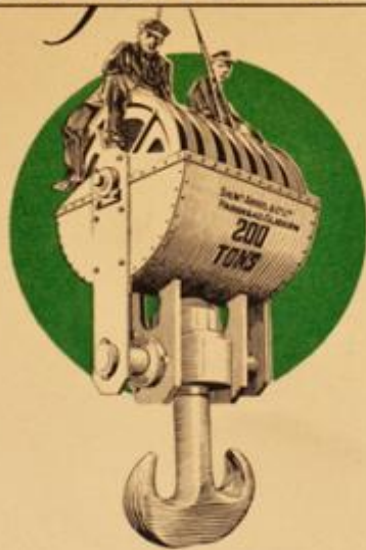






# 1927 ARROL CRANES

*for*  
ECONOMICAL LIFTING



SIR WILLIAM ARROL & CO., LTD.  
CRANE WORKS • PARKHEAD  
GLASGOW



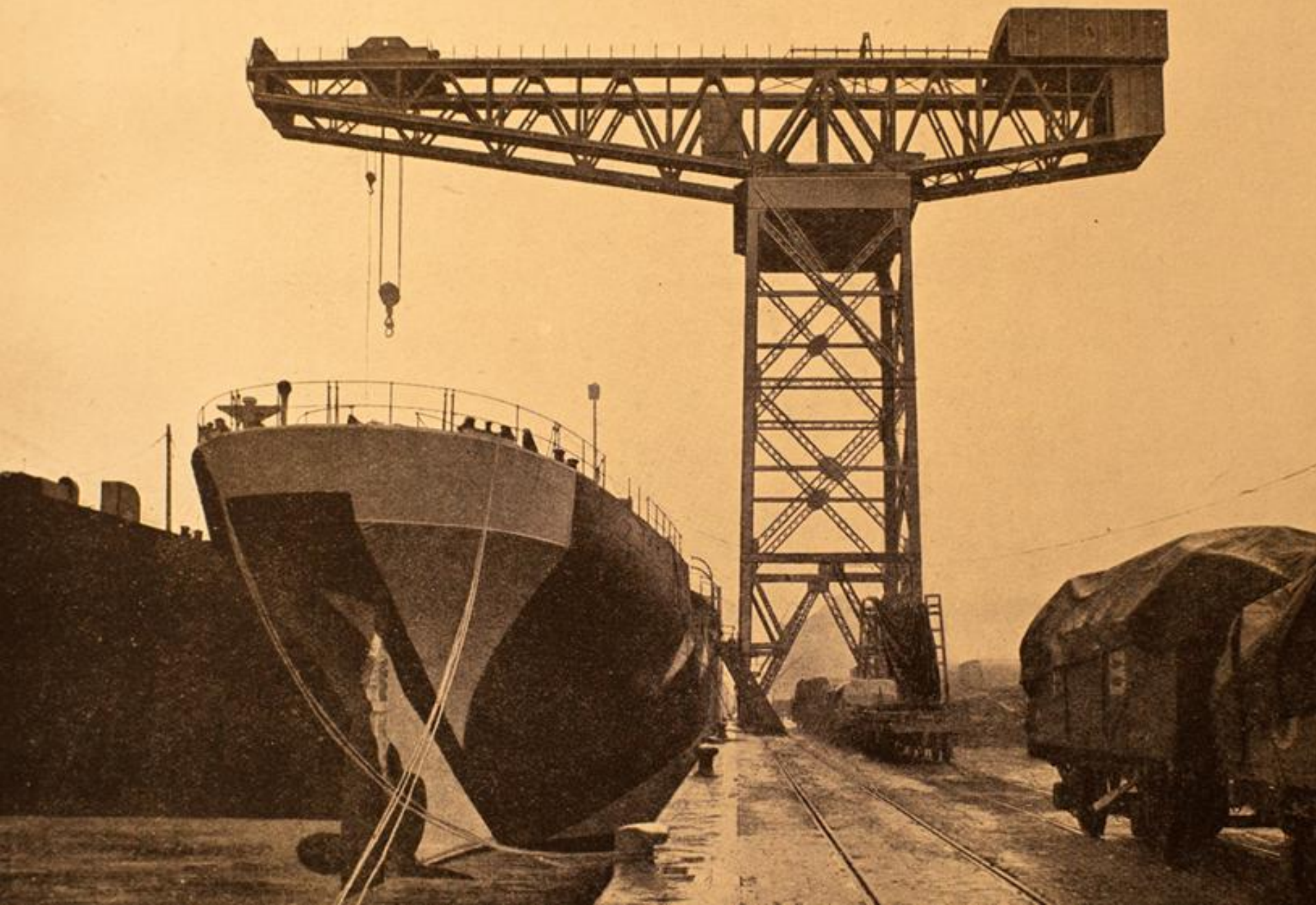
150-Ton Giant Cantilever Crane with  
Slewing Motion.

The Crane shown above was supplied to the Greenock Harbour Board.

The Cranes shown below are designed for a working load of 100 tons.















Sir William Arrol, 1839-1913

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46	a) Structures Listed by Arrol Project Number
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### Notes

1. For a brief introduction to iron and steel, see Gale, WKV, *The British Iron and Steel Industry: a technical history* 1967).
2. The existence of photographs of the new Montrose bridge in the collection is presumably in order to keep a visual note of other companies' projects.
3. See *Sir William Arrol and Company Ltd* (1909).
4. *Ibid.* p 216.
5. Thanks are due to Brian Newman of the University of Newcastle, who has been the principal source of information on Arrol's crane-building operations.
6. See RCAHMS *Catalogue of Scottish Power Collections*

7. In the post-war period, advances in the design of coal- and oil-fired power station boilers involved their relocation from ground-mounted to suspended positions within power station buildings, necessitating the construction of huge steel supporting frames. The large size of such projects usually required consortia rather than single companies, and in addition to Arrol, examples of other participants included Alex Findlay, Redpath Dorman Long, and Cleveland Bridge Co.

