COLONIAL LIGHTS

FALKLAND ISLANDS

CAPE PEMBROKE LIGHTHOUSE

and

MENGEARY POINT LIGHTHOUSE

REPORT

on condition of lighthouse stations, following survey carried out during period 29th April, 1959, to 6th May, 1959, with recommendations for improvements,

by

James E. Lewis, A.M.I.C.E., A.M.I.Mun.E.,
Assistant Civil Engineer,
Trinity House.

Philip W. Hunt, M.I.C.E.,
Engineer-in-Chief,
Trinity House,
Tower Hill,
London E.C.3.

R/SH1/CAP/1-1-01

(1)

(2)

-02

FALKLAND ISLANDS
CAPE PEMBROKE LIGHTHOUSE

Report following survey carried out during the period
29th April - 5th May, 1959.

---

1. LOCATION

The lighthouse is situated on the tip of Cape Pembroke, East Falklands, and serves as the main navigation light for shipping approaching the islands from Northerly and Easterly directions. It lies some $7\frac{1}{2}$ miles due East of Port Stanley, to which there is access by land and communication by telephone.

2. GENERAL DESCRIPTION

The station comprises a cast iron tower surmounted by a lantern in which is housed a petroleum vapour burner at the focal point of a rotating lens. The light, which has an intensity of 105,000 candles, exhibits a character of one white flash every ten seconds. The focal plane is 99 feet above H.W.S.T. and the geographical range is approximately 16 miles.

Dwelling accommodation is provided for the two resident keepers in single storey buildings sited adjacent to the tower. The station has no fog signal or radio beacon equipment. The lighthouse and dwellings are depicted on Plate 1.

The three keepers work a period of four weeks at the station, with two weeks off at Port Stanley, so that there are always two keepers on duty. A reserve man is on call if required, in case of sickness, etc.

It appears that the station was last visited by a representative of Trinity House in 1905, when the lighthouse tower was dismantled and re-erected on a new site. The following year work commenced on alterations to the dwellings and the construction of a new wing. In 1922 the "Matthews" burner in the optic was removed and replaced by the existing 50 m.m. "Hood" burner equipment.

3. TOWER

(a) Lantern

This is a standard 3rd Order lantern with gunmetal wind vane, copper ventilator, conical roof of steel plates with Tee bars, cill bar, dust plate and curtain rail, all in first class condition (see Plate 2). Very slight rusting has occurred at the bottom edge of two roof plates but no repairs are necessary. The ladder rail and brackets were in a dangerous condition but replacements have already been despatched to the lighthouse and should by now have been fitted. Gallery plating, cantilever supports and railings all in good condition.

The glazing astragals are of steel and in good condition and the glass, with the exception of one full diamond, has no cracks or chips. The one damaged panel of glass requires replacing because of two cracks in the bottom corner. The whole of the glazing is in serviceable condition, although re-puttying is required internally. At the date of survey there were only two half diamond spare panels, but recently three full and one half diamond have been despatched to the station.

The lantern murette is constructed in one tier in cast iron and steel with gunmetal access door to gallery. All is in good condition with the exception of the slam plate to the access

door which is cracked and bent. This item requires replacing to facilitate proper closure of the door. There is a disused flue pipe from the service room beneath and this is badly holed and requires removing. As a result, appropriate steel patch plates will be required to seal the apertures thus exposed in the lantern roof and floor.

(b) Optic

This is a third order, single flashing, four panel optic, the character of which was checked and verified. The general condition of the prisms and bulls eyes in the lens panels is good, there being a small number of minor chips and shells, but no repairs or replacements are necessary. The gunmetal framing and access door in good condition.

The mercury trough was lowered, mercury drained off, trough cleaned, painted internally with two coats of Shellac, and raised to its original position, after which the mercury was replaced. $3\frac{1}{4}$ cwts of mercury are contained in the trough, and one spare bottle containing 76 lbs of mercury is on station as spare.

The vertical guide rollers were examined and found to be in good condition, the ball bearings being equally worn but not pitted. The horizontal guide rollers on examination were found to be badly worn, with flats on the contact faces. All eight rollers and spindles require replacement: the lens, clock and governor were cleaned, checked and found to be in good condition. The wire rope carrying the clock driving weights, however, was found to be badly frayed and was replaced, using the spare wire rope on station.

(c) Petroleum Vapour Burner Equipment

The two I.O.B. paraffin tanks were inspected, internally, cleaned and the tin lining found to be in good condition despite the fact that the tanks were apparently last cleaned in 1935. The micrometer valves were examined and found to be serviceable but overhauling is necessary. Two spare valves were on station but these were also found to be in need of overhaul, and accordingly these have been despatched to the United Kingdom, overhauled and should by now have been received back at the lighthouse.

The I.O.B. pump was examined and found to be serviceable but the valve seatings require skimming and consequently overhaul is recommended. The spare pump on station was also in need of overhaul, and this has since been despatched to the United Kingdom, overhauled and returned to the lighthouse.

Oil piping between tanks and burner in service room and lantern all found to be in good condition.

