UNITED NATIONS

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UNDP/UNCHS/ Project VIE/86/020

Appropriate Technology Transfer in Construction

Ninh Van Commune

Ha Nam Ninh Province

Status - January 92

Progress report
January 92
DW/GRET & CERPAD

Credits

VIE/86/020 : Assistance to Human Settlements Planning and Development in Rural Areas

Funding:	United Nations Development Programme (UNDP)
UN Executing Agency:	UNCHS (Habitat) - Nairobi, Kenya
Government Implementing Agency: Development)	CERPAD (National Centre for Rural Planning and
	Ministry of Construction, Hanoi, Vietnam

Sub-contract : Appropriate Technology Transfer in Construction

Sub-contractor (consortium of NGO's):	**Development Workshop - Lauzerte, France** **GRET - Paris, France**

1 US $ = 12 000 - 11 000Dongs (January 1992) (Declining value)

1. Actions in Ninh Van : overview

1.1. Overview

This document briefly reviews progress on action and development in Ninh Van commune. CERPAD have completed a number of actions, at both communal level (road building, public well), and household level (Improved stoves, household water filters). Some actions are due to start currently in February 1992 (New Market), whilst research continues on improving the stone crushing machines.

Whilst a number of tasks have been completed, the capacity of the Commune staff to continue the work (make more roads, disseminate the filters, etc.) does not seem to have been greatly enhanced. This must therefore be the key area of effort in the coming months - a concentration on developing the local capacity to supervise in the case of major programmes, or to guide and disseminate in the case of household actions like stoves or filters. This means that CERPAD staff now need to really concentrate on training, on making training materials, and on developing public information materials. As is mentioned below, Ninh Van holds a festival in the latter part of April, and this has been set as a target for putting in place a popular mobilisation programme for all the actions which have a replicable nature.

1.2. Review of actions

This text was circulated as a memorandum at the end of the missions by J. Norton and G. Chantry in January 1992.

Action

1.1 Stone dust for concrete: complete, surface being tested in garage at CERPAD. Monitor performance.

1.2. Cement tile tests: Training and production for market to continue in February 1992 at Ninh Van.

1.3. Stone Column tests: Terminated and discontinued.

1.4 Stone masonry: Training of local masons to be started in late February 1992 for market construction. Trainer to be identified and hired by CERPAD.

2.1. Family water filter tank: More tanks are being built in the next period (Feb - March 1992). It is essential that for all water related activities regular testing takes place to monitor quality and maintenance. A chart and programme for doing this has been discussed with Mrs. Lien. In the case of the water filter at the People's Committee, stone dust has been used as a filter medium, contrary to the advice of P.J. Meynell, and this should be replaced

with yellow sand, and the filter maintained as an example to the population, which at present is not the case

2.2. Village Well Upgrade, Phu Lang: Well complete, testing of water required, and pulley rope and bucket to be installed. The care of the well is now in the hands of the Commune, and CERPAD has arranged for a man to look after the well, living next door. This should be monitored.

2.3. Rain water tank & filter: Monitoring of water filter performance needs to be done - the filter arrangement on the tank at the People's Committee does not work, and a revision should be made. Problem to be examined on next field visit by CERPAD staff.

2.4. Public washing point: A dossier has been started for this work, but was sufficiently developed to be ready for action, and CERPAD have been asked to rework the details so that the implementation can be done with a minimum of CERPAD supervision.

2.5 Water tank and filter research: Apparently not going on at present. This should be continued. There are alternative ideas, including traditional use of fired clay porous jars which can be extremely cheap and easy to use, and produce very good results. CERPAD should test such ideas.

2.6.1. Water test kit: Training has been done for 4 CERPAD staff, and field exercises done. The manual for using the Lovibond water testing equipment has been nicely translated into Vietnamese, and a copy is provided under separate cover.

More equipment is being supplied from Hanoi and Europe through the Sub-Contract, but it is imperative that CERPAD find laboratory space for this equipment to be installed. Mrs. Lien to establish a list of testing procedures, and a budget for doing tests in a village. DW/GRET have requested that a tidily presented report of the tests carried out so far be prepared by CERPAD, and work has begin on doing this.

2.6.2. Water testing programme: A cycle of tests must now be implemented on a regular basis, marked in a work book, and improvement or deterioration marked, and modifications made to the system where no improvement has taken place. In short, it is not enough to install filters, there must be monitoring of their use and training where needed, and regular testing over at least one year. It has been suggested that a cycle of tow or three month monitoring of water should be started, and that where possible the Commune AT Officer should be involved in implementation. CERPAD is being supplied with additional water testing equipment by the Sub-Contract, part being purchased in Hanoi, part in Europe.

2.7. Communication methods: CERPAD team to prepare a detailed dossier for each action on water by the 15th April (in Vietnamese,) with publicity for use in the village. This is important to enable CERPAD to participate in publicity activities in Ninh Van in the middle of April 1992, when in addition the Sub-Contractors are arranging for the Central Puppet Company of Hanoi to perform the show on water filtration in Ninh Van.

3.1. Latrines. No action; programme planned for February - April 1992. Requires detailed dossier and awareness raising programme. At present it is not clear in what way the Latrine programme is making any innovation, and at the very least there must be a public awareness campaign of this programme is to have any impact.

4. Van Le new settlement: Stopped waiting for funds.

7. Road maintenance: Work undertaken, with satisfactory results.

8. Credit system: No action

9. Stone production: Mr. Nam has undertaken a good test for improving the crushing blades of the Vietnamese stone crushers used in Ninh Van, and the results are encouraging. Before further tests are done on other machines, it is now essential to evaluate the economic viability of the improvement, from the user viewpoint, but also, and this is critical, from the producer viewpoint. Mr. Nam requires assistance from other members of CERPAD to investigate the cost and profit margin potential that would allow an manufacturer to put this new blade on the market. If not viable, although technically the operation is good, people will not be able to buy the parts, and will continue to use the old blades.

10. Commune market; The site has been cleared and the extension road completed. Some materials are being prepared. Work on construction should begin in February 1992.

11. Van le - Tam Diep Road: The road has been built, with a good surface finish. It's quality should be monitored over the coming year. The sides still require banking up, and in February two passing places should be built to enable lorries to pass each other. Work should be programmed for the bridge construction at the Van Le end of the road.

11.3 Roller: It emerges that the roller which was supplied to Ninh Van for road construction and maintenance is not in fact suitable for working on the finishing of the road construction, and an arrangement was made by the Ninh Van People's committee with the local road construction company to exchange the tractor/roller for a road roller for the surfacing work. Whilst this is an intelligent solution by the People's Committee, it reflects poorly on CERPAD's ability to give good technical advice, having stated earlier that the tractor/roller was suitable for new road building.

12. Improved stoves: 147 stoves have been built. There would seem little point in CERPAD supplying more stoves, and instead, CERPAD, as has been requested by the Commune, should provide the Commune with the equipment for making the stoves in Ninh Van, and thus develop a local production capacity. The support must now focus on putting in place a complete production and marketing capacity, with the necessary feasibility studies for assuring sales.

13. Develop commune capacity: An Appropriate Technology Officer has been appointed, Mr May, but at present his knowledge has been largely confined to work on the road, and he still feels that for more road building he would need expert support. CERPAD needs to concentrate its efforts in all fields on developing the skills of the commune and district staff, and for this to be made easier it must now develop detailed and accurate technical support information for use in training and implementation.

Overall. more work needs to be done on monitoring, on training the local counterparts, and on dissemination of ideas. CERPAD has agreed to participate in a day of promotional activity in the Commune in April, and this should focus energies on these issues.

2. CERPAD reporting on overall progress

Evaluation on results of work have been done and work have beeing implemented in Ninh Vân - From November to December 1991.

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1. Van Le - Tam diep Road :

- It has been carried out construction of the surface class by stone and pressed road by roller (high th = 0,3 m, length = 1.100 m, width = 3,0 m.)

Quantity : 930 m^3 undress stone, 813 m^3 stone (4×6), 150 m^3 stone (2×4), 75 m^3 stone (1×2) and 747 m^3 mountain earth.

- Mobilize labour working for 3 times with 1199 W-days and 36 machines shifts among which 1 tractor has been used to press tone principally at first stage. In order to finish good and quickly the remainding of surface class, the commune has exchanged a tractor for a roller which has been used in the 2nd stage.

In practive the wheels of tractor are not large enough to cover the road surface, so a third steel wheel must be equiped; The commune can buy a wheel from old roller.

- Next plan : continue to achievement the second stage of road, include embanking two side walk of road by mountain earth and 2 traffic - cross-points. (on February

2. Ninh Vân Market :

- First step : finish levening up new road formation by mountain earth (length 70 m, high 2 m, width = 6,5 m.)
Quantity = 1200 m^3 mountain earth, labour = 642 W. days.
Means of transportation : Ox - cart and hand - cart.

Second step : construction of surface class by stone will be carried out after finishing new building in the market

- New building is fixed.

+ Next plan :

• Prepare materials enough : undress Stone, cementitis, cements, sand...

• choise a skill-ful massnary group and ~~train~~ open a training course about on building Stone Wall wi cement joint without ~~plastering~~ plastering outside (afte Tet). It can be finished new building on March.

3. Phu long Village Well

- Pulley equipment for getting water has been put in
- The edge of well has been maintained and more tidy
- it is necessary to write a regulation for the defe of well.

4 Family filter Water tank

- The commune has carried out to build 50 filter wat tanks for 50 families which had the need (a list name as following)
- Every family have to prepare material and labour working. and Project provide a part : 100 kg cement 0,5 m^3 sand per tank.
- Most of tanks are used, however there are some tanks are not get active, they are not used and filter materials are not cleaned before use.

= Next plan =

• Important point must be guarantee the good water quality after filtering.

• It must be cleaned filter materials and not use stone dust, black sand instead yelow sand or cobble-stone...

• Need to build 15 other filter water tanks on Ap

5. Improved stove.

- In 1991. the commune has received 147 stove pots

from ~~Cerpad~~ CERPAD and has divided them to the villages to build (a list as following). In fact this number is n enough as the demand of Ninh Van people.

- Next plan :

. The commune will send a offical letter to ~~Cerpad~~ CERPAD for a improved stove ~~model~~ mould. CERPAD will giv one and the design documents on improved stoves

. The commune continue to achievement 200 stoves enough as planned programe under conducting of cerpad St.

6. Road maintence :

- Tractor has been used to maintain the road Dong gn tte duong cement factory (length 2500 m, With 6m, labour : 662 W.days, 1210 m^3 mountain earth, 225 m^3 stone dust, 36 machine shifts - ~~for~~ !
- Dong gnan - Thiing Village Road maintence :

It has been done from Dong gnan - Xuân Vũ (leng 400 m, Width = 4m, labour 1936 W days, 987 m^3 moun. earth, 395 m^3 stone dust.

Continue to maintain from Xuan Vu to Phiing Villa on March.

- The commune has hired a Romoc for tractor in ord to increase its operation With economy and efficienc
- This work is very good.
- Besides, the commune has cared priority to the production of local factory.

7. Stone production

- 1 stage: Studied and tried to manufacture one model, including main axis and stone cutting blazes (2/10 - 16/10).
- Chose 1 machine at Miss Hoa's house.
- A contract was ~~m~~ signed between ~~Cerpad~~ CERPAD - Commune - Household.

Experienting result:

- First time a lot of blazes were broken because the steal quality was over crispy.
- Second time: Instead broke blazes by 10 new blazes, up to now no blaze is broken.
- Household's idea: new blazes are better than old ~~bla~~ usualy old blazes just only use for 15 days, but new blazes have been used over 20 days and now they keep on working. Productivity ~~for a machine shift~~ adds 2 m^3 stone for a machine shift. Miss Hoa likes studying of stone sieve and belt.
- Next plans:

Propose to experiment to 4 machines. (on March) with helping buget from Sub-Contract

8 Study of applying building materials

- Experiment stone dust for concrete in apartment foundation of Ninh Vân market will be carried out on March when the new building has being built.
- Experiment cement titles.
  - A contract of training course ~~is~~ is signed between ~~Cerpad~~ CERPAD - Commune - Mr Tue (he ~~was~~ conductor)
  - 3 workers which were trained in 5 days, producte 300 titles, quality is rather good.
  - Sub-contract has help buget for training.
- Next plan: Keep on producting 3000 titles.
  - A training course of stone wall building for Ninh vân Market will ~~be~~ start after Tet.

9. Water testing equipment:

- Translated all English instructions into Vietnamese.
- On 3/10. Began to experiment on site in Ninh Vân by a four person group (Mr. Hùng, Miss Liên Mr Nă

Mr Chinh) (17/10 finish)

There are 30 experimented samples at different places in Ninh Vân (+ Village well, rain water, pond water, Phúc well, river water, family well...)

- There are a lot interesting results and 4 trainers can carry out experimentation well.

next plan: After having water testing equipment enough, it will be implementation of biology les

10. Rain Water tank

- Two rain water tanks ~~were~~ have been built (Mr M house and Mr Lui's house), quantity 5 m³ and small filter tank). Every family pay for material and labour working.
- Need a help of budget from sub-contract: (300 kg cement, 1 m³ sand per tank)
- ~~Note~~ propose household have to buy tap of water to pout in.

11. Washing place

- The commune received all documents of designs and drawings and prepare ~~building~~ materials to build at ~~th~~ Chan Lu Village.
- This action has been Wait~~ing~~ for budget from Sub contract.

note: drawings to be redone + dossier resubmitted

12. Latrine programme (twin latrine)

- The commune received the documents of design and dr drawing.
- Experiment in Market (on March) and need a help of budget from sub-contract.
- collected 30 needed families. ~~to have the need~~ (a list of na as following)
- On March, it will be built 10 latrines to experimen
- Demand Every family have to pay material and labo working., Project will provide a part: 200 kg cemen 0,5 m³ sand per latrine

+ Conclusion:

Some actions have progress ~~such~~ such as: Phu Lang Village well, Wan Le – Tam diep road, new market road and Experimentation cement titles; Stone production.

Weakness: The plan of doing ~~was~~ lasted; because the commune ~~was~~ is busy in harvesting crops, and the cold weather is ~~to~~ long. Some households do not care to use water filter tanks · so ~~filtered~~ water quality ~~is bad~~ (for example bad

filter tank at people ~~committee~~ committee ...)

Danh sách cấp
Bầu lò Bếp cải tiến TK. 90

1)	Thôn Xuân Vũ	15 bầu
2)	Thôn Đồng quan	15
3)	Thôn Võ Xá	10
4)	Thôn Chấn Lư	16
5)	Thôn Thường	18
6)	Thôn Hạ	16
7)	Xóm Dường Hạ	12
8)	Xóm Dường Thường.	13
9)	Thôn Phố Lăng	20
10)	Thôn Vạn Lễ.	12
	Tổng	147 Bầu.

