

Public Works (189 D) Department.

G.O., No. 1094 W

DATED 2nd Mar 1880

3/5/94

[Despatch Abstract.]

Heliographic process of printing, Pro: Annual
Sept sanctioning with remarks the proposal
to supply plant and materials for the - to all
P.W. divisional offices and permitting officers
of that department to obtain non sensitized
paper ^{locally} whenever required Comt. with remarks
to officers of the P.W.D. for information & guidance.

280/14

2

3/5

Proceedings, Financial Department, sanctioning, with remarks, the proposal to supply plant and materials for the — to all Public Works divisional offices, and permitting officers of that department to obtain non-sensitized paper locally whenever required, communicated with remarks to officers of the Public Works Department for information and guidance.

GOVERNMENT OF MADRAS.
PUBLIC WORKS DEPARTMENT.

General.
Account.

Read—the following papers:—

G.O., No. 340, Financial, dated 1st April 1898.
" " 191, " " 25th February 1898.

Read—again the following paper:—

G.O., Mis. No. 153, Financial, dated 22nd February 1894.

Read—the following paper:—

Memorandum, in the Public Works Department, No. 854-D., dated 15th September 1893.

Read—the following papers:—

Letter from the Superintending Engineer, III Circle, dated 15th August 1893, No. 1295.

I have the honour to bring to notice, with reference to memorandum, Public Works Department, No. 2529-C., dated 6th July 1893, that though cyclostyles are not usually required in Executive Engineers' offices, the use of heliographic paper for copying plans would be of the greatest service.

2. When, in Vizagapatam, I had to introduce it in consequence of difficulties about draughtsmen in the Jeypore tract, and found it both economical and practical for every purpose.

3. The outfit necessary is not costly, and consists of a sheet of plate glass with a frame and blanket, Rs. 15, a roll of German tracing parchment, 40 inches wide and 33 yards long, Rs. 22, and a roll of Marion's ferro-prussiate paper, white lines on a blue ground, 39 inches wide and 33 feet long, Rs. 13-8-0, or Rs. 50-8-0 with a small addition for carriage.

4. Original plans can be drawn on the parchment as easily as on paper, and if the inking is done uniformly black and with care, each line comes out clear.

5. The plan once drawn on the parchment, any number of copies required can be made on ferro-prussiate paper by an office peon in 15 minutes each on a sunny day, to the great relief of the draftsman and economy of time consumed under present arrangements in mere hand-copying.

6. As a rule, in the case of works to be given on contract, besides the original paper-drawing which cannot well go out of the Executive Engineer's office, a tracing has to be made for the sanction of Government, and after sanction, at least two more ought to be prepared—one for the contractor and another for the Sub-Divisional officer.

7. If this is not done, inconvenience and defective check are risked.

8. As a specimen of these heliographic copies, I enclose that of the site plan of Gooty taluk catcherry made here.

9. I have also recommended the Executive Engineer, Cuddapah, to employ this system in the many drawings he has now to prepare in a limited time for letting out the contracts for the Sagilérú scheme masonry works.

(Signed) A. T. FRASER, Col., R.E.,
Superintending Engineer, III Circle.

Memorandum to the Superintending Engineer, III Circle, dated 24th August 1893, No. 2931-C.

With reference to letter from the Superintending Engineer, III Circle, No. 1295, dated 15th August 1893, the undersigned has the honour to point out that paper for the ferro-prussiate process of copying plans is already authorized for supply to the Public Works Department and can be obtained by officers of the department by indent on the Superintendent of Stationery—*vide* page 17, Appendix A to the Stationery rules.

2. With regard to the outfit necessary for carrying out the process, the Superintending Engineer is requested to submit a clear specification of the articles required in view to the sanction of Government being obtained to their inclusion in the list of stores authorized to be supplied to the Public Works Department by the Superintendent of Stationery.

(Signed) J. HANNAN,
Ag. Chief Engineer, P.W.D.,
General Branch.

Letter from the Superintending Engineer, III Circle, dated 18th August 1893, No. 1323.

In continued reference to the subject of heliographic copying—this office No. 1295, of August 15th, current—I have the honour to enclose the site plan of the Anantapur Collector's residence done in black lines by the ferro-gallic process.

2. The ferro-gallic paper is obtained in rolls of 20 yards by 40 inches for Rs. 18 per roll.

3. With ten minutes' exposure in sunshine it is developed in a bottle of 1 oz. gallic acid and 1 oz. common alum to a gallon of water and then washed in plain water.

4. The black lines on a white ground are more pleasing than the crude blue of ferro-prussiate paper and trouble and cost are not very different.