(d) Interior (general)

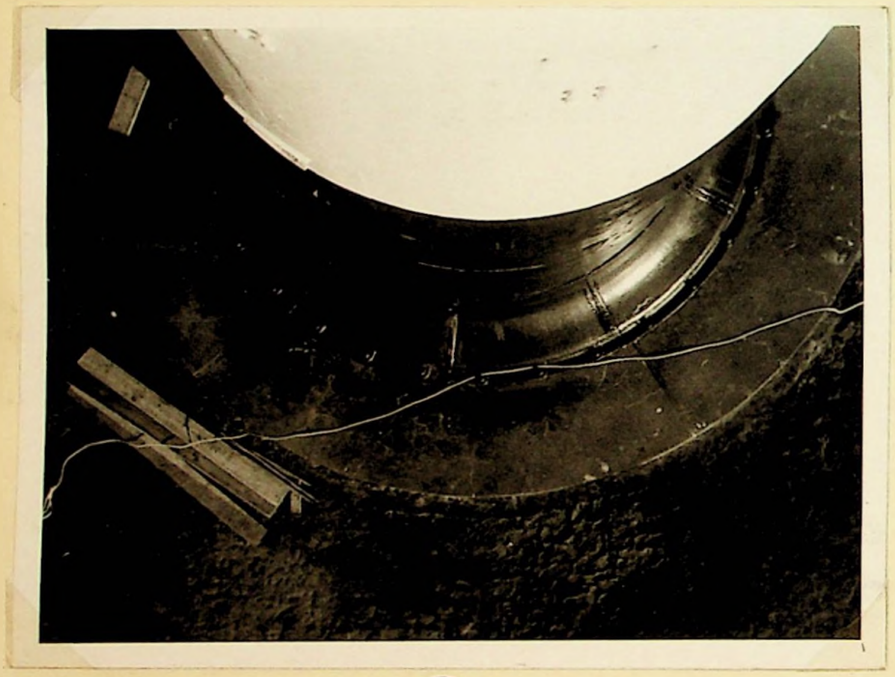
The service room, located immediately below the lantern room, houses the I.O.B. tanks, air pump and the optic clock mechanism. There is an antiquated stove which is disused and should be removed. The floor is of $\frac{1}{2}$" steel plate surfaced with $1\frac{1}{2}$" thick timbers and the whole of the flooring and side plating is in good condition.

Below this room is situated a store which was formerly used as a bedroom. It houses a cupboard in which P.V.B. spares are stored. The whole of the floor and side plating is in good condition.

The tower entrance room is used for oil storage and there are 5 No. mild steel cylindrical tanks, which store a combined total capacity of 490 gallons. The tanks, oil room floor, side plating and tower stairs are all in good condition.

3

R/SH1/CAP/1441-03



4

-04

5

-05

The weight tube, which runs from the service room floor to the tower base is in good condition, also the weights and access doors.

Two panes of glass in the tower windows are cracked and these should be replaced with 32 oz. glass.

(e) Exterior (general)

The tower was checked for verticality and found to be true on the East/West axis but has a lean of $1\frac{1}{2}$" to the South on the North/South axis. This lean is not considered to be serious and there is no evidence of any failure in the structure or foundations which would tend to worsen this condition. The exterior of the tower plating was examined in detail, and in general it is in very good condition (see Plates 3 and 4). Several joints, however, between panels require cleaning out and sealing with iron cement and red lead. The joint straps to the cast iron cill at the base of the tower are sound but there are numerous large blisters beneath the paintwork, and all the straps should be cleaned down to bare metal and primed prior to re-painting. There is one small crack in panel No. 4 of the cast iron plating, at the base of the tower, apparently of long standing, and this should be covered externally with a patch bolted to the existing, to prevent any further extension of this crack. The paintwork to the exterior of the tower is in first class condition, and the white band is not stained by any corrosion.

(f) Foundation

The tower is founded on a thick mass concrete slab, circular in plan, and excavations were carried out around the periphery of this slab to determine the condition of the concrete, which was found to be very good and free from cracks. The top of this concrete base, however, is raised above ground level and rendered with sand and cement. This rendering is badly cracked and should be removed and re-rendering carried out to the whole exposed surface.

4. DWELLINGS

The existing dwellings comprise basically the Principal Keeper's and Assistant Keeper's quarters, connected by a long passageway, which in turn provides access to the tower. The layout is shown on drawing No. 612/3. The dwellings were originally provided to accommodate keepers and their families, so that the present quarters are far too extensive for present requirements.

(a) The Principal Keeper's Quarters:

These quarters, which were constructed when the original tower was built, comprise a living room, two bedrooms, two store rooms and attached pantry, dairy, coal store, workshop and oil store (see Plate 5).

