No of Page : 46
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Tamil Nadu Archives

Government of Tamil Nadu

G.O. 605 W
Dt 13.3.1885

D.V

GOVERNMENT OF MADRAS.

PUBLIC WORKS DEPARTMENT.

Buildings and Roads.
Civil Works.

READ—the following letter from Colonel J. BEATTY, R.E., Superintending Engineer, IV Circle, to the Chief Engineer, Public Works Department, dated Coimbatore, 12th February 1885, No. 71 E.W.:—

I have the honor now to reply to your memorandum No. 2696 C., of 18th December 1884, regarding the Cruz Milagre dam and Cochin harbour. The delay in doing so has been due to the fact that the old records regarding the dam were in the West Coast division records at Calicut, and it has taken a little time to collect all the particulars.

2. The cross sections ordered in paragraph 12 of General Sankey's inspection notes of 16th February 1883 have been regularly taken and recorded; but I regret to observe that, by oversight, they have not been regularly submitted yearly to you. I now send you the copies furnished to me for May 1883, December 1883, June 1884 and December 1884. Those of December 1884 are the most reliable, as they were taken under the personal superintendence of the sub-divisional officer, Conductor Nicholson, and those of 1885 will be taken by the present sub-divisional officer, Sergeant MacAlister.

3. In his letter and statement of 9th instant, Lieut.-Colonel Ross Thompson gives the brief history of the dam that you called for, and particulars of the expenditure upon it.

4. The Cruz Milagre gap seems to have formed in 1862, and been closed by the dam in 1873-74 to prevent the silting of the channel to the harbour.

5. The original cost of the dam, according to accounts of 1870 to 1874, was Rs. 1,07,408. It was subsequently widened in 1878-79 at a cost of Rs. 3,219, and, by General Sankey's order, it was revetted on the lagoon side in 1883-84 at a cost of Rs. 1,871 (up to end of 1884). Repairs have also been done to it as follow:—

	RS.
1874-75	999
1875-76	571
1876-77	1,466
1877-78	252
1880-81	338
1882-83	1,360

6. The works ordered by General Sankey have been fully carried out and the Executive Engineer, who inspected the dam on 30th ultimo, considers it now "perfectly safe;" but as the sections show a tendency towards deepening of the river bed in front (*i.e.*, on the side of the backwater), he recommends "roughstone being dropped in and allowed to take its own angle of repose." I understand that some erosion is apparent at the toe of the revetment on the backwater side of the dam, and that, to prevent this slipping, about 2 cubic yards of stone per running yard should be dropped in along the toe of the revetment.

7. The lagoon is apparently being filled up gradually by silt brought in through the escape by the river floods, and also from drift sand from the sea beach; and this filling up is from the north towards the south.

8. As requested in paragraph 3 of your memorandum I return the "Survey of the Coast at Cochin," referred to in the first portion of General Sankey's note; the stone work of revetment and groynes specified in paragraphs 6 and 7 of that note has been fully carried out.

ENCLOSURE.

From Lieutenant-Colonel ROSS THOMPSON, R.E., Executive Engineer, West Coast Division, to the Superintending Engineer, IV Circle, dated Calicut, 9th February 1885, No. 67.

With reference to your memoranda Nos. 22 W.C. and 33 W.C., of 21st and 31st January 1885, respectively, I have the honor to report as follows.

In their report on the Cochin harbour submitted by the committee appointed under G.O., No. 2967, of 19th September 1868, the closing, by means of groynes, of the opening between the backwater and the sea, called the Cruz Milagre gap, which appears to have occurred in 1862, was recommended with a view (to use the words of the Government) "to prevent the ill-effects that the loss of water through that opening must sooner or later have on the scouring force of the current through the channel to the harbour" (*vide* G.O., No. 453, of 11th February 1869).

2. In pursuance of this recommendation an estimate of Rs. 31,600 was sanctioned in G.O., No. 2543, of 25th October 1870; but, after an outlay of Rs. 10,794 had been incurred in the collection of materials, the work appears to have been stopped. The reason for the cessation is not traceable from the records of this office.

3. Subsequently, Mr. Robertson, C.E., who had been deputed to inspect and report on the several harbours of India, suggested the desirability of attempting to close the gap by throwing out a groyne from its inner northern angle. This suggestion was adopted by Government in their order No. 1195, of 20th April 1871, and an estimate called for which was submitted for Rs. 8,662 and sanctioned in G.O., No. 1567, of 12th June 1871; but the materials intended to be used being found unsuitable (probably those collected under sanction of the estimate referred to above) a revised estimate for constructing the groyne was sanctioned in G.O. No. 3055, of 14th December 1871, and carried out at a cost of Rs. 24,302. In addition to this, an estimate of Rs. 15,277 was sanctioned in G.O. No. 1757, of 24th July 1872, for extending the above groyne and closing the gap; but from the report submitted by Captain H. W. Wood, R.E., Officiating District Engineer, Malabar, to the Chief Engineer, Public Works Department, No. A., dated 23rd April 1873, it would appear that only Rs. 7,309 were expended, the mode of closing the gap being abandoned, and another proposal to close it by means of a series of sand-bag groynes made by Colonel Farewell, Superintending Engineer, VII Division, being adopted; and, in accordance with this latter proposal, the dam was constructed and the gap closed, the work being commenced in 1872-73 and completed in 1873-74 at an aggregate cost of Rs. 72,318, against an estimate of Rs. 72,310 sanctioned in G.O. No. 388, of 14th February 1874, and G.O. No. 1377, of 22nd May 1874, for maintaining the perimeter of the gap, closing it and maintaining it until January 1884."

4. The occasions on which (so far as it has been possible to trace from the records of this office) the dam was in danger of being breached were, during the monsoon of 1874 (*vide* Mr. Executive Engineer T. D. Harris' report, submitted to the Chief Engineer with letter from the District Engineer, Malabar, No. 50, of 17th June 1874), when outlay to the extent of Rs. 1,000 was incurred against an estimate of Rs. 1,000 sanctioned in G.O. No. 1714, of 25th June 1874, and G.O. No. 2437, of 24th August 1874, for strengthening the dam both as regards damage that had occurred and that might have been expected, and during the monsoon of 1876, when an expenditure of Rs. 992 was incurred for emergent repairs to the dam against an estimate of Rs. 1,000 sanctioned in G.O. No. 916, of 17th March 1877; but the exact nature of the work done is not known, as neither the estimates nor specifications are forthcoming among the records of this office. A further strengthening of the dam was effected by widening it to 50 feet at top at a cost of Rs. 3,219 under the sanction accorded to the estimate of Rs. 3,290 in G.O., No. 321, of 12th August 1878.

5. The ordinary maintenance [illegible] to the dam have been done in the years [illegible], 1876, 1877, 1878, 1881 and 1883 at an aggregate cost of Rs. 1,635. Strengthening the revetment and tarring appear to have been the principal items of repairs.

6. A statement showing the different works done to the gap and dam, both original works and repairs, is enclosed.

7. The work recommended by Colonel Sankey, R.E., during his inspection of the dam in 1883, has been carried out as per estimate sanctioned in G.O., No. 3477 W., of 4th December 1883. The cross sections ordered by Colonel Sankey are also being duly taken. Those taken last, namely 11th and 12th December 1884, were submitted to you with Conductor Nicholson's report, bearing this office endorsement, No. 20, dated 10th January 1885.

8. I consider the dam *now* perfectly safe; but as the sections taken show a tendency towards deepening of the river bed in front of the dam, I would recommend roughstone being dropped in and allowed to take its own angle of repose along the front foot of the dam.

ORDER—dated 13th March 1885, No. 605 W., Public Works.

The Superintending Engineer, IV Circle, will take the necessary steps for the early execution of the work recommended in paragraph 8 of the Executive Engineer's letter.

(True Extract.)

(Signed) J. SHAW-STEWART, Colonel, R.E.,
Secretary to Govt., P.W.D.

To the Superintending Engineer, IV Circle, with survey map.
" Marine Department.

Exd. E. Fernandez.

Spare Copies

Govt. of (1885) Madras.

PUBLIC WORKS.

Dated March, 13th.

Recd. *Encl*

G.O., 13th March 1885, No. 605 W

MARCH.

Cruz Milagre Dam

Superintending Engineer to take t necessary steps for the early execution certain works required at the —.

605/8

Statement showing the different works carried out in connection with the Cruz Mil Gap

Year	Name of work	Estimate	Authority	Outlay New works	 Repairs	Remarks
1	2	3	4	5	6	7
1870-71	Closing the Milagro Gap. Cochin	31,500	G.O. No 2,543 of 25th Octr/70	10773 8 10	. . .	
1871-72 1872-73	Groynes at the Cruz Milagre Gap	24,824	Do No 3055 of 4th Decr 1871	24,301 8 7	. . .	
1873-74	Closing the Cruz Milagre Gap	72,310	Do No 1757 of 24th July 1872	72,313	. . .	
1874-75	Emergent repairs to the Cruz Milagre Dam	1,000	Do No 1714 of 25th June 1874 and No 2,437 of 24th Augt/74	" "	999 . .	
1875-76	Maintenance to the Cruz Milagre Dam	800	G.O. No 835 of 24th March 1875	" "	571 . .	
1876-77	Do Do Do	500	G.O. No 1369 of 1st June 1876	. . .	474 . .	
	Emergent repairs to the Cruz Milagre Dam	1,000	G.O. No 916 of 17th March 1877	" "	992 . .	
1877-78	Repairing and maintaining the Cruz Milagre Dam	485	G.O. No 1216 of 9th April 1877	" "	252 . .	
1878-79	Widening the Cruz Milagre Dam	3,260	G.O. No 3217 W of 12th Augt 1878	3218 10 9	" "	
1880-81	Maintenance to Cruz Milagre Dam	285	11/1880-81 Circle office Register	" "	338 7 4	
1882-83	Repairs to the Cruz Milagre Dam	1350	1/18[illegible]-83 Do	. .	1359 13 3	
1883-84	Revetting the Lagoon side of the Cruz Milagre Dam	1920	7/1883-84 Do	×1871 3 4	. . .	× Up to end of December 1884

(True Copy)

Executive Engineer's Office
Calicut 9th February 1885

J. Beatty
Colonel R.E.
Superintending Engineer 1st C.

(Sigd) Ross Thompson
Lieut-Colonel R.E.
Executive Engineer

Enc: 1/71/85
E.W.

11

605/5

No. 71/E.W.

Supg. Engineer's Office, 4th Circle.
Coimbatore, 12th February 1885.

From

The Supg. Engineer,
Fourth Circle.

To

The Chief Engineer,
Public Works Department.

Sir,

Enclosures 8
See the end
of this letter.

I have the honor now to reply to your Memo No. 2096 C. of 18th December 1884, regarding the Cruz Milagre Dam and Cochin Harbour. The delay in doing so has been due to the fact that the old records regarding the dam were in the West Coast Division records at Calicut, and it has taken a little time to collect all the particulars.

2. The cross sections ordered in para 12 of General Sankey's Inspection Notes of 16th February 1883, have been regularly taken

taken, and recorded, but I regret to observe that by oversight they have not been regularly submitted yearly to you. I now send you the copies furnished to me for

May 1883
December 1883
June 1884
& December 1884

Those of December 1884 are the most reliable as they were taken under the personal superintendence of the sub-divisional Officer, Conductor Nicholson, and those of 1885 will be taken by the present subdivisional officer Serjeant Macalister.

3. In his letter and statement of 9th Instant, Lieut: Colonel Ross Thompson gives the brief history of the Dam that you called for, and particulars of the expenditure upon it.

4. The bruz Milagre Gap seems to have formed in 1862, and been closed by the Dam in 1873/4×, to prevent the silting of the Channel to the harbour.

× 1873/74

5. The original cost of the Dam according to accounts of 1870 to 1874 was Rs: 1,07,408. It was subsequently widened in 1878-79, at a cost of Rs: 3219-, and by General Sankey's order it was revetted on the Lagoon side in 1883-84× at a cost of Rs: 1871. Repairs have also been done to it as follows:-

× up to end of 1884

	Rupees
1874-75	999
1875-76	571
1876-77	1,466
1877-78	252
1880-81	338
1882-83	1,360

6. The works ordered by General Sankey have been fully carried out, and the Executive Engineer, who inspected the Dam on 30th ultimo, considers it now "perfectly safe"; but as the sections show a tendency towards deepening

taken and recorded

deepening of the river bed in front, (i.e., on the side of the backwater) he recommends "rough stone being dropped in and allowed to take its own angle of repose". I understand that some erosion is apparent at the toe of the revetment on the backwater side of the dam, and that, to prevent this slipping, about 2 c. yards of stone per running yard should be dropped in along the toe of the revetment.

