

C O P Y

PANAMA CANAL COMPANY
CANAL ZONEBalboa Heights, C. Z.
October 22, 1956

MEMORANDUM TO SUPERINTENDENT OF STOREHOUSES:

Red Lead

1. Reference is made to your memorandum dated April 20, 1956 to the Designing Engineer on the above subject. The following report is furnished in accordance with your request.

2. Paint and painting are important items in our annual budget. With the high humidity, temperature, and precipitation conditions that prevail in the Canal Zone many paints fail in much less time than might be considered a reasonable life expectancy under more favorable climatic conditions. Until recently it has been the practice to paint ferrous metal roofs with an iron oxide paint (Federal Specification). Although such paint might normally be expected to give several years of service, cases of failure in a year or so were common. Some of these failures are probably due to improper preparation of surface. However, it is considered that the straight iron oxide paint might not be the most suitable paint for its intended usage. We are now using an iron oxide paint containing zinc-dust, zinc-oxide and aluminum powder with what appears to be improved results. As this paint has been in use for only about two years we are presently unable to fully evaluate its worth.

3. The following exterior roof paint is applied over our roofs after they have been primed with zinc-dust, zinc-oxide for galvanized surfaces and red lead for non-galvanized metal surfaces.

<u>Pigment not under 58% consisting of:</u>	
Synthetic Iron Oxide (calculated as Fe_2O_3)	55 to 65%
Zinc Oxide	20% minimum
Zinc Chromate	10% minimum
Aluminum Powder (leafing type)	5% to 7%
<u>Vehicle not over 42% consisting of:</u>	
Non-volatile	75% minimum
Linseed oil (TT-O-369)	65% minimum
Alkyd Resin (linseed oil derivative, phthalic anhydride content 30 to 40%)	20% minimum
Tung Oil (gas-proofed)	15% minimum
Volatile & Drier content	25% maximum
Water not over	0.5%
Coarse particles (325 sieve) not over	3.5%
Dry not over	18 hours

4. The principal use of red lead paints in the Maintenance Division is the painting of steel reservoirs in the Atlantic Area. This use is broken down into two principle classifications, namely interior and exterior. We have not had long experience with the use of red lead primers and paints in the interior of the steel reservoirs, since a system of cathodic protection was in service until about seven years ago.

5. In the painting of tank interiors we have been using paint system No. 3 in Table 10 of Volume 2 of the Publication Systems and Specifications prepared by the Steel Structures Painting Council. This system is based on the use of red lead

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paints meeting the requirements of Federal Specification TT-P-86a, Type IV. Two coats of red lead are applied to the sand blasted bare metal with an 18 hour minimum drying period after each coat. A third coat of aluminum powder and phenolic resin varnish is applied as a finish coat.

6. For use in painting exteriors we have used a three coat system consisting of a first coat of linseed oil--red lead primer meeting the requirements of Federal Specification TT-P-86a, Type I. The linseed oil primer is used for the first coat because of its superior penetrating and adhesive qualities. This is followed by an extended drying period after which a coat of phenolic red lead primer (TT-P-86a Type IV) is applied and allowed to dry for a minimum of 18 hours. A finish coat of aluminum powder and phenolic resin varnish is used.

/s/ E. M. Browder, Jr.

E. M. BROWDER, JR.
Acting Engineering and Construction Director