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Ministry of Agriculture & Land Reclamation
US Agency For Intl. Development
Agriculture Policy Reform Program
Reform Design and Implementation

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Ministry of Agriculture and Land Reclamation

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Report No. 129

Conceptual Design of the National Gene Bank



APRP

Reform Design and Implementation Unit

Development Alternatives Inc. Group: Office for Studies & Finance, National Consulting Firm Development Associates, Cargill Technical Services, The Services Group, Training Resources Group, Purdue Universities, University of Maryland

A

Report No. 129

*Conceptual Design of the
National Gene Bank*

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1. Our Past is Our Future

A wise man once said, “Our past is our future.” This is especially fitting in the context of plant genetic resources. Over the centuries, improvements in plant materials to increase yield, quality, disease resistance and myriad other characteristics originated in the plant’s genetic history—be it through plant selection, plant breeding, mutation selection or gene manipulation and splicing. The origin of the genetic information is from those materials that now exist. That is our plant genetic history, our genetic dowry.

Egypt is in the center of a unique region, geographically and politically, and is a rich source of plant genetic diversity. Many cereals, legumes, grasses and herbs originated in this region. Egypt—as a crossroads between Europe, Asia, the Middle East and Africa—has been blessed with a wide range of diversity that has found its way into locally cultivated crops and wild flora. Changes in agricultural practices, increasing urban encroachment and many other factors over the past 50 to 75 years have placed this plant genetic diversity in jeopardy.

Recognizing this, individuals and organizations in Egypt, such as the Ministry of Agriculture and Land Reclamation (MALR), have set a high priority on collecting, characterizing, preserving and utilizing Egypt’s plant genetic resources.

2. Plant Genetic Diversity and Preservation Policy

The first organized Egyptian effort to achieve this goal was a commissioned ‘German Report’ in cooperation with the German government to evaluate plant germplasm resources in Egypt. The German Report assessed the needs for conservation and management of these resources and elaborated on policy recommendations to further

Egyptian capacities for organizing, conserving and utilizing plant genetic resources.¹

The report addressed two main preservation topics: *in-situ* and *ex-situ* conservation and preservation of plant genetic materials. The information in this study is limited to *ex-situ* conservation of these materials.

The German Report contains significant facts and details on the situation and scope of plant genetic resources in Egypt. The report also provides specific policy recommendations to improve collecting, preserving and utilizing plant germplasm in the country. The overall recommendations of the report were accepted *de facto* as Egypt's policy and course of action on plant genetic diversity preservation.

The report provides a number of items that are key to developing a working plant genetic resources system in Egypt. There appear to be approximately 40,000 accessions (i.e., an identifiable sample representing a unique plant type, such as a wheat cultivar or variety) in Egypt. Approximately 50% of these accessions are located in university collections. It also appeared that there might be two to three times that number of unique genetic materials not under cultivation or held in organized collections.

While reviewing the German Report and interviewing individuals associated with this project in Egypt, it also became clear that a conceptual design of a center for the National Plant Germplasm Resources (NPGR) was needed as opposed to a Genebank, which is to be just one component of the Center. Our first task, then, was to understand and formalize the organizational structure of the National Plant Germplasm Resources Agency. (The word "Agency" is used for lack of a better term for this organization. The

¹ Appraisal Report on the Concept for A National Plant Genetic Resource Programme/Egypt, R. Schutz et al. RUDECO Ltd., 941100 Wegscheid., March 1999, Eschborn/Cairo.

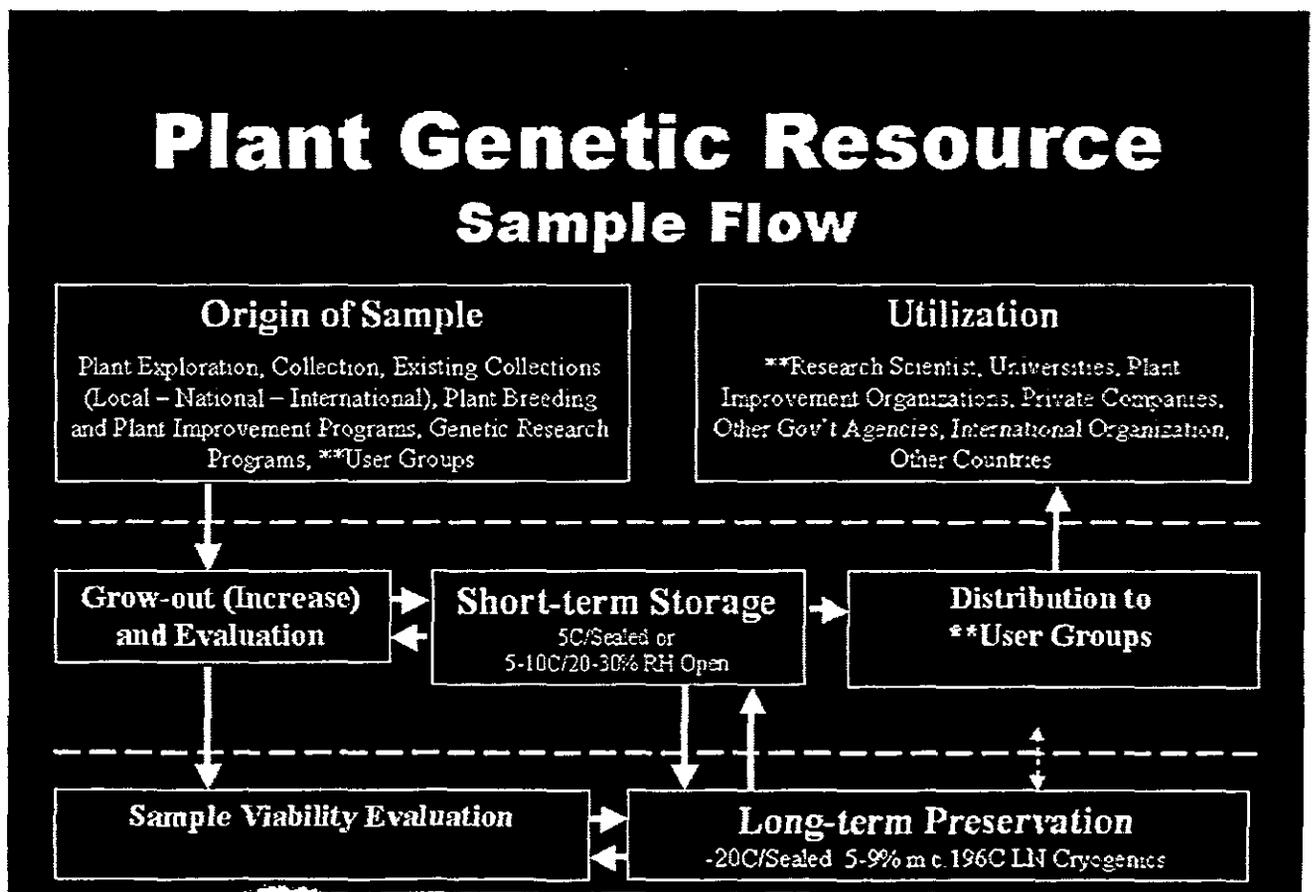
actual name of the NPGR agency has yet to be formally established by the Government of Egypt.) The Center would house a large share of the agency staff.

Clearly, the policy recommendations of this first “conceptual design review” would provide only a starting point for the Center’s actual engineering design and construction. A significant amount of interaction will be needed during the architectural and engineering design phase to clarify function and use of individual areas and systems in the Center. Many of the specifics for each room and each system will be clarified during that phase.

3. Flow of Plant Genetic Materials

In terms of developing a national plant germplasm program, Figure 1 is helpful in gaining an understanding of plant genetic resources. Germplasm can easily be thought of as a flow of genetic materials—starting with the sample’s origin from the user/scientific

Figure 1. Plant Genetic Resources – Sample Flow



community into the national system and ultimately flowing back out of the system (i.e., utilization).

There are two parts to the system: (1) the working collection/short-term storage and (2) the long-term preservation collection (i.e., Genebank). The plant materials enter the system via the working collection. The working collection's objectives are to accept material, grow and increase it as needed, collect and record evaluation data (primarily phenotypic data that increases genetic-based information). The working collection then provides temporary short-term storage of the plant materials (usually up to 5-10 years), and then distributes the materials back into the user community where they can be incorporated and used for a wide variety of scientific and commercial purposes.

Backing up the working collection is the long-term preservation, or Genebank. The Genebank's objective is to make available to future generations viable genetic material placed in their care for an infinite time period. The Genebank assists the working collections in being more effective by reducing the cost of keeping the entire collection at the working collection level.

The flow of the plant genetic materials into the national system would start with samples from plant exploration, existing collections (e.g., local, national and international sources), plant breeding and plant improvement programs, genetic research programs, and other similar user groups. The sample then enters into a working collection. The working collection is responsible for growing out, increasing and evaluating new material, providing short-term storage of the material, and distributing it to users and groups as requested. Short-term storage is accomplished, for example, by placing seed samples at 5°C in sealed containers or at 5°- 10°C and 20-30% rh in open containers.

From short-term storage, samples can be distributed to user groups to be utilized in improving plant materials. User groups would include but not be limited to research scientists, universities, plant improvement organizations, private companies, other government agencies, international organizations, etc. Any legitimate organization or individual using the material to conduct research or engage in improving plant materials would qualify as a user group.

Supporting the working collection is the long-term preservation, or Genebank. The Genebank's responsibility is to preserve the genetic materials in a viable and reusable condition and make the germplasm available for future generations. The time frame for storage in the Genebank is in the tens to hundreds of years. The Genebank tests the material for viability, prepares it for storage and places the material in an appropriate storage mode. There are two basic long-term preservation modes: 1) samples in sealed containers placed in storage at -20°C for seed at 5-9% moisture content; or 2) samples placed in cryogenic storage using liquid nitrogen storage vats at -196°C . When samples are needed from the Genebank, a sub-sample of the material would be sent to the working collection and then distributed from that site to the user community.

The working collection and Genebank work together as a team. Ideally, only 20-30% of Egypt's entire national collection would reside in the working collections. These samples would represent samples of current interest. The Genebank would possess 100% of the collection. Why this split? Simple economics—it costs less to maintain a sample at the Genebank than at a working collection. Thus, samples not of current interest can be maintained in the Genebank at a substantially lower cost. This allows the working collection to allocate limited resources to increasing, evaluating, and distributing

materials to the user community. In addition to the cost-saving benefit of keeping samples in the Genebank, the samples are also safer in terms of loss or genetic drift.

4. National Plant Germplasm Resources Agency and Center

Figure 2 illustrates the recommended structure of the agency. A description of the agency's major components and their interactions follow. Developing this structure was necessary to determine the approximate facility and support space needed, which in turn was necessary to provide a conceptual design of the NPGRA Center—the main focus of this review.

Figure 2 shows that the Director General, who reports to the Board of Directors, is responsible for the overall operation of the agency. The Director General oversees five primary working groups:

- 1) Administrative Services Group. This group is responsible for the entire agency in terms of personnel activities, social services, purchasing, engineering, building maintenance, transportation and similar activities.
- 2) Special Services. This group has an administrative head who manages approximately 13 regional coordinators. The coordinators are part of the NPGRA but are physically located throughout the major regions of Egypt where the working collections are located (e.g., the sites where the germplasm materials are handled and grown). The regional coordinator provides a vital link between the curators of local working collections and the NPGRA. The curator may or may not be a direct employee of the NPGRA. The curator could be a professor at a major university or possibly with a company in a private sector organization. The regional coordinator is an extremely important individual in terms of

making the whole system work by providing the needed continuity and cooperation between various plant germplasm groups and the NPGRA.