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A roll of tracing vellum, 40 inches wide and 33 yards long.

A roll of Marion's ferro-prussiate paper, ready sensitized, white lines on blue ground, 39 inches wide and 33 feet long.

2. To give black lines on a white ground, the outfit is—

Plate glass, felt, and drawing-board ledged as before described.

A roll of tracing vellum.

A roll of ferro-gallic prepared paper, made in Germany, 40 inches wide and 20 yards long.

Four ounces gallic acid.

Four ounces alum.

A tin trough for developing in, say, 30 inches long, 4 inches wide at top, 2 inches wide at bottom, and 4 inches deep, with side supports.

(Signed) A. T. FRASER, Col., R.E.,
Superintending Engineer, III Circle.

Memorandum—No. 854-D., Public Works, dated 15th September 1893.

Copies forwarded to the Financial Department.

2. Paper for the ferro-prussiate process of copying plans is already included in Appendix A to the Stationery rules as an authorized article of supply to the Public Works Department. It is requested that paper for the ferro-gallic process may also be included, together with the outfit necessary in each case.

Offices of the Public Works Department will then be enabled to employ either process at discretion.

(Signed) J. HANNAN,
Ag. Joint Secy. to Govt., P.W.D.

To the Financial Department.

No. 1656.

Referred to the Superintendent of Stationery for remarks.

(By order.)

OOTACAMUND.
20th September 1893.

(Signed) A. T. PRINGLE,
Assistant Secretary.

From the Hon'ble Mr. W. P. AUSTIN, I.C.S., Superintendent of Stationery,
to the Chief Secretary to Government, dated Madras, 14th February 1894,
No. 188.

With reference to your endorsement, No. 1656, dated 20th September 1893, forwarding, for my remarks, the memorandum from the Public Works Department, No. 854-D., dated 15th September 1893 (herewith returned), requesting that paper for ferro-gallic process may be included in Appendix A to the Stationery rules as an article of supply to the Public Works Department, I have the honour to report as follows.

2. The Superintending Engineer, III Circle, states that the use of heliographic paper for copying plans has been found both economical and practical for every purpose. The materials required for the process for all the circles and the sub-divisions of the Public Works Department are given below, and their value is estimated at Rs. 8,012-9-2. It appears that the first five articles, valued at Rs. 6,766-13-0, will be required annually, and the remainder, valued at Rs. 1,245-12-2, once in ten years only:—

	RS.	A.	P.
Tracing vellum in rolls of 33 × 40, at Rs. 22 per roll; for 94 rolls ...	2,068	0	1
Ferro-gallic paper, black lines on white, roll of 20 yards × 40 inches, at Rs. 18 per roll; for 80 rolls ...	1,440	0	0
Marion's ferro-prussiate paper, roll of 20 yards × 40 inches, at Rs. 22 per roll; for 142 rolls ...	3,124	0	0
Gallic acid, at 4s. per lb.; for 40 lb. = 160s. ...	130	2	8
Alum, at 1s., for 7 lb.; for 40 lb. $\frac{4}{7}$ s. ...	4	10	4
Total ...	6,766	13	0

Materials required once in ten years—

Sheet of plate glass, 1 felt and 1 frame, 21 $\frac{1}{2}$ " × 27 $\frac{1}{2}$ " × $\frac{3}{4}$ ", at Rs. 15 for the lot; for 40 ...	600	0	0
Tin-developing dish, 34" × 24" × 2 $\frac{1}{4}$ ", at Rs. 1-8-0 each; for 40 ...	60	0	0
Zinc or vulcanite trough, Imperial size, V-shaped, 18s. each; for 40 = 720s., or £36 ...	585	12	2
Total ...	1,245	12	2

Total cost for the first year ... 8,012 9 2

For the succeeding nine years the cost will be only ... 6,766 13 0

3. If the Government is pleased to sanction the introduction of this new process of copying plans, &c., I would suggest that the officers of the Public Works Department be required, after a trial of a year or two, to report on the practicability and advantage of the new process and the savings resulting therefrom.

4. The articles will be included in the next indent on the Secretary of State, which is due to Government on the 1st March next, and will be supplied to officers as soon as they are received from England.

5. As I have had to obtain some more particulars from the Public Works Department regarding estimates of quantities and value of the required materials, there has been some delay in submitting my reply to the above reference from Government.

Order—Mis. No. 153, Financial, dated 22nd February 1894.

The proposal to include in Appendix A to the Stationery rules all materials necessary for the ferro-prussiate and the ferro-gallic processes of copying plans, as articles of supply to the Public Works Department, is approved.

