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AUDITOR  
GOLDEN GATE BRIDGE  
AND  
HIGHWAY DISTRICT

THE GOLDEN GATE BRIDGE

REPORT ON COLOR AND LIGHTING

M O R R O W     &     M O R R O W

ARCHITECTS

De Young Bldg.     San Francisco  
Also 301 Lenox Avenue - Oakland

April 6, 1935.

To the Honorable Board of Directors,  
Golden Gate Bridge and Highway District,  
San Francisco, Calif.

ATTENTION OF THE CHIEF ENGINEER

Gentlemen:

Acting on authority of the agreement between ourselves dated April 17, 1934, and under the direction of the Chief Engineer, I have since the above-named date been making special studies of the color and decorative illumination for the Golden Gate Bridge. Reports and communications made from time to time to the Chief Engineer have kept him informed of the progress of this work.

I have the honor to transmit herewith my final report and conclusions resulting from these studies.

Respectfully submitted

(SGD) IRVING F. MORROW

IRVING F. MORROW  
Consulting Architect.

REPORT ON COLOR AND LIGHTING FOR THE  
GOLDEN GATE BRIDGE, SAN FRANCISCO

I

COLOR

A - GENERAL POSITION - The following study is made solely from the point of view of the appearance of the bridge, by itself and in relation to its setting. No investigation has been made of the physical properties of paints or of their durability.

The color recommended is undoubtedly not the cheapest one that could be chosen. The significance of the result to the community is far too great to warrant basing decision on economy alone. Within reasonable limits economy will have to be considered. But the margin of difference between the cheapest thing and the right thing is not sufficient to justify jeopardizing a project of this magnitude.

B - IMPORTANCE OF COLOR - It is well recognized that the color of a structure has important influence on its appearance and on its relation to its surroundings. In the present instance this subject is of particular importance for two reasons -

(1) - The Site - The Golden Gate is a scenic feature which demands all possible respect because of (a) its intrinsic beauty; (b) its great renown; and (c) its strong and long-standing sentimental attachment in the minds of inhabitants of the San Francisco Bay region. Many people, sincerely believing that a bridge must of necessity mar this landscape, opposed bridging the Golden Gate for no other reason. Poorly chosen color may actually create disharmony between the structure and the site.

(2) - The Bridge - The design of the Golden Gate Bridge is generally recognized as being exceptionally expressive and imposing. Color will be an integral factor in the final effect. Poorly chosen color may (a) fail to enforce important aspects of form; (b) actually nullify important aspects of form; (c) materially reduce the apparent size of the structure.

C - GENERAL CONSIDERATIONS - Before coming to a discussion of particular problems and colors, it will be well to mention certain general considerations concerning color on the bridge.

(1) - Color and Shadows - Shadows are visible on surfaces of light and luminous color; invisible on surfaces of dark and dull color.

The bridge towers have considerable modeling, both in the breaks of the tower legs and on the plate enclosures over the struts. This modeling will become visible only as a result of the contrast of light with shade and shadow. If the color is luminous the modeling will count, or "read". If the color is dark the modeling will disappear and the structure will be apparent only as a silhouette.

(2) - Color and Scale - Luminous colors will increase the apparent size of the structure; in other words, enhance its scale. Dark and dull colors will reduce its apparent size; in other words, decrease its scale.

One of the most conspicuous and generally appreciated virtues of the design of the Golden Gate Bridge is a very unusual and exhilarating sense of scale. This is one of the rarest and most elusive qualities in architecture. It is an asset which should not be impaired.

(3) - Variety of Tone - In the Golden Gate Bridge we are dealing with unprecedented dimensions. The composition under study is about a mile and a half in length. To paint this great extent of structure in a uniform tone, as is commonly done, would result in monotony and impairment of scale.

Whatever the color chosen, several closely related tones should be used, according to the following general principle -

(a) basic tone - towers throughout their height, except diagonal bracing below deck.

(b) slightly darker than (a) - diagonal tower bracing below deck; stiffening trusses; floor framing; arch over Fort Winfield Scott.

(c) slightly darker than (b) - San Francisco approach viaduct; Marin approach viaduct; cables.

(d) slightly darker than (c), or a contrasting color - hand rail; electroliers.

(e) neutral gray - miscellaneous minor details to be "painted out", such as airway beacons; rails on tops of strut housings; etc.

The colors referred to in (a), (b) and (c) should vary no more than as related tones of the same color, sufficiently close together to give a sense of family unity. The exact relationship between them will be dependent on the particular color chosen for

(a). It is also impossible to determine precisely where in the scale of values the cable would come, without knowing the choice for (a).

This method of grading tones will avoid dispersion of interest equally over the entire mile and half of length, and will tend to focus interest at the important place; namely at the center.

The importance of this modulation of color is a strong argument against the use of paints which are not subject to control of color.

(4) - Unity - In view of the tremendous scale and dignity of the Golden Gate Bridge, the preservation of unity is of prime importance. Small effects, cleverness, trickiness will prove disintegrating and unworthy. All treatment must aim at the utmost breadth and simplicity of effect.

D - APPROACH TO THE PROBLEM - Preliminary to discussion of particular colors, decision must be made on a matter of policy - Is it desired to emphasize the bridge as an important feature of the landscape, or to make it as inconspicuous as possible?

