Design of the AV Production Studio and Addition to the Training Institute at NARC and Development of a Physical Master Plan for NARC

Consulting Reports 1-5
(June 1986 - August 1988)

by

H. James Miller
Architect / Planner Consultant to
Winrock International under the USAID - Funded MART Project

PARC • USAID • MART • WINROCK

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PARC · USAID · MART · WINROCK

The MART (Management of Agricultural Research and Technology) Project is funded by the United States Agency for International Development (USAID). The MART Project's chief link to the Government of Pakistan is through the Pakistan Agricultural Research Council (PARC). A MART Project Coordination Committee composed of federal, provincial, and university representatives coordinates and guides project activities. Its purpose is to assist the Pakistani agricultural research system to strengthen its research management capabilities, and to improve communications, training, farming systems research, arid zone research, and research in the rural social sciences. Winrock International, through a contract with USAID, has responsibilities to assist with the first four of these tasks. Two international agricultural research centers, the international maize and wheat improvement center (CIMMYT) and the International Center for Agricultural Research in Dry Areas (ICARDA), are responsible for the other two tasks.

The mission of Winrock International Institute for Agricultural Development is to help reduce poverty and hunger in the world through sustainable agricultural and rural development. Winrock International works with people of developing areas - in Asia, Africa and the Middle East, Latin America and the Caribbean, and the United States - to strengthen their agricultural institutions, develop their human resources, design sustainable agricultural systems and strategies, and improve policies for agricultural and rural development. As an autonomous, nonprofit organization, Winrock International provides services independently as well as in partnership with other public and private organizations. The institute is recognized as a private voluntary organization.

JUNE 1986

Wright

NARC

NARC FACILITY SURVEY REPORT (1) • H. JAMES MILLER

ASSIGNMENT ISLAMABAD, PAKISTAN USAID · WINROCK · ABRLS.

ARCHITECTS and PLANNERS 214 WEST MAIN STREET URBANA, ILLINOIS 61801

Date: June 17, 1986

To: PARC, NARC and USAID officials reading this Report:

It was indeed a pleasure to return to Islamabad after twenty-seven months and find the NARC Research Complex virtually complete, occupied, and serving its intended purpose very well. The complimentary remarks from many users about the design of the buildings were very much appreciated. It was gratifying to find that most of the special features of the design concept were working as intended for the comfort and convenience of the users.

Because there are still a few lingering defects due to errors and omissions in construction; corrective measures are necessary, primarily to eliminate water damage to roof and walls. Also, some aspects of interior design were not completed at the time of construction and now need special attention to reach their full level of potential. The major purpose of this assignment was to address these issues, while at the same time reviewing the proposed expansion of Training Center facilities to be implemented as part of the MART Project.

Perhaps most satisfying was to discover that a maintenance program has been under development and is now functioning, though unofficially, since the buildings were opened. The Works Department assumed responsibility for the operation and maintenance of the buildings without a formal organizational establishment and without budgetary support. An Executive Engineer has been in charge of coordinating building repairs and maintenance. Broken windows, insect screen damage, furniture damage and other problems have been taken care of by persuading contractors still on the job to help. This cannot continue. It is essential that the "Operation and Maintenance Guidelines", prepared by ABRIS Ltd. in 1980 be fully implemented with an established organization and system, a budget, equipment, and a building.

This is to express appreciation to all of those who were generous with their time in providing information and advice during this brief assignment. I look forward with anticipation to the next challenge, that of designing even better additional facilities for NARC.

Sincerely,

H. James Miller

H. James Miller, Architect, Planning Consultant

CABLE: ABRIS TELEPHONE: 217-384-0453

June 25, 1986

NARC FACILITY SURVEY REPORT - H. James Miller, Architect, Planning Consultant
Assignment in Pakistan, June 4 - 19, 1986

USAID - Winrock Contract No. 391-0489-C-00-5055-00 MART

Purpose of Assignment

Requested by Pakistani and USAID officials, the short two week assignment was needed to obtain expatriate professional advice regarding proposed improvements to existing facilities at the NARC Research Complex at Islamabad,and to review objectives and strategies for the initiation of architectural design components of the MART project. A secondary purpose was to survey specific facilities at the Agricultural University at Peshawar, and the Agricultural Research Institute at Tarnab, and recommend possible improvements.

Rationale

In the two year period since virtual completion of the NARC complex and its inauguration, several lingering defects due to errors and omissions in construction have been the source of potential long-range damage to the buildings. Also, the use of the buildings has revealed that several modifications or refinements are needed, primarily in the furnishings. Appropriately, the principal designer of the buildings, with intimate knowledge of original intent,and experience with problems during construction, was asked to survey the issues, recommend ways to rectify defects and propose design refinements. At the same time, discussions could begin regarding expansion of NARC facilities under the MART project.

Conducting surveys for specific problems at the N.W.F.P. Agricultural University, Peshawar, and at ARI, Tarnab were conveniently included as part of the scope of work.

Expanded Scope of Work

The contract scope of work was outlined as follows:

1. "N.W.F.P. Agricultural University: Recommend modifications to interior of present library building to be implemented after the move to the new library on the new compus."

2. "ARI Tarnab: Provide advice for renovation/maintenance of existing facilities, and recommend interior treatment of major buildings."

3. "NARC Islamabad: Propose solution to efflorescence of brick exterior face, recommend improvements for reception area and atrium area of Administration Block, and recommend treatment of expansion joints,"

The scope of work was expanded after arrival in Pakistan as follows: For NARC, propose solutions to roof drainage problems and recommend possible treatment of bricks to solve damage to brick exterior surface. Propose improvements to entry plaza and a cover for arriving dignitaries. Propose uniform screening of interior and exterior windows throughout building. Propose other improvements to enhance the beauty and use of the buildings as discussed with Chairman PARC on June 8.

Review objectives and strategies for design of additional facilities for NARC as part of the MART project.

- NARC Islamabad

The following observations and recommendations stem from a reconnaissance of the physical conditions at the site, and from discussions with various concerned officials. Consulted were the Chairman PARC, Dr. Amir Muhammed; Director of Works, Idrees Anjum; and Executive Engineer; the

NARC Director General and Deputy Director, Director of Scientific Information, Director of Training Institute, and various scientists. The USAID Chief of the Agriculture Division and Chief of the Engineering Division were also consulted.

The issues are addressed in two separate groups. The first group includes construction defects that need rectification or improvement, and the second group are proposed design refinements or modifications to the buildings and to the furnishings. Rectification of some defects is already under way. Though the one year guarantee period for the contractor has passed by more than a year, apparently MLC is still involved in the rectification process.

Construction defects

Several construction defects have been causing water damage to brick wall surfaces and to some plastered surfaces. They are as follows:

(a) Expansion joint construction was faulty and incomplete.
(b) Caulking of metal roof flashing is incomplete, and workmanship of roof waterproofing at some edges was faulty.
(c) Sheet metal lining for roof drain gargoyles to throw water away from building were not provided as intended.

Water penetration of brick causes salts to effloresce or appear as a white substance on the surface. Long term dampness in brick causes fungus to grow, appearing as black spots. Other damage to brick surfaces is due to careless construction techniques and failure by the contractor to rectify the damage as follows:

(d) Brick surfaces were smeared with morter while laying the brick, or while pointing the joints with mortar.
(e) Cement slurry from poured concrete was allowed to run down the surface of the brick thus spoiling it.
(f) Brick surfaces have been spoiled by paint due to failure to mask the brick.

Recommended Solutions to defects

Brick is one of the oldest and most favored of building materials. It has a reputation for durability, lasting hundreds of years with little maintenance when of good quality and when properly laid in a wall. The major cause of deterioration is water penetration, freezing and thawing.

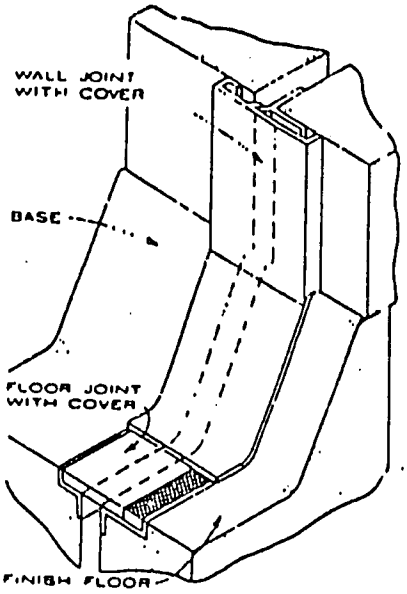
AT NARC, most of the brick walls are beautiful and will look better with age, as the weathering gradually causes a more uniform appearance. However, there are sections of walls that are discolored and defaced because the construction defects mentioned earlier have allowed water to penetrate to the inside of the wall and seep out. The following steps should be taken to solve the problems:

(a) Expansion joints that are leaking can be corrected in several ways, all expensive. One way is to try to correct the flaws in the system already in place. Though this may not be a longterm solution (it is cheapest and is already being attemped with some success). A second way is to break away the slabs and install more sophisticated imported plate and angle covers for the joints. This may be the only long range permanent solution and is preferred. A third way is to utilize one of the special synthetic silicone or butyl rubber materials that would seal the joint, adhering to both surfaces and allowing movement.

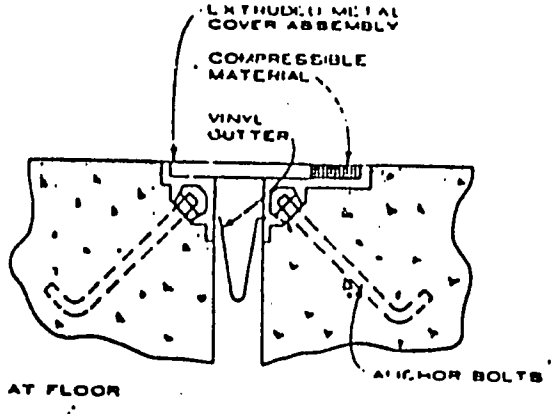
(b) The reglet joint at the top of the metal roof flashing on the parapet walls has never been caulked . The same caulking materials mentioned above should ideally be used to seal this open continuous joint. Where er else the roof is leaking, standard corrective measures must be implemented (Already being done in two are three places.)

(c) The cause of the most areas of water damage to the brick are the concrete gargoyles, which are supposed to throw the water away from

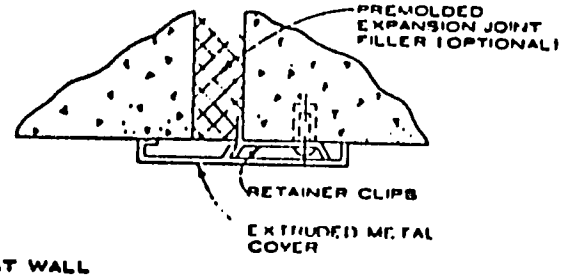
Expansion Joint Covers: Interior



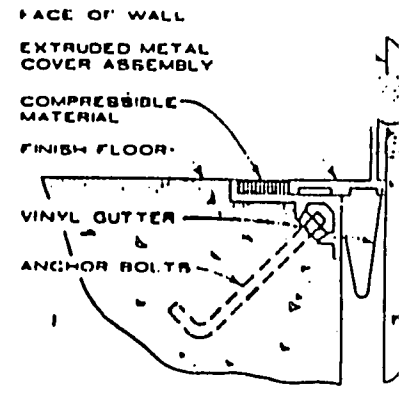
AT PROJECTING BASE



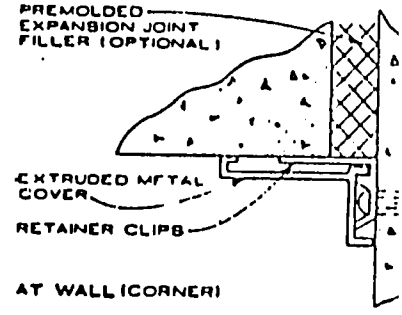
AT FLOOR



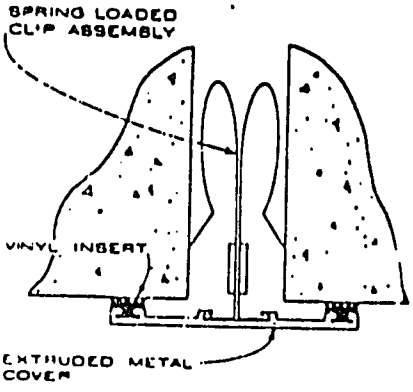
AT WALL



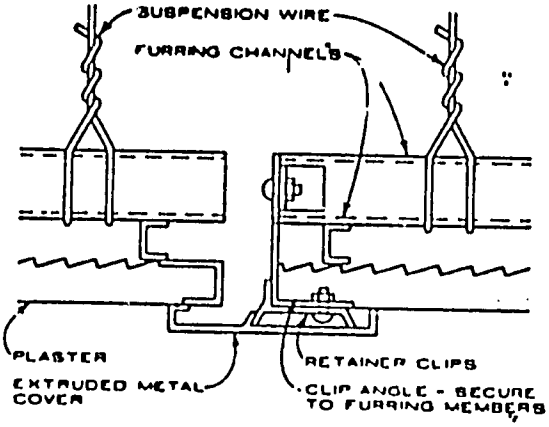
AT FLOOR AND WALL



AT WALL (CORNER)



AT WALL OR CEILING

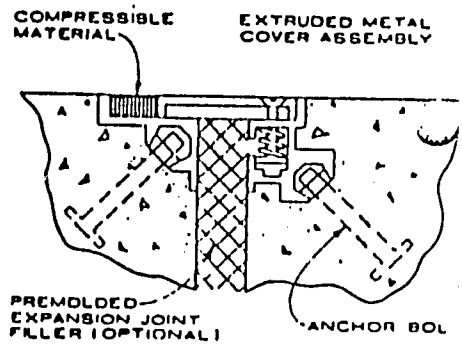


AT SUSPENDED CEILING

PREFABRICATED INTERIOR EXPANSION JOINT COVERS

NOTE

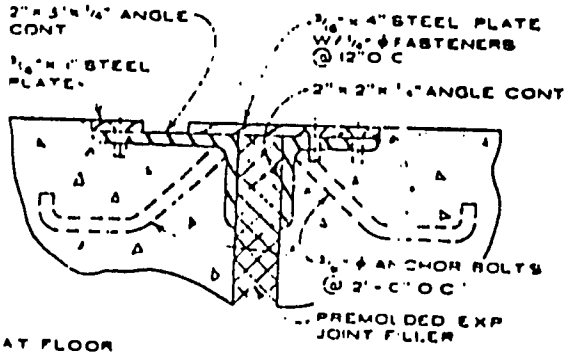
A large selection of prefabricated assemblies to cover interior expansion joints are available from various manufacturers to satisfy most joint and finish conditions.



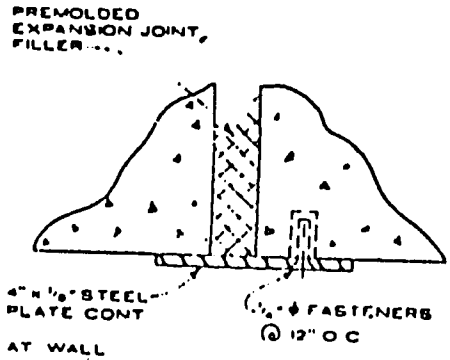
SEISMIC FLOOR JOINT COVER

NOTE

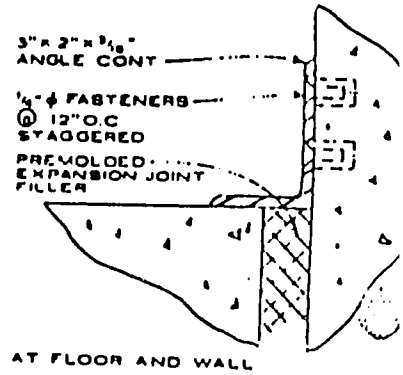
Expansion joint covers that will respond to differen movement, both laterally and horizontally should provided at joints in structures located where seis action (earth tremors and quakes) may be expected where differential settlement is anticipated.



AT FLOOR



AT WALL



AT FLOOR AND WALL

PLATE AND ANGLE TYPE INTERIOR EXPANSION JOINT COVERS

the walls, but instead allow it to run down the surface. The problem is due to missing metal liners that were supposed to project out from each opening to cause the water to fall into the gravel bed below, without hitting the wall. These must be installed to correct the problem. (see sketch). The only other alternative is to install unsightly downpipe drains.

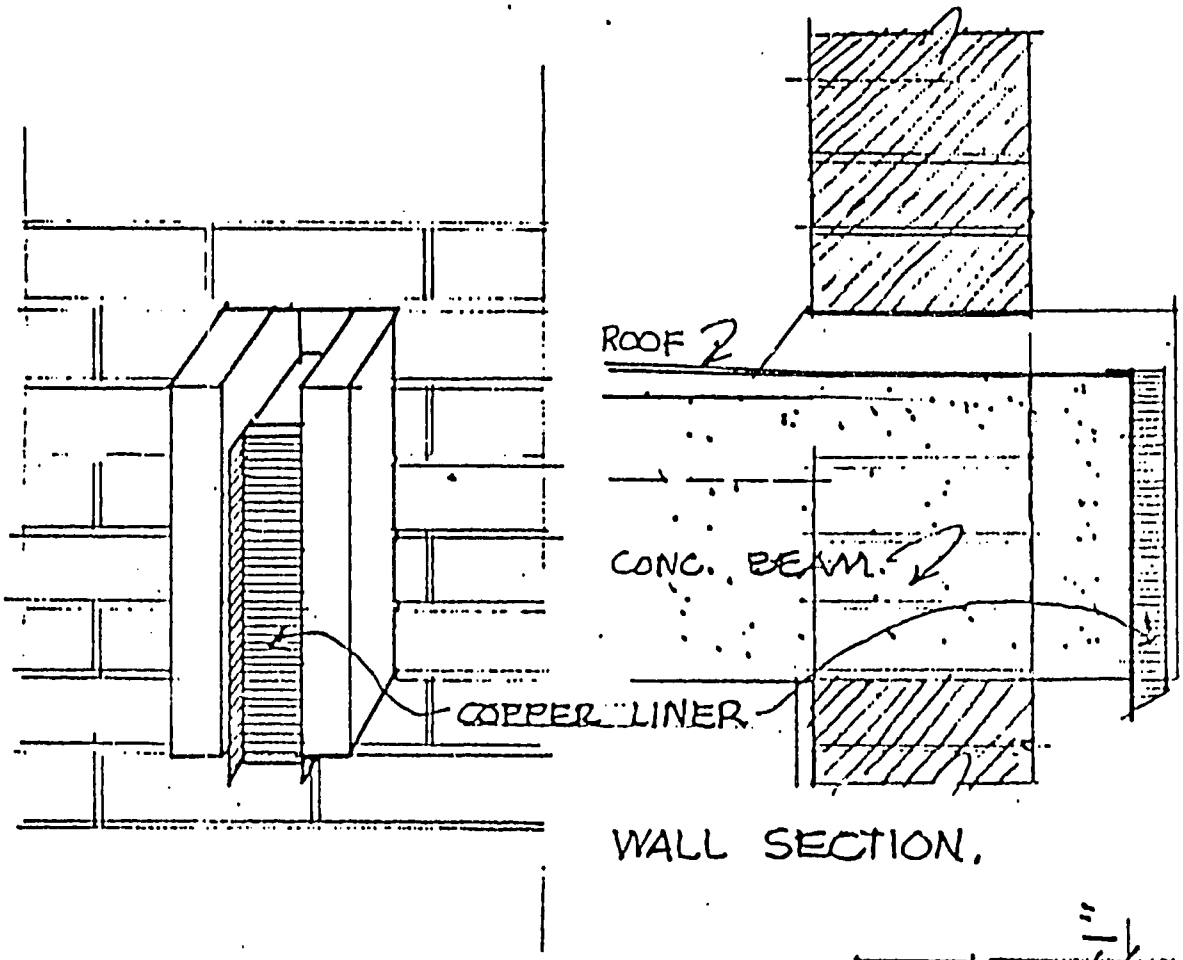
(d) Brick surfaces that were discolored during construction due to mortar stains or paint must be cleaned or replaced. Because the mortar or paint has penetrated the pores of the brick, thorough cleaning is nearly impossible. However, if a proper solvent is identified, such as a mild acid for mortar and a paint thinner for paint, much can be accomplished. A stiff brush with water and or mild detergent can remove efflorescent salts, ordinary dirt and fungus. Care must be taken when actually scraping so as not to damage or remove the glazed surface of the brick.

(e) Another defect is the spalling of brick surfaces in several localized areas. This is probably due to defective batches of brick, since the problem is not universal throughout the buildings. There is no good solution for this problem, except to replace the bricks that spall. If the problem becomes more serious in larger areas, the only solution is to plaster. It would be wise to wait and see if the problem stabilizes.