2. The attention of the Superintendent of Stationery will be drawn to the alteration as regards the size of glass proposed in the letter from the Executive Engineer, Kistna Western division, dated 24th January 1893, No. 626.

3. Arrangements will be made in the Public Works Department for the report referred to in paragraph 3 of the Hon'ble Mr. Austin's letter of the 14th February.

4. The Superintendent of Stationery will note the necessary corrections to be made in the Stationery rules.

(True Extract.)

(Signed) J. F. PRICE,
Chief Secretary.

To the Public Works Department.
„ Superintendent of Stationery.

G.O., Mis. Nos. 381, 382, Financial, dated 14th May 1894.

Read—the following papers:—

From Colonel A. T. FRASER, R.E., Superintending Engineer, III Circle, to the Chief Engineer, Public Works Department, dated Bellary, 17th March 1894, No. 3180.

With reference to G.O., No. 563 W., dated 2nd March 1893, I have the honour to suggest that the India Office be moved to send out the heliographic printing paper and materials in quarterly instalments, as there will be great risk of deterioration if a year's supply is kept in stock in this country.

2. The demand can also thus be easier controlled, because the method can only gradually come into use as draftsmen get trained.

No. 1359-C.

Transferred to the Financial Department, with reference to the orders in that department, No. 153, dated 22nd February 1894.

(Signed) J. PENNYCUICK, Col., R.E.,
Secy. to Govt., P.W.D.

28th March 1894.

No. 654.

Referred to the Superintendent of Stationery for remarks.

(Signed) J. F. PRICE,
Chief Secretary.

4th April 1894.

From the Hon'ble Mr. W. P. AUSTIN, I.C.S., Superintendent of Stationery, to the Chief Secretary to Government, dated Madras, 23rd April 1894, No. 562.

With reference to the enclosed letter from the Superintending Engineer, III Circle, No. 3180, dated 17th ultimo, referred to me for remarks with your endorsement, No. 654, dated the 4th instant, I have the honour to state that only the articles noted in the margin are liable to deterioration, and they may be supplied in quarterly instalments as suggested by the above officer.

Ferro-gallic paper, black lines on white ground.
Marion's ferro-prussiate paper.
Gallic acid.
Alum.

The other articles—viz., tracing vellum, 40 inches, sheets of plate glass, felts, frames, tin-developing dishes, and zinc or vulcanite troughs—may all be sent annually as usual.

As this is the first year in which such articles have been indented for and as there is no stock of them in store, I request that the Director-General of Stores may be requested to despatch these also, with the first instalment of the former set of articles, to enable me to supply without delay the indents which may be received.

Memorandum No. 860.

The Superintendent of Stationery is requested to return the original papers referred to him under endorsement, No. 654, dated 4th April 1894.

1st May 1894.

(Signed) J. F. PRICE,
Chief Secretary.

From E. TURNER, Esq., I.C.S., Acting Superintendent of Stationery, to the Chief Secretary to Government, dated Madras, 5th May 1894, No. 636.

I have the honour to return the enclosed letter, No. 3180, dated 17th March 1894, from the Superintending Engineer, III Circle, as requested in your memorandum of the 1st instant, No. 860.

Order—Mis. No. 381, Financial, dated 14th May 1894.

The Under Secretary of State for India will be addressed in the sense of the letter from the Superintendent of Stationery, dated 23rd April 1894, No. 562.

(True Extract.)

(Signed) J. F. PRICE,
Chief Secretary.

To the Public Works Department.
" Superintendent of Stationery.

Letter—to the Under Secretary of State for India, Mis. No. 382, dated 14th May 1894.

In continuation of my letter of the 26th March 1894, No. 243, forwarding an indent for articles of stationery required for use in the Madras Presidency in 1895-96,

Ferro-gallic paper, black lines on white ground.
Marion's ferro-prussiate paper.
Gallic acid.
Alum.

I am directed to request that the marginally-noted articles required for the heliographic printing process may be supplied in quarterly instalments as there is a risk of deterioration if a year's supply is kept in stock in this country. The

other articles required for the same purpose, viz.—
Tracing vellum, 40", sheets of plate glass, felts, frames, tin-developing dishes, and zinc or vulcanite troughs may be sent annually as usual.

2. As this is the first year in which such articles have been indented for, and as there is no stock of them in store, I am to request that the second set of these articles may be despatched along with the first instalment of the first set.

(Signed) J. F. PRICE,
Chief Secretary.

Read—also the following papers:—

Memorandum, in the Public Works Department, dated 27th July 1897, No. 3345-C.

