

From *Admitted to the Service*
The Superintending Engineer,
IIIrd Circle,
Bellary.

To

The *Chief Engineer*
Madras

No. 2736 to d. 26 October 1894

Dated 20th October 1894.

Received

Enclosures.

No. 1759

Subject.

Informing that the in
question was of a local
manufacture.

The local pur-
chase of the badge
is sanctioned.
The structure similar
supplies should be
obtained from the
P.W. Workshops, in
accordance with
P.W. memo no-3539c
of 3rd August 1891.

G 27w

CUM
27/10/94

DESIGNED
29 OCT. 94

J. E. in note
Enan P.W. 11
with copy of
memo no-3129c of 9/

obtained, to the prolonged
halt of 17 days made by
as per reasons given within

10.11.41

No. 1759

Superintending Engineer's Office,
3RD CIRCLE,

Bellary 19th October 1894.

FROM

Lieut. Col. C. C. Rawson R.E.
SUPERINTENDING ENGINEER,

3RD CIRCLE,

TO

THE Chief Engineer,
P.W.D.

Madras.

Sir,

Enclosure.

With reference to your Memo No. 3129 C dated 15th October 1894, I have the honor to state that the brass badge in question was of local manufacture.

I have the honor to be
Sir

Your most obedient servant

C. C. Rawson
19.10.94 Lieut. Col. R.E.
Suptg. Engineer, III Circle.

Obtain to the prolonged
halt of 17 days made by
as per reasons given within.

ORDER—dated 2nd October 1894, No. 391, Marine.

Recorded.

2. The Public Works Department will be requested to make early arrangements for testing the lightning conductors at Armeghon and the Seven Pagodas. It is observed that they have not been tested since 1887 and 1889, respectively.

(True Extract.)

J. F. PRICE,
Chief Secretary.

To the Presidency Port Officer.
„ the Public Works Department.
„ F. W. Ashpitel, Esq.

ENDORSEMENT—dated 2nd October 1894, No. 392, Marine.

Five copies forwarded to the Government of India, Department of Finance and Commerce.

J. F. PRICE,
Chief Secretary.

APPENDIX D.

STATEMENT showing the sanctioned Establishments of Lighthouses on the Madras Coast as they stood on the 31st March 1894.

Lights.	Superintendents.			Head Light-keepers.			Light-keepers.			Total staff of each light.	Remarks.
	1st Class.	2nd Class.	3rd Class.	1st Class.	2nd Class.	3rd Class.	1st Class.	2nd Class.	3rd Class.		
	Rs. 100.	Rs. 70.	Rs. 50.	Rs. 15.	Rs. 12.	Rs. 10.	Rs. 9.	Rs. 8.	Rs. 7.		
Coondapoor ..	..	..	..	..	..	(a) 1	..	..	(b) 1	2	(a) Charge allowance of Rs. 1.
Malpé ..	..	..	..	..	..	(a) 1	..	..	(b) 1	2	(b) Temporary from 15th September to 31st May every year.
Mangalore ..	..	..	..	..	..	(a) 1	..	..	..	2	(c) Charge allowance Rs. 2.
Cannanore ..	..	..	..	..	..	(a) 1	..	..	..	2	(c) Charge allowance Rs. 25.
Tellicherry ..	..	..	..	..	..	(a) 1	..	..	..	3	(d) Plus house allowance Rs. 25.
Calicut ..	..	..	..	..	..	(a) 1	..	..	..	3	(e) Also a watchman on Rs. 6 for the bar lights.
Cochin ..	..	..	..	..	..	(a) 1	..	..	..	4	(e) Also two water-boat leucers on Rs. 7 each.
Mattum ..	..	..	..	..	..	..	..	..	..	3	(f) Plus flag-signalling allowance Rs. 10.
Manapad ..	..	..	..	..	..	..	..	..	..	3	(f) Plus flag-signalling allowance Rs. 10.
Tuticorin ..	..	..	..	..	..	..	..	..	..	3	(g) Also a flag signaller on Rs. 8.
Pamban ..	..	..	..	..	..	..	..	..	..	5	(h) Also a flag signaller on Rs. 8.
Tondi ..	..	..	..	..	..	..	..	..	..	1	
Point Calimere ..	..	..	..	..	..	..	..	..	..	1	
Negapatam ..	..	..	..	..	..	..	..	..	..	1	
Cuddalore ..	..	..	..	..	..	..	..	..	..	1	
Seven Pagodas ..	..	..	..	..	..	..	..	..	..	1	
Madras ..	..	..	..	..	..	..	..	..	..	1	
Pulicat ..	..	..	..	..	..	..	..	..	..	1	
Arneghon ..	..	..	..	..	..	..	..	..	..	1	
Point Divi ..	..	..	..	..	..	..	..	..	..	1	
Masulipatam ..	..	..	..	..	..	..	..	..	..	1	
Hope Island ..	..	..	..	..	..	..	..	..	..	1	
Vakalapudi ..	..	..	..	..	..	..	..	..	..	1	
Santapilly ..	..	..	..	..	..	..	..	..	..	1	
Calingapatam ..	..	..	..	..	..	..	..	..	..	1	
Gopalpur ..	..	..	..	..	..	..	..	..	..	1	
Total staff.											
Lighthouses.											
Head Light-keeper and Signaller.											
Rs. 20.											
Rs. 11.											
Rs. 10.											
Rs. 9.											
Rs. 8.											
Total staff.											
Rs. 5.											
Rs. 3.											

Temporary.—Light-house Mechanic, Rs. 80 per mensem, rising by annual increments of Rs. 5 to Rs. 100.

AMALGAMATED Establishments.

APPENDIX C.

STATEMENT furnishing (1) Particulars of inspection made of Lighthouses on the Madras Coast in 1893-94 and (2) Remarks in connection with the lightning conductors.

Name of Light.	(1)		(2)	
	Officers by whom inspected.	Number of inspections.	Remarks as to Lightning conductor.	
Coondapoor ..	Presidency Port Officer	1	Lightning conductor tested three times in the year.	
	Executive Engineer	1		
	Port Officer, Mangalore	4		
	Presidency Port Officer	1		
Malpé ..	Port Officer, Mangalore	4	Lightning conductor not tested since October 1892.	
Mangalore ..	Presidency Port Officer	2		
	Executive Engineer	2	Lightning conductor was tested in August 1893.	
Cannanore ..	Presidency Port Officer	3		
	Port Officer, Calicut	2	Lightning conductor in good order.	
Tellicherry ..	Presidency Port Officer	4		
	Executive Engineer	3	Lightning conductor improved by the addition of a wire led underground into the sea.	
Calicut ..	Presidency Port Officer	2		
Cochin ..	Executive Engineer	1	Lightning conductor not tested in the present year.	
	Presidency Port Officer	1		
Muttum ..	Executive Engineer	1	Lightning conductor tested in September 1893.	
	Port Officer, Tuticorin	1		
Manapad ..	Presidency Port Officer	1	Lightning conductor tested in September 1893 and found in perfect order.	
	Public Works Department Subordinate Officers.	4		
Tuticorin ..	Presidency Port Officer	2	Lightning conductor was tested and found correct.	
	Superintending Engineer	1		
Pamban ..	Executive Engineer	1	Lightning conductor in order.	
	Presidency Port Officer	2		
Tondi ..	Executive Engineer	4	Lightning conductor in good order, but not tested since 1889-90.	
Point Calimere ..	Port Officer, Pamban	12		
Negapatam ..	Port Officer, Negapatam	1	Lightning conductor in good order.	
	Presidency Port Officer (besides visits at times from Public Works Officers).	2		
Cuddalore ..	Presidency Port Officer	3	Lightning conductor in good order.	
	Reserve Port Officer	1		
Seven Pagodas ..	Superintending Engineer	1	Lightning conductor not tested since 1887.	
	Executive Engineer	1		
Pulicat ..	Personal Assistant to Presidency Port Officer.	1	A new lightning conductor was fitted.	
	Reserve Port Officer	1		
Arneghon ..	Presidency Port Officer	1	Lightning conductor in good order; tested in August.	
	Superintending Engineer	1		
Point Divi ..	Executive Engineer	1	Lightning conductor tested and in working condition.	
	Reserve Port Officer	1		
Hope Island ..	Presidency Port Officer	1	Lightning conductor in working order. An extra conductor put up in 1892 has not yet been tested.	
	Superintending Engineer	1		
Vakalapudi ..	Port Officer, Cocanada	12	Lightning conductor in working order.	
	Superintending Engineer	1		
Santapilly ..	Presidency Port Officer	1	Lightning conductor in working order.	
	Superintending Engineer	1		
Calingapatam ..	Executive Engineer	11	See foot-note.	
	Port Officer, Bimlipatam	1		
Gopalpur ..	Presidency Port Officer	1		
	Superintending Engineer	2		
	Executive Engineer	1		
	Port Officer, Gopalpur	1		

Note.—At stations where there is a Port Officer or Conservator, such officers as *ex-officio* Superintendents frequently visited the lighthouses in addition to the outside inspections above noticed.

Coasts of the Madras Presidency—cont.

Miles visible in clear weather.	Arc of illumination. (Bearings are magnetic and from seaward).	Nature of construction, colour, or any peculiarity of light-house.	Height in feet of lantern above high water.	Height in feet of building from base to vane.	Character and order of illuminating apparatus.	Year lighted.	Remarks.
5	From S. 51° 45' W. thro' W. to N. 17° W.	Wooden post ..	30	..	Ship's side light, Dioptric.	15th October 1888.	To guide vessels leaving the harbour or making the anchorage at night.
5	Do.	Do. ..	60	..	Do.	15th October 1888.	Do. do.
14	From N. by W. thro' W. to S. by E.	Masonry column with black bands.	68	57	* Catadioptric, 4th order.	1859; improved 1870; altered 1881; improved 1893.	To guide vessels clear of the Pulicat shoal.
14	From N.E. thro' W. to S.E.	White masonry column.	107	111	Dioptric, 4th order, single flash 45 seconds.	1st January 1853; improved 1870; present light 1881; improved 1893.	Warns vessels off the <i>Arneghon</i> shoal, the shoalest part of which (1½ fathoms) lies 6 miles off shore.
12	From N.E. thro' W. to S.	Do.	48	50	* Catadioptric, 4th order.	1st May 1851; improved 1870; improved 1893.	Is intended to guide vessels clear of the Point.
6	From S. 26° W. thro' W. to N. 9° E.	Flagstaff ..	69	112	* Catadioptric, 6th order.	1858; improved 1870.	As a guide for vessels to the anchorage.
14	From N. 5° E. thro' W. to S. 5° W.	Masonry tower, horizontal alternate bands of black and white.	83	94	* Catadioptric, 4th order.	1817; improved 1886; improved 1893.	Is intended to guide vessels clear of Sacramento Shoal and Gódvári Point.
14	All round the compass.	White column ..	80	76	Dioptric, 4th order, single flash 20 seconds.	15th January 1879.	This light is intended as a guide to vessels approaching Cocanada anchorage.
2½	Do.	Wooden post ..	10	..		15th September 1886.	To guide boats entering or leaving Cocanada river.
16	From N.E. thro' W. to S.W.	On a small base-ment on the top of a small hill with a small building by the side of the lantern on the west side.	163.77	31.15	* Catadioptric, 2nd order; improved 1893.	1st November 1849; improved 1871; present light 1886; improved 16th Aug. 1888.	Exhibited to warn mariners of the <i>Santopilly</i> Rocks, from which this light bears N.W. ½ W., distant 6½ miles.
8	From N.E. thro' W. to S.W.	Obelisk of cut stone; column white; capital dark blue.	76	73	* Catadioptric, 4th order, port light.	15th Dec. 1876; improved 1st June 1890.	Intended to warn vessels off a small reef which projects from the point and which should not be passed in less than 8 fathoms when making the port at night.
10	From N.E. thro' N.W. to S.W.	Flagstaff painted white.	54	33	* Do.	Present light 1871; 1st Mar. 1892.	As a guide to the anchorage.
3	All round the compass.		25	..	Country lantern.	1st April 1887.	Points out the sea end of the pier.