The structure is framed in steel with roof trusses and purlins all in good condition. Corrosion has, however, taken place at the eaves and where members are supported in the chimney brickwork. The roof is lined with timber and clad with Robertson's Protected Metal corrugated sheeting, all in fair condition; the roof lining having been replaced in one section. The roof is watertight. The sides of the buildings are lined with tongued and grooved boarding and clad externally with R.P.M. sheeting. This external sheeting is badly corroded at the bottom edges. The walls of the building are founded on concrete strip footings which, although cracked in many places have not noticeably subsided except in the case of the coal store where subsidence has taken place. The two brick chimneys, however, which are founded independently on concrete slabs have settled some 2" - $2\frac{1}{2}$" and have distorted the timber wall and ceiling

linings attached to them. Also the floors have pronounced inclinations towards the fireplaces. The Cornish Range in the kitchen is badly cracked and is little used. All of the rooms are wired for electric lighting, which was originally powered by a windmill generator, installed during the last war. This generator, however, has been removed and power for these lighting points is not at present available.

(b) Assistant Keeper's Quarters:
The Assistant Keeper's quarters were constructed when the tower was re-sited in its present position in 1906, and are more compact, providing living room accommodation, two bedrooms and bathroom - the bathroom being accessible only from the exterior (see Plate 6).

The quarters are framed in timber with roof trusses and purlins in first class condition. The roof, which is watertight, is lined with timber and clad with R.P.M., all in good condition.

The sides of the building are lined with tongued and grooved boarding and clad externally with R.P.M., which again is corroded at the bottom edges.

Again the walls are founded on concrete strip footings and the chimney brickwork independently on a concrete slab. In this instance, however, no settlement has taken place, and all foundations are in good condition. The kitchen, bedrooms and pantry are wired for electric lights which are not in use.

(c) Passageway:
This is framed in timber and its trusses and purlins are in good condition. The roof is lined with tongued and grooved boarding and clad with R.P.M. The sides are lined with tongued and grooved boarding and clad externally with R.P.M. sheets, which are again corroded at the bottom edges. Original cast iron gutters have generally been replaced by 6" half round galvanised steel gutter which is in good condition.

(d) General Remarks:
The dwellings are far too extensive, ugly in appearance, cold and affected by subsidence in parts. It is therefore recommended that new dwelling accommodation be provided on the lines shown on drawing No. 612/3 and 612/4, as explained later in this report.

5. COW SHED AND STOCKADE

The keepers have several cows to provide the station with a supply of fresh milk and butter. A cow shed has been erected, utilising salvaged timber and discarded R.P.M. sheets, and it is of fairly sturdy construction and adequate for the purpose. It is recommended that the structure be retained but completely re-sheeted, using the best of the R.P.M. sheets obtained from demolition of the dwellings. The stockade, however, is too small and crudely fenced with sticks, straw and mud and it is considered worth while extending the size of the stockade and erecting a concrete post and 5-wire fence to the boundary. This boundary fence should incorporate a 10 ft. wide main access gate and 4 ft. wide wicket gate. This improvement would generally tidy up the station precincts after completion of the dwellings reconstruction.

⑦

⑧

9

10

6. STATION FLAG POLE

A flag pole is situated remote from the dwellings and tower adjacent to the site originally occupied by the tower. The condition of the 44 ft. long pole and timber tabernacle is quite good and it is recommended that the pole be re-sited more appropriately in the station forecourt near to the sea, as shown on drawing No. 612/3. Four steel guy ropes each 38'6" long, complete with end shackles, have recently been supplied to the station. New concrete anchor blocks for the stays and concrete base for the tabernacle will be required at the new site.

7. LANDING STAGE AND CRANE

A landing stage was constructed out of steelworksalvaged from the original jetty, which was destroyed in a gale in 1906, and its use for landing materials or personnel has been discontinued for some time. Its condition is dangerous and complete demolition is recommended (see Plates 7 and 8).

A 20 cwt capacity jib crane is situated alongside the sea below the landing stage, and it is of timber construction, supported on masonry piers. The crane is provided with a 40 ft. jib and is for hand operation only. It has not been used for some considerable time, and its general condition is such that renovation costs would be prohibitive economically, if consideration were given to its re-siting. Complete demolition is recommended.

8. ACCESS ROAD

The access road from Port Stanley to the lighthouse is not a made road in any sense. It is merely a rough track over sandy and peaty areas, which entails negotiating sections which are under water at certain times (see Plates 9 and 10). The access is generally in very bad condition and some maintenance would appear to be essential. This would, however, by reason of economy, have to be restricted to filling in large potholes and re-grading the worst sections of the track. Access by the Landrover has, on the other hand, always been possible except on one occasion in the last seven years, but this is considered to be due to the skill of the driver and very rough usage of the vehicle.

9. GENERAL MAINTENANCE

All normal maintenance is carried out by the keepers, with assistance when required, by the local Public Works Department. This includes all internal and external painting carried out at the following intervals:-

Tower interior	every 6 years
Tower exterior	every 3 years
Dwellings interior	every 3 years
Dwellings exterior	every 5 years or more

Internal and external painting of the tower is due in 1960. Paints are supplied from U.K.