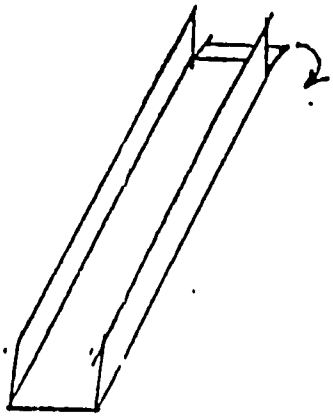
It should be mentioned that non-uniformity in brick form or color is not necessarily bad. In some countries it is fashionable to have multi-colored bricks or deformed brick. However, whatever the nature of the brick, it should be consistant throughout. It is the inconsistancy at NARC that is unattractive and must be corrected.

Finally, there is one factor unrelated to construction that influences water penetration into brick. Apparently some faces of the NARC buildings suffer from the wind driving the rain into the wall. If these walls can be identified, and after all other problems are corrected, a liquid silicone sealer could be applied to prevent the rain from entering the pores of the brick. Though expensive and lasting only 5 to 10 years, this material is used extensively in the U.S.

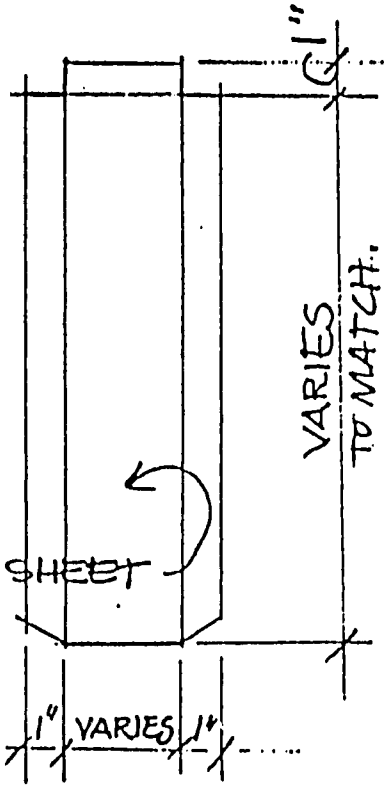
SCUPPER METAL LINER.



WALL SECTION.



FORMED LINER



CUT COPPER SHEET

NOTE: COPPER SCUPPER LINER MUST FIT TIGHT TO CONCRETE.

Design Refinements and Proposed Modifications to Buildings

Building interior design for NARC facilities was never completed by the local consultants. The ideal way now to address the issues that follow would be to commission an architect or interior design group to do the job comprehensively for all the buildings. The following concepts are recommended:

(a) Visitor arrival and entrance improvements: When it is raining, visitors can be drenched while walking the distance that is not covered between the curb and the covered plaza. A recommended solution is to design a light steel frame with colored canvas cover similar to those used at entrances to prestigious hotels and clubs around the world.

There is concern that the water drain slot in the floor of the plaza can be a potential cause of injury. The recommended solution is to provide a ½" thick tempered plate glass cover or to redesign the slot to make it narrower.

There is concern that the brick paving in the entrance plaza is too uneven and that the surface may not hold up under the traffic. It may be desirable to experiment with grouting the joints to reduce the uneven appearance. The esthetic quality is a matter of opinion. In most of the world the brick plaza would be considered beautiful. Similar plazas can be seen in Europe, the U.S., Latin America, and the Far East. It is recommended that no major change be implemented for now until the wearing quality is tested further. The brick could be replaced at any time with colored granite similar to the brick color and pattern; but marble or terrazzo would not be recommended because they are too slippery when wet, and may not fit esthetically.

(b) Administration Building improvements to reception area and atrium: There is concern that these areas are not well used, therefore seem unnecessarily large and wasted: and that the reception desk is too large and underutilized.

Solutions to the concerns are a matter of administrative policy, as well as interior design. Several potential uses for the spaces must be considered, and the best uses specifically assigned; then the spaces can be appropriately designed and furnished.

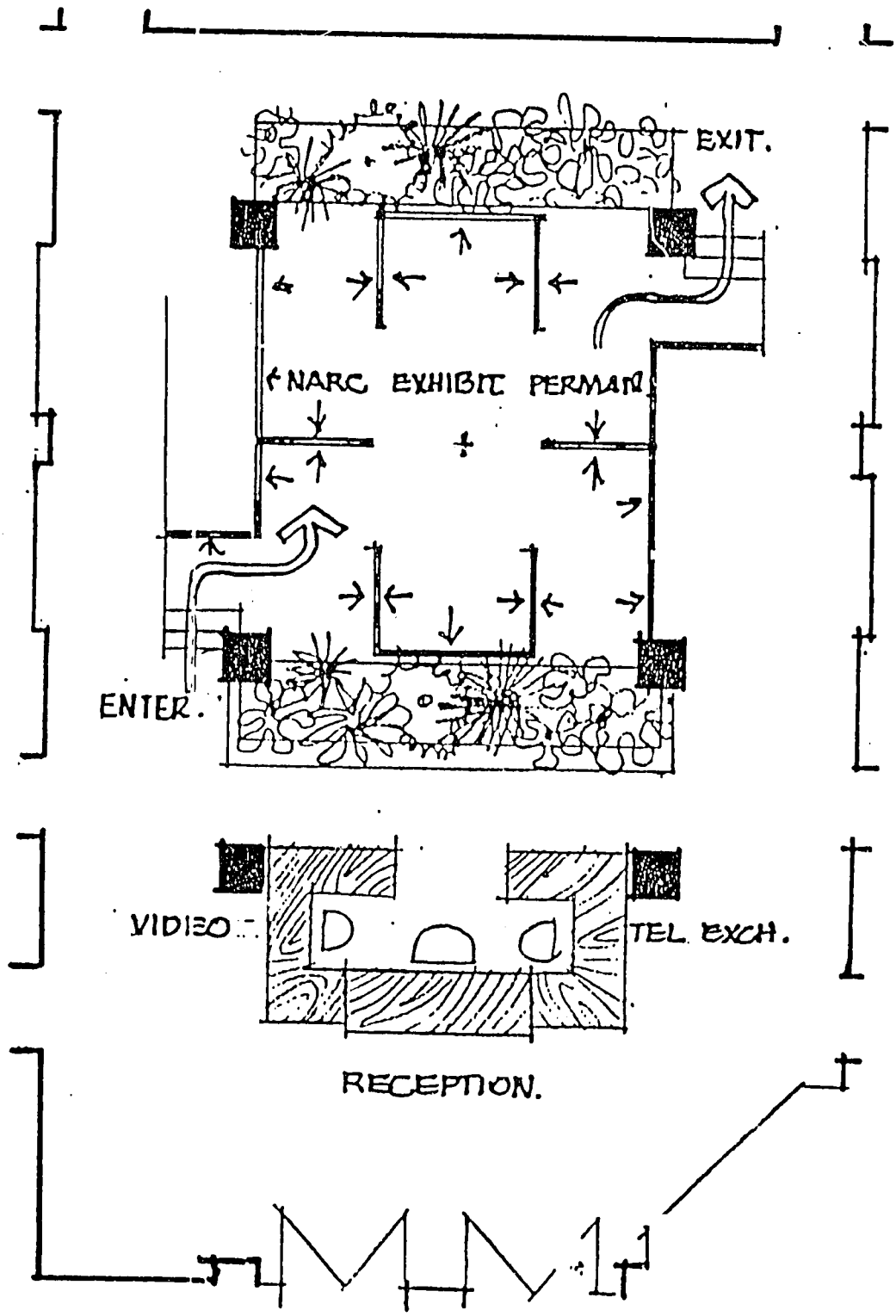
The original intention was that the atrium serve as a prestigeous arrival and control point for all visitors to the Research Center and Farm. It was intended that any administrator or scientist could be reached from the control and that all contacts, appointments and messages could be channeled through this super PA. At this place eventually television monitors could show activities going on anywhere in the complex, and a computor terminal could access data from anywhere, for use of the administration or visitors.

Without a reception desk and receptionist, the NARC would lack a sense of entrance and arrival control. The complex would have multi-entrances and no control. It is important that this be developed, and that an outstanding and well informed person with pleasant manners be assigned the responsibility of receptionist.

The central atrium space could be developed in a number of ways. It could be an elegant waiting area if properly furnished, an executive lounge where VIPs would be received and initial introductions conducted before proceeding to other parts of the complex. (Like the old palace reception courts). Alternately, the atrium could be developed as a professional permanent photographic exhibition of Pakistani agriculture, an inspirational and attractive educational tool for all VIP's arriving at the Center. Another idea would be to construct a large attractive model of the research farm and place it in the center of the atrium, so that visitors could be taken in a tour with a pointer. Or there could be a combination of these. Proper lighting, carpets on floors and stairs, paintings and other furnishing must be well designed by professionals to achieve the desired result. (see sketch diagram)

ADMINISTRATION BLOCK ATRIUM

DESIGN EXHIBITION SYSTEM, LIGHTING, FURNITURE.

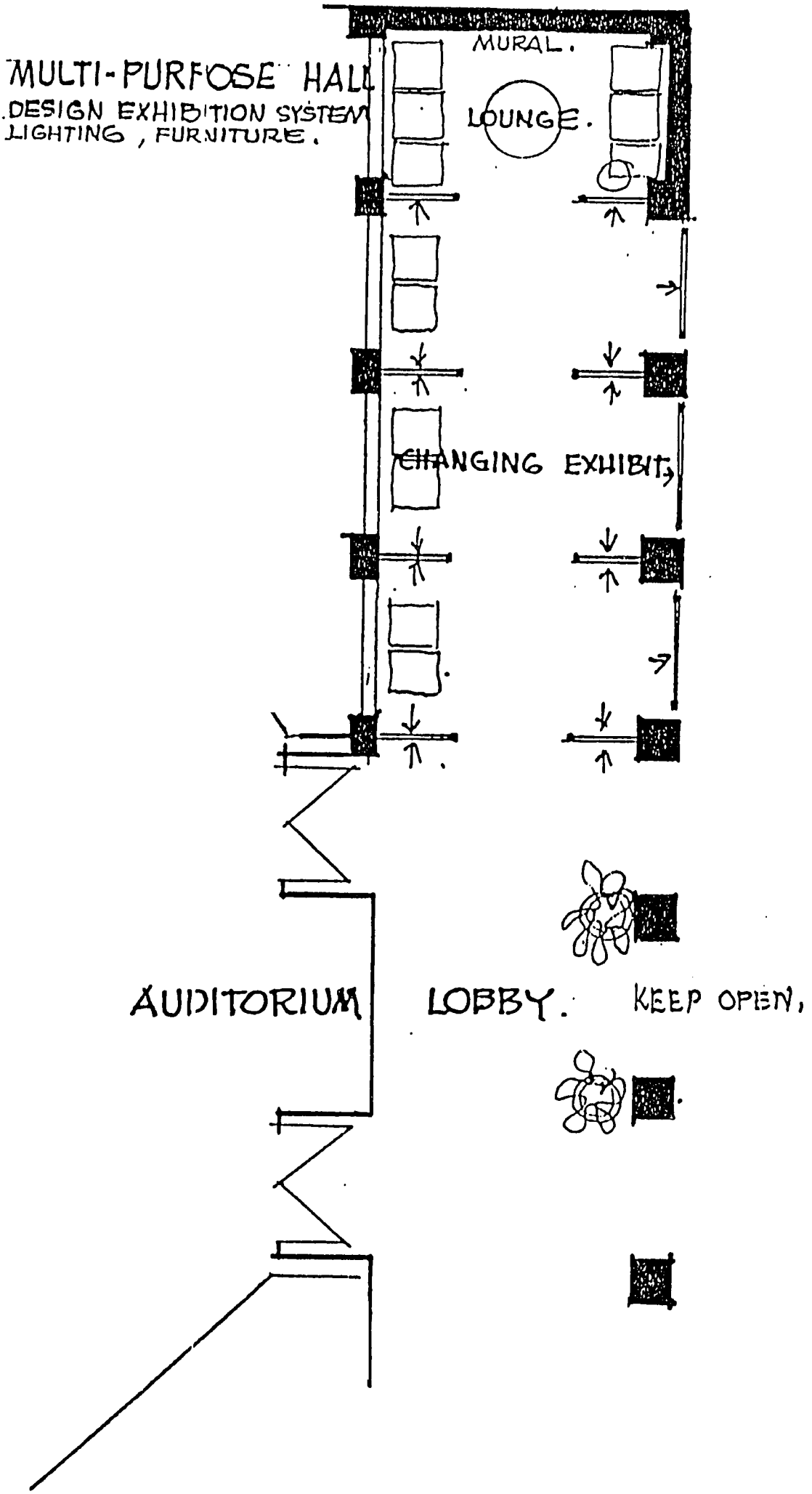


(c) Improvements to Auditorium lobby: This linear space was designed for multi-purpose use. It is primarily a lobby area for people to spill into after lectures and for setting up tables for tea and other refreshments during conferences. It was also designed for changing exhibits. Next to Documentation, the space could be used for displays of various kinds. What is lacking is an exhibition system with proper flexible lighting. The system must be attractively designed, then the space can be very effectively utilized. (see sketch diagram)

(d) Screening of large interior window area: There is concern that some of the work areas, particularly in the Administration block are too cluttered to be seen from the central atrium. A recommended solution is to provide draperies for all windows where screening is desired, whether on interior walls or exterior walls. Instead of horizontal venetion blinds which collect dust, the best and most attractive solution is to provide white vertical louver drapes. Placing paper and metal foil over windows is more disturbing than discolored brick.

(e) Use of potted plants throughout buildings: Potted plants can be an attractive addition to building interiors or can add unattractive clutter, depending upon size, color, form, combination with other plants, their container pots, and their location. Unfortunately, the plants now proliferated in small red and white pots detract and clutter rather than enhance. The metal racks also are very unattractive and should be removed, particularly the ones near the main entrance. Since this is not a military building in a cantonment area, the painted pots and racks are completely inappropriate.

A plant should not be displayed singly, unless it is very large, well formed, and planted in a nicely designed pot. Large rubber plants in white cylindrical pots 18" in diameter and 24" high is one suggestion.


MULTI-PURPOSE HALL
DESIGN EXHIBITION SYSTEM
LIGHTING, FURNITURE.
MURAL.
LOUNGE.
CHANGING EXHIBIT;
AUDITORIUM
LOBBY.
KEEP OPEN,

The small potted plants now scattered around should be gathered up and grouped together in the gravel area just outside the window of the atrium. Lessons can be learned from use of plants in airport waiting lounges.

(f) Other modifications to improve the use and appearance of the buildings must be derived first from administrative decision, then interior design would follow in response to the policies. For example, knuckle areas and staff lounges are not being used as intended nor are the areas furnished as intended. This can be remedied when the current crowded conditions are relieved as other facilities become available.

(sketches)

N.W.F.P. Agriculture University, Existing Library Modifications

The following observations and recommendations stem from a visit to the campus of NWFPAU and discussions with concerned officials. Consulted were the Vice Chancellor, the Director of Works, The Librarian, the USAID TIPAN Project Coordinator and expatriate staff.

A question yet unanswered in the S.O.M campus master plan is what uses would be appropriate for the existing two storey library building when the proposed new Library is completed. (5000 ft)^2. The building sits alone in the center of the classroom building complex and is accessible by covered corridor at both levels. Ceilings are very high (est. 16ft) and a mezzanine floor was constructed for one third of the lower floor for book stack space. The lower floor contains circulation, stack, and other library services. The rather remote upper floor, reached by a steel stairway, is used for a reading study area, with one third walled off for a student common room. The upper level is uncomfortably hot and stuffy.

It was noted that the existing library building will be on a visual axis of the proposed new main entrance to the campus, and in fact would terminate the axis. This will give it visual importance; and its location central to the existing classroom complex makes it a candidate for some sort of common use when the library function moves out.

The building appears to be structurally sound, and has the potential of remodeling for many different uses. It could be a building designated for changing uses over time to accommodate changing needs of a growing University. To provide maximum flexibility, it is recommended that the mezzanine floor be removed, along with the stair between floors. It is also suggested that the heavy partition dividing the upper level be removed.

To make the building more comfortable, it is recommended that a plaster ceiling be constructed 4ft below the existing roof on the upper floor. Large screened openings in north and south walls above the new ceiling could ventilate the air space and allow the upper floor to remain much

more comfortable throughout the day. It is also recommended that new and large windows be installed in north and south walls, with exterior sun shades to allow more natural light into the building and better cross ventilation.

It may be necessary to construct a code required fire exit and stair from the upper floor on the end opposite the corridor.

Various ideas were discussed about the use of the building. Most favoured was the use of the first floor as an examination hall cum study hall, and use of the upper floor as a common room for students and staff. On the other hand it may be too early to establish the highest priority of use until the first phase of the new construction is complete and occupied. Whatever uses are finally adopted, it will be important for the interior of the remodeled building to receive the same attention to interior design as do the new buildings. The same system of furnishing should be utilized, and this building could be every bit as nice as the new facilities.

- ARI Tarnab, proposed renovation and maintenance

The following observations and recommendations stem from a visit to ARI, Tarnab, discussions with a principal scientist, Habib-ur-Rehman, and other scientists at the Institute. (The Director was not available). ARI Tarnab is one of the oldest and is the major agricultural research centre for NWFP Province. It was established, and the first buildings were constructed, during British rule. Three successive building programs have provided a rather extensive building complex, which is generally of substandard quality for research facilities, as pointed out by those who work in the facilities.

Constructed by the Public Works Department, even the newest buildings are deteriorating, and there is little evidence of a corrective maintenance program to repair the deterioration. The ground floor corridor slab in the large newest building is settling by as much as 3" in one place. Various handicaps to the work of the scientists include dust blowing in from an adjacent road, excessive heat caused by wrongly oriented buildings, and inadequately equipped laboratories.

The original British-built buildings at the entrance to the Institute are now used primarily for stores and vehicle sheds. Walls, floors and windows of the original buildings still used as labs show long years of neglect.

A program of improvement for ARI, Tarnab, could be conducted at various levels of investment depending upon objectives, and the intended quality of the end result. Whatever improvement goals are established, it is recommended that a utilization study first be conducted to see how well the facilities now support the activities being housed, and whether an initial rearrangement of functions would be desirable. It appears that there are some spaces seriously underutilized, and others that are crowded and perhaps not as well located as is possible.

At the highest level of investment, it would be desirable to remodel the most appropriate interior spaces for one or two currently well used laboratories and equip them to a similar standard as NARC, Islamabad. This could provide a model for eventually bringing all of the labs up to the same level of operational quality.

A major impact on the character and quality of the whole station could be achieved by replacing the dusty, dilapidated original structures with a new administrative library facility, serving as a well designed entrance gateway to the Station.

The next step is to determine priorities and prepare a project.

NARC FACILITY ADDITIONS UNDER THE MART PROJECT

Though not included as a part of the contract scope of work for this assignment, nevertheless nearly half of the time was devoted to consideration of expanding facilities for NARC. Clearly, the most urgent need is for additional Training Center facilities. The number of trainees has increased from a few hundred to more than one thousand in the past three years, further growth being limited only by inadequate facilities. Fortunately, the site plan provides for additional growth.

There are also other important needs for expanded NARC facilities as emphasized in discussions with PARC, NARC, and USAID officials. These include an operation and maintenance center, additional laboratories, and a seed bank, additional staff housing, a bank and post office, a staff club-recreation area, and a community mosque. It is important that all anticipated additional facility needs be analysed and a master development plan be prepared to avoid ad hoc development that tends to occur without such a plan. The Farm Center and Staff Housing areas have already suffered due to the lack of a proper master plan. Completion and occupation of the World Bank laboratory addition has been handicapped because of the lack of a comprehensive laboratory plan.

As part of the MART project, Winrock International and ABRIS Ltd. architects and planners, will be responsible for working with PARC and NARC officials to conduct a facility needs analysis and prepare a program of requirements. The PARC Director of Works will be responsible for obtaining accurate site data. As soon as the data is available, ABRIS Ltd. will prepare a comprehensive master plan. ABRIS Ltd. will also prepare schematic design and design development drawings for the expanded Training Center facilities. A local architect will collaborate with ABRIS in preparing working drawings, and will work with the PARC Works Department during supervision of construction. ABRIS staff would be available on an as needed basis during this period. The planning process has already begun, initiated by officials of PARC and NARC, who already know their needs and have expressed them in discussion during this assignment. A target of July 20 was established for these needs to be formalized so that when the Winrock and ABRIS team arrive, these needs

can be discussed and formally confirmed. Meanwhile, the Director of Works, Idrees Anjum has promised to begin collection of necessary site data. It is essential that site data be available no later than August 20, so that the master planning process not be delayed. However, the difficulty and time required to obtain this data in accurate form should not be minimised. Site boundaries, topography, and all constructed work, including what is underground, must be accurately recorded on maps using a minimum scale of 1:500 and a minimum contour interval of one meter. The most accurate, and least costly method may be an aerial survey using photogrammetic methods supplemented by a ground control survey.

In 1975, survey of Pakistan prepared a topographical map of the site, and in 1980, a private engineering company conducted a survey. Both proved to be inaccurate. There is no point in a further survey unless it can be assumed in advance that the data will be accurate.