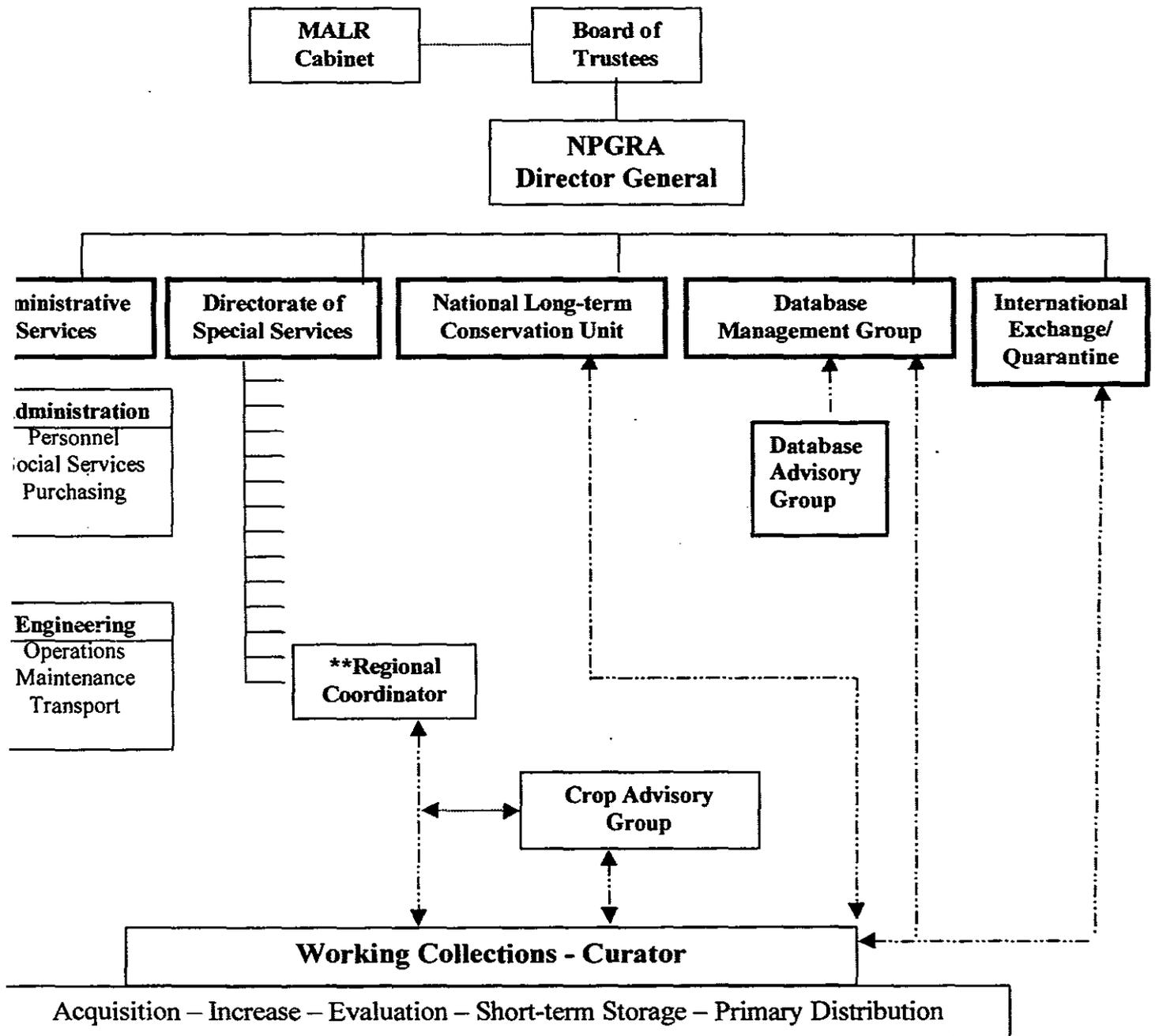
The curator is responsible for individual crops or crop groups. For instance, one curator would be responsible for wheat. The curator's responsibilities for a working collection are for the acquisition, increase, evaluation, database data entry, short-term storage, and distribution of the genetic materials back to the user groups.

3) Genebank. This group, which is part of the NPGRA, is responsible for the long-term preservation of the plant genetic materials and provides the primary backup of materials contained in the working collections.

4) Database Management Group. This group is responsible for providing the hardware, software and database superstructure for the data that is collected on the individual germplasm samples. This group is also responsible for seeing that this information is made available for distribution outside the NPGRA as directed by individual coordinators and curators. The coordinators and curators are responsible for managing the information that goes into the national germplasm database. Since the data is such an important part of germplasm, the Database Management Group has its own advisory committee comprised of individuals from other groups in the agency as well as working collection curators.

5) International Exchange and Quarantine Group. This small group facilitates the flow of germplasm within the system and to groups and individuals outside Egypt. They would facilitate the physical handling of the materials as well as administrative tasks (e.g., import/export permits of the genetic materials).

**Figure 2. - National Plant Germplasm Resources Agency
Generalized Concept of a Plant Genetic Resources Program**



5. NPGR Center Conceptual Layout

Using the organization in Figure 2 as a guide, we developed a conceptual layout of the Center delineated by functional departments. Figure 3 is an 'association' figure that physically relates the location of each department in the facility. The functional departments are as follows:

- Director General (DG)
- Special Services Coordinator (Services)
- Database Management Area (DBMU)
- Administrative Services (Admin)
- Sample Evaluation and Germination Laboratory (Genebank)
- Sample Storage Vault (Vault)
- Mechanical Equipment and HVAC (Mech)

Figure 3 was developed solely to relate one department to another and to provide a means of developing the room-by-room physical structure and requirements of the Center.

Most of the Center is comprised of general offices, conference rooms, public areas and support areas. These areas are fairly standard with few special requirements. Two areas, however, require more detail and explanation due to their purposes and specialized functional needs: (1) the plant germplasm evaluation and preparation complex (i.e., Genebank) and (2) the storage 'vault' area, where the plant germplasm samples are physically stored.

Figure 3 is a general conceptual layout of the National Plant Germplasm Resources Center. The layout is not drawn to scale and is subject to change during the design phase of the project. Figures 4 and 5 are specific conceptual layouts for the germplasm viability evaluation and sample preparation laboratory and the storage vault area, respectively. Specific rooms are summarized in Appendix 5. Appendix 6 is a detailed listing of each room, totalling almost 100. Because of its size, Appendix 6 is presented as a separate document.

Overall, there are approximately 100 rooms, laboratories, storage areas and support areas in the proposed Center. Table 3 provides a breakout of each functional group and the approximate size needed for each. About 5,678 square meters will be needed in total for the Center building. Table 4 provides a listing of the area surrounding the Center, which is about 8,505 square meters and gives a minimum site location size of 14,000-15,000 square meters.

**Figure 3. Egypt's NPGR Center
Conceptual Layout/Associations**

Parking and Entrance Area

Special Services and Coordinator	<u>Director General</u> Public Access Area		Sample Evaluation and Germination Lab Complex (<u>Genebank</u>)
Exchange & Quarantine (<u>E&Q</u>) Coordinator			
National Database Management (<u>DBMU</u>)	Break Room Area	Open Space	Storage <u>Vault</u> Complex
<u>Administrative</u> Services			
Shipping & Receiving	Security Housing		<u>Mechanical</u> Shop

Figure 4. Conceptual Long-term Storage Vault Area for NPGR Center

Backup Electrical Generator 1		Backup Electrical Generator 2		LN2 Generator with 2,000 Liter Storage	
Mechanical/ Refrigeration and Electrical/ System Controls	Vault 1 -20°C Individual Sample Storage	Vault 2 -20°C Bulk Sample Storage	Future Vault	Cryopreservation Vault LN2 Biological Storage Vats	Slow Grow Preservation 5°C Constant
Vault Ante-room (Transition from Laboratory to Vaults) 5° to 10°C Low Humidity (Less than 40%)					

The long-term storage vault area is a complex that is structurally different from the rest of the NPGR Center. Although it could be considered as a 'different' building, it must be connected to the rest of the Center to provide appropriate access, support and services. The vault should be built to withstand most natural hazards and to be fully operational for 20-30 days without any outside service input (e.g., electricity). All floors, walls and ceilings are to be constructed of solid reinforced concrete with exterior walls being 12"- 18" thick and interior walls 8"- 12" thick. The architectural and engineering firm should conduct a risk assessment to provide specific recommendations for wall construction. The study should include risks of fire, flooding (i.e., internal systems and external sources such as surface flooding), earthquakes, severe storms, wind, blowing sand, extreme temperatures, physical affronts (e.g., high-speed automobile traffic, civil unrest, random vandalism) and other local factors that may interfere or cause significant damage to the Center.

Each of the above areas is to be a separate room, connected only by appropriately secured doorways. This separate 'cell' approach to the construction will provide high levels of security and safety for the plant germplasm stored in this area.

This vault area has the highest level of security (i.e., Level 3) and limited access. Only laboratory personnel and escorted guests are allowed into this area and are usually restricted to entry during working hours only. Access to vaults from the laboratory area is through an anteroom.

Construction of this area should be such that future additional sample storage spaces could be added.

Figure 5. Conceptual Design for Genebank Laboratory and

Support Area

NPGR Center - Egypt

Genebank Data/Information Offices	Hallway	Genebank Sample Records Room
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Sterilization Room	Culture Room Short-term Slow Growth	In-Vitro Culture Preparation Laboratory	Cryopreparation Laboratory	Sample Packaging Laboratory	To Vault Access Area	Sample Cleaning Laboratory	Spare Laboratory	
	Hallway	Hallway						
Wash and Sterilization Room		Accession Evaluation Area Open/ High Ceilings Indirect Natural Sunlight			Short-term – 20°C holding chamber Sample Drying (2) 5°C 20% RH	Quarantine Laboratory	Acquisition and Sample Checking Laboratory	
		Hallway						
Women's bathroom	Men's Bathroom	Conference Room	Germination Lab Supervisor	Copy Room/Files	Visiting Scientist	Visiting Scientist	Secretary Genebank	Head Genebank

The germination laboratory area (i.e., Genebank) provides administration, support, and laboratories to accept, process, evaluate sample viability, prepare for storage, and provide temporary storage of germplasm samples, both seed and vegetative. Access to the vault area is available only through the Genebank, thus providing a passive security screen for entry into the restricted vault area. Rooms are arranged to demonstrate room/laboratory associations and are not drawn to scale. Detailed explanations and dimensions of each room are provided in the appropriate tables in this report.

Table 1. Room Schedule Summary By Functional Group

**Proposed Rooms in the NPGR Center
(Detailed Room Specifications are listed in the Appendix)**

Functional Group	Code	Total Number of Rooms	Total Area (sq.ft.)	Approximate Size in sq. meters
Administrative Support	Admin	12	9,661	1,040
Database Management Unit	DBMU	10	2,495	269
Main office and support staff for the Director General of the NPGRS	Director General	18	7,399	796
Plant Material Exchange and Quarantine Coordination Office	E & Q	6	1,032	111
Germination and Evaluation Laboratory and Support Areas	Gene Bank	28	9,661	1,040
HVAC, Electrical and Similar Rooms	Mechanical	6	7,120	466
General Service Areas for the Center	Services	5	1,068	115
Storage Vault Area for Germplasm and Support Areas	Vault	12	6,629	714
Building Subtotal			52,185	5,678

Note: All dimensions are approximate, subject to change, and represent inside wall dimensions.

Description of Notations:

Standard Office Furniture: Office desk, chair, bookcase, filing cabinet, extra chair, computer desk, printer stand, and telephone.

Fresh Air Makeup: This number is a percentage and represents the amount of filtered outside fresh air that is added to the interior air being recycled.

Security Level: There are three security levels in the Center:

- Level 1 is open to the general public during normal working hours. Guests need not be escorted.
- Level 2 is open to the general public, but a Center staff member must escort visitors.
- Level 2 and Level 3 security areas are to be secured at all times by locked entry doors accessible only by Center staff using either a PIN code or card entry security system.
- Level 3 security is for the vault area. A Center staff member with clearance to enter the vault area must escort the general public. The vault area should have restricted entry to access doors. Level 3 security areas can be entered only through Level 2 security areas. The entire Center will be secured during non-working hours and protected by an active motion and entry detection system.

6. Area Surrounding the Proposed NPGR Center

During the site selection and design phases of this project, the areas surrounding the Center building (Table 2) must be considered. The sizes of these areas are estimates. Most are self explanatory except for the “Buffer Zone”. This is an area around the building that must be kept free of any fixed objects and should be wide enough to

accommodate service and emergency vehicles. Surrounding the buffer zone should be some sort of security or restricted entry fence (or preferably, a wall).