16/1/1991.
Ban Chỉ Đạo PTNTXM

Phạm Đức May

Vật liệu để chuẩn bị

- Đá Dăm $20\ m^3$
- Đá Mạt $10\ m^3$

Ngày 3 ÷ 12 . 1991

Người Theo dõi

XÃ: NINH VÂN

BẢNG

Theo dõi Thi Công đào Hè

Ngày Tháng	Số Lượng	Phương Tiện V/C	Khối Lượng m3	Bình quân LĐ
I Nâng Mặt chè				
3 - 11	40	Xe Bò + Gánh Tiền	55	1.37
5 - 11	50	nt	80	1.6
6 - 11	60	Công Nông + xe Bò	95	1.58
7 - 11	60	nt	100	1.66
9 - 11	65	nt	90	1.38
10 - 11	10	nt + Ô Tô	30	3.00
	285		450	1.57
II Đường chè				
12 - 11	50	Xe Bò - Công Nông	90	1.80
13 - 11	54	nt	74	1.37
14 - 11	50	nt	75	1.50
17 - 11	50	nt	70	1.40
18 - 11	50	nt	97	1.94
19 - 11	55	nt	80	1.45
20 - 11	55	nt	95	1.72
22 - 11	60	nt	75	1.25
23 - 11	50	nt	83	1.66
24 - 11	50		84	1.68
27 - 11	20	Công Nông + Ô Tô	75	3.75
28 - 11	20	Công Nông Ô Tô	75	3.75
29 - 11	29	nt	110	3.79
30 - 11	29	nt	100	3.44
1 - 12	20	nt	77	3.85
	642		1200 m3	1.87 m3/1LĐ

UBND Xã Nậm Văn
Ban chỉ đạo PTNT

NHẬT KÝ CÔNG TRÌNH

Tên công trình: Nâng cấp đường Đồng quan → cầu Sắt.
CB: Phụ trách: Phạm Đức Hay

Ngày tháng	Số người thực hiện	Kết quả đạt được	Nhận xét đánh giá	Khối lượng vật liệu đã thi công.	ghi chú
Tên Đồng quan - Thủng					
10/11 → 20/11	29 công	37 ô vuông	tiến độ tốt thi công đảm bảo	79 m^3 cấp phối	Đường Đồng quan - Thủng cầu Sắt
21/11 → 26/11	47 công	620 m^2	thi công nhanh.	105 m^3 cấp phối	
1/12 → 5/12	218 công	2496 m^2	tiến độ Tốt	374 m^3 cấp phối	
6/12 → 16/12	220 công	2450 m^2	thi công đảm bảo kỹ thuật	367 m^3 cấp phối	
17/12 → 25/12	32 công	412 m^2	thi công Tốt.	62 m^3 cấp phối	
26/12 → 30/12	600 công	12000 m^2	Thi công bề dầy mặt đường	395 m^3 đá mạt	
Đường Đồng quan → xi măng Hệ Đường					
1/11 → 6/11	75 công	900 m^2	Cải tạo Đường	135 m^3 cấp phối; 26 m^3 mạt	Đường đồng quan - xi măng - cầu sắt
7/11 → 13/11	106 công	1380 m^2	thi công tốt.	207 m^3 cấp phối; 34 m^3 mạt	
17/11 → 25/11	134 công	1740 m^2	thi công nhanh kỹ thuật Tốt	262 m^3 cấp phối; 48 m^3 mạt	
26/11 → 30/11	169 công	1980 m^2	Tiến độ thi công nhanh	297 m^3 cấp phối; 52 m^3 mạt	
1/12 → 12/12	178 công	2040 m^2	Thi công nhanh kết quả tốt.	309 m^3 cấp phối; 65 m^3 mạt	
10/11 → 20/12			máy kéo chuyển vật liệu + Lu đường cả 2 Tuyến	36 ka.	

* Tổng hợp vật liệu nhân công đường đồng quan - xóm Thủng.
- Nhân công: 1136 Công x 6000đ
- Cấp phối: 987 m^3 x 9000đ
- Mạt 345 m^3 x 18000đ

* Tổng hợp vật liệu nhân công đường Đồng quan - xi măng Hệ Đường.
- Nhân công 662 Công.
- Cấp phối: 1210 m^3 9000đ.
- Mạt: 225 m^3 18000
* Ka xe vận chuyển + Lu 36 Ka

Ngày 5/1/1952
CB. Thực hiện

Văn Trường Sơn

UBND xã Minh Tân
Ban PTNT.
Công trình : Đường vạn lê

NHẬT KÝ CÔNG TRÌNH

	Số người thực hiện	Kết quả đạt được	Nhận xét đánh giá	Khối lượng vật liệu đã thi công	
15/10 - 20/10	70 công	1268 m^2	Rải cấp phối đợt 1	189 m^3 cấp phối.	
21/10 - 23/10	19	333 m^2	thi công chậm do thời tiết.	50 m^3 cấp phối	
23/10 - 25/10			Nghỉ lũ không công.		
26/10 - 30/10	175	3153 m^2	Thi công nhanh kết quả tốt	473 m^3 cấp phối	
31/10 - 4/11	60	300 m^2	Đợt 2 Rải Đá thi công chậm	75 m^3 đá hộc ; 12 m^3 đá 2x4 ; 65 m^3 đá 4x6	
5/11 - 15/11	088	540 m^2	thi công bảo đảm kỹ thuật	135 m^3 đá hộc ; 21 m^3 đá 2x4 , 117 m^3 đá 4x6	
16/11 - 20/11	75	600 m^2	thi công nhanh	150 m^3 đá hộc ; 24 m^3 đá 2x4 ; 130 m^3 đá 4x6	
21/11 - 25/11	82	660 m^2	Tiến độ tốt	165 m^3 đá hộc ; 29 m^3 đá 2x4 ; 156 m^3 đá 4x6	
26/11 - 30/11			thời tiết xấu mưa rét nghỉ thi công		
2/12 - 10/12	79	450 m^2	thi công chậm do thời tiết xấu	112 m^3 đá hộc ; 18 m^3 đá 2x4 ; 97 m^3 đá 4x6	
11/12 - 20/12	60	480 m^2	thi công tốt	120 m^3 đá hộc ; 19 m^3 đá 2x4 ; 104 m^3 đá 4x6	
21/12 - 29/12	86	690 m^2	thi công nhanh	173 m^3 đá hộc ; 27 m^3 đá 2x4 ; 149 m^3 đá 4x6	
29/12 - 7/1/92	100	1500 m^2	Rải cấp phối thi công nhanh	225 m^3 cấp phối.	
5/1 - 10/1/92	113	1893 m^3	thi công tốt. Đảm bảo kỹ thuật	283 m^3 cấp phối.	
10/1 - 16/1/92	192	3443 m^2	Lu lèn Rải Đá mặt mặt đường	75 m^3 đá mặt	

Cán bộ phụ trách

Phạm Đức Mạy

Tổng hợp

- Nhân công : 1199 công giá Đơn vị 6000đ.
- Đá hộc : 930 m^3 " 12000đ.
- đá 2x4 150 m^3 18000đ.
- Đá 4x6 818 m^3 17000đ
- Cấp phối 747 m^3 9000đ.
- Mặt đá 75 m^3 18000đ

LIST OF DOCUMENTS WHICH IS SENT TO Mr. BILL CHARNTRY.

1. General report on results of Work have been done and Work have being implemented in Ninh Vân - From November to December 91.

2. There are son documents as below : (by English)

- Liot of improved stoves which was given to the villages in Ninh Vân.
- Diary on construction road to expand market (by Vietnamese)
- Diary on repairing and maintenance : Dong Quan - Thường Village road , Dong quan - He Duong Cement factory road.
- Diary on constuction of Van Le Road. (by Vietnamese)
- List of families which have needed twin latrine (by Vietnamese)
- Liot of family filter water tanks which was complemented (by Vietnamese).
- Report on results of water testing in site (in Ninh Vân). With a experimenting set LAVIBOND (by Vietnamese).
- General of Water sample experimenting in Ninh Vân (by Vietnamese)
- Tables of water chemical analysis for 11 diference places. (by Vietnamese).
- Report of on action 1.1 : using stone dust in Concrete (by English)
- Conducting of constuction and repairing and maintenance stone road in Rural (by Vietnamese)
- A contract was signed between CERPARD - Machine owner (Miss Hòa) - commune for stone production.
  A report on first experimenting result (by English and Vietnamese)
- Report on action 2.2. Improving public well in Phu lang Village (by English)

3. Documento of training course of water testing equipment at CERPARD.

(From 16 TO 21/9/91)

- A receipt of class organizing and hiring a explaner.
- A receipt of translating and photocopy which was complemented, Document for conducting and using a set of water testing analysis LOVIBOND 2000.

- A paper of informing goods which was lacking
- 4 certificates of creating for 4 participants. (Mr. Trần Nguyên Chinh, Miss Phan thị Liên, Mr Nguyễn Hồng, Mr Nguyễn Trang Nam).
- Schedule for training course (by Vietnamese) 16 - 21.9.91.
- Evaluation of the course was wrotes by every participant (by English and Vietnamese)
- Document for conducting and using a set of water testing analysis LOVIBOND 2000 (43 pages From English into Vietnamese, 3 photocopies)
- Thesis for teaching and conducting of using a water analysis set - LOVIBOND 2000. This is wrotes by Miss Nguyễn thị Tuyết - explainer (26 pages by Vietnamese, 3 photocopies)
- Document of ELE Pagnalab agent (by English. 4 small, thin books)

3. Individual progress reports and action proposals

REPORT OF ACTION 1.1 : USING STONE DUST IN CONCRETE

I. TESTING IN IBM

Concrete samples with 3 compositions as following have been produced and tested to determine the best composition by using stone dust replacing sand . The samples had been test to check the possibility of using local cement (He duong) instead of Bim son cement.

The results are as following:

Kinds of cement	Composition (volume)			Press strengt		
	Cement	Stone dust	Gravel.	R3	R7	R28
Bim son	1	2 under 5cm	3	158	196	228
He duong	1	2	3	132	142	240
He duong	1	2	3	78	152	255

The result will be better if stone dust through the mesh 5 cm, but for concrete structures in houses and public houses in the rural areas, the original stone dust could be used and it is quite reach to the requirements.

In IBM the additive PG2 have been used for easy mixing with the proportion 1.5% cement (weight).

2.EXPERIMENT IN CERDAD

1. Determining the granular of stone dust:
   - granular set up by set with electric shaker
   - the diagram shown enclosed hereby.
   - The proportion of stone dust as following:

under 0.5	21.3%
0.5 - 1	14.0%
1.0 - 2.0	22.6%
2.0 - 3.0	21.3%

2. Experimental construction of 15m2 ground floor using stone dust, powder lime and local cement

- From 4/12/1991 to 7/12/1991, 15m2 surface of car park have been done with experimental objectives to determine the composition of low-cost concrete for ground floor as well as to examin the possibility of easy cleaning and suffuring special loads and flooding as the criterias for choosing mentioned.

- Materials and proportions used shown in the table followed:

- Testing the samples at the age 28 days , results as following:

Samples	Composition		
	Cement	Powder lime	Stone dust
I	1	-	4
II	1	1 (wasted)	4
III		1	3
IV	1		3 sand

SAMPLE	PRESS STRENGTH
I	86,9
II	82,16
III	4,03

- Analysis of cost:

Materials	Unit	Quanti -ty	Unit price	Sub total	Total
COMPOSI.I					
Cement	kg	220	400	88,000	
Stone dust	m3	0.83	10,000	8,300	96,300
COMPOSI.II					
Cement	kg	180	400	72,000	
Wasted Lime	kg	120	50	6,000	
Stone dust	m3	0,70	10,000	7,000	85,000
COMPOSI.III					
Lime	kg	200	150	30,000	
Stone dust	m3	0,80	10,000	8,000	38,000
COMPOSI.IV					
Cement	kg	300	400	120,000	
Sand	m3	0,80	32,000	32,000	152,000

CONCLUSION.

1. Stone dust can replace sand in concrete.
2. For reinforce concrete, it is better if the stone dust only used the parts under mesh 2.5-3cm. The technology will be introduced in the lintels during the construction of Ninh van market.
3. For floor surface, stone dust can be used with cement and wasted lime, it can give a dure and easy cleaning surface with the cost reasonable.
4. The Ninh van market will be a demonstration and training site of the technology.

Hanoi, 5-1-1992

Ninh Van pilot applications — *Monitoring of costs*

Action 1.1. : USING STONE DUST IN CONCRETE

Operation : RESEARCH

Estimation : / /91 Completion : 15 /10/91 to 10 /12/91

Item	Estimated cost: Orig.	Unit	Quant.	Unitary cost	Sub-total	%	Real cost: Date	Supplier	Quant.	Current price	Sub-total	%	Difference: Quant.	Unit. cost	Sub-total
1. Stone dust	N Vân	m^3	2,5	15,000	37,500		10/91	N. Vân	2,5	12,000	30,000				
2. BSđn Cement	HN	kg	50	480	24,000		10/91		50	520	26,000				
3. Local Cement	N. Vân	kg	250	420	105,000		11/91		250	420	105,000				
4. Sand	HN	m^3	0.5	35,000	17,500		10/91		0.5	35,000	17,500				
5. Gravel 1x2	HN	m^3	0.5	23,000	11,500		10/91		0.5	23,000	11,500				
6. Wasted lime	–	m^3	1.5	45,000	67,500		12/91		0.5	50,000	25,000				
7. Broken brick	–	m^3	1,2	30,000	36,000		12/91		1,2	30,000	36,000				
8. Quick lime	–	kg	200				12/91		200	200	40,000				
9. Sample Test. concrete	–	sample	36	4,000	144,000		11+12/91		~~36~~ 9	4000	144,000 36,000				
10. Floor sample Test															
11. Experimental floor in CERPAD		w.day	5	12,000	60,000		12/91		5	12,000	60,000				
Total				(Dongs)	503,000		Total			(Dongs)	531,000		Total	(Dgs)	
				(US $)						(US $)				(US$)	

Estimated cost: Components		Amount	%
* Labour			
*Building materials :	Local		
	National		
	Imported		
	Total		
*Transport			
*Others			
Total			

Real cost: Components		Amount	%
* Labour			
*Building mat. :	Local		
	Nat.		
	Imp.		
	Total		
*Transport			
*Others			
Total			

Difference	%
Total	

REPORT OF ACTION 1.2 (TRAINING PHASE)

Base on the agreement between CERPAD- The People's Committee of Ninh van Commune- Mr Nguyen van Tuc, the tile productor, signed at 11/11/1991, a training workshop had been organized for tile production using stone dust and local cement.

1/ The trainees: selected from villages:
- Nguyen van Dai - He village;
- Duong van Ky- He village:
- Dinh thi Ly - Thuong village

The trainer is Mr Nguyen van Tuc, tile productor, who had produced some tiles by the chosen composition using stone dust and He duong cement.

2/ The training time:
In the first report , the training workshop should last 3 days, but after 3 days, the trainees can not produce the tile as requirement, and the training workshop had been extended 2 days more.
The workshop had been organized from 15/11 to 19/11/1991.

3/ Result of training:

- After training, the trained villagers hand the technique to produce roof tile by cement and stone dust- from casting to curing and storage. They can make tile for their village by themselves.
- During the training workshop, 300 cement tiles were produced with materials supplied from the commune.

4/ Monitoring cost.

On the first report of action 1.2, one base table will be bough for training as well as for production later. At the time of preparing the workshop, no base tile table in the market or in ordering from elsewhere.

Expenditure:

- Trainer:	60,000d/day x 5days	= 300,000d
- trainees:	48,000d/day x 3 wor x 5days	= 720,000d
- Moulds :	8,000 d x 40 mould	= 320,000d
- Rent of base tile table:	5,000d/day x 5days	= 25,000d
	TOTAL	1,365,000d

5/ The tiles produced will be used in Ninhvan market, just now stored in the Commune store.