Read—the following papers:—

From the Superintending Engineer, I Circle, dated	8th July	1896, No. 255-Gl.
" " " " " "	1st August	" " 306-Gl.
" " " " " "	31st July	" " 1120-K.W.
" " " " " "	21st September	" " 1793-W.
" " " " " "	23rd August	" " 420-W.
" " " " " "	27th July	" " 205-W.
" " " " " "	1st October	" " 308-W.
" " " " " "	16th March	1897, " 466-T.C.
" " " " " "	3rd April	" " 1915-C.
Public Works Department Memorandum	" 7th "	" " 1281.
From the Consulting Engineer for Railways	" 6th "	" " 56.
" Consulting Architect to Government	" 15th "	" " 110.
" Chief Engineer for Irrigation	" 5th May	" " 26-E.W.
" " " " " "	" 15th "	" " "
" " " " " "	" 20th "	" " No. 517-K.N.
" Superintending Engineer, II Circle	" 1st June	" " 2743-C.
Office-note to the Chief Engineer for Irrigation	" "	" " "

Office-note from the Joint Secretary to Government, Public Works Department, Irrigation Branch, to the Secretary to Government, Public Works Department, dated 5th June 1897.

After reading the papers submitted with your office-note No. 2743-C., dated 1st instant, I see no reason to alter the opinion I have expressed in my endorsement No. 26 E.W. of 5th May 1897.

Of the officers who have given the processes a trial, Major Baddeley, Superintending Engineer, II Circle, says it is most desirable that the use of the ferro-prussiate process should be extended. Captain Ellis, who has used the process extensively, reports considerable saving in labour of copying plans and still more in increased efficiency and convenience of control by enabling the Division office to supply a sufficient number of copies of plans of works under construction to persons employed on them. Colonel Boddy, Superintending Engineer, VI Circle, reports that the ferro-prussiate process gives excellent results, and that, by use of the process, subordinates on works will be better provided with copies of plans. The Executive Engineers of the Gódáviri Eastern and Western divisions report that the process would be of great use.

The officers who have not realized the full advantages of the process for the most part appear to consider it of little service unless numerous copies of plans are required; but I consider that for the great majority of works, if not for all, there should be at least two copies of the plan—one for record and one to go on the work. In many cases more are required—one for the subordinate in immediate charge of the work and one for the Sub-Divisional officer. If this system were generally ordered, it would hardly be possible for the plans of a whole system of works to be not forthcoming when required as has recently been the case. Numerous cases of plans of works of comparatively recent date being missing have occurred and this is probably attributable to the fact of the original plans being sent from the division offices to the works. The systematic record of plans of works has already been ordered by Government, but so long as original plans leave the division offices, it is next to certain that losses will occur.

Order—No. 340, Financial, dated 1st April 1898.

Communicated to the Public Works Department in continuation of G.O., No. 191, Financial, dated 25th February 1898.

(True Extract.)

(Signed) S. G. ROBERTS,
for Chief Secretary.

READ—the following paper:—

From the Superintendent of Stationery, Madras, dated 22nd March 1898,
No. 518.

In continuation of my letter No. 100, dated 26th January 1898, I have the honour to enclose, for information, a copy of a letter No. 138/D/8143, dated 21st February last, received from the Superintendent, Gun Carriage Factory, who reports that heliographic printing is extensively used in his department, and that very satisfactory results have been secured by obtaining non-sensitized paper from this office, and sensitizing it when required.

ORDER—No. 1094 W., dated 2nd May 1898.

Communicated to officers of the Public Works Department for information and guidance.

2. It will be seen that non-sensitized paper may be obtained, and sensitized locally by officers themselves, whenever required.

3. With reference to paragraph 4 of the letter from the Superintendent of Stationery, No. 100, dated 26th January 1898, printed above, officers of the department, who have been supplied with defective troughs, will report whether the latter can be repaired departmentally.

4. Directions for sensitizing will be furnished if required.

(True Extract.)

Under Secretary to Government.

To the Chief Engineer for Irrigation.
„ Superintending Engineers.
„ the Consulting Architect to Government.
„ the Superintendent of Works, Lighthouse Division.
„ the Examiner, Public Works Accounts.

Exd. W. D'Moss.

Papers to be read in Proceedings:—

Again G.O., dated

189 , No.

Again G.O., dated

189 , No.

Current No. 2731 of 1898, dated 25.2.98, from the Chief Secy—

„ „ 3241 „ 1898, „ 1-4-98 „ — do —

„ „ „ 189 „ „ „

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Ch. S. for Secy
Supt. Secy
Ch. C. Secy
S. of Secy
Secy Secy

4. Directions for sensitizing
will be furnished if
required
H.H.
27.4.98

[Eccl.]
1.
200-15-0-06.

