

- (1) Number of pages _____
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MADRAS RECORD OFFICE

Government of Madras

Public Works DEPARTMENT

G.O. No.	1094	(9)	Press
B.P. No.			Mis.
Dated	1-5-	1876	

Not to be folded or roughly handled

Read the following papers :—

No. 25. Proceedings of the Madras Government in the Financial Department,
dated 1st April 1876, No. 610.

ABSTRACT.—*Cumbum—Sanitary.*—Orders passed on papers relating to the insani-
tary condition of Cumbum.

No. 7. K. R.

MEMORANDUM.

No. 25-A.

THE undersigned has the honor to return the estimate for the channels under the
Cumbum tank with reference to the

	Rs.
1 Abstract Estimate	32,700
1 Do.	8,840
3 Plans.	
1 Statement of Ayacut Assessment.	
1 Specification.	
1 Report giving dimensions of channels.	
1 Letter No. 181, 1875.	
1 do. 850, "	
1 do. 485, "	
1 do. 486, "	
1 do. 381, "	
1 Tabular Statement of Inam lands, &c.	
1 do. of lands cultivated.	
1 do. of do.	
1 do. of do.	
17	
1 Distribution Statement prepared in the office.	

following remarks :—

2. The data on which the estimate
for repairing and improving the channels
has been framed are not apparent, and
there is nothing to show that the proposed
dimensions of the channels had been based
on levels on which alone can those
requisites be determined. The few cross
sections of the channels which have been
submitted indicate arrangements which
would seem not to be suitable, and for the
Chinna Cumbum channel there are no
sections of any kind. To take the sections

of the Seekrail Cuthwa Calwa for instance, the first section shows an intended bottom
width of 3 feet, and no water line is given ; then follow sections with bottom widths of
6, 8, 11 and 19 feet, water-depths varying from 4 to nearly 6 feet, and areas of water-
way from 18 to 80 square feet, and of these sections have been plotted in the order of
their position from the top of the channel downwards ; it would seem that as the
quantity of water required for irrigation becomes less the capacity of the channel
increases, and that in a manner which can hardly be accounted for by differences of
fall. Again, there is no mention at each section of the position to which it refers.

3. The estimate could in no case have been approved as prepared for it lumps
together work on all the channels, whereas not only should the work to be done on
each channel be separately shown, but each channel should be divided into convenient
sections, either by miles or to heads of particular branch channels, or otherwise, and
for the work of each such section there should be a minor total.

4. The first essential for the determination of the requirements of the channels,
and for the subsequent preparation of the estimate, is a complete set of levels, viz. :—

(1.) A line of levels along each channel. These may most conveniently be
taken on the ground surface rather than in the channel bed.

(2.) Cross sections at every 100 feet. These can be taken either in conjunction
with the longitudinal levels or immediately afterwards from pegs laid down on the

longitudinal line, on which pegs the staves should be placed for the longitudinal levels.

(3.) A longitudinal section prepared from the cross sections.

The information thus afforded will be—

(a.)—The ground level.

(b.)—The bed levels of the channels.

(c.)—The cross sections of the channels throughout, and these cross sections should be extended at least to the boundaries of the ground belonging to the channels, and beyond these lines if any alteration of alignment seem probable.

5. The next thing to be done is to prepare a statement of the area of land under each part of each main channel, and the enclosed form will be convenient for this purpose, as in it can be shown subsequently every required particular or hydraulic detail. Then columns 5 and 6 of the statement should be filled in. Probably 2 to 2½ cubic yards an hour will be used for irrigation and this will be the ordinary supply, while the maximum supply will be either that prescribed by Circular 27, or any other quantity which the circumstances of the case may render necessary. For instance, the dimensions of a main channel cannot be diminished after each minor channel head has been passed, unless arrangements can be made for the disposal of surplus, for when the ryots do not want water in their fields, e.g., when there is much rain falling, the heads of these channels will be closed, and the main channel should be capable of carrying all the water at a level not higher than that fixed for the maximum.

