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LSM-38724

EVALUATION OF PILOT PROGRAM ACTIVITIES

CONSTRUCTION OF APPURTENANT STRUCTURES
ON FOOD FOR WORK ROADS

FOURTH INTERIM REPORT

24 August 1983

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SCOPE OF REPORT

This Fourth Interim Report reflects information attained in 10 interviews and 81 construction site visits conducted from 17 July to 2 August 1983. Interviews were held with Thana Nirbahi Officers (TNOs) and their technical staffs involved in the Local Government Pilot program. The table on the following page summarizes the interviews and site visits conducted in the preparation of this report.

These 10 thanas were visited for the third, and final, time - also marking the final field work involved in the preparation of this evaluation.

Thana	District	Interview Date	No. Structures Seen
Shailakupa	Jessore	17 July	14
Alamdanga	Kushtia	18 July	9
Shymnagar	Khulna	19 July	6
Fatikchari	Chittagong	21 July	5
Ishurdi	Pabna	25 July	15
Puthia	Rajshahi	26 July	9
Shariakandi	Bogra	27 July	3
Sarail	Comilla	31 July	9
Chunarughat	Sylhet	1 August	9
Begumganj	Noakhali	2 August	2

THIRD ROUND VISITS

As stated in the Third Interim Report, the purpose of this final round of visits is: (1) to obtain a final assessment of progress, (2) to attempt to see as many completed structures as weather, road conditions and time permits, and (3) to gather any other information deemed useful for the future small bridge/culvert program.

In introduction, a few general comments are in order: In the text that follows, a "completed" scheme generally does not include the completion of guardrails, removal of formwork/shuttering, touch-up plastering, curing, or earthwork. (Only in Begumganj thana did the completion of earthwork rate 2% in the monthly progress reports.) The proper placement of weepholes in wingwalls and abutments was generally not understood. In all thanas, except Shariakandi Thana, significant improvement was seen in the quality of brickwork, evidently following guidance given during the second round visit.

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In addition, in a late June memorandum, the Ministry of Food asked each thana involved in the Local Government Pilot program to complete a proforma summary of work progress with revised dates of completion. Each thana was also instructed not to begin schemes where high-water problems had already set in for the duration of the monsoon season. Finally, only Sarail and Begumganj Thanas reported receiving the second installment of 6.34 lakh taka from the Ministry through their respective Deputy Commissioners (DCs) on 1 August.

SHAILAKUPA THANA

All 24 schemes were completed through slab casting and parapet wall plastering prior to the 30 June deadline. All the structures are 5- to 10-foot span brick masonry open foundation culverts, taking approximately 2 to 3 weeks to construct once the materials are at the site. With the completion of these 24 schemes, 6 roads have their total complement of appurtenant structures, while 2 other roads are "complete" except for the need for one moderate-size bridge on each.

A total of 14 structures were seen on this visit. The brickwork was much improved over that seen in the second round visit, as reported in the Second Interim Report. All slabs were cast in the presence of the Thana Engineer (TE) by appointment. Villagers were reported to have been actively involved in reporting any anomalies in construction site activities to the Thana supervisors, and in addition, the TNO had the Unions form committees to verify the completion of work.

All structures have expansion joints between the wingwalls and abutments. Weepholes are provided in most parapet walls, wingwalls, and abutments. Due to the presence of water in some of the excavations, several courses of brick at the bottom of a number of structures could not be plastered, and will be completed during the dry season. Since most of the culverts seen were still undergoing slab curing, the formwork (shuttering) was still in place; after removal of the shuttering, the underside of the slabs will be plastered; at this time, the parapet walls will also be re-plastered since proper curing was not done after the initial plastering due to the Eid holiday. Each contract calls for earthwork approaches that are leveled back to 100 feet from the culvert. All earthwork will be redone by the contractors after a few rainy periods to allow for natural compaction; this will be followed by slope turfing.

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The TNO had not received any funds beyond the initial 8 lakh taka. All contractors had been payed 40-50% of the final estimate. Payment to 90% of the final bill (security money makes up the remaining 10%) will be made only after completion of plastering and approach work.

ALAMDANGA THANA

All 11 schemes were completed to slab casting by the 30 June deadline; 10 of the schemes are 5- and 8-foot brick masonry box culverts, while the other is a 20-foot bridge. Nine of these structures were seen during this visit. Since the Ministry's selection criteria was not received prior to the scheme selection deadline, all 4 roads that were "developed" in this pilot program require more appurtenant structures for total completion.

As reported in the Second Interim Report, there were some considerable groundwater infiltration problems which precluded the casting of foundations at two culverts. With the advice of the District Engineer and the Water Development Board (WAPDA) executive engineer, and the good fortune of several weeks of dry weather, work on these culverts commenced on 15 June, and both were completed within two weeks. With the dry spell, the water levels in the excavations went well below the foundation levels. Excavation then proceeded to about two feet below the foundation elevation; this extra excavation was filled with good quality sand from another area, on top of which was placed brick soling beds and the foundation slab (using quick-setting cement).