6/ CERPAD, the People's Committee of Commune, Trainer and trainees are very please about the result obtained and propose that the People's Committee give the trained villagers opportunities to performance their new job in the commune.

Ninh van, 30/11/1991

Representative of CERPAD	Trainer	People's Committee of NV Commune
Chief engineer	Ng.v.TUC	Chairman
La quang Binh		Dinh.quang.Khoai

REPORT ON ACTION 2.2

1. Work : Improvement of public well in PHULANG village .

Duration : Step 1 : 2/5/91 - 5/6/91 : finished digging up the soil, cleaning, building the well and building the filter box

Step 2 : 25/6/91 - 17/7/91 : Diging and covering the the soil and finishing the dam .

Step 3 : 5/10 - 10/10/91 : Building the wall , repairing some places (crack) and finishing .

2. Construction :

- Start and finish following the proposed work program
- The commune supplied materials
- Labour : Commune : 30%
  People : 70%
- Machine : Commune : 100%

3. Water sesources :

- The quantity of unfiltered water : enough for use year around .
- The quality of water after filtering : good

4. Maintainance :

The village nominated one person who in charged of maintainance and operating the filter following the gnidance .

5. People's point of news :

- It is very glad to have safety water from naw on , specially having enough water for use in drying season .
- Filtered water used for cooking, dringking, washing .

6. Expenditane for step 2 and 3 :

1	2	3 Unit	4 Quantity	5 Price/unit	6 Sub-total

1	2	3	4	5	6
Material	Stone	m3	80	8.000	640.000
	Cement	ton	2	400.000	800.000
	Broken stone	m3	8	15.000	120.000
	Dust stone	m3	10	11.000	110.000
	Quick lime	ton	1	80.000	80.000
	Lime (class 3)	ton	1	30.000	30.000
	Hoisting system taking water	set	1	400.000	400.000
					2.180.000
Labour	Pumping water out	working/ day	3		
	Clean the well	-	15	5.000	
	Diging the soil	-	21		
	Building foundation the w wall	-	25		
	Flating the foundation	-	10		
	Building the wall (dam)	-	90		
	Building the ring	-	20		
	Building defective wall	-	22		
	Finishing	-	12		
			218		1.090.000
Machines	Pumping water	shift	3	100.000	300.000
				Total	3.570.000

7. Total of expenditure :

	Material	Labour	Machine	Total
Step 1	1.865.000	1.095.000	400.000	3.360.000
Step 2	2.180.000	1.090.000	300.000	3.570.000
Total	4.045.000	2.185.000	700.000	6.930.000

Quantity of material, labour, machine for 3 steps

		Unit	Quantity
Material	Bỉm sơn cement	ton	4
	Stone	m3	115,5
	Broken stone	m3	12
	Dust stone	m3	24
	Black sand	m3	5
	Yellow sand	m3	4,5
	Quick lime	ton	3
	Lime (class 3)	ton	1
	Ashy coal	m3	2
	Hoisting system for taking water	set	1
labour	Clean the well, diging the soil,		
	flating	working day	204
	Building	-	217
			421workingda
Machine	Pumping water	Shift	7

9. Remark - Evaluation

- Design : Right following the design

- Estimated cost : 6.518.000 đ - Balanced cost 6.930.000 đ

- Balanced cost in fact rised 6,3% compared with estimated cost, The balanced cost is receiptable, it is in permited limitation .

- The water quality after filtering is safety water for family consumption (if cleaning the filter carefully and frequently) .

- With this demostration the commune can apply widely model for improvment of other public wells within commune .

NINHVAN people commune

Name of construction : Phu Lang village

DIARY OF CONSTRUCTION

MOC

PROJECT VIE 86/020

Date	Items of work	People number	Results	Remarko	
25/6/91	pump water	3 shift +			Quantity
26/6/91		3 labour			
27/6/91	Extracting mud	15 labour	18 m3	mud +stone	square stone 80 m^3
28/6/91	Dig ground foundation	21 -	25 m3	stone+earth- stone	Quick lime : 2ton
29/6/91	Build fundation	25 -	15 m3	quick	Grave :10 m^3
1/7/91	Expand graund foundation	10 -	13 m3	good	Cement : 2 ton
2/7 - 3/7	Build wall	40 -	15 m3	good	Grave stone : 8m^3
4/7/91	Build wall	35 -	12 m3	good	
5/7	Build + trower	15 -		good	
7/7	Embank edge of well	20 -	25 m3	Stisnf	
/10 -					
6/10	Build wall + trower	22 -	10 m3	good	
/10	Expand earth	5 -	6 m3	good	
	Vam earth and clean	7 -			
	Total	218 labour			
		(132 labour build)			

MACHINE

BOAD OF LEADERS OF NINHVAN COMMUNE

Hoang Ban

Pham Duc May

REPORT ON ROAD MAINTENANCE IN NINH VAN COMMUNE

I.General items:

- Work: Maintenance of road system in NINH VAN commune
- Place: NINH VAN commune
- Duration: From July/1990 to Feb/1991
- To be incharge of work: Chief engineer LA QUANG BINH
- Design: By CERPAD - Ministry for construction
- Undertaking on site: From Oct/1991 to Feb/1992

II.Work programme

2.1/ Preparation of equipments:

- Bought a tractor-MTZ.50 and manufactured steel wheel. Delivered to NINH VAN(7/1991).The commune made concrete for the wheel(8/1991)
- Transfered to NINH VAN: Manual for using and maintenaning tractor, guidance for use note book, machine record.
- The commune selected 2 qualified drivers for using the tractor(9/1991)

2.2/ Preparation for construction:

- Prepared(10/1991)building materials with 40m3 of dust stone for pilot construction in 11/1991

2.3/ Work plan:

Based on agreements between CERPAD and people's committee and Project management Board of Commune, the timing as follow:

- 5/11/1991 to 7/11/1991: Technical training for members incharged of suppervision, direction the work ; then the Commune will organize the labour force to 15/11/1991.
- 15/11/1991 to 25/11/1991: Construct pilot 1 km of road from DONG QUAN to THUONG village on the way from footstore to XUAN VU bridge
- From the end of 11/1991 to the first of 12/1991: Continue the preparation building materials for the construction of road from XUAN VU brigde to THUONG village and from THUONG village to cement plant
- THe work will be undertaken to the end 2/1991 on:
  + Road from DONG QUAN to DUONG THUONG
  + Road from THUONG village to VAN LE village

After finishing the maintenance above roads, the commune will have basic road system, meeting requirement of transportation in-ex commune

19/10/1991

Reg 4 28/10/91

Kq 28/10/91

REPORT ON
Pilot works in NINH VAN commune

I- General items :

- Work : VAN LE _ TAM ĐIEP road
- Place : VAN LE _ TAM ĐIEP village
- Duration : 1/5/1991 - 30/9/1991
- To be in charged of the work : Chief engineer LA QUANG BINH
- Design : by CERPAD (from 1/4/1991 - 20/4/1991)
- Undertaking : from 9/5/1991 to 30/9/1991
- Agreement, discussion , communication taken place from 1/5/1991 to 8/5/1991

II- First stage : Preparation and organization

a/ From 1/5/1991 to 8/5/1991 : Meeting with members of people's council, members of people's committee, public organizations, party's members, famer's assocation, chiefs of workinggroups, chiefs of villages, persons incharged of technic and construction.

All participatians are 80.

Content of meetings including communicationof technical requirements needed for the implementation, work program, contentsof prepared designing contents , organization the labour force, apointment the person who incharged of supplymaterials.

Together with preparations for the work within commune, CERPAD had undertaken a agreement with TAM DIEP town - YEN BINH commune - KHANH HOA cooperative onthe coordination between sides to construc road on the land of localities

b/ From 7/5/1991 to 8/5/1991 ,all persons(involved to the direction , supervision, guidancethe construction) gave a visiting the site and receiptthe site , to place the line for construction, to determine the road line limitation and the altitute of road.

c/ Then, villages and working groups organized labour force with the interpretation of technical requirements , timimg.

III- Third stage : Construction.

Step 1 : Started from 9/5/1991 to 20/5/1991
Step 2 : Started from 21/6/1991 to 30/6/1991
Transferred 1800m3 mountain earth for road foundation.
Step 3 : From 15/9/1991 to 30/9/1991
For the reason haversting there were an interval bettween steps
Step 1,2 : Heighten and widen the road foundation with soil taken from canals (coordinated between making more deep canal and heighten the road)
Step 3 : Heighten the road foundation by mountain earth

IV- Working day expenditure and the cost :

- Step 1: Mobilized 5100persons/day (working time 4-5h/day), quantity : 2845m3 soil.
- Step 2 : Mobilized 2400persons/day (working time 4-5h/day) quantity : 1200m3 soil
The quantity of soil unbalanced with estimated quantity is 700m3 (2845 + 1200 _ 3345 = 700m3,) as the lenght of road constructed in fact 60m is more than the road planed.
- Step 3 : Constructed the foundation with mountain earth : Mobilization 50 oxcarts and small tractors, transfered 1800m3 mountain earth for heighten foundation.
- The cost , exchanged from working day for heighten the foundation in to cash:
7500 working day x 3000d = 22.500.000d
- The cost for transfer the soil :
1800m3 x 7500d = 13.500.000d

V- Evaluation on results

- The quantity of road construction had undertaken completely including the unbalance between the quantity planned and the quantity done in fact
- The timing was not met but it is receiptable for difficulties in the commune (production and climate)
- The quality of roa construction : basic technical requirement have been met, there are still some work need to be perfected like : Flating the foundation , widen more the passing place and communication for the locality to continue the works before constructing the cover.

- On social field : People , specially in VAN LE area are very glad after finishing the road foundation .
- On stimulation of production : Really creating good cndition for new reclaime land along the road , people groun a crop of rice.

VI- Work program for next step

After having agreement with people's committee of NINH VAN and project Management Board, the work program for next step is :
- Within Oct. 1991 : Preparation building materials including stone production , tranfer stone to the site.
- From 5/11/1991 to 7/11/1991 : Technical training for persons in charged suppervision, direction the construction of road
- From 8/11/1991 to 10/11/1991 : Pilot construction : 100m
- Within 12/1991 : Continue to construc all the cover till finishing the work.

Oct. 19th, 1991

Study scheme for improvement the Crushing part of hammer crusher at Ninh Van

A/Background

Crushing part is the most important part of the hammer crusher but it is operational under hard conditions of prequent loading bearing and High friction resulted from crushing process. That's why this part is fast wear rate and needed for prequent replacement, leading to low productivity in term of economic effectively. The serviceable time of this related machine item available at Ninh Van is very low for example:

- One set of hammer needed to replace after 10-12 days of use.
- One set of subaxile needed to replace after 17-20 days of use.
- One set of bearing of support and belt needed to replace after 60-65 days of use.

Vice-vers other items of the machine as machine's body sieving and machine flatform are very low wear Rate, That's why it is necessary to find out the proper solution for the serviceable time of the crushing items in accordance with other long lasting items of the machine.

Having limited fund and time so detail study not covering to all parts of machine but only of crushing pent, the most important part of the machine costing 60% of total machine value.

B/ Objectives of the scheme

- Increasing the serviceable time of the crushing part
- Increasing the endurance, friction resistance and percussion reduction of the crushing part.
- Increasing the productivity of the machine in a academe with available engine.
- Increasing the economic effectiveness of production cutput.

C/ Methodology, practical bases of the study scheme.

- Checking the real condition of the machine, disassemble the machine for full check up.
- Application the technical documents for clarification of crushing process, physical characteristics of raw material.
- Considering all notes related to machine's condition from technical experts and users.

D/ Concrete design: Detailed set of Map consists of

- General description of the crushing part
- Description of existing hammer
- Description of improved hammer
- Description of other crushing items

E/ Manufacture: Following materials needed for manufacture crushing part:

Steel 45	Steel sheet CT5
Steel 50xRA	Steel IUx6

Steel 50C, 55C - Cast iron

- Manufacture of crashing items'll be made at Metal-engineuning factories
- Increasing the working capability of the heat-Metallurgy base

Implementation: Manufacturing the whole set of crushing part consists of:

- 32 crushing hammers
- Main Axiles
- Sub Axiles
- Rollers
- Supports
- Other items as: - Steel Discos - screw-unit and latches

32 hammers'll be manufactured with the same design or different for trial running installed the same machine to determine the working capability of each new crushing item

Estimated cost for manufacturing 1 set of crushing part for 1 hammer crusher

No	Description	Quantity	Materials	Unit cost	Total cost
1	Main axile	16 kg	Steel CT 7	10,000 d	160,000 d
2	Axile for hammer	10 kg	Steel CT 7	10,000 d	100,000 d
3	Steel for hammer	16 kg	50 x RA	12,000 d	192,000d
4	Bearing 20309	2 set	Steel	70,000 d	140,000 d
5	Steel Disc	16 kg	Steel Sheet CT 5	9,000 d	144,000 d
6	Roller	1 set	Cast iron		105,000 d
7	Support	2 set	-------	60,000 d	120,000 d
8	Manufacturing work				280,000 d
9	Heat Metallurgy				290,000
10	Installation				50,000
11	Latches and Seals	40 pieces	Steel		160,000
	Total:				1,545,000 d

Cost for sparepart replacement for the hammer's continues operation in 3 months: 300,000 d

Evaluation on the application of new crushing part for the hammer crusher

General description:

In order to determine the sufficient quality of long lasting endurable crushing part of crusher at Ninh Van, the signing of application the new crushing part had been made a many 3 parties -

New Rural committee , machine owner and National centre for rural development.

The new crushing part together with some necessary accessories had been supplied to machine owner Tran Thi Hoa for the installation on the old engine, sieving and machine flat form. Inspection on the condition of new crushing part has made by the staff of National Centre for rural development since Nov.11.1991
and under here the observed informations.

- Assembling the new part, putting the machine in to production, instruction on the use, maintenance of new part on Nov. 11/1991 for the user.
- Checking the machine condition on Nov. 20.1991 and noting that almost the old hammers broken and the same happened to some new designed hammers with the broken point on the hammer's face.

Other parts of the machine are in normal condition and it is noted that the broken hammers event comes from insufficiently methodized - over metallurgical for the hammers. Morever the unexpected error occurred during the installation of the new crushing part with old machine flatform and body also causing to the broken of the hammer. Correcting the mistake, installing new hammer, calibrating and putting the machine operation on the machine was under taken with following findings:

- After nearly 2 months of operation, the crushing part is in good working condition, much less trouble during the operation and only periodic calibration and maintenance needed.

- Better quality of crushing stone, higher productivity of the machine.
- Less replacement of hammers, under here the comparative table.

Name type	Bea-ring (in shifts	Axile	Sub-Axile	Disc	Roller	Support	Belt	Ham-mer	Sub-acce-sso Ries	Output
Old Set	30 Shifts	180 Shi	15-20 Shi	90 shi	180 shifts	200 shifts	30 shi	15-20 shi	60 shi	15-15 m3
New set	60 Shifls	> 180	30-35 Shi					30-35 Shi		17-20 m3

Findings: The advantage of new crushing part is better quality and longer serviceable duration.