All fitted with either reflectors or mirrors and show over an arc of from 180° to 270°.

DIX B.

Coasts of the Madras Presidency.

Miles visible in clear weather.	Arc of illumination. (Bearings are magnetic and from seaward).	Nature of construction, colour, or any peculiarity of light-house.	Height in feet of lantern above high water.	Height in feet of building from base to vane.	Character and order of illuminating apparatus.	Year lighted.	Remarks.
6 to 8	From N. thro' E. to S., shut in to the westward of N. by trees.	Steel mast ..	45	40	6th order Dioptric port light.	1st October 1888; present light 1st Nov. 1891.	Exhibited only from 15th September to 31st May.
6 to 8	From N. thro' E. to S., shut in between N. and N. E. by trees, N. 53° E. and N. 57° E. by St. Mary's Islands, N. 73° E. to N. 80° E. by St. Mary's Islands.	Do. ..	53	50	Do.	Do.	Do. do.
14	From N. by E. ½ E. thro' E. to S. by W. ½ W.	Small white masonry tower.	240	65	* Catadioptric, 4th order.	1st October 1842; improved 1870.	
6 to 8	Between the bearings of N. W. by W. ½ W. and E. by S. ½ S.	Small masonry tower of a light yellow colour.	64	25 from the rampart.	* Catadioptric, 6th order, port light.	17th Oct. 1843; improved 1870; transferred to tower 1880.	
6 to 8	N.W. thro' E. to S.E.	Small masonry tower.	70	26	Do.	1835; improved 1870; transferred to tower 1881.	
7	All round the compass.	Small white pyramid.	52	7	..	1885.	Shown only during N.E. monsoon.
14	From N. 25 W. thro' E. to S. 14 E.	White column ..	102	98	* Catadioptric, 4th order.	1847; improved 1881.	To guide vessels to the anchorage, clear of the reef, which lies about 1 mile S. 30° W. from the light. A small red light is exhibited from the head of the pier as a guide for small coasting craft when entering the roadstead.
10	180° from N.N. W. thro' E. to S.S.E.	Flagstaff ..	95	102	Country made lantern.	1865.	Is exhibited from 15th May to 30th September.
14	From N. by W. ½ W. thro' E. to S. by E.	White laterite column.	100	91	Catadioptric, 4th order.	1st April 1839; improved 1868.	
17	All round the compass.	Masonry round white tower.	113	115	Catadioptric, 1st order (Holo-photal).	1862.	
17	From N. 65 W. thro' N. to S. 85 E.	Dark gray granite column, showing black and white horizontal stripes from seaward.	142	72	* Catadioptric, 1st order.	1875; altered 1st January 1883.	Is intended to mark the vicinity of the Crocodile Rock, which lies 3 miles S.W. ½ S. of Cadiapatam Point.

all fitted with either reflectors or mirrors and show over an arc of from 180° to 270°.

List of Lights on the

Name of Light.	Location.	Latitude, N.	Longitude, E.	Number and relative position of lights.	Colour of lights.	Fixed, flashing, inter- mitting, alternat- ing or revolving.	Interval of revolu- tion or flash or occultation.
Gulf of Manaar.	Manapad ..	On summit of Mana- pad Point.	8° 22' 30"	78° 6' 30"	1	Red ..	F.
	Tuticorin ..	On the north extreme of Hare Island or Paundian-tivo, 2½ miles east of Tuti- corin town.	8 47 10	78 11 20	1	White ..	F.
	Pámban or Pámban Pass.	On a sand-hill about one mile east of Northern Channel.	9 17 14	79 12 38	1	Do. ..	F.
Tondi ..	..	About 14 yards due south of the Tondi Sea Custom House.	9 44 45	79 00 30	1	Red ..	F.
Point Calimere.	..	On the point about 30 miles south of Negapatam.	10 18 0	79 51 30	1	Do. ..	F.
Negapatam ..	..	On the jetty near to the river mouth.	10 45 30	79 50 20	1	White ..	F.
Karikal (French Territory).	..	At the mouth of the Arselaar river.	10 55 0	79 50 35	1	Do. ..	F.
Cuddalore ..	..	On cross-trees of flag- staff.	11 43 0	79 46 15	1	Red ..	F.
Pondicherry (French Terri- tory). Do.	..	In square, near the beach.	11 55 25	79 49 35	1	White ..	F.
	..	End of landing stage.	..	..	1	Red ..	F.
Seven Pagodas or Mahabali- puram.	..	On a rock half-a-mile inland marked on chart "Ruined Pagoda" on rock very conspicuous and about 6 miles northward of Sadras	12 36 55	80 11 31	1	Do. ..	F.
Madras or Fort St. George.	..	On the Esplanade, north of the Fort.	13 05 11	80 16 51	1	White ..	Fl. The mo- tion is Revi- procat- ing and not Ro- tatory. The flashes and eclipses are irregular, but the proportional time of light to darkness is as 2 to 3.

*These lights have hitherto in Light Lists been described as Dioptric; they are

Coasts of the Madras Presidency—cont.

Miles visible in clear weather.	Arc of illumination. (Bearings are mag- netic and from sea- ward).	Nature of construc- tion, colour, or any peculiarity of light- house.	Height in feet of centre of lantern above high water.	Height in feet of building from base to vane.	Character and order of illuminating ap- paratus.	Year lighted.	Remarks.
8	N.N.E. thro' E. to S.S.W.	White masonry tower.	104	27	* Catadioptric, 4th order, port light.	June 1888;	Is intended to warn vessels of the dangerous shoal in the vicinity.
14	All round the compass.	Sandstone column colored brown, lantern white.	85	91	Dioptric, 4th order.	15th May 1845; im- proved 1874; im- proved 1893.	
14	Do.	Circular masonry column.	97	72	Do.	21st April 1846; im- proved 1860; im- proved 1893.	
6 to 8	Visible from all directions sea- ward.	Steel mast ..	63	52	* Catadioptric, 6th order, port light.	1st October 1892.	As a guide to vessels making for the Pámban Channel.
6 to 8	All round the compass.	Steel mast, painted white.	49	..	Dioptric, 6th order, port light.	1st June 1890.	
14	From N. 5 W. thro' W. to S.S.E.	Masonry column, painted white.	79	83	* Catadioptric, 4th order.	1st August 1846; im- proved 1870; im- proved 1893.	
9	Visible from all directions sea- ward.	Do.	42	..	Lamp burning coconut oil.	1853.	When surf is heavy, and approach to landing prohi- bited, a <i>fixed green</i> light is shown.
6 to 8	N. thro' W. to S.	Flagstaff ..	130	31	* Catadioptric, 6th order, port light.	1st July 1889; pre- sent light, 5th Oct. 1891.	
14	Visible from all directions sea- ward.	Masonry column, painted light yellow.	89	76	Dioptric 4th order.	1886.	
4	Do.		31	..		1881.	Is intended to warn mariners of the dangerous outlying patches of rock composing the Tripatore reef and other reported dangers in its vicin- ity, to avoid which vessels navigating between Sadras and Covelong should not come into a less depth than 13 fathoms.
10	From N. thro' W. to South (180°).	Small turret. grey	119	26	* Catadioptric, 4th order.	10th July 1887; im- proved 1893.	
17	From N.N.E. thro' W. to S.S.E.	Granite column.	128	125	Dioptric, order.	3rd 1st January 1844; new light, 1894.	

all fitted with either reflectors or mirrors and show over an arc of from 180° to 270°

List of Lights on the

Name of Light.	Location.	Latitude, N.	Longitude, E.	Number and relative position of lights.	Colour of lights.	Fixed, flashing, inter- mitting, alternat- ing or revolving.	Interval of revolu- tion or flash or occultation.
Madras Leading Light.	Madras Pier T. Head.	13° 05' 44"	80° 17' 15"	1	Red ..	F.	
Do.	Custom Office Terrace.	13 05 47	80 17 05	1	Green ..	F.	
Pulicat ..	Near the Beach ..	13 25 15	80 19 06	1	White ..	F.	
Arneghon or Armogham.	On the mainland, village of Moona or Moonapollum.	13 53 08	80 11 47	1	Do. ..	Rev.	Every 45 seconds ..
Point Divi or Divy.	About 2 miles North-west of the Point.	15 58 55	81 09 25	1	Do. ..	F.	
Masulipatam ..	In the Fort ..	16 09 15	81 09 25	1	Do. ..	F.	
Coringa or Hope Island.	On the southern part of Hope Island, Coringa harbour, and distant about 2½ miles from the sea.	16 49 05	82 18 58	1	Do. ..	F.	
Cocanada or Vakalapudi.	4½ miles north of Cocanada river and about 500 yards from the shore.	17 0 40	82 16 30	1	Do. ..	Rev.	Every 20 seconds ..
Cocanada River.	One on the end of the North Groyne, and the other on the end of the South Groyne, entrance to river.	..	..	2	Red ..	F.	
Santopilly ..	On a small detached hill some distance inland. This distance said to be ½ of a mile.	18 04 56	83 37 35	1	White ..	F.	
Calingapatam ..	On the Point ..	18 19 0	84 07 30	1	Red ..	F.	
Gopalpur ..	On the mainland 60 yards from low water mark.	19 13 0	84 52 0	1	White ..	F.	
Do.	On the extreme end of the pier head, port of Gopalpur.	..	..	1	Red ..	F.	

* These Lights have hitherto in Light Lists been described as Dioptric: they are

GOVERNMENT OF MADRAS.

MARINE DEPARTMENT.

READ—the following paper:—

From Commander W. J. POWELL, R.I.M., Presidency Port Officer, Madras, to the Chief Secretary to Government, dated Madras, 22nd September 1894, No. 1722—356-G.

I have the honour to forward herewith the annual report on the lights and lighthouses in the Madras Presidency for the official year 1893-94.

ENCLOSURE.

REPORT on the Lights and Lighthouses on the Coasts of the Madras Presidency for the official year 1893-94.

NEW LIGHTS.

The new 3rd Order Light for Madras was installed on the tower of the Law Courts and all arrangements completed in time for exhibiting it during the year under review, but owing to the breakage of a lens which had to be replaced by another from England and to six months' notice having to be previously afforded for the information of mariners, the new light was not displayed until 1st June 1894.

At Masulipatam two white lights in globular lanterns hoisted on posts were brought into use at the entrance to the backwater to guide boats over the bar at night. The expenditure on account of these lights is met from the Masulipatam Landing and Shipping Dues Fund. These lights do not affect shipping, and no notice to mariners was issued; they are, therefore, not included in the light list.

CHANGE IN CHARACTER OF LIGHT.

The red sector showing in the direction of Sacramento Shoal which was fitted to the lantern of the new Hope Island Light was removed in the year, having been found defective, and also unnecessary as noticed in last year's report.

PROPOSED CHANGE IN CHARACTER OF LIGHT.