This report is frankly based on the conviction that the bridge should be made to count to the fullest possible degree. The reasons for this decision are as follows -

(1) - Impossibility of Effective Elimination - While it is possible by color to vary the conspicuousness of the bridge within a considerable range, the idea that a structure of its magnitude and position can be effaced in any true sense of the word is an illusion. The attempt to do so, even if deemed desirable, would be bound to result in obvious failure. It may as well be recognized from the start that the bridge is certain to be prominent, and accept this as the basis of treatment without effort at self-deception.

(2) - Position - Many, perhaps most bridges, as far as appearance is concerned, are casually located; that is to say, there is for the eye no reason why they should not have been located here or there or almost anywhere else. The Golden Gate Bridge, on the contrary, is geographically "placed". Its position in the landscape is inevitable. This gives it an almost formal architectural relationship with its setting which not only justifies, but motivates a conspicuous treatment.

(3) - Harbor Gateway - Due in part to its location at the actual harbor entrance, in part to the geographical considerations brought out in (2) above, the Golden Gate Bridge will constitute in a very real sense the "gateway" to San Francisco harbor. This common expression, which is usually more or less symbolically employed, here becomes a literal description of the fact. This aspect also demands a conspicuous treatment.

(4) - Magnitude - The Golden Gate Bridge is one of the greatest monuments of all time. Its unprecedented size and scale, along with its grace of form and independence of conception, all call for unique and unconventional treatment from every point of view. What has been thus played up in form should not be let down in color.

(5) - Advertisement - All that has gone before points to an unparalleled opportunity to derive legitimate community publicity from the bridge.

E - THE PROBLEM - Following upon the decision to emphasize the bridge, the next question to arise is, What color or kinds of colors will accomplish this purpose?

To answer this question it is necessary to consider the typical atmospheric effects of the region.

(1) - Local Atmospheric Effects - During a considerable portion of the year, particularly during summer, the San Francisco Bay area is covered by high fogs and is relatively sunless. At these times the atmosphere is gray. In sunny weather the predominant color of bay and ocean is blue. In other words, the prevalent atmospheric colors are cool. A structure which is to be emphasized must appear in contrasting or warm colors.

(2) - The Color - Architects in San Francisco have consistently ignored the above facts and their implications. Except during the transitory Panama-Pacific International Exposition of 1915, local architecture has remained on the whole timidly colorless, hence without the accent and warmth which conditions call for.

The colors which meet the above requirements range through yellow, orange and red. Not all, however, are equally appropriate from other points of view. Yellow shades would lack substance; deep reds would be heavy and without luminosity.

Fortunately it is not necessary to make a decision on theoretical considerations alone, for there have been two practical demonstrations of the ideal color. During the erection of north tower, and again at the present moment with the south tower assuming form, observers from all walks of life have been universally impressed by the beauty of the structures in the shop red lead coat. This color is luminous, undergoes atmospheric changes with great beauty, is prominent without insistence, enhances the architectural scale to the utmost and gives weight and substance at the same time that it is light enough properly to register variations of shade and shadow. In short, it is the ideal color from every point of view, and is hereby recommended and urged as the most appropriate and satisfactory color for the finished bridge.

Referring back to the discussion of variation of tone in section C - (3) (Page 2), the final recommendation would appear as follows -

- (a) Orange vermillion, or the color of shop red lead paint.
- (b) Orange vermillion, slightly tinged with burnt sienna.
- (c) Burnt Sienna leaning toward orange vermillion.
- (d) Burnt Sienna.

F - COMMENTS ON THE SELECTION - Several comments are in order on this recommendation.

(1) Permanence - Objection has been raised that the colors here recommended cannot be obtained in permanent pigments.

Permanence of paint color under the very severe conditions of exposure obtaining at the bridge site is at best a relative conception. Probably no color exists which in the course of a year or even less will literally undergo no alteration. It seems reasonable to suppose that there must be pigments in the range of color selected which are sufficiently permanent for practical purposes. There is, however, but one way to determine the facts; namely, to make actual test exposures, as is now being done at Fort Winfield Scott. If these tests are sufficiently inclusive, final policy will have to be in reasonable conformity with the lessons there learned.

It may be noted that for over thirty years the Key system, under conditions approaching those at the bridge site, and with reasonable success, has been painting its boats a color closely allied to those here recommended for the bridge.

It is sometimes assumed that fading of color necessarily means inferiority of the paint as protection. There are two separate characteristics involved in a paint; the permanence of the film as a coating, and the permanence of the color of the coating. Deterioration of the two may be connected, but not necessarily so. A paint may possess satisfactory physical properties even though the color of the pigment accompanying it undergoes alteration.

The letter of Mr. Maynard Dixon attached hereto as Enclosure D brings up an interesting point in this connection. He recommends the use of red lead paint, even though its color is known to be impermanent; urging that the fading will be harmonious with atmospheric effects and that the irregular variation in tone due to repaintings will have positive value as picturesqueness. The point of view deserves consideration. It is true that the magnitude of the structure and the great distances separating its parts could absorb considerable of the kind of variation of tone and "weathering" that we admire in the great monuments of the past.

(2) - Uniqueness of Opportunity - While the design of the Golden Gate Bridge has qualities which would emerge to some degree through almost any color, no color will so enhance and enforce its majesty and exhilarating scale as orange vermillion. There will always be legitimate opportunities to paint bridges any of the alternative colors which can be suggested. An opportunity such as is offered here does not occur once in a generation.

The unprecedented opportunity for publicity was mentioned in D - (5) (Page 4). There are cities, not outside of California, which, far from permitting such an opportunity to slip, would go out of their way to make it.