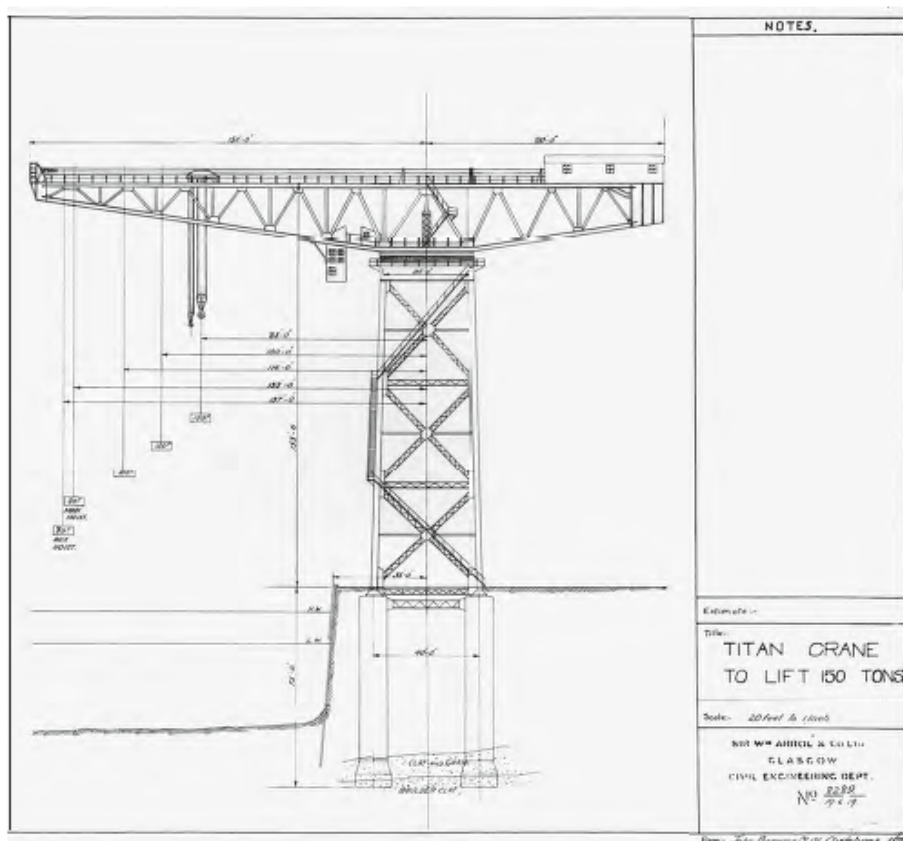


Figure 1: John Brown and Company, Clydebank, 150-ton crane, 1907. This was the first Giant Cantilever crane built by Sir William Arrol and Company.





Plate 10: Rosyth Dockyard. Tugs taking charge after the launch of one of the seven sliding dock caissons designed and built by Arrol for the Admiralty, en route from the construction site at North Queensferry to Rosyth Dockyard, c. 1914. In the background, the Forth Railway Bridge, Sir William Arrol and Company's most famous project (1882-1890).



Plate 11: 'HM Dockyard, Rosyth Testing 250 Tons Crane... 5.7.17'. The acquisition of the Porthead Crane Works in 1910 allowed Arrol not only to design and build such cranes, but also to provide the machinery (C 87838 PO, item 32).

C 87045 PO: 'Lifting old north gate out of place'  
d: 22/5/1980  
C 87049 PO: 'Stepping north gate (new)'  
d: '23/5/80'  
C 87042 PO: Crane rigging on site  
d: '25/5/80'  
C 87052 PO: C 87053 PO/CN: C 87054 PO/CN: Dock gates in place  
n.d.  
C 87033 PO - C 87034 PO: General view  
d: '8/4/80'  
C 87037 PO - C 87038 PO; C 87040 PO: General views of gates  
d: 1980  
C 87035 PO - C 87036 PO; C 87039 PO: north gate  
d: '1980'  
C 87050 PO - C 87051 PO: north gate (new)  
d: '1980'

C 87041 PO; C 87046 PO - C 87048 PO: View of both Dock gates  
d: '15/5/80'  
Box 12  
C 88213 PO - C 88218 PO: Details of original lock gates  
d: '26/4/79'  
C 88206 PO - C 88212 PO; C 88219 PO - C 88228 PO: Details of original lock operating mechanism / hinge  
d: '26/4/79' & '2/5/79'

#### DUNFERMLINE

32, Rosyth, HM Dockyard (Plates 10 and 11)  
Fife Council  
NT08SE 41 [NT 09 82]  
Cranes; Docks

B 90518 PO: 'Carpenters scaffolding erected  
d: 10/5/32'  
B 90514 PO: 'east approach in foreground'  
d: '9/5/32'  
B 90496 PO: 'General view looking west from Temple Lock, JC Lilley's  
cofferdam in the foreground  
d: 24/1/32'  
B 90500 PO: 'General view looking west...'  
d: '23/2/32'  
B 90510 PO: 'Main steelwork erection complete...  
d: 16/4/32'  
B 90473 PO - B 90474 PO; B 90481 PO; B 90483 PO - B 90492 PO; B 90499  
PO; B 90501 PO; B 90517 PO: 'north abutment...'  
d: '23, 25/2/32' & '9/5/32' & '18/11/31' & '21/11/31' & '5/11/31' & '18/8/31'  
B 90495 PO: 'north cofferdam and temporary footbridge'  
d: '24/1/32'  
B 90480 PO: 'north cofferdam piles spliced and excavation proceeding...  
Reinforcing steel being placed for floor slab in counterweight pit'  
d: '5/11/31'  
B 90465 PO; B 90469 PO - B 90470 PO; B 90472 PO; B 90475 PO - B 90479  
PO; B 90526 PO; B 90493 PO: 'south abutment...'  
d: '5/10/31' & '18/9/31' & '21/10/31' & '24/6/32' & '21/11/31'  
B 90515 PO: 'south approach to bridge under construction'  
d: '9/5/32'  
B 90505 PO: 'View from north bank showing north abutment and steel erection  
on south side...  
d: 25/3/32'  
B 90494 PO - B 90504 PO: 'Views looking south west...'  
d: '21/11/31' & '24 July 1932'  
B 90507 PO: 'View of bridge from behind south abutment...  
d: 9/4/32'  
B 90516 PO: 'west approach and pre-cast yard beyond'  
d: '9/5/32'  
B 90527 PO: Bridge in open position on completion  
d: probably 1932  
B 90462 PO: General view (Temple Gasworks, Temple Sawmills and Temple  
Ironworks in frame) of site before construction  
d: '26th May 1931'  
B 90463 PO; B 90464 PO; B 90466 PO - B 90467 PO; B 90502 PO - B 90503  
PO; B 90511 PO; B 90509 PO; B 90520 PO - B 90522 PO: General views of  
site  
d: '26th May 1931' - '16/4/32'  
B 90461 PO: Looking south on east of bridge  
d: 26th May 1931  
Note: Temple Sawmills are visible in the background  
B 90523 PO: Looking south-east  
d: '30/5/32'  
B 90528 PO: Looking along Bearsden Road and across the Temple Bridge  
d: 1930s  
B 90512 PO: Looking towards Temple Gasworks  
d: '16/4/32'