Table 2. Areas Surrounding the NPGR Center

Surrounding Area	Size (sq. meters)
Landscaping	1,615
Parking	1,292
Buffer Zone	2153
Future Additions	2,153
Roads & Others	1,292
Sub-Total for Area Surrounding the NPGR Center	8,505

7. NPGR Center Development Timeline

1. Preliminary Evaluation – German Report
2. Development of National Objectives
Conceptual Design – (Current Study)
3. Architectural and Engineering Design
4. Construction: Architectural and Engineering Drawings and Specifications
5. Construction Cost Estimates
6. General Contractor – Construction
7. Commissioning of Center
8. Training of Center Staff
9. Development of Working Collections (i.e., sites, policies, staffing)

Developing Egypt's national plant germplasm agency and center should follow a specific line of events. The German Report set the technical stage, which then led to developing an overall national priority that set objectives for plant germplasm conservation. This project addresses the conceptual design of the agency and a center to

house the fundamental agency staff and operations. From these conceptual plans, an architectural and engineering firm will develop construction plans, specifications and cost estimates. Those documents will then be used to bid on the construction of the Center. Following the construction will be the commissioning of the facility and its mechanical systems, followed by training of the Center staff.

Once the Center has been established and is staffed and operating, the focus will then shift to developing the field working collections.

Appendix 1

Overview of the National Plant Genetic Resources Program

● **National Plant Genetic Resources Program**

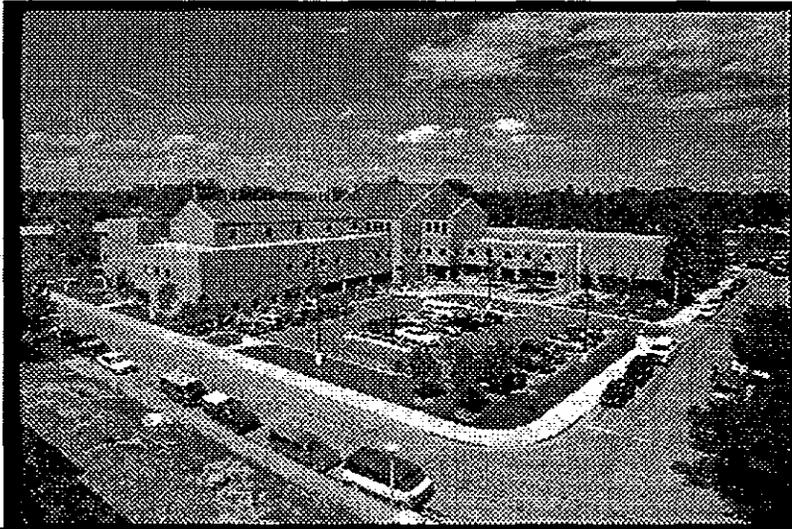
Republic of Egypt

Phillip C. Stanwood Ph.D.

- Retired from 30 years germplasm research – cryopreservation
- Soil Conservation Work
- Managed a Research Farm (Breeders, Increase, Foundation and Production of Grass Seed)
- Assisted GeneBanks in Canada, China, India, Saudi Arabia and others

1514 Perdita Ln, Lincoln, CA 95648 phils@rsi-web.com

National Seed Storage Laboratory, USA



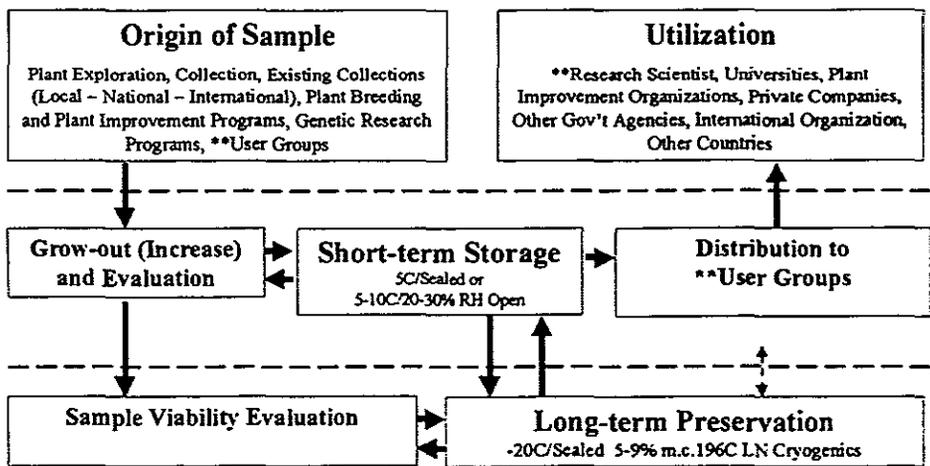
Consultancy Objectives DAI - USAid - MALR

- Review the GTZ 'German' Report
- Provide Conceptual Plans for NPGR 'Center'
- Present Findings
- Plans for Future Work

Plant Genetic Resource Sample Flow

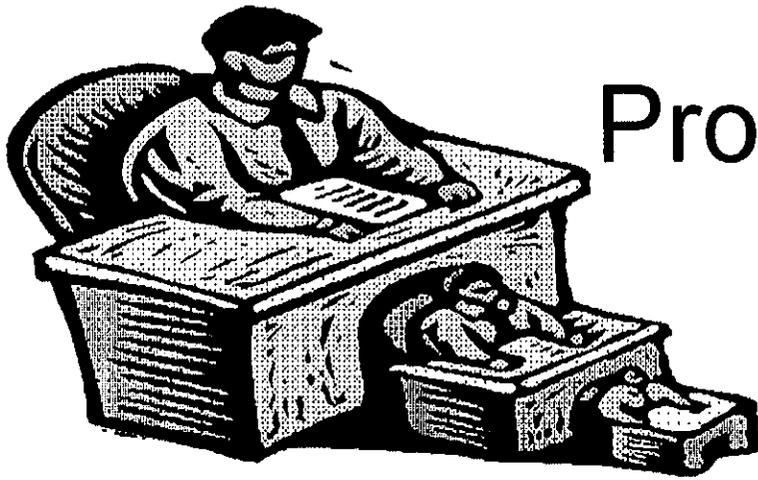


Plant Genetic Resource Sample Flow



Appendix 2

Program Components of the National Plant Genetic Resources Program



Program Components:

An autonomous NPGR Central Agency

attached to:

MALR at cabinet level and has a high degree of autonomy in financial and staff development.

A network of satellites

representing :

different organizations, active communities and beneficiaries

Linked to :

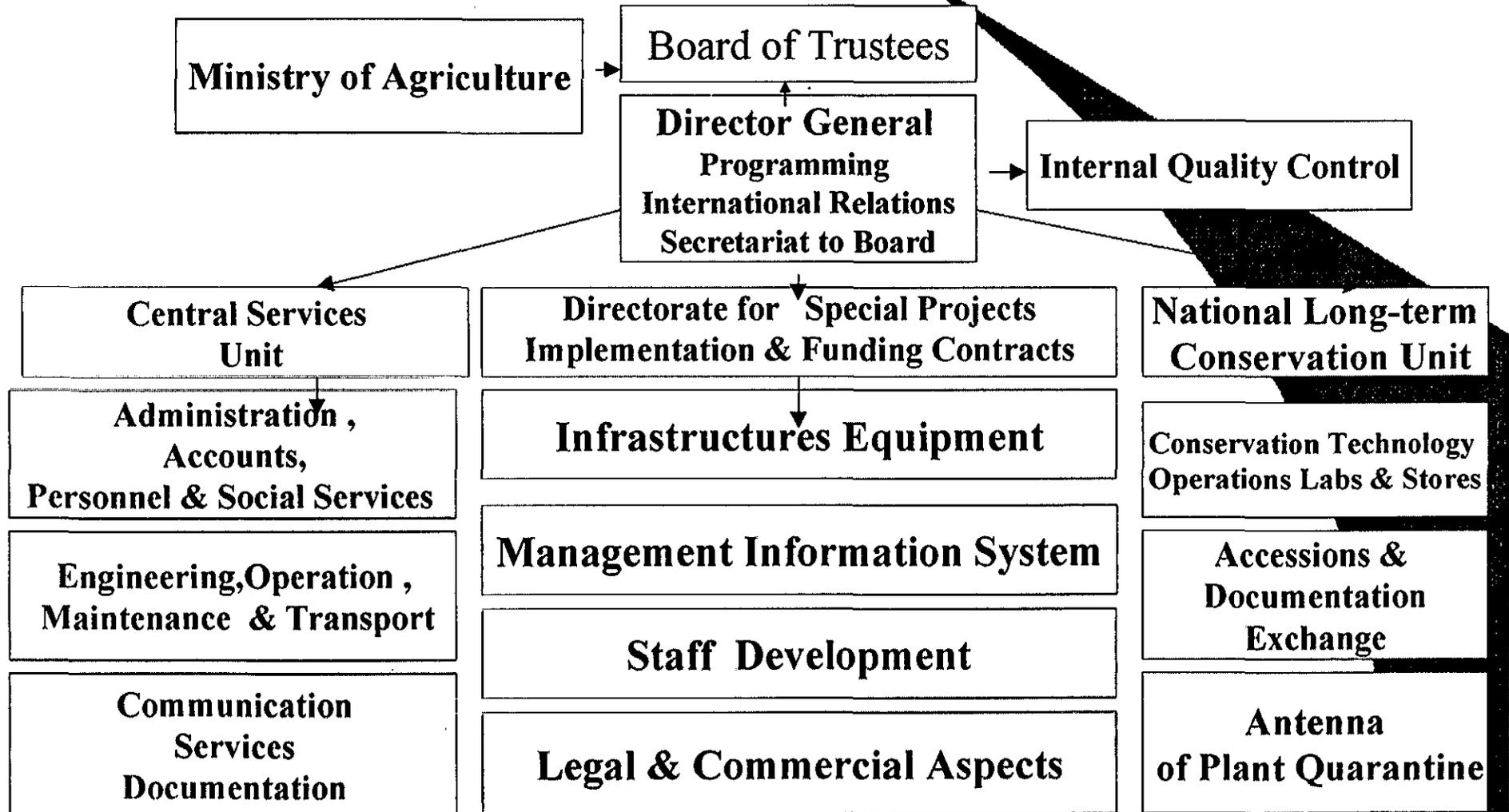
The Central Agency by special projects tend to be based on commercial service contracts.