7. The lagoon is apparently being filled up gradually, by silt brought in through the escape by the river floods, and also from drift sand from the sea beach; and this filling up is from the north towards the south.

8. As requested in para 3 of your Memo, I return the "survey of the Coast at Cochin" referred to in the first portion of General Sankey's

Sankey's

p 3

Sankey's Note. The stone work of revetment and groynes specified in paras 6 and 7 of that note has been fully carried out.

I have the honor to be,
Sir,
Your most obedt servant.

L. Beatty - Col. R.E.,
Supg. Engineer, 1st Circle.

Enclosures of this letter

1 Tracing - Survey and levels of the Cruz Milagre Dam in May 1883.
2 — Do. — of December 1883.
1 — Do. — of June 1884.
1 — Do. — of December 1884
1 — Do. — Survey of the Coast at Cochin of 22nd January 1883.
1 Report of the Executive Engineer West Coast division No. 67 of 9th February 1885
1 Statement to accompany the Executive Engineer's Report.

No 2967 d/14.9.68
" 453 d/11.2.69
No 2543 d/25.10.70
" 1105 d/20.4.71
" 1567 d/12.6.71
" 3055 d/4.12.71
" 1125 d/2.5.72
" 1449 d/12.6.72
" 1757 d/24.7.72
" 363 d/14.2.74
" 1377 d/12.5.74
" 1714 d/25.6.74
" 2437 d/28.8.74
" 27 d/7.1.75
" 397 d/12.2.75
" 1775 d/12.7.76
" 916 d/17.3.77
" 624 W d/22.8.77
" 871 W d/21.2.78
" 2637 d/3.5.78
" 1341 W d/31.5.78
" 3217 W d/12.8.78
" 3652 W d/19.9.78
" 4321 W d/11.11.78
" 1883 W d/1.8.81
" 1967 W d/12.8.81
" 2226 W d/8.9.81
" 737 W d/21.3.82
" 1082 W d/1.5.82
" 460 C d/21.2.83
" 1804 W d/26.6.83
" 1982 W d/16.7.83
" 3097 W d/4.12.83
" 702 W d/14.3.84
" 725 W d/17.3.84
" 703 W d/2.4.84
" 2096 C d/18.12.84

From

The Supg. Engineer,
Fourth Circle.

14 FEB 85

Dated 12th } February 85.
Recd: 13th }

No 71/E.M.

Enc: 5

Cruz Milagre Dam.—

Furnishing the brief history and other information regarding the —, called for in Memo: No: 2096C of 18th December 1884.

No 67

West Coast Division Office,
Calicut, 9th February 1885.

From

The Executive Engineer,
West Coast Division

To

The Superintending Engineer,
Fourth Circle.

Sir,

Enclosure
1 Statement

With reference to your Memo: No 22/W.C. and 33/W.C. of 21st, and 31st January 1885 respectively, I have the honor to report as follows:—

1. In their report on the Cochin harbour, submitted by the Committee appointed under G. O. No: 2967 of 14th September 1868, the closing by means of groynes of the opening between the backwater, and the sea, called the Cruz Milagre Gap, which appears to have occurred in 1862, was recommended with a view (to use the words of the Committee) "to prevent the ill effects that the loss of water through that

that opening must sooner or later have on the scouring force of the current through the Channel to the harbour." Vide G.O. No. 453 of 11th Feby: 1869.

2. In pursuance of this recommendation, an estimate of Rs: 31,500 was sanctioned in G.O. No. 2543 of 25th October 1870, but after an outlay of Rs: 10794 had been incurred in the collection of materials, the work appears to have been stopped, the reason for the cessation is not traceable from the records of this Office

3. Subsequently Mr. Robertson, C.E. who had been deputed to inspect and report on the several harbours of India, suggested the desirability of attempting to close the gap by throwing out a groyne from its inner northern angle. This suggestion was adopted by Government in their order No. 1105 of 20th April 1871, and an estimate called for which was submitted for Rs: 8,662 and sanctioned in G.O. No. 1567 of 12th June 1871; but the materials intended to be used being found unsuitable (probably those collected under sanction of the estimate referred to above) a revised estimate for constructing a stone groyne was sanctioned in G.O. No. 3055 of 14th December 1871 and carried out at a cost of Rs: 24,302. In addition to this, an Estimate of Rs: 15,277 was sanctioned in G.O. No. 1757 of 24th July 1872 for extending the above groyne and closing the gap; but from the report submitted by Captain H. W. Wood, R.E., officiating District Engineer, Malabar, to the Chief Engineer, P.W.D., No. A, dated 23rd April 1873, it would appear that only Rs: 7,309 were expended, the mode of closing the gap being abandoned, and another proposal to close it by means of a series of sand bag groynes, made by Colonel Farewell superintending

Superintending Engineer 7th Division being adopted; and in accordance with this latter proposal, the dam was constructed, and the gap closed; the work being commenced in 1872/73 and completed in 1873/74 at an aggregate cost of Rs: 72,313 against an estimate of Rs: 72,310 sanctioned in G. O. No. 363 of 14th February 1874 and G. O. No: 1377 of 22d May 1874 for maintaining the perimeter of the gap, closing it and maintaining it until January 1874.

4. The occasions on which (so far as it has been possible to trace from the records of this Office) the dam was in danger of being breached, were during the monsoon of 1874 (vide Mr. Executive Engineer Mr. T. D. Harris' report, submitted to the Chief Engineer with letter from the District Engineer, Malabar, No. 59 of 17th June 1874) when outlay to the extent of Rs: 1,000 was incurred against an Estimate of Rs: 1,000 sanctioned in G. O. No: 1714 of 25th June 1874 and G. O. No. 2,437 of 24th August 1874, for strengthening the dam both as regards damages that had occurred and that might have been expected; and during the monsoon of 1876 when an expenditure of Rs: 992 was incurred for emergent repairs to the dam against an estimate of Rs: 1000, sanctioned in G. O. No. 916 of 17th March 1877; but the exact nature of the work done is not known as neither the estimates nor specifications are forthcoming among the records of this Office. A farther strengthening of the dam was effected by widening it to 50 feet at top at a cost of Rs: 3219 under the sanction accorded to the Estimate of Rs: 3,260 in G. O. No. 3217 of 12th August 1878.

5. The ordinary maintenance

and repairs to the dam have been done in the years 1874-76-77-78 81 and 83 at an aggregate cost of Rs: 635; strengthening the revetment and turfing appear to have been the principal items of repairs.

6. A statement showing the different works done to the gap and dam—both original works and repairs—is enclosed.

7. The work recommended by Colonel Sankey, R.E., during his inspection of the dam in 1883 has been carried out as per estimate, sanctioned in G.O. No 3477 W. of 4th December 1883. The cross sections ordered by Colonel Sankey, are also being duly taken, those taken last, viz. 11th and 12th December 1884 were submitted to you with Conductor Nicholson's report, bearing this office endorsement No 20 dated 10th January 1885.

8. I consider the dam *now* perfectly safe, but as the sections taken show a tendency towards deepening of the river bed in front of the dam, I would recommend rough stone being dropped in and allowed to take its own angle of repose along the front foot of the dam.

I have, &ca,
(signed) Ross Thompson Lt.Col. R.E.,
Ex. Engineer.

(True copy)

Beatty - Col. R.E.,
Supg. Engineer, 4th Circle.

Anc: 2/71/85

C N-1362

13

Cruz [illegible]

[illegible]

[illegible] le Chef

[illegible] 1 8bre (C J)

21/[illegible]

Enc

Send draft

Order to Ch

Send for [illegible]

[illegible]

If [illegible] meanwhile

Suspend issue

Ch

21/3

Enc

G.O. 13.3.85 – W. 605 W

I presume above order was countersigned by Chief Secretary – before issue.

21-3-85

To W.

The G.O. has not been counterinitialled by Chief Secretary –

It has not yet been issued, & if ordered, the draft will now be sent to Mr Webster.

21-3-85

Yes – certainly

The expenditure will be from Marine.

3-85

16

Order may be passed authorising execution of the work recommended in para 8 of E. E's letter