- Two heads hammer type is 1/3 longer serviceable timer compared with 1 head type
- One head hammer type is sufficient to hard rode with high strength- Production output increase from 1 to 2 m3/shift apart from

strong points, the weak point of inadequate quality of first hammer delivery is on full responsibility of the user

Recommendations: For the availability of full informations on the application of new crushing part and data comparative the following recommendations are made for the consider action of national centre for rural development and experts:

- Permission for the continuous study and application of new crushing part to 4 remaining machines.
- Further study on the preliminary sieving process of the machine for higher crushing quality:

Date Jan.17.1992

Usage diary for the crushing part

Name and surname: Tran Thi Hoa
Address: Ninh Van commune
Subject: Observation the application of crushing part from Nov.10.1991

No	Working time	Output	Condition	Type of hammer	Remark
1	10/11/91 8h	18 m3	Good	I, II, III	Good
2	8h	19 m3	--		--
3	8h	19 m3	--		--
4	7h	16 m3	1 hammer broken	I	Fair
5	8h	19 m3	Good		Good
6	8h	17 mm3	Hammer Uo1 wear	No1	
7	8h	19 m3	Good		
8	8h	18 m3	Good		
9	7h	16 m3	Good		Good
10	6h	15 m3	Good		
11	8h	16 m3	Hammer broken	No2	
12	8h	17 m3	Good		Good
13	8h	18 m3	Good		Good
14	7h	15 m3	Good		Good
15	8h	19 m3	Good		Good
16	7h	15 m3	The sieving loose	Sieving needed to Repair	
17	8h	19 m3	Good		Good
18	7h	18 m3	Good		Good
19	7h	17 m3	Good		Good
20	8h	19 m3	Good		Good
21	8h	19 m3	Good		Good
22	8h	19 m3	Good		Good
23	7h	17 m3	Good		Good
24	7h	17,5m3	Good		Good
25	7h	18 m3	Good		Good
26	8h	20 m3	Good		Good
27	8h	20 m3	Good	Old Hammer	Good
28	7h	18 m3	Good		Good
29	8h	19 m3	Good		Good
30	7h	18 m3	Good		Good
31	8h	20 m3	Good		Good
32	8h	19 m3	Hammer No3 Broken		
33	7h	18 m3	Sub Axile Broken		
34	8h	20 m3	Good		Good
35	8h	19 m3	Good		Good
36	7h	18 m3	Belt Replacement		
37	8h	20 m3			Good
38	8h	19 m3			Good
39	8h	17 m3	Repair electricity Machine		Good

No	Working time	Output	Condition	Type of hammer	Remark
40	6h	15 m3	Welding		
41	4h	10 m3	Rest		
42	8h	20 m3	Good		Good
43	7h	18 m3		Replacement Hammer No2	Good
44	8h	19 m3	Good		
45	7h	19 m3	Good		
46	8h	20 m3	Good		
47	7h	18 m3	Good		Good
48	7h	18 m3	Good		Good
49	8h	20 m3	Good		Good

Finished on Jan 15 1992

Observed and checked up by commune staff

Observed by

Dinh Van Khoai

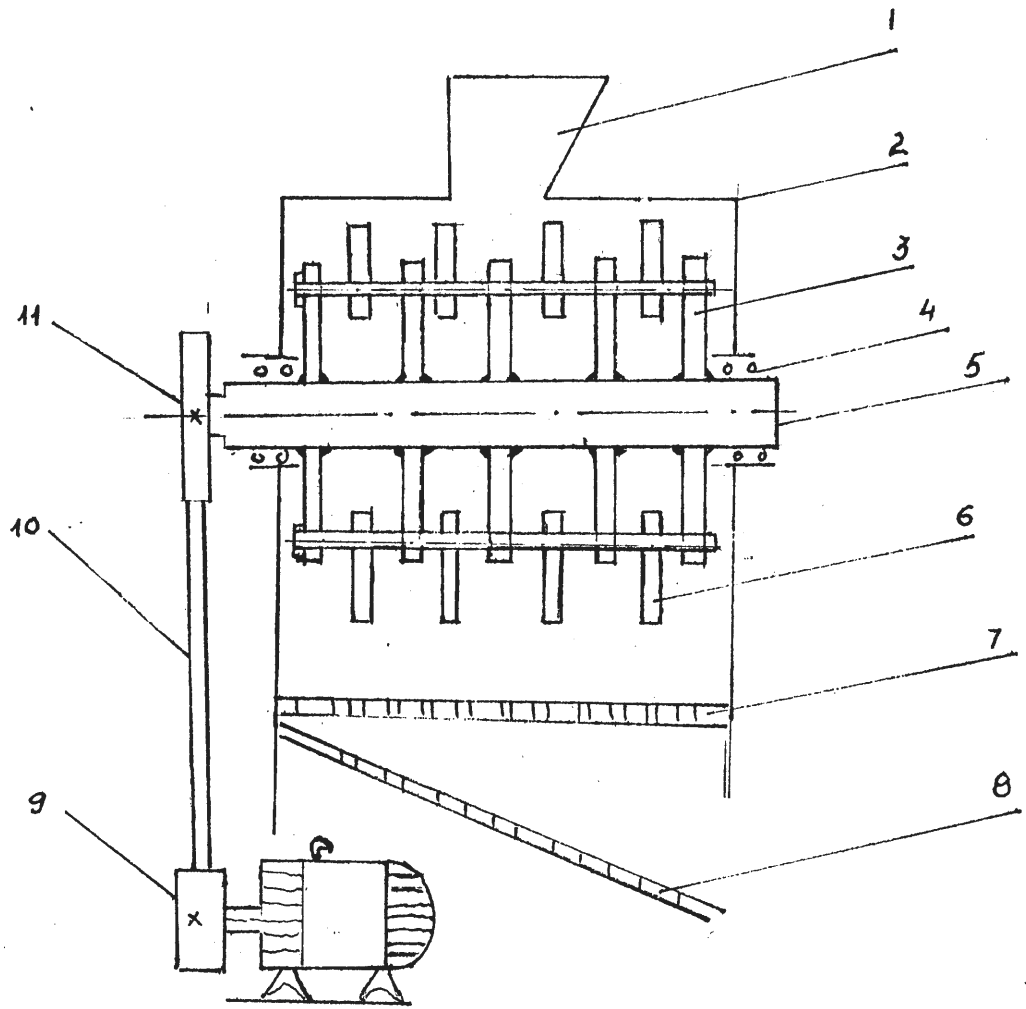
Nguyen Thi Hoa

Máy Đập đá

Những chi Tiết bộ phận đập.

Kỹ sư: Nguyễn Thành Nam.
TRUNG TÂM PHÁT TRIỂN NÔNG THÔN

Hà nội 1991



1 cửa đá vào

2 Vỏ Máy

3 Đĩa Thép Đĩa Thép

4 Ổ bi ổ bi

5 Trục chính

6 Búa đập

7 Sàng Sơ

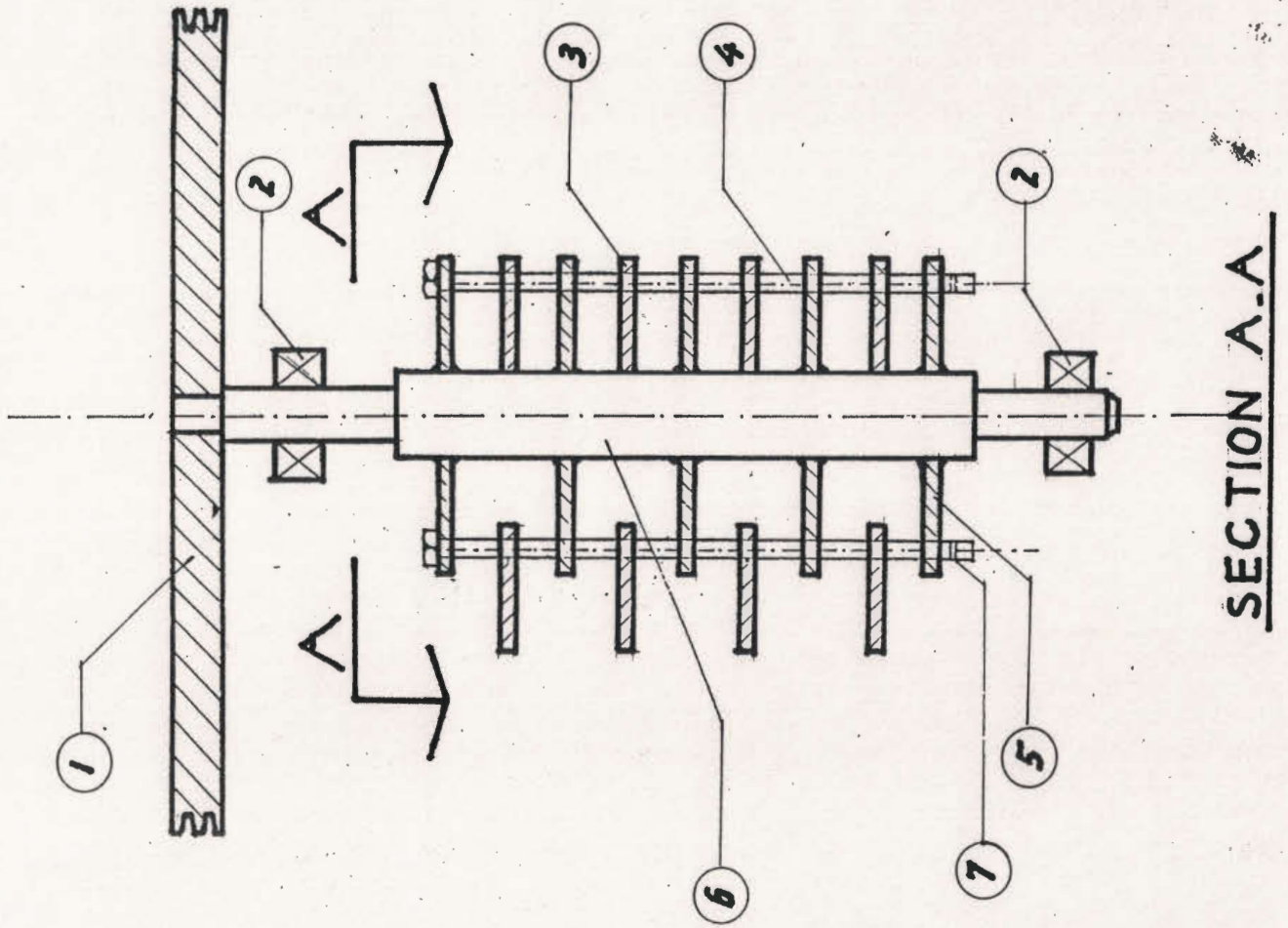
8 Sàng

9 động cơ

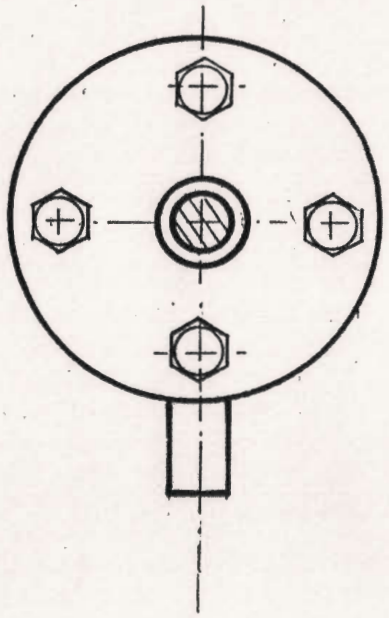
10 dây đai

11 Buly

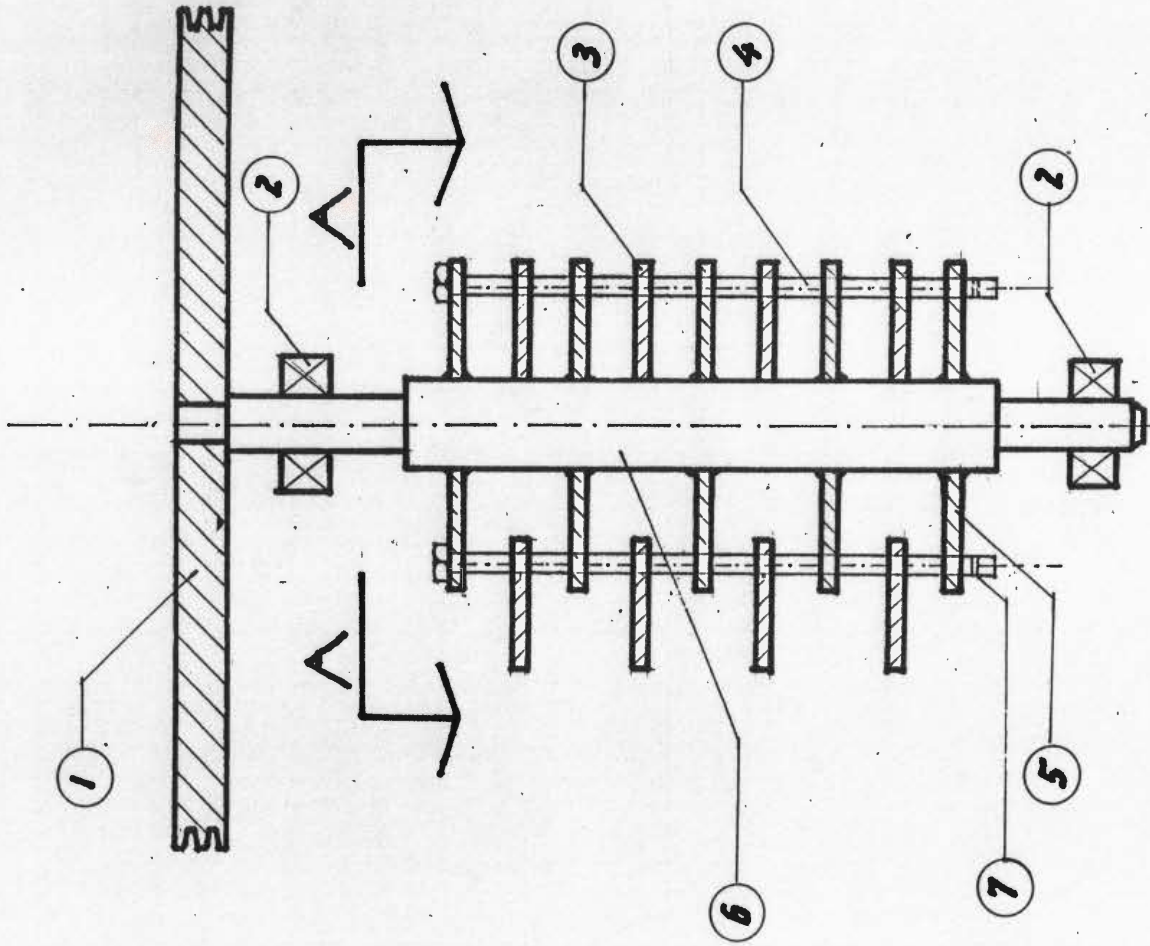
Người vẽ	Nguyễn Th Nam	8/10/91	**SƠ ĐỒ MÁY ĐẬP ĐÁ**
Kiểm Tra			
TRUNG TÂM PHÁT TRIỂN NÔNG THÔN			Tỷ lệ Bản vẽ