Public Works
Ecclesiastical (1898) Department.

CURRENT No. 3241

From
The Finance Dept

Order

No. 340.

Dated 1st April 1898.

Received
Registered } 13.4.98

Enclosures

Spare copies

2831

SUBJECT.

Communicating letter from the Supdt of
Stationery Madras enclosing copy of a
communication from the Supdt of
Carriage Factory stating that the
Heliographic process of printing
is extensively used in his Dept
and that very satisfactory results
have been secured by obtaining
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o. 2549 129/11

PROCEEDINGS OF THE MADRAS GOVERNMENT.

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Communicated to the Public Works Department in continuation of G.O. No. 191, Financial, dated 25th February 1898.

(True Extract)

28. R. S. for Chief Secretary.

To

The Public Works Department. /
Superintendent of Stationery.

BACK PAPERS.

G.O.	No.	Department.	Date.
	563W	2-3-94	
	4022C	29-11-93	

FURTHER PAPERS.

G.O.	No.	Department.	Date.

Public works (1898) department

Current No: 2831

Government {1898} of Madras.

FINANCIAL.

Not Stamping

4-5

Recd. 28. 3. }
Regd. 28. 3. } 1898.

Enclosures 1 file sent to the Secy.

Spare copies 10.

G.O., No. 191, 25th February 1898.

FEBRUARY.

Heliographic Process of Printing.

Sanctioning the proposal to supply plant and materials for the — to all divisional offices in the Public Works department; permitting officers of that department to obtain non-sensitized paper locally whenever required; and requesting the Public Works Department to communicate with the Superintendent of Stationery in regard to the supply of guttapercha-lined wooden troughs.

22/2

GOVERNMENT OF MADRAS.

FINANCIAL DEPARTMENT.

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(Signed) A. T. FRASER, Col., R.E.,
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4

No. 191, FINANCIAL, 25TH FEBRUARY 1898.

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Copies forwarded to the Financial Department.

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To the Financial Department.

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Referred to the Superintendent of Stationery for remarks.

(By order.)

OOTACAMUND,
20th September 1893.

(Signed) A. T. PRINGLE,
Assistant Secretary.

From the Hon'ble Mr. W. P. AUSTIN, I.C.S., Superintendent of Stationery, to the Chief Secretary to Government, dated Madras, 14th February 1894, No. 188.

With reference to your endorsement, No. 1656, dated 20th September 1893, forwarding, for my remarks, the memorandum from the Public Works Department, No. 854-D., dated 15th September 1893 (herewith returned), requesting that paper for ferro-gallic process may be included in Appendix A to the Stationery rules as an article of supply to the Public Works Department, I have the honour to report as follows.

2. The Superintending Engineer, III Circle, states that the use of heliographic paper for copying plans has been found both economical and practical for every purpose. The materials required for the process for all the circles and the subdivisions of the Public Works Department are given below, and their value is estimated at Rs. 8,012-9-2. It appears that the first five articles, valued at Rs. 6,766-13-0, will be required annually, and the remainder, valued at Rs. 1,245-12-2, once in ten years only:—

	RS.	A.	P.
Tracing vellum in rolls of 33 x 40, at Rs. 22 per roll; for 94 rolls ..	2,068	0	1
Ferro-gallic paper, black lines on white, roll of 20 yards x 40 inches, at Rs. 18 per roll; for 80 rolls ..	1,440	0	0
Marion's ferro-prussiate paper, roll of 20 yards x 40 inches, at Rs. 22 per roll; for 142 rolls ..	3,124	0	0
Gallic acid, at 4s. per lb.; for 40 lb. = 160s. ..	130	2	8
Alum, at 1s., for 7 lb.; for 40 lb. $\frac{4}{7}$ s. ..	4	10	4
Total ..	6,766	13	0

Materials required once in ten years—

Sheet of plate glass, 1 felt and 1 frame, 21½" x 27½" x ¾", at Rs. 15 for the lot; for 40 ..	600	0	0
Tin developing dish, 34" x 24" x 2½", at Rs. 1-8-0 each; for 40 ..	60	0	0
Zinc or vulcanite trough, Imperial size, V-shaped, 18s. each; for 40 = 720s., or £36 ..	585	12	2
Total ..	1,245	12	2

Total cost for the first year .. 8,012 9 2

For the succeeding nine years the cost will be only .. 6,766 13 0

3. If the Government is pleased to sanction the introduction of this new process of copying plans, &c., I would suggest that the officers of the Public Works Department be required, after a trial of a year or two, to report on the practicability and advantage of the new process and the savings resulting therefrom.