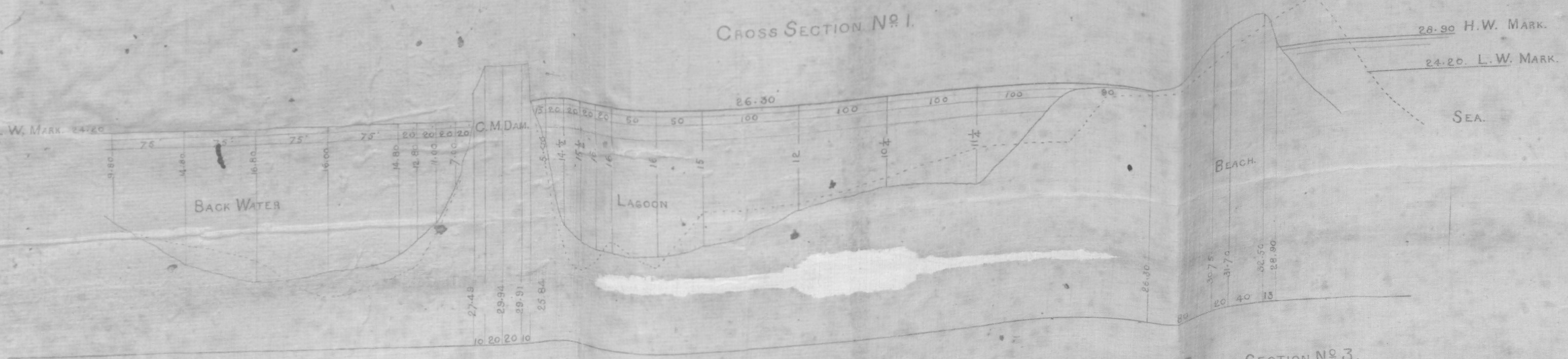
12-3-45

CRUIZ MILAGRY DAM
DECEMBER 1884

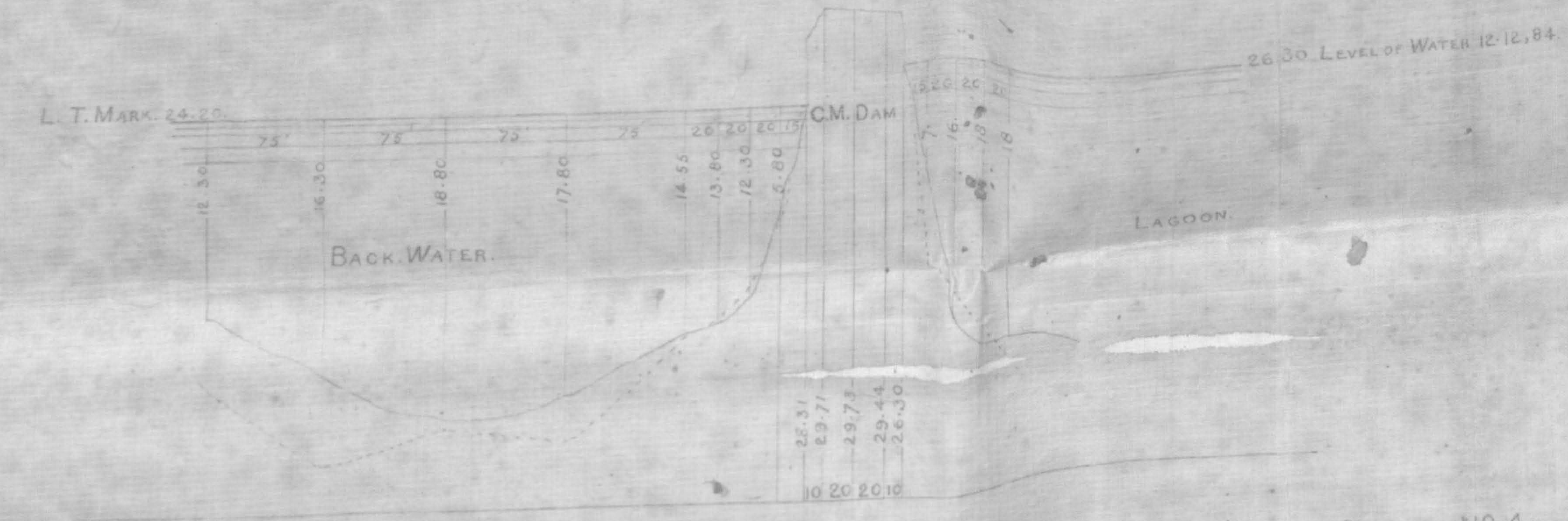
SCALE

HORIZONTAL SCALE $\frac{1}{1000}$
VERTICAL SCALE $\frac{1}{100}$

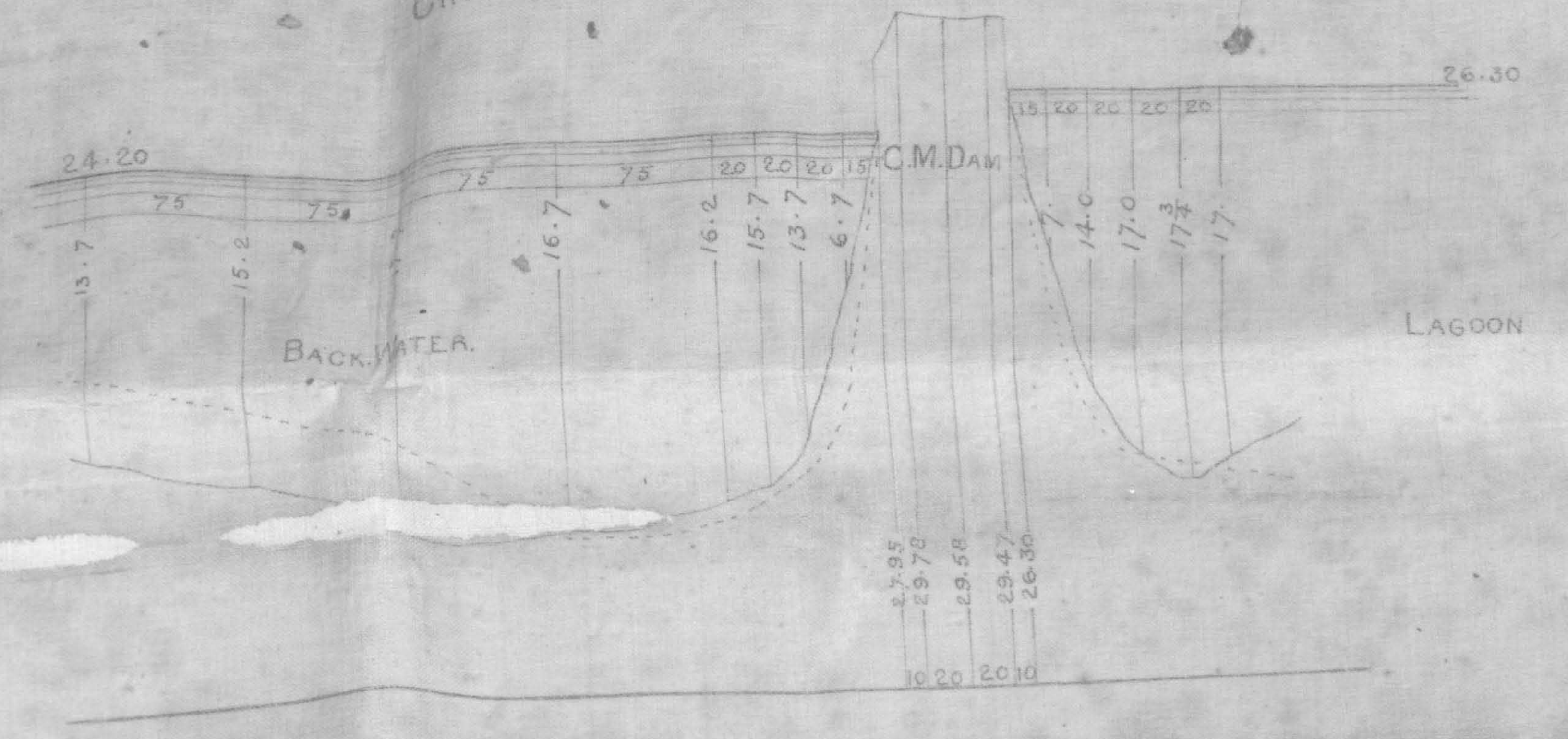
CROSS SECTION No. 1.



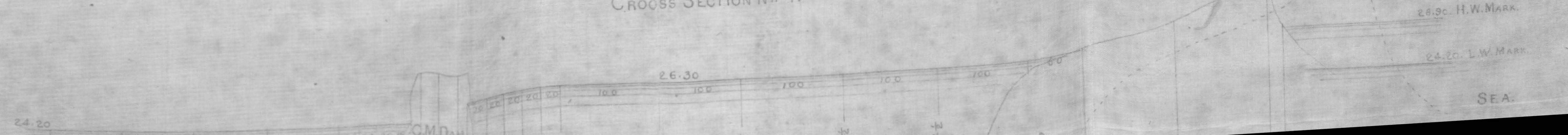
CROSS SECTION No. 2.

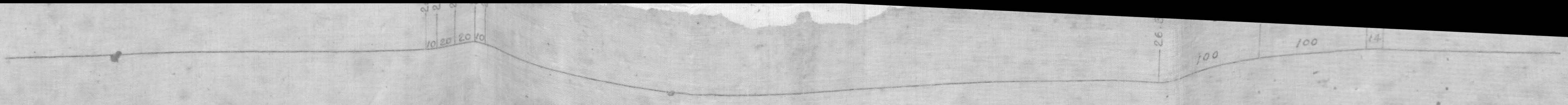


CROSS SECTION No. 3.

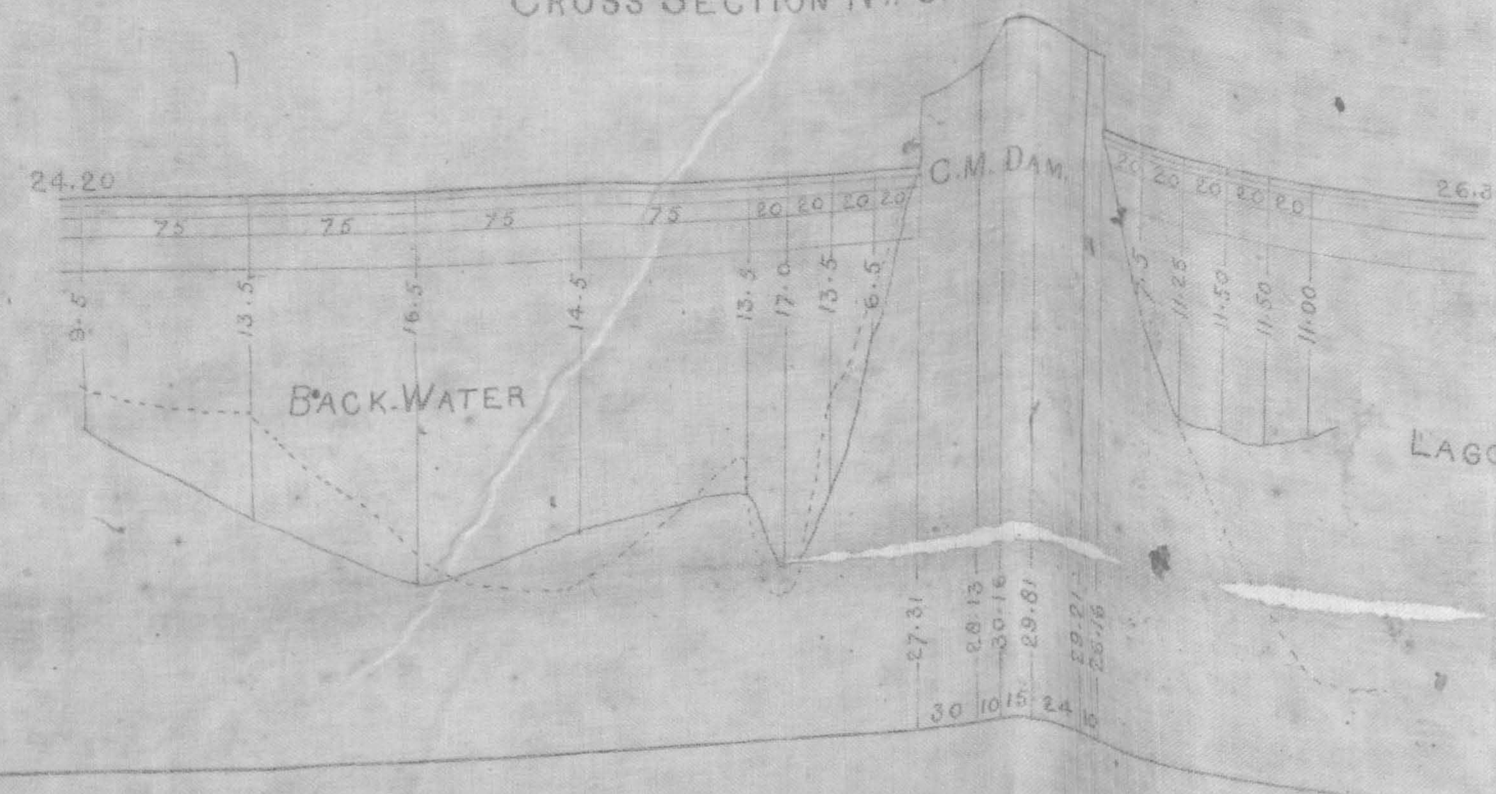


CROOSS SECTION No. 4.