All the abutments and wingwalls were pointed and many were provided with grooves for optional placement of a sluice gate. All slabs will be plastered underneath. Earthwork will be leveled back to 100 feet from the culverts; there are no provisions for compaction on turfing.

It is of interest to note that the structures built in Alamdanga Thana were much more costly than similar sized spans in other pilot thanas that used WAPDA designs. When questioned about this, the TTS explained that they "beefed-up" the designs toward the Design Manual dimensions, providing a thicker foundation slab, a 6-inch concrete slab over a brick soling floor under the entire structure (forming a full box culvert), concrete angles were cast at the approach ends of each slab to protect the slab from bullock-cart impact, and slabs are on concrete seats, and wheelguards (curbs) were provided on the inside of the parapet walls.

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Partial payments of up to 60% were made to contractors for 9 of the 11 structures. The TNO has made several requests to the DC and the Ministry of Food for the release of the remaining 50% of the tendered price.

SHYMNAGAR THANA

In Shymnagar Thana, where, as stated in the Second Interim Report, availability and delivery of construction materials is an acute problem, three weeks of rain and receding flood waters combined with late design changes and funding delays to further aggravate the progress of work.

In early June, the District Council executive engineer finally reviewed the designs submitted by the TTS, and after a site visit to the four larger bridges with the Roads & Highways assistant engineer, determined that the two 40-foot bridges and one of the 30-foot bridges require mid-span piers. Only after this review did the DC release the balance of 4 lakh taka of the original 8 lakh taka disbursed by the Ministry. Since, up to that time, the TNO was not able to pay the contractors on their running bill, work progress continued to be slow; then, three weeks of flooded conditions exacerbated the already modest rate of materials delivery.

By 30 June, 7 reinforced concrete (rcc) box culverts were "completed" although all earthwork will have to await the dry season, since no earth is available in this submerged lowland area. Three other rcc box culverts will be completed by 31 July. Their other box culvert was 50% completed on 30 June when work was suspended due to high water levels and currents that made the placement of formwork/shuttering impossible. As previously mentioned, three bridges will require a central pier which, in all likelihood, will not be completed until the dry season allows casting of the pier foundations. Their other 30-foot bridge is scheduled for completion by 31 August. With the completion of these pilot schemes, 3 roads will have their full complement of appurtenant structures, and 2 other roads will be only partially complete.

Five completed rcc box culverts were seen, with varying degrees of expertise exhibited by the aesthetics of the final structure. (It should be noted that, given proper materials, thana supervision, and road bending and placement, rcc work has generally been of at least satisfactory quality throughout this pilot program.) Since these box culverts were designed without

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facewalls or wingwalls, earthen facewalls will be built using locally available good-compacting soil. This was one of the few thanas where excavations were safely sloped. Here, as in Shailakupa Thana, the quality of brickwork seen at the 40-foot bridge visited was much improved over that observed in the second round visit; several "mistries" (craftsmen) were dismissed and replaced following my criticism of their work. As a final note, the TNO will request additional funding from the Ministry for the construction of the three mid-span piers required by the District Council executive engineer; WAPDA has also offered to allow their canal to be diverted to the outside of the abutments at the site of one of the 40-foot bridges during this monsoon season if the contractor can be guaranteed extra payment for the pier and for this diversion operation.

FATIKCHARI THANA

Progress has also been curtailed in Fatikchhari Thana, with little work being done in the first 3 weeks of July due to the Eid holiday and heavy rains. As of 30 June, two 10-foot open foundation culverts and 5 rcc pipe culverts were "completed". All their remaining structures, with the exception of one 30-foot bridge which cannot be started until December due to high water, are scheduled for completion by 15 August (this includes 8 bridges of 20- to 40-foot span). At one 20-foot and one 25-foot bridge, high groundwater and poor soil (loose sand) prompted the TE to consult with the District Council executive engineer; the solution reached was to drive piling down to stable soil to support the foundations. In order to expedite the general progress and to assure work through the monsoon season, the TNO has told the contractors that running bills will not be accepted until completion of works. (It should be noted that, as of 21 July, the TNO had only received 5 lakh taka from his DC, with the promise of 3 lakh taka due for transfer to the thana bank by the end of July.) All 3 roads will have their full complement of appurtenant structures with the completion of this pilot program.

Supervision still remains a severe problem in this thana, with distant roads, no personal transport, and the part-time availability of 4 TTS supervisors. Among the several bridges and culverts seen, the quality of brick masonry work varies considerably among contractors, with some very good work and some structures with brickwork done course-by-course with many vertical joints without mortar. All structures will be plastered.