This painting programme is considered satisfactory. It is recommended that the following revised instructions are given with regard to maintenance of equipment, utilising skilled labour from the local P.W.D.:-

1. Clean paraffin and air I.O.B. tanks and lower and clean mercury trough every 5 years.

2. Overhaul lens clock every 5 years.

3. Inspect lens clock wire rope monthly and renew as soon as any fraying becomes evident.

Taking into account the lack of skilled supervision over the past 50 years, the general condition of the equipment and paintwork is remarkably good, although maintenance of Items 1 and 2 above was long overdue. A quantity of P.V.B. and other general spares, additional to those at the station at the date of survey, were considered necessary and these have already been supplied to the lighthouse.

10. PROPOSALS

(a) Lighthouse Tower & Equipment

The general condition of the lighthouse tower, optical and associated equipment is very good and no major repairs or improvements are necessary. It is considered that the station has functioned extremely well in the past with the minimum of maintenance - thus no change in the type or operation of lighting equipment is worthy of consideration, having regard to all factors. Certain minor works, as summarised below and already detailed in the report, are necessary to put everything in first class condition.

(i) Remove flue pipe in lantern and stove in service room and fit patch plates to lantern roof and floor.

(ii) Remove worn and defective slam plate from lantern door to gallery and fit new brass plate.

(iii) Fit steel patch plate to exterior of crack in tower panel No. 4; site drilling as required.

(iv) Cut out loose putty to interior of lantern glazing and re-putty whole of interior with stop-starra putty.

(v) Take out one full diamond, with crack in corner, in lantern glazing and replace with new panel from station spares.

(vi) Take out 2 No. cracked panes of glass in tower windows and replace by 32 oz. clear glass obtained locally.

(vii) Clean out certain joints to exterior of tower plating and re-seal with red lead and iron cement.

(viii) Remove paint and blisters off cast iron cill and straps at base of tower, prime with red lead and paint 3 coats. Materials to be supplied from station stores.

(ix) Remove defective rendering to concrete foundation block to tower to a depth of 9" below ground level. Re-render with sand/cement mortar in 2 coats, each $\frac{3}{8}$" thick. Materials to be supplied locally.

(x) Remove all 8 No. horizontal optic guide rollers and fit new ones.

(xi) Fit new I.O.B. gauge in lantern.

(xii) Fit 2 No. new micrometer valves to P.V.B. and return existing to Trinity House Workshops.

(xiii) Fit new I.O.B. pump and return existing to Trinity House Workshops.

All necessary materials, where not stated otherwise, will be supplied by Trinity House. It is assumed that all site labours will be carried out by the keepers with assistance from the Public Works Department, Port Stanley. Details of the cost of this work are shown on the attached estimate.

(b) New Keepers' Quarters

Proposals for new single storey dwellings, together with engine room/workshop and stores are shown on drawings Nos. 612/3 and 612/4. The accommodation is designed having regard to the following essential pre-requisites.

(1) Two keepers only are on duty at the station at any time, with a third keeper on leave. It is considered that three bedrooms are essential but that the provision of a fourth as a spare is unnecessary having regard to the particular circumstances.

(2) Compactness, together with adequate insulation of walls and roofs, is required to minimise heat losses and conserve fuel.

(3) Prefabrication of component parts will assist materially in reducing erection costs and the use of lightweight materials will reduce shipping and handling charges. In addition, semi skilled labour will suffice for the relevant site works.

(4) The materials employed, in particular internal and external finishings, should be such that future maintenance is reduced to a minimum.

(5) Dwelling accommodation should have direct covered access to the tower and the engine room.

(6) Its siting to be such that demolition of the existing dwellings will not be necessary until erection of the new structure is completed.

(i) Planning & Construction

The accommodation proposed comprises a kitchen/dining room, larder, lounge, three bedrooms, W.C., bathroom and broom cupboard, housed in a block 36 feet x 21 feet. Covered passage access will be provided to an engine room/workshop and general store in a detached block 24 feet x 12 feet. Covered access will also be provided to the lighthouse tower, including the construction of concrete steps to gain access thereto.

Subsoil conditions are poor so far as load bearing capacity is concerned and thus it is proposed to found the new structure on a 12" thick reinforced concrete raft. Any future settlement will be negligible, but in any event should be uniform over the whole area of the raft. Settlement joints will, however, be introduced between the dwellings and tower and in the passageway to the engine room, to cater for the possibility of slight differential settlement.

The single storey buildings will be supplied in a fully prefabricated form and framing will be in either aluminium alloy or laminated timber to suit the peculiar specifications of contractors tendering for the work. The external walls will comprise panels in 4 feet wide modules, $3\frac{1}{2}$" thick with 20 gauge aluminium-alloy ribbed external sheeting bonded to $\frac{1}{4}$" resin bonded plywood and $\frac{1}{4}$" thick suitably faced resin bonded plywood internal lining. The 3" cavity will provide adequate insulation with 2" glass wool and 1" air space. Internal partitions will have linings of $\frac{1}{4}$" plywood veneered with decorative wood or formica as appropriate, with 3" insulated cavity.