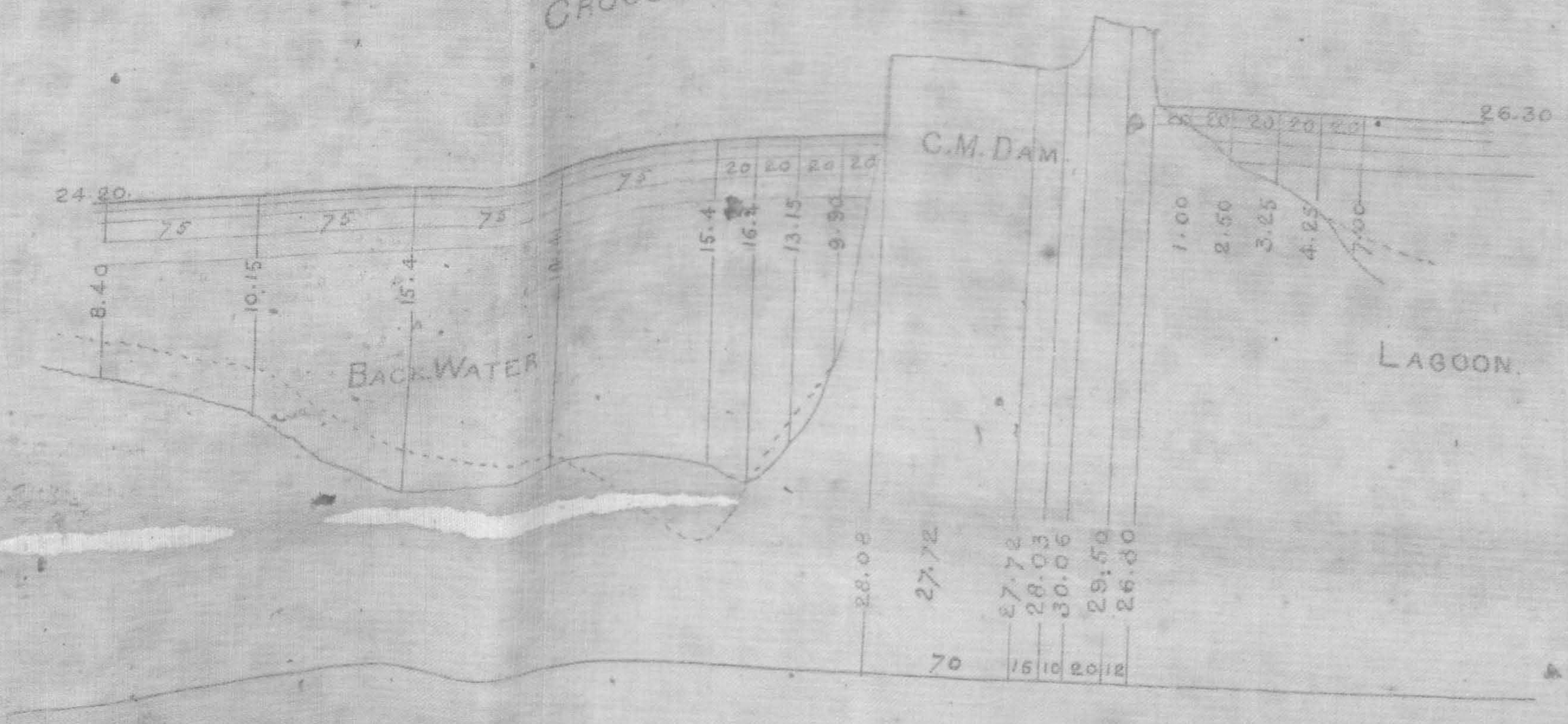




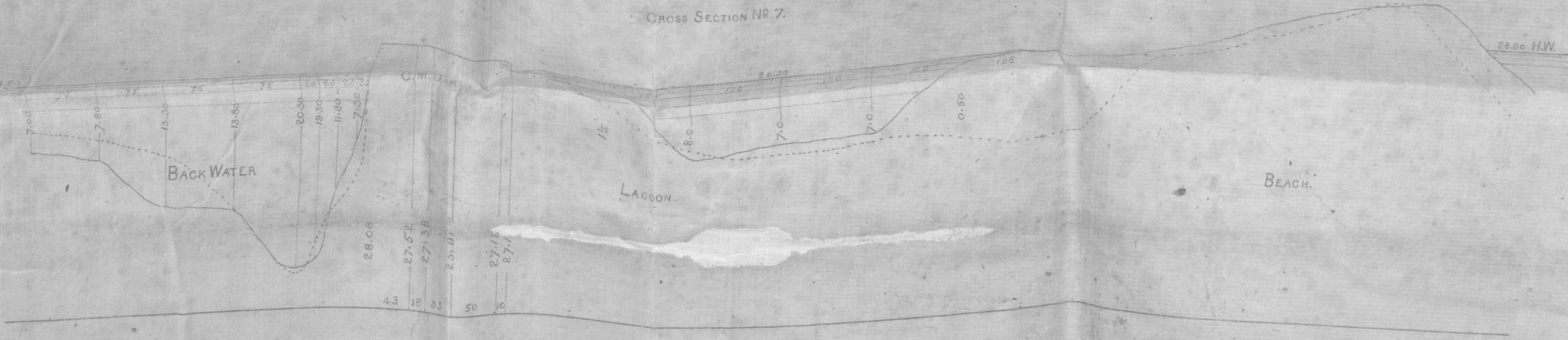
Cross Section No. 5.



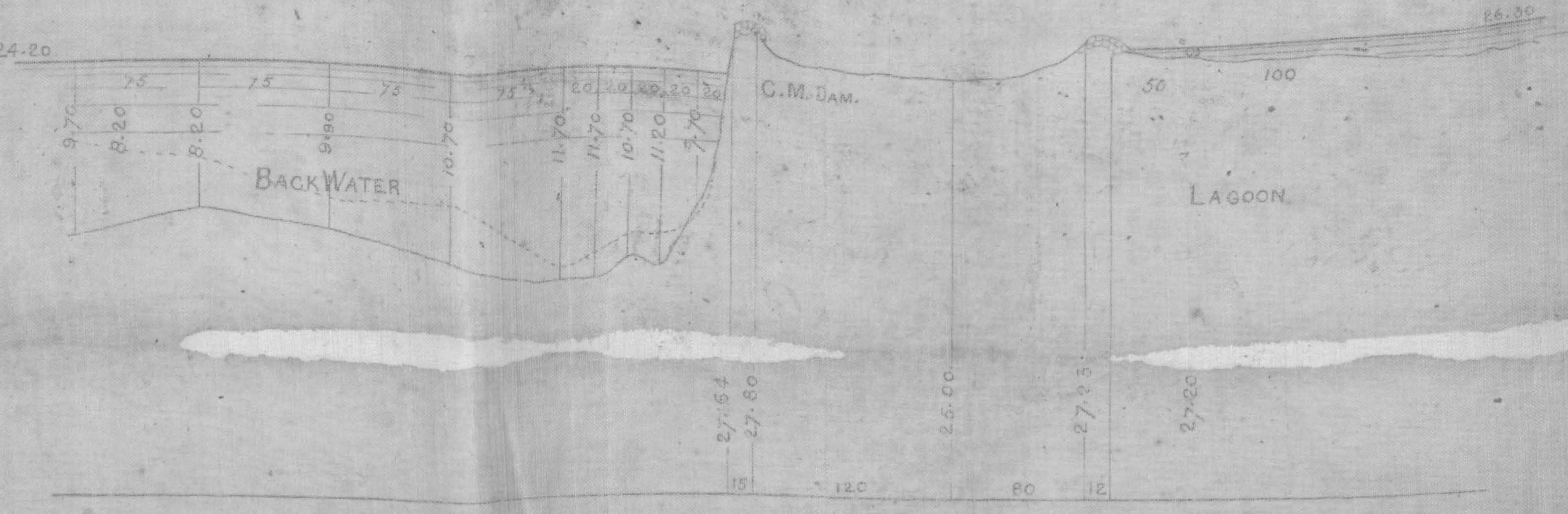
Cross Section No. 6.



Cross Section No. 7.



Cross Section No. 8.



Note.

The Levels Taken in December 1883 are shown in dotted lines on every Cross Section

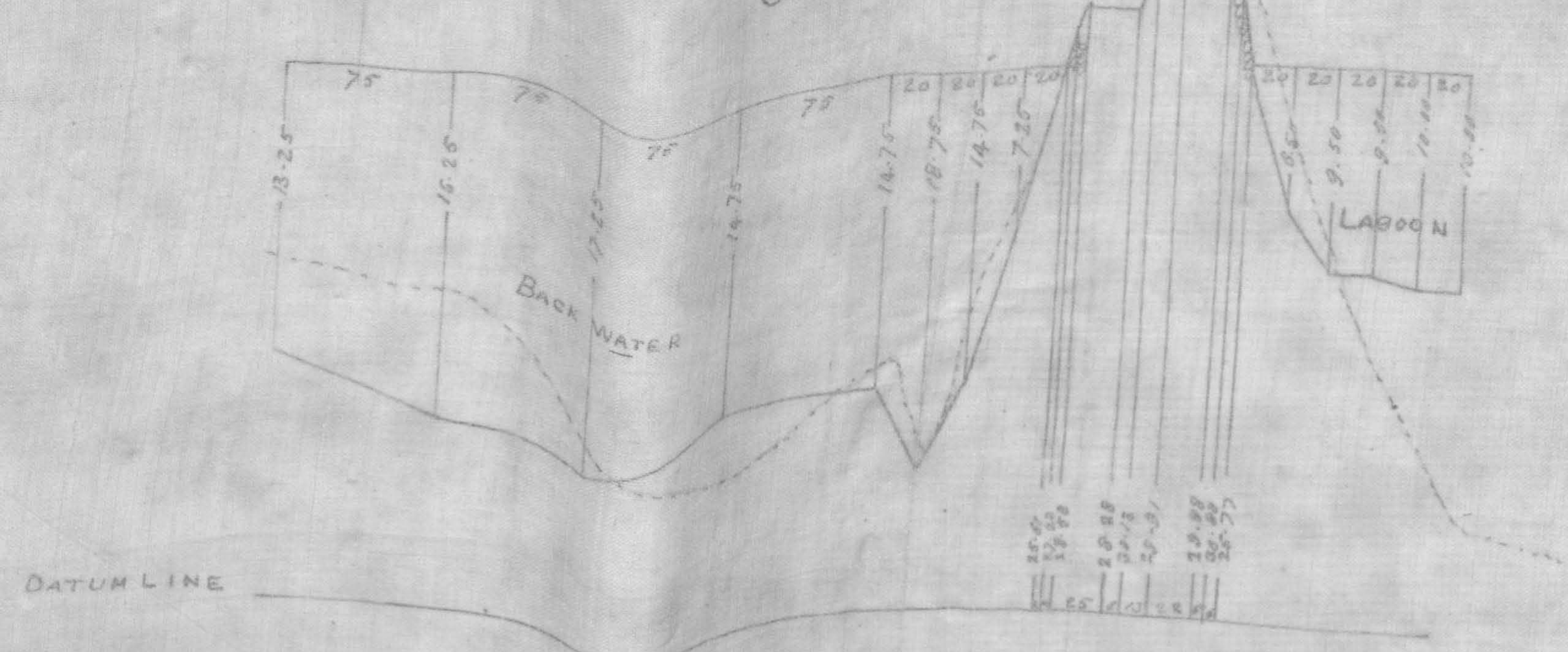
Lieut. Col. R.E.
Executive Engineer.

West Coast Divisional Office.
[illegible] January 1885

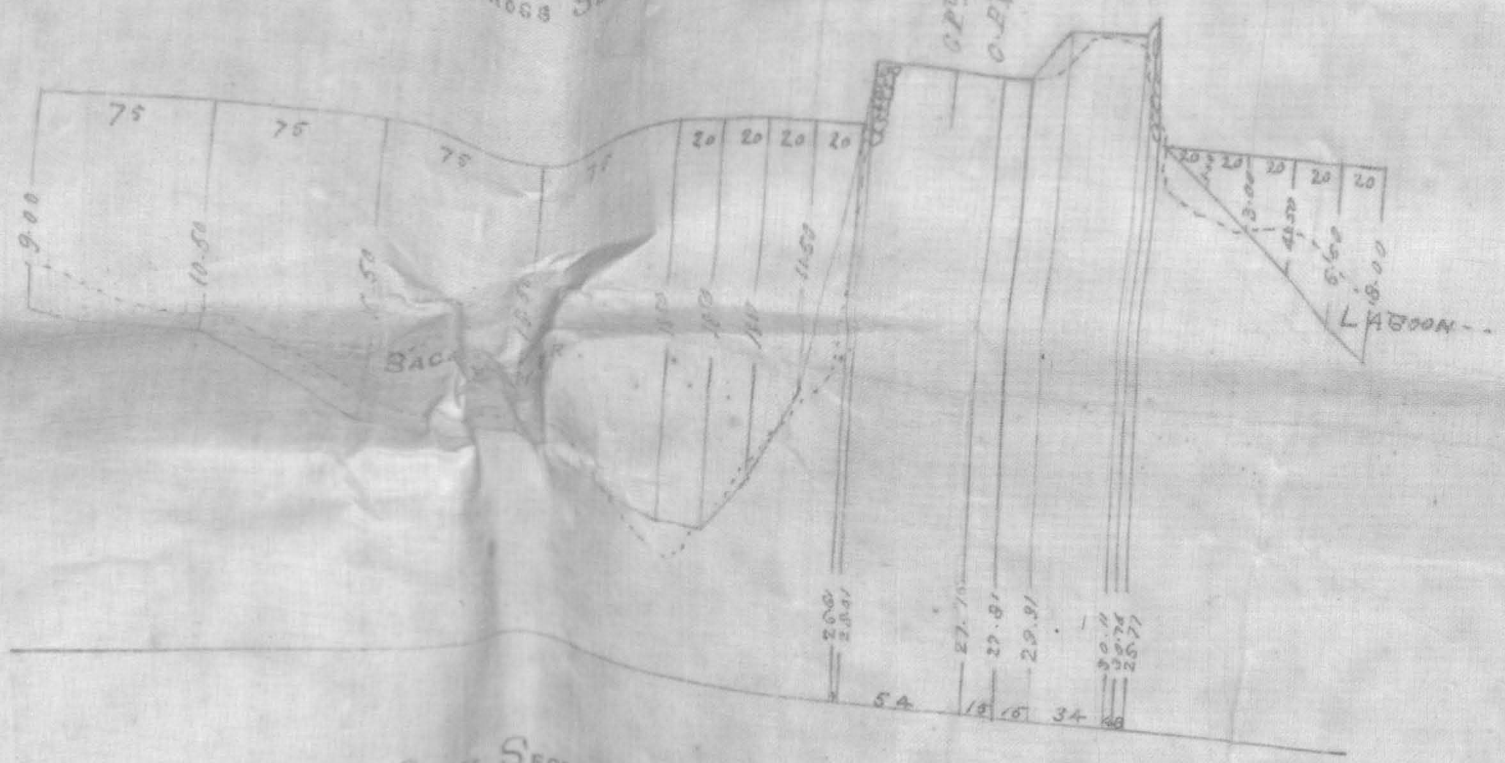
Sections at the
Ruiz Milegre Dam
in Decemb 1884