(3) - Reflective Value of Illumination - From the point of view of illumination, which is discussed in part II of this report and here anticipated because of bearing on choice of color, orange vermillion will be less efficient than would be light gray or aluminum. The reflection factor of the former would probably be around one half of that of the latter.

This does not mean, however, that if the light paint were used, the same illumination could be obtained, with half the equipment or half the current required by the red paint. Due to the necessities of covering the tower with a series of beams of small spread, the same number of searchlights would be required; and the length of throw necessary would not permit reduction of power in proportion to the relative efficiencies in reflection. The current required for the light paint would probably be at least three-fourths that required for the red.

Furthermore, the color of the bridge is unhesitatingly put forward as of more importance than the illumination. If this possible economy in current consumption is a controlling consideration, then the recommendation is to abandon decorative illumination and preserve the right color.

(4) - Possibility of Change - Since we are concerned with paint, which under any circumstances must undergo periodic replacement, no decision is irreparable. For either practical or aesthetic reasons the color could with little difficulty be changed at any future time. It is therefore urged that, at least for the first painting, the recommendations above be followed. And once seen as here advocated, the desire and the means for perpetuating the effect are certain to be forthcoming.

G - ALTERNATIVES - Three colors appear as possible or likely alternatives to orange vermillion - black, aluminum and gray. Their characteristics should be briefly discussed.

(1) Black - Of all colors black is the most objectionable; in fact, from the point of view of appearance, it has no possible recommendation. The reasons for its unattractiveness are as follows -



(a) - Scale - It will reduce the scale or apparent size of the bridge more than any color.

(b) - Modeling - It will suppress modeling more completely than any color, reducing the towers to silhouettes.

(c) - Weight - Although it is a heavy color and weight is desirable, its weight is a dead weight incompatible with grace.

(d) - Variation - Variation of tone, as advocated in C - (3) (Page 2) is impossible.

(e) - Discord in Landscape - At any period of the year and under any atmospheric conditions it will be stubbornly inharmonious in the landscape.

(2) - Aluminum - Aluminum is unsuitable for the bridge for the following reasons -

(a) - Lightness - Proponents of aluminum paint adduce its beauty as seen on dirigible aircraft. The Particular beauty which it unquestionably has in such situations disqualifies it for the Golden Gate Bridge. An effect of bubble-like fragility and lightness is appropriate to a huge bulk floating in mid air. Nothing could be less appropriate to such massive, weight-bearing structures as the bridge towers. They will be deprived of substance and become deplorably "timmy".

(b) - Variation - Variation of tone, as advocated in C - (3) (Page 2) is impossible.

(3) Gray - The term "gray" does not identify a specific shade, but applies to the whole range of neutral tones varying from the blueish color known as "battleship gray" at one end to colors bordering on light brown at the other. Warm grays, that is to say, those which lean toward brown, will be preferable to cold grays, or those which lean toward blue. While gray offers no particular distinction, at the same time a well chosen gray is not open to any specific objection - beyond, perhaps, the very fact that it does offer no particular distinction. Warm gray is recommended as alternative, or second choice (a distant second) to orange vermillion, for the following reasons -

(a) Scale - While not conspicuously enhancing the scale, or apparent size, on the other hand gray will not impair it.

(b) - Modeling - In any reasonably light gray, shades and shadows will register and the modeling of the towers will "read".

(c) - Weight - For expression of solidity, gray is not disadvantageous.

(d) - Variation - Variation of tone, as advocated in C - (3) (Page 2) is possible.

(e) - Harmony with Landscape - Gray will be harmonious in the landscape - in fact, it is generally chosen because it is inconspicuous, hence not discordant.

H - MAKING OF SAMPLES - There is only one sure way to select colors for anything, and that is to see fairly extensive samples of the actual materials which are to be used, in the actual place where they are to be used. Matching of other materials or under other conditions, no matter how similar, presupposes powers of memory and imagination which are very rare and not safe to assume.

In other words, whatever color is finally determined upon, no sample should be approved until seen applied over a fairly large area on the structure itself.

The writer of this report trusts that it will be his privilege to make such final approval.

J - PUBLIC COMMENTS - During the construction of the Marin Tower of the bridge, and again with the San Francisco Tower assuming form, public recognition of the effectiveness of the red lead color has been very general, not only among artists, but among all classes of laymen.

Attached hereto are copies of eight letters to the writer of this report (Enclosures A to H inclusive), expressing opinions on the color of the bridge. These are of interest as including painters, sculptors, musicians, scientists, and members of the general public.

## II

DECORATIVE ILLUMINATION

A - GENERAL POSITION - The following study includes only decorative illumination on the bridge and approach viaducts. Roadway lighting, airway beacons and obstruction lights, and the illumination of the toll plaza are not considered.

The recommendations of this report constitute a minimum program. To compromise on lower standards or fewer parts would fall short of conveying the intended effect, and hence be wasteful. It is therefore recommended that if the scheme proposed is deemed too costly, decorative lighting be abandoned.

B - OBJECTIVES - Two important points must be kept in mind in lighting the Golden Gate Bridge; (a) the enormous size of the project - we are creating a composition in illumination about a mile and half in length, and 750 feet high at the highest points; (b) the tremendous scale and dignity of the project.