B 90529 PO, B 90530 PO: Opening ceremony  
d: probably 1932  
B 90482 PO: Photograph 'showing JC Lilley's operations'  
d: '5/11/31'  
B 90513 PO: south bank  
d: '22/4/32'  
B 90519 PO: View over the yards of Temple Sawmills  
d: '30/5/32'

#### 71. Glasgow, Castlebank Street Railway Bridge

City of Glasgow Council  
NS56NE 205 [NS 558 663]  
Railway Bridge  
Box 9 [B22]  
B 90236 PO - B 90238 PO: 'Castlebank Street Bridge, Partick... Job No. 2057'  
d: 'Oct. '67'

#### 72. Glasgow, 18 Clydebrae Street, Govan Graving Docks

City of Glasgow Council  
NS56NE 118 [NS 5615 6550]  
Graving Docks  
Box 12 [J10]  
Note: all photographed by W Ralston Ltd, Glasgow  
C 88045 PO - C 88046 PO: 'Clyde Navigation Trust' floating out old caisson to  
make way for Floating Caisson, No.1 Graving Dock, Govan  
d: 7/1960  
Note: dimension of caisson given  
C 87149 PO - C 87162 PO: Views of damage, dock no. 2 caisson, 'Clyde Nav.  
Trust',  
d: 7/1961  
Box 21  
C 88241 PO - C 88242 PO: View of dock containing caissons (unidentified)  
d: '8 Feb. 1972'

#### 73. Glasgow, Govan, Fairfield Shipyard & Engine Works

City of Glasgow Council  
NS56NW 36.0 [NS 548 660]  
Shipyard  
Box 19 [S23]  
C 88089 PO: 'Site of operations Fairfield Shipbuilding Yard. Truck mixed  
concrete being discharged direct into foundations for your new crane...'  
n.d.  
C 87921 PO/CN - C 87945 PO/CN: 'Transfer of completed 60/10 ton electric  
level lifting crane onto permanent tracks. Contract no. ND 10825/000012'  
d: 7/1970s  
Box 20 [S42]  
C 88093 PO: Unidentified  
n.d.  
Note: photographed by Amman, Glasgow?



Plate 18: View from south-south-west across the fitting-out basin of the former Fairfield Shipyard in Glasgow (now Kvaerner Govan), showing the Arrol 220-ton Giant Cantilever crane (built in 1911) (B 41310, 1990, RCAHMS, item 74).





Plate 8: 150-ton Giant Cantilever Crane, Barrow-in-Furness, England [N18]. General view lifting test load of 182.5 tons at maximum radius of 85 feet, 1942. This replaced an earlier crane built by the Glasgow Electric Crane and Hoist Co. which was destroyed in an air raid in May 1941. (NMRS Image No. SC355111).



Plate 9: Giant Cantilever Crane, Walker Shipyard, Newcastle-upon-Tyne, England [N21]. View of crane undergoing testing with 250-ton load, 1931 (NMRS Image No. SC355113).



Plate 10: 250-ton Giant Cantilever Crane, Singapore Harbour [N12]. General view of crane on completion at Singapore, 1938 (NMRS Image No. SC355107).



Plate 11: Giant Cantilever Crane, Sydney, New South Wales, Australia [N5]. General view of crane with Sydney Harbour Bridge in background, 1951 (NMRS Image No. SC355104).



Plate 12: Giant Cantilever Crane, North East Marine Shipyard, Wallsend, England [N22]. View of completed crane with test load of 187 tons, 1909 (NMRS Image No. SC355120).



Plate 13: Giant Cantilever Crane, Wallsend Slipway Engineering Company, England [N24]. General view of crane nearing completion, 1910 (NMRS Image No. SC355127).



Plate 14: Giant Cantilever Crane, HM Dockyard, Portsmouth, England [N23]. General view of completed crane, 1912 (NMRS Image No. SC355126).

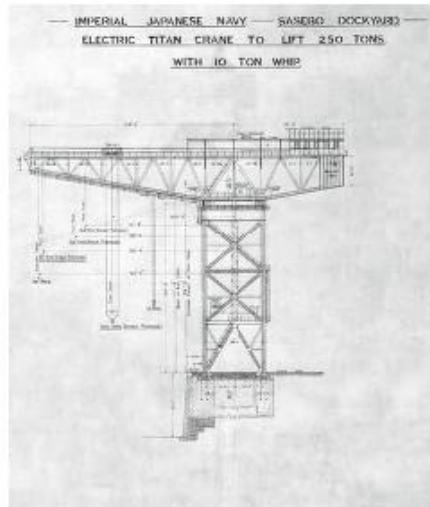


Figure 2: Extract from a general arrangement drawing of the 250-ton giant cantilever crane which was built by Arrol for the Imperial Japanese Navy's Sasebo Dockyard, dated 23 January 1912 [N11]. (NMRS Image No. 505981).



Plate 15: 200-ton Giant Cantilever, Stormont Quay, Belfast, Northern Ireland [N45]. View of the crane nearing completion in July 1958 (NMRS Image No. SC355141).