[illegible]

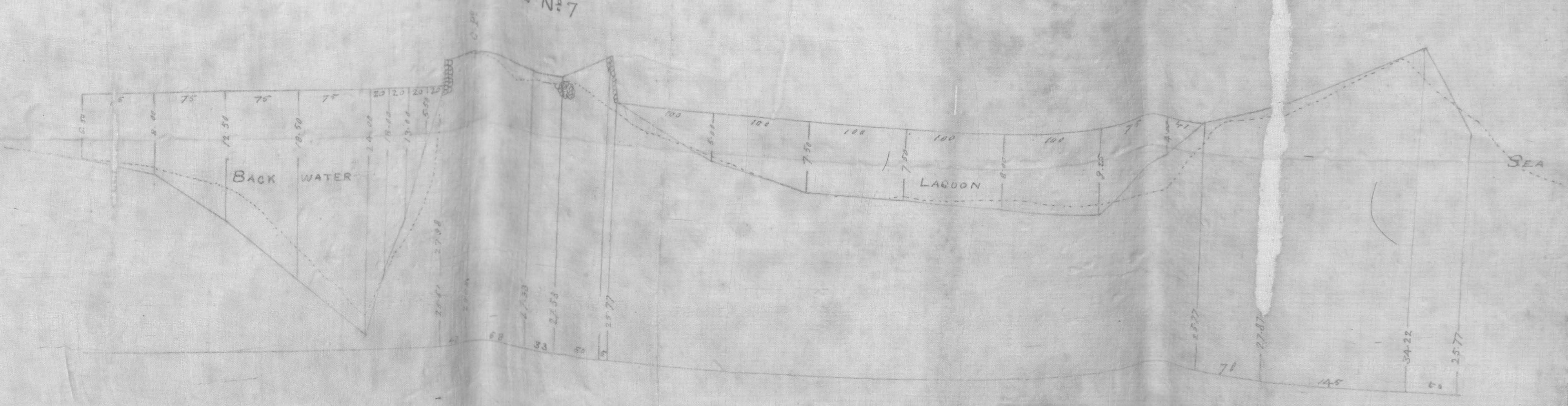
CROSS SECTION No. 5



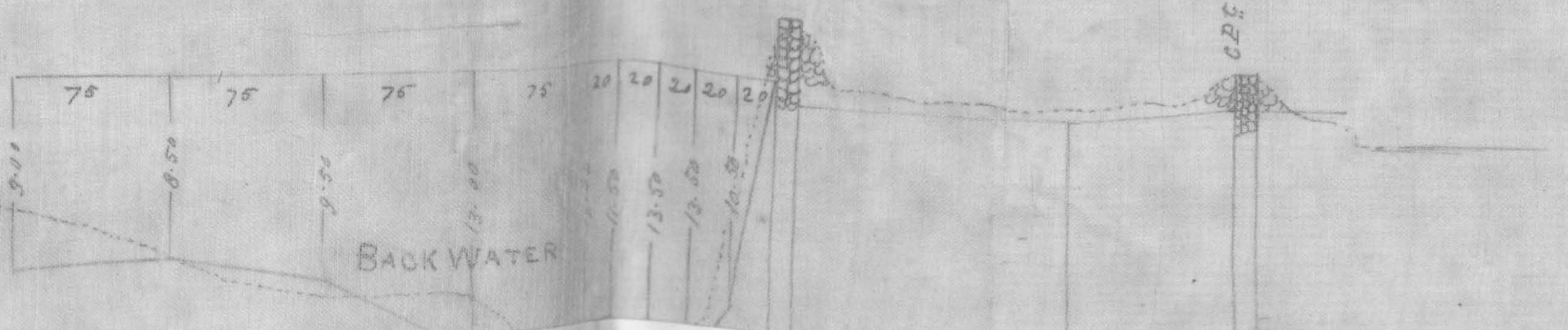
CROSS SECTION No. 6



CROSS SECTION No. 7



CROSS SECTION No. 8



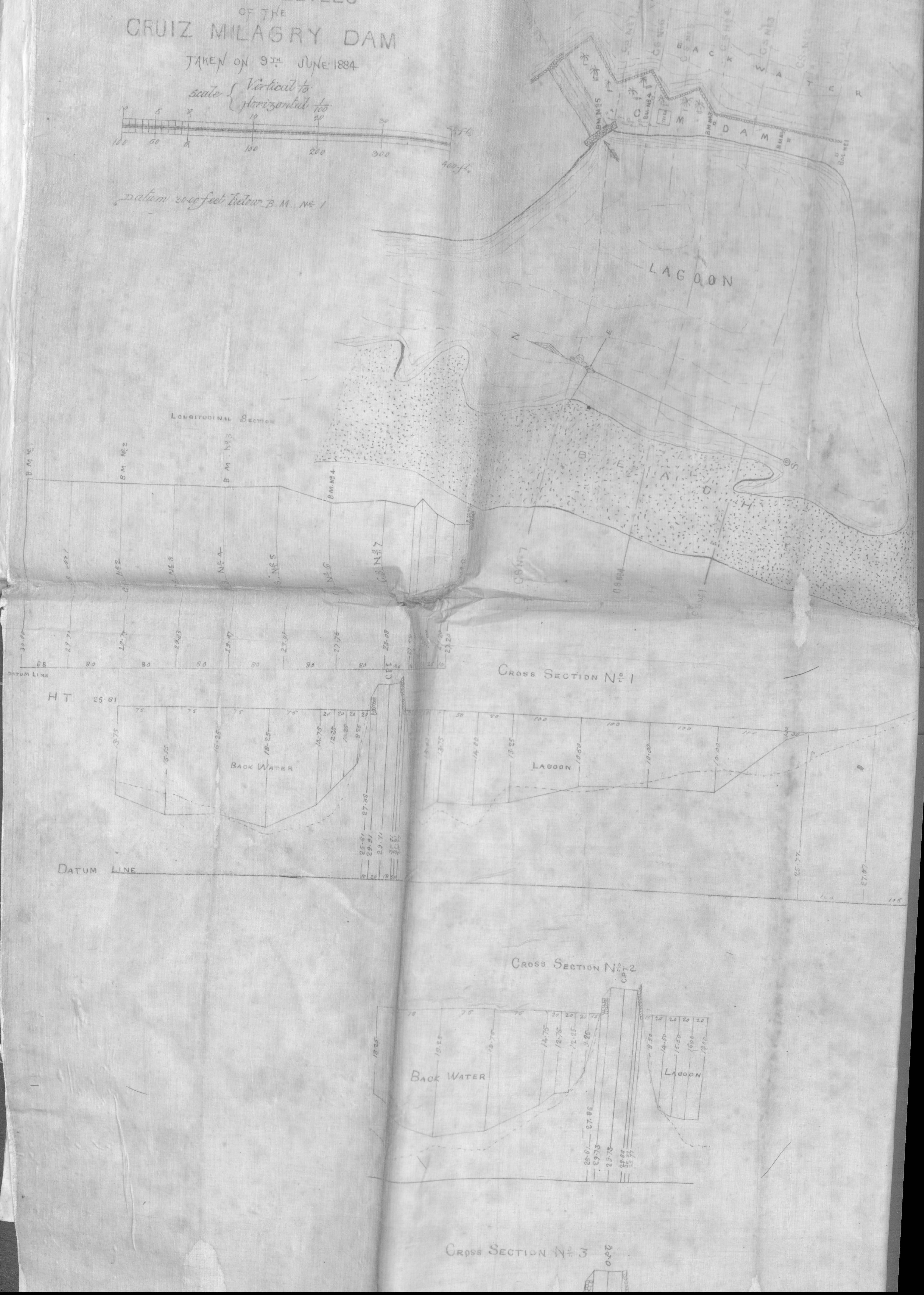
NOTE THE LEVELS TAKEN IN DECEMBER 1883 ARE SHOWN IN DOTTED LINES ON EVERY CROSS SECTION,

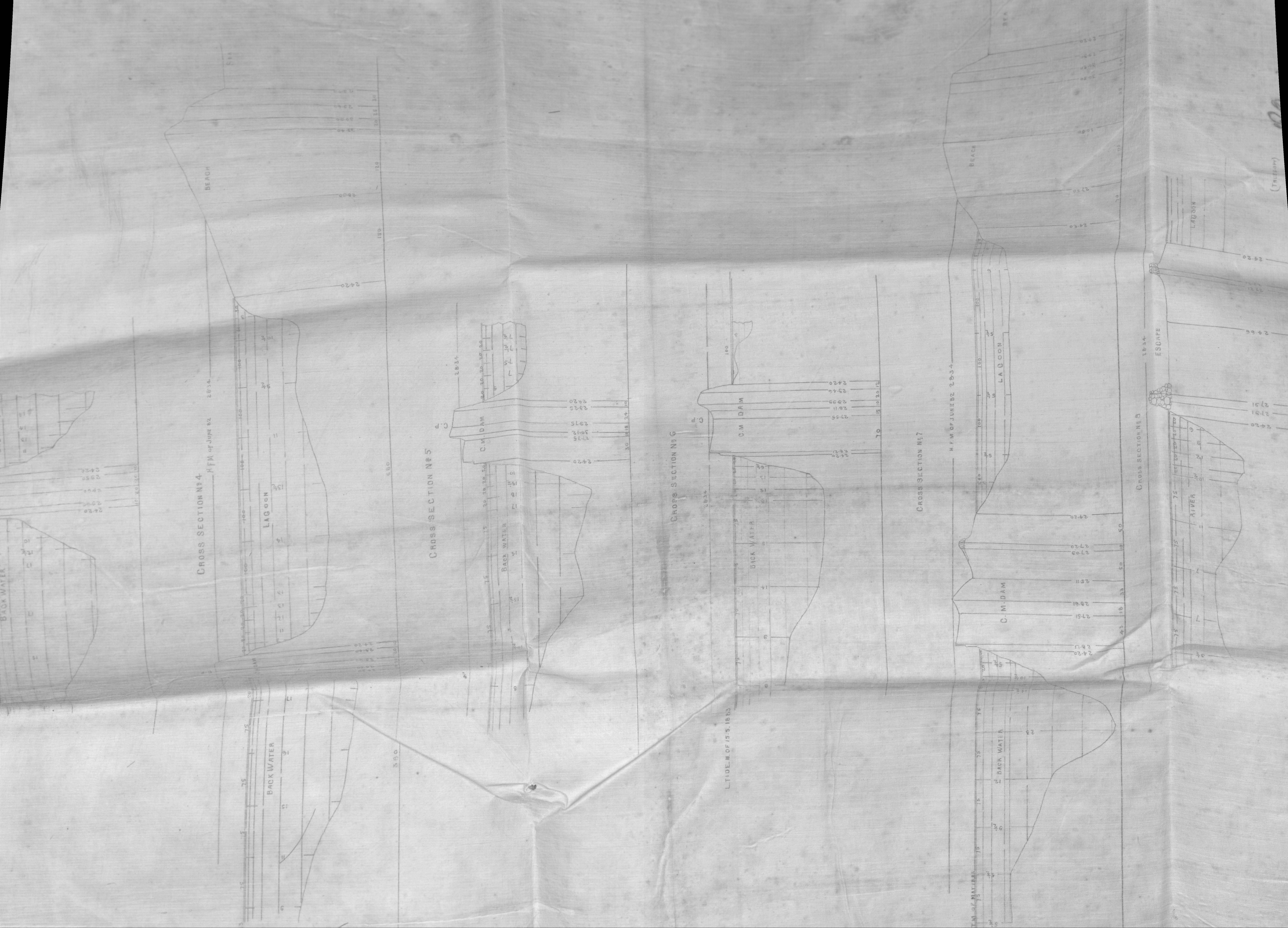
SURVEY AND LEVELS
OF THE
CRUIZ MILAGRY DAM