6. The disposal of upland drainage is a matter on which the efficiency of the channels will greatly depend. Probably it will in most cases have to be admitted to the channel, and, if so, the points of admission should be selected and should be fixed as far as possible at places where M.W.L. agrees with or is slightly below ground level, in which case a sufficient opening in the banks, and by sufficient ample is intended, as a broad stream 3 inches deep does no harm, while a narrow stream, 18 inches deep, may carry much silt into the channel, and outlets to correspond should be given on the other side of the channel; for these latter a stone pavement with or without a small crest wall will usually be required. The masonry wall, if there be one, must be raised at the ends to form a wing, and the ends of the channel banks should be revetted.

7. The slope of the channel must be adjusted so that the current may not destroy the slopes, and these should be regulated as experience may have shown to be necessary, for if the banks have with a given slope stood well a velocity which will not be exceeded in the future, no change involving expense will be necessary.

8. The channel banks should be at a fixed height above M.W.L. Apparently no embankment is required on the upper side of channels in which or where M.W.L. is below ground level, but as the crests of escapes in the lower bank will be at

To be raised ordinarily to 2 inches above M.W.L. by a small earth bund, 9 inches thick at base. 6 inches below M.W.L., and water may occasionally rise higher, there must be a margin for safety. Probably 2 feet above M.W.L. will suffice. In the sections forwarded no regular height appears to have been adopted.

9. In cases in which it may be desirable to reduce the present fall of main channels, this will be effected by means of weirs, the lengths and levels of the crests of which will be adjusted to secure a certain surface level for the water above; velocity of approach will have to be taken into account. If the District Engineer will send to the undersigned—

- (1.) A cross section of the channel at the intended site of a weir,
- (2.) Particulars of discharge (ordinary),
- (3.) Water surface level above (ordinary and maximum),
- (4.) Cross section of channel below (as intended) with bed level,

a design will be prepared as a guide for similar works.

10. It is desirable in order to facilitate distribution arrangements that the water level should vary as little as possible.

11. Allusion has been made in the papers submitted to work having to be done with water always in the channels, and to the tanks sluices being never closed; explanation is required as to the circumstances as to the measures proposed for enabling the discharge from the tank to be regulated, and should this be impracticable the maximum discharge from each sluice must be ascertained, the channels will have to be arranged to carry it, and the surplus if any will have to be disposed of.

The undersigned has not seen the Cumbum tank for about twenty years, and then had nothing to do with it, but he believes that one sluice was repaired about that time by the late General Boileau, and that regulation was at that time effected by great wooden plugs, the lower parts of which were covered.

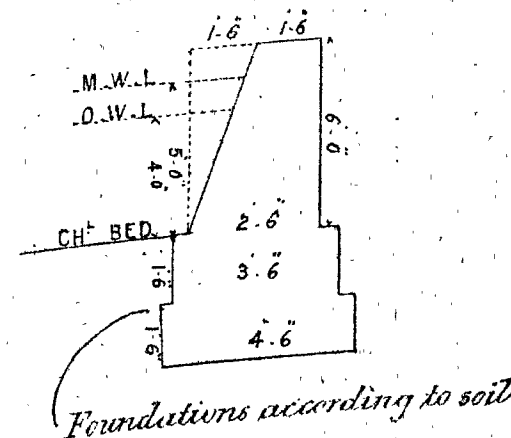
12. Masonry side walls should be but sparingly used, and, when necessary, they should have a mean width of one-half the depth of water, a batter on the water face of about 1 in 4, and their tops should be not less than 1 foot above M. W. L.

13. Revetments must in all cases have a proper backing, and the stone should be laid either at right angles to the slope, or in steps according to the materials; only stone of regular shape and of sufficient length, i.e., the thickness of the revetment, is adapted for stepped revetment. It can be built at a steep slope, whereas 1 to 1 is the steepest allowable for irregular stone, and then only in revetments of small height.

14. Puddle must to be efficacious be carried down to—

- (a.)—Water-tight material.
- (b.)—A depth sufficient to prevent water readily passing under it.