The MART project provides A&E technical assistance for overall master planning and for the design of Training Center facilities only. It also provides funds for construction of the same buildings. For other facilities it may be desirable for the project to be amended to support initial design studies; but other sources of funds must be found for complete A&E services and construction costs.

To facilitate the planning process, it is recommended that the local A&E firm currently under contract with NARC be retained to collaborate with ABRIS Ltd. The firm has a good reputation and has developed a excellent relationship with the PARC Works Department. They have successfully produced the PARC Headquarters building, the FMI building and staff housing at NARC. The same firm was recommended by this consultant for the NARC project in 1975. Unfortunately, the advice was not followed at that time.

Master planning and preliminary design of first buildings will probably require approximately four to six months, if data is available on schedule. Working drawings may require another four months, so that potentially construction could begin by March, 1987.

OPERATION AND MAINTENANCE OF NARC FACILITIES

The importance of a fully mobilized operation and maintenance system for the new facilities at NARC cannot be overemphasized. This is understood by everyone. The problem is in formally establishing the system, hiring and training staff, providing support facilities, and having a budget that is adequate to implement the system.

Since the NARC complex was inaugurated and occupied over two years ago, the Works Department has continued its involvement by assuming the responsibility for operations and maintenance, without formal action and without a separate budget. Salaries and costs are coming out of the development budget. Repair of windows, roofs, walls, and furniture is being done through the cooperation of various contractors who are still at site. Though this sense of reponsibility and the work being done is commendable, of course it is not a proper arrangement and cannot continue.

USAID has provided nearly $100,000 worth of workshop equipment, maintenance tools and materials for the operation and maintenance division. Because of lack of staff, no workshop, and no budget, these items cannot be fully utilized as intended.

The operation and maintenance guidelines prepared by ABRIS, Architects in 1984, plus the manual prepared by Mr. Idrees Anjum, provide sufficient direction to implement an O and M organization and system. An Executive Engineer under the Director of Works is willing to head such an organization, and is prepared to go abroad for specialized training.

It is strongly recommended that formal action be taken to set up the system, and provide at least 1% of the capital value of buildings on an annual basis for a supporting budget. Requests on this basis have already been submitted. Meanwhile, a building for OM should be designed and constructed as a priority.

ACTION GUIDELINES FOR NARC EXPANSION-MART

The following is a priority sequence of actions to be taken in the process of implementing the planning and design of expanded facilities for NARC under the MART Project:

1. A representative planning committee must be formed and given a mandate to prepare a formal statement of requirements and priorities for expanded facilities at NARC. It is important to have a rationale behind the needs, with quantifiable descriptions of activities to be housed by new facilities. The deadline for completion of this statement is July 20, when Professor Miller will return to begin planning the facilities.

2. The Works Department under Idrees Anjum must initiate efforts toward obtaining accurate site data, using several survey methods. The most accurate is the photogrammetic method using aerial survey photographs. Two ground surveys have already been done, one in 1975 and one in 1980, both not dependably accurate. The deadline for having this data available is August, 20.

3. It is recommended that the local office of Naqvi and Siddiqi be asked to continue their work for PARC by collaborating with ABRIS Ltd. in the MART supported project. Since they have established a satisfactory reputation with PARC, are local, and are recognized as the best available locally, this choice is logical and would expedite the process. They should be prepared to begin their collaboration by November, 1986.

4. The representative planning committee formally constituted for item #1 should be prepared to review planning and design proposals at various stages of the work, beginning in August and continuing intermittantly through January, 1987.

5. An Operation and Maintenance organization and system must be formally established with staff, budget, vehicles, and other

supporting facilities, beginning for fiscal year 1986-87. The Executive Engineer now in charge would be a good choice to head up the system. It would be wise to send him abroad for a three month training period to a place like the University of Illinois where a formal training course is available.

In conclusion, these administrative actions are critical to the timely implementatior of the development process that is to occur under the MART project.

H. James Miller

August 14, 1986

2

NARC/MART INTERIM REPORT (2.) H. James Miller, Architect, Planning Consultant
Assignment in Pakistan, July 24 - August 15, 1986

USAID-WINROCK Contract No. 391-0489-C-00-5055-00 MART

Objectives of Assignment

The major work of this assignment was directed toward launching a two track planning effort, to meet the physical planning and development goals of the MART project. Track one is the long range process of preparing a comprehensive master plan for NARC, of which physical development plans are an important part. Track two is intended to provide A&E services for the development of additional facilities for the Training Institute and an A.V. Media Unit at NARC.

Additional objectives of the assignment were to establish working relationships with the Winrock/MART Team, counterparts at NARC, and USAID project officers who will be involved in the process. Intermittent advice was also given to the Director of Works, PARC, regarding rectification of defects in NARC construction.

Summary of Work Accomplished

1. Virtually completed site and project familiarization through discussions, site inspections, collection of information from all sources, and photography.

2. Conducted and virtually completed a needs analysis (facilities programming) process for the Training Institute additions and A.V. Media Unit. This was done through a planning committee system, with specific assignments and questionnaires to key people who could provide the answers and required data. (see attached "Planning Future Facilities for NARC").

3. Was involved with USAID Engineering and the Director of Works, PARC in the review of tenders and selection of a company to conduct a survey for the 1400 acre Farm site. Provided guidelines for the nature of the survey and the final product.

4. Initiated a long range master planning process for NARC, focused initially upon needs for additional facilities and development of the farm. With Murray Dawson, the concept of "Master Planning" as a much larger task than just physical planning was communicated.

5. Prepared a Memo for Winrock entitled "Proposed Strategies and a Development Schedule for fulfilling ABRIS responsibilities as a Subcontractor under the MART Project" (See attached).

6. Worked intermittently with the PARC Department of Works, advising the Director and Executive Engineer in regard to rectification of defects and incomplete aspects of NARC buildings.

7. Prepared a memo for USAID Engineering regarding Scope of Work of ABRIS, Ltd., and guidelines for collaborative relationship to local architect for the A&E services at NARC. (See attached).

8. Gave verbal reports of progress of planning to the Chairman PARC, Director General NARC, Chief Agriculture Division USAID, Chief Engineering Division USAID, and Winrock Chief of Party.

During the assignment, three weekly meetings of the "NARC/MART Facilities

Planning Group" were held to guide the work of seven planning subcommittees. (Refer to attached paper" Planning Future Facilities for NARC)". Meetings of the subcommittees were also attended to provide as much assistance as possible. A series of meetings were held to select a site survey company. Meetings were held to report on progress of planning with the various division and agency leaders, listed below.

Key Individuals in Assignment Activities

PARC	Chairman, Dr. Amir Muhammed	Vision and advice
	Director of Works, Idrees Anjum	Effective Counterpart
NARC	Director Gen., Dr. Yousef Chowdhary	Guided Planning processes
	Deputy D.G., Dr. Rahman Khan	Convenor Subcommittee 4
	Info Transfer, Dr. Ali Chowdhary	" " 1B
	Training Institute, Dr. Khan Rana	" " 1A
	Plant Science Inst. Dr. Qasim Chatta	" " 2
	Animal Sci. Inst. Dr. Waheed Ahmed	" " 3
	Administrator, G.M. Shahid	" " 5
	Lab Support, Dr. Akmal Khan	" " 6
	Post Grad. School, Dr. Yousef Ch, D.G.	" " 7
USAID	Mr. Al Hankins, Chief ARD Division	
	Alex Sondermann, Chief Engineering Division	
	Harry Dickherber, ARD/MART Project Officer	
	Yousaf Said, Liaison Officer, Engineering	
WINROCK	Dr. Bill Wright, Chief of Party	
	Dr. Cordell Hatch, Advisor Information Transfer	
	Dr. Murray Dawson, Advisor Farming Systems	

Action Guidelines for NARC/MART Project

The following is a priority sequence of actions to be taken in the process of implementing the planning and design of expanded facilities at NARC, and preparation of a physical master plan:

1. As soon as site survey information becomes available, it is important that it be sent on to ABRIS, Architects in Urbana,

Illinois. Phase 1 of the survey is supposed to be ready by mid September. Contact Yousaf Said in Engineering and or Idrees Anjum, PARC Director Works.

2. The work of the NARC/MART Facilities Planning Group should be completed by early October. The assembled and approved package should be sent off to ABRIS by mid-October. Contact Murray Dawson and or D.G. Yousef Chowdhary.

3. Schematic Design drawings for the Training Institute Addition and A.V. Media Unit will be sent to Pakistan by mid-October for review, suggested refinements, and approval. Please return approved drawings by November 1 at the latest.

4. Liaison with USAID Engineering in the process of selecting a local Architect. It will be important for ABRIS and the local Architect to reach an understanding of their working relationship in the project.

5. Begin to identify short term consultants that will be needed to advise ABRIS in the following areas:

   a. Research Farm Land use that would be commensurate with the overall research thrust of NARC.
   b. Rationale for comprehensive design and distribution of research laboratories to conduct the kind of effective research needed by Pakistan.
   c. Possible specialists in subsoil analysis, hydraulics engineering and other areas to advise in master planning the whole farm.

29 JULY 1986

NARC/MART PLANNING FUTURE FACILITIES FOR NARC H. James Miller ABRIS/WINROCK

The first general planning meeting was convened by D.G. NARC, Dr. M. Yousef Choudhery, in the NARC Executive Committee room at 3. p.m. Monday, July 28. The purpose of the meeting was to initiate an intense planning effort by seven planning sub-committees that were constituted previously. Chaired by Dr. Choudhery, the meeting discussions were directed toward a review of various proposals for additional seriously needed facilities for NARC. Most time and attention was focused upon specific Training Center and Communication facilities that are to be financed under the MART project.

In a very general sense the needs for additional facilities are known, but ambiguities and differences of opinion about the nature and location of new facilities were illuminated in the "brainstorming" session. For example, the proposed combination of Training Center facilities and "media" or communications facilities in one building was seen as impractical for various reasons, and inadequate.

It was decided that planning would proceed on two parallel tracks. Obviously, long range planning for a Master Plan will take some time, but the process should begin now. Because of the short range urgent need for additional training facilities, efforts will also be focused upon planning for these first phase facilities without waiting for the completion of the long range Master Plan.

The following planning subcommittees were constituted with a charge to meet as often as twice per week, in order to move the process along. The conveners of each subcommittee constitute the main committee, which will have its second meeting Monday, August 4, at 2:30 p.m. in the NARC Executive Conference room.

1. TRAINING AND COMMUNICATIONS
   Convenor - Dr. Anwar Ali Choudhery, Director S.I.U.

2. CROP SCIENCE OFFICE, LAB AND FIELD FACILITIES

Convenor - Dr. M. Qasim Chatta, Director P.S.I.

3. ANIMAL SCIENCE OFFICE, LAB AND FIELD FACILITIES

Convenor - Dr. Waheed Ahmad, Director A.S.I.

4. RECREATION & COMMON FACILITIES

Convenor - Dr. A. Rahman Khan, Deputy Director General

5. SUPPORT SERVICES

Convenor - G.W. Shahid, Administrator, Director FO&S.

6. LAB FACILITIES

Convenor - Dr. M. Akwal Khan, C.S.O. Central Labs

7. POST GRADUATE SCHOOL

Convenor - Dr. M. Yousef Choudhery, NARC Director General

It was recommended that it may be desirable to divide the first subcommittee into two parts since the guidelines of this committee are essential in the short range for the first priority buildings under the MART project. Suggested division below:

Subcommittee 1(a) TRAINING FACILITY ADDITIONS - DR. M.S. Khan Rana, Convenor

1(B) INFORMATION PRODUCTION AND TRAINING - Dr. Anwar Ali Chaudhery, Convenor

The Winrock specialists of the MART project are available as important resources for assistance to the committees.

The target for finalizing a statement of requirements for Training Center and Communications facilities is August 14. The work of other Committees should proceed as rapidly as possible but would require more time. A goal of mid October should be established for having the results of the committees' work available for review, and initiation of Master Plan studies and proposals.

To assist the various planning subcommittees with their work, the following guidelines and questions are provided, in addition to the instructions and room description forms given at the first general committee meeting:

NARC/MART FACILITIES PLANNING GROUP-SUBCOMMITTEE 1(A)

TRAINING CENTER FACILITY ADDITIONS: Dr. M.S. Khan Rana, Convenor

1A

Information needed:

1. Provide a one page overview statement of the purpose and objectives of the Training Center at NARC, now and as proposed for the future.

2. Provide an outline of the programs provided by the Training Center over the past one year with titles, dates, number of participants both non resident and resident, (in hostels provided) and identity the origins of participants. (Constituency of Training Center)

3. Explain how the training programs (and conferences) were accommodated, indicating any specific handicaps due to limited facilities.

4. Is there an optimum size for training sessions and programs? Please indicate total number of participants, size of sessions, number of sessions, frequency, and staffing requirements.

5. Is it foreseen that NARC would develop programs and invite participation on the basis of optimum standards for training? This would clearly be a great advantage in knowing how to design optimally sized facilities that would serve NARC well into the future.

6. What then are specific facilities needed in an expanded Training Center? (use room prescription forms to describe every building space required).

7. List facilities needed for Training Center

Classrooms	No.	Type	Sizes
Laboratories	"	"	"
Offices	"	"	"
Support spaces	"	"	"
Hostels	"	"	"
Cafeteria	"	"	"
Other	"	"	"

(Key the room prescription forms to the above list).

9. Indicate any known ideal models for the type of facilities needed.

10. Indicate any other requirements such as car or bus parking, service access, or special needs that would be helpful to the architects who must design the facilities.

NARC/MART FACILITIES PLANNING GROUP SUBCOMMITTEE 1(B)

INFORMATION PRODUCTION AND TRANSFER: Dr. Ali Anwar Chowdhery, Convenor

1B

Information needed:

1. Provide a one page overview statement of the purpose and objectives of the information production and transfer unit at NARC, now and as proposed for the future.

2. Provide an outline of the various functional divisions of this unit as operated during the past year, and as anticipated for the future. Indicate services performed by each division, the institutions and people served.

3. Explain how the various functions were supported by existing facilities at NARC, indicating specific handicaps due to limited facilities.

4. Is there sufficient experience in information production and transfer at NARC, so that optimum facility needs could be described at this time? Is it necessary that this be an expandable facility?

5. What specific additional facilities are now needed at NARC to support this information or "Communication Unit". (Use "room prescription" forms to describe every building space required).

6. Where is the optimum location for this unit? Suggest alternative locations and compare advantages and disadvantages.

7. Indicate any known ideal model for the type of facilities needed.

8. Indicate any other needs or requirements or advice that would be helpful to the Architects that is not covered in the above information.

NARC/MART FACILITIES PLANNING GROUP - SUBCOMMITTEE 2

CROP SCIENCE OFFICE LAB AND FIELD FACILITIES: Dr. M. Qasim Chatta, Convenor

2

Information needed

1. Provide a one page overview statement of the purpose and objectives of the Plant Sciences Institute, the Farm Machinery Institute and all other aspects of the Crop Farm Center. (is this the correct name for this field facility group)?

2. Explain how this center of activities relates to the main Research Complex and indicate ways in which they are mutually supportive.

3. Describe how this center utilizes the research farm around it. How much area is now in intensive use? (Provide maps).

4. Indicate how well the necessary activities of the farm center complex are supported by the facilities now available. Also explain if there are any handicaps due to lack of facilities.

5. What specific facilities are still needed for the Crop Farm Center? (use "room prescription" form to provide every building space required).

6. List additional facilities needed, if any:

	No.	Type	Size
Crops processing storage?	"	"	"
Field Laboratories?	"	"	"
Field Offices?	"	"	"
Machinery Sheds?	"	"	"
Operation and Maintenance?	"	"	"
Field facilities	"	"	"
Other including plots?	"	"	"

7. Indicate any known ideal models for the type of facilities needed.

8. Provide any other requirements or advice that would be helpful to the architects who must design the facilities.

NARC/MART FACILITIES PLANNING GROUP - SUBCOMMITTEE 3

ANIMAL SCIENCE OFFICE, LAB, AND FIELD FACILITIES - Dr. Waheed Ahmad, Convenor

3

Information Needed:

1. Provide a one page overview statement of the purpose and objectives of the Animal Sciences Institute and all other institutional aspects of the Animal Farm Center that is to be developed at NARC.

2. Explain how this center of activities is to relate to the main Research Complex and indicate ways in which they would be mutually supportive.

3. How are the existing Dairy Farm facilities on Park Road related to the ASI? What other existing facilities at NARC are part of ASI, and what is their purpose and use?

4. Provide copies of the comprehensive plan of the proposed ASI Farm Center, the building plans and the land requirements. These are to be used in developing a comprehensive Master Plan for the whole NARC.

5. Do the plans now developed for the Farm Center represent the long range needs of the ASI? If not, what additional facilities would be needed? (Give specific requirements on "room prescription" forms provided).

6. Indicate an ideal model for facilities that are being proposed for the ASI.

7. Provide any other requirements or advice that would be helpful to architects preparing the Master Plan.

NARC/MART FACILITIES PLANNING GROUP - SUBCOMMITTEE 4

RECREATION AND COMMON FACILITIES - Dr. A. Rahman Khan, Convenor

4

Information Needed

1. Provide a one page overview statement of the purpose and objectives of recreation and common facilities to be developed for NARC.

2. Define "common facilities" and indicate what groups and numbers of people will be using the facilities.

3. List specific recreational and common facilities that are needed, and indicate priority of need.

4. Indicate if there are optimum numbers and capacities for the facilities, or will the facilities need to be expandable? Explain.

5. How would these facilities be operated and maintained? Who would manage them?

6. Indicate desirable locations for recreational and common facilities. Suggest alternative locations, with relative merits of each alternative.

7. Provide specific requirements for common facilities utilizing "room prescription" forms to describe every building space required.

8. Indicate any known ideal model for the type of facilities envisioned.

9. Indicate any other requirements or advice that would be helpful to the architects who must design the facilities.

NARC/MART FACILITIES PLANNING GROUP - SUBCOMMITTEE 5

SUPPORT SERVICES - G.N. Shahid, Convenor

5

Information Needed:

1. Provide a one page overview statement of the purpose and objectives of "Administration", the support services aspect of NARC.

2. Provide an administrative chart illustrating the organization of NARC, and the position of support services now, and as proposed for the future.

3. Describe the functions of each support service division and indicate current and proposed staffing patterns.

4. Describe how and where existing support services are accommodated, and indicate any specific handicaps due to limited facilities.

5. What specific facilities are required for support services to be fully and efficiently operational. (Use "room prescription" forms to describe every building space required).

6. Indicate desirable locations for support service facilities. Suggest alternative locations, with relative merit of each alternative.

7. Indicate any ideal models for the type of facilities required.

8. Provide any other requirements or advice that would be helpful to the architects who must design the facilities.

NARC/MART FACILITIES PLANNING GROUP - SUBCOMMITTEE 6

LAB FACILITIES - Dr. M. Akmal Khan, Convenor

6

Information Needed:

1. Provide a one page overview statement of the purpose and uses of laboratory facilities at NARC.

2. Provide a comprehensive listing of the various divisions of research requiring laboratory support, and the desirable relationships, linkages and mutualties of each division.

3. Are laboratories at NARC organized on the basis of the functions they perform, or on the basis of the disciplines they serve? Are they to be designed and organized on the latest patterns of the best research institutions or on the old traditional patterns? Provide a rationale for their use.

4. Considering that one or two more blocks of laboratories can be provided, what are the long range needs for additional laboratories? Provide specific requirements utilizing the "room prescription" forms to describe every building space necessary.

5. Indicate ideal models for the type and organization of facilities required.

6. Provide any other requirements or advice that would be helpful to the architect who must design the facilities.

NARC/MART FACILITIES PLANNING GROUP - SUBCOMMITTEE 7

POST GRADUATE SCHOOL. Director General, Dr. Yousef Choudhary, Convenor

7

Information Needed:

1. Provide an overview statement of the purpose and objectives of a post graduate school at NARC. Why is this so important in view of the University System already in existence?

2. What types of study activities would be required in this post graduate school? Courses? Supervised research? Use of Library? Field activities?

3. Indicate numbers of students proposed to begin and the probable batch sizes in the foreseable future.

4. Indicate probable staff requirements in addition to the existing staff.

5. Provide specific requirements for facilities beyond those necessary for the Training Center and the Research Complex for the post graduate school. Classrooms? Laboratories? Hostels? Other?

6. Indicate desirable locations for post graduate facilities. Suggest alternative locations, giving relative marks of each alternative.

7. Indicate any known ideal model for a post graduate institute operating as part of a national research center.

8. Provide any other requirements or advice that could be helpful to the architect who must design the facilities.

MEMO August 4, 1986

TO : Bill Wright, Chief, Winrock/MART, Islamabad

FROM : H. James Miller, Architect/Planner H James Miller

SUBJECT: Proposed Strategies and Development Schedule for fulfilling ABRIS responsibilities as a Subcontractor to Winrock for the MART Project

Though what is now foreseen can change, the following is an outline of how I propose our work to unfold over the next year in some detail. Beyond that it is not possible to predict.. Attached is a schedule summarizing the various aspects of the work with suggested target dates.