Appraisal Report

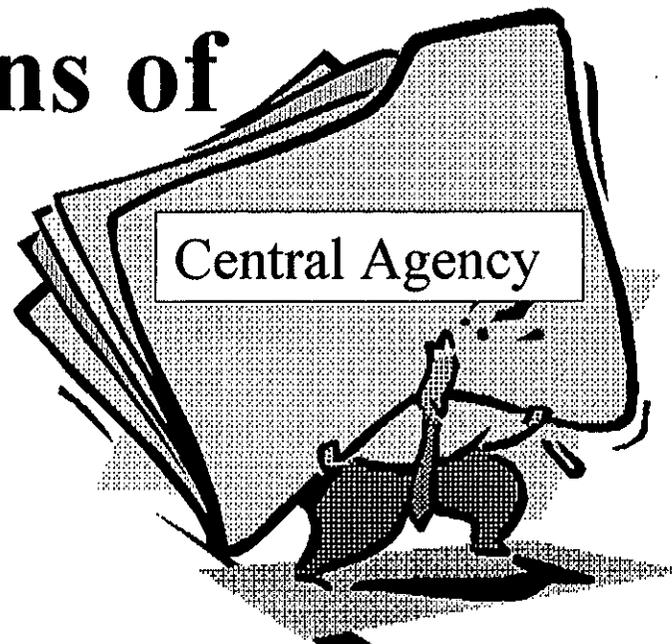
For

A National Plant Genetic Resources Program in Egypt

Organization Chart

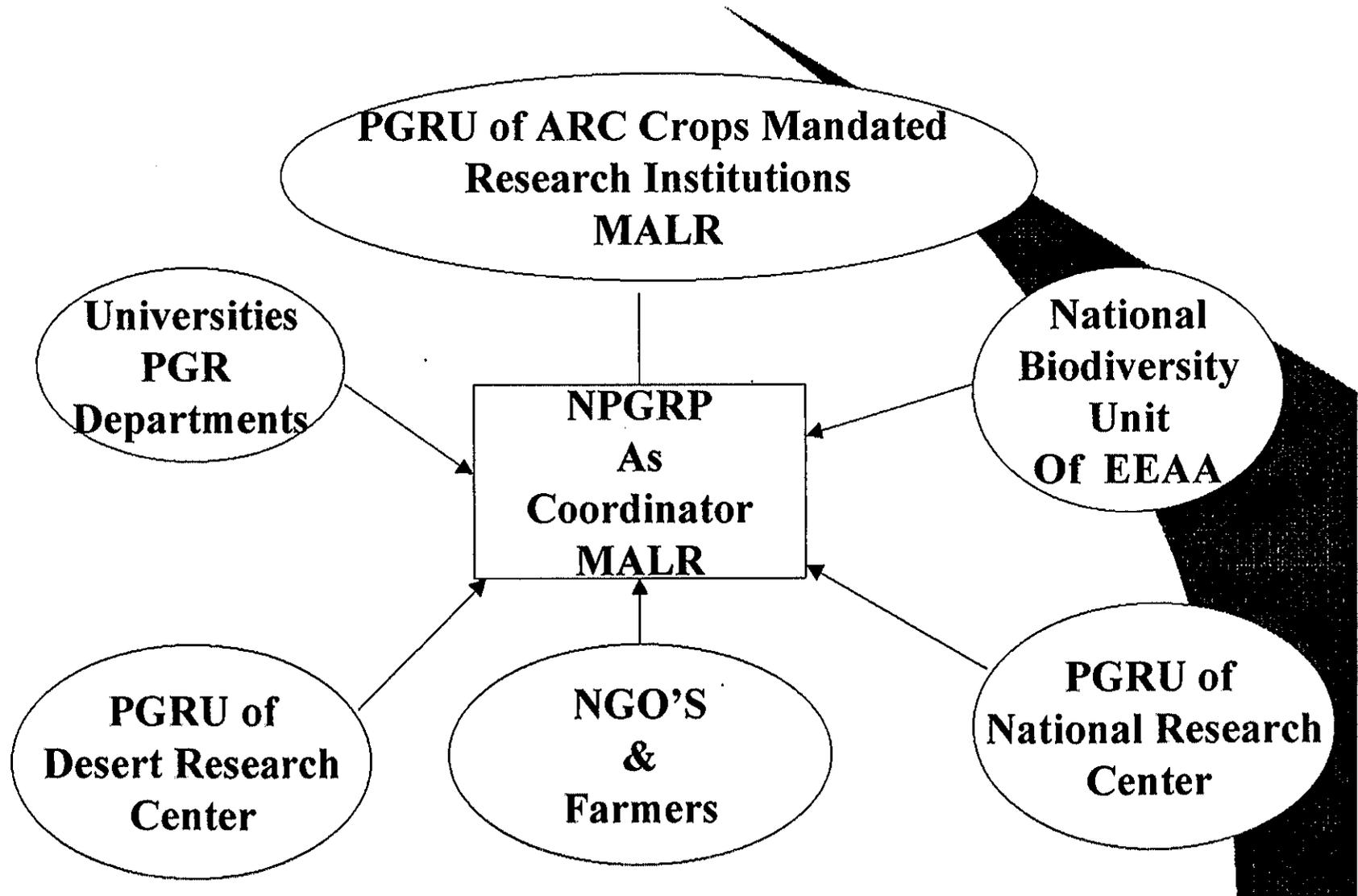


Functions of

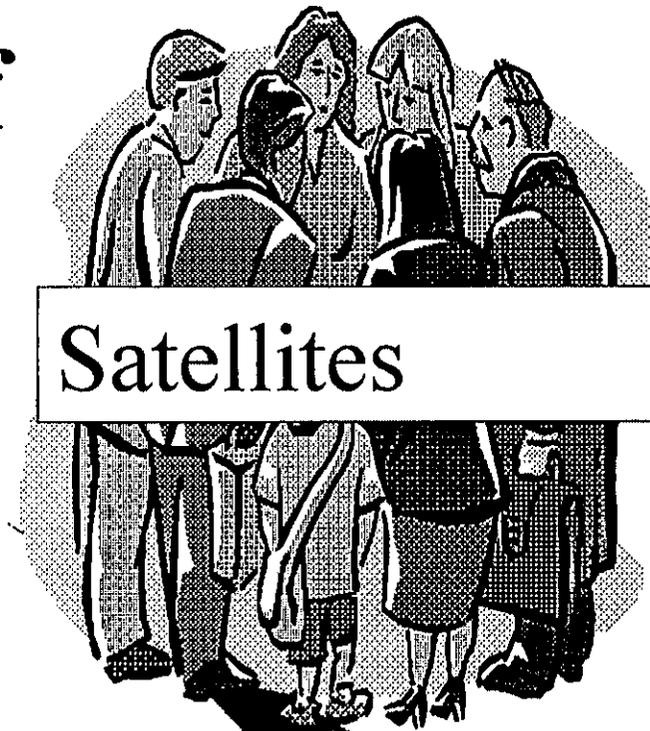


- Operate the national long-term conservation facilities
- Act as a clearinghouse for national & international permit exchange
- Act as an advisory body for satellite institutions on the utilization of data documentation, conservative & use activities
- Acquire national & international co-funding for Environment related projects
- Coordinate and supervise the implementation of satellite activities

PGR Network in Egypt

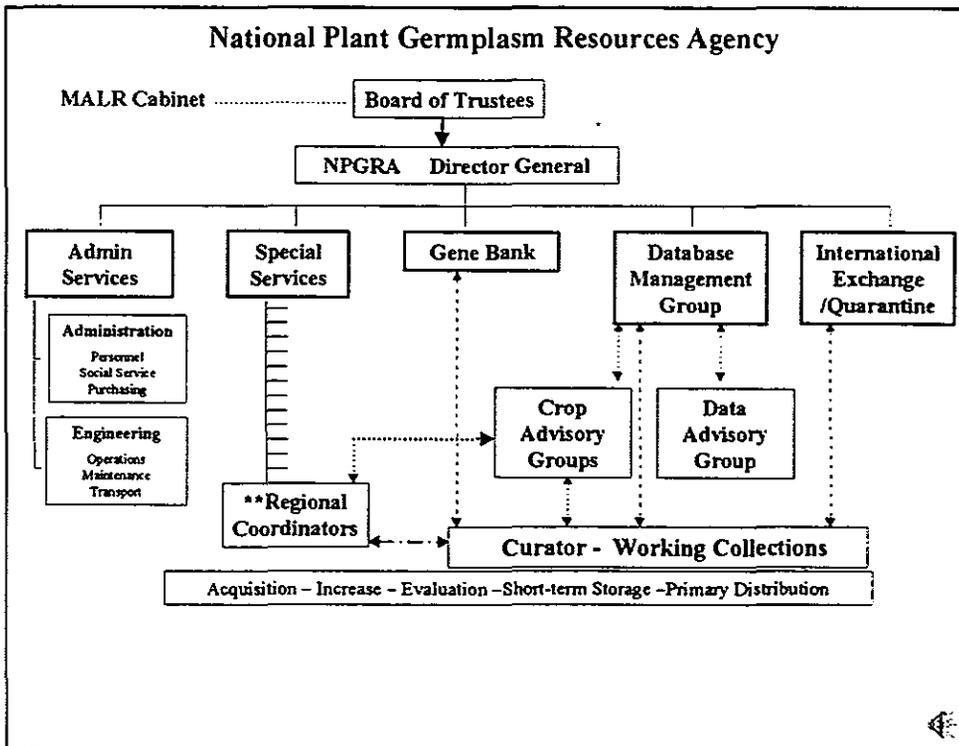


Functions of



Satellites

- **Germplasm collecting missions**
- **Maintenance of active collections**
- **Characterization/evaluation of germplasm**
- **Regeneration of plant material**



Crop Germplasm Advisory Committees

- Public & Private Sector representing various scientific disciplines and geographical locations.
- Identify gaps in Egyptian collections and proposals to fill those gaps
- Prioritize evaluation traits/DB mgt.
- Assist in regeneration/quarantine
- Identify sources of germplasm

Crop Germplasm Advisory Committees

- Assist curator in identifying duplicate samples
- Assist curator and DBMU in correcting passport data.
- Assist in germplasm collection activities
- Provide other technical advice to crop curator



NPGR Center - Egypt Conceptual Layout/Associations

Special Services and Coordinator Area	Director Public Access Area		GermLab Area
National Database Management Area	Break Room Area	Open Area	Storage Vault Area
Administrative Services Area			
Shipping Receiving Area	Security Housing Area		Mechanical Shop Area

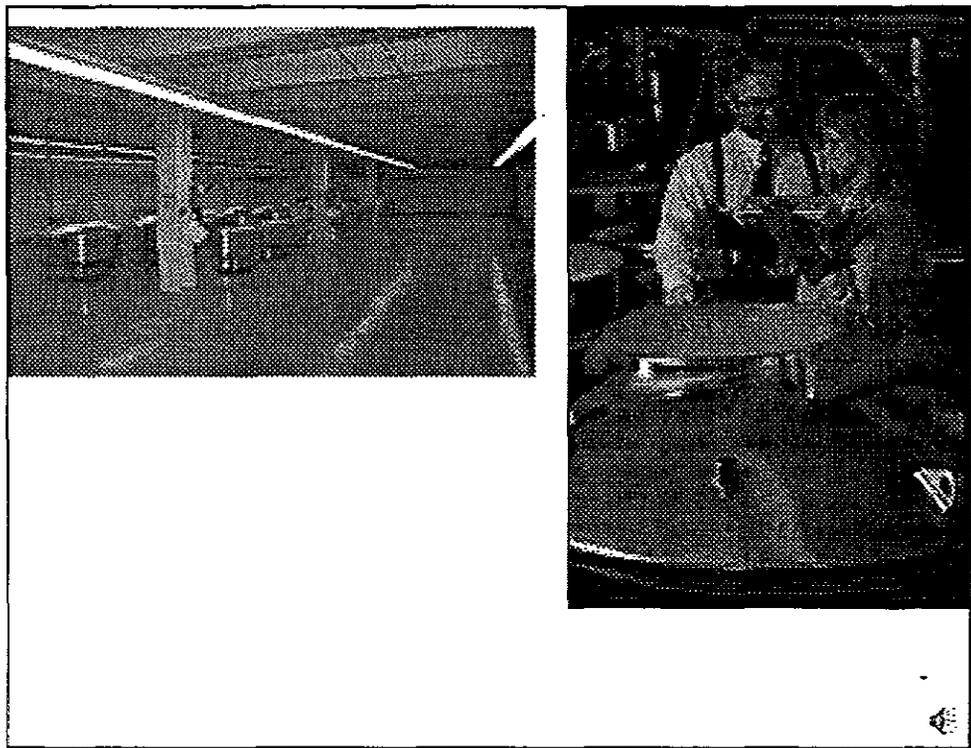
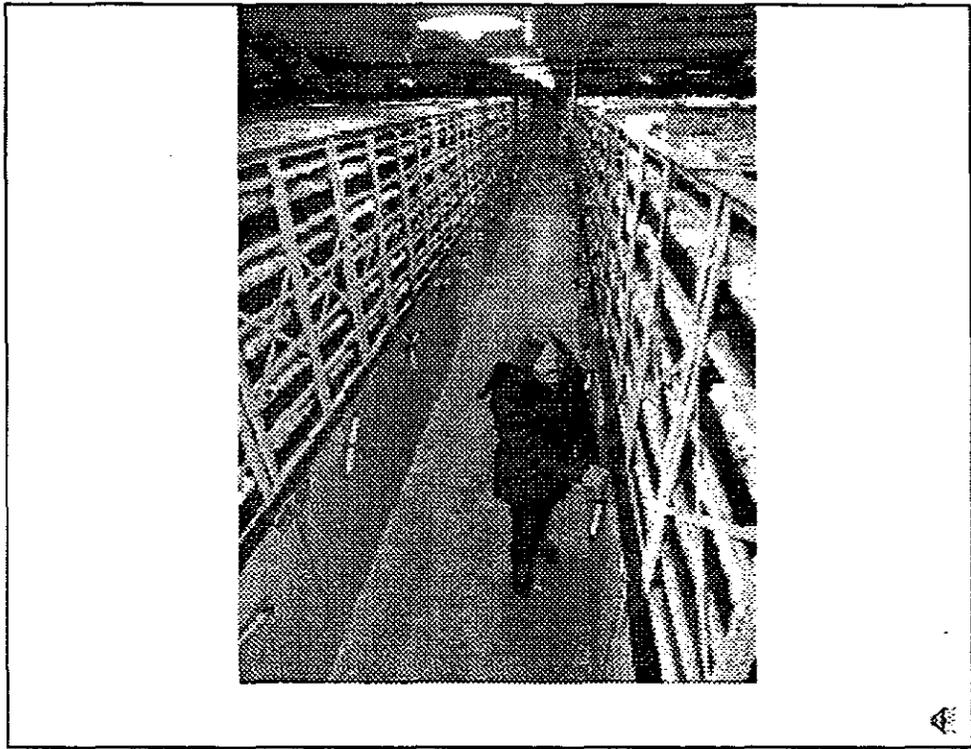