Internal lining to engine house and general store will be 20 gauge aluminium alloy flat sheets bonded to plywood. The roof will be clad with 20 gauge industrial pattern aluminium-alloy corrugated sheets laid with adequate end and side laps suitably sealed. An under lining of $\frac{1}{2}$" thick insulation board will be fixed to the sheeting to increase insulation and render the roof virtually air-tight. Suspended ceilings will be provided to the dwellings only and will comprise fibre board panels with a 1" glass wool blanket superimposed.

The concrete floors will be laid with a waterproofing membrane and then surfaced with thermoplastic tiles or quarry tiles in the case of the engine room and general store.

(ii) Fittings

Kitchen fitments will include sink unit, storage cupboards, airing cupboard and paraffin-fired cooker. The cooker proposed is a "Kempsafe" model G.W.I. fitted with oil-firing equipment and designed to operate from a 24 volt battery. The fuel consumption is estimated at between 300 and 400 gallons per year. Good quality sanitary fittings including W.C. unit, bath and pedestal hand basin will be provided in the bathroom and toilet. A fitted cupboard will be provided for storage of general domestic utensils with access from the passageway.

Space heating of the dwellings is proposed and in view of the particular circumstances, a paraffin-fired "Valor" boiler will be installed to supply hot water to a low pressure central heating system serving radiators in all rooms and passageway. An indirect hot water cylinder will be fitted and an independent supply will thus be available to feed the kitchen sink, bath and hand basin. The boiler is fitted with a wick burner and no electric supply is necessary for its operation. The estimated annual consumption of fuel for this purpose is 1,000 gallons.

The estimated total annual consumption of 1,400 gallons of paraffin is to be compared with the present consumption of 12 tons of solid fuel at approx. £21. 0. 0. per ton. The new conditions, however, will provide complete central heating in addition to cooking facilities, and thus will prove more efficient and economic. In these present proposals the use of solid fuel is completely eliminated.

(iii) Electricity Supply

In the modern quarters proposed for the keepers it is considered appropriate and reasonable to instal electric lighting points in all the rooms, passageways and tower. Consideration has therefore been given to the possible use of electricity generated in Port Stanley, but it is understood that the cost of a suitable overhead feed line to the lighthouse would be approximately £6,000 and the present charge for electricity consumption is high. It will be more economic to provide local generation facilities, and accordingly it is proposed to install a $1\frac{1}{4}$ Kw, 230 volt, single phase diesel alternator set in the engine room/workshop. In addition to supplying lighting points, this generator would supply two electric motor driven water pumps and power to several 5 amp points. The electric cables and fittings required will be supplied in a prefabricated assembly so far as is practicable.

The generator will be automatic on demand and electric starting of the diesel engine will be operated from a 12 volt battery. This battery and two similar batteries will be supplied in a bank to cater for a 24 volt supply to the oil-fired cooker, in addition to engine starting.

Charging of the 12 volt starter battery will be carried out automatically by a charging circuit emanating from the D.C. excitation winding of the alternator. The 24 volt supply obtained by coupling two 12 volt batteries in series, will be maintained by a 24 volt charging unit, which will operate at night when the generator is normally running. It is assessed that the annual consumption of fuel oil for the generator will be 500 gallons, the total installation cost amounting to approx. £500.

(iv) Water Supply

The present arrangements for rainwater catchment from the dwelling roofs are inadequate and storage is limited to individual surface mounted small tanks sited immediately beneath the rainwater down pipes. It is proposed to construct two underground storage tanks to collect water from all the new roof area. The primary settlement tank will be of 1,000 gallons capacity, whereas the secondary settlement tank will hold 2,000 gallons. Water from the larger tank will be used for general domestic and drinking purposes and an independent supply from the smaller tank will be used for lavatory flushing and the central heating system. The water will be conducted into the storage tanks via pitch fibre pipes and pumped therefrom to two 100 gallon capacity asbestos cement header tanks sited in a tank room, over the new concrete steps in the tower access passage. In the event of there being no electric supply for the water pumps, or a breakdown of the pumps themselves, standby, hand operated semi-rotary pumps will be fitted.

(v) Drainage

Waste drainage from bathroom, W.C. and kitchen sink will be conducted via underground pitch fibre pipes to drain conveniently over the cliff edge into the sea. Paved areas will also be drained into this system and thus will provide a means of flushing to keep the drains clean.

(vi) Oil Storage

It is proposed to provide storage capacity for 1,000 gallons of paraffin to supply by gravity the central heating boiler and oil-fired cooker. This would be contained in two 500 gallon capacity welded steel cylindrical tanks, mounted on concrete plinths and sited as shown on drawing No. 612/3. These tanks should require re-filling no more than twice annually.

Diesel oil for the generator set will be stored in a 500 gallon capacity tank mounted on a concrete plinth immediately adjacent to the engine room. Oil would gravitate to a hand operated semi-rotary pump located in the engine room, which would be used to top up a 15 gallon header tank. The 500 gallon storage tank will not require re-filling more than once annually.

