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MADRAS RECORD OFFICE

Government of Madras

Public Works

DEPARTMENT

G.O. No.	2101	Press
B.P. No.		Mis.
344-346		
Dated	23.8.	1843.

Not to be folded or roughly handled

Read the following papers:—

No. 374. From Major R. F. OAKES, R.E., District Engineer, Tanjore, to Colonel G. W. WALKER, R.E., Secretary to Government, Public Works Department, dated Tanjore, 21st July 1873, No. 418.

WITH reference to G. O., No. 1,766, dated 9th July, I have the honour to observe that it is not clear what is intended by the substitution of flush escapes 'which will be self-regulating, for the old pattern of calingulah.' A flush escape, according to the ordinary acceptance of the term 'self-regulating,' is not in any way self-regulating; it does not in any way limit the level to which water may rise. If it is intended that flush escapes only shall be used, it should be distinctly stated at what level the crest of the weir or flush escape should be placed relative to the full supply water level of the tank, and what depth of water may pass over it; if it is placed on the full tank supply level, and water is to be allowed to rise half a yard above it, the whole bank must be raised half a yard higher than the

This would add 6,820 cubic yards to a third-class tank bank, two yards high and one mile long at a cost of Rupees 426-4-0.

ordinary level given to tank banks of the various classes, while if it is placed below the full supply level, the capacity of the tanks is virtually reduced, not in

proportion to the number of inches the water is to be retained below its normal level, but in a far higher proportion; for in most tanks the content of the upper foot is as great as that of the $1\frac{1}{2}$ feet below it, and probably is as much as a depth of 3 or 4 feet in the deep bed of the tank would give.

2. If surplus weirs are built with flush crests, and especially if they are built on a low level, a strong temptation is afforded to ryots and others to place ring-bunds in front of the weirs. Such a proceeding is certainly objectionable, the more so if the bunds are made strong, and so in point of fact render the calingulah or weir altogether ineffective; it would appear that the order referred to by the Extract Minutes Consultation, No. 250, of 27th January 1859. Secretary of the Revenue Board relates to such front embankments, and not to

the ordinary mud wall placed between the dam stones of a weir; if dam stones are 2 feet or $2\frac{1}{2}$ feet high, and the crests of the weirs are 3 feet broad, as is usual in small works built in the present day, the base of the mud bank or wall cannot be more than 3 feet, and when water rises $1\frac{1}{2}$ feet or 2 feet against this mud wall it is inevitably breached, but if not it cannot possibly stand when it is once over-topped and the weir may truly be said to be self-regulating.

3. If the width of the crest of a weir is so small that a formidable bank cannot be formed upon it, but only a mud wall, and the dam stones be 2 feet high, the water level to be retained with safety being, say, half a foot above the dam stones, while the crest of the flush weir would be, say, 1 foot below this level, a length of 36 feet would be required for the discharge of 144 cubic feet per 1", or the drain-

1" per hour.

age area of 6 square miles over the flush weir, while a weir 14 feet long with the

dam stones as proposed above (allowing for dam stones and reducing co-efficient from $\frac{1}{4}$ ths to $\frac{1}{3}$ ths on account of the dam stones) would be sufficient. Hence, on the score of economy and of self-regulation, I would suggest that flush weirs should not be constructed, and that the formation of mud walls between the dam stones should

*Proceedings of the Madras Government, Public Works Department,
23rd August 1873.*

not be prohibited so long as the ryots are satisfied and are willing to restore the mud walls or to retain water by planks, as the water falls below the high water level they wish to retain.

No. 461.

No. 375. *Note by the Chief Engineer for Irrigation.*

THE flush self-regulating tank escapes referred to in paragraph 2 of G. O., No. 1,766, of the 9th July 1873, should have their crests on full tank level.

2. Major Oakes says "a flush escape, according to the ordinary acceptation of the term 'self-regulating,' is not in any way self-regulating; it does not in any way limit the level to which water may rise." I am, however, at a loss to understand how this officer could have advanced this opinion. A flush escape will limit the level to which the water is to be allowed to rise, that limit depending upon the length of the crest of the weir, its circumstances as regards outfall and the maximum discharge from the tank basin. It must depend upon the conditions of the tank whether the maximum depth passing over the crest of its escape should be fixed at 18 inches or more. In one case a very long weir may be capable of being constructed for a small sum; elsewhere the existing bund may be high, and the space for an escape weir limited. Again, it may be cheaper where the bund is short, to raise this rather than to make the escapes long.