Arrangements were made for replacing the present red dioptric light at Calingapatam by a 4th order, dioptric, white, occulting light and pending installation of the new light on the column to exhibit the present one from a temporary wooden structure.

ALTERATION IN DATE OF EXHIBITION OF LIGHT.

With the special sanction of Government, the lights at Malpé and Coondapoor were exhibited during the year from 8th September instead of from 1st October.

BURNERS.

The improved type of burners brought into use at the more important lights in the preceding year have been found to be very satisfactory.

REPAIRS, &c.

Gopalpur.—The flagstaff from which the port light is shown was overhauled and put into efficient repair; lightkeepers' quarters repaired.

Vakalapudi.—An additional tank for storing oil supplied, store-room and keepers' quarters put in thorough repair.

Hope Island.—A new 400-gallon tank supplied for storing water.

Cocanada.—Groyne Lights.—Supplied with two new burners and a spare lamp.

Pulicat.—Lantern painted and Superintendent's quarters repaired.

Seven Pagodas.—A small service room built on the terrace of the turret.

Point Calimere.—Lightkeepers' quarters repaired.

Mangalore.—New quarters provided for the lightkeepers.

LIGHTNING CONDUCTORS.

See remarks in Appendix C.

ESTABLISHMENTS.

Particulars of the lighthouse staff are given in Appendix D. Details of cost will be found in Appendix A.

STORES AND SUPPLIES.

The supply of stores and mineral oil was well maintained (the latter with a surplus stock as usual of six months' requirements) at the several lighthouses.

Particulars of the lights are furnished in Appendix B.

LIGHTHOUSE CHARGES.

Appendix A furnishes particulars of lighthouse charges for the year under report, and the following is a comparative statement of the charges therein specified for the last three years:—

	1891-92.	1892-93.	1893-94.
Establishment, stores and contingencies	RS. 38,687	RS. 72,292	RS. 32,589
Public Works charges	5,463	9,849	7,409
Total ..	44,150	82,141	39,998

The charges for 1893-94 on account of establishment, stores and contingencies, as also those on account of public works, have been considerably less than charges of a similar nature incurred during the year previous, and the variations under each head of charge compared with those of 1892-93 are explained below:—

	1892-93.	1893-94.	Difference.	
			More.	Less.
Superintendents and Lightkeepers	RS. 20,054	RS. 19,978	..	76
Oil	4,850	6,617	1,767	..
Stores	42,342	1,936	..	40,406
Contingencies	5,046	4,058	..	988
Public Works charges	9,849	7,409	..	2,440
Total ..	82,141	39,998	1,767	43,910
			— 42,143	

Consequent on the improved type of burners introduced having been in use throughout the year, the cost of oil was in excess of that of the year 1892-93. There was a decrease under each of the remaining heads.

The large sum shown as contingencies of the Madras lighthouse includes a charge of Rupees 1,003-13-0 incurred on account of telegrams notifying the postponement of the exhibition of the new Madras Light.

Public Works expenditure charged to Pulicat lighthouse represents cost of alterations to the Superintendent's quarters.

APPENDIX A.
PARTICULARS OF CHARGES relating to different Lights.

	Establishment.		Oil.	Stores.	Contingencies and Miscellaneous.		Construction and repairs.	Total, 1893-94.	Total, 1892-93.	Total, 1891-92.	Remarks.
	Superintendents.	Light-keepers.			A.	P.					
Coondapoor	RS. 192 13 10	..	RS. 67 11 7	..	RS. 127 3 6	..	RS. 16 14 8	RS. 404 11 7	RS. 348 7 4	RS. 2,979 0 6	Light at end of Pier.
Malpé	192 6 11	..	67 11 8	..	25 13 0	..	3 12 0	289 12 4	271 9 3	3,067 7 2	
Mangalore	317 12 11	..	135 7 5	..	44 1 6	..	442 12 7	940 2 10	2,551 7 7	501 2 9	
Cannanore	228 0 0	..	48 15 10	..	55 0 10	..	..	333 1 5	883 14 3	404 15 4	
Tellicherry	223 0 0	..	84 7 0	..	37 3 8	..	..	580 14 9	694 13 8	496 9 9	
Calicut	326 12 1	..	287 10 3	..	44 5 6	..	..	1,004 15 7	1,451 12 8	759 9 5	
Do.	324 0 0	..	252 11 1	..	40 10 2	..	..	878 5 9	1,777 3 2	888 12 2	
Cochin	528 0 0	..	995 4 1	..	51 13 1	..	..	51 13 1	5,081 9 3	3,829 11 3	
Beyport	293 3 8	..	146 12 3	..	86 11 4	..	..	2,084 8 10	1,195 10 7	1,569 14 6	
Muttam	696 0 0	..	313 5 1	..	324 5 7	..	..	1,476 9 10	2,587 11 2	1,293 14 10	
Manapad	324 0 0	..	232 15 6	..	36 14 11	..	..	612 13 7	1,389 5 11	523 12 3	
Tuticorin	228 0 0	..	39 7 3	..	57 8 3	..	..	336 1 6	669 9 3	2,813 5 11	Two lights mark the entrance to the harbour and two lights show the fair way.
Pamban	324 0 0	..	64 10 7	..	104 2 8	..	..	499 5 0	1,136 10 11	747 15 9	
Tondi	417 3 8	..	158 4 11	..	64 8 6	..	..	700 1 5	2,526 12 1	591 5 8	
Point Calimere	432 0 0	..	42 1 2	..	41 5 3	..	..	526 0 4	3,886 3 0	1,725 14 9	
Negapatam	840 0 0	..	106 9 0	..	41 10 6	..	..	1,606 9 2	2,466 4 9	3,415 6 4	
Cuddalore	1,500 0 0	..	1,895 0 3	..	1,398 5 6	..	..	6,724 4 1	27,921 4 9	..	
Seven Pagodas	..	..	..	..	..	..	..	..	..	..	
Madras	..	..	..	..	..	..	..	..	..	..	
Do.	..	..	..	..	..	..	..	..	..	..	
Pulicat	..	..	..	..	..	..	..	..	..	..	
Arneghon	..	..	..	..	..	..	..	..	..	..	
Point Divi	..	..	..	..	..	..	..	..	..	..	Bar lights.
Manalipatam	..	..	..	..	..	..	..	..	..	..	
Do.	..	..	..	..	..	..	..	..	..	..	
Hope Island	..	..	..	..	..	..	..	..	..	..	
Cocanada	..	..	..	..	..	..	..	..	..	..	
Do.	..	..	..	..	..	..	..	..	..	..	
Vakalapudi	..	..	..	..	..	..	..	..	..	..	
Santapilly	..	..	..	..	..	..	..	..	..	..	
Calingapatam	..	..	..	..	..	..	..	..	..	..	
Gopalpur	..	..	..	..	..	..	..	..	..	..	
Do.	..	..	..	..	..	..	..	..	..	..	
Total ..	10,092 10 4	9,885 0 5	6,616 10 5	1,936 9 8	4,058 7 2	7,409 0 8	39,998 5 8	82,140 8 5	44,933 11 10	..	Light at end of pier.

APPEN
List of Lights on the

Name of Light.	Location.	Latitude, N.	Longitude, E.	Number and relative position of lights.	Colour of lights.	Fixed, flashing, inter- mitting, alternat- ing or revolving.	Interval of revolu- tion or flash or occultation.
Coondapoor ..	On the beach at the north side of en- trance to the river.	13° 38' 20"	74° 39' 40"	1	Red ..	F.	
Malpé ..	In the vicinity of the Custom House.	13 20 40	74 42 0	1	White ..	F.	
Mangalore ..	On a hill above the town, and near some high trees.	12 52 17	74 50 08	1	Do. ..	F.	
Cannanore ..	On the Fort rampart near the beach.	11 51 10	75 21 45	1	Red ..	F.	
Tellicherry ..	On the Fort wall near the beach.	11 44 50	75 28 30	1	White ..	F.	
Mahé (French Territory).	On the south side of the entrance to the river at the foot of the flagstaff.	11 42 10	75 31 10	1	Red ..	F.	
Calicut ..	Near the beach ..	11 15 05	75 45 35	1	White ..	F.	
Narakel (Cochin Territory).	On the beach at mouth of creek 5 miles to the north- ward of Cochin.	10 03 0	76 12 0	1	Do. ..	F.	
Cochin ..	On a small mound which formed a bastion of the old fort to the south of the harbour.	9 57 47	76 13 45	1	Do. ..	F.	
Alleppy or Alipee (Travancore Territory)‡	On the beach about one cable inland.	9 30 0	76 19 0	1	Do. ..	Rev. ...	One minute ..
Muttam ..	On a rocky promon- tory 300 yards from sea, known as Mut- tum Point.	8 07 30	77 18 10	1	Do. ..	F.	

* These lights have hitherto in Light Lists been described as Dioptric; they are

Paper taken out of the Records from the charge of the Referencer.

Press
Miscellaneous No. 2784, dated 26-10-1894 19
Routine

Date taken out.	FOR WHAT PURPOSE.			Initials of clerk taking the paper or of attender.	Date returned.	Initials of attender.
	Department.	C. No.	Year.			
3-11-41	M. No 12827/41				5-12-41	AD

2ND OCTOBER 1894, Nos. 391, 392, MARINE.

GOVERNMENT OF MADRAS.

MARINE DEPARTMENT.

READ—the following paper :—

From Commander W. J. POWELL, R.I.M., Presidency Port Officer, Madras, to the Chief Secretary to Government, dated Madras, 22nd September 1894, No. 1722—356-G.

I have the honour to forward herewith the annual report on the lights and light-houses in the Madras Presidency for the official year 1893-94.

ENCLOSURE.

REPORT on the Lights and Lighthouses on the Coasts of the Madras Presidency for the official year 1893-94.

NEW LIGHTS.

The new 3rd Order Light for Madras was installed on the tower of the Law Courts and all arrangements completed in time for exhibiting it during the year under review, but owing to the breakage of a lens which had to be replaced by another from England and to six months' notice having to be previously afforded for the information of mariners, the new light was not displayed until 1st June 1894.

At Masulipatam two white lights in globular lanterns hoisted on posts were brought into use at the entrance to the backwater to guide boats over the bar at night. The expenditure on account of these lights is met from the Masulipatam Landing and Shipping Dues Fund. These lights do not affect shipping, and no notice to mariners was issued; they are, therefore, not included in the light list.

CHANGE IN CHARACTER OF LIGHT.

The red sector showing in the direction of Sacramento Shoal which was fitted to the lantern of the new Hope Island Light was removed in the year, having been found defective, and also unnecessary as noticed in last year's report.

PROPOSED CHANGE IN CHARACTER OF LIGHT.

Arrangements were made for replacing the present red dioptric light at Calingapatam by a 4th order, dioptric, white, occulting light and pending installation of the new light on the column to exhibit the present one from a temporary wooden structure.

ALTERATION IN DATE OF EXHIBITION OF LIGHT.

With the special sanction of Government, the lights at Malpé and Coondapoor were exhibited during the year from 8th September instead of from 1st October.

BURNERS.

The improved type of burners brought into use at the more important lights in the preceding year have been found to be very satisfactory.

REPAIRS, &c.

Gopalpur.—The flagstaff from which the port light is shown was overhauled and put into efficient repair; lightkeepers' quarters repaired.
Vakalapudi.—An additional tank for storing oil supplied, store-room and keepers' quarters put in thorough repair.

Hope Island.—A new 400-gallon tank supplied for storing water.

Cocanada—Groyne Lights.—Supplied with two new burners and a spare lamp.