The first consideration requires considerable subtlety and variety in treatment. Uniform intensity on all parts must be avoided. Uniform distribution over a distance of a mile and half would seem too artificial for belief, and would hence compromise the effect of size. Similarly with the height of the towers. With tops illuminated as brilliantly as the bases, they would appear to fall within the range of ordinary elevations; if the tops practically disappear into the night, they will seem to soar beyond the range of illumination.

The second consideration requires the greatest simplicity and sobriety of means. Tricky, flashy or spectacular effects would be unworthy of the dignity and permanence of the bridge, and put it into the class of temporary expositions, or worse yet, of frivolous amusement parks.

The ideal animating these recommendations is so contrary to accepted objectives in illumination that it may be of service to point out the difference. It is common illuminating practice to seek both high intensity and uniform distribution of light. In this case we are seeking relatively low intensities and constant gradation of light. Illuminating problems are commonly approached in a spirit of virtuosity; that is to say, of exhibiting technical electrical resources as such. Virtuosity or display have no place here. The object is to reveal aspects of a great monument which are unsuspected under the conditions of natural, or day lighting. The above is said not in criticism of any particular individuals or projects, but by way of defining the present point of view.

C - THE PICTURE - An artist drawing a building defeats his purpose if every detail, regardless of importance, is represented with equal insistence. Artistic quality and increased verity are achieved by stressing the significant points and allowing the imagination to supply the minor ones. The illumination of the bridge is conceived in an analogous spirit.

The picture aimed at is as follows:- towers enveloped in a mellow glow at the bases and at tops practically disappearing into the night; cables suggested by diffusion from roadway lighting and from towers; anchorage merely suggested in position, not detailed in form; approach viaducts disappearing into the night; threading through all this the continuous horizontal line of diffusion from the roadway lighting.

In thinking of a given effect, a certain range of distance for the spectator must be assumed. In this discussion the bridge is thought of as viewed either from the roadway itself, or from vantage points within the city of San Francisco, up to a distance about equal to that of Alcatraz Island, or the habitual course of the Sausalito ferry boats on the bay. From the far side of the bay, in Oakland or Berkeley, it will doubtless appear very dimly lighted. On the other hand, lighting which would seem adequate from these great distances would be too brilliant at close range.

#### D - DETAILED REQUIREMENTS AND OBSERVATIONS -

The main elements to be considered are, (1) towers; (2) cables; (3) pylons and arch at Fort Winfield Scott; (4) San Francisco anchorage; (5) Marin anchorage; (6) San Francisco approach viaduct; (7) Marin approach viaduct; (8) roadway lighting; (9) airway marking. Following are the detailed requirements and special observations in regard to each:

(1) - Towers - The towers should be lit as one sweep from water to summit. From the bases to a point 40 or 50 feet above the roadway they should be enveloped in a mellow glow of moderate intensity. At this level the light should begin gradually to diminish in intensity until the tops are scarcely more than discernible.

Outside of the bridge no positions for lighting units exist which are similarly located with reference to each tower. As it is essential that the illumination of the two towers be identical, it follows that it must be done from the bridge itself.

The towers, however, cannot be successfully lit by lights placed at the offsets of the structure. This will be objectionable for two reasons; (a) When the source of illumination is so close to the surface lit, there is a sudden glare of light grading rapidly into lower intensity. This destroys the impression of solid substance and produces a disagreeable illusion of luminous

glass. Many existing illumination jobs demonstrate this error. (b) Lights at the offsets will create a fresh start at each setback, thus dividing the tower into five disjointed sections, like a mammoth notch grass.

The projecting sidewalk around the towers provides a favorable point from which to project light. It also forms an obstacle which cannot be passed, which necessitates handling the tower lighting in two units — from the sidewalk up; and from the underneath of the sidewalk down. The unit above the roadway will be handled in one throw of closely spaced searchlights with narrow angle of beam spread. The unit below the roadway will be lit by wide angled flood-lights throwing down from the under side of the sidewalk. These may be supplemented if necessary by additional flood-lights mounted on the top of the concrete pier. This method of handling the tower lighting has the distinct advantage of accessibility for maintenance.

As the light on the tower above the sidewalk will come from below, triangular shadows will develop at each offset on the outside, and above each portal housing on the inside. These will be incidental in nature and decorative in effect. Should any of them prove too strong, it is possible to attenuate them by weak local lights mounted within the shadows themselves. Only experiment can indicate whether this is necessary, and if so, just what. Wiring in the tower should provide for possible outlets at the offsets for this contingency.

Average illumination on towers - 5 foot candles.

Enclosure J shows location of units above the sidewalk at towers, as suggested by preliminary study. This indicates a possible 40 - 1000 watt searchlight at each tower. These lights will be mounted on electroliers made to take two units each, and designed in conformity with the other appurtenances of the bridge.

The towers below the roadway will each require about 30 - 1000 watt flood-lights.

(2) - Cables - At the center and ends the cables will pick up light from the roadway lighting, and toward the top they will pick up some from the tower lighting. This will probably be all that is required to suggest their lines. It is undesirable that they be uniformly lit throughout their length.

Under no circumstances should decorative outline lighting of any kind be tolerated on the cables.

(3) - Pylons and Arch at Fort Winfield Scott - These should be lit from each side. Illumination should be slightly lower in intensity than on the lower part of the towers. It should be strongest at the base and diminish a little toward the top; and should penetrate somewhat to the north and south cross surfaces.

With the San Francisco anchorage they will require about 120 - 1000 watt flood-light, which should be mounted on poles placed at an average of 100 feet from the surfaces to be lit. A distance much greater will be uneconomical; a shorter distance will make a sufficiently gradual graduation of light impossible.