As indicated in our first planning meeting at NARC on July 28, we will be proceeding on two parallel tracks in response to what is implied in the RFP, and the Winrock Technical Proposal for MART.

Track One: Major emphasis is placed upon the preparation of a "comprehensive long range MASTER PLAN for the NARC." In fact it is referred to as the "first task" (RFP P-C-18). I interpret that to mean no delay in getting started, since development of the envisioned full blown Master Plan may require one to two years or even longer.

Track Two: Meanwhile, considerable emphasis is also placed upon the urgent short range need for additional Training Institute facilities and an Audio Visual Media Unit. Since the sites for these facilities have been virtually already been designated, it is not necessary to delay the process of designing them. They could be ready for use within the next two years if planning begins now. Therefore, this one month assignment is directed toward providing A&E services for the first three project aspects of the list of eleven on P-97 of Winrock's Technical Proposal for MART. They are as follows:

1. Site and Project Familiarization (Reconnaissance)

This work was initiated during the two week assignment in June, through discussions, site visits, photography, and check measurements. Specific assignments and requests were made at that time to NARC and USAID officials to assist in obtaining information.
Follow up familiarization continued during early July at the ABRIS home office reviewing available drawings, preparing working guidelines and plan diagrams based upon current understanding.

During this July-August assignment the following is in process:

G.N. Shahid, Administrator and Farm Manager, has agreed to provide a set of the Farm development drawings prepared during Don Minehart's tenure. Idrees Anjum will be providing drawings of roads, irrigation canals, and buildings that were designed by ZCL Engineers, and Naqvi and Siddique, Architects. This information will be used to cross check the accuracy of survey data, and to provide as complete information as possible. It remains to be seen what missing information may still be needed.

A photographic reconnaissance will supplement the above.

2. Needs Analysis (Facilities programming)

The Facilities Planning Group that was constituted by D.G. Yousaf Choudhary, is meeting weekly to initiate the process of needs analysis. The seven planning Subcommittees are charged with preparing requirements for each physical aspect of NARC. The conveners of each of the subcommittees plus other key individuals make up the main planning committee.

In response to concern about direction for the planning effort, I prepared a set of guidelines and questions for each subcommittee. A target of August 14 was set for completing the major work of Subcommittees 1A and 1B. This is important so that necessary requirements for the Training Institute and A.V. Media Unit can be functional for ABRIS to proceed with the design of the facilities in the next two or three months.

The work of other committees can continue for another month or two as may be required. This is to recommend that Murray Dawson, in concert with D.G. Yousaf Chowdhary, keep this process in motion until the job is done. They will need to complete the information, review it, refine it and finally approve it before sending it on to us. We must have all of it in preparing our preliminary master plan proposals.

3. Obtaining Accurate Survey Data Existing Situation

A local professional survey team is to be selected during the next week to begin the task of surveying the whole 1400 acre NARC farm. They will be asked to complete the task within two months. I have given instructions as to what is required and have suggested that the work be sequenced so we can have a survey of the area containing the main buildings within a month. Yousaf Said of USAID Engineering, and Idrees Anjum, Director of Works, PARC will be monitoring this effort. I have been assured that the work can be accurate. This data is of course the single most important requirement for us to be able to proceed with physical master planning for the whole farm. As soon as the topographical survey is available, I have asked that it be sent as expeditiously as possible to our office in Urbana so we can initiate preparation of site basemaps, recording the current configuration, and including all available data.

Master Planning Process

The "Comprehensive Long Range (10 year) MASTER PLAN for NARC" is dependent upon a a much broader and lengthier process than what has been initiated in the first two weeks. Planning for institutional development requires three major interdependent aspects:

Academic or Functional Planning
Physical Planning
Financial Planning

Theoretically, physical planning would not be initiated until the academic aspects were all delineated, clarifying the specific

requirements to support the organization, programs, and personnel of NARC. It is feasible to begin physical planning now, only because the institution is already operational, and there are clearly some immediate facility needs that can be readily defined. However, before a comprehensive physical plan can be finalized, the other aspects must be completed. Financial planning will either provide guidelines for comensurate resource requirements, or will establish constraints upon the implementation of academic and physical plans.

Our interest then is to proceed parallel with other aspects of planning being guided by the Winrock MART team, always being careful not to get ahead of the more important academic planning imperatives.

An outline of the sequence of actions in the master planning process is suggested below:

August 86 Initiate master planning process in all of its three aspects. Murray Dawson can expedite work at NARC. Miller to be actively in communication through Winrock, Arkansas and will interface in Islamabad, as allowed by the contract.

Collect requirements for short range facility needs. (Training Institute expansion and Media Unit): Obtain USAID concurrence in changes to Project Paper program guidelines, and ABRIS responsibilities.

Commission local survey company to proceed with topographical survey of whole 1400 acre farm site.

Collect all extant NARC farm site data to take back to Urbana.

Complete on ground photo reconnaissance.

Select local architect for collaboration with ABRIS (This may or may not be possible at this time under USAID rules)

Oct. 1986 All seven Subcommittees of the Facilities Planning Group should have completed their work in answer to the questions and guidelines provided them. The information should be reviewed, refined, approved, and compiled and sent on to ABRIS in Illinois.

The first stage of the site surveyor's work should be ready and sent on to Illinois. Meanwhile, the Schematic plans for the Training Institute and Media Center would be sent from Urbana to Islamabad for review and comments.

Nov. 86 The remaining site survey work should be complete and sent on to Illinois

If not earlier, the local architect should have been selected, and collaboration details worked out with ABRIS.

The Schematic Plans for the IT and MU should have been approved and sent back to Illinois, with comments, so that

design development work can proceed.
Based upon survey drawings and other data, site basemaps would be prepared in preparation for proceeding with the physical master plan of the whole NARC farm.

Jan. 1987 Design development drawings for IT and MU, Farm basemaps and proposed master plan alternatives would be delivered to Pakistan and formally presented for review and approvals.

Design development drawings would be transferred to the local architect for them to proceed with working drawings and specifications.

Alternatives would be selected as a basis for proceeding with master planning the building areas of NARC. Detailed discussions about farmland requirements would be directed toward long range development.

May 1987 Working drawings should be completed by the local Architect for the Training Institute and Media Unit, ready for review and approvals. Tenders could be prepared and called for as soon as plans are approved.

June 1987 Construction could begin on the new Training Institute and Media Unit facilities.

By this time a decision should be reached as to what agency will finance additional facilities that are seen as short range needs, such as Cafeteria, Hostel, Operation and Maintenance Center, VIP housing etc.
Another decision is needed as to what A&E agency would be responsible for the design of these facilities. A wise procedure would be for the MART project to finance the A&E services, so facility design could proceed parallel with master planning. That would expedite the development process, and would provide clear projects for donor agencies to pick up.

An expatriate Farm Development Engineer will be required as a short term consultant from Winrock to work with ABRIS in delineating the long range land use development of the farm.

By this time, perhaps a first draft of the "Comprehensive Long Range Plan Master Plan " should be initiated to pull together all of the work that has been done, raising questions and identifying gaps still remaining

Aug. 1987 Final drawings of the proposed physical master plan could be ready at this time for review in Islamabad. They should be formally presented, reviewed, discussed by PARC and USAID officials to make certain there is full agreement. If there are still uncertainties due to incompletion of any academic aspects of the larger master planning process, final documentation can await those decisions.

It is impossible at this time to speculate how the project

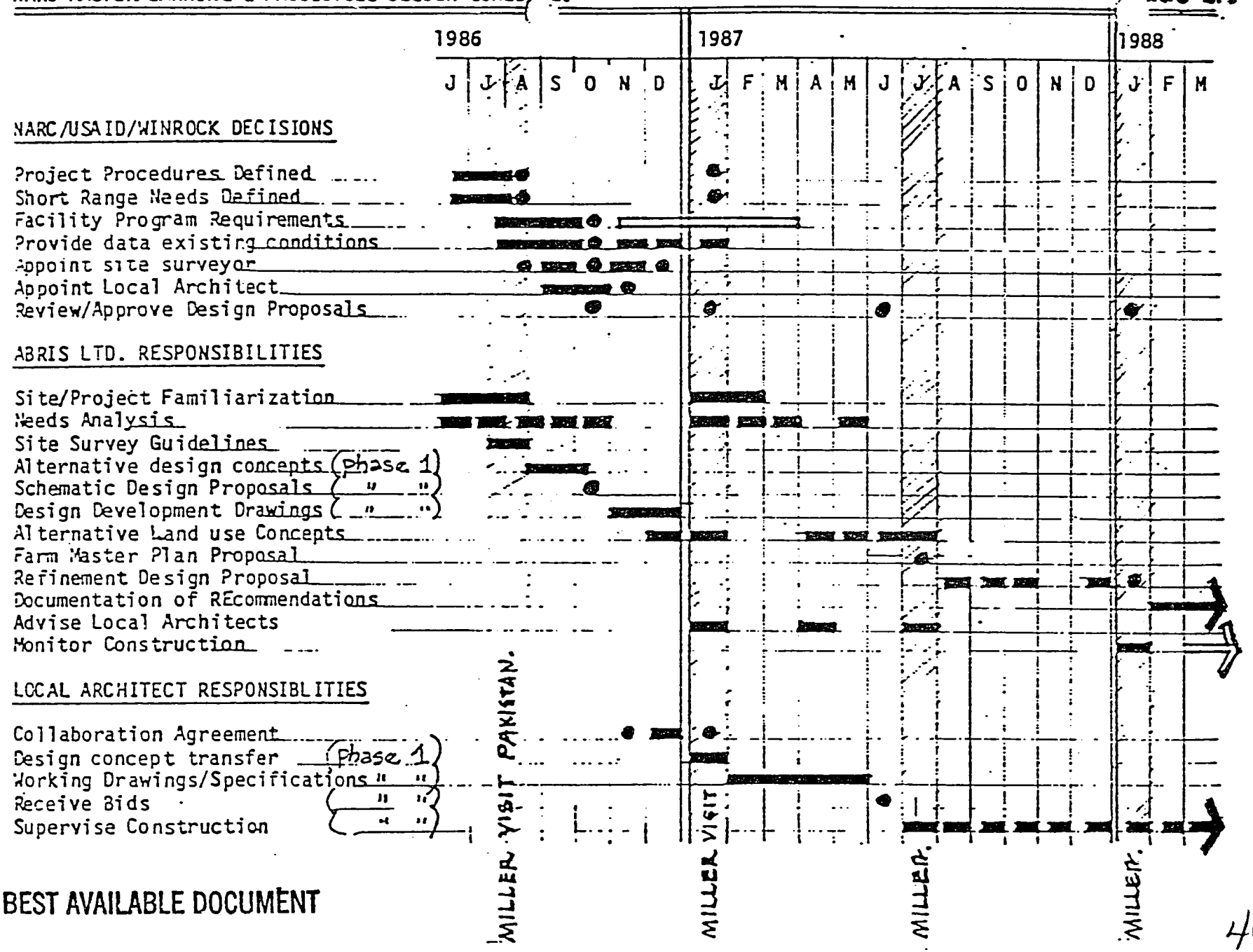
will unfold after August 1987. The RFP calls for ABRIS Ltd. to respond "as may be required" during the development process.

"As may be required", could include additional responsibility for design of facilities, advice to the local architects, review and approval of their work, intermittant monitoring of construction, as may be requested by USAID or PARC.

observations:

NARC MASTERPLANNING & FACILITIES DESIGN SCHEDULE.

ABRIS LTD



August 13, 1986

MEMO

TO: Alex Sundermann, Chief, O/ENG, USAID/Islamabad

FROM: H. James Miller, Architect, Planner

SUBJECT: Collaboration between ABRIS Ltd., Architects and Planners, and Local Pakistani A&E Firm

By November, 1986 at the latest, it would be well to have identified and selected a local A&E firm to collaborate with ABRIS Ltd. for the Training Institute and Audio Visual Media facility at NARC.

ABRIS Ltd. will be responsible for preparation of building schematic design, and design development services for the facilities. Floor plan drawing and elevations, and building cross sections would be transferred to the local architects in the form of sepia reproductions of ink mylar drawings. These drawings can be directly converted into working drawings by the local architects.

The project will be approximately 27,000 ft2 in gross floor area, estimated to cost Rs.400 per ft2 or roughly Rs.11,000,000. The standard breakdown in fees would be 35% of total fee for design development, 65% for working drawings and project supervision. The 65% would be a good fee for the local architect. Because building costs are higher in the U.S., the 35% is not the right basis for calculating the design fees. Using a probable cost of $80/ft2 for this type facility in the U.S., the total cost there would be $2,160,000. A modest total A&E fee of 7% would amount to $150,000. Design fees of 35% would amount to $52,500. ABRIS is committed to work within the project agreement to provide the necessary service.

The following would be provided to the Local Architect:

1. Site plan @ 1/16" = 1'-0"
2. Ground and first floor plans @ 1/8" = 1'-0"
3. Four building elevations @ 1/8" = 1'-0"
4. Building detail cross section @ 1/2" = 1'-0"
5. Concept overlays for the following:
   - -Furniture and equipment layouts
   - -Mechanical system layouts
   - -Lighting and electrical layouts
   - -Landscape design

The target for completion of design development drawings is January, 1987. They would be reviewed, approved and transferred to the local architect at that time.

Purpose:- TO FINALIZE SELECTION OF A FIRM FOR TOPOGRAPHICAL SURVEY OF N.A.R.C FROM THE SHORT-LISTED FIRMS:-

Professor James Miller, M.Idrees Anjum, and Yousaf Saeed visited the offices of the following firms in Rawalpindi on 5th August, 1986:-

Pakistan Surveys(Private) LTD.

United Survey Corporation.

The first rated firm

Engineering Consultants(EC) of Karachi was requested to send their technical representative to meet with the appraisal Committee. Mr. Sheikh Ejaz Ahmed represented EC on 13/08/1986.

The Committee examined drawings prepared by each firm, and discussed proposed methods for conducting the survey In the case of the Rawalpindi firms, surveying instruments/ tools in possession of the offices were also examined. The Committee discussed the change in the scope of work desired, i.e from a contour interval of 1 meter to an interval of 1 foot, and the corresponding effect on cost.

The Committee's conclusions were as follows:-

Engineering Consultants were rated first. Their proposal was better than other proposals. They were willing to complete additional work in the same cost. Hence, it is recommended that the work be awarded to Engineering Consultants.

Mr. Sheikh Ejaz Ahmed of EC was asked to supply a cost breakdown of the proposal, which he promised to do on the 1st working day after Eid Holidays.

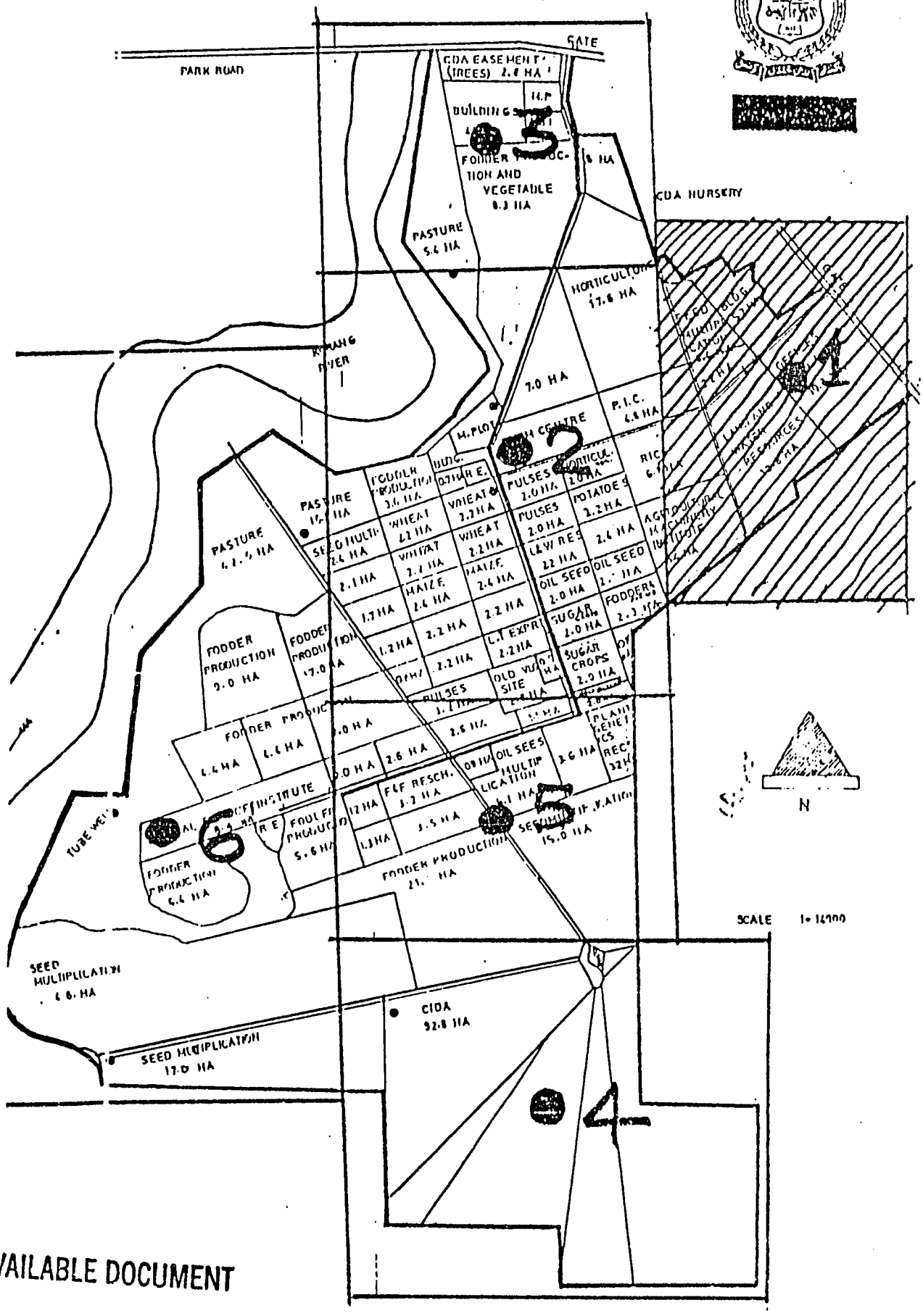
H. James Miller

Professor H. James Miller,
Architect,
M/S. Winrock, America.

Mr. Yousaf Saeed
Project Engineer
Engineering-office,
USAID, ISLAMABAD:

NATIONAL AGRICULTURAL RESEARCH CENTRE. ISLAMABAD.

LAND USE.



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NARC MANUAL

3

NARC MASTER PLANNING REPORT • H. JAMES MILLER

ASSIGNMENT ISLAMABAD, PAKISTAN USAID · WINROCK · ABRLS.

January 18, 1987

NARC/MART INTERIM REPORT (3) H. JAMES MILLER, Architect, Planning Consultant

3

Assignment in Pakistan, January 5-19, 1987

USAID-WINROCK Contract No. 391-0489-C-00-5055-00 MART

Objectives of Assignment

The work of this assignment was focused toward three major objectives:

1. Continue the process of designing a new AV Com/Training Center for NARC and obtain final approval of the schematic design proposal.

2. Continue the process of obtaining data for the long range master plan for the NARC research station. Collect copies of topographical survey work just completed for the 1200 acre farm.

3. Begin collaboration with a local Architectural/Engineering firm for the AVCTC facilities, particularly the local mechanical engineering consultant, to reach agreement upon building systems.

Activities

A lengthy debate and evolution of thinking regarding the required additional facilities for the Training Institute has caused a delay in finalizing preliminary plans for the proposed AV Com/Training Institute building. Much of the assignment was devoted to preparing and discussing alternative plans, including possible separation of the two functions into two separate buildings on different sites.

Considerable time was spent with appropriate Pakistan and U.S.A. specialists in discussing detailed requirements for air conditioning, lighting, equipment and furniture needs for the new AVCTC. This information will be utilized in finalizing the design development drawings for the building.

Considerable time with a PARC review committee was devoted to reviewing proposals from 23 local A & E firms. A ranking of the firms was provided to PARC and USAID for selection. A multi-page scope of work for the local A & E was reviewed jointly with USAID engineering to be used in negotiating a contract.

Time was also spent with another PARC committee reviewing credentials submitted by 17 building contractors. This was to establish pre-qualification of a short list of contractors to invite for tendering the AV Comm/Training Center.

Three formal meetings of the NARC/MART Facilities Planning Group were convened to consider the design proposals, to review alternatives, and finally to approve the schematic design for a new combined AV Comm/ Training Center facility. In the same meetings subcommittees of the planning group reported their recommendations for other additional facilities. Siting alternatives for the additional buildings were discussed to reach a concensus for a physical master plan of the main research complex, and the crops farm center complex.