Copper piping, laid undergournd in 2" dia. asbestos-cement ducts, will be used to convey diesel oil or paraffin from the storage tanks to the various appliances.

c. Ancillary Works

The present arrangements for storage of paraffin for the navigation light comprise five steel storage tanks located in the base of the lighthouse tower. The keepers have to decant paraffin from these tanks and carry it up the tower stairs to top up the I.O.B. tanks. This situation can be improved upon and at the same time removal of storage tanks from the tower will lessen the risk of fire. It is proposed, therefore, to provide two welded steel tanks, each of 500 gallons capacity, sited adjacent to the tower above ground on a concrete plinth.

The existing tanks can be removed and disposed of together with the plinth on which they stand. From the new tanks a piped supply will be provided overhead on a suitable galvanised steel beam secured to the tower plating and propped at the other end by a galvanised steel tubular post. A hand operated pump will transfer the paraffin to a 20 gallon header tank to be installed in the Service Room, where decanting for topping up the I.O.B. tanks would in future be carried out. An overflow pipe from the header tank will be provided to discharge freely into a tundish sited adjacent to the paraffin pump in the tower base. This will drain back into the external storage tanks via the overhead steel pipe beam.

The station is at present supplied with 800 gallons of paraffin annually and the proposed storage arrangements will provide, therefore, ample capacity for one year's consumption. Future handling and storage of 40 gallon drums will be obviated as a result of this proposal.

Other proposals under this heading include improvements to cowshed and stockade, re-siting of flagpole, demolition of landing stage and jib crane and repairs to access road. These works have been adequately described in the context of this report under subsections 5, 6, 7 and 8 respectively.

D. EXECUTION & COST

The bulk of the building materials and fittings will be supplied from the United Kingdom, together with the oil storage tanks, diesel alternator, water pumps and adjustable shelving to the general store. It is envisaged that the site preparation works, including demolition, foundations, drainage works, underground water storage tanks, plinths for oil storage tanks etc., will be carried out entirely by the Public Works Department, Port Stanley, including the supply of most of the necessary materials. The erection of the new dwellings together with internal fittings could also be carried out using local labour, and it may not be necessary to send a skilled supervisor from the United Kingdom in this connection. If, however, skilled supervision is subsequently considered to be desirable, appropriate financial provision is made on the estimate of costs appended to this report. This estimate forecasts an overall expenditure of £10,000, without skilled supervision, and £10,500 if otherwise.

The scheme, as described in this report, is recommended for early implementation.

CAPE PEMBROKE LIGHTHOUSE

FALKLAND ISLES

PROPOSED WORKS FOLLOWING SITE SURVEY, 1959

ESTIMATE OF COSTS

		£
A.	LIGHTHOUSE TOWER AND EQUIPMENT	
1.	Remove disused flue pipe in lantern and stove in Service Room.	5.
2.	Fit flue patch plates to lantern roof and floor.	15.
3.	Remove worn and defective slam plate from lantern door to gallery and fit new brass plate.	5.
4.	Fit patch plate to exterior of crack in plate No.4 near tower base.	10.
5.	Cut out loose putty to interior of lantern glazing & re-putty with stop starra.	15.
6.	Take out one full diamond, with crack in corner, in lantern glazing and replace.	10.
7.	Take out 2 No. cracked panes of glass in tower windows and replace with 32 oz. glass.	2.
8.	Clean out exterior of certain joints in tower plating and re-seal with red lead and iron cement.	30.
9.	Remove paint and blisters from cast iron cill and straps at tower base, prime and paint 3 coats.	5.
10.	Remove defective rendering to concrete foundation block to tower and re-render with sand/cement.	35.
11.	Remove 8 No. horizontal optic guide rollers and fit new ones.	50.
12.	Fit new I.O.B. gauge in lantern.	3.
13.	Fit 2 No. micrometer valves to P.V.B. and return existing to Trinity House.	40.
14.	Fit new I.O.B. pump and return existing to Trinity House.	35.
	Carried to Summary	£ 260

£

B. NEW KEEPERS' QUARTERS

(i) Site preparation, foundations, drainage etc.

		£
15.	Demolish 2 No. stores and Elsan Closet.	40.
16.	Break up and remove concrete slab foundation and apron to ditto.	35.
17.	Take up and re-site telephone pole.	10.
18.	Excavate for and lay 12" thick reinforced concrete slab.	600.
19.	New concrete steps from dwellings to tower	125.
20.	Thermoplastic tiles to floors and steps.	170.
21.	Heavy duty quarry tiles to engine room and store floors.	80.
22.	3" Concrete in paths and aprons, laid on 3" clinker.	130.
23.	Underground water storage tanks with concrete bases, hollow block reinforced walls and reinforced concrete covers with access manholes.	340.
24.	Mass concrete plinths to oil tanks.	205.
25.	$\frac{3}{4}$" and $\frac{1}{2}$" diameter copper oil pipes laid underground in 2" dia. asbestos cement ducts, including terminal chambers.	25.
26.	Oil piping to tanks and control valves.	15.
27.	4" dia. pitch fibre drainage pipes, laid to an average depth of 2'6".	170.
28.	Inspection Chambers constructed with concrete bases and $4\frac{1}{2}$" hollow block reinforced walls, complete with C.I. inspection covers.	120.
29.	G.S.W. trapped yard gulleys, rainwater pipe gulleys and drain interceptor.	60.
30.	Concrete apron at drainage outfall.	10.
31.	Form heating ducts and concrete steps.	20.
32.	1" Dia. Polythene suction pipes from underground tanks to engine house.	12.
33.	2 No. $1\frac{1}{2}$" floating suction strainers complete with flexible pipes fixed in underground water storage tanks.	25.
34.	1" dia. copper water suction pipes inside engine house.	8.
35.	Demolish existing dwellings and stores after new quarters are erected. Dispose of materials and salvage best of R.P.M. sheets for re-use.	350.
36.	Break up foundations, steps etc. and level site as necessary.	100.
37.	Provide and fix 1 No. 500 gallon capacity welded steel diesel oil storage tank, including cradles.	120.
38.	Ditto. 500 gallons capacity, 2 No., but for storage of paraffin.	240.
	Carried to Summary	£3,010.