4. The articles will be included in the next indent on the Secretary of State, which is due to Government on the 1st March next, and will be supplied to officers as soon as they are received from England.

5. As I have had to obtain some more particulars from the Public Works Department regarding estimates of quantities and value of the required materials, there has been some delay in submitting my reply to the above reference from Government.

Order—Mis. No. 153, Financial, dated 22nd February 1894.

The proposal to include in Appendix A to the Stationery rules all materials necessary for the ferro-prussiate and the ferro-gallic processes of copying plans, as articles of supply to the Public Works Department, is approved.

2. The attention of the Superintendent of Stationery will be drawn to the alteration as regards the size of glass proposed in the letter from the Executive Engineer, Kistna Western division, dated 24th January 1893, No. 626.

3. Arrangements will be made in the Public Works Department for the report referred to in paragraph 3 of the Hon'ble Mr. Austin's letter of the 14th February.

4. The Superintendent of Stationery will note the necessary corrections to be made in the Stationery rules.

(True Extract.)

(Signed) J. F. PRICE,
Chief Secretary.

To the Public Works Department.

„ Superintendent of Stationery.

G.O., Mis. Nos. 381, 382, Financial, dated 14th May 1894.

Read—the following papers:—

From Colonel A. T. FRASER, R.E., Superintending Engineer, III Circle, to the Chief Engineer, Public Works Department, dated Bellary, 17th March 1894, No. 3180.

With reference to G.O., No. 563 W., dated 2nd March 1893, I have the honour to suggest that the India Office be moved to send out the heliographic printing paper and materials in quarterly instalments, as there will be great risk of deterioration if a year's supply is kept in stock in this country.

2. The demand can also thus be easier controlled, because the method can only gradually come into use as draftsmen get trained.

No. 1359-C.

Transferred to the Financial Department, with reference to the orders in that department, No. 153, dated 22nd February 1894.

(Signed) J. PENNYCUICK, Col., R.E.,
Secy. to Govt., P.W.D.

28th March 1894.

No. 654.

Referred to the Superintendent of Stationery for remarks.

(Signed) J. F. PRICE,
Chief Secretary.

4th April 1894.

From the Hon'ble Mr. W. P. AUSTIN, I.C.S., Superintendent of Stationery, to the Chief Secretary to Government, dated Madras, 23rd April 1894, No. 562.

With reference to the enclosed letter from the Superintending Engineer, III Circle, No. 3180, dated 17th ultimo, referred to me for remarks with your endorsement, No. 654, dated the 4th instant, I have the honour to state that only the articles noted in the margin are liable to deteriorate, and they may be supplied in quarterly instalments as suggested by the above officer.

The other articles—viz., tracing vellum, 40 inches, sheets of plate glass, felts, frames, tin developing dishes, and zinc or vulcanite troughs—may all be sent annually as usual.

As this is the first year in which such articles have been indented for and as there is no stock of them in store, I request that the Director-General of Stores may be requested to despatch these also, with the first instalment of the former set of articles, to enable me to supply without delay the indents which may be received.

Memorandum No. 860.

The Superintendent of Stationery is requested to return the original papers referred to him under endorsement, No. 654, dated 4th April 1894.

1st May 1894.

(Signed) J. F. PRICE,
Chief Secretary.

From E. TURNER, Esq., I.C.S., Acting Superintendent of Stationery, to the Chief Secretary to Government, dated Madras, 5th May 1894, No. 636.

I have the honour to return the enclosed letter, No. 3180, dated 17th March 1894, from the Superintending Engineer, III Circle, as requested in your memorandum of the 1st instant, No. 860.

Order—Mis. No. 381, Financial, dated 14th May 1894.

The Under Secretary of State for India will be addressed in the sense of the letter from the Superintendent of Stationery, dated 23rd April 1894, No. 562.

(True Extract.)

(Signed) J. F. PRICE,
Chief Secretary.

To the Public Works Department.
Superintendent of Stationery.

Letter—to the Under Secretary of State for India, Mis. No. 382, dated 14th May 1894.

In continuation of my letter of the 26th March 1894, No. 243, forwarding an indent for articles of stationery required for use in the Madras Presidency in 1895-96,

Ferro-gallic paper, black lines on white ground.
Marion's ferro-prussiate paper.
Gallic acid.
Alum.

I am directed to request that the marginally-noted articles required for the heliographic printing process may be supplied in quarterly instalments as there is a risk of deterioration if a year's supply is kept in stock in this country. The

other articles required for the same purpose, viz.—

Tracing vellum, 40", sheets of plate glass, felts, frames, tin developing dishes, and zinc or vulcanite troughs may be sent annually as usual.