Advice was provided relative to proposed modifications to the NARC Administration Building and other concerns somewhat peripheral to the MART project.

Key individuals participating in the work described were the same as during the August assignment, except D.G. Abdus Salam Akhtar replaced Dr. Yousaf Choudhry. Also Dr. Ted Buila has been added to the MART team (see last report 2).

Action taken and decisions reached since the last assignment;

1. Though delayed by three to four months later than scheduled, the topographical survey for the whole farm is virtually complete. The first three phases have been completed and delivered, and the first phase plan facilitated much of the work of this

assignment. Providing detail maps at 1:500 scale with 1'.0" contour intervals, the survey appears to be an accurate record of the farm and will be the basis for preparation of base maps for the master planning process to follow.

2. From a group of 23 A & E firms submitting proposals to provide working drawings and specifications for the AVCTC, a short list was prepared for final selection. Most of the firms were predominantly engineering companies without experienced architectural leadership. Six firms submitted good proposals, out of which only three were legitimate architectural companys. One local firm, Naqvie and Siddique were clearly the best choice, being the only locally based firm of the group, with the kind of qualifications and experience being sought. Also, they have a good record of performance with PARC.

3. From a group of 17 building contractors responding to an advertisement for pre-qualification, eight or nine are being short listed and will be those invited to tender for the AVCTC project when the contract documents are ready.

4. The expanded training facilities will generate more people than can be accommodated by the existing cafeteria and hostels. Though already too small, there is no appropriate way to enlarge the cafeteria on its present site. Therefore it was decided by the NARC planning group that a new cafeteria should be designed at the south end of the hostel row, combining it with a community space, club, and visiting scientists' quarters. The existing cafeteria can continue to function as a place for tea service, and VIP lunches. Other uses are also possible.

5. Proposed sites for the following facilities at the main center were also reviewed and approved by the NARC Planning Group:

(a) Additional hostels
(b) Bank and post office
(c) Mosque
(d) Volley ball and tennis courts
(e) Access roads and parking
(f) Walkway system

6. Proposed sites for the following facilities at the Farm Center were reviewed and approved by the NARC Planning Group:
   (a) Operations and Maintenance Center
   (b) Security Office
   (c) Transportation Center and Vehicle Storage and Maintenance
   (d) Warehouse Addition
   (e) Seed processing and storage expansion.
   (f) Equipment storage expansion
   (g) Plant Sciences Institute
   (h) Field Cafeteria
   (i) Field Huts

It was also decided that post graduate study programs at NARC would be less ambitious than previously anticipated, and that hostel/cafeteria space for a maximum of thirty students at one time would meet the needs for this service activity.

It was decided that storage of vehicles should occur at the Farm Center instead of taking valuable parking space at the Main Complex.

Because the new Animal Science Institute is still under construction, no planning has been done for location of proposed additional facilities for that area of the Farm. Also, no information has been provided regarding the need for expanding staff housing at NARC.

Of most serious consequence to the planning process is the fact that master planning of NARC research programs in the context of a national plan is lagging. Until there is a clear understanding of how the Farm

needs to be developed further, to optimally support the research programs, it is not possible to prepare a physical master plan for farm development.

Physical master plans for the various building centers will proceed based upon current knowledge and decisions taken about specific sites for buildings. The complete farm master plan must wait for the more important programmatic master plan.

Action Guidelines for NARC/MART Project.

The following is a priority sequence of decisions and actions to be taken in the process of implementing the planning and design of expanded facilities at NARC, and preparation of a physical master plan for the whole Farm.

1. An agreement must be signed with the selected local architect, so collaboration can proceed toward completion of working drawings for the AVCTC. Design development drawings should be ready to mail to Pakistan by late March or early April. Working drawings and specifications should be completed by the local Architect sometime in July. Tendering for construction could occur in September.

2. All remaining survey drawings, including the 1:5000 map of the whole farm, should be mailed to ABRIS as early as possible so basemap preparation of the whole site can proceed without further delay.

3. A decision should be reached between NARC and USAID regarding the funding of additional facilities under the MART project. It is recommended that USAID fully fund the AVCTC as intended, and that all additional funds be allocated to construction of a new cafeteria/community center/visiting scientist quarters complex. All other anticipated facilities must be funded from othersources.

(See memo to Bill Wright dated January 15, 1986 appended to this report).

4. Critical to successful implementation of the proposed road system for the master plan is the agreement to provide additional land for the village graveyard. It is essential that a 50' wide strip of land be retained between the NARC property line and the additional land being taken so that the proposed secondary farm access road can pass through as planned from the very beginning in 1980. Any compromise will cause a long range permanent handicap to the functioning of the completed Research Station. The needs of the villagers for access to the graveyard can easily be accommodated without taking away this essential entrance to the Farm.

5. Though the needs for various facilities at the Farm Center have been identified, and sites have been selected, it is obvious that more depth of thinking is required. The floor areas provided for operations and maintenance, and for the warehouse addition seem too low. On the other hand the proposed addition of seed storage and processing facilities should be conditioned upon better utilization of the existing facilities, which appear to be poorly managed.

6. If it is important to expand the senior staff housing, the only appropriate site would be to expand into the underutilized area of CDA nursery at a higher elevation directly north of the existing colony. That would require another land trade with CDA. Master planning for that area cannot proceed until some decision is taken.

7. Though information has been provided regarding the needs for additional facilities for the Animal Sciences Institute, there is insufficient qualitative research basis for the requests. It is unclear how the facilities are used and will be utilized to support viable research programs. There are no guidelines regarding land needs to support the programs. Considerably more programmatic planning

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is necessary before a good physical master plan can be prepared. The numbers of animals for quality research work seems extravagent, when compared to other similar research stations.

8. Master planning is a complex, time consuming, and very demanding exercise. To prepare such a plan requires that already busy people must give extra time to a task that is somewhat separate from other job responsibilities. It is highly probable that the task may not be accomplished without some catalytic action. As has been done in similar situations it is recommended that a team of international specialists be commissioned with the specific task of producing programmatic plans for NARC. An experiment station director, a farm development engineer and a research laboratory specialist should team with the physical planner to pull loose ends together and produce a comprehensive plan.

Until this is done, it would be impossible to produce a physical master plan that is appropriate to the real long range needs of the National Agricultural Research Center.

January 15, 1987

MEMO TO : Bill Wright, Chief, Winrock/MART

FROM : H. James Miller, Architect/Planner H. James Miller

SUBJECT: Update on Strategies and Development Schedule for fulfilling ABRIS responsibilities under the MART project. (Reference benchmark memo dated August 4, 1986).

The major purpose of this memo is to compare the actual progress of fulfillment of ABRIS responsibilities in the MART project against expectations of the project framework, and as we anticipated in our original proposal to Winrock. Also, it is important this time to call attention to several factors that were either unanticipated in the original project paper or have become at variance with it; and to recommend modification actions.

Progress of planning

The project paper anticipated that we would devote up to five months in the first year of the project to conduct a comprehensive analysis of the existing NARC campus and to work with the MART team in programming future needs of the center to provide a basis for a "civil works" (physical) master plan. At the same time we were to program needs for proposed building additions funded under the MART project and provide "conceptual" designs for use of a local architect in preparing working drawings. Particular emphasis was given to the importance of expediting the design of an AV Com/training center facility (AVCTC).

Our proposal to Winrock anticipated a masterplanning teamwork "blitz" to occur during the summer months of 1986, at the beginning of the project, to compile the programmatic and physical data necessary to begin the physical master planning process. Our proposal also anticipated working rapidly toward providing design proposals for the first new building addition under the project. The following unanticipated factors have caused the work of ABRIS to be considerably extended:

1. PARC/NARC officials have yet to do their homework in establishing NARC research objectives in the context of a national plan. Until this is done, a comprehensive outline of research programs to be supported by NARC is not available making it virtually impossible to prepare a programmed master plan for NARC. A civil works (physical) master plan is wholly dependent upon this more important programmatic master plan.

2. It has taken 6 months to obtain a topographical survey of the farm and facilities to provide the possibility of preparing an accurate basemap of the station. (Promised to be completed now by the end of January).

3. It has taken 6 months to select a local architect to enable collaboration to begin on the first facility.

4. Controversy among NARC/USAID/MART planners has caused a two month delay in the process of planning the AVCTC. Approval of the ABRIS schematic design proposal expected in November has only now been obtained.

The design schedule prepared in August (updated copy attached) partially anticipated the delays, but depended upon the farm survey being available in September 1986, and appointment of local architect in November. It also anticipated vigorous planning efforts toward a programmatic master plan and approval of schematic design proposals for the AVCTC in November. The implications of the delays as they affect the planning schedule are as follows:

1. The design development drawings for the AV Comm/Training Center should be ready to transfer to the local architect to begin working drawings by late March or early April. Working drawings and other contract documents should be ready for tendering by late July or early August. The building should be ready for occupancy as early as September or October of 1988, but December 1988 may be more realistic, because of inevitable delays.

2. Master planning is a complex, time consuming, and very demanding exercise, somewhat separate from other responsibilities of PARC/NARC officials, therefore, it is probable the needed effort would not occur without some catalytic action. (Suggested from past experience) It will be necessary to provide a team of expatriate planning specialists assigned the specific task of assisting PARC/NARC officials in preparing a programmatic plan. Until this is scheduled it is impossible to predict when the civil works master planning process can proceed, let alone be completed.

Variances from Project Framework

The project places a strong priority upon planning for an AV Comm/Training Center facility. The approved schematic design plan for the AVCTC provides the same total floor area of 22,000 ft^2 as prescribed, though the Training Center needs were overestimated, while the AV Com needs were underestimated. The budget for the construction is probably adequate for the civil work, but is insufficient for a required fully airconditioned building. It is now apparent that more than half of the facilities budget in the MART project must go to this building.

Even though other facilities in the MART project have been considered of lower priority, nevertheless completion of the AVCTC will require a cafeteria that is adequate to serve training participants plus the resident NARC staff. The existing cafeteria will be woefully inadequate. Additional hostel accommodation is also important, but is of a lesser priority than the cafeteria. The MART project provides for small increments of space for a cafeteria, community space, a hostel, visiting scientist quarters, and covered parking. The budgeted provisions were originally too small, and are now further reduced by the required cost of the AVCTC.

The scope of work of ABRIS has been affected in several ways causing concern about completing the project within their budget. An extra service was provided as a result of a pre-contract request for an assignment in June 1986 which was not anticipated under the subcontract. Also, the delays described earlier have resulted in extra work for ABRIS, extra personnel costs, and possibly unanticipated further travel expense.

The ABRIS subcontract calls for provision of "conceptual" designs for facilities, which would be only diagram plans just beyond programmatic requirements. However, in the interest of providing a quality facility as expeditiously as possible for the AVCTC, ABRIS assumed responsibility for design development drawings to be issued to the local architect. This responsibility is feasible only if the rest of the contract can be fulfilled with maximum efficiency.

Recommended project modifications:

1. Supplemental funds should be specifically allocated to completing the AVCTC without subtracting from other budget provisions.

2. A new larger cafeteria/kitchen should be given a high priority to be planned and constructed along with the AVCTC. Supplemental funding should be allocated to the small provision for cafeteria and kitchen "expansion" and the "common room/Recreational room".

3. Residential accommodation for 8 visiting scientists should remain as a high priority need, to be funded and built as part of a complex including the new larger cafeteria.

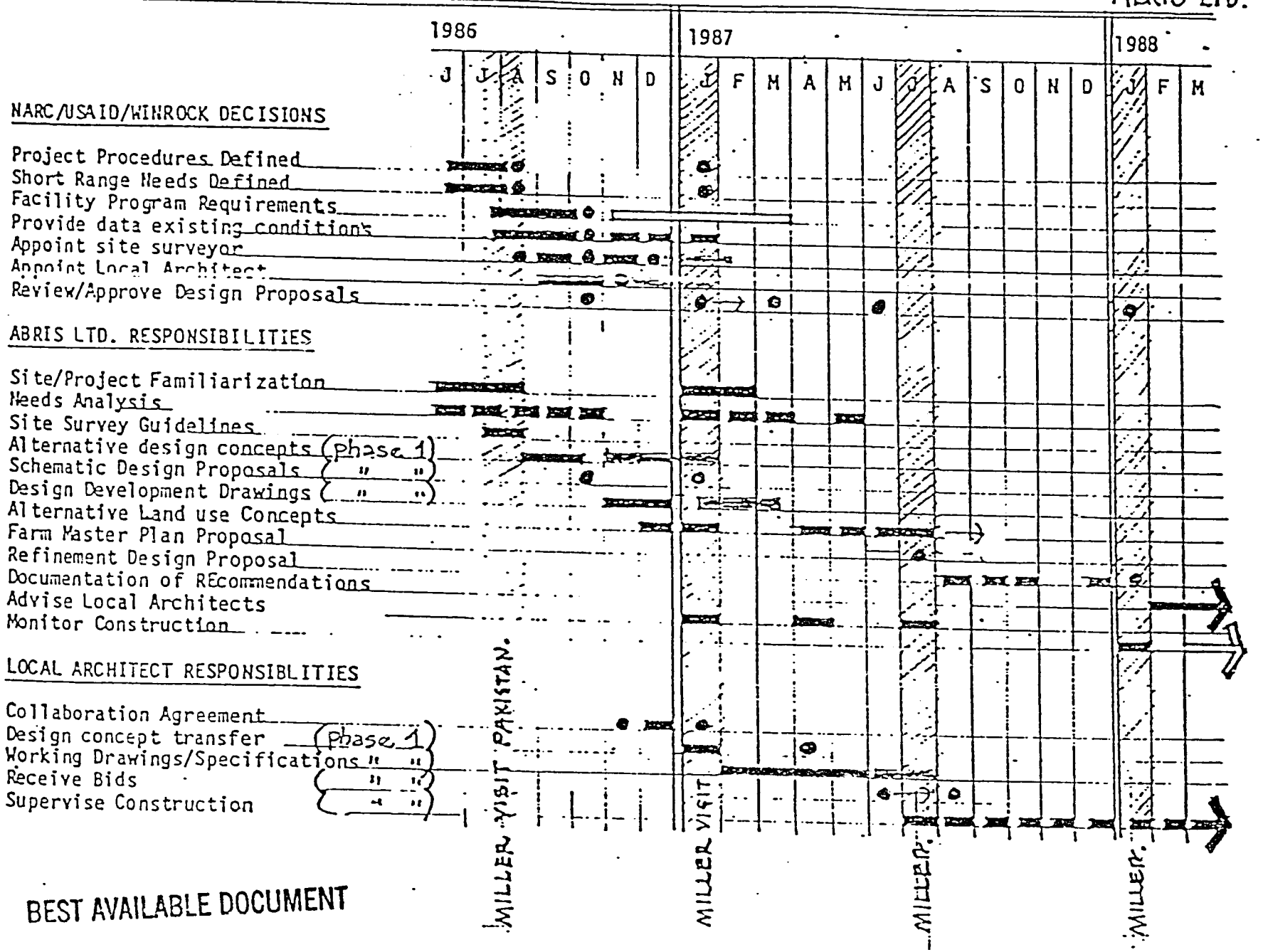
4. The hostal accommodation for 40 persons could become part of an anticipated World Bank funded project.

5. ABRIS should be asked to provide design development drawings for a new cafeteria/kitchen, visiting scientist complex, as part of master planning of the major research center complex.

In conclusion, ABRIS will continue to work within the budgeted provision for A and E services as efficiently as possible, with the understanding that extra services could cause the budgeted amount to be exhausted. If that should occur, supplemental funds would need to be provided.

NARC MASTERPLANNING & FACILITIES DESIGN SCHEDULE.

ABRIS LTD.



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AUGUST 1987

NARC MART

NARC FACILITY DESIGN REPORT • H. JAMES MILLER

ASSIGNMENT ISLAMABAD, PAKISTAN USAID · WINROCK · ABRIS.

August 24, 1987

NARC/MART INTERIM REPORT (4) H. JAMES MILLER, Architect, Planning Consultant Assignment in Pakistan, August 10-24, 1987

USAID-WINROCK Contract No.391-0489-C-00-5055-00 MART

Objectives of the Assignment

The work of this assignment was directed toward three major objectives:

1. Review, modification and approval of working drawings for the new AVCTI building was essential, so contract documents can be prepared by the local Architects conforming to original design intentions.

2. Presentation of ABRIS design proposals for a new cafeteria, visiting scientists quarters, and a new hostel was necessary to obtain user feedback that will guide final configuration of the design and location of these buildings.

3. Presentation of physical master plans for building areas of NARC was important in order to obtain approval for building locations, and to point out administrative actions necessary for implementation of the plans. Computor drawings of various aspects of the whole farm at different scales illustrated the versatility of the digitized data now available for the master planning process.

Summary of Activities and Work Accomplished

1. Met with the Winrock/MART team, and USAID project officials in ARD and Engineering to review design proposals and assignment strategies.

2. Met the Chairman, PARC on several occasions for his views and guidance on the planning and design issues.

3. Met the NARC D.G and Deputy D.G, and several concerned administrative and scientific staff to obtain their views. Formally presented proposals to two sessions of the "NARC/MART Facilities Planning Group", and obtained a consensus on the alternatives proposed.

4. Worked with PARC Director of Works Idrees Anjum, and his deputy Asghar, in determining a realistic development time-table, building construction priorities, and procedures for working with local architects and contractors on the USAID financed projects.

5. Devoted many hours to the scrutiny of working drawings prepared by Naqvi and Siddiqi, local architects, for the AVCTI building. Modifications to the plan proposals of ABRIS Ltd Architects were few and minor. However, the architectural detailing by the local architects left much to be desired and required considerable work and dialogue to convey the qualitative results expected. The architects were cooperative, as were their consultants, willing to receive advice and implement it. Intentions are seemingly correctly directed.

6. Worked with the specialized consultant to local Architects to review their detailed proposals as follows:

   HVAC Engineers -- FND, Fahim, Nanji, and de Souza, Karachi
   Structural Engineers -- Akbar & Assoc., Karachi
   Electrical Engineers -- Jafri and Associates, Karachi
   Plumbing Engineers -- Zahur Ali Qureshi, Islamabad.

   Provided advice and criticism of the proposals to bring them into conformance with good design and practice and to meet design intentions.

7. With MART/USAID/PARC officials, reviewed the financial budget for construction of MART funded facilities to determine what can now be financed with project funds. When construction begins, four years will have elapsed since the project paper was written, with inflation of 40-50% having occured. Priorities were established, and some modifications to the original PC-1 were made.

8. Met with PARC Executive Engineers Asghar and Aftab to discuss questions about existing building, including air conditioning, (not "cold" enough) roof leaks, and brick discoloration. Also met with Interior Decorator and D.D.G.Committee. Suggested refinements to reception area of Administration.

AVCTI Building Contract Documents; Completion Schedule; and Costs

The selected local Architects, Naqvi and Siddiqi, received ABRIS design development drawings on May 17, 1987. However, USAID approval of their contract was communicated on May 26 and verbal approval to proceed came on June 4, 1987. Their contract was not signed until July 8 ,1987. The contract calls for this firm and their consultants to complete working drawings and specifications from the design development drawings prepared by ABRIS, Ltd. Naqvi and Siddiqi must also to be responsible for site supervision during project construction. Based upon the instructions to proceed, the firm began their work, but only to a limited extent awaiting their contract. During June and July they completed a few drawings sufficient to submit to CDA for their review and approval. Only minor suggestions were made by CDA. Consultants began their work beginning about August 1, 1987.

Contract Documents-During this assignment, progress architectural working drawings were reviewed, including floor plans, wall sections, door and window details, roofing details, door and window schedules, finish schedules, exterior finishes, and expansion joint details. The detail drawings, though incomplete, provided enough information for discussion and modifications to achieve an understanding of what would be expected. Unfortunately, the Architect had not had sufficient time to complete stair details, toilet details, built in storage details, or any of the special details required for the special rooms of the AV Unit. At this time only outline material specifications were ready for review. When ready, the completed documents must sent to the U.S for review and approval.

The various engineering consultants to the Architect were able to begin their work early August, based upon ABRIS provided design development drawings. Progress drawings of Karachi based consultants were reviewed, including structural drawings, HVAC drawings, electrical drawings, and plumbing drawings. An average of five to seven hours was devoted to reviewing and discussing each consultants' proposals.

HVAC Systems-Met Mr. Fahim, of Fahim, Nanji and de Souza, Consulting Engineers based in Karachi. He presented a report describing the proposed heating, ventilating and air conditioning systems for the AVCTI building (refer to referenced "Report on Proposed HVAC System - AVCTI"). The proposals closely conform to the conceptual systems recommended by ABRIS Ltd., Architect, with some additional ideas of provisions for future air conditioning of areas not included in the initial plan.

Load calculations, performance criteria for sound control, and air velocities were given, with methods for meeting the criteria. A brief word description of the proposed system type and initial cost estimates were included in the report. Unfortunately, no specifications were provided, and no preliminary equipment manufacturers were recommended. There is much yet to come, through the general concepts presented were in line with what was anticipated. Supplementing the report were five incomplete progress drawings showing proposed locations for equipment, duct runs and sizes, and diffuser locations.