3. A flush escape, by which is meant a crest wall without any upright stones or other impediments to the free flow of water, and without any facilities for raising the water to be retained above the proper full tank level, will always retain a full supply, and will always pass off water in excess if the calculated maximum be correctly determined.

4. It is undoubtedly the case that the bunds of many tanks will have to be raised to make them secure, but this is in many cases equally true of tanks with the old form of calingulah. There are many instances of upright stones reaching to several feet above full tank level; indeed, almost if not quite to that of the top of the bund, and such tanks would be far safer were the upright stones removed and the crests raised, even were no other addition to the length of escape provided than would result from getting rid of the stones.

5. When tanks are furnished with flush escapes no damming above the crests of any kind must on any account be allowed.

6. Escapes with crests on full tank level should be the pattern adopted for all new works of this class; it may, however, be noticed that, where circumstances render such an arrangement desirable, and the importance of the tank may justify the expense, any desired number of sluices may be placed in the body wall. Such sluices are sometimes advantageous when for any cause, such as slips in the bunds, etc., it may be desirable to lower the water level, but the length of the crest of the one or more escapes should nevertheless be that proper to ensure the discharge of a maximum flood without allowing the water to rise above that level, with reference to which the levels of the top of the bund and the revetments may have been fixed.

OOTACAMUND,
29th July 1873.

(Signed) J. MULLINS, Lieut.-Colonel, R.E.,
Chief Engineer for Irrigation.

*Proceedings of the Madras Government, Public Works Department,
23rd August 1873.*

No. 376.

ORDER THEREON, 23rd August 1873, No. 2,101.

IRRIGATION, No. 25.

ORDERED that the above Note by the Chief Engineer for Irrigation be communicated to the District Engineer, Tanjore, with reference to his letter recorded in these Proceedings, and to all other District Engineers in continuation of G. O., No. 1,766, of the 9th July 1873.

(True Extract.)

(Signed) J. MULLINS, Lieut.-Colonel, R.E.,
Joint Secretary to Government.

To the District Engineer, Tanjore.
To all other District Engineers.
To the Chief Engineer for Irrigation.

Exd. S. T. Austin.

Spare Copies.

No 418.

District Eng's Office

Tanjore 21st July 1873.

From, Major R. F. Oakes, R.E.
District Engineer, Tanjore.

To, Colonel J. H. Walker, R.E.
Secretary to Government.

Sir, I have the honor to acknowledge the receipt of your letter of the 19th inst.

With reference to G.O. No. 766,

dated 9th July, I have the honor to

observe that it is not clear what

is intended by the substitution of

flush escapes which will be self

regulating, for the old pattern of

A flush escape according to the

ordinary acceptance of the term

'Self regulating' is not in any way

self regulating, it does not in any way

limit the level to which water may

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flush escapes only shall be used,

it should be distinctly stated at
what level the crest of the weir or
flush

flush escape should be placed relative to the full supply water level of the tank & what depth of water may pass over it. if it is placed on the full tank supply level and water is to be allowed to rise $\frac{1}{2}$ a yard above it, the whole bank must be raised $\frac{1}{2}$ a yard higher than the ordinary level given to tank banks of the various classes, while if it is placed below the full supply level the capacity of the tanks is virtually reduced, not in proportion to the number of inches the water is to be retained below its normal level but in a far higher proportion, for in most tanks the content of the upper foot is as great as that of the $1\frac{1}{2}$ below it & probably is as much as a depth of 3 or 4 feet in the deep beds of the tank would give. —

Of surplus water...

If surplus weirs are built with flush crests & especially if they are built on a low level, a strong temptation is afforded to Ryots & others to place ring bunds in front of the weirs; such a proceeding is certainly objectionable, the more so, if the bunds are made strong and

[illegible]

S. M. C. -
No 2500
27 January
1880

and so in point of fact, under the Calicut
sulphur or resin altogether in effect, it
would appear that the system referred
to by the Secretary of the Revenue Board
relates to such fortifications
& not to the ordinary mud wall placed
between the Dam Stones of a weir.
if Dam Stones are 2' or 2½' high &
the Crests of the weirs are 3' broad,
as is usual in small works built
in the present day, the base of the
mud bank or wall cannot be more
than 3' & when water rises ½ or 2'
against the mud wall it is
inevitably breached, but if not it
cannot possibly stand when it is
over overtopped and the weir may
truly be said to be self-regulating.