Average illumination - 5 foot candles.

(4) - San Francisco Anchorage - Light should be stepped down a trifle in intensity from the pylons and arch strongest at the bottom and toward the bridge, and diminishing toward the top and away from the bridge.

Average illumination - 5 foot candles.

(5) - Marin Anchorage - Illumination should be slightly lower in intensity than on the lower part of the towers. It should be strongest at the base, and should reach the south and north faces. No illumination will be required on the west, because of its position close against the hill.

It will require about 20 - 1000 watt flood-lights, which should be mounted on poles, placed at an average of 100 feet from the surfaces to be lit, for the reasons named under (4) above.

Average illumination - 5 foot candles.

(6) - San Francisco Approach Viaduct - This should be visible at its junction with the anchorage, but practically disappear as it approaches the San Francisco abutment.

It will probably be sufficient to throw light along the start from the last flood-light on the San Francisco anchorage.

(7) - Marin Approach Viaduct - This should be visible at its junction with the anchorage, but practically disappear as it approaches the Marin abutment.

It will be sufficient to throw light along the start of this from the last flood-light on the Marin anchorage.

(8) - Roadway Lighting - While the roadway lighting is installed for practical purposes, it will have decorative value as well. The long line of yellow glow marking the roadway will serve as the one constant bond uniting the various parts of the structure, and diffusion from it will pick out many points of incidental interest. Many of these effects will be the more interesting for being accidental and uncalculated.

Considering the roadway lighting for a moment in its practical aspect, it may be remarked that one of the principal services of such lighting is the imposition of a definite sense of direction, particularly in a fog. With this in mind, consideration is recommended of a continuous white neon tube mounted on the top of the curb, in a pocket formed by a channel with in-turned flanges and an angle lip at the top. If this installation proves too costly, its purpose may be to some degree supplied by painting and maintaining the top of the curb white; although this device will doubtless be much less effective, due to the action of the sodium vapor light in destroying all colors.

(9) - Airway Marking - Information has not been furnished as to what airway lighting will be required by the Government. In addition to the beacons surmounting the towers, it is assured that obstruction lights will be required on the cables. None of this lighting, if properly handled, will have an appreciable effect on the decorative scheme. The greatest danger will be lights on the cables, which should be spaced as far apart as allowed, and made as inconspicuous as possible except from the air.

E - UNCERTAINTIES - Although illumination has been established on an objective basis, calculation depends to a large degree on factors determined by experiment and by experience. No precedent exists for lighting a structure of this kind and in the manner proposed. The formulae used with confidence in ordinary problems cannot be trusted to a similar degree under very different conditions. Before reasonably exact calculations could be made, the reflection factors for the particular colors to be used would have to be known.

Due to these facts, as well as to the fact that, as far as methods go, this is only a preliminary survey, the numbers of flood-lights named above are in the nature of the case only approximations, from which variation may ultimately be necessary.

Matters of policy still undetermined may also affect the illuminating problem in unforeseen ways.

For all these reasons, considerable experimentation will be required on the job. The adjustment of intensity of certain lights, of the exact positions of certain ones, and even decision as to whether certain ones are required, can only be determined by trial.

#### F - PRACTICAL CONSIDERATIONS -

(1) - Poles for Flood-lights - The distance indicated for flood lighting units on the San Francisco pylons, arch, and anchorage, and on the Marin anchorage, will probably place some if not all of them outside the right of way of the Golden Gate Bridge and Highway District. Permission will therefore have to be obtained for the installation of conduits and poles, and access thereto.

(2) - Equipment - No specific equipment is here recommended. In the difficult atmospheric conditions encountered, however, anything but first quality equipment will be poor economy. All lighting units should be copper or bronze.

G - COST - Cost of equipment and installation has been estimated at \$89,196.00 (See letter of Alta Electric and Mechanical Company, Inc., presented as Enclosure K). (For the word "pylons" in Paragraphs 1, 2 and 3 of this letter read "towers").

Cost of operation will be reduced to a low figure by the submission of a new rate schedule to the District (See letter of Pacific Gas and Electric Company presented as Enclosure L).



Dear Mr. Morrow -

I have been watching very closely the progress of the towers on the Golden Gate Bridge in its structural beauty its engineering and architectural simplicity - and of course its color that moves and molds itself into the great beauty and contours of the hills - let me hope that the color will remain the red terra cotta because it adds to the structural grace and because it adds to the great beauty and the colorful symphony of the hills - and it is because of this structural simplicity that carries to you my message of admiration in this note - this comes to you with my warmest thought and wishes -

I am

(signed) Beniamino Bufano

ENCLOSURE A

COPY

MILLS COLLEGE  
School of Fine Arts  
Art Gallery - Department of Art  
MILLS COLLEGE - CALIFORNIA

March 11, 1935.

Mr. Irving F. Morrow  
de Young Bldg.  
San Francisco, Calif.

Dear Mr. Morrow,

In answer to your question, what is the best color for the Golden Gate Bridge, I would say this:

At those times of day when the bridge is to be seen mainly as a silhouette, early morning before the sun strikes it, and late afternoon when the sun is about to set, it would not matter much what the color was. But, since these periods of day are relatively short, it seems to me that the bridge should be painted a color best suited to its appearance between the hours of eight in the morning and five in the afternoon, as well as at night.