Some changes were recommended in zoning of equipment and simplification of duct runs. It was recommended that package units be considered in the future for training facilities instead of tying back into the central system. It was recommended that high volume, low velocity exhaust fans be provided for the high spaces in the Training Center that will not be air-conditioned, initially. Final approval will await the submission of complete plans and specifications; and a new cost estimate should be submitted leaving out custom duties.

Structural System - Met Mr. Akbar Gul of Akbar and Associates, Consulting Structural Engineers based in Karachi. He presented three incomplete progress drawings showing the structural framing plan as proposed by ABRIS Ltd. The columns and beams were sized, but reinforcing details had not been worked out.

The problem of building on earth fill, and recommended soil bearing pressures was discussed. Since the building is only two storeys and relatively simple in framing system, the problems are all fairly routine.

Special requirements like retaining walls, brick ledges, expansion joints, and exposed concrete finish were discusssed in some detail. The importance of a good specification to control concrete mix, shuttering, pouring, and curing was stressed. It was emphasized that exterior plastering to cover up poor concrete work is not to be permitted.

Final approval of structural design will await submission of complete plans and specifications.

Electrical and Illumination Systems - Met Mr. Zahid Razi, Senior Engineer with Jafri and Associates, Consulting Electrical Engineers of Karachi. He presented a preliminary report and nine incomplete progress drawings giving recommendations for the electrical and illumination system for the AVCTI building, along with initial cost estimates for the systems.

An earlier meeting with Cordell Hatch had provided clarification of the special needs of the AV Unit, particularly lighting and power requirements for the recording studio and supporting control rooms.

The "Preliminary Report for Electrification of AVCTI", is disappointing in its non-specificity. The statement of 'Scope of Work' is incomplete and the language throughout is too general, such as "main L.T. switchboard is to be located in the premises of building" and there will be "two or four distribution boards on each floor". There were catalogue pages showing proposed lighting fixtures, but no literature showing proposed distribution boxes, switches, and other electrical items.

The progress drawings showed little more information than was provided in ABRIS design development drawings, primarily light fixures, fan and power outlet locations.

Considerable discussions ensued regarding necessary illumination levels, power demands, potential power diversity, light fixture type and location, power plug requirements and location, and distribution board locations.

A proposed emergency power system was considered to be too expensive and unnecessary for this facility.

Final approval of electrical and illumination systems will await submission of complete plans and speficications, and a revised cost estimate.

Plumbing System - Met Mr. Zahid Ali Qureshi of ZAQ Consulting Engineers of Islamabad. He presented a report and drawings for the plumbing and drainage systems for the AVCTI building. The report was straightforward and clear as to intentions, and the drawings were nearly complete. The report also provided initial cost estimates for the systems.

The most significant changes to ABRIS plans by the local architects was in changes to toilet arrangements. Urinals are no longer permitted in Pakistan and a space for ablutions is required. A new plan was proposed by Naqvi and Siddique to provide these requirements.

The plumbing system proposed by Mr. Ali Qureshi seemed reasonable, except that distribution pipes were often shown within the walls. It was recommended that instead they should be either in accessible pipe chases; or run inside walls under counters.

It was recommended that instead of gas heated hot water tanks, roof located solar panels should be provided for hot water.

Very little information was provided about fixture types and quality. It was apparent that only residential quality fixtures are being proposed. It was pointed out that the sinks in the dark room and other work areas should be built into counters and need to be large, deep and heavy. The problems of coordination of this work was discussed, as well as the need for commercial fixtures.

A possible major problem was discussed regarding sewage disposal from the ground floor. A septic tank for the building will be required and can be easily provided. However, the effluent from the tank may be at too low a level to enter the drainage system to the existing leach field. This has yet to be determined.

The importance of complete and tight performance specifications was stressed to obtain a good system that is adequately tested, and will last without problems.

Final review and approval of plumbing system must await submittal of complete plans and specifications.

Schedule-Naqvi and Siddiqui have prepared a development schedule for completion of contract documents, tendering procedures and construction period (see copy in Appendix). This is a realistic, though optimistic schedule, assuming every thing will take place as anticipated. Since this has not been the case so far in this project, one can only hope further delays will be minimal. A review of original schedules and delays that have occured may be educational.

The project schedule in the PC-1 was unrealistic in planning time, and did not anticipate the delay in project start up. That schedule anticipated a completed building by March 1987. The project did not get underway until August 1986, when planning for the facility was launched by MART Consultants and NARC Staff. A new schedule prepared in August 1986 was realistic, anticipating completion of working drawings by July, 1987, and completion of construction by December 1988. However, that schedule anticipated approval of schematic design proposals, (completed in October 1986) by November 1986, and completion of design development drawings and their approval by January 1987. The schedule also called for appointment of local architects by November or December of 1986. Unfortunately, the schematic design approval process required more than two months, and the selection and appointment of a local architect required over ten months. Design development drawings were completed in March 1987, but were lost for one month in the mail. However, that did not affect the schedule, since the local architect had not yet been appointed.

The project is over six months behind due to bureaucratic delays. If review and approval processes and contracting can be expedited, the current schedule is probably good. It anticipates that the building would be completed by June 1989.

Costs - At this stage it is not possible to know actual costs. Only an intelligent estimate can be made, based upon experience with other buildings and their unit cost per square foot. Naqvi and Siddiqui have suggested that the AVCTI Building would probably cost in the range of Rs.550-600/sq.ft. Using a total floor area of 27,000 square feet and a rate of Rs. 580/sq.ft., the total cost would be approximately Rs.15,660,000. That includes air conditioning, but does not include furniture, equipment or site development.

During this assignment, concern was expressed about the size of the building being 25% over the PC-1 space provision. The concern stemmed from the policy of the GOP Planning Commission to severely question variance in the PC-1 of more than 10%. This concern should have been an important factor in the earlier stages of the design of the building, when in January, 1987 the schematic design was approved. At this late stage it is difficult and costly to make changes. However, an exercise was conducted to see if the floor areas could be reduced to 10% over the PC-1. It was found to be feasible to cut 2300 square feet out of the building by trimming some space from the edges, and removing the mechanical equipment penthouse from the roof. Some errors were found in area calculations which helped the situation. By adding "covered car parking" from the PC-1 it was found to be possible to bring the floor area to within 8% of the PC-1 provision. (Refer to "Floor Area and Cost Analysis" in Appendix).

Design proposals for new Cafeteria; Visiting Scientists Quarters; Hostel

With the top priority AVCTI project well underway, attention is now focussed upon the other facilities to be provided as part of the MART Project. These include provision in the PC-1 for a larger cafeteria, community space, visiting scientists' quarters, and an additional hostel.

The PC-1 did not anticipate the non-feasibility of substantial expansion of the existing cafeteria. In January, 1987 it was decided to build a new cafeteria of correct size on a new site south of the existing main complex. It was considered desirable in some way to incorporate a community centre as part of the new cafeteria.

Eight visiting scientists' quarters were proposed to be located near the new cafeteria. There was debate as to whether they should instead be located near, or as a part of the existing staff housing colony.

A new hostel was to be added correcting all the design and construction defects of the existing hostels.

During the assignment, design diagrams were presented for the facilities mentioned above. A modern cafeteria, with seating for 300 was designed as a first floor. The sloping grade permits a community center to be constructed on the ground floor, either now or at a later stage. Alternative plans and alternative locations were presented for eight visiting scientists' quarters. Modifications to the existing hostel plans were presented to correct the design and construction defects and provide much finer facilities.

Because of the time lapse of four years since the project paper was written and the inflation of construction costs of 40% - 50%, there was a question as to whether project funds would be sufficient for all work anticipated. Also, the AVCTI building is larger than envisioned, as is the proposed new cafeteria. Priorities were established and a cost analysis was conducted. It was decided that the proposed new hostel be considered as the lowest priority, and if any aspect of the project were to be sacrificed the hostel would be postponed. (See "Floor Area and Cost Analysis" in Appendix).

It is recommended that funds be included in the World Bank project funds to complete the half hostel built in 1983 from World Bank funds. If funds prove available in the MART Project, they should go toward an entirely new third hostel.

The following summarizes the concensus of the "NARC/MART Facilities Planning Group" that met August 20 at PARC, with Dr. Amir Muhammed chairing the meeting :

1. In response to concern about overbuilding training facilities, it was pointed out that this same discussion occured in January, 1987 and the training facilities were cut down at that time as a result of the same concerns. The PC-1 budgeted 14,256 square feet for training facilities alone. That has been reduced in the current plan to only 8,600 square feet which is probably minimal if one is to improve upon the existing training facilities. However, the point about effective utilization of the facilities is always important. Occupancy of 70% is considered minimal to justify having a facility.

2. The AVCTI is over the PC-1 because the audio-visual needs were grossly under estimated in the PC-1. Considering the intended program of use, what is planned meets the real needs, according to the user experts.

   If required by the Planning Commission or USAID, it was shown to be possible to reduce the size of the building so that it does not exceed the original budget by more than 10%. However, the local architect raised objection due to the stage of development of the working drawings. Further discussion indicated that the total project could still be completed within the acceptable variations of areas and costs. It is up to USAID and NARC officials to decide whether the proposed cuts should be made in the building size. Making the cuts would not require major re-design effort, but would entail some re-drawing.

3. Priorities for additional facilities in the proposal were confirmed by the committee as follows :

   (a) New Cafeteria (reduce to seating for 200 + 50 in private dining) Approved the schematic design plan and the location shown in the master plan.

   (b) Community Centre - Approved the location of the community facility on the ground floor of the Cafeteria as shown in the schematic design plan. Other recreational facilities should be included nearby such as tennis courts, volley ball, and perhaps a swimming pool in the future.

(c) Visiting Scientists' Quarters - Eight visiting scientists' quarters should be provided at the location shown in the master plan. They should be clustered as row houses, similar to what is shown, with a variety of special arrangements, to match considerable variations in visitors' length of stay and personal needs.

(d) Hostel - It was agreed that the first three facilities would be completed as a second phase of the MART Project, after the first phase AVCTI building. Additional hostel rooms would be considered as a third phase, after it is known whether there are sufficient resources left in the project.

4. It was pointed out that completion of the farm road system should be included in some donor program. The cafeteria and visiting scientists quarters should not be built until access roads parking areas, walkways and utility extensions are in place.

The BARD Project and the World Bank should be asked to include the cost of part of the road network in their projects, now being planned.

A proposed system of primary, secondary and tertiary roads was shown to the committee. No specific action was taken, except acknowledgement that the roads are needed.

Farm Master Plan

The process that was begun over one year ago, and the assignments that were given to the Planning Committee remain unfulfilled toward a functional Master Plan for NARC as a national center of excellence. However, renewed impetus for a master plan and a fresh beginning was initiated by questionnaires and guidelines prepared by the MART Team, and inaugurated by Chairman PARC, Amir Muhammed, in July 1987.

As soon as NARC is equipped with a computer CAD system matching the system at ABRIS Ltd., the digitized detailed plan of the whole Farm will be available for anyone needing information. During the assignment a series of printouts of various details at different scales were shown to illustrate the versatality of the system.

When the system is fully developed, a scientist, an engineer, or an administrator can request a printout of the whole farm or any area of the Farm at

any scale, with any pre-selected combination of data. Each aspect of the Farm data is stored in a different memory "layer", such as the following :

Farm boundarys	Power system
Area grid (100'x100')	Water system
Topography (1 foot interval)	Phone system
Road system	Sewerage system
Buildings	Plot use
Irrigation system	Land use
Drainage system	Vegetation
Soil type	Notations, etc.

During this assignment additional data was collected about the existing irrigation and drainage systems. Also, proposed drainage, proposed road systems, as well as new building were discussed. Within a few weeks all existing conditions on the Farm will have been recorded in the computor memory and on discs ready for use.

Once the functional Master Plan is complete, providing needed direction about proposed long range use of the Farm, a physical master plan can be prepared. The plan would be dynamic, so that modifications and or refinements can be easily and quickly introduced by computer.

It should be pointed out here that the computer components and software required to utilize the digitized farm plan is supplemental to what is already needed and planned for Agricultural Communications. An IBM-AT can run it, with the requisite card and software. A Hewlett-Packard plotter, or equivalent, is necessary to plot the drawings; but the same plotter is also needed for Ag Communications graphics work.

If new computors are being purchased it is recommended that the latest model IBM be selected for graphics works, since it costs no more, but is much faster for CAD drawings.

In conclusion, the following set of guidelines and suggestions are offered to assist in the physical master planning process.

Problem Analysis/Programming

1. PARC/NARC Administrators and Scientists must establish firm objectives for use of the national farm facility

   (a) Experimental work that is less site specific.
   (b) Work that requires close day to day supervision by scientists based at the station.
   (c) Basic plant breeding work.
   (d) Specific work most appropriate for this agro-climatic setting.
   (e) Relationship between animal and crop research.
   (f) Future growth and change.
   (g) Other

2. NARC Research staff must establish clear clear programs and the quantitative, qualitiative land requirements to carry out the programs.

3. A comprehensive land use plan must be prepared based upon soil types, topography, drainage, accessibility, and other factors. (See ICRISAT model).

4. A hydrological profile of the whole farm needs to be conducted, considering the factors of river, Rawal lake, the high ground water table and the CDA pumping stations. Irrigation needs and sub-soil drainage needs are a part of the hydrological problems to be investigated in order to recommend required irrigation and drainage systems. An important consideration may be the potential of fertilizer polution of the CDA drinking water.

5. Factors just outside the boundaries of the farm should be investigated to see if there are any adverse impacts on the research areas.

6. The relationship of the BARD project area to the rest of the farm must be established.

7. Additional roads must be developed as a part of an overall access plan for the whole farm. BARD and World Bank should fund the work.

8. Additional building needs must be determined and located in the master plan.

9. Electrical service, water supply, telephone and other utility service systems must be extended as required.

10. Since support of livestock requires considerable land area, a clear statement of numbers of livestock needed for research projects must be established, so that land requirements can be determined for fodder and grazing.

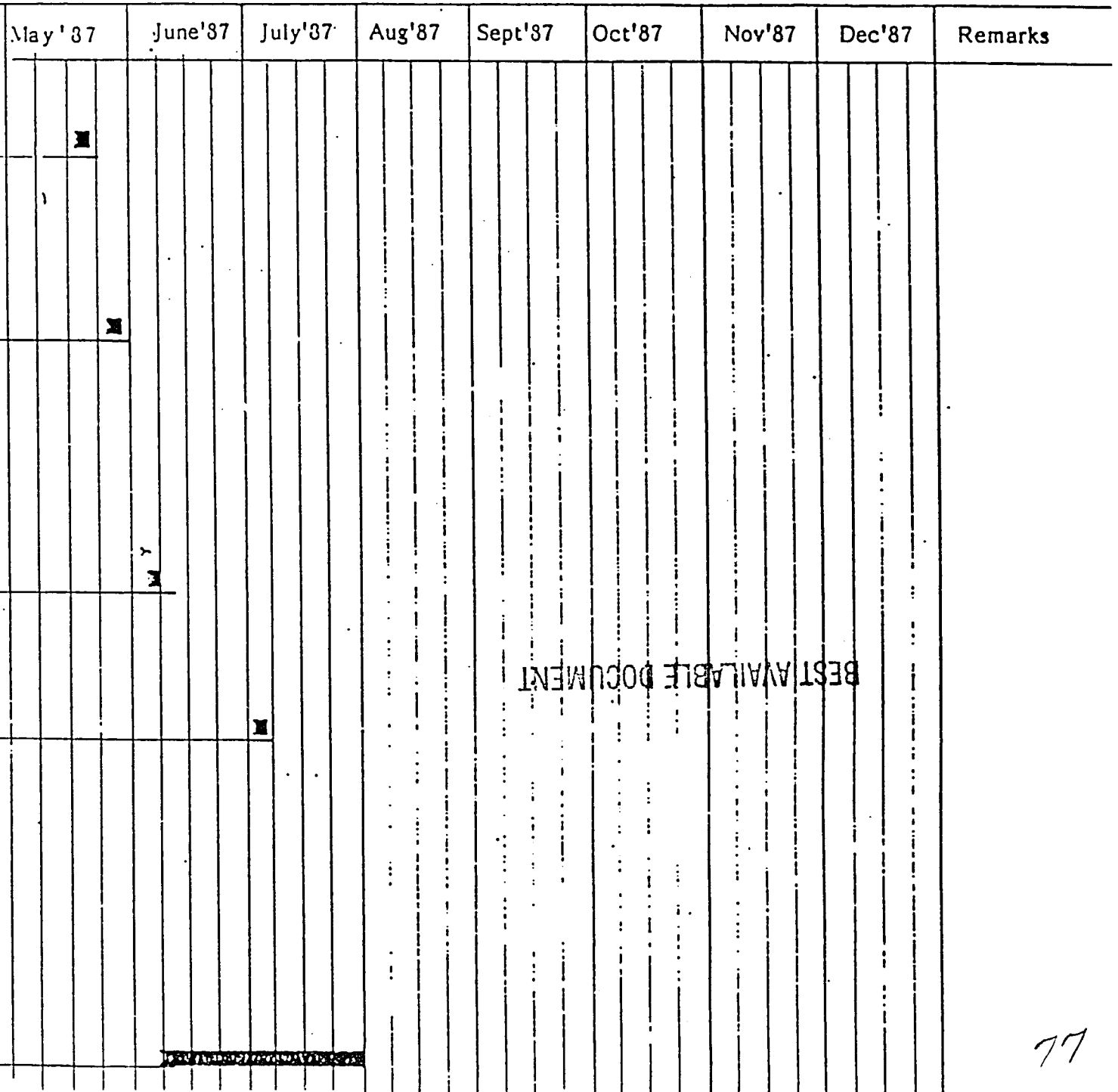
11. The organizational and operational philosophy appropriate to one component of a national system of research farms (relationship to provincial centres) is very fundamental to all of the above.