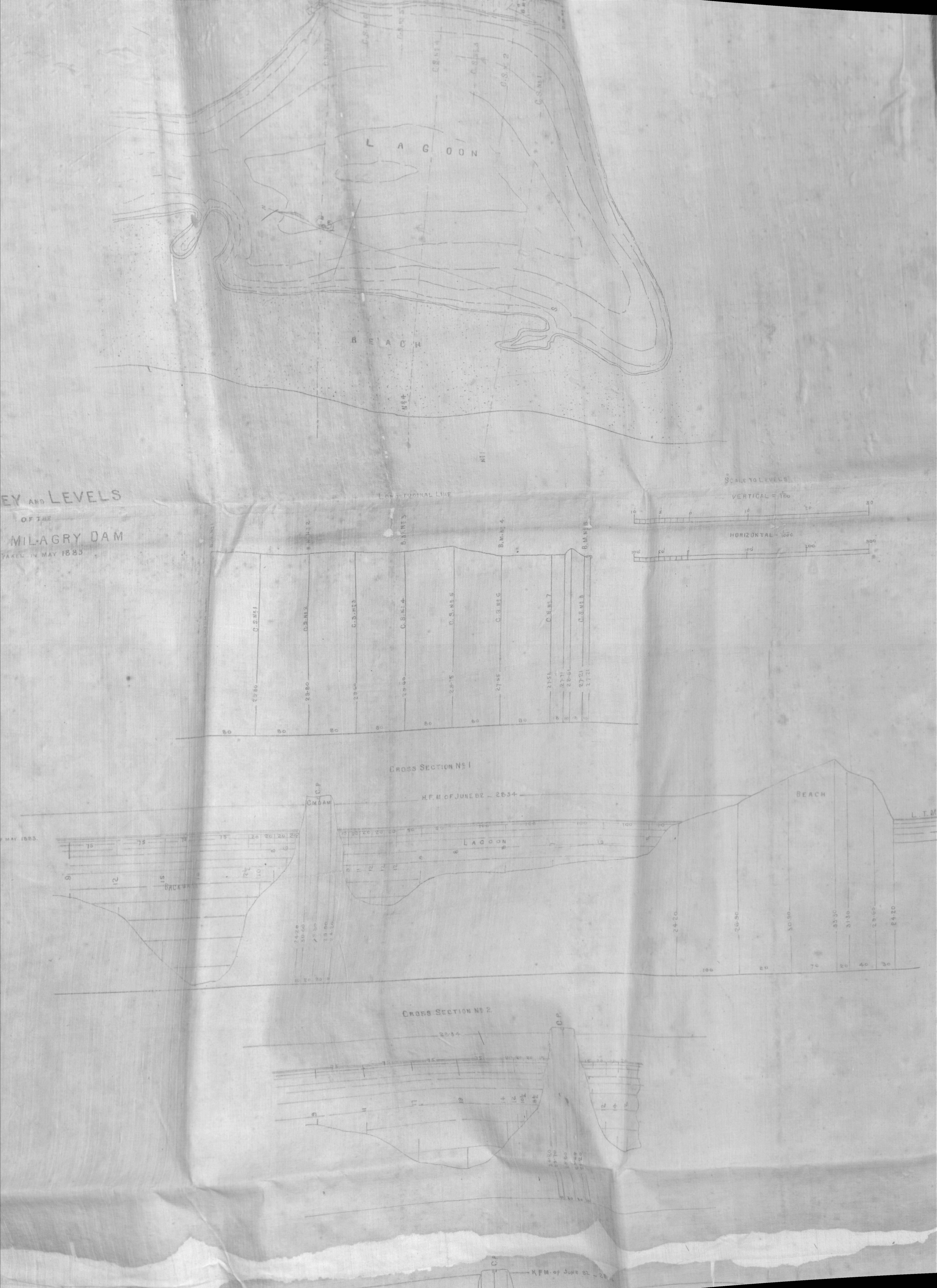
TAKEN ON 9TH JUNE 1884

scale { Vertical 1/10
Horizontal 1/100

Datum 30.00 feet below B.M. No 1



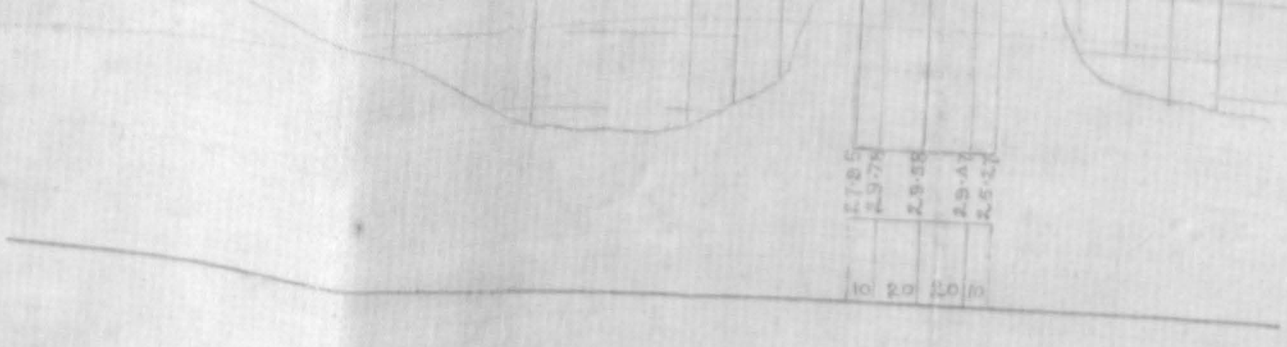

CROSS SECTION No 4
H.F.M. OF JUNE 82
28.34
BEACH
LAGOON
BACK WATER
BACK WATER
24.20
120
180
550
380
CROSS SECTION No 5
C.M. DAM
C.P.
BACK WATER
28.34
CROSS SECTION No 6
C.M. DAM
C.P.
BACK WATER
28.34
L.TIDE.M. OF 15.5.1883
CROSS SECTION No 7
H.F.M. OF JUNE 82 28.34
BEACH
SEA
LAGOON
C.M. DAM
BACK WATER
CROSS SECTION No 8
28.34
ESCAPE
LAGOON
RIVER

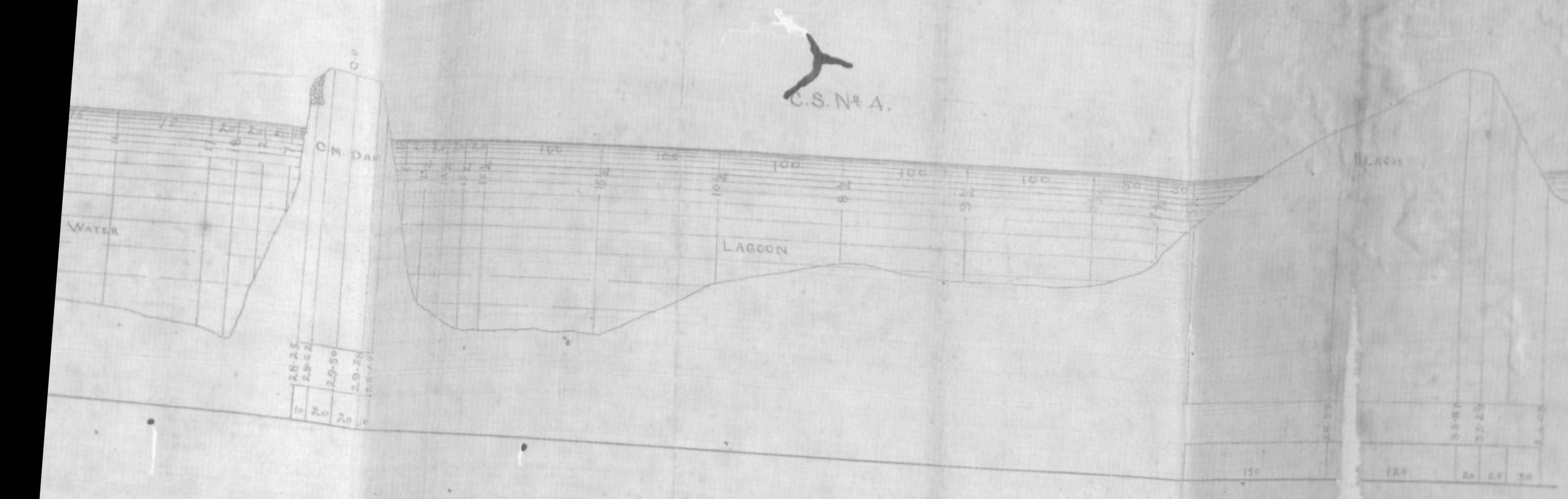


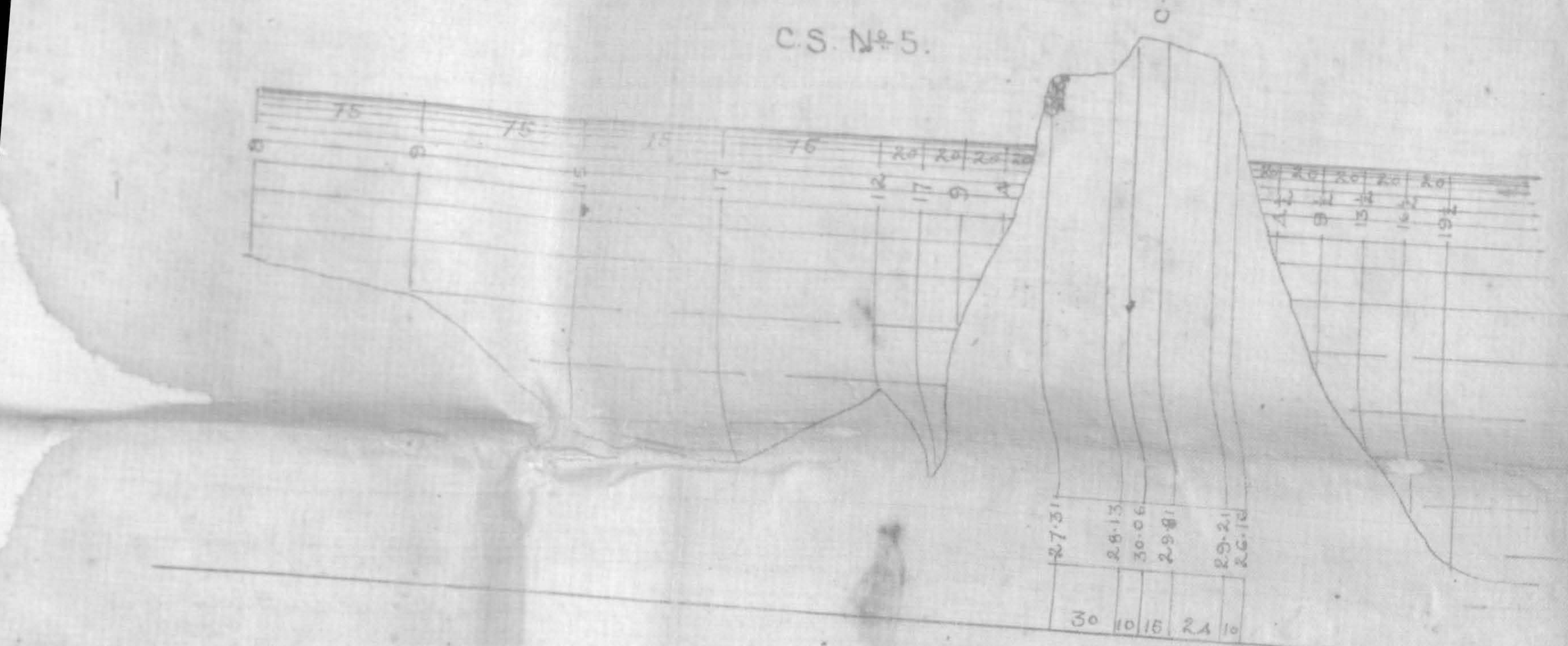
EY AND LEVELS
OF THE
MILAGRY DAM
TAKEN IN MAY 1883