# Glasgow's Cranes: an uplifting legacy

## Doors Open Day lecture



Strange abundance of cranes

Some background - how it all started

Some context - what they are and what they do

Celebrating the cranes - the Scottish Ten ☐

Hull .....	2,335.665 <sup>T</sup>
Protection ..	216.691
Fittings ....	175.275







Plate 61: 250-ton Giant Cantilever Crane for the Japanese Imperial Dockyard, Sasebo [N11]. View of the crane jib assembled outside Arrol's Parkhead Works, Righy Street, Glasgow in 1912. The Japanese clients can be seen inspecting the work on top of the jib (MARS Image No. SC555100). See also Figure 2.

## JAPAN

Nagasaki, Mitsubishi Dockyard, 300-ton Giant Cantilever Crane  
Crane, Giant Cantilever, 1912  
DC27750: General arrangement drawing, dated 1912. If built, this would have had the largest lifting capacity of any giant cantilever crane. It is, however, not certain if it was ever built. Mitsubishi did, however, have a smaller giant cantilever crane built by the Glasgow Electric Crane & Hoist Co.  
Drawings Collection

Sasebo, Imperial Japanese Navy Dockyard, Crane [N11] (Plate 61 and Figure 2)  
Crane, Giant Cantilever, 1912  
DC27749: General arrangement drawing, dated 23 January 1912.  
E89774/PO-E89777/PO  
4 images: views the roller path and jib assembled at Arrol's Parkhead Crane Works, Glasgow prior to dispatch to Japan.  
Box 43, and Drawings Collection

## LESOTHO

Tsoeliki Suspension Bridge [F29] (Plates 62 and 63)  
Bridge, Road, 1930  
C88723/PO-C88726/PO  
4 images: views include pieces of the bridge assembled outside Arrol's Dalmarnock Iron Works in Glasgow, and aerial views of the bridge following completion on site.  
Box 26

## MALTA

Grand Harbour, Hydraulic Rivetting Machine [R62]  
Machinery, machine tool (rivetter) for Admiralty Dockyard, 1956  
E90116/PO  
1 image: view of the hydraulic rivetting machine at Arrol's works, Glasgow.  
Box 46

## MYANMAR (BURMA)

Burma Railways, Bridges  
Bridge, Railway, 1947  
D65436-8: Copy negatives of drawings showing details of steel trusses  
3 copy-negatives of drawings  
Negative Store

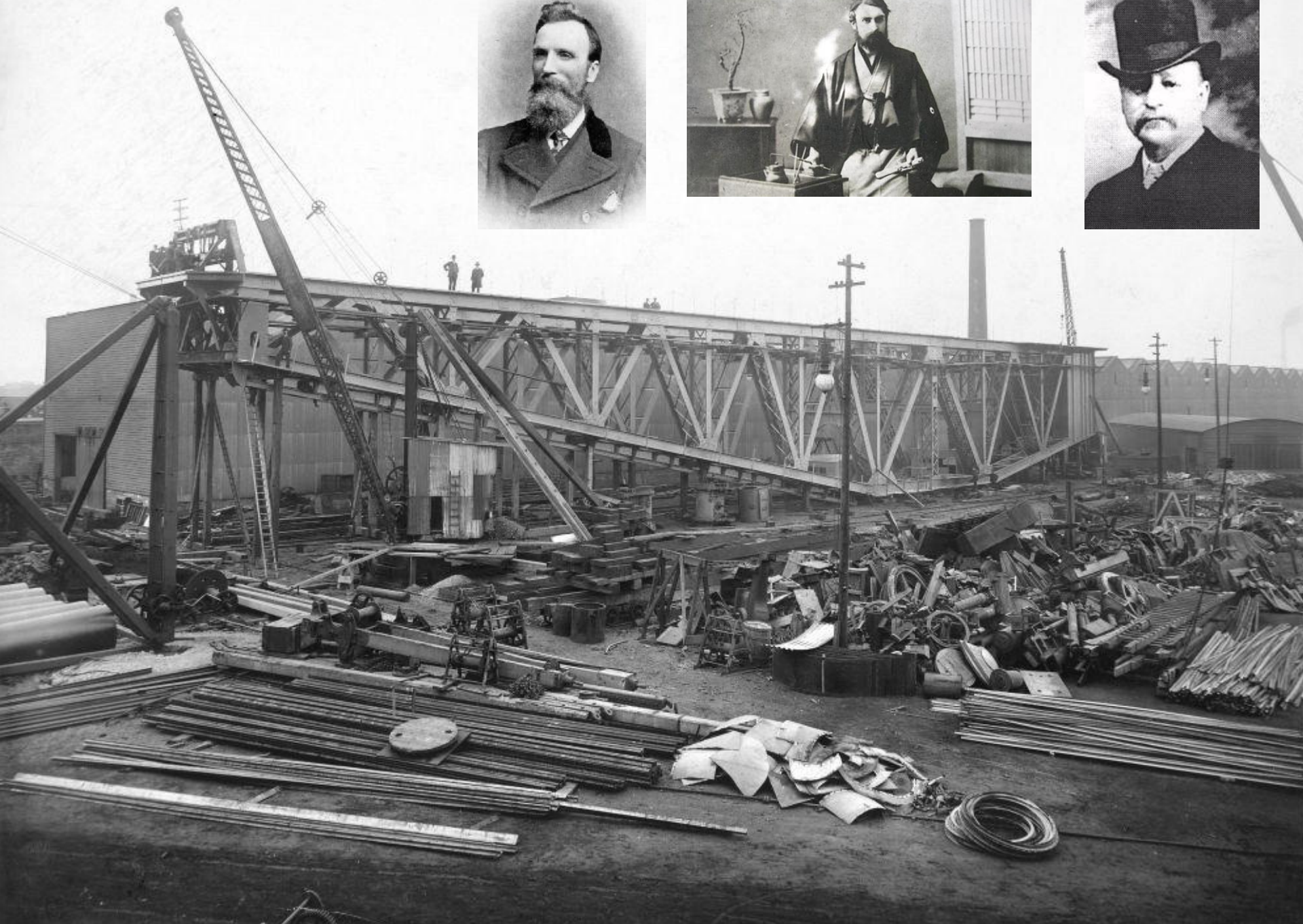
## NEPAL

Bridge, location unknown [E46] (Plate 64)  
Bridge, Railway, Road, 1926  
B93164/PO  
1 image: view of bridge assembled outside Arrol's Dalmarnock Iron Works, Glasgow.  
Box 8