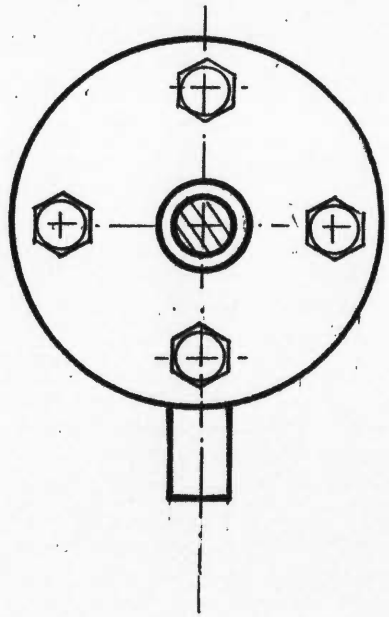
SECTION A.A



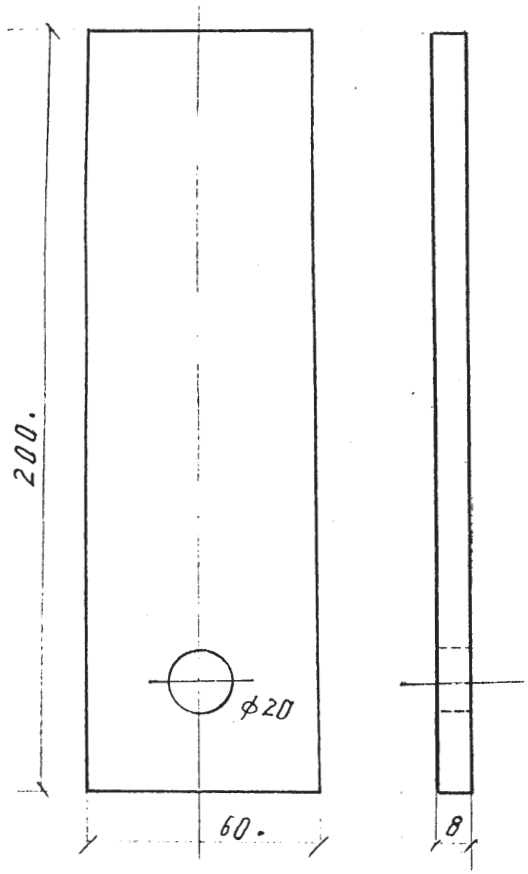
NGƯỜI VẼ	NGUYỄN THÀNH NAM	9/10/91	BỘ PHẬN ĐẬP ĐÁ
KIỂM			
TRUNG TÂM PHÁT TRIỂN NÔNG THÔN			1:4
			BẢN VẼ 02



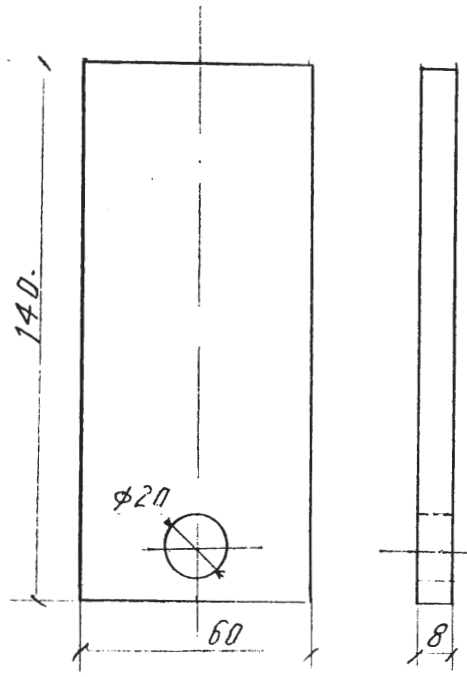
SECTION A.A



NGƯỜI VẼ	NGUYỄN THÀNH NAM	8/10/91	BỘ PHẬN ĐẠP ĐẠ
KIỂM			
TRUNG TÂM PHÁT TRIỂN NÔNG THÔN			1:4
			BẢN VẼ 02



KIỂU 1



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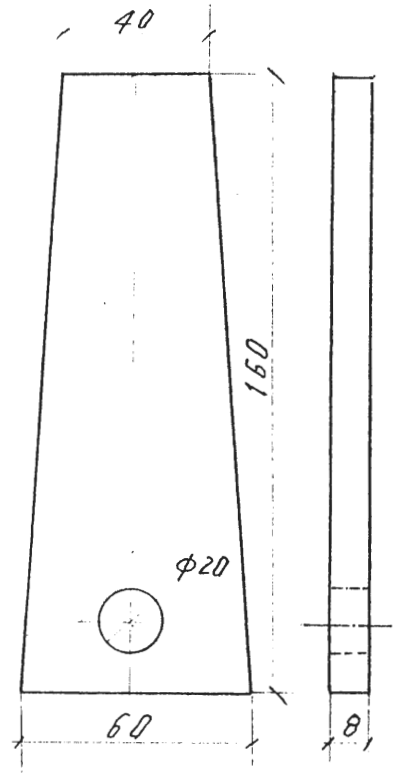

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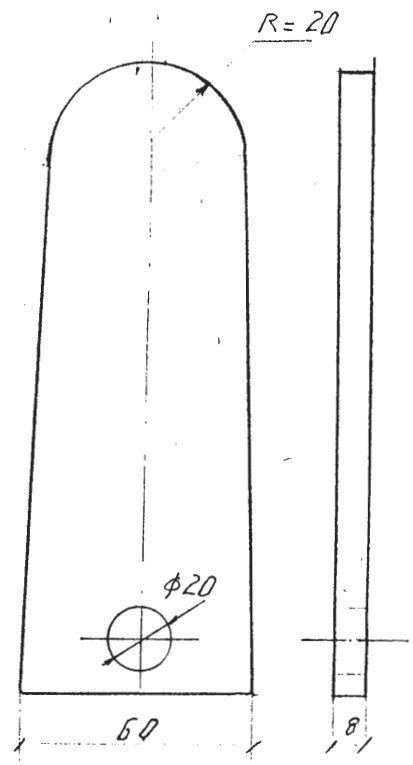
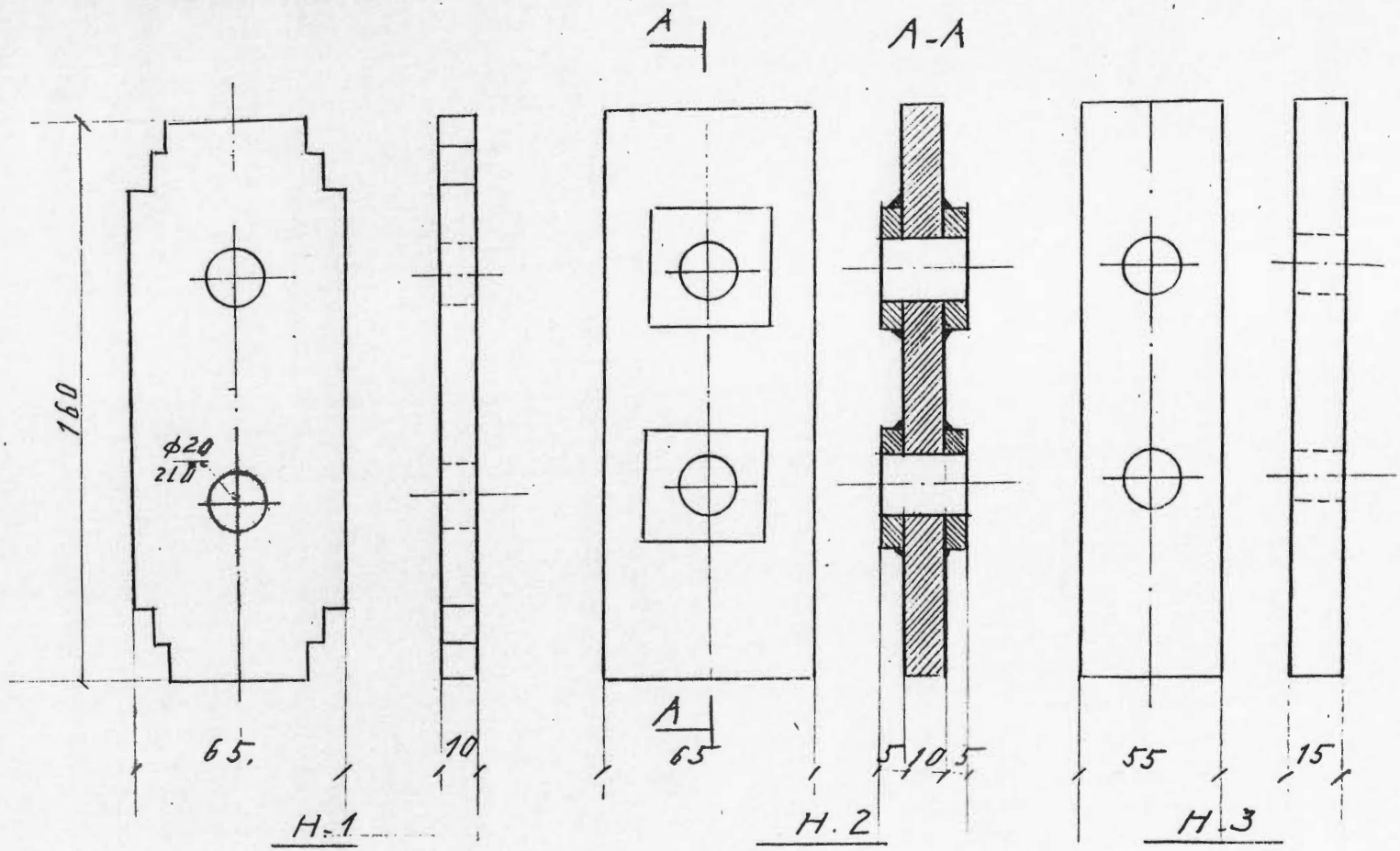
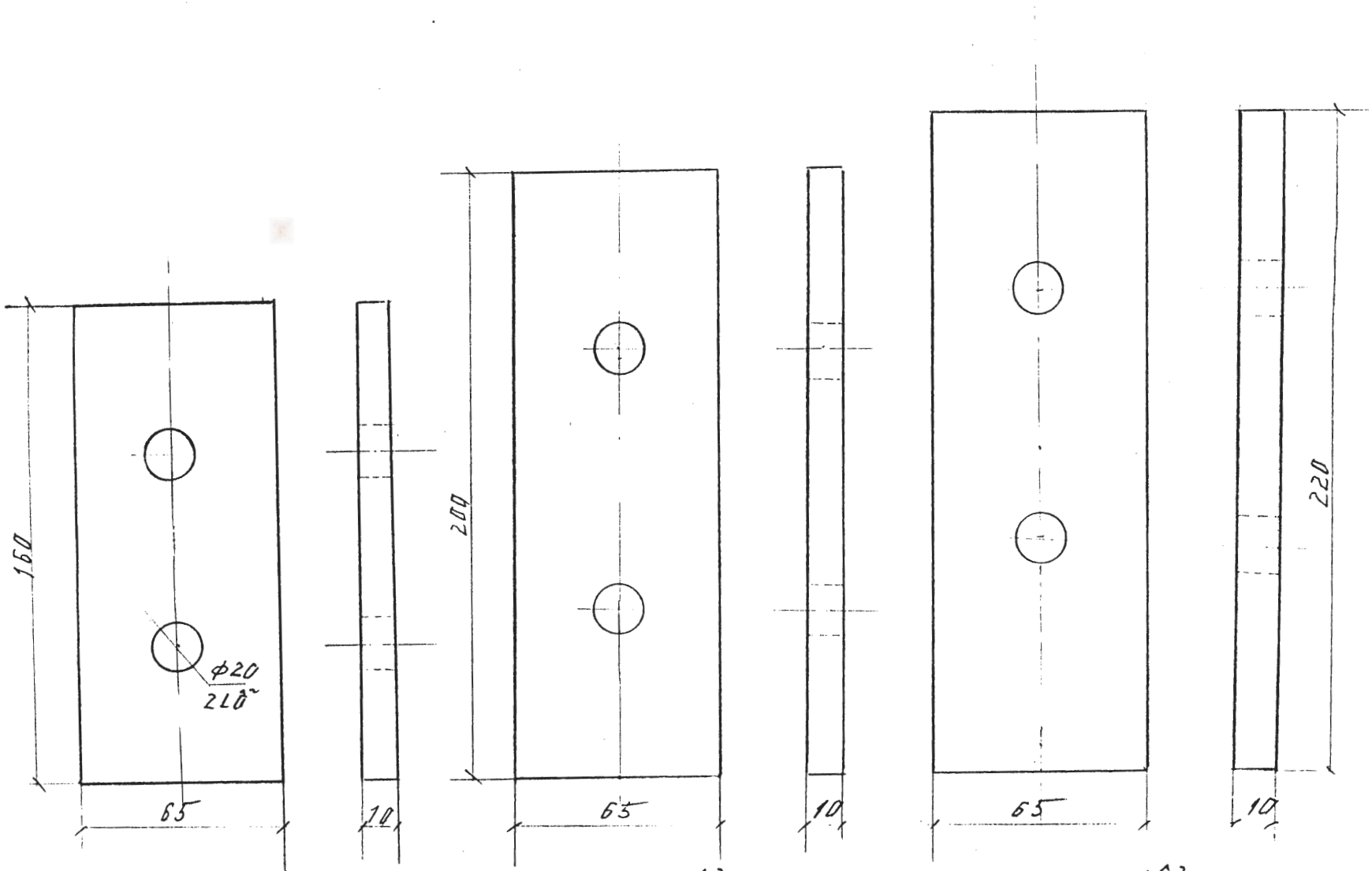


KIỂU 4

NGƯỜI VẼ	NGUYỄN-T: NAM	10-9-91	**BÚA ĐẬP ĐÁ CỮ.**
KIỂM TRA			
TRUNG TÂM PHÁT TRIỂN NÔNG THÔN.			1:2
DỰ ÁN VIE-86-020.			BẢN VẼ 01



NGƯỜI VẼ	NGUYỄN-T.NAM	10.9-91	CẤU TẠO BÚA MỚI
KIỂM TRA			
TRUNG TÂM PHÁT TRIỂN NÔNG THÔN			1:2
DỰ ÁN VIE - 86. 020			BẢN VẼ 02