12. Other

Notes:

APPENDIX

TENTATIVE TIME SCHEDULE FOR DESIGN OF AVTC (NARC) ISLAMABAD



1. Preliminary Drawings received in A.E. Office

   17th. May, 1987

2. US Aid Approval of A.E. Firm communicated to P.A.R.C.

   26th. May, 1987

3. US Aid Approval of Prof. Miller's preliminary design with comments for MODIFICATIONS.

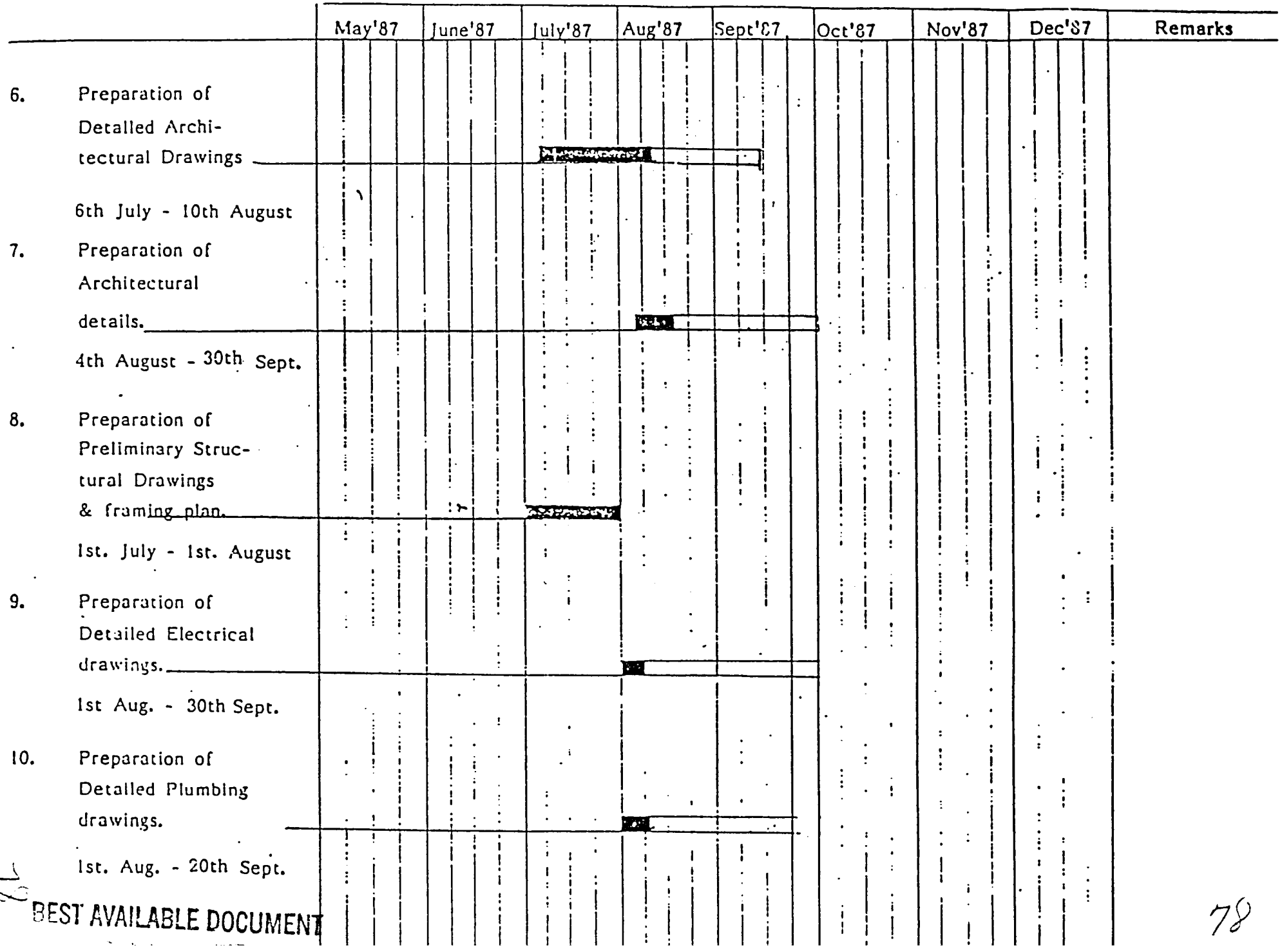
   4th June, 1987

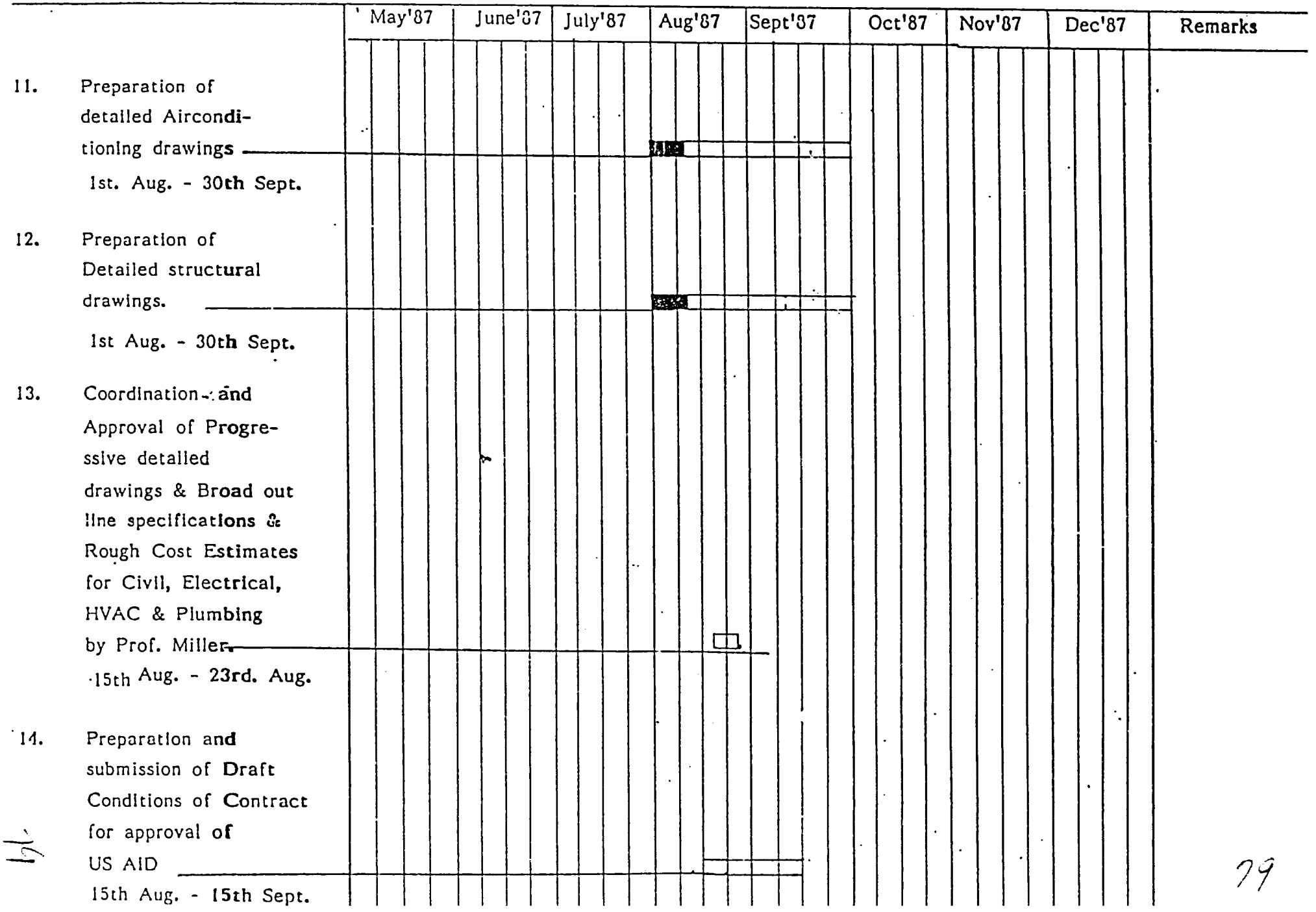
4. Soil Investigation Report received on

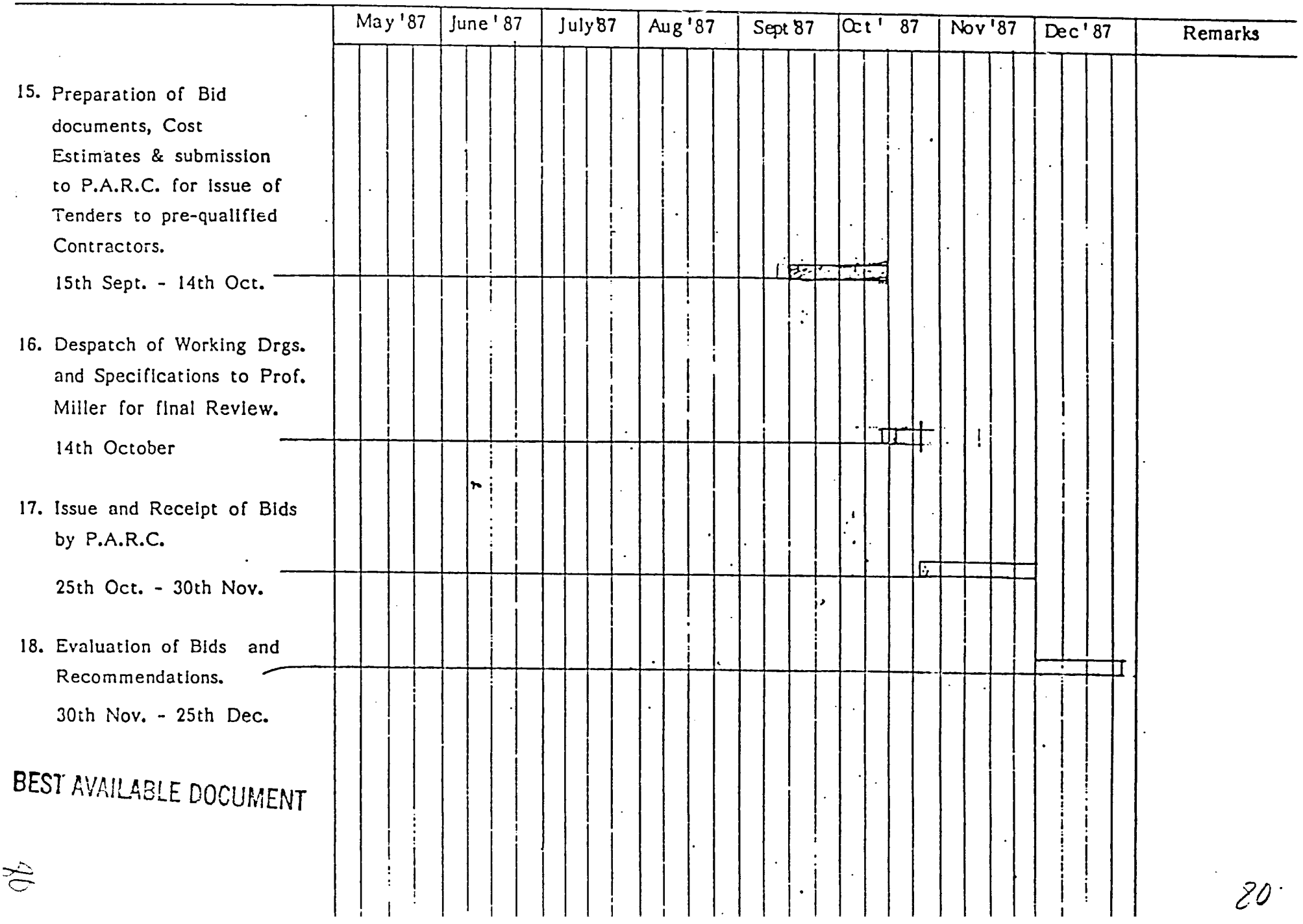
   5th July, 1987

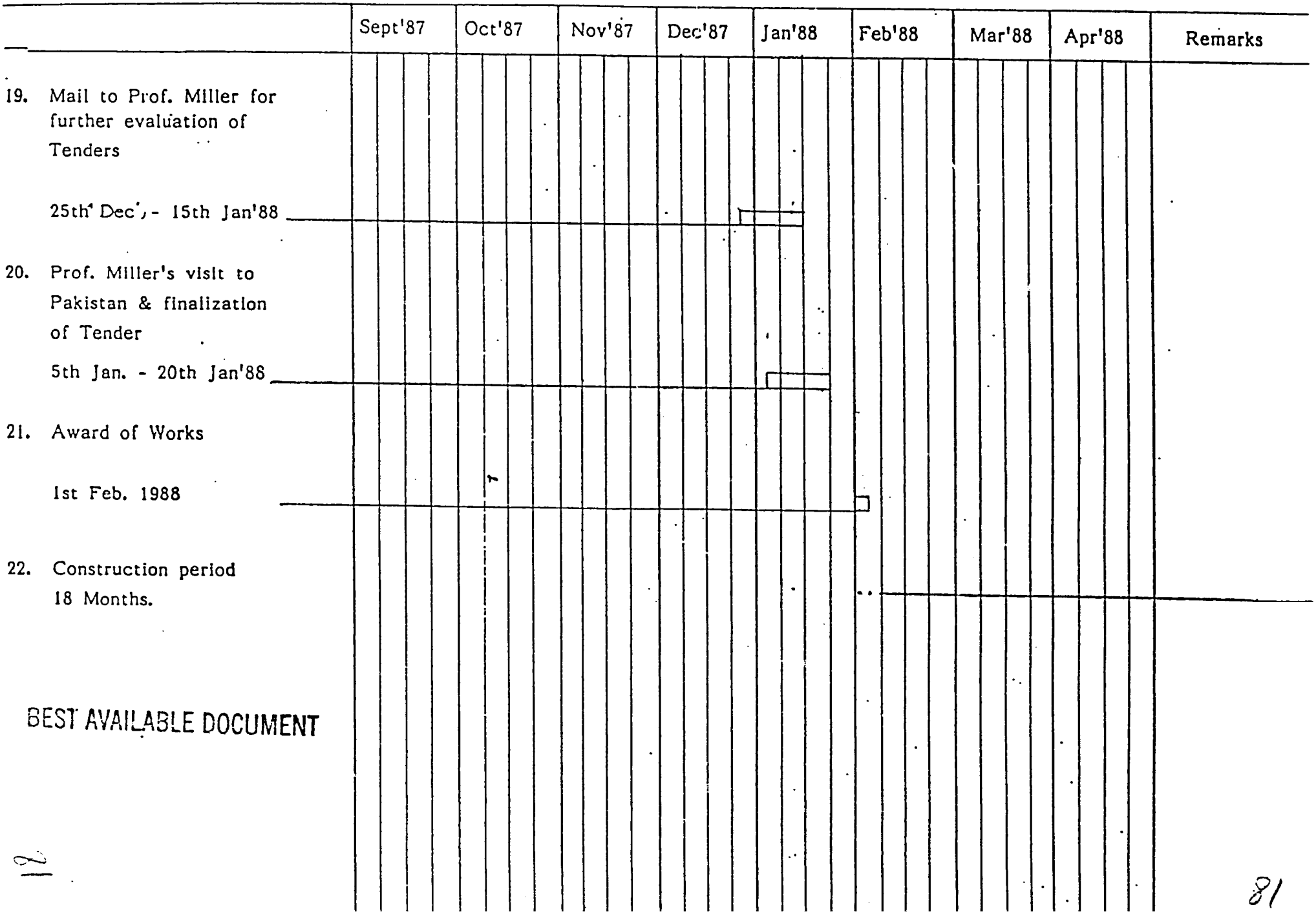
BEST AVAILABLE DOCUMENT

5. Study of Preliminary Design & preparation of submission Drawings for approval of of C.D.A. Incorporating amendments suggested by US Aid









August 17, 1987

APPENDIX

FLOOR AREA & COST ANALYSIS NARC/MART CONSTRUCTION PROJECT
Compliance with PC-1 and project paper guidelines. H.J. Miller

The following is a comparison of the NARC facilities envisioned in the PC-1, prepared in 1984, and the facilities proposed in 1987:

The normal process of obtaining expert advice and new information, of evolving priorities, and of in-depth design studies have produced variations from the PC-1, which are entirely justifiable.

FLOOR AREAS - (Square-feet)

Facility	PC-1 Guidelines	Current Proposals
1. AVCTI	23,373 (+10%) 2,337	27,600 2,370 (Reduction)
	25,710 ⟷	25,230
2. CAFETERIA	4,650+10%=5,115	7,600
3. VISIT SCIENT. QUARTERS	4,925 (8x600)	4,800
4. HOSTEL	9,850	0
	42,805 ft^2	39,130 ft^2

The AVCTI building is 8% over the area in the PC-1 because there was insufficient expertise at the time the PC-1 was drafted.

The Cafeteria is 40% over because the PC-1 did not anticipate that it is not feasible to enlarge the existing cafeteria. A new one is essential.

The Visiting Scientists Quarters can be built as prescribed in the PC-1 budget.

The Hostel need is not as serious as foreseen in the PC-1 and can be postponed.

In summary, the PC-1 provided a total floor area budget of 42,805 ft^2. The current proposals call for building construction of 39,130 ft^2, a reduction of 3,675 ft^2.

COSTS - Dollar grant construction budget, and rupee costs.

Grant for construction NARC/MART project facilities		-	$ 1,659,306
" " furniture " " " "		-	199,234
Grant in terms of 1987 rupees $1= Rs 17.42	----------	=	Rs 28,905,000
1. AVCTI Building - 25,230 ft^2 x Rs 580*	----------	=	Rs 14,634,000
2. CAFETERIA - 7600 ft^2 x Rs 580	----------	=	Rs 4,408,000
(Community Center incl) (5400 " x Rs 580)	---------	=	Rs (3,132,000)
3. Visit Scient. Quart. 4800 ft^2 x Rs 400	----------	=	Rs 1,920,000
Total		=	Rs 24,094,000
Bal.		=	Rs 4,811,000

If the new Cafeteria with Community Center is built, in lieu of a new hostel, the budget covers with over 4 million rupees still remaining.

If the Community Center is deferred, there should be sufficient funds to build a new hostel 12,000 ft^2 x Rs 500 = Rs 6,000,000.

Priorities established by the NARC Planning Group indicate that the Community Center and related recreational facilities have a higher priority than the hostel. It is recommended that a Cafeteria/ cum Community Center be designed as part of the project, and that the hostel be deferred.

*Unit cost estimate provided by local Architects Naqvia & Siddiqua. will be firmed up later when working drawings complete.

AUGUST 1988

NARC·MART

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NARC MASTERPLANNING REPORT. H. JAMES MILLER

ASSIGNMENT ISLAMABAD PAKISTAN USAID · WINROCK · ABRIS.

ARCHITECTS and PLANNERS 214 WEST MAIN STREET URBANA, ILLINOIS 61801

August 20, 1988

NARC/MART INTERIM REPORT (5) H. James Miller, Architect, Planning Consultant
Assignment in Pakistan, August 8-20-1988

USAID-WINROCK Contract No. 391-0489-C-00-5055-00 MART

Objectives of the Assignment

The work of this assignment was directed toward five major objectives:

1. The Physical Master Plan for NARC is dependant upon requirements for land and facilities derived from the Research Master Plan. Research Master Planning is intensely in process, so some integration of procedures, sharing of information, and agreement upon format was important to be achieved during this assignment.

2. Collecting additional information about proposed projects to be funded by the World Bank, the Japanese, and the Italians was necessary. It was also important to confirm earlier recommendations about improvement of Farm infrastructure, all for incorporation into the Physical Master Plan.

3. Follow-up review of the recommended modifications to drawings and specifications for the AVCTI Building was important to check final conformity to original design intentions.

4. A review of local Architect's modifications to the proposed Cafeteria and Visiting Scientists' Housing was directed toward reaching final schematic design decisions.

5. A detailed proposal for a Training Program for Mr. Aftab Ikram, Exec. Engineer in charge of Operation and Maintenance at NARC, was prepared and discussed with all concerned parties.

Summary of Activities and Work Accomplished

1. Interacted with Winrock/Mart team as appropriate for different aspects of the assignment and met within USAID/ARD project officers for their advice.

2. Worked primarily with PARC Director of Works, Idrees Anjum and his executive engineers, Asghar and Aftab, reviewing AVCTI construction contract, interviewing contractor, and wrapping up reviews of drawings and specifications for AVCTI Building.

CABLE: ABRIS TELEPHONE: 217-384-0463

3. Held several conferences with local Architects, Naqvie and Siddique to transfer final comments for improving and completing AVCTI contract documents, and their proposals for the Cafeteria and Visiting Scientists' Housing.

4. Met with Roy Hafterson and Yousef Said of USAID Engineering to update them on the status of the AVCTI Building, the Cafeteria and Housing, as well as Physical Master Planning.

5. Had several meetings with Rashid Akhtar, Farm Operations Director, about physical problems and needs of the Farm that should influence master planning decisions.

6. Participated in a physical planning meeting of concerned NARC Directors, MART consultants and USAID officials to review the status of the Physical Master Plan, and to discuss the outstanding issues that need resolution in order to complete the Physical Master Plan.

7. Met the Chairman, PARC to report the activities of the assignment, to discuss the issues to be resolved; and to obtain his views and decisions.

AVCTI Building contract documents and construction.

It is almost inconceivable, but true, that six months have elapsed since contract documents were completed for the AVCTI Building and the project was tendered. Construction has still to begin, so that the project is nearly a year behind schedule. Several periods of delay were not caused by the professional consultants. The cause is governmental bureaucracy.

On the positive side, a good general contractor, "Quality Construction", has been selected and issued a letter to proceed by PARC. It is anticipated that a contract will be signed momentarily. During the assignment an opportunity to interview the Contractor and staff provided gratification as to the suitability of the choice. Site mobilization began this week, and a groundbreaking ceremony was scheduled for Thursday, August 18. Unfortunately the untimely death of the President of Pakistan caused cancellation of the ceremony.

Yet to be tendered is the HVAC contract for the building. This should not be delayed, as it could cause construction problems due to lack of coordination.

A follow-up review of plans and specifications for the AVCTI Building, and letters of compliance by consultants to earlier advice, revealed the following outstanding concerns:

1. There is still no provision for heating for the Training Center. A phone conversation with the HVAC consultant revealed that he did not understand that heating should be provided. It was agreed that Idrees Anjum should write a letter instructing the consultant to design a hot water convection system utilizing the boilers already designed for the rest of the building.

2. The external electrification extension to the building has not been redesigned as advised. The present location of a transformer kiosk, and routing of cable is totally unacceptable. Idrees Anjum and USAID Engineering must insist on the required change in drawings, specifications, and BOQ.

3. There are no details for connecting the effluent from the proposed septic tank into the existing leachfield.

4. The specifications call for omitting the incremental AC units from the contract. Also, there are insufficient details for the correct installation of these units.

5. The electrical consultant continues to refer to the incremental units as "window units", and insists on providing wall plugs for each unit. These are permanent through the wall unit ventilators to be <u>direct wired.</u>

6. The structural drawing details call for footings to be set 5'-0" below ground level. Since the ground slopes in two directions, that means that every footing would be a different level, and the columns a different length. This must be corrected so that groups of columns are the same length.

7. Other observations and recommendations are less critical, such as exposed wood around all the windows on the exterior, incorrect sinks in the photolabs, lack of soundproof seals around doorways, in the recording studios, a sliding door in a wrong location, and a number of other lesser issues.

All of the above points were discussed with Architect Nagvie and Siddique in the presence of Idrees Anjum, who will be in charge of project supervision. A set of red marked drawings was left with Idrees.

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In wrapping up the review it is important to state that in spite of the errors and omissions, the work of this Architect and the other consultants was much superior to that of local consultants on the earlier projects at NARC. Their cooperation and compliance with advice was good. If the final drawings are an indication, the resultant building should be the best NARC building to date.