B. NEW KEEPERS' QUARTERS (Cont'd).

(ii) New Single Storey Dwellings — £

39. Prefabricated dwelling accommodation comprising kitchen, living room, three bedrooms, larder, W.C. and bathroom. Covered access to lighthouse tower and to detached engine room/workshop and general store. Buildings constructed of timber and aluminium alloy framing clad with aluminium-alloy side panelling and roofed with aluminium-alloy sheeting. Suspended ceiling and walls suitably insulated. Engine Room and general store lined internally with fire resisting material. Fittings include kitchen sink unit, fitted cupboards, bath, wash basin, low flush W.C. unit, larder shelving, electric wiring and internal plumbing. Price F.O.B. British Port. 2,950.

40. Connect passageway to lighthouse tower, including all necessary flashings. 50.

41. Erection complete of new dwellings including all external and internal decoration. 500.

42. Shipping and insurance costs for materials supplied from U.K. 600.

Carried to Summary £ 4,100.

(iii) Special Fittings in dwellings and engine room

43. $\frac{3}{8}$" dia. copper piping to "Valor" boiler including stop and fire valves. ..... 15.

44. $\frac{3}{4}$" dia. copper piping to diesel alternator in engine room. 10

45. 2 No. self priming electric motor driven water pumps in engine room. ..... 100.

46. 2 No. 1" C.I. semi-rotary pumps fitted as standby to above. ..... 20.

47. 1" copper piping in delivery pipes to water storage tanks. ..... 30.

48. 2 No. 100 gallon capacity asbestos cement water storage tanks. ..... 20.

49. $1\frac{1}{4}$ Kw 230 volt, single phase, 50 cycles, automatic on demand diesel alternator set complete with 15 gall. fuel tank, supply piping, exhaust silencer and piping, 12 volt starter battery and three years supply of spares, installed in engine room on prepared concrete plinth. ..... 250.

50. Timber work-bench in engine room fitted with vice. 40.

51. Adjustable steel shelving in general store. 80.

52. 3 No. portable fire extinguishers. 15.

53. "Kempsafe" oil-fired cooker, Model G.W.1. 150.

54. 3 No. 12 volt batteries to supply oil burner (24 volt supply). ..... 40.

£ 770.

/55.

		£.
B. NEW KEEPERS' QUARTERS (Cont'd)	Carried forward	770.
55.	24 volt battery charger in engine room.	20.
56.	"Valor" S.A. 35 paraffin-fired boiler in kitchen.	80.
57.	7 No. radiators, towel rail, steel piping and valves etc. in low pressure, central heating system.	220.
58.	4" dia. stove enamelled flue pipes to boiler and cooker.	20.
59.	Louvred "Colt" ventilator in engine room.	5.
60.	Electric motor operated "Colt" extractor fan, to ventilate engine room.	25.
	Carried to Summary	£1,140.

C. ANCILLARY WORKS

61.	2 No. 500 gallon welded steel tanks to store paraffin for P.V.B. Sited above ground on concrete plinth.	240.
62.	Mass concrete plinth to oil tanks.	120.
63.	Galvanised steel oil pipe overhead bearer.	20.
64.	Galvanised steel tubular post to support bearer.	15.
65.	¾" Copper pipe from tanks to pump and to header tank in Service Room.	30.
66.	1" Copper overflow pipe to tanks, including tundish in tower base.	30.
67.	Hand operated paraffin pump in tower base.	15.
68.	20 gallon paraffin header tank in Service Room.	10.
69.	Remove 5 No. paraffin tanks in tower base.	10.
70.	Break up plinth to tanks and dispose of material.	10.
71.	Strip sheeting off cowshed, repair framework and re-sheet with salvaged R.P.M. sheets.	30.
72.	Remove rough straw and mud fence to cowshed stockade, and dispose of materials.	10.
73.	Reinforced concrete post and five wire fence to new boundary of stockade, including 10 ft. wide five barred gate and 4'6" wide wicket gate.	120.
74.	Take down and re-site flagpole, including necessary repairs to tabernacle and new concrete foundation blocks.	70.
75.	Demolish existing disused landing stage and dispose of materials	30.
76.	Demolish existing 20 cwt. jib crane & dispose of materials.....	40.
77.	Repairs to access road from Port Stanley.	100.
	Carried to Summary.....	£ 900.