KIỂU 1

KIỂU 2

KIỂU 3

NGƯỜI VẼ	NGUYỄN.T-NAM	10.9.91	CÁC KIỂU BÚA MỚI
KIỂM TRA			
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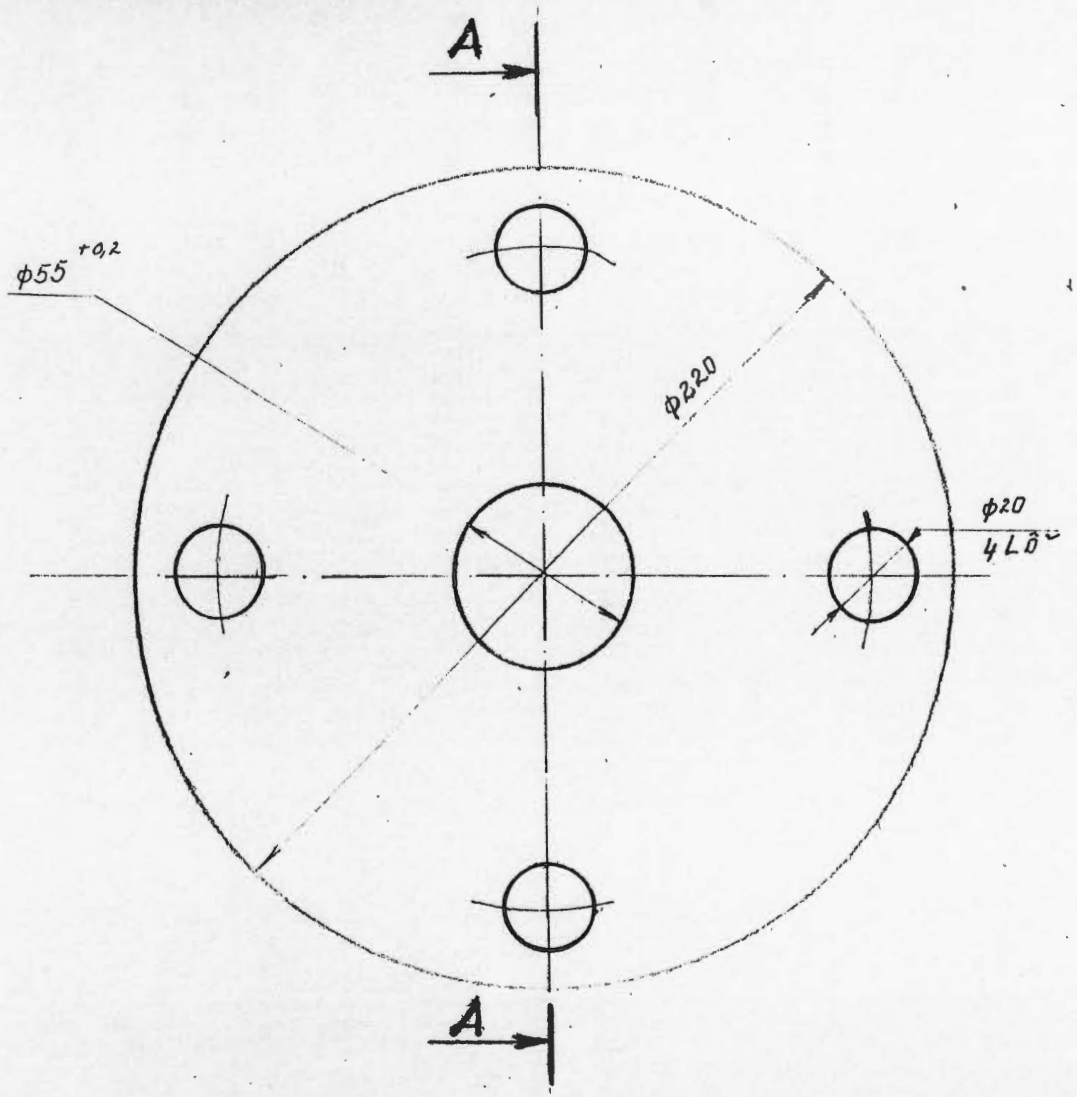
DỰ ÁN VIE-86-020			BẢN VẼ.03



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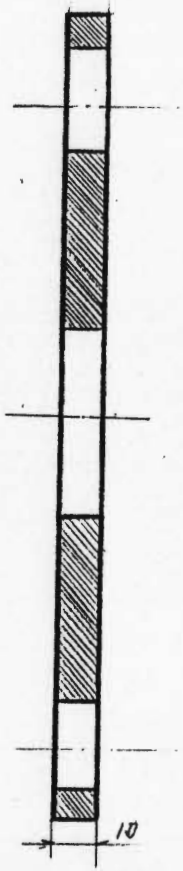
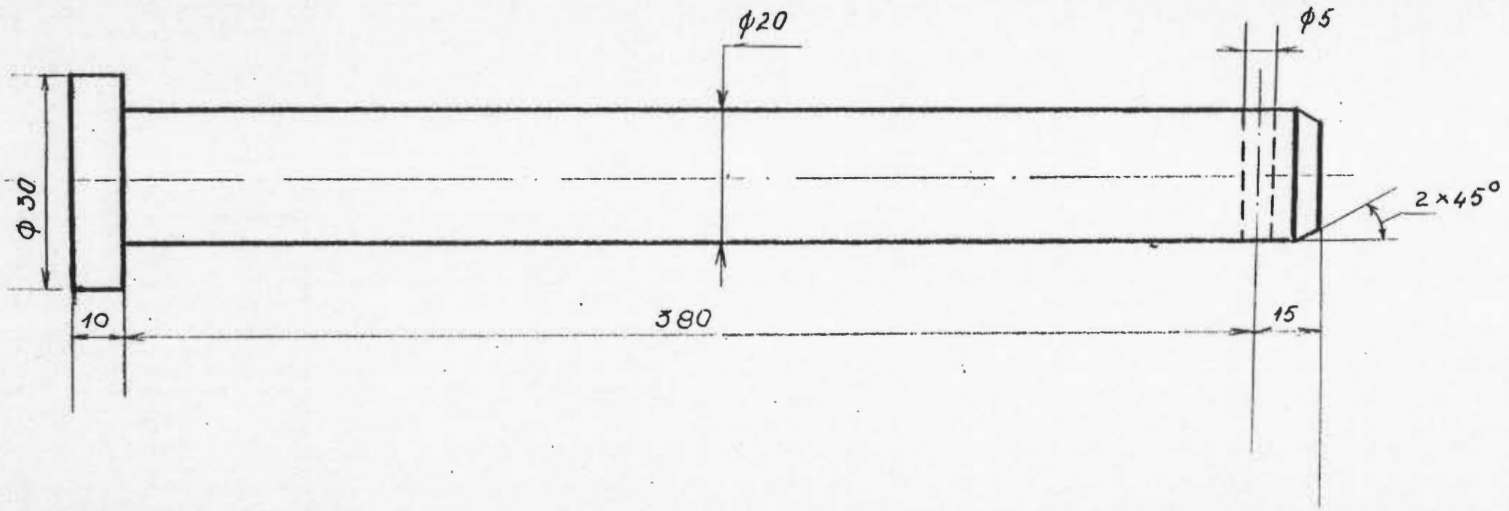
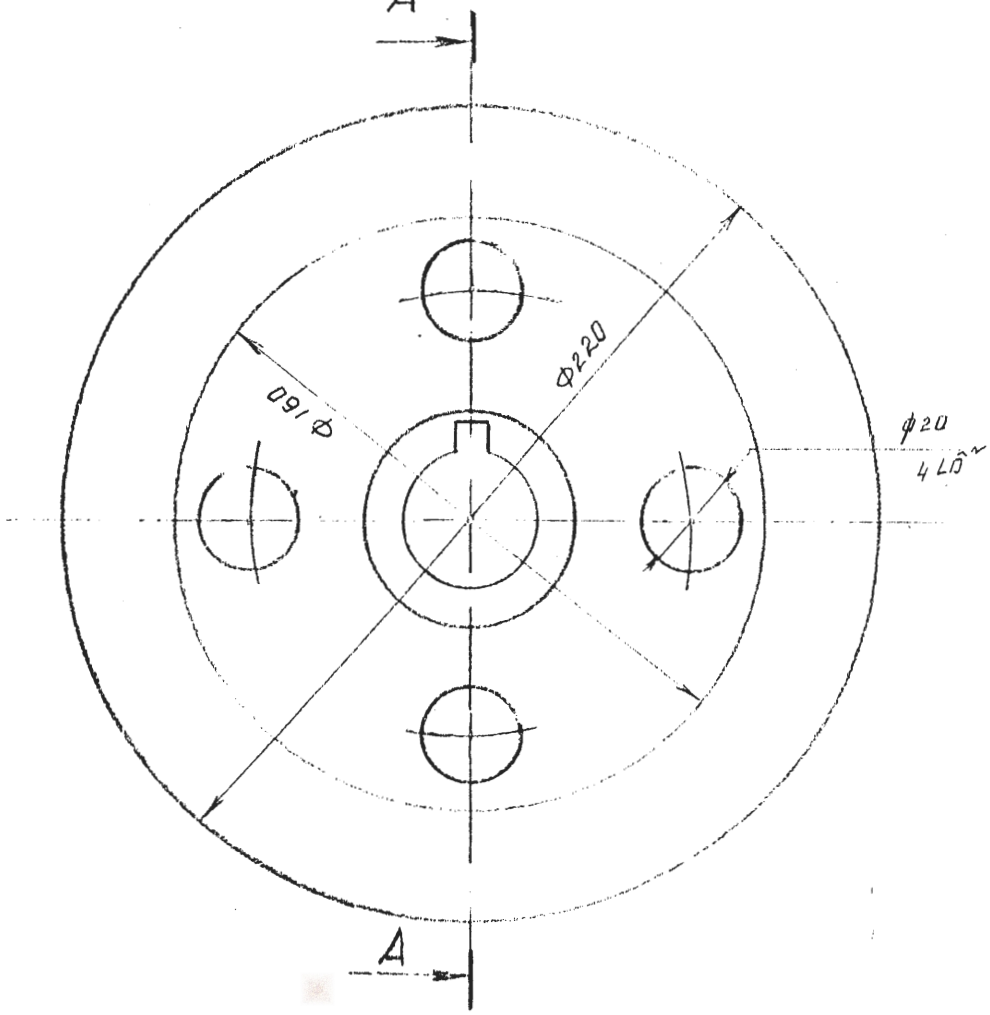
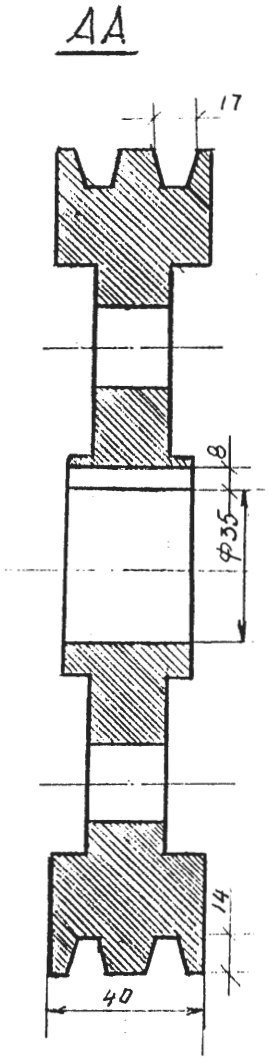


NGƯỜI VẼ	NGUYỄN.T-NAM	8/9/91	ĐĨA THÉP
KIỂM TRA			
TRUNG TÂM PHÁT TRIỂN NÔNG THÔN			1:2
			BẢN VẼ 09

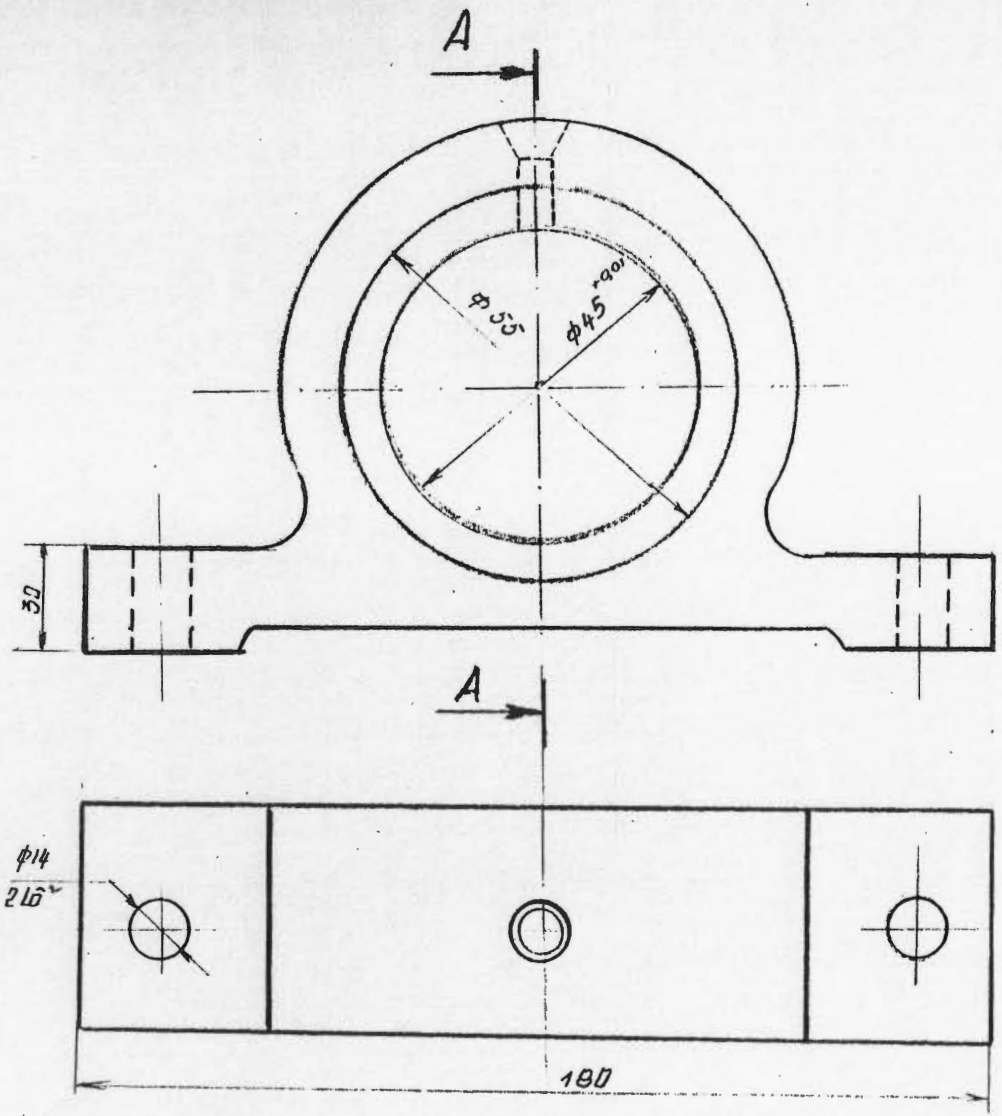


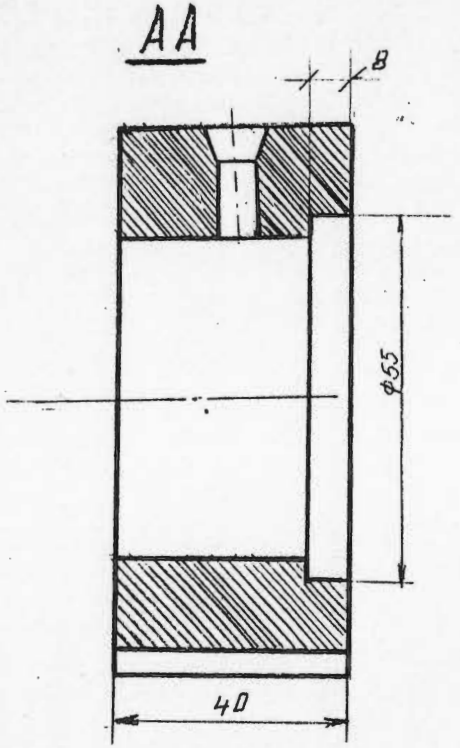
Người vẽ	Nguyễn Th Nam	5/10/91	**TRỤC PHỤ**
Kiểm Tra			
TRUNG TÂM PHÁT TRIỂN NÔNG THÔN			1:1
			BẢN VẼ Nº 05