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ISHURDI THANA

In Ishurdi Thana, 26 schemes were completed by 30 June, including 20 four-foot span brick masonry box culverts and 6 eight-foot span rcc arch culverts. Their 40-foot bridge was "completed" on 10 July. The remaining four 4-foot box culverts were completed on 25 July, while the other 8-foot arch culvert will be completed by 31 July; progress on these last 5 schemes was delayed by a slow down in materials delivery due to the presence of open excavations of other culverts in this pilot program. With the completion of these schemes, 3 roads will have all appurtenant structures needs met.

All brick masonry is pointed, with expansion joints separating wingwalls from abutments. The 4-foot box culverts have curtain walls at each end with floors of brick herringbone over soling topped with mortar. The underside of all slabs will be plastered. One of the 4-foot box culverts visited appeared undersized (probably should have been a 8-foot span culvert), since it must drain a large field into a relatively large canal. The 8-foot arch culverts are aesthetically appealing structures that have good structural qualities and is cost-competitive with other box culvert designs of similar span and boat clearance requirements. These structures have 8-inch thick arches, supported by 9-inch thick rcc abutments, with rcc floors, brick wingwalls separated by expansion joints, with a thick earth covering forming the roadway on top of the arch.

By 25 July, all contractors had been given running bill payments (up to 60-70% of the contracted price) with the 8 lakh taka received by the thana. It was reported that the DC-Pabna had received an additional 6.34 lakh taka for this program from the Ministry.

PUTHIA THANA

All 19 schemes in Puthia Thana were completed by 29 June, fulfilling all the appurtenant structure needs of 7 roads, and all but one 10-foot culvert for another road. Each contractor has been payed 40-60% of the contract price, and the TMO has made 3 separate enquiries over the prior month regarding the Ministry's release of the remainder of funds for contractor payment.

As reported in the Third Interim Report, both pointing and plastering was used to finish the brick masonry. Although the bridges and culverts are described as open foundation culverts/bridges, each structure included plastered brick curtain walls and a 3-inch thick concrete floor over brick soling. The 20-foot bridge has a double-slab (6 inches and 8 inches thick), and one of the 10-foot culverts has a wooden sluice gate. No expansion joints were provided between wingwalls and abutments, although an older WAPDA open foundation culvert on one of the pilot roads had wingwalls splintered apart from the abutments, indicating that although the soil conditions seemed satisfactory, differential settling may take place in this area, and expansion joints should have been provided (just to be safe).

SHARIAKANDI THANA

All 8 schemes in Shariakandi Thana were completed by 30 June. Since, as described in the Third Interim Report, the second phase tender was not issued, these 8 schemes are scattered throughout the thana, and no roads were completed. One contractor for a 10-foot culvert was replaced by another contractor, since the original contractor would not start the work in a timely fashion. All contractors were payed up to 50% of the total contract price. The brickwork seen was not improved over that observed during the second round visit, with clear evidence of course-by-course bricklaying with many vertical joints having little or no mortar in them. All culverts/bridges are plastered. Raincuts had already occurred in the recently replaced earthwork behind the wingwalls.

SARAIL THANA

In Sarail Thana, 8 of the total of 10 schemes were completed by 31 July. At the isolated site of their 25-foot bridge, 2½ tons of bent reinforcing rods were stolen on 25 July; slab casting for this bridge is scheduled for 4 August. Shuttering was in place for beam casting at the 50-foot rcc bridge during this visit; slab casting is scheduled for 5 August. Due to high water in this lowland thana, the wingwalls for the 50-foot bridge and the earthwork for their two 20-foot, 25-foot and 50-foot bridges will have to be done during November/December.

In this thana, where half the structures are brick masonry and the other half are rcc, all the brickwork is plastered. Nine out of the 10 schemes were seen on this visit, and the overall quality of work is quite good.

CHUNARUGHAT THANA

In Chunarughat Thana, where major flooding in July exacerbated an already difficult materials transport problem, 8 out of a total of 28 schemes were completed by 31 July. Their two large structures, a 30-foot and a 50-foot rcc box bridge, could not be started so late this season since water levels were too high for foundation pouring. All the remaining schemes will be completed by 15 August. With the completion of the two large bridge, this pilot program will "complete" the appurtenant structures needs of 2 roads. For total roadway completion, these roads require a major bridge of several hundred feet in span over the Kowai River; with this bridge, the TNO claims that crores of taka in commercial business would be created for this thana since these roads would provide a shortcut for the transport of a significant portion of the tea and timber production from this part of Habiganj Subdivision. All brickwork is plastered and there are no expansion joints provided between abutments and wingwalls due to good soil conditions.

BEGUMGANJ THANA

Begumganj Thana, which had the latest start in this pilot program, "completed" all 13 of their schemes, which included four 25-foot bridges and two 30-foot bridges in about 10 weeks time; and the quality of work is quite good. Plastering and guardrails on all the structures will be completed by 15 August; earthwork on all but 3 schemes will have to await the next dry season due to the lack of unsubmerged earth in this lowland thana. Payments to contractors are made in 2 running bills plus a final bill for schemes greater than one lakh taka in cost; less costly schemes are payed in one running bill and a final bill.