New Cafeteria and Visiting Scientists' Quarters

As instructed during a meeting with NARC, MART, and USAID officials, the local Architect revised the design proposals prepared by ABRIS, Architects. These latest drawings were reviewed and criticised during the assignment. (See full report in Appendix 1) In summary, the larger housing is acceptable with fewer units on the limited site as shown. However, it is recommended that a mix of one and two bedroom units be provided, instead of all two bedroom units, to allow at least six units total.

The modifications to the Cafeteria are unsatisfactory in many ways. It would be better to return to the original plan prepared by ABRIS in January, 1987, with 250 regular seats plus 50 V.I.P. seats. This was confirmed in a meeting with the Chairman, Indrees Anjum and Bill Wright on August 17, 1988. Marked drawings with comments were transferred to Yousef Said of USAID, Engineering.

Physical Master Plan

The physical master planning process has been on hold for more than a year, awaiting the knowledge to be gained from the Research Master Plan, and some necessary engineering advice about a few problems on the NARC Farm. During this assignment a concerted effort was underway, directed by other MART consultants, to complete the Research Plan. Discussions were held with the same committee to review the status of the Physical Master Plan and to point out information still required. (A full explanation of what is required, and how to proceed is included in a seven page memo to Bill Wright, dated August 15, 1988, in Appendix 2)

Discussions were held about a possible three part Master Plan document, perhaps of differing sizes, but having complimentary covers and being produced in the same style. Because of illustrations and plans, the physical master plan would need to be larger, perhaps 11" X 17" minimum, or double the standard 8½ X 11.

There are many decisions still pending; but there are assurances that the Research Plan completion, and further discussions with consultants can provide the authoritative answers necessary to provide a physical Master Plan targeted for the year 2000.

A Master Planning System

Far more important than a "Master Plan" is a system for master planning. A master plan is good for only one point in time. Then it goes on the shelf and collects dust. It is a static thing, which when fulfilled becomes a dead record. Whereas "master planning" is a continuous dynamic process that guides a continuous flow of information and controls it through a decision making process.

Ironically, the MART project is directed more toward the less important "Master Plan", so that the much more valuable implementation of a systematic process could be lost.

Managing Agricultural Research and Technology" (MART) implies managing a process. That is why it would seem of primary importance to provide training, to demonstrate systems, and then to implement them. How else can the needed changes be brought about?

That leads to the final section of this report which addresses the proposed implementation of a physical master planning system which could produce master plans on into the future. To repeat, this would be a far greater achievement than producing the one shot "Physical Master Plan".

Training program for Operation and Maintenance System

One year ago Mr. Idrees Anjum requested that ABRIS Ltd., Architects assume responsibility for training his executive engineer in operation and maintenance, and project management. The idea seemed to fit into MART objectives, but the ABRIS subcontract does not provide for such an activity. Furthermore, ABRIS is not specialized in such training. A better alternative was suggested, to enroll Aftab in the University of Illinois for management courses, and computer training, while spending time within the Operations and Maintenance Division of the University learning their systems.

Simultaneously, ABRIS offered to permit Aftab to spend approximately ten hours per week in their offices to learn the computerized master planning system that they have developed over the past eighteen months. The architect who developed the system works part time for ABRIS, LTD. and also teaches the AUTOCAD course in the School of Architecture at the University of Illinois. He would be responsible, along with Professor Miller, for teaching Aftab while in their office.

A formal request to implement the training program came from Idrees Anjum, followed by several letters of request from Abdul Hafeez, Director of Training, PARC. Those requests came between November, 1987 and March, 1988. Each time a positive response was given by letter. There is a growing understanding and belief that this training would be an important key to transmitting and implementing the major investment of ABRIS, LTD. in the physical planning for NARC.

(Refer to Appendix 3 - Memo of August 11, 1988 to Curtis Nissley, USAID project officer regarding the proposed training program)

Unfortunately, there is an apparent lack of understanding as to the value to be derived from the computerized planning tool developed for NARC. Also, it is not understood that the investment in the system by USAID in providing a comprehensive bench mark topographical survey of the whole Farm, and the work in setting up the system by ABRIS LTD. could be lost, if there is no transfer and no implementation.

Questions raised are that the system is too advanced, Pakistan is not ready for it, the necessary equipment would break down, the personnel will not be able to use it. All of those arguments are just as valid for the "Master Plans". These are arguments used against any kind of outside technical assistance. Without faith that advice will be accepted and followed, there would be no MART project.

In conclusion, it would be very shortsighted not to support the possibility of implementing a beautiful state of the art system, which would be a key tool in Farm operations and research plot management, in building operation and maintenance and institutional development.

It is certain that if this system is not transferred and implemented, the USAID investment over the past two years in the physical master planning effort could be largely wasted.

- NEW CAFETERIA and VISITING SCIENTISTS QUARTERS
Review of local architects modifications to ABRIS plans of 1987.

New Cafeteria: (Site location and general exterior character are maintained):

1. The local architect reduced the total floor area by just over 1000ft^2 (from 7940 to 6900) or 13%. This was accomplished by reducing all of the components by about the same ratio (dining, kitchen, serving, and service) The kitchen in the ABRIS plan was 27% of the total. The modified kitchen is now 23% of the total. What was the purpose, and what was accomplished by these reductions?

2. The quality of the design of the kitchen and the serving line have been reduced from that of a high standard to something similar to the quality of the existing cafeteria. The capacity of the kitchen is reduced, the quality of equipment is greatly reduced, the wall space is not well utilized, there is no office for the cafeteria manager. This may be acceptable if only simple fixed Pakistani menus are to be provided.

3. The dining areas are reconfigured, with the longest wall facing directly west. Accessibility from the serving lines is improved, but there will be a serious problem with afternoon sun and heat buildup, the worst possible orientation.

4. The main entrances to the Cafeteria do not work. It is not clear how one would enter. There is no space beside the stairways and it would not be good to enter on the corridors by the toilets.

5. The ground floor of the Cafeteria is not shown. For this site to work on the slope as planned originally, the ground floor was proposed to be left open, and later enclosed for a community center. This would be on a level with the proposed swimming pool and other recreational facilities.

Visiting Scientists Quarters - (Site location and character maintained)

1. The local architect increased the size of the ABRIS proposed efficiency apartments by nearly 50%, (from 572 ft^2 to 841 ft^2) in order to add one bedroom.

2. The number of units provided was reduced from eight to only four, because of insufficient space on the site for the larger units. Also, the longer units do not work as well on the sloping site.

3. The floor plan of the enlarged unit is good, if this is the size required.

Site Design for Cafeteria and Quarters

1. Because of the existing high terraces across the site, the use of levels, retaining walls, and grading were provided in the original ABRIS site plan proposals. This was not understood and has not been incorporated in the modifications by the local Architect.

2. Finish grades are not shown in the modified proposals.

RECOMMENDATIONS: (Stemming from foregoing observations.)

1. The proposed modifications to the Visiting Scientists Quarters are acceptable from a design standpoint. (Except site grading) The tradeoff is that now there are only half as many larger units. It may be good to provide a mix of one and two bedroom units.

   Site grading as proposed in the ABRIS plan is essential to make the site workable.

2. The modifications proposed for the new Cafeteria are not good. The original purposes for building a new cafeteria are apparently being overlooked in the process. The existing cafeteria is too small for the growing Research Center, and its kitchen is of recognized poor quality. Designed by local architects it has been repeatedly criticised.

   The intent in proposing a new cafeteria funded by the MART project was to provide a higher quality, larger sized replacement for the existing one. The drawings now indicate a building that will serve only twice the number of people in a kitchen that is of about the same quality as the existing one.

   The original ABRIS proposal was for a capacity of 300 people, not large by institutional standards, but sufficient to handle anticipated growth in the Research Center. The kitchen was intended to provide higher quality service to that number, plus the future community center below. Also it would be required to cater for special functions from time to time that could be very large, when the Training Center expansion is complete.

   It is recommended that the requirements for the new cafeteria plus Community Center be carefully re-evaluated. It does not seem worth investing MART funds in a facility that would be only double the existing Cafeteria in size, and having a kitchen that is very little different in quality. Perhaps that cafeteria would be appropriate for the one proposed near the Farm Center.

Finally, it is important to recognize the need and to plan for the development of the site; including roads, parking, walkways, retaining walls, utilities and landscaping. These costs, plus the costs of equipping and furnishing these buildings must be included in the project budget. Until now, these costs have not been fully considered, yet will have a major bearing upon how much can be afforded from the MART project funds.

August 15, 1988

Memo to: Bill Wright cc: Murray Dawson

From : H. James Miller

Subject: NARC Physical Master Plan

Attached is a first draft of an outline for the proposed "NARC Physical Master Plan." While waiting for the information to be derived from the Research Master Plan, writing can also begin on the introductory aspects of the physical plan. I would appreciate any comments or advice that anyone may have at this time. It would be helpful to know expectations of Winrock and USAID, as well as the Chairman of PARC. (The Chairman, along with Ray Carpenter of USAID came up with the idea in the first place. Their model was the very slick "Master Plan" document produced for the University project in Peshawer.) Have expectations changed?

For Uniformity it seems to me it would be wise to also submit the draft narrative for the physical Master Plan to Winrock's editor Steve Breth, following his editing of the Research plan draft. If that is to happen, and the total master plan documentation is to be produced simultaneously, we need to get on the production calendar for our work. However, the proposed October 30 date for "published final report" is far too optimistic for even the research plan, in my opinion. Even if we finally obtain all the necessary information, for us to produce a documented physical master plan by January, 1989 would be a big challenge.

As soon as the draft Research Plan document is complete, we would need a copy to provide the information awaited for many months. I anticipate there will be explicit and detailed land requirements to support research programs. I also anticipate explicit requirements for research lab facilities and other supporting facility requirements to be provided by the year 2000. We would proceed to show the Physical Master Plan proposals targeting the same year.

As I have often stated, we have been handicapped in our planning without a station development engineer and hydraulics engineer as consultants to

provide advice about the problems and needs of the farm. Our original proposal anticipated that Winrock would provide such expertise under the MART project. Now that Ernie Nunn is expected to be involved, it would be shortsighted not to make use of his expertise to provide the information and guidance we need. Ideally, he and I would have had overlapping assignments.

I recommend that as part of Ernie Nunn's assignment that he be asked to give at least two weeks to the following specific tasks:

1. Evaluate the Research Master Plan, focusing particularly upon the stated needs for land and other farm facilities, confirm the needs and summarize them into a form that can be translated into a Physical Master Plan.

2. Evaluate existing land use at site and compare with the requests for land support of research programs. Provide advice about improvement of existing research plots and supporting infrastructure, and the development of additional plots and infrastrcture, including roads, irrigation and drainage.

3. Provide advice about groundwater and waterlogging problems, the effects upon crop research, and possible mitigation measures that should be taken,, to be included in the Physical Master Plan.

4. Provide advice about the CDA water pumping system,its probable effects upon crop research, and any mitigation measures that should be indicated in the Physical Master Plan.

5. Provide advice about any additional projected needs for farm and or building facilities that should be included in the Physical Master Plan.

I would need to confer with Ernie before he comes to Pakistan to discuss further what we need from him. Then it is very important for Ernie and I to get together perhaps at Winrock or our office after he completes his assignment. We must discuss his findings so they can be incorporated in our physical plan.

As you know, what we have done so far in our master planning of the farm is to thoroughly record the existing situation. Beyond that we show only information given to us by G.N. Shahid as proposals, primarily that had been prepared by Don Minehart. Though I respect the ideas, G.N. Shahid is not an engineer, and he would be the first to say that we need a farm development engineer to confirm what is needed and to design the systems. That is why we need to involve Ernie Nunn. Otherwise what we are doing for the farm is somewhat hypothetical, and not good master planning.

On the other hand, our work in preparing master plans for the Main Center complex and the Farm Center complex is thorough and correct. I feel confident including those proposals in the Master Plan. Unfortunately, we do not have the same confidence in recommending development of future staff housing or the overall farm development. Yet I believe we have a responsibility under the contract to leave behind a good set of guidelines for future development of the whole farm, whether it is to be well utilized or not.

During this assignment we need one more general meeting for official approval of all of proposals we have introduced to date. These issues have been repeatedly discussed, and refinements introduced, but to my knowledge there has been no formal acceptance or official approval so that we are authorized to incorporate the concepts into a Physical Master Plan document.The following is a list of those issues:

Main Research Complex

1. Overall master plan showing location of proposed new buildings roads, parking, walkways, grading and landscaping.
2. Proposed secondary access to Animal Research Center and Bard Research Complex.
3. Extension of reserve area for future development of glasshouses and other support facilities, and reserve area on high ground for other future construction.

Farm Center Complex

1. Overall master plan showing location or proposed new buildings roads, parking, walkways, grading and landscaping.

2. Extension of reserve areas for future development of additional buildings and other facilities to east and west.

Housing Complex

1. Overall plan for extending housing into CDA land. If not acceptable, a decision is needed as to where additional staff housing is to be provided if at all. Policies regarding provision of housing at NARC is not clear.

2. Sites for mosque and for recreation areas must be approved.

Animal Farm Center Complex

1. Several additional facilities were proposed for the Animal Farm, but there has been no indication of approval, since there is not good utilization of the facilities already provided.
What should be our position in providing a master plan for this area?

2. No guidelines at all have been provided for any proposed development of the old Dairy Farm Complex.

Other projects

Other building sites for anticipated projects during the next ten years should be identified, discussed and approved.

August 8, 1988

NARC PHYSICAL MASTER PLAN Draft Outline.

FOREWORD - Historical prologue, development of NARC - Development Guide 1977

PREFACE - Value, purpose and use of this document

1.0 INTRODUCTION

- 1.1. Definition "physical master plan"
- 1.2. Master planning as a continuous systematic process.
- 1.3. Organization for master planning
- 1.4. Plan implementation-response to needs prioritized
- 1.5. Present status of NARC development.
- 1.6.

2.0 Nature of NARC Physical Master Plan of 1988 (Refer to Appendix)

- 2.1. Survey of existing conditions, 1987
- 2.2. Recording of survey data using Autocad computer system
- 2.3. Nature of computerized physical plans and value of system
  - 2.3.1. Land use
  - 2.3.2. Road infrastructure
  - 2.3.3. Irrigation system
  - 2.3.4. Drainage system
  - 2.3.5. Research Plot system
  - 2.3.6. Vegetation
  - 2.3.7. Buildings
  - 2.3.8. Utilities
  - 2.3.9. Topography
  - 2.3.10. Grid

3.0 Proposed short range physical development needs

- 3.1 Specific computerized site planning proposals
  - 3.1.1. Land use development to match research needs.
  - 3.1.2. Buildings and domain to match research needs.
    - 3.1.2.1. Main Research Complex
    - 3.1.2.2. Crop Farm Center
    - 3.1.2.3. Animal Farm Center
    - 3.1.2.4. Housing Complex
    - 3.1.2.5. Dairy

3.1.3. Road development
3.1.4. Irrigation
3.1.5. Drainage
3.1.6. Utilities
3.1.7.

3.2 Unanticipated short range needs.

4.0 Probable long range physical development needs.

4.1 Planning horizons
4.1.1. Twenty year plans (year 2010)
4.1.2. Ten year plans (year 2000)
4.1.3. Five year plans (year 1995)

4.2. Institutional changes requiring new facilities.
4.2.1. Educational degree granting
4.2.2. Training
4.2.3. Extension
4.2.4. Linkage strengthening (visitor increase)

4.3. Program growth requiring new facilities.
4.3.1. Research laboratories
4.3.2. Land development
4.3.3. Housing
4.3.4. Farm structures
4.3.5. Infrastructure

5.0 Action Guidelines for Implementing Master Planning System
5.1. Personnel
5.2. Training
5.3. Equipment
5.4. Procedures

IPD

6.0 • Appendices (Separate large Scale?)

6.1 Drawing existing condition

6.2. Short range plan proposals 1-5 years

6.3. Long range plan proposals 5-20 years

6.4. Computer system - hardware, software use

August 11, 1988

Memo to: Dr. Curtis Nissly
Project Officer, MART
ARD/USAID

cc: Mr. Abdul Hafeez
Janet Paz-Castillo
Dr. Bill C. Wright

From : H. James Miller
Architect/Abris Ltd.

Subject: Professional training for Aftab Ikram, NARC Executive Engineer

This memo is to provide a comprehensive, outline of a proposed six month non-degree training program in the United States for Mr. Aftab Ikram. The proposal has been approved by NARC, PARC, and the GOP. The original intent was to implement the training beginning with the fall semester at the University of Illinois. Because that is not now possible, it is recommended that the training be scheduled to begin, coinciding with the start of the spring semester mid-January 1989; and continue into summer as necessary, limited to a maximum of 6 months.

Aftab is the Executive Engineer currently in charge of all construction, operation, and maintenance at NARC. He is directly responsible to Idrees Anjum, PARC Director Works, who initiated the request for special training. The areas of training that would equip Aftab to better serve NARC are as follows:

1. Operations and maintenance management
2. Project administration and construction management. (including project scheduling and cost control)
3. Computer aided programs for the above
4. Implementation of computer controlled farm center master planning system set up by ABRIS Ltd., ARchitect.

A training program to encompass the above has been proposed that would have Aftab enrolled at the University of Illinois in Engineering or Architecture (yet to be determined) for one semester, non-degree status. It is proposed that he devote approximately one fourth of his time in regular basic computer aid construction management courses. Upto half time would be devoted to apprentice course actually within the Operation and Maintenance Division of the University of Illinois.

The final fourth of Aftab's time in the U.S. would be spent in the offices of ABRIS Ltd., learning and developing the computer system to support all of the above and doing coursework on the same computer. The major time on the computer would be devoted to the master planning system set up for the NARC farm and facilities, not only in learning it, but further developing it along with ABRIS staff.

It has been proposed that one of the many computers to be purchased from MART funds and granted to NARC be allocated for use by Aftab in his training program. When he returns to Islamabad, he would carry the same appropriately configured equipment back to Pakistan and put it into operation in his office to run Autocad and to efficiently manage the amount of memory required by the Master plan. It would be very desirable to purchase the most current model IBM which is much faster than the AT, yet is fully compatible with the other PC's owned by NARC.

Estimated costs

Travel R/T Pakistan to Champaign/Urbana Ill.	= $	_____
Monthly maintenance costs - 6x$720	= $	4200
Tuition and fees University of Illinois, Est.	= $	2000
ABRIS personnel and office costs (est max.)	= $	5400
Contigency costs, expenses?	= $	1500
Total		

Note attached possible list prices of computer hardware and software for a dedicated station for Aftab during his training. This should be paid for separately from MART funds. It is essential that computer capability be provided, otherwise the training proposal has little merit. The major tool for learning all of the things that will help Aftab, requires the computer. If necessary, a maximum can be set for the equipment costs, and compromises will be made in the extent and quality of what is purchased. Equipment and software can be purchased at or near cost through the University of Illinois for students and staff.

If a plotter is eliminated, because one will be available at NARC when Aftab returns, $9,900 can be cut from the budget. If "Autocad release 9" software will be available, another $3000 can be cut from the budget.

It is recommended that the "system unit," "graphic display hardware", and "miscellaneous items" be included because of the special of needs of the Autocad Master plan system set up by ABRIS.

With the University discounts, there is a high probability that the total costs of the equipment required could be $12,000 or less. The attached workstation costs are list prices for an optimum, complete station.

In conclusion it is well to point out that this proposed training program should be viewed as an essential component in the implementation of the NARC Physical Master Plan, and indeed as an important support element in the whole of the MART objectives. Much of the investment will be lost if this training is not provided.

[redacted] ARCHITECTS and PLANNERS 214 WEST MAIN STREET URBANA, ILLINOIS 61801

July 25, 1988

COMPUTER WORKSTATION FOR NARC.

SYSTEM UNIT.	LIST PRICE	
IBM Model 80 (8580-111) 1.44 MB Disk Drive 115 MB Hard Disk 2 MB RAM Serial Port Parallel Port Video Adapter 32 Bit Architecture, 20 MHZ Keyboard	$10,995.	
GRAPHIC DISPLAY:		
High Resolution Color Display (8574) 1024 X768 Resolution 256 Color	$ 1,550.	
Graphic Adapter Card (8514)	$ 1,290.	
Memory Expansion for 85H Adapter (4081)	270.	
MISC.		
32 Bit, 20 MHZ Math Co-Processer	$ 1,295.	
5.25 " External Disk Drive (4869)	335.	
5.25 " External Disk Drive Adapter (8560)	60.	
PS/2 Mouse (8770)	99.	
Misc. Interface Cables	50.	
PLOTTER:		
Hewlet Packard Draftsmaster I E Size Plotter	$ 9,900.	omit ?
SOFTWARE:		
DOS 4.0	150.	
Autocad Release 9	$ 3,000.	omit ?

Possible 30% discount through Univ?

CABLE: ABRIS

TELEPHONE: 217-384-0463