Pulicat.—Lantern painted and Superintendent's quarters repaired.

Seven Pagodas.—A small service room built on the terrace of the turret.

Point Calimere.—Lightkeepers' quarters repaired.

Mangalore.—New quarters provided for the lightkeepers.

LIGHTNING CONDUCTORS.

See remarks in Appendix C.

ESTABLISHMENTS.

Particulars of the lighthouse staff are given in Appendix D. Details of cost will be found in Appendix A.

STORES AND SUPPLIES.

The supply of stores and mineral oil was well maintained (the latter with a surplus stock as usual of six months' requirements) at the several lighthouses.

Particulars of the lights are furnished in Appendix B.

LIGHTHOUSE CHARGES.

Appendix A furnishes particulars of lighthouse charges for the year under report, and the following is a comparative statement of the charges therein specified for the last three years:—

	1891-92.	1892-93.	1893-94.
Establishment, stores and contingencies	RS. 38,687	RS. 72,292	RS. 32,589
Public Works charges	5,463	9,849	7,409
Total ..	44,150	82,141	39,998

The charges for 1893-94 on account of establishment, stores and contingencies, as also those on account of public works, have been considerably less than charges of a similar nature incurred during the year previous, and the variations under each head of charge compared with those of 1892-93 are explained below:—

	1892-93.	1893-94.	Difference.	
			More.	Less.
Superintendents and Lightkeepers	RS. 20,054	RS. 19,978	..	76
Oil	4,850	6,617	1,767	..
Stores	42,342	1,936	..	40,406
Contingencies	5,046	4,058	..	988
Public Works charges	9,849	7,409	..	2,440
Total ..	82,141	39,998	1,767	43,910
			— 42,143	

Consequent on the improved type of burners introduced having been in use throughout the year, the cost of oil was in excess of that of the year 1892-93. There was a decrease under each of the remaining heads.

The large sum shown as contingencies of the Madras lighthouse includes a charge of Rupees 1,003-13-0 incurred on account of telegrams notifying the postponement of the exhibition of the new Madras Light.

Public Works expenditure charged to Pulicat lighthouse represents cost of alterations to the Superintendent's quarters.

APPENDIX A.
PARTICULARS OF CHARGES relating to different Lighthouses.

	Establishment.		Oil.	Stores.	Contingencies and Miscellaneous.		Construction and repairs.	Total, 1893-94.	Total, 1892-93.	Total, 1891-92.	Remarks.
	Superintendents.	Light-keepers.			Miscellaneous.	Calicut Port Contingencies.					
	2	3	4	5	6	7	8	9	10	11	
Coondapoor	RS. A. P. 192 13 10	RS. A. P. 67 11 7	RS. A. P. 252 11 1	RS. A. P. 55 8 3	RS. A. P. 127 3 6	RS. A. P. 16 14 8	RS. A. P. 404 11 7	RS. A. P. 348 7 4	RS. A. P. 2,979 0 6	Light at end of Pier.	
Malpe	192 6 11	67 11 8	252 11 1	55 8 3	25 13 0	3 12 0	289 12 4	348 7 4	2,979 0 6		
Mangalore	317 12 11	135 7 5	146 12 3	139 3 6	25 13 0	3 12 0	289 12 4	348 7 4	2,979 0 6		
Cananore	228 0 0	48 15 10	313 6 1	19 9 4	44 1 6	442 12 7	940 2 10	2,551 7 7	3,067 7 2		
Tellicherry	223 0 0	84 7 0	232 15 6	20 9 1	55 0 10	181 11 7	333 1 5	363 14 3	404 15 4		
Calicut	326 12 1	237 10 3	397 7 3	19 9 4	37 3 8	333 7 0	530 14 9	1,451 12 8	496 9 9		
Do.	324 0 0	252 11 1	397 7 3	19 9 4	44 1 6	333 7 0	1,004 15 7	1,451 12 8	753 9 5		
Cochin	528 0 0	996 4 1	146 12 3	139 3 6	25 13 0	3 12 0	289 12 4	348 7 4	2,979 0 6		
Beyport	293 3 8	146 12 3	313 6 1	19 9 4	44 1 6	442 12 7	940 2 10	2,551 7 7	3,067 7 2		
Mattum	696 0 0	232 15 6	397 7 3	19 9 4	55 0 10	181 11 7	333 1 5	363 14 3	404 15 4		
Manapad	324 0 0	232 15 6	397 7 3	19 9 4	55 0 10	181 11 7	333 1 5	363 14 3	404 15 4		
Tuticorin	228 0 0	84 7 0	232 15 6	20 9 1	55 0 10	181 11 7	333 1 5	363 14 3	404 15 4		
Pamban	324 0 0	232 15 6	397 7 3	19 9 4	55 0 10	181 11 7	333 1 5	363 14 3	404 15 4		
Tondi	324 0 0	232 15 6	397 7 3	19 9 4	55 0 10	181 11 7	333 1 5	363 14 3	404 15 4		
Point Calimere	417 3 3	153 4 11	64 10 7	11 2 0	104 2 9	54 8 6	700 1 5	1,136 10 11	747 15 9		
Negapatam	432 0 0	182 1 2	106 9 4	10 9 11	58 14 9	111 15 11	1,006 9 2	2,526 12 1	591 5 8		
Cuddalore	840 0 0	106 9 4	182 1 2	10 9 11	58 14 9	111 15 11	1,006 9 2	2,526 12 1	591 5 8		
Seven Pagodas	1,500 0 0	1,835 0 3	1,835 0 3	539 7 2	1,398 5 6	833 4 7	6,724 4 1	27,921 4 9	3,415 6 4		
Madras	840 0 0	106 9 4	182 1 2	10 9 11	58 14 9	111 15 11	1,006 9 2	2,526 12 1	591 5 8		
Do.	840 0 0	106 9 4	182 1 2	10 9 11	58 14 9	111 15 11	1,006 9 2	2,526 12 1	591 5 8		
Pulicat	1,200 0 0	212 12 0	35 0 4	20 9 1	24 9 6	551 3 8	2,223 4 9	2,591 8 10	1,921 10 2		
Arnerghon	875 0 0	212 12 0	35 0 4	20 9 1	24 9 6	551 3 8	2,223 4 9	2,591 8 10	1,921 10 2		
Point Divi	216 0 0	676 10 9	181 1 5	196 14 2	170 13 8	..	2,065 8 0	9,998 9 8	2,434 9 9		
Masilipatam	840 0 0	676 10 9	181 1 5	196 14 2	170 13 8	..	2,065 8 0	9,998 9 8	2,434 9 9		
Do.	840 0 0	676 10 9	181 1 5	196 14 2	170 13 8	..	2,065 8 0	9,998 9 8	2,434 9 9		
Hope Island	810 10 4	489 8 9	232 0 11	40 1 10	178 2 6	741 9 9	2,492 2 1	2,545 7 2	2,315 9 3		
Ocanada	840 0 0	468 0 0	677 14 11	53 1 4	202 12 6	36 10 0	2,278 6 9	3,838 2 8	1,808 4 10		
Vakalapudi	240 0 0	228 0 0	111 8 6	34 3 3	31 10 4	133 5 11	778 12 0	608 13 10	1,519 11 6		
Santapilly	214 11 5	80 4 4	..	..	75 7 8	120 0 0	490 7 5	329 5 4	1,875 15 8		
Calangapatam	..	..	..	..	..	..	..	..	..		
Gopalpur	..	..	..	..	..	..	..	..	..		
Do.	..	..	..	..	..	..	..	..	..		
Total ..	10,092 10 4	2,885 0 5	6,616 10 5	1,936 8 8	4,058 7 2	7,409 0 8	39,998 5 8	82,140 8 5	44,933 11 10		

Two lights mark the entrance to the harbour and two lights show the fair way.

Bar lights.

Groyne lights.

Light at end of pier.

APPEN
List of Lights on the

Name of Light.	Location.	Latitude, N.	Longitude, E.	Number and relative position of lights.	Colour of lights.	Fixed, flashing, inter- mitting, alternat- ing or revolving.	Interval of revolu- tion or flash or occultation.
Coondapoor ..	On the beach at the north side of entrance to the river.	13° 38' 20"	74° 39' 40"	1	Red ..	F.	
Malpé ..	In the vicinity of the Custom House.	13 20 40	74 42 0	1	White ..	F.	
Mangalore ..	On a hill above the town, and near some high trees.	12 52 17	74 50 08	1	Do. ..	F.	
Cannanore ..	On the Fort rampart near the beach.	11 51 10	75 21 45	1	Red ..	F.	
Tellicherry ..	On the Fort wall near the beach.	11 44 50	75 28 30	1	White ..	F.	
Mahé (French Territory).	On the south side of the entrance to the river at the foot of the flagstaff.	11 42 10	75 31 10	1	Red ..	F.	
Calicut ..	Near the beach ..	11 15 05	75 45 35	1	White ..	F.	
Narakel (Cochin Territory).	On the beach at mouth of creek 5 miles to the northward of Cochin.	10 03 0	76 12 0	1	Do. ..	F.	
Cochin ..	On a small mound which formed a bastion of the old fort to the south of the harbour.	9 57 47	76 13 45	1	Do. ..	F.	
Alleppy or Alipee (Travancore Territory).‡	On the beach about one cable inland.	9 30 0	76 19 0	1	Do. ..	Rev. ..	One minute ..
Muttam ..	On a rocky promontory 300 yards from sea, known as Muttam Point.	8 07 30	77 18 10	1	Do. ..	F.	

* These lights have hitherto in Light Lists been described as Dioptric; they are

DIX B.

Coasts of the Madras Presidency.

Miles visible in clear weather.	Arc of illumination. (Bearings are magnetic and from seaward).	Nature of construction, colour, or any peculiarity of light-house.	Height in feet of centre of lantern above high water.	Height in feet of building from base to vane.	Character and order of illuminating apparatus.	Year lighted.	Remarks.
6 to 8	From N. thro' E. to S., shut in to the westward of N. by trees.	Steel mast ..	45	40	6th order Dioptric port light.	1st October 1888; present light 1st Nov. 1891.	Exhibited only from 15th September to 31st May.
6 to 8	From N. thro' E. to S., shut in between N. and N. E. by trees, N. 53 E. and N. 57 E. by St. Mary's Islands, N. 73 E. to N. 80 E. by St. Mary's Islands.	Do. ..	53	50	Do.	Do.	Do. do.
14	From N. by E. ½ E. thro' E. to S. by W. ½ W.	Small white masonry tower.	240	65	* Catadioptric, 4th order.	1st October 1842; improved 1870.	
6 to 8	Between the bearings of N. W. by W. ½ W. and E. by S. ¾ S.	Small masonry tower of a light yellow colour.	64	25 from the rampart.	* Catadioptric, 6th order, port light.	17th Oct. 1843; improved 1870; transferred to tower 1880.	
6 to 8	N.W. thro' E. to S.E.	Small masonry tower.	70	26	Do.	1835; improved 1870; transferred to tower 1881.	
7	All round the compass.	Small white pyramid.	52	7	..	1885.	Shown only during N.E. monsoon.
14	From N. 25 W. thro' E. to S. 14 E.	White column ..	102	98	* Catadioptric, 4th order.	1847; improved 1881.	To guide vessels to the anchorage, clear of the reef, which lies about 1 mile S. 30° W. from the light. A small red light is exhibited from the head of the pier as a guide for small coasting craft when entering the roadstead.
10	180° from N.N. W. thro' E. to S.S.E.	Flagstaff ..	95	102	Country made lantern.	1865.	Is exhibited from 15th May to 30th September.
14	From N. by W. ¾ W. thro' E. to S. by E.	White laterite column.	100	91	Catadioptric, 4th order.	1st April 1839; improved 1868.	
17	All round the compass.	Masonry round white tower.	113	115	Catadioptric, 1st order (Holo-photal).	1862.	
17	From N. 65 W. thro' N. to S. 85 E.	Dark gray granite column, showing black and white horizontal stripes from seaward.	142	72	* Catadioptric, 1st order.	1875; altered 1st January 1883.	Is intended to mark the vicinity of the Crocodile Rock, which lies 3 miles S.W. ¾ S. of Cadiapatam Point.

all fitted with either reflectors or mirrors and show over an arc of from 180° to 270°.