CRUIZ MILA DAM

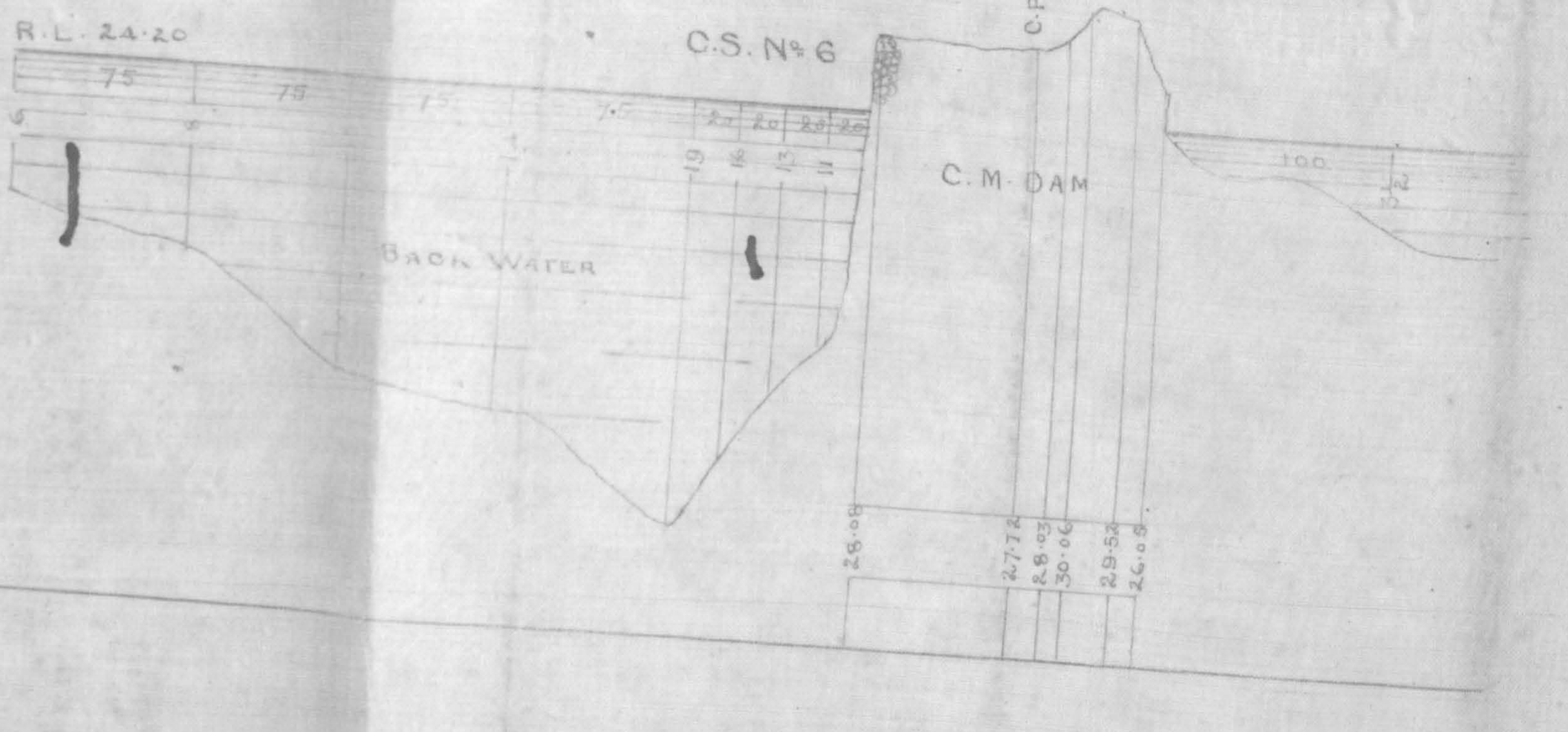
DECEM

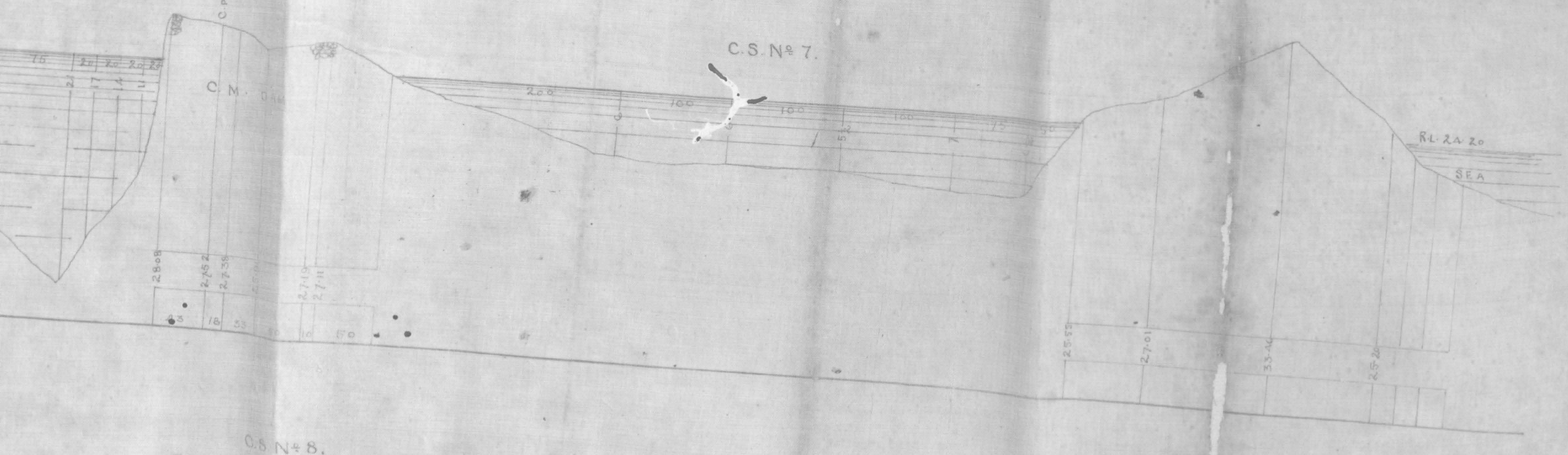


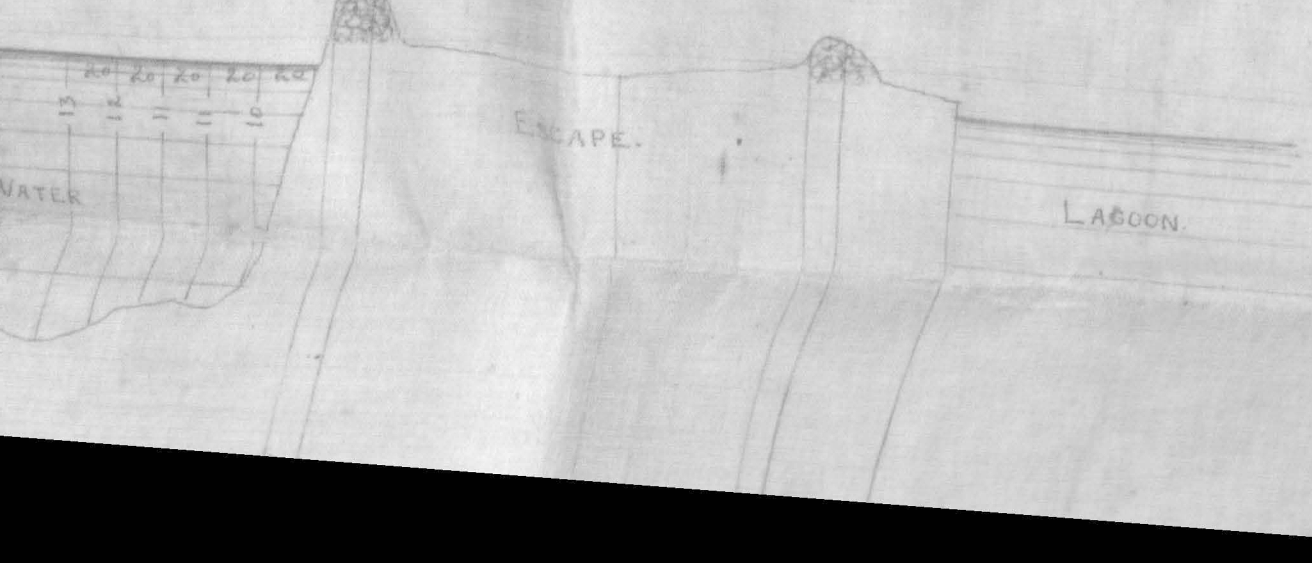

C.S. No 4.


C.S. No 5.

OF MAY 1883

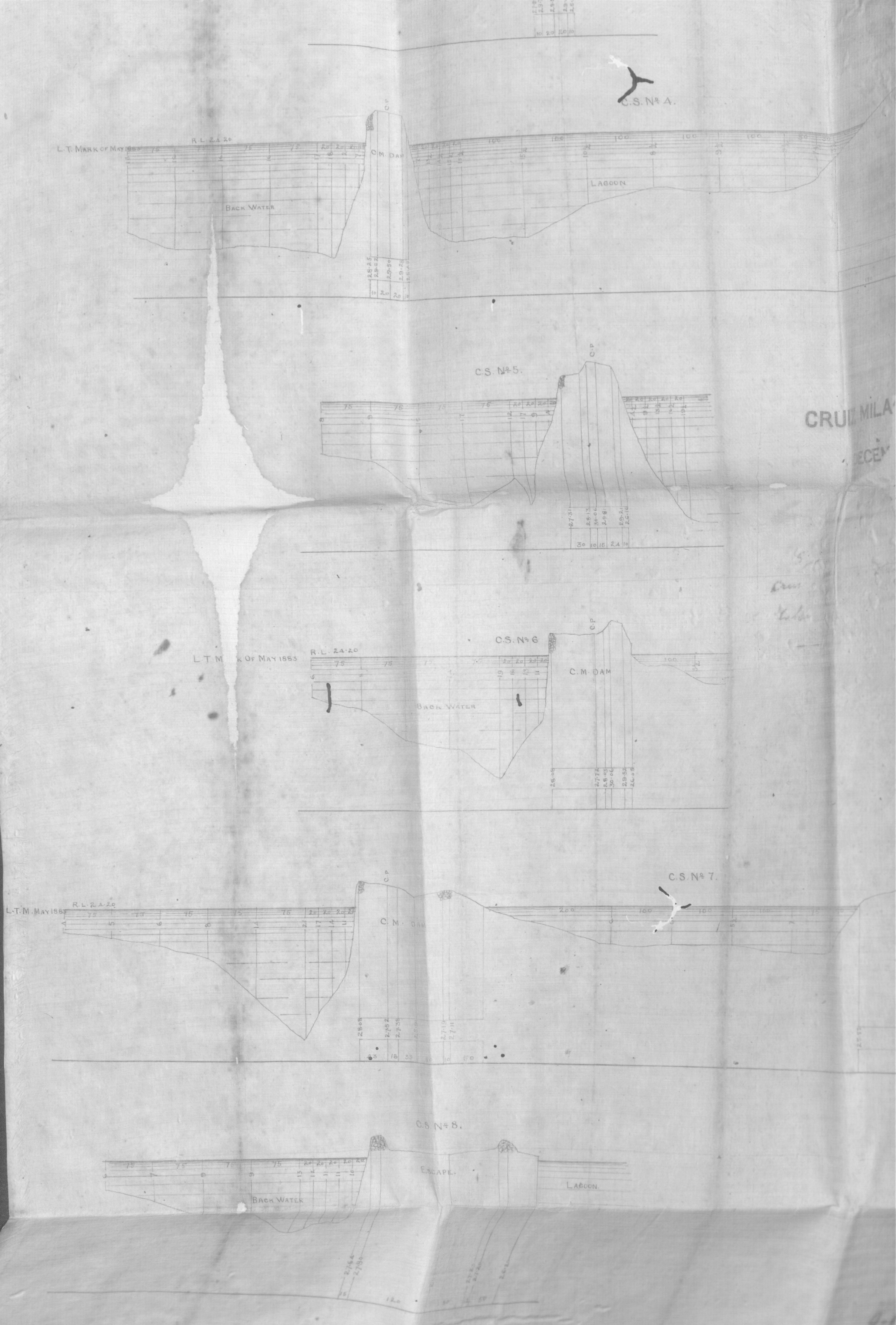

C.S. No 6


C.S. No 7.


C.S. No 8.