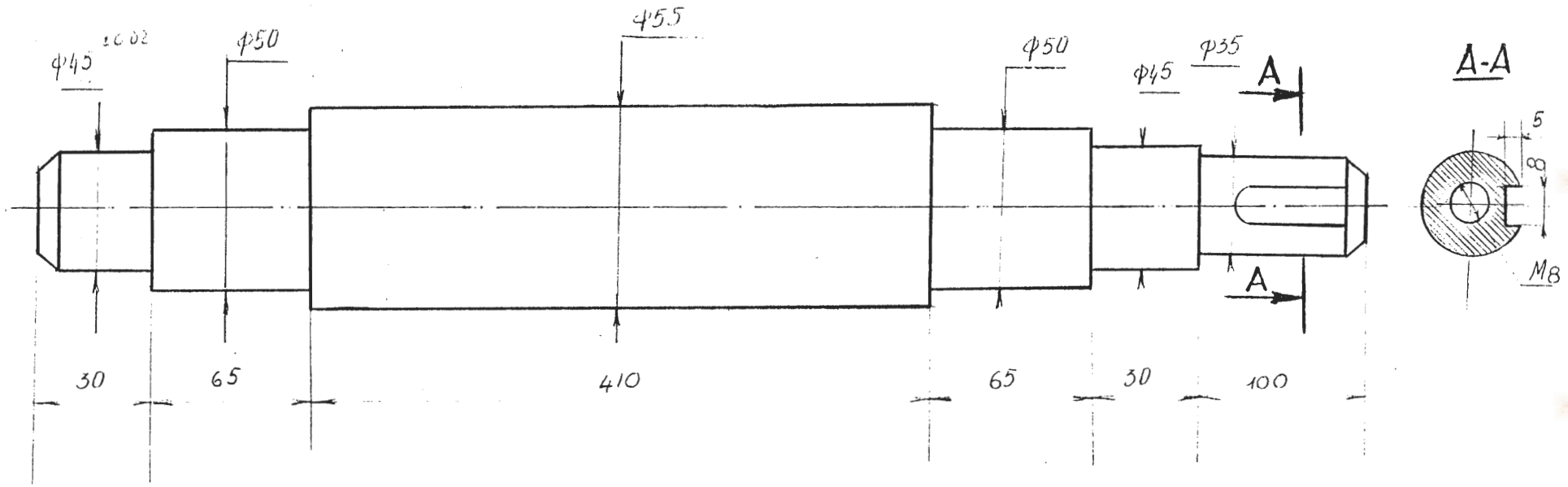


NGƯỜI VẼ	NGUYỄN-T-NAM	10/10/91	PULY
KIỂM			
TRUNG TÂM PHÁT TRIỂN NÔNG THÔN			1:2
			BẢN VẼ ĐỒ





NGƯỜI VẼ	NGUYỄN-T-NAM	11/9/91	**GỐI ĐỠ**
KIỂM			
TRUNG TÂM PHÁT TRIỂN NÔNG THÔN			BẢN VẼ 1.



Người vẽ	Nguyễn Th Nam	9/10/91	TRỤC THÉP
Kiểm Tra			
TRUNG TÂM PHÁT TRIỂN NÔNG THÔN			1:2
			BẢN VẼ 08

WATER SUPPLY AND SANITATION IN NINHVAN COMMUNE

Name of work: container tanks and refinery tanks of raining water for households.

Name of village/ family or the locality of experimentation: Ninhvan commune.

1. Discription of contexts (meterials, social, economic)

In the territory of Ninhvan commune, except the communities residing near the mountain, the water quality is quite bad with the mixture of alloy, even there is iron somewhere. This commune belongs to the area of sub- climate with a great volume of raining water and heavy rains. So the best way economically and sanitationally in this area is to preserve raining water for everyday life, especially for the dry season. However, the raining water contains some alloys when dropping and agglomerating on the surfaces, so there should be some simple remedies for eliminating them.

2. Brief discription of the problem.

Through investigation on the condition of raining water tanks in the commune, the fact shows that there are only 44,7% of the households owning their raining water tank with the average volume per capita of 0,88m^3/capita.

In order to have the raining water enough for the use in dry season, it is necessary to have an average tank volume per capita of 1,5m^3/capita (with the average use of 10l/capita/day for cooking and drinking)

3. Purpose discription

The improvement and build up of this constructio, will help sanify the water source, supply enough using water for people in dry season, thus improving people's health.

4. Discription of the new, creative things to be proposed.

- Purify and sanify the ~~#~~ water source, according to the standards stipulated by the Ministry of Health Care.

- Supply enough water for drinking, cooki ng, and washing in dry season.

- Build tanks with the volume of $10m^3$.

5. Discription/list of standards for choosing this approach (for example: payable, durable, local materials,)

- Local materials are available.

- Water enough for all the year round.

- Sanify the water source, meeting the standards stipulated by the Ministry of Health Care.

6. Construction design (details/ fields/ sections/)

See the enclosed diagrams.

7. Discription of the performance.(step by step)

- Choose the place for construction.
- Prepare the materials.
- Make concrete panels.
- Make underground basement.
- Build the stone tanks, render and coulour the tanks.
- Fit the concrete panels.
- Build the raising water refinery tank.
- Accomplish.

[illegible] list of material volume, price, labour

Item	material	unit	unit price	Volume (quantity) 10 m³	8 m³	6 m³	Filter	Total price 10 m³	8 m³	6 m³	Filter
[illegible]	cement	kg	400	1580	1250	870	4	632.000	500.000	348.000	1.600
	gravel stone	m³	6.500	14,5	12	8		94.250	78.000	52.000	
	broken stone	m³	15.000	2,5	2	1,5		37.500	30.000	22.500	
	powder stone	m³	10.000	7,5	6,2	5	0,02	75.000	62.000	50.000	100
	~~lime~~ quick lime	kg	200	500	420	360		100.000	84.000	72.000	
	iron ϕ6	kg	3.500	30	26	22		105.000	91.000	77.000	
	steel net	m²	9.000				0,04				360
	water tap	piece	5.000	2	1	1		10.000	5.000	5.000	
	brick	cake	120				45				5.400
			4.000	10				40.000			
			6.000		3	3			18.000	18.000	
								1.093.800	868.000	644.500	7.500
[illegible]	digging ground labour	[illegible]		8	7	6					
	mixing concrete	"		5	5	4					
	~~panels~~										
	~~building tank~~	"		44	36	25					
	making tank surface	"		8	6	5					
	building refinery tank	"					1				5.000
	accomplishing	"		10	9	8					
				75	63	48	1	375.000	315.000	240.000	5.000
					Total price			1.468.800	1.183.000	884.500	12.500

9. Technological operation and maintainence.

- Follow and control continuously

- The cover must be closed so that leaves and dirt can't fall down into the tank.

- The refinery tank must be washed just after the rain.

As for the public construction, a guard should be needed for safeguarding and maintaining.

10. Detail discription of the performance (step by step)

- Investigate and survey : October- December 1990

- Study, experiment, design : Jan.- April 1991

- Negotiate on the construction: from April 1991

- Directing techniques, conducting performence : from April- June 1991

- Evaluation, appraisal, dissemination : July- December 1991

11. Discription of mass media using for disseminating.

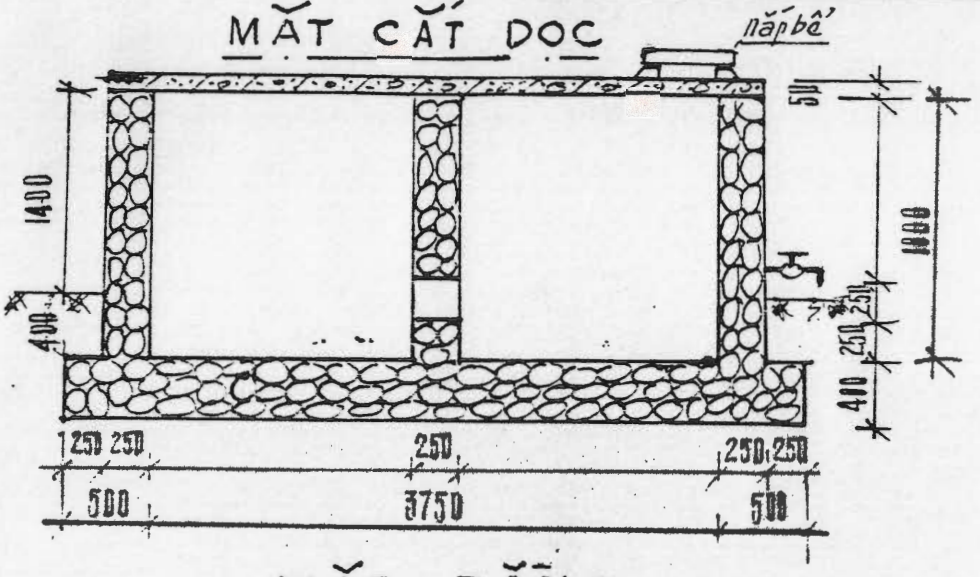
- Dissemination loudspeakers.

- Mobilize among working groups and units.

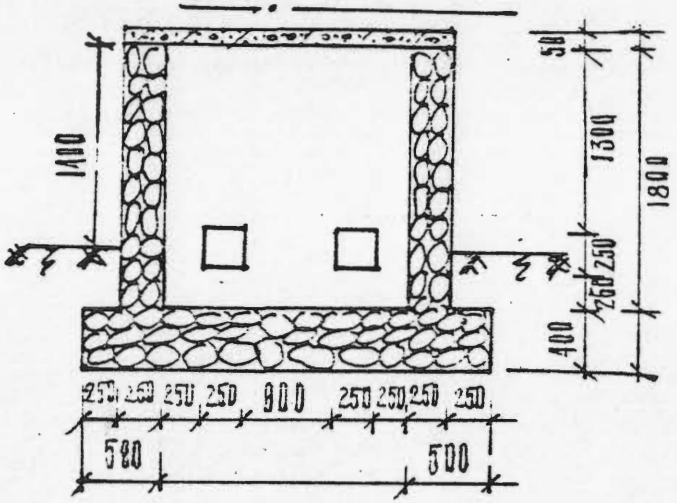
Items	Material	unit price	unit	Total price	payer: commune population	payer: subcontract	
Raising water tank with volum of 10 m³ (for public use) and raising filter tank	- cement, iron steel, watertap	789.000	2	1.578.000		1.578.000	
	- quicklime, stone, brick, bamboo	312.000	2l	624.000	312.000	312.000	
	- labour	380.000	2	760.000	228.000	532.000	(cm3
				2.962.000	540.000	532.000	1.890.000
Raising water tank with volum of 9 m³ (for private use) and raising filter tank	- cement, iron steel, watertap	616.000	2l	1.232.000			1.232.000
	- quick lime, stone, brick, bamboo	260.000	2l	520.000	104.000	416.000	(m)
	- labour	320.000	2	640.000	128.000	512.000	(m.
				2.392.000	232.000	928.000	1.232.000
Raising water tank with volum of 6 m³ (for private use) and raising filter tank	- cement, iron steel, watertap	459.000	2	918.000			918.000
	- quick lime stone, brick bamboo	202.000	2	404.000	91.000	313.000	(m
	- labour	245.000	2l	490.000	98.000	392.000	(m
				1.734.000	189.000	715.000	900.000
	Total price			7.148.000	951.000	2.175.000	4.022.000

BỂ CHỨA NƯỚC MƯA GIA ĐÌNH $W_b = 10\ m^3$

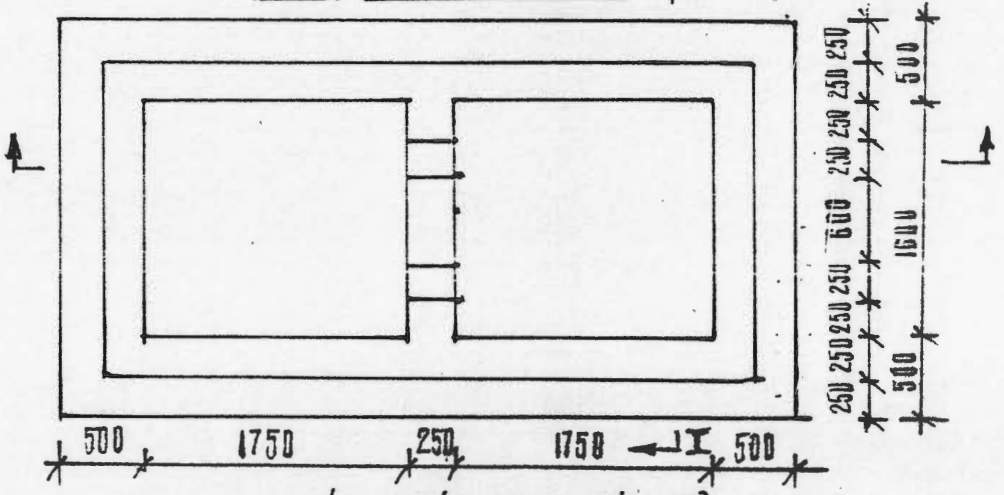
MẶT CẮT DỌC



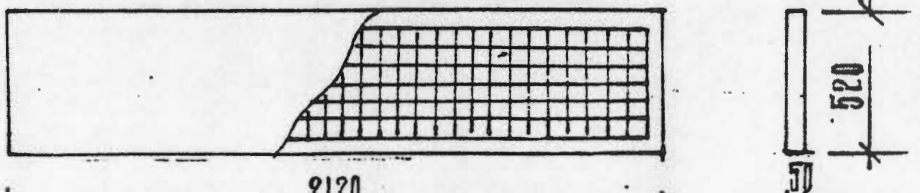
MẶT CẮT I.I



MẶT BẰNG



CHI TIẾT TẤM ĐAN NẮP BỂ

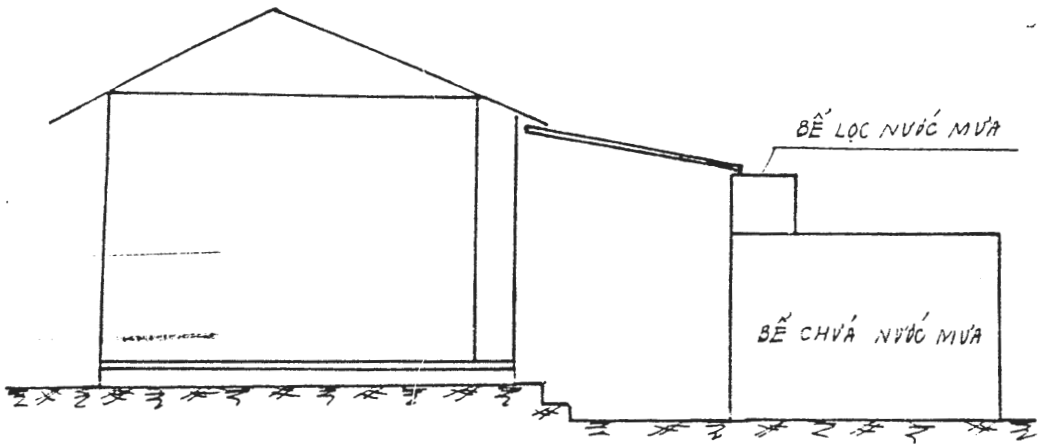


THỐNG KÊ VẬT LIỆU

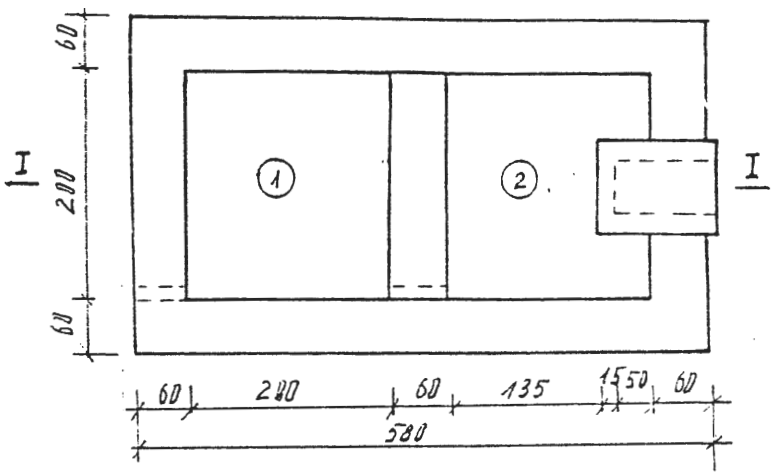
Số TT	Vật liệu	Đơn vị	Khối lượng	Ghi chú
1	Xi măng	kg	1580	
2	Đá hộc	m^3	14,500	
3	Đá dăm	m^3	2,500	
4	Mặt đá	m^3	8,000	
5	Vôi cục	kg	400	
6	Sắt ϕ6	kg	30	
7	Lưới Thép	m^2	0,04	
8	Vòi nước ϕ20	chiếc	1	
9				