List of Lights on the

Last of Lights on the								
Name of Light.	Location.	Latitude, N.	Longitude, E.	Number and relative position of lights.	Colour of lights.	Fixed, flashing, inter- mitting, alternat- ing or revolving.	Interval of revolu- tion or flash or occultation.	
Gulf of Manaar.	Manapad ..	On summit of Mana- pad Point.	8° 22' 30"	78° 6' 30"	1	Red ..	F.	
	Tuticorin ..	On the north extreme of Hare Island or Paundian-tivo, 2½ miles east of Tuti- corin town.	8 47 10	78 11 20	1	White ..	F.	
	Pámban or Pámban Pass.	On a sand-hill about one mile east of Northern Channel.	9 17 14	79 12 38	1	Do. ..	F.	
	Tondi ..	About 14 yards due south of the Tondi Sea Custom House.	9 44 45	79 00 30	1	Red ..	F.	
	Point Calimere.	On the point about 30 miles south of Negapatam.	10 18 0	79 51 30	1	Do. ..	F.	
	Negapatam ..	On the jetty near to the river mouth.	10 45 30	79 50 20	1	White ..	F.	
	Karikal (French Territory).	At the mouth of the Arselaar river.	10 55 0	79 50 35	1	Do. ..	F.	
	Cuddalore ..	On cross-trees of flag- staff.	11 43 0	79 46 15	1	Red ..	F.	
	Pondicherry (French Terri- tory).	In square, near the beach.	11 55 25	79 49 35	1	White ..	F.	
	Do.	End of landing stage.	..	..	1	Red ..	F.	
	Seven Pagodas or Mahabali- puram.	On a rock half-a-mile inland marked on chart " Ruined Pagoda " on rock very conspicuous and about 6 miles northward of Sadras	12 36 55	80 11 31	1	Do. ..	F.	
	Madras or Fort St. George.	On the Esplanade, north of the Fort.	13 05 11	80 16 51	1	White ..	Fl. The mo- tion is Revi- procat- ing and not Ro- tatory.	The flashes and eclipses are irregular, but the proportional time of light to darkness is as 2 to 3.

* These lights have hitherto in Light Lists been described as Dioptric; they are

Coasts of the Madras Presidency—cont.

Miles visible in clear weather.	Arc of illumination. (Bearings are mag- netic and from sea- ward).	Nature of construc- tion, colour, or any peculiarity of light- house.	Height in feet of centre of lantern above high water.	Height in feet of building from base to vane.	Character and order of illuminating ap- paratus.	Year lighted.	Remarks.
8	N.N.E. thro' E. to S.S.W.	White masonry tower.	104	27	* Catadioptric, 4th order, port light.	June 1888;	Is intended to warn vessels of the dangerous shoal in the vicinity.
14	All round the compass.	Sandstone column colored brown, lantern white.	85	91	Dioptric, 4th order.	15th May 1845; im- proved 1874; im- proved 1893.	
14	Do.	Circular masonry column.	97	72	Do.	21st April 1846; im- proved 1860; im- proved 1893.	As a guide to vessels making for the Pámban Channel.
6 to 8	Visible from all directions sea- ward.	Steel mast ..	63	52	* Catadioptric, 6th order, port light.	1st October 1892.	
6 to 8	All round the compass.	Steel mast, painted white.	49	..	Dioptric, 6th order, port light.	1st June 1890.	As a guide to vessels passing between Point Calimere and the shoals to the Eastward.
14	From N. 5 W. thro' W. to S.S.E.	Masonry column, painted white.	79	83	* Catadioptric, 4th order.	1st August 1846; im- proved 1870; im- proved 1893.	
9	Visible from all directions sea- ward.	Do.	42	..	Lamp burning coconut oil.	1853.	
6 to 8	N. thro' W. to S.	Flagstaff ..	130	31	* Catadioptric, 6th order, port light.	1st July 1889; pre- sent light, 5th Oct. 1891.	
14	Visible from all directions sea- ward.	Masonry column, painted light yellow.	89	76	Dioptric 4th order.	1886.	When surf is heavy, and approach to landing prohi- bited, a fixed green light is shown.
4	Do.		31	..		1881.	
10	From N. thro' W. to South (180°).	Small turret. grey	119	26	* Catadioptric, 4th order.	10th July 1887; im- proved 1893.	Is intended to warn mariners of the dangerous outlying patches of rock composing the Tripatore reef and other reported dangers in its vic- inity, to avoid which vessels navigating between Sadras and Covelong should not come into a less depth than 13 fathoms.
17	From N.N.E. thro' W. to S.S.E.	Granite column.	128	125	Dioptric, 3rd order.	1st January 1844; new light, 1894.	This light was replaced on the 1st June 1894 by an ap- paratus of the third order group flashing type, having a focal distance of 500 mil- limetres and a vertical angle of 80 degrees, exhibited from the main tower of the Law Courts on the Esplanade. The apparatus consists of eight panels of lenses in four groups of two panels. The period of the light is double flashing every half-minute. The flashes will be of half minute periods giving two flashes of about two seconds separated by an eclipse of about three seconds, followed by an eclipse of 23 seconds, and should be visible in clear weather at a distance of 19 miles from all directions seaward. The value of the beam of light is equal to 18,000 candles.

all fitted with either reflectors or mirrors and show over an arc of from 180° to 270°

List of Lights on the

Name of Light.	Location.	Latitude, N.	Longitude, E.	Number and relative position of lights.	Colour of lights.	Fixed flashing, inter- mitting, alternat- ing or revolving.	Interval of revolu- tion or flash or occultation.
Madras Leading Light.	Madras Pier T. Head.	13° 05' 44"	80° 17' 15"	1	Red ..	F.	
Do.	Custom Office Ter- race.	13 05 47	80 17 05	1	Green ..	F.	
Pulicat ..	Near the Beach ..	13 25 15	80 19 06	1	White ..	F.	
Armeghon or Armogham.	On the mainland, village of Moona or Moonapollium.	13 53 08	80 11 47	1	Do. ..	Rev.	Every 45 seconds ..
Point Divi or Divy.	About 2 miles North- west of the Point.	15 58 55	81 09 25	1	Do. ..	F.	
Masulipatam ..	In the Fort ..	16 09 15	81 09 25	1	Do. ..	F.	
Coringa or Hope Island.	On the southern part of Hope Island, Coringa harbour, and distant about 2½ miles from the sea.	16 49 05	82 18 58	1	Do. ..	F.	
Cocanada or Vakalapudi.	4½ miles north of Cocanada river and about 500 yards from the shore.	17 0 40	82 16 30	1	Do. ..	Rev.	Every 20 seconds ..
Cocanada River.	One on the end of the North Groyne, and the other on the end of the South Groyne, entrance to river.	..	..	2	Red ..	F.	
Santopilly ..	On a small detached hill some distance inland. This dis- tance said to be ¾ of a mile.	18 04 56	83 37 35	1	White ..	F.	
Calingapatam ..	On the Point ..	18 19 0	84 07 30	1	Red ..	F.	
Gopalpur ..	On the mainland 60 yards from low water mark.	19 13 0	84 52 0	1	White ..	F.	
Do.	On the extreme end of the pier head, port of Gopalpur.	..	..	1	Red ..	F.	

* These Lights have hitherto in Light Lists been described as Dioptric: they are

Coasts of the Madras Presidency—cont.

Miles visible in clear weather.	Arc of illumination. (Bearings are mag- netic and from sea- ward).	Nature of construc- tion, colour, or any peculiarly of light- house.	Height in feet of centre of lantern above high water.	Height in feet of building from base to vane.	Character and order of illuminating ap- paratus.	Year lighted.	Remarks.
5	From S. 51° 45' W. thro' W. to N. 17° W.	Wooden post ..	30	..	Ship's side light, Dioptric.	15th October 1888.	To guide vessels leaving the harbour or making the anchorage at night.
5	Do.	Do. ..	60	..	Do.	15th October 1888.	Do. do.
14	From N. by W. thro' W. to S. by E.	Masonry column with black bands.	68	57	* Catadioptric, 4th order.	1859; improved 1870; altered 1881; improved 1893.	To guide vessels clear of the Pulicat shoal.
14	From N.E. thro' W. to S.E.	White masonry column.	107	111	Dioptric, 4th order, single flash 45 seconds.	1st January 1853; improved 1870; present light 1881; improved 1893.	Warns vessels off the Armeghon shoal, the shoalest part of which (1½ fathoms) lies 6 miles off shore.
12	From N.E. thro' W. to S.	Do.	48	50	* Catadioptric, 4th order.	1st May 1851; improved 1870; improved 1893.	Is intended to guide vessels clear of the Point.
6	From S. 26° W. thro' W. to N. 9° E.	Flagstaff ..	69	112	* Catadioptric, 6th order.	1858; improved 1870.	As a guide for vessels to the anchorage.
14	From N. 5° E. thro' W. to S. 5° W.	Masonry tower, horizontal alternate bands of black and white.	83	94	* Catadioptric, 4th order.	1817; improved 1886; improved 1893.	Is intended to guide vessels clear of Sacramento Shoal and Gódvári Point.
14	All round the compass.	White column ..	80	76	Dioptric, 4th order, single flash 20 seconds.	15th January 1879.	This light is intended as a guide to vessels approaching Cocanada anchorage.
2½	Do.	Wooden post ..	10	..		15th September 1886.	To guide boats entering or leaving Cocanada river.
16	From N.E. thro' W. to S.W.	On a small base-ment on the top of a small hill with a small building by the side of the lantern on the west side.	163-77	31-15	* Catadioptric, 2nd order; improved 1893.	1st Nov-ember 1849; improved 1871; present light 1886; improved 18th Aug. 1888.	Exhibited to warn mariners of the Santopilly Rocks, from which this light bears N.W. ½ W., distant 6½ miles.
8	From N.E. thro' W. to S.W.	Obelisk of cut stone; column white; capital dark blue.	76	73	* Catadioptric, 4th order, port light.	15th Dec. 1876; improved 1st June 1890.	Intended to warn vessels off a small reef which projects from the point and which should not be passed in less than 8 fathoms when making the port at night.
10	From N.E. thro' N.W. to S.W.	Flagstaff painted white.	54	33	* Do.	Present light 1871; 1st Mar. 1892.	As a guide to the anchorage.
3	All round the compass.		25	..	Country lantern.	1st April 1887.	Points out the sea end of the pier.

all fitted with either reflectors or mirrors and show over an arc of from 180° to 270°.

STATEMENT furnishing (1) Particulars of inspection made of Lighthouses on the Madras Coast in 1893-94 and (2) Remarks in connection with the lightning conductors.