Conceptual Long-term Storage Vault Area NPGR Center - Egypt

Backup Electrical Generator (2)				LN2 Generator with 2,000 liter storage	
Mechanical Refrig and Electrical and System Controls	Vault 1 -20C Individual Sample Storage	Vault 2 -20C Bulk Sample Storage	Future Vault	Cryopresers Vault LN2 Biological Storage Vats	Slow Grow Preserve 5C Constant
Vault Ante-room Transition from Laboratory to Vaults 5 to 10C Low Humidity (Less than 40%)					

Sample Storage Trays

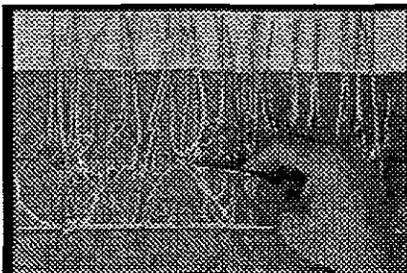




Genebank Laboratory

Germinator Room	Culture Room Slow Growth	In-Vitro Culture Prep Lab	Cryo Laboratory	Sample Packaging Lab	To Vault Access Area	Sample Cleaning Laboratory	Spare Lab	
	Hallway	Hallway						
Wash and Sterilization Room		Accession Evaluation Area Open High Ceilings Indirect Natural Sunlight	Short-term -20C holding chamber	Quarantine Lab	Acq and Sample Checking Lab			
			Drying (2) 5C 20% RH					
	Hallway							
Women's WC	Men's WC	Conference Room	GermLab Supervisor	Copy Room/File	Visiting Scientist	Visiting Scientist	Secretary Genebank	Head Genebank

Seed & Vegetative Preparation for Storage



NPGR "Center" Development

- Preliminary Evaluation
- National Objectives
- **Conceptual Design**
- A&E Design
- Const. Specs.
- Const. Drawings
- Cost Estimates
- General Contractor – Construction
- Commissions of Center
- Training
- Development of Working Collections



Appendix 3

Crop Germplasm Advisory Committees

Appendix 3. Crop Germplasm Advisory Committees

The Crop Germplasm Advisory Committee (CGAC) is a generic name for a specific national working group of specialists providing analysis, data and recommendations on genetic resources within a specific crop or group of related crops that are of present or future economic importance. The CGAC acts as an advisory group to the specific crop curator and NPGRA coordinator for a given crop.

These committees represent their user communities. Their membership consists of representation from public and private sectors; representation from various scientific disciplines; and geographical representation for the crop(s).

Crop Germplasm Advisory Committees are concerned with the following critical issues facing the NPGRA:

1. Identifying gaps in Egyptian collections and developing proposals to fill these gaps through exchange and collaborative collecting trips.
2. Assisting crop curators in identifying duplication within the collections.
3. Prioritizing traits for evaluation and developing proposals to implement the evaluations.
4. Assisting crop curators and data management personnel in correcting passport data and ensuring that standardized, accurate and useful information is entered into the Egyptian plant germplasm database.
5. Assisting in germplasm regeneration projects.
6. Identifying closed-out programs and other germplasm collections in danger of being lost and developing plans to rescue the important material from these programs.

7. Working with quarantine officials to identify and ensure new techniques for pathogen identification that will assist in the expeditious release of plant germplasm.
8. Maintaining current reports on the status of their crops for the key individuals and organizations involved with the NPGRA.

Appendix 4

Minimum Selection Criteria for the Proposed Architectural and Engineering Design Company

Appendix 4. Architectural and Engineering Design Company - Minimum Selection Criteria for the Proposed Egyptian Plant Genetic Resources Central Facility

The development of the central facilities for the Egyptian Plant Genetic Resources Agency follows a series of steps. The process starts with a conceptual design of the facility, component function, and organization/specifications of individual rooms and building systems. With this information an architectural and engineering design firm will be selected to provide the specific engineering and architectural drawings, book of specifications and cost estimates. These documents are then used to bid the contract to a general contractor who would construct the building as well as install and commission critical facility systems.

The following is a list of minimum selection criteria for the architectural and engineering design firm.

A. Demonstrate internal capability to provide:

- 1) site design, site feasibility and soil investigations. This would include landscape design.
- 2) architectural, foundation, interior, sanitary, water supply, sewage, and electrical, mechanical, heating/ventilation/air conditioning design drawings and written specifications.
- 3) construction cost estimates.
- 4) on-site supervision of construction to ensure confirmation to drawings and specifications and to generally represent the government's interest during the construction phase of the facility.

B. Within the last three years, the architectural and engineering design firm should have designed five projects that include office, mechanical, research laboratory and public access/conference areas that have a building construction cost exceeding 15 million L.E.

C. Demonstrated financial stability.

During the design phase, a minimum of two major reviews and approvals to proceed with planning should be scheduled. The first review should be conducted when the physical layout and the exterior design of the Center have been completed. The second major review should be performed when the HVAC, electrical, plumbing, phone and LAN plans have been completed. This normally occurs around the time that 75% of the plan has been completed. This review should also include all technical specifications done to date. Design work should not significantly proceed until this review has been completed and approved by the appropriate MALR contracting agent.

The last review is done upon completion of all of the drawings, specifications and cost estimates. Final changes are made at this point. The completed plans and drawings as modified at this review are submitted for final approval by MALR.

Appendix 5
NPGR Room Schedule
Tabular Summary Listing

Appendix 5

Room Schedule – Tabular Summary Listing

National Plant Germplasm Resources Center (NPGR)

Egypt

This appendix is a summary tabular listing, room by room, of the proposed NPGR Center for Egypt. “Rm ID” has no particular significance except to easily index and cross reference the room to other documents associated with the conceptual design of this facility. This suggested room schedule is subject to review and change before being submitted to an architectural and engineering firm for construction specifications and associated drawings.

Note: Full room details can be found in Appendix 6.

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NPGR Center - Room Schedule- Tabular Report

<i>Description/Purpose</i>	<i>ID</i>	<i>Group</i>	<i>Size</i>	<i>Notes</i>
Transport Assistant Office	70	Admin	12 x 12 x 10	Conference table and chairs for 10 people plus std. AV equipment
Head Admin Support Office	33	Admin	15 x 15 x 10	Std. Office Furniture plus small table with 4 chairs
Personnel Assistant - Office	35	Admin	12 x 12 x 10	Std. Office Furniture
Personnel Assistant - Office	36	Admin	12 x 12 x 10	Std. Office Furniture
Social Services Assistant - Office	37	Admin	12 x 12 x 10	Std. Office Furniture
Secretary - Office - Admin Services	34	Admin	12 x 12 x 10	Std. Office Furniture
Maintenance Assistant Office	69	Admin	12 x 12 x 10	Std. Office Furniture
Purchasing Assistant - Office	39	Admin	12 x 12 x 10	Std. Office Furniture
Operations Assistant - Office	40	Admin	12 x 12 x 10	Std. Office Furniture
Conference Room - Admin Services	42	Admin	20 x 20 x 10	Small conference room for 10-15 people
Purchasing Assistant - Office	41	Admin	12 x 12 x 10	Std. Office Furniture
Social Services Assistant - Office	38	Admin	12 x 12 x 10	Std. Office Furniture

<i>Description/Purpose</i>	<i>ID</i>	<i>Group</i>	<i>Size</i>	<i>Notes</i>
Secretary Office - DBMU	18	DBMU	12 x 12 x 10	Std. Office Furniture
Conference Room	66	DBMU	20 x 20 x 10	This room is for working conferences and should be arranged for approximately 20 people at writing desks. Extra electrical outlets should be provided at each desk for connection of laptops and similar supplemental equipment. The room should have all the standard display equipment (e.g., digital projectors, overhead projectors, slide projectors, screens, whiteboard, etc.).
Head DBMU Office	17	DBMU	15 x 15 x 10	Std. Office Furniture
DBMU Staff Office - 2	23	DBMU	12 x 12 x 10	Std. Office Furniture
Copy/Filing Room - DBMU	19	DBMU	20 x 20 x 10	Filing cabinets for hard copy backup of records. Fire safe cabinet for storage of backup data tapes and disks.
DBMU Multi-purpose Office	25	DBMU	Approx. 15 x 30 x 10 total for 6 work areas.	Std. Office Furniture
Central Computer Hardware - DBMU	20	DBMU	15 x 20 x 10	This room will house the LAN computer, database computer, LAN hub, primary connection to the internet with appropriate firewall equipment and peripheral equipment (e.g., printers and multi-disk array systems). The room should be sound proof. The floor should be a raised false floor to accommodate computer wire connections. This room should also be fire protected with a system designed specifically for computer rooms. The LAN hub system will be a 'star' system, so this room should be as centrally located as possible. This room should be closely associated with the DBMU staff offices and have limited access.

<i>Description/Purpose</i>	<i>ID</i>	<i>Group</i>	<i>Size</i>	<i>Notes</i>
DBMU Staff Office - 1	21	DBMU	12 x 12 x 10	Std. Office Furniture
DBMU Staff Office - 2	22	DBMU	12 x 12 x 8	Std. Office Furniture
DBMU Staff Office - 3	24	DBMU	12 x 12 x 10	Std. Office Furniture
Main Conference Room	7	Director General	Large enough for 100 people	This room should be designed and equipped to provide general lectures, meetings, symposia and similar events. A projection room, translator room, supply room and refreshment serving room should be included. Specific A/V, computer, internet, lighting, soundproofing, seating requirements to be recommended by the A/E firm during the design phase with guidance and approval from the PGR official design representative(s). This room will be in a public area security zone.
Visiting Scientist - Office	32	Director General	12 x 12 x 10	Std. Office Furniture
Office - PGR Director General	1	Director General	15 x 20x 10	Std. Office Furniture
Copy/Mail/Filing	3	Director General	15 x 15 x 10	Room for Center fax, mail, copy machine, office supplies, general filing. Associated directly to Room 2, Secretary to the Director General.
Prayer Room - Nondenominational	63	Director General	12 x 18 x 10	This room should be in a quiet area away from heavy pedestrian traffic and easily accessible from all parts of the Center.
Visiting Scientist - Office	62	Director General	12 x 12 x 10	Std. Office Furniture
Secretary to Director General	2	Director General	12 x 12 x 10	Std. Office Furniture

<i>Description/Purpose</i>	<i>ID</i>	<i>Group</i>	<i>Size</i>	<i>Notes</i>
Library	10	Director General	15 x 20 x 10	This is a general library for the Center. It should be closely aligned with the General Director's Office.
Security Housing	97	Director General	To Be Determined	Std. Office Furniture
Security Office	96	Director General	15 x 15 x 10	Std. Office Furniture
Visiting Scientist - Office	30	Director General	12 x 12 x 10	Std. Office Furniture
Receptionist Office for General Public	4	Director General	12 x 12 x 10	This office acts as a receptionist office for the general public and secondary emergency operations office for fire, security and special service alarms. To be located at main lobby entrance, behind security window and locked door. Associated next to main public lobby.
Public Lobby/Entrance	5	Director General	30 x 30 x 18	Security - Open during working hours, locked with security monitor during non-work hours. Room to be visible from outside. Special interior design with theme promoting plant genetic diversity in Egypt.
Public Relations Specialist	6	Director General	12 x 12 x 10	Office to be associated next to or near the Director General's Office. Std. Office Furniture

<i>Description/Purpose</i>	<i>ID</i>	<i>Group</i>	<i>Size</i>	<i>Notes</i>
Employee Break room	11	Director General	20 x 40 x 10	This should be a light and airy room with an associated vending/food preparation room and general cleanup sink in the main room. The room to be equipped with chairs and tables to site approximately 30 people. The room should be centrally located away from laboratories and busy pedestrian areas. The food preparation area should have a stove, oven, refrigerator, microwave, sink and cabinets for plates, pots, pans and utensils.
Visiting Scientist - Office	31	Director General	12 x 12 x 10	Std. Office Furniture
Women's Restroom	8	Director General	As appropriate for 5 individuals	Restroom to be closely associated with the General Conference Room and Men's Restroom.
Men's Restroom	9	Director General	As appropriate for 5 individuals	Restroom to be closely associated with the General Conference Room and Women's Restroom.
Head - E&Q Office	26	E & Q	15 x 15 x 10	E & Q - Exchange and Quarantine Std. Office Furniture plus a small conference table and 4 chairs.
Germplasm Exchange Specialist Office	28	E & Q	12 x 12 x 10	Std. Office Furniture
Secretary - E&Q Office	27	E & Q	15 x 15 x 10	Std. Office Furniture
Quarantine Specialist - Office	29	E & Q	12 x 12 x 10	Std. Office Furniture
Files/Records/Copy Room	67	E & Q	10 x 15 x 10	This is the records and documents room for the Exchange and Quarantine Office in the NPGR Center.