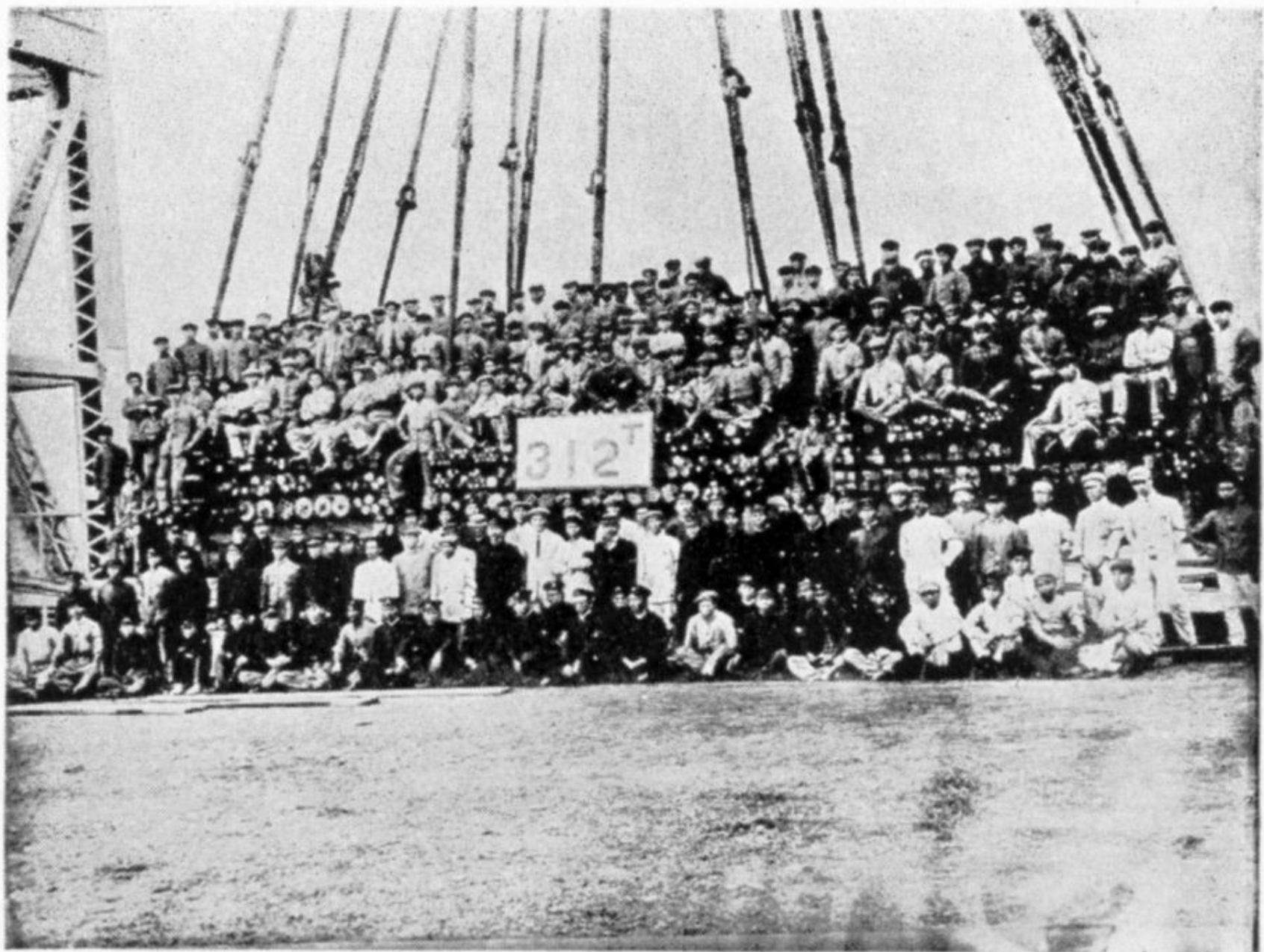




ENGRAVING No. 1052.

250-ton Giant Cantilever Crane, with Slewing Motion.





Test Load.





Hull .....  
Protection  
Fittings ..  
Equipment ..  
Machinery ..  
Armament ...  
Total.

No. of Rivets

長良工事現況  
(第十一回) 昭和九-九-20













OT  
横











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A large, dark, industrial crane stands over a shipyard. In the background, a large ship is visible, and the water in the foreground is dark and rippled. The scene is industrial and historical.