Note.—At stations where there is a Port Officer or Conservator, such officers as *ex-officio* Superintendents frequently visited the lighthouses in addition to the outside inspections above noticed.

STATEMENT showing the sanctioned Establishments of Lighthouses on the Madras Coast as they stood on the 31st March 1894.

Temporary.—Light-house Mechanic, Rs. 80 per mensem, rising by annual increments of Rs. 5 to Rs. 100.

ORDER—dated 2nd October 1894, No. 391, Marine.

Recorded.

2. The Public Works Department will be requested to make early arrangements for testing the lightning conductors at Armeghon and the Seven Pagodas. It is observed that they have not been tested since 1887 and 1889, respectively.

(True Extract.)

Hedrick Price

Chief Secretary.

To the Presidency Port Officer.
 „ the Public Works Department,
 „ F. W. Ashpitel, Esq.

ENDORSEMENT—dated 2nd October 1894, No. 392, Marine.

Five copies forwarded to the Government of India, Department of Finance and Commerce.

J. F. PRICE,
 Chief Secretary.

P. W. CURRENT No. 8001

Govt. of {1894} Madras.
MARINE.

No. 2734 to d. 26 October 1894

B

Communicated
to Suptg. Engrs.

2. The officers

concerned with

make early ar 2

arrangements for testing

the lightning conductors

of the Soneghon

and seven

Pagodas light

houses.

27/10/94

DESPATCHED
29 OCT. 94

Lights and Lighthouses.

Recording, with remark, the report on — in
the Presidency for 1893-94.

2ND OCTOBER 1894, Nos. 391, 392, MARINE.

GOVERNMENT OF MADRAS.

MARINE DEPARTMENT.

READ—the following paper:—

From Commander W. J. POWELL, R.I.M., Presidency Port Officer, Madras, to
the Chief Secretary to Government, dated Madras, 22nd September 1894,
No. 1722—356-G.

I have the honour to forward herewith the annual report on the lights and light-
houses in the Madras Presidency for the official year 1893-94.

ENCLOSURE.

Report on the Lights and Lighthouses on the Coasts of the Madras Presidency for the official
year 1893-94.

NEW LIGHTS.

The new 3rd Order Light for Madras was installed on the tower of the Law Courts and all
arrangements completed in time for exhibiting it during the year under review, but owing to the
breakage of a lens which had to be replaced by another from England and to six months' notice
having to be previously afforded for the information of mariners, the new light was not displayed
until 1st June 1894.

At Masulipatam two white lights in globular lanterns hoisted on posts were brought into
use at the entrance to the backwater to guide boats over the bar at night. The expenditure on
account of these lights is met from the Masulipatam Landing and Shipping Dues Fund. These
lights do not affect shipping, and no notice to mariners was issued; they are, therefore, not
included in the light list.

CHANGE IN CHARACTER OF LIGHT.

The red sector showing in the direction of Sacramento Shoal which was fitted to the lantern
of the new Hope Island Light was removed in the year, having been found defective, and also
unnecessary as noticed in last year's report.

PROPOSED CHANGE IN CHARACTER OF LIGHT.

Arrangements were made for replacing the present red dioptric light at Calingapatam by a
4th order, dioptric, white, occulting light and pending installation of the new light on the column
to exhibit the present one from a temporary wooden structure.

ALTERATION IN DATE OF EXHIBITION OF LIGHT.

With the special sanction of Government, the lights at Malpé and Coondapoor were exhibited
during the year from 8th September instead of from 1st October.

BURNERS.

The improved type of burners brought into use at the more important lights in the preced-
ing year have been found to be very satisfactory.

REPAIRS, &c.

Gopalpur.—The flagstaff from which the port light is shown was overhauled and put into efficient repair; lightkeepers' quarters repaired.

Vakalapudi.—An additional tank for storing oil supplied, store-room and keepers' quarters put in thorough repair.

Hope Island.—A new 400-gallon tank supplied for storing water.

Cocanada.—Groyne Lights.—Supplied with two new burners and a spare lamp.

Pulicat.—Lantern painted and Superintendent's quarters repaired.

Seven Pagodas.—A small service room built on the terrace of the turret.

Point Calimere.—Lightkeepers' quarters repaired.

Mangalore.—New quarters provided for the lightkeepers.

LIGHTNING CONDUCTORS.

See remarks in Appendix C.

ESTABLISHMENTS.

Particulars of the lighthouse staff are given in Appendix D. Details of cost will be found in Appendix A.

STORES AND SUPPLIES.

The supply of stores and mineral oil was well maintained (the latter with a surplus stock as usual of six months' requirements) at the several lighthouses.

Particulars of the lights are furnished in Appendix B.

LIGHTHOUSE CHARGES.

Appendix A furnishes particulars of lighthouse charges for the year under report, and the following is a comparative statement of the charges therein specified for the last three years:—

	1891-92.	1892-93.	1893-94.
Establishment, stores and contingencies	RS. 38,687	RS. 72,292	RS. 32,589
Public Works charges	5,463	9,849	7,409
Total ..	44,150	82,141	39,998

The charges for 1893-94 on account of establishment, stores and contingencies, as also those on account of public works, have been considerably less than charges of a similar nature incurred during the year previous, and the variations under each head of charge compared with those of 1892-93 are explained below:—

	1892-93.	1893-94.	Difference.	
			More.	Less.
Superintendents and Lightkeepers	RS. 20,054	RS. 19,978	..	76
Oil	4,850	6,617	1,767	..
Stores	42,342	1,936	..	40,406
Contingencies	5,046	4,058	..	988
Public Works charges	9,849	7,409	..	2,440
Total ..	82,141	39,998	1,767	48,910
			— 42,143	

Consequent on the improved type of burners introduced having been in use throughout the year, the cost of oil was in excess of that of the year 1892-93. There was a decrease under each of the remaining heads.

The large sum shown as contingencies of the Madras lighthouse includes a charge of Rupees 1,003-13-0 incurred on account of telegrams notifying the postponement of the exhibition of the new Madras Light.

Public Works expenditure charged to Pulicat lighthouse represents cost of alterations to the Superintendent's quarters.

APPENDIX A.
PARTICULARS OF CHARGES RELATING TO DIFFERENT LIGHTS.

	Establishment.		Oil.	Stores.	Contingencies and Miscellaneous.	Construction and repairs.	Total, 1893-94.	Total, 1892-93.	Total, 1891-92.	Remarks.
	Superintendents.	Light-keepers.								
1	2	3	4	5	6	7	8	9	10	11
Coondapoor ..	RS. A. P. 192 13 10	RS. A. P. 67 11 7	RS. A. P. 67 11 7	RS. A. P. 0 0 9	RS. A. P. 127 3 6	RS. A. P. 16 14 8	RS. A. P. 404 11 7	RS. A. P. 348 7 4	RS. A. P. 2,979 0 6	Light at end of Pier.
Malpe ..	192 6 11	67 11 8	67 11 8	0 0 9	25 13 0	3 12 0	239 12 4	271 9 3	3,067 7 2	
Mangalore ..	317 12 11	135 7 5	135 7 5	0 0 6	44 1 6	442 12 7	833 1 5	2,551 7 7	5,012 2 9	
Cannanore ..	228 0 0	48 15 10	48 15 10	1 0 9	55 0 10	..	330 14 9	363 14 3	404 15 4	
Tellicherry ..	228 0 0	84 7 0	84 7 0	4 8 6	37 3 8	181 11 7	530 14 9	594 13 8	496 9 9	
Calicut ..	326 12 1	287 10 3	287 10 3	12 12 9	44 5 6	333 7 0	1,004 15 7	1,451 12 8	759 9 5	
Do. ..	324 0 0	252 11 1	252 11 1	25 4 9	40 10 2	235 11 9	878 5 9	1,777 3 2	888 12 2	
Cochin ..	..	..	..	51 13 1	..	..	51 13 1	..	..	
Baymore ..	..	..	..	574 0 1	..	..	3,956 2 5	5,081 9 3	8,829 11 3	
Matum ..	..	..	..	16 11 11	..	..	2,084 8 10	1,195 10 7	1,669 14 6	
Manapad ..	..	..	..	19 15 0	..	..	824 5 7	2,587 11 2	1,293 14 10	
Tuticorin ..	..	..	..	18 2 8	..	..	612 13 7	1,389 5 11	2,813 12 3	
Pamban ..	..	..	..	11 2 0	..	..	386 1 6	669 9 3	2,813 12 3	
Tondi ..	..	..	..	6 4 8	..	..	104 2 9	1,136 10 11	747 12 9	
Point Calimere ..	..	..	..	11 2 0	..	..	58 14 3	2,526 12 1	591 5 8	
Negapatam ..	..	..	..	10 9 11	..	..	41 5 3	3,886 3 0	969 1 6	
Cuddalore ..	..	..	..	74 5 6	..	..	41 10 5	2,465 4 8	1,725 14 9	
Seven Pagodas ..	..	..	..	539 7 2	..	..	1,398 5 6	27,921 4 9	3,415 6 4	
Madras ..	..	..	..	..	..	..	..	..	..	
Do. ..	..	..	..	..	..	..	..	..	..	
Pulicat ..	..	..	..	..	..	..	..	..	..	
Arneghon ..	..	..	..	..	..	..	..	..	..	
Point Divi ..	..	..	..	..	..	..	..	..	..	
Masulipatam ..	..	..	..	..	..	..	..	..	..	
Do. ..	..	..	..	..	..	..	..	..	..	
Hope Island ..	..	..	..	..	..	..	..	..	..	
Cocanada ..	..	..	..	..	..	..	..	..	..	
Do. ..	..	..	..	..	..	..	..	..	..	
Vaknapudi ..	..	..	..	..	..	..	..	..	..	
Santopilly ..	..	..	..	..	..	..	..	..	..	
Calingapatam ..	..	..	..	..	..	..	..	..	..	
Gopalpur ..	..	..	..	..	..	..	..	..	..	
Do. ..	..	..	..	..	..	..	..	..	..	
Total ..	10,092 10 4	9,885 0 5	6,616 10 5	1,936 8 8	4,058 7 2	7,409 0 8	39,998 5 8	82,140 8 5	44,933 11 10	

Two lights mark the entrance to the harbour and two lights show the fair way.

Bar lights.

Groynes lights.

Light at end of pier.

APPEN
List of Lights on the

Name of Light.	Location.	Latitude, N.	Longitude, E.	Number and relative position of lights.	Colour of lights.	Fixed, flashing, inter- mitting, alternat- ing or revolving.	Interval of revolu- tion or flash or occultation.
Coondapoor ..	On the beach at the north side of en- trance to the river.	13° 38' 20"	74° 39' 40"	1	Red ..	F.	
Malpé ..	In the vicinity of the Custom House.	13 20 40	74 42 0	1	White ..	F.	
Mangalore ..	On a hill above the town, and near some high trees.	12 52 17	74 50 08	1	Do. ..	F.	
Cannanore ..	On the Fort rampart near the beach.	11 51 10	75 21 45	1	Red ..	F.	
Tellicherry ..	On the Fort wall near the beach.	11 44 50	75 28 30	1	White ..	F.	
Mahé (French Territory).	On the south side of the entrance to the river at the foot of the flagstaff.	11 42 10	75 31 10	1	Red ..	F.	
Calicut ..	Near the beach ..	11 15 05	75 45 35	1	White ..	F.	
Narakel (Cochin Territory).	On the beach at mouth of creek 5 miles to the north- ward of Cochin.	10 03 0	76 12 0	1	Do. ..	F.	
Cochin ..	On a small mound which formed a bastion of the old fort to the south of the harbour.	9 57 47	76 13 45	1	Do. ..	F.	
Alleppy or Alipee (Travancore Territory).†	On the beach about one cable inland.	9 30 0	76 19 0	1	Do. ..	Rev. ..	One minute ..
Muttam ..	On a rocky promon- tory 300 yards from sea, known as Mut- tum Point.	8 07 30	77 18 10	1	Do. ..	F.	