2. As this is the first year in which such articles have been indented for, and as there is no stock of them in store, I am to request that the second set of these articles may be despatched along with the first instalment of the first set.

(Signed) J. F. PRICE,
Chief Secretary.

READ—also the following papers:—

Memorandum, in the Public Works Department, dated 27th July 1897, No. 3345-C.

Read—the following papers:—

From the Superintending Engineer, I Circle, No. 255-GI., dated 8th July 1896.

" " I " " 306-GI. " 1st Aug. " " " II " " 1120-K.W., dated 31st July 1896.

" " III " " 1793-W., dated 21st Sept. 1896.

" " IV " " 420-W. " 23rd Aug. "

" " V " " 205-W. " 27th July "

" " V " " 308-W. " 1st Oct. "

Public Works Department Memorandum " 466-T.C. " 16th Mar. 1897.

From the Consulting Engineer for Railways, No. 1281, dated 7th April 1897.

" Consulting Architect to Government, No. 56, " 6th "

" Chief Engineer for Irrigation, No. 110, dated 15th April 1897.

" " " " 26-E.W. " 5th May "

" Superintending Engineer, II Circle, No. 517-K.N., dated 20th May 1897.

Office-note to the Chief Engineer for Irrigation, No. 2743-C., dated 1st June 1897.

Office-note from the Joint Secretary to Government, Public Works Department, Irrigation Branch, to the Secretary to Government, Public Works Department, dated 5th June 1897.

After reading the papers submitted with your office-note No. 2743-C., dated 1st instant, I see no reason to alter the opinion I have expressed in my endorsement No. 26 E.W. of 5th May 1897.

Of the officers who have given the processes a trial, Major Baddeley, Superintending Engineer, II Circle, says it is most desirable that the use of the ferro-prussiate process should be extended. Captain Ellis, who has used the process extensively, reports considerable saving in labour of copying plans and still more in increased efficiency and convenience of control by enabling the Division office to supply a sufficient number of copies of plans of works under construction to persons employed on them. Colonel Boddy, Superintending Engineer, VI Circle, reports that the ferro-prussiate process gives excellent results, and that, by use of the process, subordinates on works will be better provided with copies of plans. The Executive Engineers of the Gódávári Eastern and Western divisions report that the process would be of great use.

The officers who have not realized the full advantages of the process for the most part appear to consider it of little service unless numerous copies of plans are required; but I consider that for the great majority of works, if not for all, there should be at least two copies of the plan—one for record and one to go on the work. In many cases more are required—one for the subordinate in immediate charge of the work and one for the Sub-Divisional officer. If this system were generally ordered, it would hardly

be possible for the plans of a whole system of works to be not forthcoming when required as has recently been the case. Numerous cases of plans of works of comparatively recent date being missing have occurred and this is probably attributable to the fact of the original plans being sent from the Division offices to the works. The systematic record of plans of works has already been ordered by Government, but so long as original plans leave the Division offices, it is next to certain that losses will occur.

If it were desired to show a financial saving by the adoption of the process, the time of the Sub-Divisional officer and subordinates taken up in making copies of plans for themselves should be taken into account as well as the time taken up in correspondence and the making of new plans in cases of loss.

The ferro-prussiate process has lately been adopted in the Tank Restoration Scheme branch of my office and with a very little more labour and time than is required to produce one inked in copy of a plan on paper, two complete plans and one pencilled original design are produced.

The original design is drawn in pencil by the designing officer on section paper, corrected, altered if necessary, and approved. A tracing of this is made on cloth which takes no more time than to ink in the original drawing. From this tracing as many copies as may be required are made, each taking only a few minutes.

I think there can be no doubt whatever as to the advantages and eventual economy of the adoption of the ferro-prussiate process in Division offices. The objection of one Executive Engineer that the process required fine bright weather need not, I think, be taken much account of in this country, it is found that any properly drawn tracing makes a good copy and it is comparatively easy to make a sufficiently dark room.

As to the quality of the paper if the process were more generally used, this would no doubt be arranged. The Superintending Engineer, II Circle, reports that his last supply of paper from the Stationery office was good, and that used in the Tank Restoration Scheme office gives good results.

Note by the Chief Engineer, Public Works Department, dated 24th July 1897.

Submitted to Government.

2. On reconsideration, the undersigned agrees with the Chief Engineer for Irrigation that it would be advisable to supply all divisional offices of the Public Works Department with the apparatus and materials for heliographic printing and, if the proposal be approved, it is suggested that the notes on the subject by the Chief Engineer for Irrigation, dated 5th May and 5th June 1897, be printed for the guidance of officers of the department.