As a point of aesthetics it would be essential that the color of the bridge did not tend to make it melt into the sky. To avoid this, certainly any colors similar to sky colors should not be used, such as gray or even aluminum. It would also be a mistake I feel to use black since then the bridge would be sombre and unfriendly, and most important, it would lose a great deal of beauty of pattern which a warm color would bring out.

It would seem to me then that a rich warm color would be the best for both day and night, especially since a warm color would make a more beautiful contrast to the cool colors of sky and ocean which form the greatest part of its background. I think this point was rather well illustrated during the P.P.I.E. when Mr. Maybeck had the doors of all pier sheds painted an orange red.

Very sincerely yours,

(signed) Warren Cheney

Warren Cheney, Lecturer in Art

ENCLOSURE B

COPY

SAN FRANCISCO CONSERVATORY OF MUSIC, INC.  
3435 Sacramento Street  
San Francisco

Telephone Number Walnut 3496

HONORARY DIRECTOR  
Ernest Bloch

CO-DIRECTORS  
Ada Clement  
Lillian Hodghead

BOARD OF TRUSTEES  
Selah Chamberlain  
Ada Clement  
Milton H. Esberg  
Lillian Hodghead  
Paul Shoup

March 2, 1935

Henry U. Brandenstein  
Attorney and Counselor

Mr. Irving Morrow,  
De Young Building,  
San Francisco, California

My dear Mr. Morrow:-

HONORARY ADVISORY BOARD  
Harold Bauer  
Ernest Bloch  
Carl Friedberg  
Alfred Hertz  
Joseph Lhevinne  
Bernardino Molinari

I am writing to you as architect of the Golden Gate Bridge to protest against having a black bridge on our side of the Bay as I see projected from the Oakland Bridge.

As a commuter from Mill Valley it has been a daily joy to me to see the beautiful red towers against the sky and Bay and I would like to put in a plea that that color be made its permanent color. Our Golden Gate with its marvelous variety of colors at sunset and sunrise is one of the joys of all true San Franciscans and one of the sights which visitors most comment upon. I believe these beautiful towers will enhance this if they are light in color and know that my opinion is shared by a large number of people who travel across the Bay.

Very sincerely yours,

(signed) Ada Clement

AC:CS

ENCLOSURE C

COPY

M A Y N A R D   D I X O N  
728 Montgomery St ; San Francisco : Telephone Davenport 6885

March 9, 1935.

Dear Morrow -

While this question of bridge color is up for decision I would like to write you personally what I wrote to the News: that if our bridges - and particularly the Golden Gate Bridge - are to appear the wonders of the world they are supposed to be and thereby fully perform their function as additions to and glorifications of the Bay Cities they should most certainly be painted an eye-filling color. If they are given a dark, neutral or receding tone the publicity - the "wonder" - part of that function will be largely defeated. The exact value of this eye-filling is hard to calculate, but that it has a great and real value has been fully proven by other cities that understand display advertising. I think this point should be urged upon the Bridge directors for careful, if not prayerful, consideration before final choice is made.

I understand that some objection is made to red lead because it changes color somewhat. From my point of view, as one whose business is paint and color, this fading is a gain in harmony of tone rather than a loss. It is Nature's method of bringing the raw paint into relation with its surroundings. The directors should not try to be smarter than God.

Yours,

(signed) Maynard Dixon

ENCLOSURE D.

COPY

SAN FRANCISCO CONSERVATORY OF MUSIC, INC.  
3435 Sacramento Street  
San Francisco

Telephone Number Walnut 3496

HONORARY DIRECTOR  
Ernest Bloch

CO-DIRECTORS  
Ada Clement  
Lillian Hodghead

BOARD OF TRUSTEES  
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Ada Clement  
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Paul Shoup

March 23, 1935

Henry U. Brandenstein  
Attorney and Counselor

HONORARY ADVISORY BOARD

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Josef Lhevinne  
Bernardino Molinari

Mr. Irving Morrow,  
De Young Building,  
San Francisco, California

My dear Mr. Morrow:-

This letter is an appeal to you as architect of the Golden Gate Bridge to use your utmost efforts to avoid having a black bridge, such as I see every morning when I commute from Mill Valley, on the Oakland bridge.

It is a source of joy to see these lovely red towers, as they now are, outlined against the hills of Marin and the ever changing sky.

I am sure I voice the sentiment of most commuters, as well as residents of San Francisco, in making this plea to you to have the bridge painted red.

Sincerely yours,

(signed) Lillian Hodghead

LH:CS

ENCLOSURE E

COPY

KENTFIELD  
MARIN COUNTY  
CALIFORNIA

Dear Mr. Morrow

For some time I have been wanting to express to you how fine the Golden Gate Bridge tower on the Marin Shore seems to me.

I have watched it from the Ferry and the city in almost every kind of weather and light, and find it superbly in harmony with the landscape both in design and color.

Now that the south tower is beginning to appear the beauty of that color of red lead has been brought home to me even more - in marked contrast to the drab color of the Carquinez Bridge and others about the bay.

Couldn't the Golden Gate Bridge be left in red lead or some finishing paint that approaches vermillion?

It would enhance the dignity of the great structure and harmonize it completely with its surroundings.

Very sincerely yours,

(signed) Robert B. Howard

February 21, 1935.

ENCLOSURE F

COFY

## UNITED STATES DEPARTMENT OF AGRICULTURE

## BUREAU OF PLANT INDUSTRY

Division of  
FOREST PATHOLOGY  
85 Second Street  
San Francisco, Calif.