6. If the width of the Crest of a weir is so small that a formidable bank cannot be formed upon it but only a mud wall, and the Dam Stones be 2 feet high, the water level to be retained with safety being say $\frac{1}{2}$ a foot above the Dam stones while the Crest of the flush weir would be

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 discharge of 144 cfs. ^{on the drainage}
 area of 6 square miles over the flush
 main. ^{14.1 long with the}
 dam stones proposed above (allowing
 for dam stones and remaining 100 ft.
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 that flush mires should not be con-
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 should not be prohibited so long
 as the Ryots are satisfied and
 are willing to restore the mud walls
 or to replace them by planks, as the
 water falls below the H.W. level they
 wish to retain.

I have the honor to be

Yours most obedt Servt

N. T. P. Major A.E.
 District Engineer Sanjona

No 461
 Note by the Chief Engineer for Irrigation

The flush self regulating tank
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 G.O. No 1766 of the 9th July 1873 should
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 water is to be allowed to rise, that
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 of the crest of the weir, its circum-
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 tank basin. It must depend upon
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the conditions of the Tank, whether the maximum depth passing over the crest of its escape should be fixed at 18 inches or more. In one case a very long weir may be capable of being constructed for a small sum; elsewhere the existing bund may be high, and the space for an escape weir limited. Again it may be cheaper, where the bund is short, to raise this rather than to make the escapes long.

3. A flush escape by which is meant a crest wall without any upright stones or other impediments to the free flow of water, and without any facilities for raising the water to be retained above the proper full Tank level, will always retain a full supply and will always pass off water in excess, if the calculated

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4. It is undoubtedly the case that the bunds of many tanks will have to be raised to make them secure, but this is in many cases equally true of tanks with the old form of calingulah. There are many instances of upright stones reaching to several feet above full Tank level, in fact above full Tank level, indeed almost if not quite to that of the top of the bund, & such tanks would be far safer were the upright stones removed & the crests raised, even were no other addition to the length of escape provided than would result from getting rid of the stones.

5. When tanks are furnished with flush escapes no damming above the crests of any kind must

on any account be allowed.

b. Escapes with crests on full tank level should be the pattern adopted for all new works of this class; it may however be noticed that, where circumstances render such an arrangement desirable, and the importance of the tank may justify the expense, any desired number of sluices may be placed in the body wall. Such sluices are sometimes advantageous when for any cause, such as slips in the banks &c, it may be desirable to lower the water level, but the length of the crest of the one or more escapes should nevertheless be that proper to ensure the discharge of a maximum flood without allowing the

the water to rise above that level, with reference to which the levels of the top of the bank & the revetments may have been fixed.

Potomac and Chesapeake Stolls
29 July 1873
Chief Engineer for Irrigation

To The Secretary of Govt
P. W. D.

AP 2101 P.M.A.
 Pro. of the Madras Govt.
 Read the following

From the District Engineer (H.E. No. 418 of 21 July/33)
 (Ch. Engineer for Irrigation) No. 461 of 29 July/33

Ordered that
 the above note by
 the Chief Engineer
 for Irrigation be
 communicated to
 the District Engineer
 Tanjore, with reference
 to his letter recorded
 in these Proceedings,
 & to all other Dis-
 trict Engineers in
 continuation of G.O.
 No. 1766 of the 9th
 July

[Faint handwritten notes and signatures]

AP 2101 P.M.A.
 Pro. of the Madras Govt.
 Read the following
 From the District Engineer (H.E. No. 418 of 21 July/33)
 (Ch. Engineer for Irrigation) No. 461 of 29 July/33
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 No. 1766 of the 9th
 July

[Faint handwritten notes and signatures]

July 1873

Aug. 30/73

General

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The Dist. Eng. Surveyor
All other Dist. Eng.
The Chief Eng. for W.D.

Dated 1/9/73

Ms. 4116 + 4457

Govt. of 1873 Madras.

PUBLIC WORKS.

To The District Engineer
Tanjore

Dated

Recd.

Encl.

G. O. 23 Aug 76 No. 2101.

Nos. 374 & 376

Flush escapes. Note
by the Chief Engineer
on the subject
of the flush self re-
gulating bank es-
capes, Comd. D. D. C.
Sug. S.