When there is no water-tight soil a lining of puddle to the channel itself rather than a puddle wall on one side will usually be best. Puddle walls need not be as thick at top as at base. A width of half the depth of water at base, or, say, 3 feet, and of 1 foot at top will be suitable in the case of these channels.



*Proceedings of the Madras Government, Public Works Department,
1st May 1876.*

15. All the enclosures recorded with the District Engineer's No. 33 of the 29th November last are returned. Those which will be necessary to elucidate the circumstances of the work should be resubmitted. Mr. Farmer's letter, No. 486 of the 10th December 1874, is an important communication, but it contains so many clerical errors that it can hardly be printed unless corrected.

16. Owing to mismanagement in the record department of this office, the disposal of these papers has been greatly and most unfortunately delayed, and it is desirable that the revision of the estimates should be accelerated as much as possible. The sections of, and the proposals in regard to, one channel may be sent up therefore as soon as ready, and they will be reviewed at once, so that the work may be started as soon as possible.

(Signed) JOHN MULLINS, Lt.-Col., R.E.,
Chief Engineer for Irrigation.

25th March 1876.

P.S.—The longitudinal and cross sections should be plotted on hand-made Imperial paper, on consecutive sheets (not on one long sheet); the longitudinal section occupying the centre of the length of the paper and the cross sections alongside with references to the longitudinal section. See plan attached to Circular No. 1, dated 27th November 1867. Of course one datum will be used for all the levels, and the figures denoting those levels will be referred thereto, but the line from which the levels are actually plotted may be 50 or 100 or 500 feet above datum, the extent of the omission being noted at the end of the line. The bench-mark to which the datum used may be referred must be specified in such a way that it may be found by any one from the description, and it should be marked in some distinguishing way, the mark used being copied on the first sheet of levels of each channel. The datum should be fixed at a sufficient depth below the bench-mark to make all the levels + Bench-marks at moderate distances must be selected. They may be on any permanent masonry structures near the channels; they should be marked with tar and referred to on the survey and sheets of levels, and a list of them should be an appendix to the estimate. Revenue Survey stones will do very well for bench-marks when they happen to be securely fixed, as is the case with village boundary stones; they should not be marked in any way, but the exact place where the staff may be placed should be noted. The scales to be used will be—

Longitudinal section, scale for lengths, 600 feet to an inch or $\frac{1}{7200}$ to agree with survey.

Longitudinal section, heights, and cross sections (lengths and heights) $\frac{1}{100}$.

Plans of masonry works scales $\frac{1}{100}$ and $\frac{1}{50}$ according to circumstances. If there be any details requiring a still larger scale one of $\frac{1}{25}$ may be used.

(Signed) JOHN MULLINS, Lt.-Col., R.E.,
Chief Engineer for Irrigation.

25th March 1876.

*Proceedings of the Madras Government, Public Works Department,
1st May 1876.*

*CUMBUM TANAL
Distribution Statement for the Chinna Cumbum Channel.*

Distribution Statement for the Chinna Canom Channel														
Distance from Head.	Lengths.	Positions.	Acreage.	ORDINARY DISCHARGE.			DEPTH.		Hydraulic mean depth (Ordinary).	Fall or slope of bed.	Bottom Width.	Side slopes.	Names of Minor Channels.	Acreage.
				Required.		Provided.	Maxim.	Ordinary.						
				Cubic feet a second.	C. yards a. hour.	Cubic feet a second.								
1	2	3	4	5	6	7	8	9	10	11	13	14	15	
Chinna.	Feet.	To head of Gootala Calwa											Gootala Calwa.	
675	(575)	"											"	
2020	1,345	To head of Chinna and Jumboo Calwas.											Chinna do. Jumboo do.	

* The surface fall is the proper inclination, but this may perhaps be not readily determinable if the channel vary much in bed fall and if there be no regulating weirs. Another column for surface fall may be interpolated if it can in some places be determined.
Column 7.—Columns 5 and 6 will have reference directly to the acreage, and Column 7 to the arrangements which will be practically convenient. See Memorandum paragraph 5.

Proceedings of the Madras Government, Public Works Department,
1st May 1876.

No. 26. ORDER THEREON, 1st May 1876, No. 1,094.