SUMMARY OF EXPENDITURE

		£
SECTION "A" LIGHTHOUSE TOWER & EQUIPMENT		260.
SECTION "B" NEW KEEPERS' QUARTERS		
Sub-section (i) Site Preparation, foundations etc.	3010	
" (ii) New Single Storey dwellings.	4100	
" (iii) Special fittings in dwellings and Engine Room.	1140	
		8250.
SECTION "C" ANCILLARY WORKS		900.
Contingencies		590.
Total Cost		£10,000.

Note: If erection of the new dwellings is carried out under skilled supervision supplied from the U.K. Item No. 41 in Estimate will be increased to £1,000, and the overall cost will become £10,500.

PHILIP W. HUNT, M.I.C.E.,

Engineer-in-Chief.

The Corporation of Trinity House,
Tower Hill,
London E.C.3.

(11)

(12)

FALKLAND ISLANDS

MENGEARY POINT LIGHTHOUSE

Report following survey on 6th May, 1959.

1. LOCATION

The lighthouse is situated at Mengeary Point, East Falklands, and serves as a harbour light for shipping entering and leaving Stanley Harbour, and also a local navigation light for small coasters visiting camps around the islands. It is the Northern harbour entrance light - Cape Pembroke serving as the Southern light.

2. GENERAL DESCRIPTION

The lighthouse, depicted on Plates 11 and 12, comprises a steel lattice tower 44 ft. high from ground level to underside of lantern, surmounted by a lantern in which is housed an acetylene open flame burner, which exhibits a character of two white flashes every seven seconds. Operation of this flasher is by sun-valve located on the lantern roof.

Acetylene gas is stored in six accumulators (A.50) housed in a steel cabinet situated at the base of the tower, and the gas is piped therefrom to the lantern. Immediately adjacent to the tower is a small timber shed for the Attendant's use, and which also houses one reserve gas accumulator.

3. TOWER

The tower is of mild steel lattice construction with four corner legs bolted down to concrete foundation blocks by two 2" diameter holding down bolts per leg. The structural members are generally of angle section, the legs being double angles battened, and connections are riveted, or bolted. The whole of the steelwork is in an advanced stage of corrosion and many of the structural members are so reduced in effective cross sectional area that over stressing to serious proportions must obtain when strong wind forces are in action. The access ladder is also of mild steel and is attached to the tower at each level of cross bracings. The degree of corrosion, apart from other considerations, means that access is dangerous. No guard hoops are provided to the ladder and no intermediate platform is fitted. The lantern gallery steelwork and floor plating is in a very bad and dangerous condition. There is evidence of lack of adequate maintenance or protection by regular painting.

4. LANTERN

The lantern murette, glazing astragals and roof are of mild steel but apart from local areas of corrosion these are in fair condition, although rust removal, priming and painting is required urgently, to arrest further corrosion. Certain of the glazing capping strips are loose, the bolts having loosened and, in some instances, fallen out. The lantern glazing comprises 15 panes, twelve of which are cracked, and in two of these there are holes. The glazing is generally in a deplorable condition, although spares are housed inside the lantern, comprising one large and three small panes, all of which are serviceable. The sun-valve, which is fixed to the lantern roof by a steel bracket, appears to function but the bracket and gas piping are in bad condition.

5. OPTIC AND FLASHER

The optic is a 500 m.m. diameter drum lens, and the glass and gunmetal framing are dirty but in good condition. The flasher is an A.G.A. reference KK130/81095 T130/9964, and it would appear

that it was last serviced in 1936. A 25 litre burner is fitted and the flasher unit as a whole is dirty but evidently in a serviceable condition.

6. ACETYLENE CYLINDER CUPBOARD

This cupboard is of mild steel and is fixed to the tower steelwork at the base. Housed inside are 6 No. A50gas accumulators, which are all coupled to one common supply line. The cabinet is severely corroded and the pipework and unions are also corroded and in a bad condition.

7. RECOMMENDATIONS

The general condition of the steel tower, access ladder, lantern gallery and railings is such that any attempt to repair or renew sections of the steelwork would be extremely difficult and definitely uneconomical. The structure is considered to be dangerous and unsafe, and complete replacement is considered to be the only satisfactory solution. The lantern, however, together with the optic and flasher, can reasonably be salvaged and incorporated in any new proposals, which might take the form of a tubular steel tower, or perhaps precast concrete. New storage arrangements would also be necessary for the acetylene accumulators and this could take the form of a cabinet constructed in steel or timber. If mild steel is entertained for the new construction, all such material should be galvanised. Although the flasher is serviceable it is recommended that a replacement unit be provided immediately by the A.G.A. and the present one returned to them for full overhaul.

Finally, it is suggested that perhaps when the new tower is erected, maintenance should be carried out at more frequent intervals in order that deterioration of the materials will not reach the stage of the present tower.