* These lights have hitherto in Light Lists been described as Dioptric; they are

DIX B.

Coasts of the Madras Presidency.

Miles visible in clear weather.	Arc of illumination. (Bearings are mag- netic and from sea- ward).	Nature of construc- tion, colour, or any peculiarity of light- house.	Height in feet of centre of lantern above high water.	Height in feet of building from base to vane.	Character and order of illuminating ap- paratus.	Year lighted.	Remarks.
6 to 8	From N. thro' E. to S., shut in to the westward of N. by trees.	Steel mast ..	45	40	6th order Diop- tric port light.	1st October 1888; pre- sent light 1st Nov. 1891.	Exhibited only from 15th September to 31st May.
6 to 8	From N. thro' E. to S., shut in between N. and N. E. by trees, N. 53 E. and N. 57 E. by St. Mary's Islands, N. 73 E. to N. 80 E. by St. Mary's Islands	Do. ..	53	50	Do.	Do.	Do. do.
14	From N. by E. ½ E. thro' E. to S. by W. ½ W.	Small white masonry tower.	240	65	* Catadioptric, 4th order.	1st October 1842; im- proved 1870.	
6 to 8	Between the bearings of N. W. by W. ½ W. and E. by S. ½ S.	Small masonry tower of a light yellow colour.	64	25 from the ram- part.	* Catadioptric, 6th order, port light.	17th Oct. 1843; im- proved 1870; transferred to tower 1880.	
6 to 8	N.W. thro' E. to S.E.	Small masonry tower.	70	26	Do.	1835; improved 1870; transferred to tower 1881.	
7	All round the compass.	Small white pyramid.	52	7	..	1885.	Shown only during N.E. mon- soon.
14	From N. 25 W. thro' E. to S. 14 E.	White column ..	102	98	* Catadioptric, 4th order.	1847; improved 1881.	To guide vessels to the anchor- age, clear of the reef, which lies about 1 mile S. 30° W. from the light. A small red light is exhibited from the head of the pier as a guide for small coasting craft when entering the road- stead.
10	180° from N.N. W. thro' E. to S.S.E.	Flagstaff ..	95	102	Country made lantern.	1865.	Is exhibited from 15th May to 30th September.
14	From N. by W. ¾ W. thro' E. to S. by E.	White laterite column.	100	91	Catadioptric, 4th order.	1st April 1839; im- proved 1868.	
17	All round the compass.	Masonry round white tower.	113	115	Catadioptric, 1st order (Holo- photal).	1862.	
17	From N. 65 W. thro' N. to S. 85 E.	Dark gray granite column, show- ing black and white horizontal stripes from seaward.	142	72	* Catadioptric, 1st order.	1875; altered 1st January 1883.	Is intended to mark the vici- nity of the Crocodile Rock, which lies 3 miles S.W. ¾ S. of Cadiapatam Point.

all fitted with either reflectors or mirrors and show over an arc of from 180° to 270°.

List of Lights on the

Name of Light.	Location.	Latitude, N.	Longitude, E.	Number and relative position of lights.	Colour of lights.	Fixed, flashing, inter- mitting, alternat- ing or revolving.	Interval of revolu- tion or flash or occultation.
Gulf of Manar.	Manapad ..	On summit of Mana- pad Point.	8° 22' 30"	78° 6' 30"	1 Red ..	F.	
	Tuticorin ..	On the north extreme of Hare Island or Paundian-tivo, 2½ miles east of Tuti- corin town.	8 47 10	78 11 20	1 White ..	F.	
	Pámban or Pámban Pass.	On a sand-hill about one mile east of Northern Channel.	9 17 14	79 12 38	1 Do. ..	F.	
	Tondi ..	About 14 yards due south of the Tondi Sea Custom House.	9 44 45	79 00 30	1 Red ..	F.	
Point Calimere.	On the point about 30 miles south of Negapatam.	10 18 0	79 51 30	1 Do. ..	F.		
Negapatam ..	On the jetty near to the river mouth.	10 45 30	79 50 20	1 White ..	F.		
Karikal (French Territory).	At the mouth of the Arselaar river.	10 55 0	79 50 35	1 Do. ..	F.		
Cuddalore ..	On cross-trees of flag- staff.	11 43 0	79 46 15	1 Red ..	F.		
Pondicherry (French Terri- tory). Do.	In square, near the beach. End of landing stage.	11 55 25 ..	79 49 35 ..	1 White .. 1 Red ..	F. F.		
Seven Pagodas or Mahabali- puram.	On a rock half-a-mile inland marked on chart "Ruined Pagoda" on rock very conspicuous and about 6 miles northward of Sadras	12 36 55	80 11 31	1 Do. ..	F.		
Madras or Fort St. George.	On the Esplanade, north of the Fort.	13 05 11	80 16 51	1 White ..	Fl. The mo- tion is Revi- procat- ing and not Ro- tatory.	The flashes and eclipses are irregular, but the proportional time of light to darkness is as 2 to 3.	

* These lights have hitherto in Light Lists been described as Dioptric; they are

Coasts of the Madras Presidency—cont.

Miles visible in clear weather.	Arc of illumination. (Bearings are mag- netic and from sea- ward).	Nature of construc- tion, colour, or any peculiarity of light- house.	Height in feet of centre of lantern above high water.	Height in feet of building from base to vane.	Character and order of illuminating ap- paratus.	Year lighted.	Remarks.
8	N.N.E. thro' E. to S.S.W.	White masonry tower.	104	27	* Catadioptric, 4th order, port light.	June 1888;	Is intended to warn vessels of the dangerous shoal in the vicinity.
14	All round the compass.	Sandstone column colored brown, lantern white.	85	91	Dioptric, order.	15th May 1845; im- proved 1874; im- proved 1893.	
14	Do.	Circular masonry column.	97	72	Do.	21st April 1846; im- proved 1860; im- proved 1893.	As a guide to vessels making for the Pámban Channel.
6 to 8	Visible from all directions sea- ward.	Steel mast ..	63	52	* Catadioptric, 6th order, port light.	1st October 1892.	
6 to 8	All round the compass.	Steel mast, painted white.	49	..	Dioptric, order, port light.	1st June 1890.	As a guide to vessels passing between Point Calimere and the shoals to the Eastward.
14	From N. 5 W. thro' W. to S.S.E.	Masonry column, painted white.	79	83	* Catadioptric, 4th order.	1st August 1846; im- proved 1870; im- proved 1893.	
9	Visible from all directions sea- ward.	Do.	42	..	Lamp burning cocoanut oil.	1853.	
6 to 8	N. thro' W. to S.	Flagstaff ..	130	31	* Catadioptric, 6th order, port light.	1st July 1889; pre- sent light, 5th Oct. 1891.	
14	Visible from all directions sea- ward.	Masonry column, painted light yellow.	89	76	Dioptric order.	1886.	When surf is heavy, and approach to landing prohib- ited, a fixed green light is shown.
4	Do.		31	..		1881.	
10	From N. thro' W. to South (180°).	Small turret.	119	26	* Catadioptric, 4th order.	10th July 1887; im- proved 1893.	Is intended to warn mariners of the dangerous outlying patches of rock composing the Tripatore reef and other reported dangers in its vic- inity, to avoid which vessels navigating between Sadras and Covelong should not come into a less depth than 13 fathoms.
17	From N.N.E. thro' W. to S.S.E.	Granite column.	128	125	Dioptric, order.	3rd 1st January 1844; new light, 1894.	This light was replaced on the 1st June 1894 by an ap- paratus of the third order group flashing type, having a focal distance of 500 mil- limetres and a vertical angle of 80 degrees, exhibited from the main tower of the Law Courts on the Esplanade. The apparatus consists of eight panels of lenses in four groups of two panels. The period of the light is double flashing every half-minute. The flashes will be of half minute periods giving two flashes of about two seconds separated by an eclipse of about three seconds, followed by an eclipse of 23 seconds, and should be visible in clear weather at a distance of 19 miles from all directions seaward. The value of the beam of light is equal to 18,000 candles.

all fitted with either reflectors or mirrors and show over an arc of from 180° to 270°

List of Lights on the

Name of Light	Location.	Latitude, N.	Longitude, E.	Number and position of lights	Colour of light	Fixed, flashing, intermitting, alternating or revolving	Interval of revolution or flash or occultation
Madras Leading Light.	Madras Pier T. Head.	13° 05' 44"	80° 17' 16"	1	Red ..	F.	
Do.	Custom Office Terrace.	13 05 47	80 17 05	1	Green ..	F.	
Pulicat ..	Near the Beach ..	13 25 15	80 19 06	1	White ..	F.	
Armeghon or Armogham.	On the mainland, village of Moona or Moonapollium.	13 53 08	80 11 47	1	Do. ..	Rev.	Every 45 seconds ..
Point Divi or Divy.	About 2 miles North-west of the Point.	15 58 55	81 09 25	1	Do. ..	F.	
Masulipatam ..	In the Fort ..	16 09 15	81 09 25	1	Do. ..	F.	
Coringa or Hope Island.	On the southern part of Hope Island, Coringa harbour, and distant about 2½ miles from the sea.	16 49 05	82 18 58	1	Do. ..	F.	
Cocanada or Vakalapudi.	4½ miles north of Cocanada river and about 500 yards from the shore.	17 0 40	82 16 30	1	Do. ..	Rev.	Every 20 seconds ..
Cocanada River.	One on the end of the North Groyne, and the other on the end of the South Groyne, entrance to river.	..	..	2	Red ..	F.	
Santopilly ..	On a small detached hill some distance inland. This distance said to be ¾ of a mile.	18 04 56	83 37 35	1	White ..	F.	
Calingapatam ..	On the Point ..	18 19 0	84 07 30	1	Red ..	F.	
Gopalpur ..	On the mainland 60 yards from low water mark.	19 13 0	84 52 0	1	White ..	F.	
Do.	On the extreme end of the pier head, port of Gopalpur.	..	..	1	Red ..	F.	

* These Lights have hitherto in Light Lists been described as Dioptric: they are

Coasts of the Madras Presidency—cont.