3. The Superintendent of Stationery should be instructed to obtain paper of the best quality to ensure the production of clear and durable prints.

4. It will be seen that no great saving in establishment can be anticipated, but when a number of copies of a plan are required, the employment of temporary tracers or draftsmen will be rendered unnecessary by the use of the process. It will further be of great advantage to Executive Engineers to be able to supply a sufficient number of copies of plans of works under construction to the persons employed on them, and to keep the original plans on record in the division office.

(Signed) D. McNEIL CAMPBELL, Col., R.E.,
Chief Engineer.

Memorandum—No. 3345-C., Public Works, dated 27th July 1897.

Transferred to the Financial Department, with reference to paragraph 3 of G.O., No. 153, Financial, dated 22nd February 1894.

(Signed) F. J. WILSON,
Under Secretary.

To the Financial Department, with file of papers.

From J. N. ATKINSON, Esq., I.C.S., Acting Superintendent of Stationery, to the Chief Secretary to Government, dated Madras, 26th January 1898, No. 100.

With reference to G.O., No. 1173, dated 1st September 1897, communicating, for remarks, memorandum, No. 3345-C., dated 27th July 1897, from the Public Works Department on the subject of heliographic printing, and G.O., R. No. 1692, dated 29th December 1897, I have the honour to report as follows.

2. With reference to G.O., No. 153, Financial, dated 22nd February 1894, the plant and other materials required for heliographic printing were obtained and supplied

Chief Engineer for Irrigation, Madras.	to the marginally-noted officers who had
Superintending Engineer, I Circle.	indented for them. From the reports
" " IV "	received, which are only from a few of
" " VI "	the above officers, it will be observed that,
Executive Engineer, Gódvári Western Division.	except in the Kistna Northern division
Executive Engineer, Gódvári Eastern Division.	office, the heliographic printing process
Executive Engineer, Vizagapatam Division.	was not much used partly owing to there
" " Ganjam	being no necessity for taking a large
" " Kistna Northern Division.	number of copies of plans and partly to
" " Kistna Western Division.	the inferior quality of the materials
" " Nellore Division.	supplied.
" " Salem	
" " Coimbatore Division.	
" " West Coast "	
" " South Arcot "	
" " Madura "	
" " Trichinopoly "	
" " Tinnevely "	
" " Bangalore "	
" " Water-supply Division.	
" " Light-house Division, Madras.	
Principal, College of Engineering, Madras.	
General Superintendent, Public Works Stores, Madras.	

3. It is admitted on all hands that the process saves much labour when a large number of copies of a plan is required to be taken, and I agree with the Chief Engineer for Irrigation in thinking that the plant and materials should be supplied to all the divisional offices, although there may be no appreciable financial saving in all cases. Many of the divisional offices have already been supplied with them and the seventeen sets, which are still in stock, may be issued to the remaining divisional offices.

4. In the above sets of apparatus which have been received from England, the gutta-percha-lined wooden troughs are slightly cracked and similar defects seem to have prevented some of the officers from trying the process. If these cannot be repaired departmentally, fresh troughs will have to be obtained and supplied.

5. As regards sensitized paper, there are 212 rolls of ferro-prussiate and 126 rolls of ferro-gallic paper in store. Of these, six rolls of the former and seven of the latter are apparently damaged. The condition of the remaining paper cannot be ascertained unless and until the cases are broken and the paper taken out for use. The paper is enclosed in tin rollers which are again packed in tin-lined wooden cases. As the paper is liable to be affected by exposure to light, the cases are not opened until the paper is actually required for issue. It was received in the years 1895 and 1896. Though carefully packed and preserved, the paper is liable to deteriorate from climatic influences. Under these circumstances, I would recommend, as suggested by the Executive Engineer, Tanjore division, that non-sensitized paper may be obtained and sensitized locally by the officers themselves whenever required.

ORDER—No. 191, Financial, dated 25th February 1898.

The proposal to supply plant and materials for the heliographic process of printing to all divisional offices in the Public Works Department is sanctioned. Officers will be permitted to obtain non-sensitized paper locally whenever required.

2. The Public Works Department will be requested to communicate with the Superintendent of Stationery in regard to the guttapercha-lined wooden troughs referred to in paragraph 4 of that officer's letter.

(True Extract.)

S. J. Roberts
for Chief Secretary.
21. 3. 98

To the Public Works Department. ✓
" Superintendent of Stationery.
" Accountant General.