<i>Description/Purpose</i>	<i>ID</i>	<i>Group</i>	<i>Size</i>	<i>Notes</i>
Visiting Scientist Office	68	E & Q	12 x 12 x 10	Std. Office Furniture
Secretary, Genebank - Office	44	Genebank	12 x 12 x 10	Std. Office Furniture
Conference Rm - Genebank	45	Genebank	20 x 20 x 10	This conference room should be equipped with a large conference table with 15 chairs and A/V equipment for presentations and small seminars.
Men's Restroom	82	Genebank	As needed	This restroom should have showers and lockers in addition to standard facilities. The showers are for safety reasons.
Supplies Room for Labs.	72	Genebank	15 x 15 x 10	This is a room to store general supplies needed for germplasm viability testing and packaging.
Viability Monitoring Laboratory	88	Genebank	40 x 40 x 18	This room is used as the primary location for testing viability of germplasm samples, mostly seed. Special workstations are to be designed (specific details of each workstation to be determined later). Each station will have normal electrical and phone requirements, plus LAN connections and a need for a vacuum line and special air handling to remove airborne dust at each station. This room must be centrally located to all operations in the Genebank area, in addition to having natural, indirect sunlight.
Sample Cleaning Laboratory	90	Genebank	12 x 18 x 10	This is a laboratory where germplasm materials are cleaned, if necessary. This room is subjected to an abnormal amount of dust and thus requires a special vacuum system to collect and filter the dust. Specialized cleaning equipment that will connect with the vacuum system has yet to be determined.

<i>Description/Purpose</i>	<i>ID</i>	<i>Group</i>	<i>Size</i>	<i>Notes</i>
Head Genebank - Office	43	Genebank	15 x 15 x 10	Std. Office Furniture
Vault and Laboratory Equipment Monitoring	89	Genebank	12 x 10 x 10	This room is designed to hold electronic monitoring equipment for the Genebank and Vault areas.
Records Room - Data	59	Genebank	15 x 20 x 10	A general room for records, filing cabinets and copy equipment.
Wash & Sterilization Room	81	Genebank	15 x 20 x 10	This room is to wash and sterilize small laboratory equipment, trays and germinators. The room should be equipped with floor drains, hot and cold water, and steam.
Supervisor Viability Monitoring - Office	61	Genebank	12 x 12 x 10	Std. Office Furniture
Short-term -20°C Chamber	83	Genebank	10 x 15 x 8	The room is designed to be a short-term holding area for seed materials. It should be equipped with racks so that trays of seed can be easily placed and identified. This chamber should be close to the seed evaluation area.
Short-term 5°C Storage Chamber	84	Genebank	10 x 15 x 8	This is a short-term chamber running at 5°C. Humidity is kept at 20% RH plus/minus 5% to nominal.
Visiting Scientist Office	85	Genebank	12 x 12 x 10	Std. Office Furniture
Visiting Scientist Office	86	Genebank	12 x 12 x 10	Std. Office Furniture
File/Copy/Supply Room	71	Genebank	8 x 10 x 10	This room is for storage of office supplies, plus filing cabinets and a copy machine.

<i>Description/Purpose</i>	<i>ID</i>	<i>Group</i>	<i>Size</i>	<i>Notes</i>
Visiting Scientist Office	87	Genebank	12 x 12 x 10	Std. Office Furniture
Geminator Room	80	Genebank	20 x 30 x 10	Large enough for 15-20 stand-alone germinators, culture chambers. This room will have abnormally high heat loads and electrical outlet requirements. Loads to be determined.
In-vitro Conservation Pre-Lab	57	Genebank	20 x 20 x 10	Specialized laboratory for preparing samples for in-vitro long-term conservation. The lab is equipped with standard laboratory benches.
Acquisition Lab	46	Genebank	20 x 20 x 10	This is a general laboratory with laboratory benches. This laboratory will be used to start the in-processing of new germplasm samples.
Health & Quarantine Lab	47	Genebank	20 x 20 x 10	This is a special lab that has a fume hood capable of handling dusty material. The lab is also equipped with laboratory benches. Electrical and similar services to be determined.
Drying Room - 2	49	Genebank	15 x 20 x 10	This room is to be used to adjust seed moisture content. Seed is placed in this room open to the chamber atmosphere and allowed to equilibrate to 20% RH. This room should have internal air flow capability (e.g., fans) to keep the environment equal throughout equilibration and to promote equilibration with good air exchange.
Packaging Room	50	Genebank	20 x 20 x 10	This is a standard laboratory with benches. Small lab. Top equipment should be used for the packaging of materials for long-term preserve.

<i>Description/Purpose</i>	<i>ID</i>	<i>Group</i>	<i>Size</i>	<i>Notes</i>
Cryopreservation Preparation	56	Genebank	20 x 20 x 10	This is a general laboratory used to prepare samples for long-term cryopreservation.
General Laboratory	51	Genebank	20 x 30 x 10	This is a general laboratory used for specialized viability testing methods. This room is to be equipped with standard laboratory benches.
In-Vitro Conservation Growth Room	58	Genebank	10 x 20 x 8	This is a prefabricated chamber designed for growing plant cultures and vegetative material. Materials in this chamber are to be held for short periods of time (less than one year).
Drying Room - 1	48	Genebank	15 x 20 x 10	This is a room designed to equilibrate moisture content for incoming samples.
Data Processing Room	79	Genebank	15 x 25 x 10	Room for 5 computer stations.
Electrical Power Distribution	13	Mechanical	Approx. 6 x 15 x 10	This room houses the main electrical distribution panels and fuse switching. It should be centrally located and closely aligned with the step-down transformer room and germplasm vault area.
Shipping/Receiving	16	Mechanical	20 x 30 x 10	A general maintenance shop to maintain building mechanical equipment.
Vehicle Garage	65	Mechanical	As needed for 3-5 vehicles	The garage area is to house project vehicles. It should be out of sight of the general public and have facilities for general cleaning and maintenance of vehicles. A small washroom should be associated with this area.

<i>Description/Purpose</i>	<i>ID</i>	<i>Group</i>	<i>Size</i>	<i>Notes</i>
HVAC Equipment Room	64	Mechanical	As needed - Approx. 50 x 100	This area is for all the HVAC and support equipment for the entire Center complex (except for the Storage Vault area, which houses its own separate HVAC/mechanical support systems).
Electrical Transformer Room	12	Mechanical	Approx. 8 x 10 x 10	The transformer room provides an area for step-down transformers and any power filtering equipment required for the electrical system. Fresh air to be circulated through the Room; temperature conditioning is not Needed; fresh air is to be filtered for dust and fine particles. Earth-ground electrical system to be provided. The transformer room should be closely associated with emergency generators. The room should be highly secured with construction consisting of solid concrete floor, walls and ceiling.
Maintenance Shop	15*	Mechanical	15 x 30 x 10	
Files/Records/Copy/Supply Room	94	Services	15 x 15 x 10	A general room to store office supplies, files and provide space for copy equipment.
Small Conference Room	95	Services	Approximately 15 x 25 x 10	Small conference table to seat 10-15 people, plus appropriate AV equipment.
Special Services - Head Office	91	Services	12 x 15 x 10	Std. Office Furniture
Special Services Secretary - Office	92	Services	12 x 12 x 10	Std. Office Furniture
Visiting Scientist Office	93	Services	12 x 12 x 10	Std. Office Furniture

<i>Description/Purpose</i>	<i>ID</i>	<i>Group</i>	<i>Size</i>	<i>Notes</i>
Emergency Generator Room	14	Vault	Approximately 20 x 20 x 100	The emergency generator room should house two primary electrical generators capable of providing total facility electrical requirements for up to 20 days without delivery of fuel (diesel). The generators should be configured to automatically engage if there is a general outside power failure. Batteries should be automatically recharged and consist of a primary and backup set of batteries. The room should be constructed of solid concrete walls and placed in a security level 2 environment. Security 2 is accomplished by allowing access only through a security 1 environment.
Misc. Small Supply Room	78	Vault	12 x 12 x 10	A spare room in the vault area for misc. items. This room could be used to store important documents.
Backup Generator Room -1	76	Vault	15 x 15 x 10 (or as needed)	This is a generator room housing the primary electrical generator. There should be only one generator in a given room. This generator should have enough fuel reserves to operate the facility for 5-10 days. Primary fuel reserves to be located outside the vault complex.
Backup Generator Room 2	98	Vault	15 x 15 x 10 (or as needed)	
Mechanical/Electrical/Control Room	74	Vault	15 x 30 (Approx.)	This room houses all the compressors and air handling equipment required for the vault area. All electrical, controls and HVAC systems for the vault area should be stand-alone from the rest of the Center facilities.
Slow Growth Tissue Culture Room	73	Vault	20 x 40	This is a vault room that will have an on-site, pre-fabricated room to provide 5°C, moderate humidity and lighting system to provide slow growth conditions for long-term preservation of tissue culture material.

<i>Description/Purpose</i>	<i>ID</i>	<i>Group</i>	<i>Size</i>	<i>Notes</i>
Expansion Vault	55	Vault	20 x 40 x 15	This room is for future expansion for either conventional mechanical refrigeration, -20°C or LN2 preservation systems.
Cryovault	54	Vault	20 x 40 x 15	This is a special room for holding large 5' diameter x 4' high LN2 biological vats. This room requires special air handling, oxygen monitoring and personnel safety systems, which will be determined during A&E design phase.
Conventional Storage Vault - 2	53	Vault	20 x 40 x 15	This room is reserved for future use.
Conventional Storage Vault - 1	52	Vault	20 x 40 x 15	This is a vault area using a pre-designed chamber installed onsite. This chamber will house the primary -20°C sample collection. The internal racking system will either be moveable or static shelves (to be determined during A&E planning phase). See appendix for a suggested chamber type.
LN2 Generator Room	77	Vault	15 x 15 x 10 (or as needed)	This is a room designed to house a LN2 generator plant. Phillips Corporation, Netherlands should be the supplier of the generator that is capable of generating 10W/hr of LN2 and has a holding LN2 of approximately 1,500 to 2,000 liters.
Ante/Access Area to Vaults	75	Vault	As needed but no less than 8' in any direction	This is an area used for transition from the general laboratory area into the storage vaults and associated support systems.

Appendix 6.