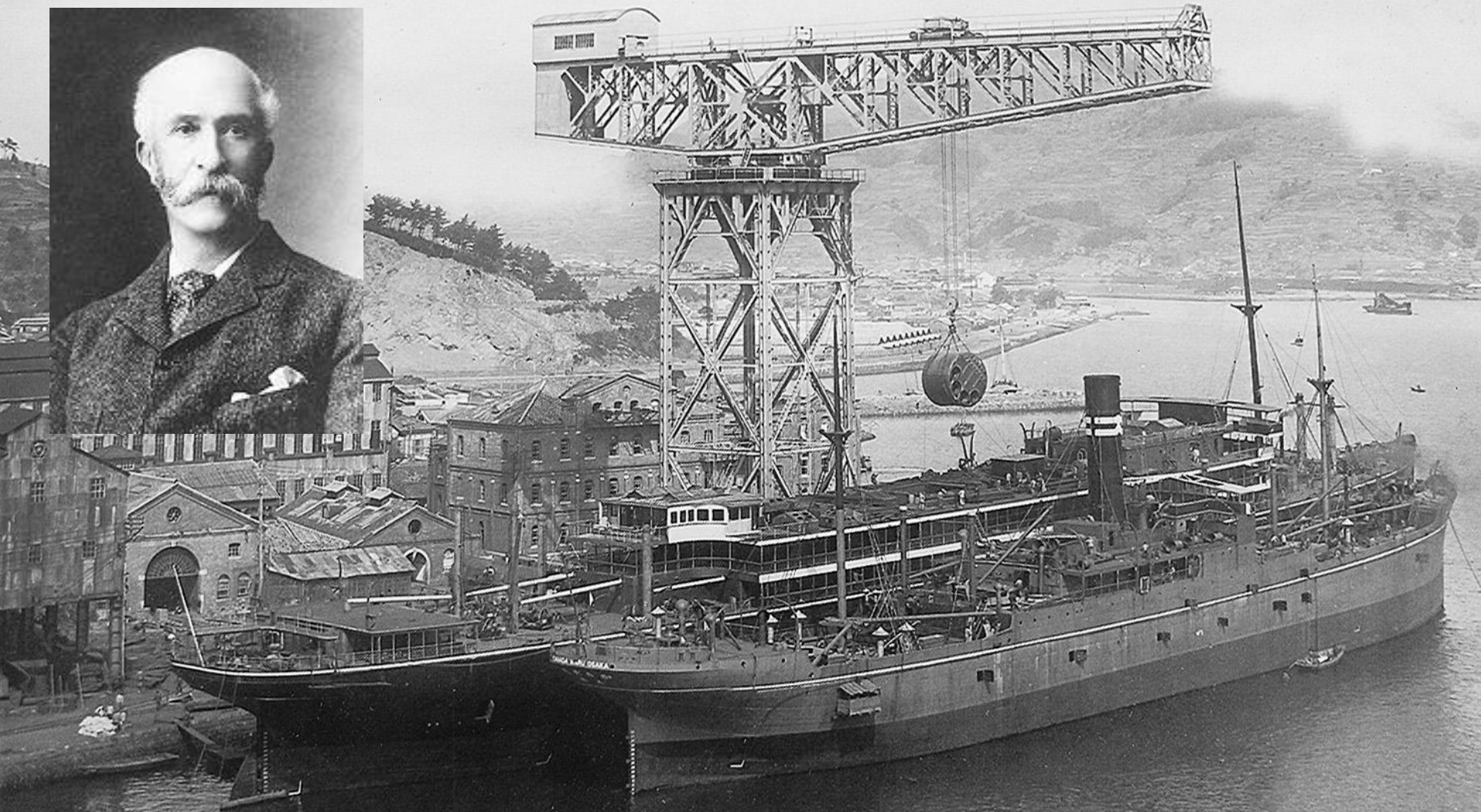
Hull .....	2,335.665
Protection ..	216.691
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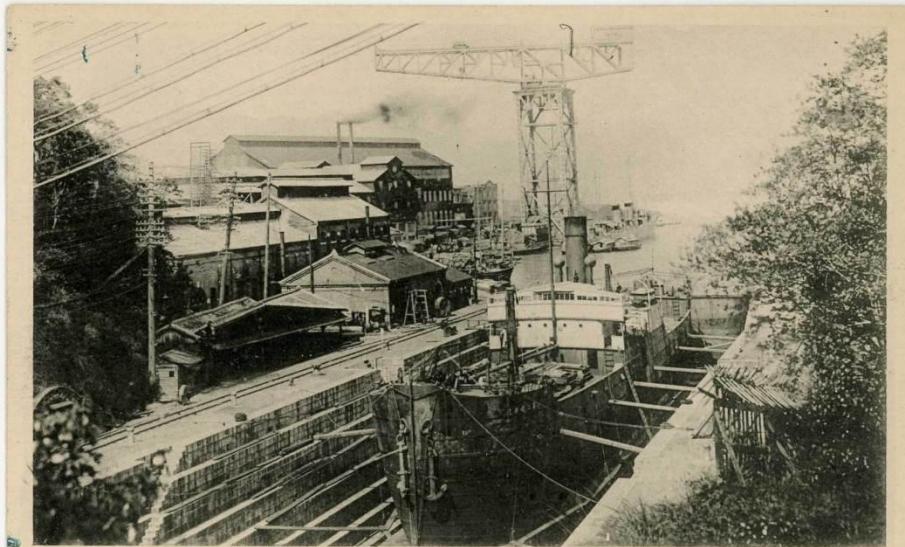