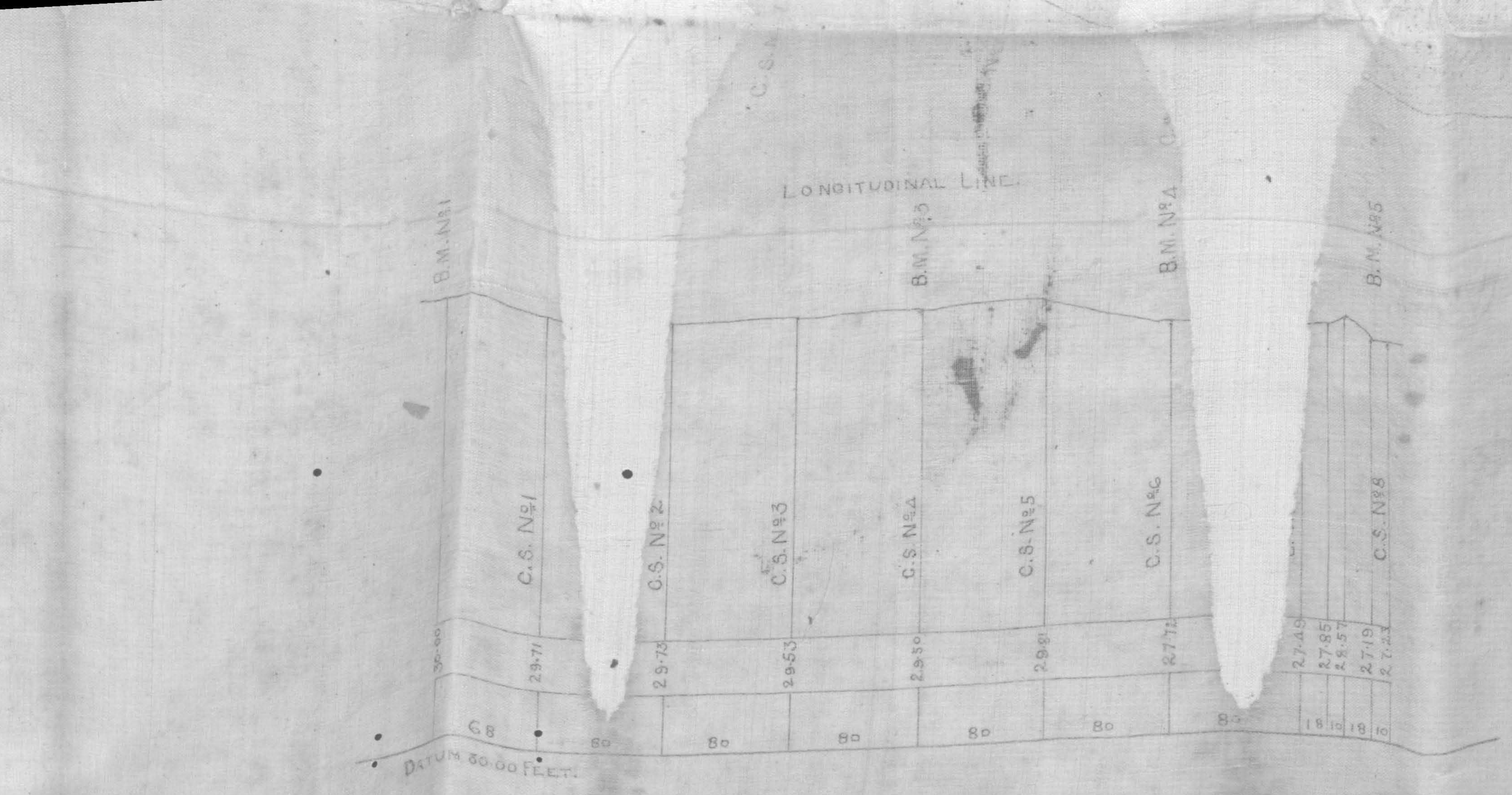
CRUI MILA

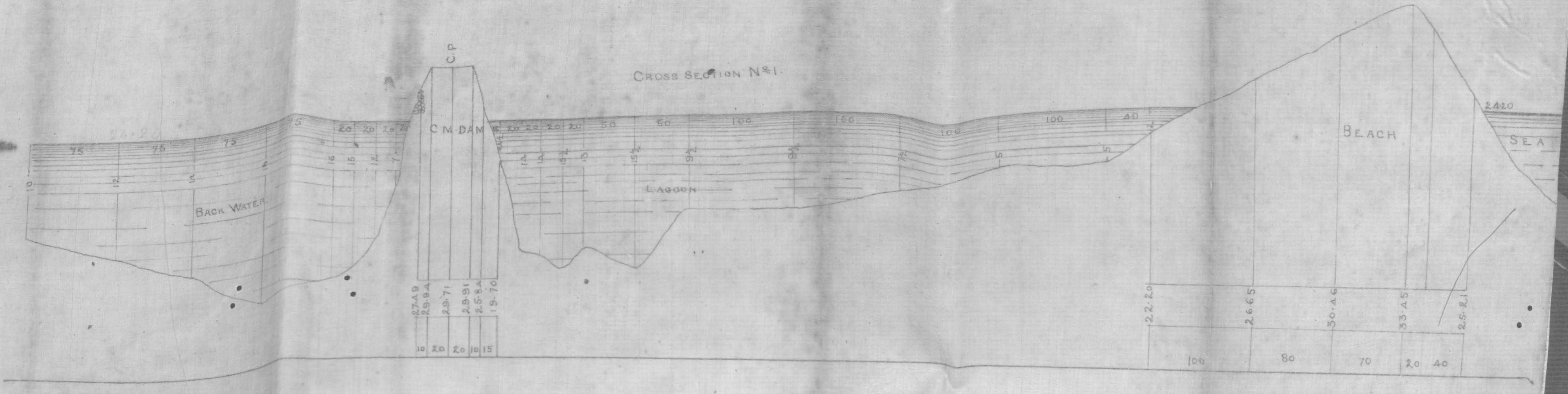
DECEM



CRUIZ MILAGRY DAM

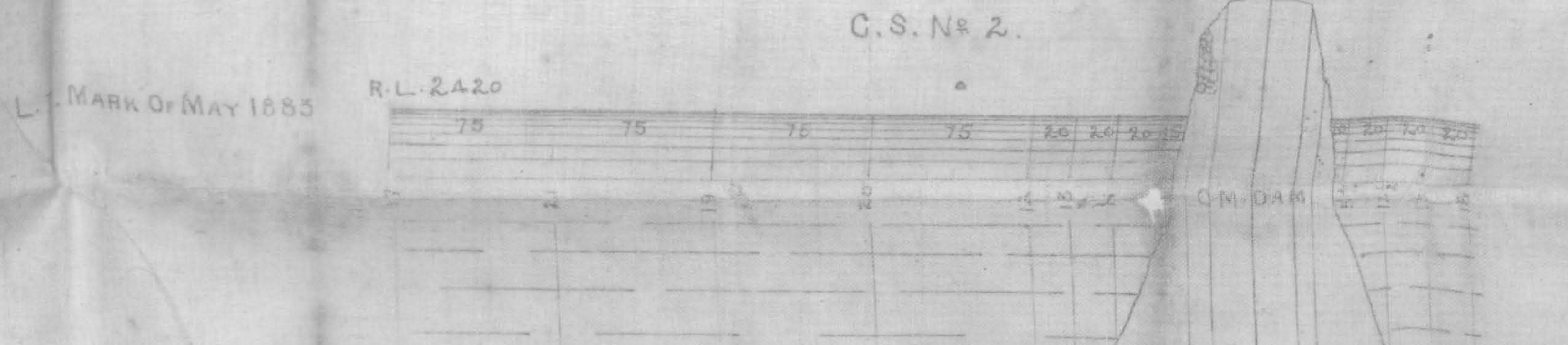
DECEMBER 1883





CROSS SECTION No 1.

C.S. No 2.



9.5.84 EXECUTIVE ENGINEER.

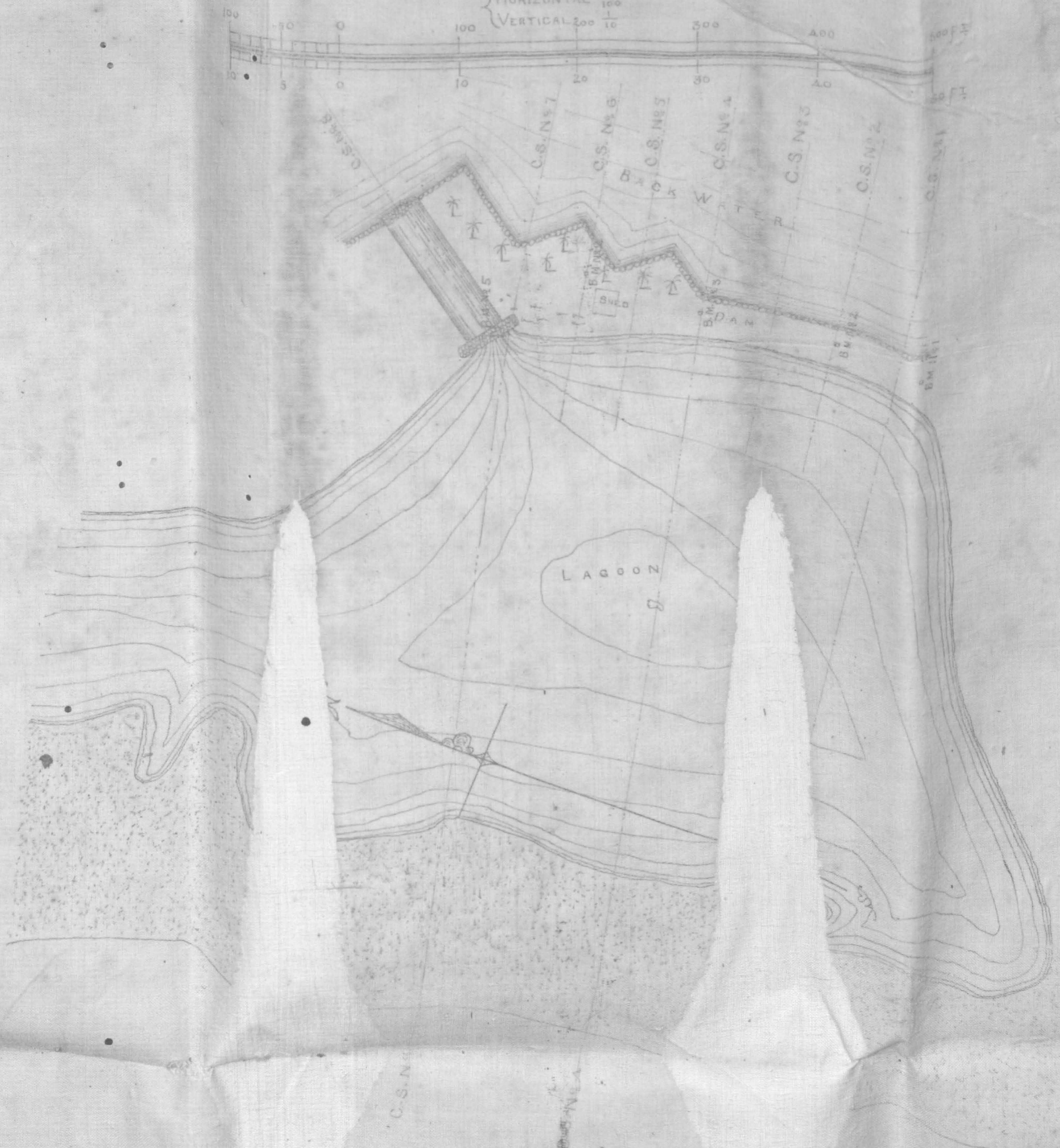
CRUIZ MILACRY DAM
DECEMBER 1883

SHEET No 1

LEVELS OF THE
Cruiz Milagry Dam.

(TAKEN IN DECEMBER 1883)

SCALE TO LEVELS:—
HORIZONTAL $\frac{1}{100}$
VERTICAL $\frac{1}{10}$



No. 605. W PUBLIC WORKS DEPARTMENT.

22

PROCEEDINGS OF THE MADRAS GOVERNMENT.

UNDER date the 13th March/85

READ the following

Letter from the Supdg. Engineer IV Circle No. 71/SW dt. 12th Feby/1885

24 MAR 85
DEPARTMENT

The Supdg. Engineer IV Circle will take the necessary steps for the early execution of the work recommended in para 8 of the Executive Engineer's letter.

13. 3. 85

13. 3. 85

Chief Secretary for favour of communication

23/3

To S.E. IV Circle, with survey map

Marine Dept.

From
The P. M. D. No. 60 & 17

D. 13 March 58
R. 22 do.

Enclos'd [illegible]

1362

Govt. of Madras.

PUBLIC WORKS.

36

[illegible]

[illegible]