Miles visible in clear weather.	Arc of illumination. (Bearings are magnetic and from seaward).	Nature of construction, colour, or any peculiarity of light-house.	Height in feet of lantern above high water.	Height in feet of building from base to vane.	Character and order of illuminating apparatus.	Year lighted.	Remarks.
5	From S. 51° 45' W. thro' W. to N. 17° W.	Wooden post ..	30	..	Ship's side light, Dioptric.	15th October 1888.	To guide vessels leaving the harbour or making the anchorage at night.
5	Do.	Do. ..	60	..	Do.	15th October 1888.	Do. do.
14	From N. by W. thro' W. to S. by E.	Masonry column with black bands.	68	57	* Catadioptric, 4th order.	1859; improved 1870; altered 1881; improved 1893.	To guide vessels clear of the Pulicat shoal.
14	From N.E. thro' W. to S.E.	White masonry column.	107	111	Dioptric, 4th order, single flash 45 seconds.	1st January 1853; improved 1870; present light 1881; improved 1893.	Warns vessels off the Armeghon shoal, the shoalest part of which (1½ fathoms) lies 6 miles off shore.
12	From N.E. thro' W. to S.	Do.	48	50	* Catadioptric, 4th order.	1st May 1851; improved 1870; improved 1893.	Is intended to guide vessels clear of the Point.
6	From S. 26° W. thro' W. to N. 9° E.	Flagstaff ..	69	112	* Catadioptric, 6th order.	1858; improved 1870.	As a guide for vessels to the anchorage.
14	From N. 5° E. thro' W. to S. 5° W.	Masonry tower, horizontal alternate bands of black and white.	83	94	* Catadioptric, 4th order.	1817; improved 1886; improved 1893.	Is intended to guide vessels clear of Sacramento Shoal and Gódvári Point.
14	All round the compass.	White column ..	80	76	Dioptric, 4th order, single flash 20 seconds.	15th January 1879.	This light is intended as a guide to vessels approaching Cocanada anchorage.
2½	Do.	Wooden post ..	10	..		15th September 1886.	To guide boats entering or leaving Cocanada river.
16	From N.E. thro' W. to S.W.	On a small basement on the top of a small hill with a small building by the side of the lantern on the west side.	163·77	31·15	* Catadioptric, 2nd order; improved 1893.	1st November 1849; improved 1871; present light 1886; improved 16th Aug. 1888.	Exhibited to warn mariners of the Santopilly Rocks, from which this light bears N.W. ¾ W., distant 6½ miles.
8	From N.E. thro' W. to S.W.	Obelisk of cut stone; column white; capital dark blue.	76	73	* Catadioptric, 4th order, port light.	15th Dec. 1876; improved 1st June 1890.	Intended to warn vessels off a small reef which projects from the point and which should not be passed in less than 8 fathoms when making the port at night.
10	From N.E. thro' N.W. to S.W.	Flagstaff painted white.	54	33	* Do.	Present light 1871; 1st Mar. 1892.	As a guide to the anchorage.
3	All round the compass.		25	..	Country lantern.	1st April 1887.	Points out the sea end of the pier.

all fitted with either reflectors or mirrors and show over an arc of from 180° to 270°.

APPENDIX C.

STATEMENT furnishing (1) Particulars of inspection made of Lighthouses on the Madras Coast in 1893-94 and (2) Remarks in connection with the lightning conductors.

(1)			(2)
Name of Light.	Officers by whom inspected.	Number of inspections.	Remarks as to Lightning conductor.
Coondapoor ..	Presidency Port Officer ..	1	Lightning conductor tested three times in the year.
Malpé ..	Executive Engineer ..	1	
Malpé ..	Port Officer, Mangalore ..	4	
Mangalore ..	Presidency Port Officer ..	1	
Mangalore ..	Executive Engineer ..	4	Lightning conductor not tested since October 1892.
Cannanore ..	Presidency Port Officer ..	2	
Cannanore ..	Port Officer, Calicut ..	2	
Cannanore ..	Presidency Port Officer ..	3	
Tellicherry ..	Port Officer, Calicut ..	2	Lightning conductor was tested in August 1893.
Tellicherry ..	Executive Engineer ..	4	
Calicut ..	Presidency Port Officer ..	3	
Calicut ..	Presidency Port Officer ..	2	
Cochin ..	Executive Engineer ..	1	Lightning conductor in good order. Lightning conductor improved by the addition of a wire led underground into the sea.
Muttum ..	Presidency Port Officer ..	1	
Muttum ..	Executive Engineer ..	1	
Muttum ..	Port Officer, Tuticorin ..	1	
Manapad ..	Presidency Port Officer ..	1	Lightning conductor not tested in the present year.
Manapad ..	Port Officer, Tuticorin ..	1	
Manapad ..	Public Works Department Subordinate Officers ..	4	
Tuticorin ..	Presidency Port Officer ..	2	
Tuticorin ..	Superintending Engineer ..	1	Lightning conductor tested in September 1893.
Pamban ..	Executive Engineer ..	1	
Pamban ..	Presidency Port Officer ..	1	
Pamban ..	Executive Engineer ..	1	
Tondi ..	Port Officer, Pamban ..	2	Lightning conductor tested in September 1893 and found in perfect order.
Point Calimere ..	Port Officer, Negapatam ..	4	
Negapatam ..	Presidency Port Officer (besides visits at times from Public Works Officers) ..	12	
Negapatam ..	Presidency Port Officer ..	1	
Cuddalore ..	Presidency Port Officer ..	2	Lightning conductor in order.
Cuddalore ..	Reserve Port Officer ..	3	
Cuddalore ..	Superintending Engineer ..	1	
Cuddalore ..	Executive Engineer ..	1	
Seven Pagodas ..	Personal Assistant to Presidency Port Officer ..	1	Lightning conductor tested in September 1893.
Seven Pagodas ..	Reserve Port Officer ..	1	
Seven Pagodas ..	Presidency Port Officer ..	1	
Seven Pagodas ..	Superintending Engineer ..	1	
Pulicat ..	Executive Engineer ..	1	Lightning conductor in good order, but not tested since 1889-90.
Pulicat ..	Reserve Port Officer ..	1	
Pulicat ..	Presidency Port Officer ..	1	
Pulicat ..	Superintending Engineer ..	1	
Armeghion ..	Reserve Port Officer ..	1	Lightning conductor in good order.
Armeghion ..	Presidency Port Officer ..	1	
Armeghion ..	Superintending Engineer ..	1	
Armeghion ..	Reserve Port Officer ..	1	
Point Divi ..	Presidency Port Officer ..	1	Lightning conductor not tested since 1887.
Point Divi ..	Assistant Engineer ..	1	
Point Divi ..	Port Officer, Masulipatam ..	1	
Point Divi ..	Presidency Port Officer ..	12	
Hope Island ..	Superintending Engineer ..	1	A new lightning conductor was fitted.
Hope Island ..	Port Officer, Cocanada ..	1	
Hope Island ..	Presidency Port Officer ..	2	
Hope Island ..	Superintending Engineer ..	8	
Vakalapudi ..	Presidency Port Officer ..	1	Lightning conductor in good order; tested in August.
Vakalapudi ..	Superintending Engineer ..	1	
Vakalapudi ..	Port Officer, Cocanada ..	1	
Vakalapudi ..	Presidency Port Officer ..	12	
Santopilly ..	Superintending Engineer ..	1	Lightning conductor tested and in working condition.
Santopilly ..	Executive Engineer ..	1	
Santopilly ..	Port Officer, Bimlipatam ..	1	
Santopilly ..	Presidency Port Officer ..	11	
Calingapatam ..	Superintending Engineer ..	1	Lightning conductor in working order. An extra conductor put up in 1892 has not yet been tested.
Calingapatam ..	Executive Engineer ..	1	
Calingapatam ..	Port Officer, Gopalpur ..	2	
Gopalpur ..	Port Officer, Gopalpur ..	1	
See foot-note.			

Note.—At stations where there is a Port Officer or Conservator, such officers as *ex-officio* Superintendents frequently visited the lighthouses in addition to the outside inspections above noticed.

APPENDIX D.

STATEMENT showing the sanctioned Establishments of Lighthouses on the Madras Coast as they stood on the 31st March 1894.

Lights.	Superintendents.				Head Light-keepers.				Light-keepers.				Remarks.	
	1st Class.		2nd Class.		3rd Class.		1st Class.		2nd Class.		3rd Class.			
	Rs. 100.		Rs. 70.		Rs. 50.		Rs. 15.		Rs. 12.		Rs. 10.			
	Rs. 100.		Rs. 70.		Rs. 50.		Rs. 15.		Rs. 12.		Rs. 10.			
Coondapoor	..	..	..	..	..	..	..	..	..	..	..	..	(a) Charge allowance of Re. 1.	
Malpé	..	..	..	..	..	..	..	..	..	..	..	..	(b) Temporary from 15th September to 31st May every year.	
Mangalore	..	..	..	..	..	..	..	..	..	..	..	..	(c) Charge allowance Rs. 2.	
Cannore	..	..	..	..	..	..	..	..	..	..	..	..	(d) Plus house allowance Rs. 25.	
Tellicherry	..	..	..	..	..	..	..	..	..	..	..	..	(e) Also a watchman on Rs. 6 for the bar lights.	
Calicut	..	..	..	..	..	..	..	..	..	..	..	..	(f) Also two water-boat lascars on Rs. 7 each.	
Cochin	..	..	..	..	..	..	..	..	..	..	..	..	(g) Plus flag-signalling allowance Rs. 10.	
Muttum	..	..	..	..	..	..	..	..	..	..	..	..	(h) Also a flag signaller on Rs. 8.	
Manapad	..	..	..	..	..	..	..	..	..	..	..	..		
Tuticorin	..	..	..	..	..	..	..	..	..	..	..	..		
Pamban	..	..	..	..	..	..	..	..	..	..	..	..		
Tondi	..	..	..	..	..	..	..	..	..	..	..	..		
Point Calimere	..	..	..	..	..	..	..	..	..	..	..	..		
Negapatam	..	..	..	..	..	..	..	..	..	..	..	..		
Cuddalore	..	..	..	..	..	..	..	..	..	..	..	..		
Seven Pagodas	..	..	..	..	..	..	..	..	..	..	..	..		
Madras	..	..	..	..	..	..	..	..	..	..	..	..		
Pulicat	..	..	..	..	..	..	..	..	..	..	..	..		
Armeghion	..	..	..	..	..	..	..	..	..	..	..	..		
Point Divi	..	..	..	..	..	..	..	..	..	..	..	..		
Masilupatam	..	..	..	..	..	..	..	..	..	..	..	..		
Hope Island	..	..	..	..	..	..	..	..	..	..	..	..		
Vakalapudi	..	..	..	..	..	..	..	..	..	..	..	..		
Santopilly	..	..	..	..	..	..	..	..	..	..	..	..		
Calingapatam	..	..	..	..	..	..	..	..	..	..	..	..		
Gopalpur	..	..	..	..	..	..	..	..	..	..	..	..		
AMALGAMATED ESTABLISHMENTS.														
Lighthouses.					Head Light-keeper and Signaller.								Total staff.	
					Light-keeper and Signaller.									
					Rs. 20.								Rs. 8.	
					Rs. 11.								Rs. 8.	
					Rs. 10.								Rs. 8.	
					Rs. 9.								Rs. 8.	
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ORDER—dated 2nd October 1894, No. 391, Marine.

Recorded.

2. The Public Works Department will be requested to make early arrangements for testing the lightning conductors at Armeghou and the Seven Pagodas. It is observed that they have not been tested since 1887 and 1889, respectively.

(True Extract.)

J. F. PRICE,
Chief Secretary.

To the Presidency Port Officer.
„ the Public Works Department.
„ F. W. Ashpitel, Esq.

ENDORSEMENT—dated 2nd October 1894, No. 392, Marine.

Five copies forwarded to the Government of India, Department of Finance and Commerce.

Chief Secretary.

Govt. of {1894} Madras.

MARINE.

Issued

Recd.

Encl.

GO., &c., 2nd October 1894,
Nos. 391, 392.

OCTOBER.

Lights and Lighthouses.

Recording, with remark, the report on — in
the Presidency for 1893-94.

No. 2734 to dt 26 October 1894

Communicated to
Suptg. Engineers.

2. The officers concerned
will make early arrange-
ments for testing the
lightning conductors of
the Arneghon and
Seven Pagodas light-
houses

(Sd) J.P.
H

Suptg. Engrs.

(except III)

R.A. to Encl.

200