IRRIGATION, No. 4-A.

ORDERED that Major Hasted, R.E.,
Superintending Engineer, Kistna, be
nominated for the duty referred to in

paragraphs Nos. 13 and 14 of the order above-mentioned, and that he be instructed to
meet the Collector of Kurnool and the Sanitary Commissioner at the time and place
fixed by the former.

2. The District Engineer, Kurnool, will likewise meet Major Hasted, and the
latter officer will afford Mr. Goodchap such assistance and advice as may be required
for the effective treatment of the channels under the tank, in connection with the
instructions already given by the Chief Engineer for Irrigation in the foregoing
memorandum.

(True Extract.)

Colonel,

Offg. Under Secy. to Govt., P.W.D.

To the District Engineer, Kistna.

" " Kurnool.
" Collector of do.
" Sanitary Commissioner.
" Chief Engineer for Irrigation.

This memorandum to be printed in P.W.D. on
S.O. R.D. or Public Draft, on which
disposal was drafted a few days ago in which
Major Hasted was nominated to meet the
Collector of Kurnool & the Sanitary Commissioner
by 1/5

No 1094 Public Works Department.

PROCEEDINGS of the MADRAS GOVERNMENT.

Under date the 1 May/76

Read the following:—

Proceedings of the Madras Government.
Financial Dept. No 610 dated 1st April 1876.
Memo by the Chief Engineer for Irrigation
on the estimates for the repair of
the Gumbum Tank channels, dated
25 March 1876. No 7 R.R.

Ordered that
Major Hasted R.E.,
Superintending Engineer,
Kistna, be nominated
for the duty referred
to in paras Nos 13 & 14
of the order above
mentioned, and that
he be instructed to
meet the Collector
of Kurnool and the
Sanitary Commissioner
at the time and place

fixed by the former.

2. The District

Engineer, Kurnool,
will likewise meet

Major Stated, and

the latter officer will

afford Mr Goodchap

such assistance and

advice as may be

required for the

effective treatment

of the channels under

the tank in connection

with the instructions

already given by

the Chief Engineer

for Irrigation in

the foregoing Memo-

-randum in the

enclosed No. 2672

to be forwarded to

the Government

S. E. Krishna /
P. E. Kurnool /
C. E. - do - /
Sanitary Commr. /
C. E. P. S. /
Tail Sept. /

Recd 16/5/16

Govt. of 1876
PUBLIC WORKS.

Accepted for deposit
H. B. E. H. H. H.