Room Schedule

National Plant Germplasm Resources

Center (NPGR)

Egypt

This appendix is a detailed listing, room by room, of the proposed NPGR Center for Egypt. "Rm ID" has no particular significance except to easily index and cross reference the room to other documents associated with the conceptual design of this facility. This suggested room schedule is subject to review and change before being submitted to an architectural and engineering firm for construction specifications and associated drawings.

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Room Schedule - NPGR Center

Rm ID: 1 **Description/Purpose:** Office - PGR Director General

Group: Director General

Type: Office

Size: 15 x 20 x 10

Electrical Requirements: Electrical outlets (one per wall)

Lighting Requirements: General Office

Telephone: Yes - Multiple Line

Special: Built-in bookshelf along one wall

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal/No control

Fresh Air: Standard Office 20% makeup

Network Internet: Outlet on each wall Std. tBase 10/100

Security Level: 1

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 2 **Description/Purpose:** Secretary to Director General

Group: Director General

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One electrical outlet on each wall

Lighting Requirements: Standard Office

Telephone: Multi-line desk set.

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25° C Nominal

Humidity: Nominal

Fresh Air: 20% fresh makeup

Network Internet: tbase 10/100 One outlet on each wall

Security Level: 1

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 3 **Description/Purpose:** Copy/Mail/Filing

Group: Director General

Type: General

Size: 15 x 15 x 10

Electrical Requirements: One outlet on each wall. Extra outlet on one wall next to fax outlet.

Lighting Requirements: General Office

Telephone: One outlet on each wall, plus Fax connected to LAN

Special: Fax connected to LAN

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 1

Notes: Room for Center fax, mail, copy machine, office supplies, general filing.
Associated directly with Room 2, Secretary to the Director General.

Room Schedule - NPGR Center

Rm ID: 4 **Description/Purpose:** Receptionist Office for General Public

Group: Director General

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet for each wall

Lighting Requirements: General Office

Telephone: Main service telephone

Special: Fire, security, and service function alarm center

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet on each wall

Security Level: 1

Notes: This office acts as a receptionist office for the general public and secondary emergency operations office for fire, security and Special: service alarms. To be located at main lobby entrance, behind security window and locked door. Associated next to main public lobby.

Room Schedule - NPGR Center

Rm ID: 5 **Description/Purpose:** Public Lobby/Entrance

Group: Director General

Type: General

Size: 30 x 30 x 18

Electrical Requirements: One outlet on each wall

Lighting Requirements: Natural light with supplemental spot and office

Telephone: One line restricted to internal use

Special: TV monitor for Special: public presentation

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One or two, depending on final design

Security Level: 1

Notes: Security - Open during working hours, locked with security monitor during non-working hours. Room to be visible from outside. Special: interior design with theme promoting plant genetic diversity in Egypt.

Room Schedule - NPGR Center

Rm ID: 6 Description/Purpose: Public Relations Specialist

Group: Director General

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet on each wall

Lighting Requirements: General Office

Telephone: Multi-Line

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet on each wall

Security Level: 1

Notes: Office to be associated next to or near the Director General's office. Standard office furniture.

Room Schedule - NPGR Center

Rm ID: 7 Description/Purpose: Main Conference Room

Group: Director General

Type: General

Size: Large enough for 100 people

Electrical Requirements: As needed, but minimum of one outlet per wall.

Lighting Requirements: Per A/E recommendations for a conference room

Telephone: One outlet front and rear

Special: To be determined

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet front and rear

Security Level: 1

Notes: This room is to be designed and equipped to provide general lectures, meetings, symposia and similar events. A projection room, translator room, supply room and refreshment serving room should be included. Specific A/V, computer, internet, lighting, soundproofing, seating requirements are to be recommended by the A/E firm during the design phase with guidance and approval from the PGR official design representative(s). This room will be in a public area security zone.

Room Schedule - NPGR Center

Rm ID: 8 **Description/Purpose:** Women's Restroom

Group: Director General

Type: Restroom

Size: As appropriate for five individuals

Electrical Requirements: As need, but minimum of one outlet

Lighting Requirements: General lighting

Telephone: One outlet as appropriate

Special: As needed

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 50% makeup

Network Internet: None

Security Level: 1

Notes: Restroom to be closely associated with the General Conference Room and Men's Restroom.

Room Schedule - NPGR Center

Rm ID: 9 **Description/Purpose:** Men's Room

Group: Director General

Type: Restroom

Size: As appropriate for five individuals.

Electrical Requirements: As needed, but minimum of one outlet

Lighting Requirements: General Lighting

Telephone: One outlet

Special: As needed

Temperature: Adjustable: 21°C Day; Night 15- 25°C Nominal

Humidity: Nominal

Fresh Air: 50% makeup

Network Internet: None

Security Level: 1

Notes: Restroom to be closely associated with the General Conference Room and Women's Restroom.

Room Schedule - NPGR Center

Rm ID: 10 **Description/Purpose:** Library

Group: Director General

Type: General

Size: 15 x 20 x 10

Electrical Requirements: One outlet on each wall

Lighting Requirements: General

Telephone: One outlet on each wall

Special: Bookshelves on two walls

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet on each wall

Security Level: 1

Notes: This is a general library for the Center and should be closely aligned with the General Director's office.

Room Schedule - NPGR Center

Rm ID: 11 Description/Purpose: Employee Break Room

Group: Director General

Type: General

Size: 20 x 40 x 10

Electrical Requirements: One outlet on each wall

Lighting Requirements: General

Telephone: One outlet on each wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet on each wall

Security Level: 1

Notes: This should be a light and airy room with an associated vending/food preparation room and general cleanup sink in the main room. The room should be equipped with chairs and tables to seat approximately 30 people. The room should be centrally located but away from laboratories and busy pedestrian areas. The food preparation area should have a stove, oven, refrigerator, microwave, sink and cabinets for plates, pots, pans and utensils.

Room Schedule - NPGR Center

Rm ID: 12 Description/Purpose: Electrical Transformer Room

Group: Mechanical

Type: Mechanical

Size: Approximately 8 x 10 x 10

Electrical Requirements: As needed

Lighting Requirements: General

Telephone: One outlet

Special: Step-down Transformers

Temperature: Nominal

Humidity: Nominal

Fresh Air: Nominal

Network Internet: One outlet

Security Level: 2

Notes: The transformer room provides an area for step-down transformers and any power-filtering equipment required for the electrical system. Fresh air should be circulated through the room, temperature conditioning is not needed. Fresh air should be filtered for dust and fine particles. Earth-ground electrical system to be provided. The transformer room should be closely associated with emergency generators. The room should be highly secured with construction consisting of solid concrete floor, walls and ceiling.

Room Schedule - NPGR Center

Rm ID: 13 **Description/Purpose:** Electrical Power Distribution

Group: Mechanical

Type: Mechanical

Size: Approximately 6 x 15 x 10

Electrical Requirements: As needed

Lighting Requirements: General lighting

Telephone: One outlet

Special: See Notes below

Temperature: 22°C Constant

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet

Security Level: 2

Notes: This room houses the main electrical distribution panels and fuse switching. It should be centrally located and closely aligned with the step-down transformer room and germplasm vault area.

Room Schedule - NPGR Center

Rm ID: 14 **Description/Purpose:** Emergency Generator Room

Group: Vault

Type: Mechanical

Size: Approximately 20 x 20 x 10

Electrical Requirements: See Notes

Lighting Requirements: General Lighting

Telephone: One outlet

Special: See Notes

Temperature: Nominal

Humidity: Nominal

Fresh Air: 100% makeup

Network Internet: One outlet

Security Level: 2

Notes: The emergency generator room should house two primary electrical generators capable of providing total facility electrical requirements for up to 20 days without delivery of fuel (diesel). The generators should be configured to automatically engage upon general outside power failure. Batteries should be automatically recharged; there should be a primary and backup set of batteries. The room should be constructed of solid concrete walls and placed in a Security 2 environment. Security 2 accessed only through a Security 1 environment.

Room Schedule - NPGR Center

Rm ID: 15 Description/Purpose: Maintenance Shop

Group: Mechanical

Type: Mechanical

Size: 15 x 30 x 10

Electrical Requirements: To be determined

Lighting Requirements: General lighting

Telephone: Two outlets

Special: To be determined

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: Two outlets

Security Level: 2

Notes:

Room Schedule - NPGR Center

Rm ID: 16 **Description/Purpose:** Shipping/Receiving

Group: Mechanical

Type: General

Size: 20 x 30 x 10

Electrical Requirements: One outlet on each wall

Lighting Requirements: General Lighting

Telephone: One outlet

Special: Overhead chain hoist for heavy loads

Temperature: Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet

Security Level: 2

Notes: A general maintenance shop to maintain building mechanical equipment.

Room Schedule - NPGR Center

Rm ID: 17 Description/Purpose: Head DBMU Office

Group: DBMU

Type: Office

Size: 15 x 15 x 10

Electrical Requirements: One electrical outlet on each wall

Lighting Requirements: General Office

Telephone: One outlet on each wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet on each wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 18 **Description/Purpose:** Secretary's Office - DBMU

Group: DBMU

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet on each wall

Lighting Requirements: General Office

Telephone: One outlet on each wall

Special:

Temperature: Adjustable: 21°C Day 15°C Night

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: 1 outlet each wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 19 **Description/Purpose:** Copy/Filing Room - DBMU

Group: DBMU

Type: General

Size: 20 x 20 x 10

Electrical Requirements: One outlet

Lighting Requirements: General Office

Telephone: One outlet - one multi-line set

Special: See notes

Temperature: Adjustable: 21°C day; 15°C night.

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet

Security Level: 2

Notes: Filing cabinets for hard-copy backup of records. Fire-safe cabinet for storing backup data tapes and disks.

Room Schedule - NPGR Center

Rm ID: 20 **Description/Purpose:** Central Computer Hardware - DBMU

Group: DBMU

Type: Special:

Size: 15 x 20 x 10

Electrical Requirements: Outlets for 15 computers and peripherals.

Lighting Requirements: General Office

Telephone: Three outlets

Special: See notes

Temperature: Adjustable: 21°C Constant

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: To be determined

Security Level: 2

Notes: This room will house the LAN computer, database computer, LAN hub, primary connection to the internet with appropriate firewall equipment and peripheral equipment such as printers and multi-disk array systems. The room should be soundproof. The floor should be a raised false floor to accommodate computer wire connections. This room should also be fire protected with a system designed specifically for computer rooms. The LAN hub system will be a 'star' system, so this room should be as centrally located as possible. This room should be closely associated with the DBMU staff offices and provide limited access.

Room Schedule - NPGR Center

Rm ID: 21 Description/Purpose: DBMU Staff Office - 1

Group: DBMU

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet on each wall

Lighting Requirements: General Office

Telephone: One outlet on each wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°-25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet on each wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 22 Description/Purpose: DBMU Staff Office - 2

Group: DBMU

Type: Office

Size: 12 x 12 x 8

Electrical Requirements: One outlet on each wall

Lighting Requirements: General Office

Telephone: One outlet on each wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet on each wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 23 **Description/Purpose:** DBMU Staff Office - 2

Group: DBMU

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet on each wall

Lighting Requirements: General Office

Telephone: One outlet on each wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°-25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet on each wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 24 Description/Purpose: DBMU Staff Office - 3

Group: DBMU

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: General Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% Makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 25 Description/Purpose: DBMU Multi-purpose Office

Group: DBMU

Type: Shared Office

Size: Approximately 15 x 30 x 10 total

Electrical Requirements: One outlet for each work area

Lighting Requirements: General Office

Telephone: One outlet for each work area

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet for each work area

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 26 **Description/Purpose:** Head - E&Q Office

Group: E & Q

Type: Office

Size: 15 x 15 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: General Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: E & Q - Exchange and Quarantine Standard office furniture plus a small conference table and four chairs.