# THE TENTH SCOTTISH TEN SITE: JAPAN

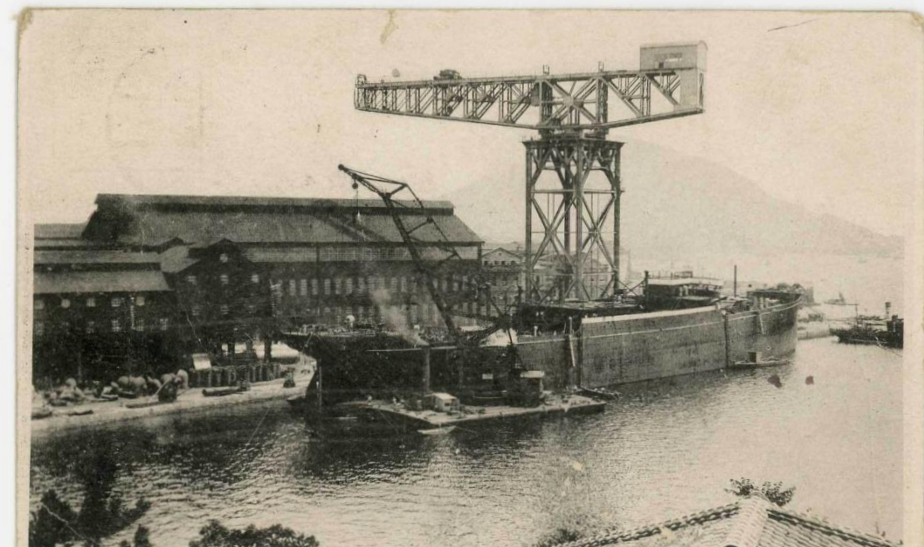




# THE TENTH SCOTTISH TEN SITE: JAPAN



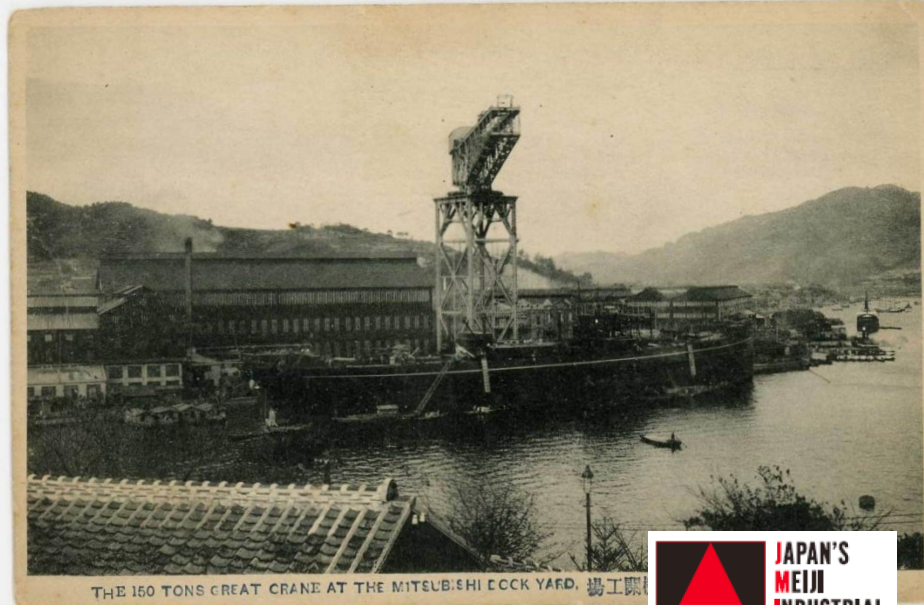
The Dock No.2 Mitsubishi Nagasaki      クッドニ第菱三崎長      (所名崎長)



MITSUBISHI DOCK NAGASAKI.      ンレーグリドンカ所船造菱三崎長

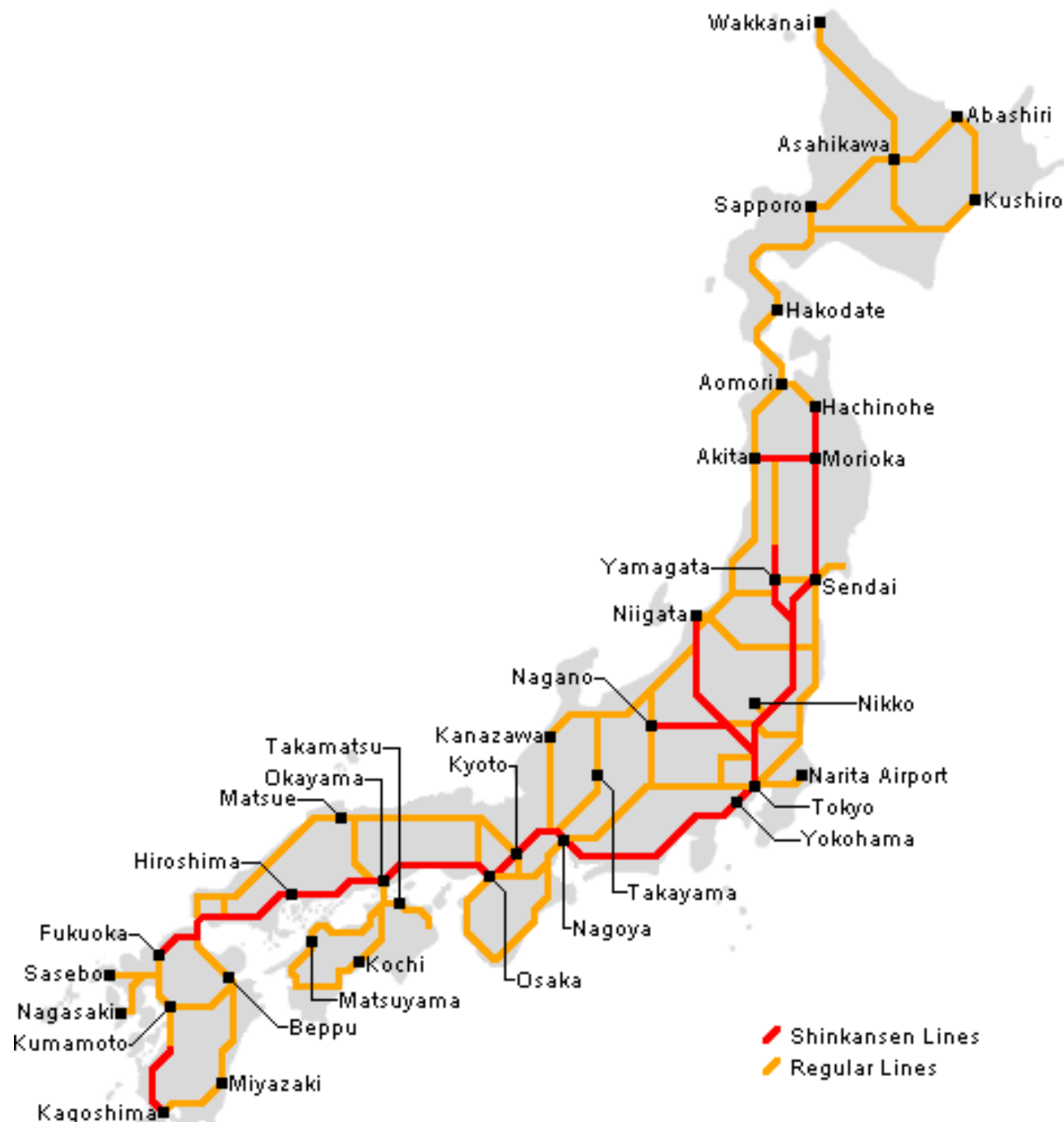


No. 1 Nagasaki Dockyard.      所船造一第崎長



THE 160 TONS GREAT CRANE AT THE MITSUBISHI DOCK YARD. 揚工機









**WELCOME TO NAGASAKI**

長崎の街・産業遺産ファンクラブ



# The Tenth Scottish Ten Site

- The 10<sup>th</sup> Scottish Ten site is based in Nagasaki
- Its most significant element is a Giant Cantilever Crane designed and built in Scotland and erected for Mitsubishi in 1909
- The crane is still in use today
- Also to be surveyed is Kosuge Dock, built in 1868 using equipment imported from Scotland
- A third part of the digital documentation will be Hashima Island, a spectacular off-shore coal-mining island





Two other sites in Nagasaki with strong Scottish links. These include Kosuge Dock, which was installed by the 'Scottish Samurai', Thomas Blake Glover, in 1868 using equipment sourced in Aberdeen