San Francisco, Calif.  
February 23, 1935

Mr. Irving F. Morrow,  
Morrow and Morrow,  
deYoung Building,  
San Francisco, Calif.

Dear Mr. Morrow:

Will you permit me to discuss shortly a matter I am keenly interested in and which lies in your realm of work. I am referring to the choice of paint to be given to the Golden Gate Bridge. This bridge will change, fundamentally, the landscape values of the entrance to the Bay. The structure itself, with its gigantic towers, is not subordinate to the natural features of the two shores but dominates and even dwarfs the hills on both sides. Since this profound alteration affects one of the most famous land and sea scapes of the world the most careful thought should be given to the choice of color.

No one doubts that the economic aspects of so costly an item must be very carefully considered. On the other hand, a one-sided decision, based purely on cost, sins against the first principles of the preservation of our natural treasures. The Golden Gate Bridge is not, either in its future use or in its architectural treatment, a purely economic structure. It is perhaps the only one of the great bridges of the world in which the esthetic element is of paramount importance.

It is my understanding that black has been chosen for the painting of the bridge. From a purely economic standpoint the choice is undoubtedly a wise one. It is at the same time most objectionable from the esthetic viewpoint. The colossal structure will be made even more conspicuous. It will be heavy and ponderous and will necessarily lose all elegance of design it possesses.

Grey or aluminum, on the other hand, tends to lighten the bridge unduly and to give it a flimsiness out of keeping with its monumental character, quite apart from the fact that aluminum paint is economically not to

ENCLOSURE G

COPY

Irving F. Morrow - 2.

be recommended. Olive grey-green reflects the light poorly and will throw the bridge out of perspective with its surroundings.

Of the very limited range of possible colors there is one which, I feel sure, will bring out the inherent beauty of the bridge and at the same time will fit into the landscape. During the construction of the towers of the Golden Gate Bridge, as well as of the Bay Bridge, I was struck by the extraordinary beauty and richness in tone of the red lead. The tone is beautiful under all light conditions. It has the advantage of defining structural lines clearly and yet not obtrusively and of fitting harmoniously into sky, water, distance and the Marin hills, whether in their spring green or in their warm summer tones. If a paint of this value were applied, the Golden Gate Bridge would stand out against its surroundings without danger of ruining one of the most beautiful harbor entrances of the world.

Very sincerely yours,

(signed) E. P. Meinecke.

E. P. MEINECKE.

ENCLOSURE G

COPY



MRS. LESTER L. ROTH  
3355 Pacific Avenue  
San Francisco

Mr. Irvin Morrow,  
de Young Building  
San Francisco

Dear Sir:

The other day, I expressed admiration for the lovely color to which the red paint on the Golden Gate Bridge had faded; to Jane Berlandina Howard who in agreement, said you thought so too; and would I write and tell you. Here it is "We want red Bridges".

How many "seconds" do you need to put your "notion" through? Here are a few.