6. 11. 18 May 1944 1094

7708. 25-26-68

25-26-27
28-29-30-31-32-33-34-35-36-37-38-39-40-41-42-43-44-45-46-47-48-49-50-51-52-53-54-55-56-57-58-59-60-61-62-63-64-65-66-67-68-69-70-71-72-73-74-75-76-77-78-79-80-81-82-83-84-85-86-87-88-89-90-91-92-93-94-95-96-97-98-99-100-101-102-103-104-105-106-107-108-109-110-111-112-113-114-115-116-117-118-119-120-121-122-123-124-125-126-127-128-129-130-131-132-133-134-135-136-137-138-139-140-141-142-143-144-145-146-147-148-149-150-151-152-153-154-155-156-157-158-159-160-161-162-163-164-165-166-167-168-169-170-171-172-173-174-175-176-177-178-179-180-181-182-183-184-185-186-187-188-189-190-191-192-193-194-195-196-197-198-199-200-201-202-203-204-205-206-207-208-209-210-211-212-213-214-215-216-217-218-219-220-221-222-223-224-225-226-227-228-229-230-231-232-233-234-235-236-237-238-239-240-241-242-243-244-245-246-247-248-249-250-251-252-253-254-255-256-257-258-259-260-261-262-263-264-265-266-267-268-269-270-271-272-273-274-275-276-277-278-279-280-281-282-283-284-285-286-287-288-289-290-291-292-293-294-295-296-297-298-299-300-301-302-303-304-305-306-307-308-309-310-311-312-313-314-315-316-317-318-319-320-321-322-323-324-325-326-327-328-329-330-331-332-333-334-335-336-337-338-339-340-341-342-343-344-345-346-347-348-349-350-351-352-353-354-355-356-357-358-359-360-361-362-363-364-365-366-367-368-369-370-371-372-373-374-375-376-377-378-379-380-381-382-383-384-385-386-387-388-389-390-391-392-393-394-395-396-397-398-399-400-401-402-403-404-405-406-407-408-409-410-411-412-413-414-415-416-417-418-419-420-421-422-423-424-425-426-427-428-429-430-431-432-433-434-435-436-437-438-439-440-441-442-443-444-445-446-447-448-449-450-451-452-453-454-455-456-457-458-459-460-461-462-463-464-465-466-467-468-469-470-471-472-473-474-475-476-477-478-479-480-481-482-483-484-485-486-487-488-489-490-491-492-493-494-495-496-497-498-499-500-501-502-503-504-505-506-507-508-509-510-511-512-513-514-515-516-517-518-519-520-521-522-523-524-525-526-527-528-529-530-531-532-533-534-535-536-537-538-539-540-541-542-543-544-545-546-547-548-549-550-551-552-553-554-555-556-557-558-559-560-561-562-563-564-565-566-567-568-569-570-571-572-573-574-575-576-577-578-579-580-581-582-583-584-585-586-587-588-589-590-591-592-593-594-595-596-597-598-599-600-601-602-603-604-605-606-607-608-609-610-611-612-613-614-615-616-617-618-619-620-621-622-623-624-625-626-627-628-629-630-631-632-633-634-635-636-637-638-639-640-641-642-643-644-645-646-647-648-649-650-651-652-653-654-655-656-657-658-659-660-661-662-663-664-665-666-667-668-669-670-671-672-673-674-675-676-677-678-679-680-681-682-683-684-685-686-687-688-689-690-691-692-693-694-695-696-697-698-699-700-701-702-703-704-705-706-707-708-709-710-711-712-713-714-715-716-717-718-719-720-721-722-723-724-725-726-727-728-729-730-731-732-733-734-735-736-737-738-739-740-741-742-743-744-745-746-747-748-749-750-751-752-753-754-755-756-757-758-759-760-761-762-763-764-765-766-767-768-769-770-771-772-773-774-775-776-777-778-779-780-781-782-783-784-785-786-787-788-789-790-791-792-793-794-795-796-797-798-799-800-801-802-803-804-805-806-807-808-809-810-811-812-813-814-815-816-817-818-819-820-821-822-823-824-825-826-827-828-829-830-831-832-833-834-835-836-837-838-839-840-841-842-843-844-845-846-847-848-849-850-851-852-853-854-855-856-857-858-859-860-861-862-863-864-865-866-867-868-869-870-871-872-873-874-875-876-877-878-879-880-881-882-883-884-885-886-887-888-889-890-891-892-893-894-895-896-897-898-899-900-901-902-903-904-905-906-907-908-909-910-911-912-913-914-915-916-917-918-919-920-921-922-923-924-925-926-927-928-929-930-931-932-933-934-935-936-937-938-939-940-941-942-943-944-945-946-947-948-949-950-951-952-953-954-955-956-957-958-959-960-961-962-963-964-965-966-967-968-969-970-971-972-973-974-975-976-977-978-979-980-981-982-983-984-985-986-987-988-989-990-991-992-993-994-995-996-997-998-999-1000-1001-1002-1003-1004-1005-1006-1007-1008-1009-1010-1011-1012-1013-1014-1015-1016-1017-1018-1019-1020-1021-1022-1023-1024-1025-1026-1027-1028-1029-1030-1031-1032-1033-1034-1035-1036-1037-1038-1039-1040-1041-1042-1043-1044-1045-1046-1047-1048-1049-1050-1051-1052-105

~~Insanitary condition of~~
~~Punjab - Khosla B.~~

Issuing instructions
to Major D. H. Asch. Re.
Mr. Goodchap relative to
the Committee appointed
Finl. Co. No. 510 of 1st
of 1876 to enquire into the

—K 25-26