Hashima Island, also known as “Gunkanjima” because of its battleship shape. This is a coal-mining island in the sea off Nagasaki which owes its origins to Thomas Blake Glover’s early coal mining business

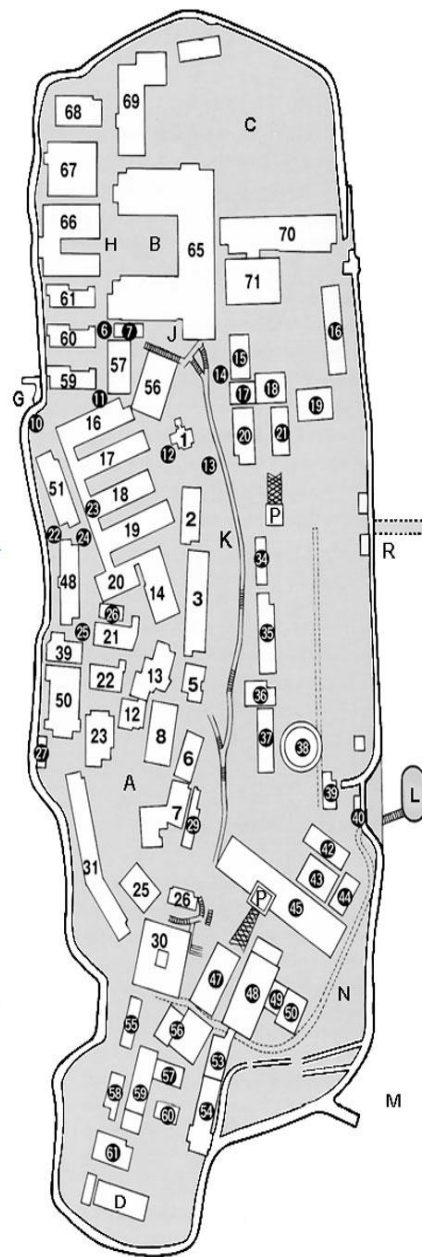






no:	date:	type:	use:
1	1936	wood, 1F	-shrine
2	1950	RC, 3F	-company flats for staff
3	1959	RC, 4F	-company flats for staff
5	1950	wood, 2F	-company house for manager
6	1936	wood, 2F	-company dormitory for single staff -clubhouse for senior staff
7	1953	wood, 2F	
8	1919	RC+wood, 3F	-public bath + company flats for workers -company flats for workers
12	1925	RC+wood, 3F	-public flats for teachers + office workers -company flats for workers, Chuo flats
13	1967		-company flats for miners
14	1941	RC, 4F	Nikkayu flats
16	1918	RC, 5F	Nikkayu flats
17	1918	RC, 9F	Nikkayu flats
18	1918	RC, 9F	Nikkayu flats
19	1918	RC, 9F	Nikkayu flats
20	1918	RC, 9F	-police station 1F + company flats for miners -Takashima branch office + public flats for office workers
21	1954	RC, wood, 6+1F	-lodgings for primary school teachers and Sempukuji temple
22	1953	RC, steel, 5+1F	-cafe, hotel + company flats for workers -lodgings for subcontracted workers
23	1921		-flats for subcontracted workers (originally for miners)
25	1931	RC, 5F	-public bath, post office + company flats for miners
26	1966	wood, 2F	-citizen's hall
30	1916	RC, 5F	-company flats for miners
31	1957	prefab, 2F	-movie theatre (Showa-kan)
39	1964		-company flats for miners
48	1955	RC, 7F	-company flats for workers
50	1927	RC, 3F	-shops 1F + company flats for miners -shops (underground) + company flats for miners
51	1961	RC, 5F	-shops (underground) + company flats for miners
56	1939	steel, 2F	-public baths (underground) + company flats for miners
57	1939	RC, 8F	-kindergarten + company flats for miners
59	1953	RC, 3F	-company dormitory for miners
60	1953	RC, 4F	-company dormitory for miners
61	1953	RC, 5F + steel 1F	-hospital isolation ward
65	1945	RC, 5F + steel 1F	-Hashima (Gunkanjima) hospital
66	1940	RC, 5F + steel 1F	-Hashima (Gunkanjima) primary + junior high school
67	1950	RC, 9F + steel 1F	-school gymnasium
68	1958		
69	1958	RC, 4F	
70	1958	RC, 4F	
71	1970	RC, 2F	
		RC, 4F	
		RC, 7F	
		RC, 2F	

A: small park for children  
 B: public park for children  
 C: playground  
 D: swimming pool  
 E: water tank  
 F: shopping market  
 G: shore protection opening  
 H: Salt-Spray Street  
 I: "Stairwell to Hell"  
 J: "The 50 steps stairway"  
 K: green promenade  
 L: Dolphin Pier  
 M: The harbor  
 N: tunnel walk  
 O: company office  
 P: winch turret  
 Q: tennis court  
 R: intake









# THE TENTH SCOTTISH TEN SITE: JAPAN





# THE TENTH SCOTTISH TEN SITE: JAPAN

SCOTTISH TEN 



The Giant Cantilever Crane, Mitsubishi Heavy Industries Shipyard, Nagasaki Harbour, Kyushu, Japan







# THE TENTH SCOTTISH TEN SITE: JAPAN





# THE TENTH SCOTTISH TEN SITE: JAPAN

SCOTTISH TEN 



The Giant Cantilever Crane, Mitsubishi Heavy Industries Shipyard, Nagasaki Harbour, Kyushu, Japan









# THE TENTH SCOTTISH TEN SITE: JAPAN

SCOTTISH TEN 



The Giant Cantilever Crane, Mitsubishi Heavy Industries Shipyard, Nagasaki Harbour, Kyushu, Japan



# THE TENTH SCOTTISH TEN SITE: JAPAN





KIRIN

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# 明治日本の 産業革命遺産を世界遺産に



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「明治日本の産業革命遺産を世界遺産に」  
デザイン缶1本につき1円を寄付し、  
世界遺産登録に関する活動を応援いたします。



ストップ! 未成年者飲酒・飲酒運転。お酒は楽しく適量で。妊娠中・授乳期の飲酒はやめましょう。のんだあとはリサイクル。① キリンビール株式会社