TRUNG TÂM, PHÁT TRIỂN NÔNG THÔN VIE 86/020	BỂ CHỨA NƯỚC MƯA GIA ĐÌNH $W_b = 10\ m^3$			Bản vẽ số
				Hoàn Thành
GIÁM ĐỐC	CHỦ NHIỆM	THIẾT KẾ	CAN	KIỂM
	Lê Bích			

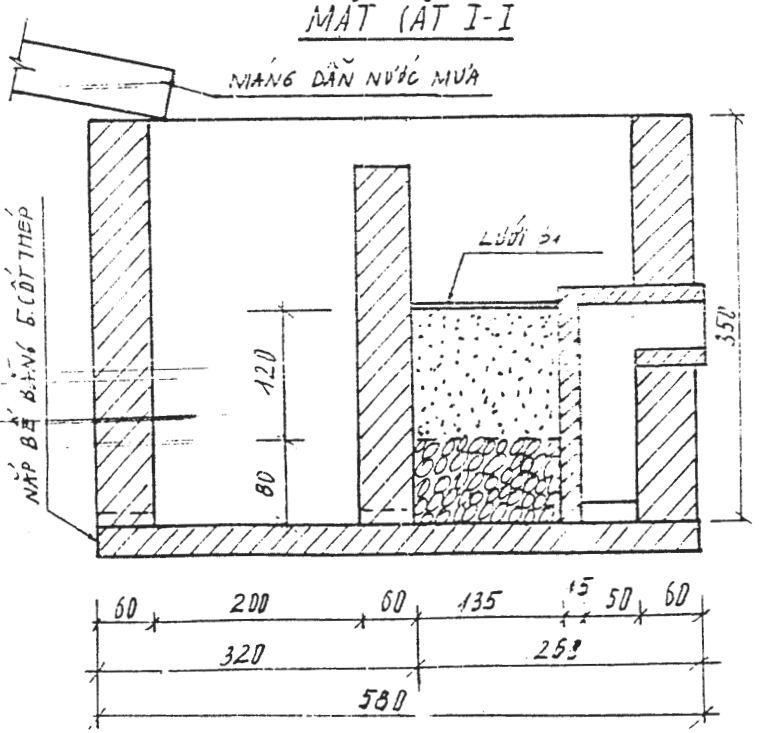
SƠ ĐỒ BỂ LỌC NƯỚC MƯA GIA ĐÌNH



MẶT BẰNG BỂ LỌC NƯỚC MƯA GIA ĐÌNH



MẶT CẮT I-I



TỔNG HỢP VẬT LIỆU

SỐ T.T	LOẠI V.LIỆU	Đ.VỊ	S.LƯỢNG
1	GẠCH	VIÊN	45
2	XI MĂNG	Kg	4
3	CÁT VÀNG	m^3	0,02
4	LƯỚI Ø1 mm	m^2	0,04

GHI CHÚ:

- KÍCH THƯỚC BẢN VẼ THEO MM.
- ① NGĂN LẮNG NƯỚC
- ② NGĂN LỌC NƯỚC

TRUNG TÂM PHÁT TRIỂN NÔNG THÔN VIE 86/020	THIẾT KẾ CHI TIẾT BỂ LỌC NƯỚC MƯA G.ĐÌNH	BẢN VẼ SỐ 01 H.THÀNH 7/1990
GIÁM ĐỐC NGUYỄN.V.THAN	CHỦ NHIỆM LÝ QUANG BÌNH / KIỂM	THIẾT KẾ PHAN THỊ LIÊN / CAN

1

ACTION 2 - 3

1. Name of action: rainy water tank and filter tank

2. Place of construction:

- Public construction: He village, Vuxa village

- Families: Xuanvu, Thuong, Vanle, heduong.

3. Plans for implementation:

Transfer and guide techics to implement: 11 - 12/1991

4. Construction process:

- Chosing suitable location for construction: near kitchen, near facilies of maintaining water
- Public construction: seay for people fetching water.

+ Should not build near perient trees

- Material should be cleaned before implementing
- Ground foundation should be rammed tighly

* For weak foundation:

+ Underground water is lower than bottom of foundation:

. Sand thick: 40 - 50 cm (water and ram tighly)
. Underground water is higher than bottom of foundation: 10 - 15 columes of bamboo/m2

5. Operation and maintenance:

- Every year tank should be cleaned once in March or april
- Filter tank shold be cleaned after each rain
- One person should be nomiated to guard and maintain public construction.

6. Cost of construction:

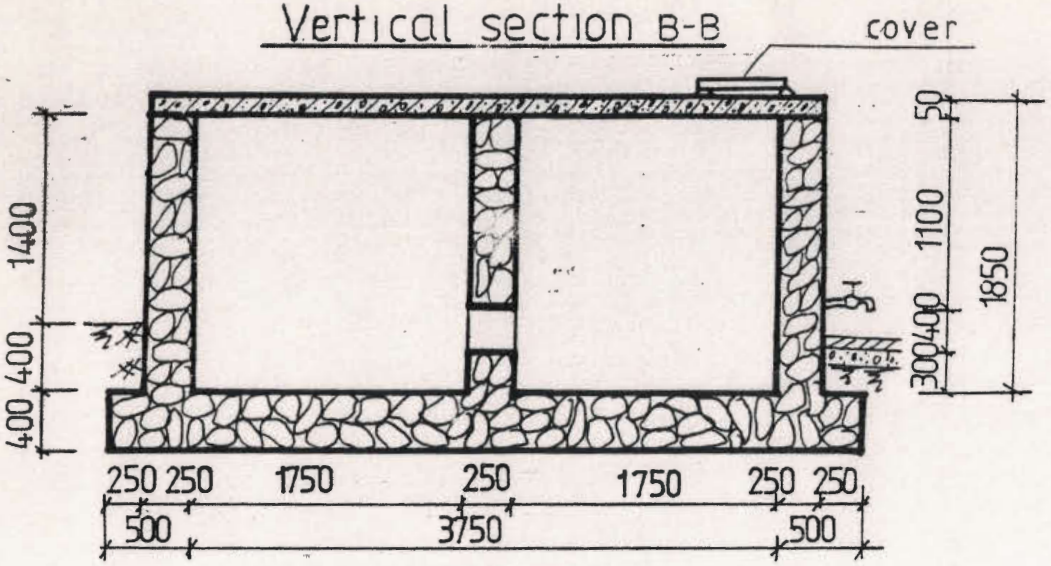
Item	problem	unit price		Total price	payer			
					Commune	population	Subcontract	
aing water	Building							
ank with	mat Nationa	962.400	2	1.924800			1.924.800	
olum of	Local	373.500	2	747.000	373.500		373.500	Com.. 2
0 m³ (for	Labour	456.000	2	912.000	274.000	638.000		
rivate use)								
end raing				3.583.800	647.500	638.000	2.298.300	
filter tank								
aing water	Building							
ank with	mat Nationa	728.000	2	1.456.000			1456.000	
olum of 8m³	Local	350.000	2	700.000	140.000	560.000		Com 20%
for private	Labour	384.000	2	768.000	154.000	614.000		Com 20%
use)								
nd raing				2.924.000	294.000	1.174.000	1.456.000	
ilter tank								
ing Water	Building							
nk with	mat Nationa	527.600	2	1.055200			1.055.200	
olum of	Local	266.000	2	532.000	106.000	426.000		Com 20,
m³ (for	Labour	294000	2	588.000	118.000	470000		Com.20,
rivate use)								
nd raing				2175.200	236.000	896.000	1.055200	
ilter tank								
–	TOTAL PRICE			8.680.000	1.160000	2.710000	4.810.000	

3. List of material Volume / price / labour – the Cost 1/10/1991 Rain Water tank

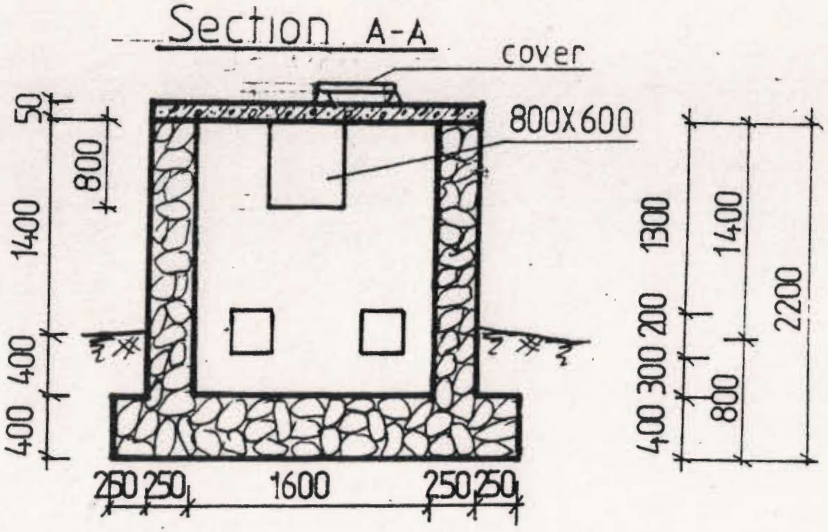
Item	Material	unit	Unit price	Quantity				Total			
				10 m³	8 m³	6 m³	Filter	10 m³	8 m³	6 m³	Filter
Material	Cement	kg	480	1580	1250	870	4	758.400	600.000	417.600	1.920
	great Stone	m³	13.000	14,5	12	8		188.500	156.000	104.000	
	Broken Stone	m³	16.000	2,5	2	1,5		40.000	32.000	24.000	
	powder Stone	m³	15.000	7,5	6,2	5	0,02	112.500	93.000	75.000	300
	Quick lime	kg	100	500	420	360		50.000	42.000	36.000	
	Iron ϕ6	kg	4500	30	26	22		135.000	117.000	99.000	
	Steel net	m²	15.000			0,04	0,04				600
	Water tap	piece	8.000	2	1	1		16.000	8.000	8.000	
	Brick	unit	200				45				9.000
	gutter bamboo	tree	6.000	4	3	3		24.000	18.000	18.000	
								1323.400	1066.000	781.600	12.000
Labour	Digging ground	labour	6.000	8	7	6					
	Making concrete	"		5	5	4					
	panels	"									
	Building tank	"		44	36	25					
	Making tar Surface	"		8	6	5					
	Building refinery tank						1				
	accomplishing			10	9	8					
				75	63	48	1	450.000	378.000	288.000	6.000
						TOTAL		1773.400	1444.000	1069.600	18.000

Family rain water tank

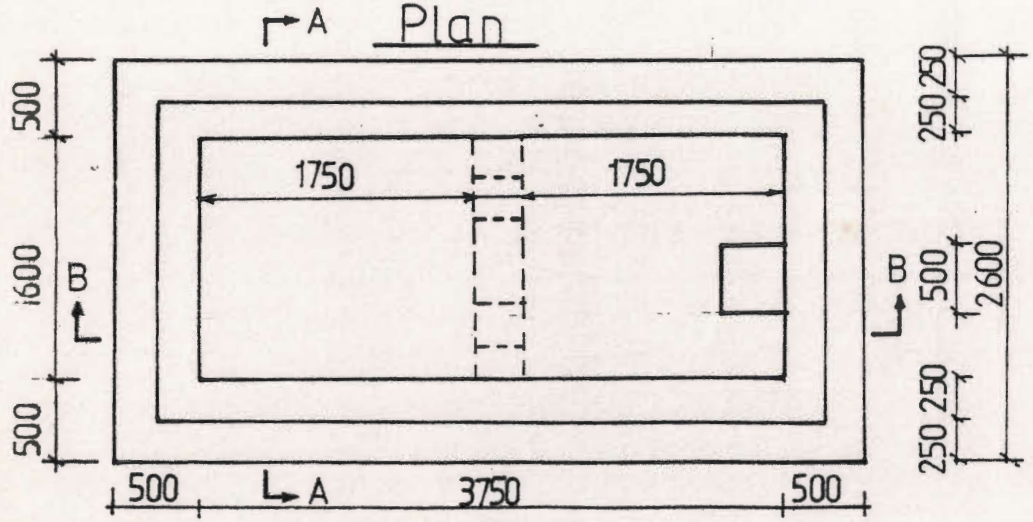
Vertical section B-B



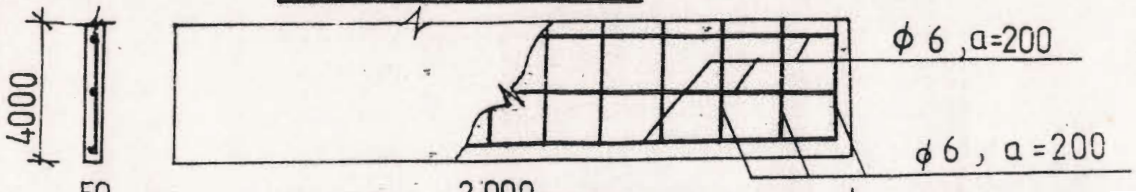
Section A-A



Plan



Detail of cover



MATERIALS LIST

MATERIALS	UNIT	VOLUME OF TANK 10 m³	8 m³	6 m³
cement	kg	1580	1250	870
stone	m³	14.5	12	8
broken stone	m³	2.5	2	1.5
powder stone	m³	7.5	6.2	5
quick lime	kg	500	420	360
iron	kg	30	26	22
steel net	m²			
water tap	piece	2	1	1
brick	unit			
gutter bamboo	tree	4	3	3

CERPAD VIE 86/020 PROFECT	FAMILY RAIN FILTER TANK	Number
		Date 4/1991
Director	Chief of study / Designer	Draw