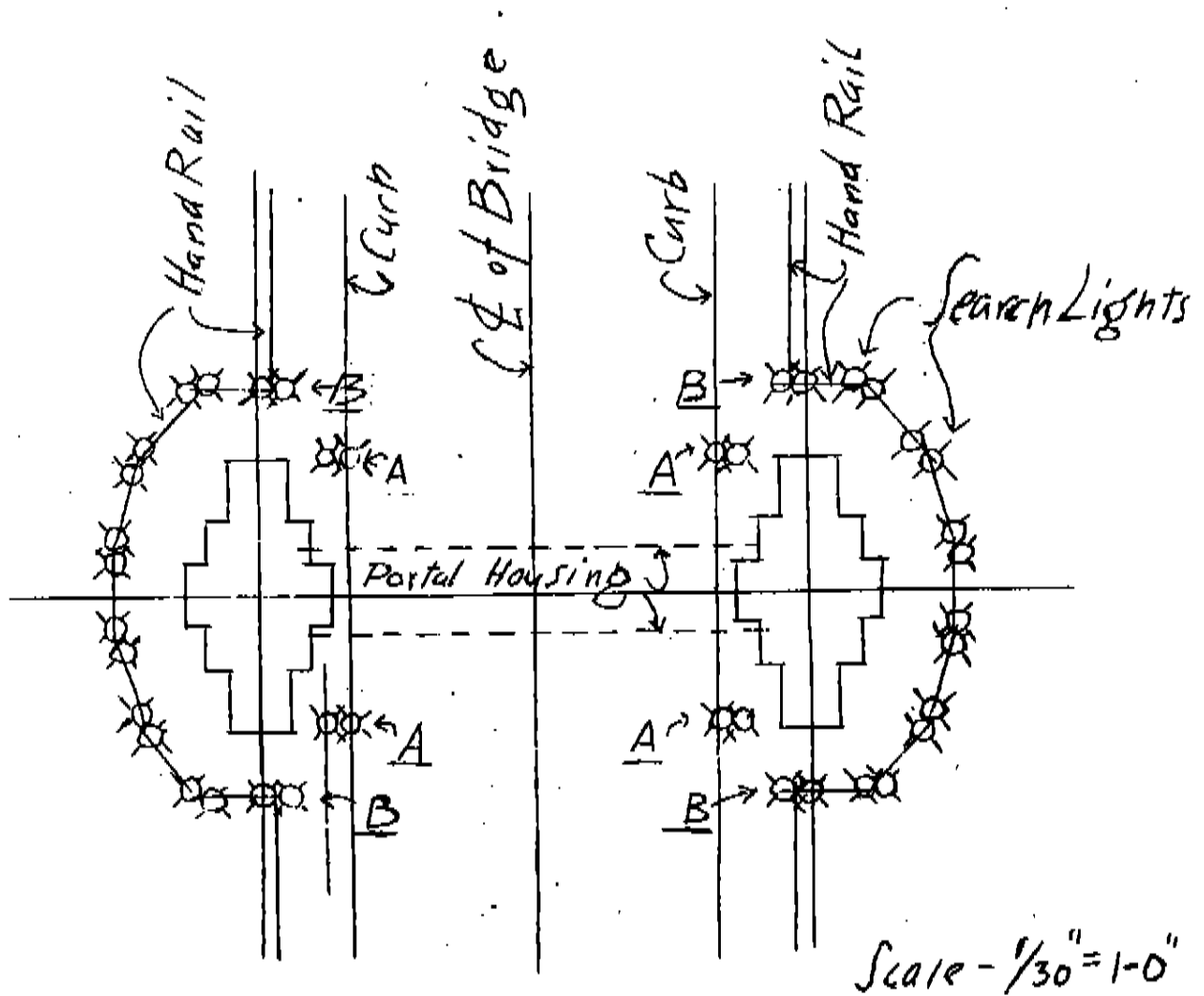
Cordially yours

(signed) Marion R. Roth  
& Lester L. Roth &  
Marion E. Roth  
Armenarie Geller

Saturday

ENCLOSURE H

COPY



## SEARCH LIGHTS AT TOWERS - GOLDEN GATE BRIDGE

Pairs of Search Lights at corners of sidewalk outside of Towers, and at points marked A.  
 Further study or experiment may show lights to be necessary also at points marked B

12-7-34

ALTA ELECTRIC AND MECHANICAL COMPANY, INC.  
467 O'FARRELL STREET  
SAN FRANCISCO, CALIF.

January 15, 1935.

Golden Gate Bridge and Highway District,  
111 Sutter Street  
San Francisco

Gentlemen:

As per your request, we are herewith rendering you a quotation covering the floodlighting of the pylons and anchorages for the Golden Gate Bridge, complete as per your specifications, as follows:

Item No. 1. The complete installation covering the pylons and anchorages and both the San Francisco and Marin shores, for the sum of EIGHTY NINE THOUSAND ONE HUNDRED NINETY SIX DOLLARS (\$89,196.)

Proposition No. 2. The illumination of the pylons only on both the San Francisco and Marin shores for the sum of FIFTY NINE THOUSAND SEVEN HUNDRED THIRTY FOUR DOLLARS (\$59,734.)

Trusting we may be favored with your valued order covering the same, we are

Very truly yours,

ALTA ELECTRIC AND MECHANICAL  
COMPANY, INC.

(Signed) By TOM J. BENNETT

TJB:H  
cc to Strauss Eng. Corp.

ENCLOSURE K

COPY

PACIFIC GAS AND ELECTRIC COMPANY  
245 MARKET STREET  
SAN FRANCISCO, CALIFORNIA

February 15, 1935.

Mr. Irvina F. Morrow  
1605 De Young Building  
San Francisco, Calif.

Dear Sir:

Since our verbal discussion concerning the installation of flood lighting equipment on the Golden Gate Bridge, we have made some studies to show the expected operating costs of such equipment.

The entire matter has been discussed with Mr. Bennett of the Alta Electric Company, who has estimated a load near 264 kw. to complete the flood lighting scheme as prepared by you.

Further studies have caused us to believe that it would be to the advantage of the Bridge District to have us alter the former special rate made in April, 1934. We are advising Mr. Reed of the Bridge District, through our regular channels that we will apply our regular lighting schedule L-1 less 10%, which will show a reduction in excess of 10% over the former rate offer when applied to the expected kw. hr. consumption of the bridge. We feel that this form of rate will be much more attractive for the operation of flood lighting than the special rate offer made in April.

The following estimates have been made to show the possible lighting costs for the operation of the bridge approaches, etc., together with flood lighting:

A. Main Bridge and Approaches (less flood lighting).

Maximum Demand - 350 kw.  
125,000 kw. hrs. per month.  
Cost L-1 less 10% - - - - - \$1,730.25  
Cost per kw. hr. - - - - - 1,385 cents

B. Main Bridge and Approaches plus flood lighting.

100 hours monthly use of flood lighting.

Maximum Demand - 600 kw.  
150,000 kw. hrs. per month  
Cost L-1 less 10% - - - - - \$2,236.50  
Cost per kw. hr. - - - - - 1.49 cents

PACIFIC GAS AND ELECTRIC COMPANY  
245 MARKET STREET  
SAN FRANCISCO, CALIFORNIA

Mr. Irvine F. Morrow February 15, 1935.

C. Main Bridge and Approaches plus flood lighting.  
200 hours monthly use of flood lighting.

Maximum Demand - 600 kw.  
175,000 kw. hrs. per month.  
Cost L-1 less 10% - - - - - \$2,461.50  
Cost per kw. hr. - - - - - 1.41 cents.

We hope this information will be helpful to you  
and will allow you to complete your flood lighting studies.

We will be very glad to cooperate with you and  
furnish any additional information that may be useful to you.

Yours very truly,

(signed) R.E.Fisher

Vice President in Charge of  
Public Relations and Sales

WRP:FC

ENCLOSURE L

COPY