Room Schedule - NPGR Center

Rm ID: 27 Description/Purpose: Secretary E&Q - Office

Group: E & Q

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 28 Description/Purpose: Germplasm Exchange Specialist Office

Group: E & Q

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 29 Description/Purpose: Quarantine Specialist - Office

Group: E & Q

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°-25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 30 Description/Purpose: Visiting Scientist - Office

Group: Director General

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 31 Description/Purpose: Visiting Scientist - Office

Group: Director General

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% Makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 32 **Description/Purpose:** Visiting Scientist - Office

Group: Director General

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 33 **Description/Purpose:** Head, Admin. Support Office

Group: Admin

Type: Office

Size: 15 x 15 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture, plus small table with four chairs

Room Schedule - NPGR Center

Rm ID: 34 **Description/Purpose:** Secretary , Office of Admin. Services

Group: Admin

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 35 **Description/Purpose:** Personnel Assistant - Office

Group: Admin

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 36 **Description/Purpose:** Personnel Assistant - Office

Group: Admin

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 37 **Description/Purpose:** Social Services Assistant - Office

Group: Admin

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 38 **Description/Purpose:** Social Services Assistant - Office

Group: Admin

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 39 **Description/Purpose:** Purchasing Assistant - Office

Group: Admin

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 40 **Description/Purpose:** Operations Assistant - Office

Group: Admin

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 41 **Description/Purpose:** Purchasing Assistant - Office

Group: Admin

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 42 **Description/Purpose:** Conference Room - Admin Services

Group: Admin

Type: General

Size: 20 x 20 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special: See Notes

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: A small conference room for 10 - 15 people

Room Schedule - NPGR Center

Rm ID: 43 **Description/Purpose:** Head of Genebank - Office

Group: Genebank

Type: Office

Size: 15 x 15 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 44 Description/Purpose: Secretary, Genebank - Office

Group: Genebank

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 45 **Description/Purpose:** Conference Room - Genebank

Group: Genebank

Type: General

Size: 20 x 20 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: This conference room should be equipped with a large conference table and chairs for up to 15 people, with A/V equipment for presentations and small seminars.

Room Schedule - NPGR Center

Rm ID: 46 **Description/Purpose:** Acquisition Lab

Group: Genebank

Type: Laboratory

Size: 20 x 20 x 10

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 100% makeup

Network Internet: To Be Determined

Security Level: 2

Notes: This is a general laboratory with laboratory benches. This laboratory will be used to start the in-processing of new germplasm samples.

Room Schedule - NPGR Center

Rm ID: 47 Description/Purpose: Health & Quarantine Lab

Group: Genebank

Type: Laboratory

Size: 20 x 20 x 10

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 100% makeup

Network Internet: To Be Determined

Security Level: 2

Notes: This is a special lab that has a fume hood capable of handling dusty material. The lab is also equipped with laboratory benches. Electrical and similar services to be determined.

Room Schedule - NPGR Center

Rm ID: 48 **Description/Purpose:** Drying Room - 1

Group: GeneBank

Type: Special:

Size: 15 x 20 x 10

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone:

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: 20% RH

Fresh Air: 100% makeup

Network Internet: To Be Determined

Security Level: 2

Notes: This is a room designed to equilibrate moisture content for incoming samples.

Room Schedule - NPGR Center

Rm ID: 49 **Description/Purpose:** Drying Room - 2

Group: Genebank

Type: Special:

Size: 15 x 20 x 10

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone:

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: 20% RH

Fresh Air: 100% makeup

Network Internet: To Be Determined

Security Level: 2

Notes: This room is used to adjust seed moisture content. Seed is placed in this room open to the chamber atmosphere and allowed to equilibrate to 20% RH. This room should have internal air flow capability (e.g., fans) to keep the environment equal throughout equilibration and to promote equilibration with good air exchange.

Room Schedule - NPGR Center

Rm ID: 50 **Description/Purpose:** Packaging Room

Group: Genebank

Type: Laboratory

Size: 20 x 20 x 10

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: 20% RH

Fresh Air: 100% makeup

Network Internet: To Be Determined

Security Level: 2

Notes: This is a standard laboratory with benches. Small lab. Top equipment is used for the packaging of materials for long-term preservation.

Room Schedule - NPGR Center

Rm ID: 51 **Description/Purpose:** General Laboratory

Group: Genebank

Type: Laboratory

Size: 20 x 30 x 10

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone: To Be Determined

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 100% makeup

Network Internet: To Be Determined

Security Level: 2

Notes: This is a general laboratory used for specialized viability testing methods. This room should be equipped with standard laboratory benches.

Room Schedule - NPGR Center

Rm ID: 52 **Description/Purpose:** Conventional Storage Vault - 1

Group: Vault

Type: Special:

Size: 20 x 40 x 15

Electrical Requirements: To Be Determined

Lighting Requirements: To Be Determined

Telephone:

Special:

Temperature: -20°C

Humidity: Nominal

Fresh Air: Nominal

Network Internet: To Be Determined

Security Level: 3

Notes: This is a vault area using a pre-designed chamber installed onsite. This chamber will house the primary -20°C sample collection. The internal racking system will either be moveable or static shelves (to be determined during A&E planning phase). See appendix for a suggested chamber type.

Room Schedule - NPGR Center

Rm ID: 53 Description/Purpose: Conventional Storage Vault - 2

Group: Vault

Type: Special:

Size: 20 x 40 x 15

Electrical Requirements: To Be Determined

Lighting Requirements: To Be Determined

Telephone:

Special:

Temperature: -20C

Humidity: Nominal

Fresh Air: Nominal

Network Internet: To Be Determined

Security Level: 3

Notes: This room is reserved for future use.

Room Schedule - NPGR Center

Rm ID: 54 **Description/Purpose:** Cryovault

Group: Vault

Type: Special

Size: 20 x 40 x 15

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone: One outlet for each wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 100% makeup

Network Internet: One outlet for each wall

Security Level: 3

Notes: This is a special room for holding large 5' diameter x 4' high LN2 biological vats. This room requires special air handling, oxygen monitoring and personnel safety Systems (to be determined during A&E design phase).

Room Schedule - NPGR Center

Rm ID: 55 Description/Purpose: Expansion Vault

Group: Vault

Type: Special:

Size: 20 x 40 x 15

Electrical Requirements: To Be Determined

Lighting Requirements: To Be Determined

Telephone:

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup initially

Network Internet: To Be Determined

Security Level: 3

Notes: This room is for future expansion for either conventional mechanical refrigeration, (-20°C) or LN2 preservation systems.

Room Schedule - NPGR Center

Rm ID: 56 **Description/Purpose:** Cryopreservation Preparation

Group: Genebank

Type: Laboratory

Size: 20 x 20 x 10

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone: One outlet per wall

Special:

Temperature: Adjustable 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 100% makeup

Network Internet: To Be Determined

Security Level: 2

Notes: This is a general laboratory used to prepare samples for long-term cryopreservation.

Room Schedule - NPGR Center

Rm ID: 57 Description/Purpose: In-vitro Conservation Pre-Lab

Group: Genebank

Type: Laboratory

Size: 20 x 20 x 10

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 100% makeup

Network Internet: To Be Determined

Security Level: 2

Notes: Specialized laboratory for preparing samples for in-vitro long-term conservation.
The lab should be equipped with standard laboratory benches.

Room Schedule - NPGR Center

Rm ID: 58 **Description/Purpose:** In-Vitro Conservation Growth Room

Group: Genebank

Type: Laboratory

Size: 10 x 20 x 8

Electrical Requirements: To Be Determined

Lighting Requirements: To Be Determined

Telephone: To Be Determined

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Adjustable 40 to 80% RH

Fresh Air: As required

Network Internet: To Be Determined

Security Level: 2

Notes: This is a prefabricated chamber designed for growing plant cultures and vegetative material. Materials in this chamber are to be held for short periods of time (i.e., less than one year).

Room Schedule - NPGR Center

Rm ID: 59 **Description/Purpose:** Records Room - Data

Group: Genebank

Type: General

Size: 15 x 20 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: A general room for records, filing cabinets and copy equipment.

Room Schedule - NPGR Center

Rm ID: 61 **Description/Purpose:** Supervisor, Viability Monitoring - Office

Group: Genebank

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 62 **Description/Purpose:** Visiting Scientist - Office

Group: Director General

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% Makeup

Network Internet: One outlet per wall

Security Level: 1

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 63 **Description/Purpose:** Prayer Room - Nondenominational

Group: Director General

Type: General

Size: 12 x 18 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard office, plus light dimming

Telephone: One outlet

Special: Floor appropriate for prayer rugs

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% Makeup

Network Internet: One outlet

Security Level: 1

Notes: This room should be in a quiet area away from heavy pedestrian traffic and easily accessible from all parts of the Center.

Room Schedule - NPGR Center

Rm ID: 64 **Description/Purpose:** HVAC Equipment Room

Group: Mechanical

Type: Mechanical

Size: As needed – approximately 50 x 100

Electrical Requirements: As needed

Lighting Requirements: Standard General

Telephone: Minimum of three phones

Special: As per design

Temperature: 21°C Constant

Humidity: Nominal

Fresh Air: 30-50% Makeup

Network Internet: At least three outlets appropriately placed.

Security Level: 2

Notes: This area is for all of the HVAC and support equipment for the entire Center complex (except for the storage vault area, which houses its own separate HVAC/mechanical support systems).

Room Schedule - NPGR Center

Rm ID: 65 **Description/Purpose:** Vehicle Garage

Group: Mechanical

Type: Mechanical

Size: As needed for 3-5 vehicles

Electrical Requirements: As needed

Lighting Requirements: As needed

Telephone: A minimum of one phone outlet

Special: As needed for general car maintenance

Temperature: Nominal

Humidity: Nominal

Fresh Air: Nominal

Network Internet: A minimum of 1 LAN outlet

Security Level: 1

Notes: The garage area is to house project vehicles. It should be out of sight of the general public and possess facilities for general cleaning and maintenance of vehicles. A small washroom should be associated with this area.

Room Schedule - NPGR Center

Rm ID: 66 Description/Purpose: Conference Room

Group: DBMU

Type: Conference Room

Size: 20 x 20 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office plus light dimming

Telephone: One outlet per wall

Special: See Notes

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% Makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: This room is for working conferences so should be arranged for approximately 20 people at writing desks. Extra electrical outlets should be provided at each seat for connecting lap tops and other supplemental equipment. The room should have all the standard display equipment (e.g., digital projectors, overhead projectors, slide projects, screens, whiteboard, etc.).

Room Schedule - NPGR Center

Rm ID: 67 Description/Purpose: Files/Records/Copy Room

Group: E & Q

Type: General

Size: 10 x 15 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% Makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: This is the records and documents room for the Exchange and Quarantine Office in the NPGR Center.

Room Schedule - NPGR Center

Rm ID: 68 **Description/Purpose:** Visiting Scientist Office

Group: E & Q

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% Makeup

Network Internet: One outlet per wall

Security Level:

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 69 **Description/Purpose:** Maintenance Assistant Office

Group: Admin

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: General Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% Makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 70 **Description/Purpose:** Transport Assistant Office

Group: Admin

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: General Office

Telephone: One outlet per wall

Special: See Notes

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% Makeup

Network Internet: One outlet per wall

Security Level:

Notes: Conference table and 10 chairs, plus standard A/V equipment

Room Schedule - NPGR Center

Rm ID: 71 **Description/Purpose:** File/Copy/Supplies Room

Group: Genebank

Type: General room

Size: 8 x 10 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: General Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Ambient

Fresh Air: 20% Makeup

Network Internet: One outlet per wall

Security Level: 2

Notes: This room is to store office supplies, plus filing cabinets and a copy machine.

Room Schedule - NPGR Center

Rm ID: 72 **Description/Purpose:** Supplies Room for Labs

Group: Genebank

Type: General

Size: 15 x 15 x 10

Electrical Requirements: Two outlets

Lighting Requirements: General Office

Telephone: One outlet

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20% Makeup

Network Internet: One outlet

Security Level: 2

Notes: This room is to store general supplies for germplasm viability testing and packaging.

Room Schedule - NPGR Center

Rm ID: 73 **Description/Purpose:** Slow Growth Tissue Culture Room

Group: Vault

Type: Vault

Size: 20 x 40

Electrical Requirements: To be determined

Lighting Requirements: To be determined

Telephone: One outlet

Special: See Notes

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: To be determined

Fresh Air: To be determined

Network Internet: One outlet

Security Level: 3

Notes: This is a vault room that will have an on-site, pre-fabricated room to provide 5°C, moderate humidity and a lighting system to provide slow growth conditions for long-term preservation of tissue culture material.

Room Schedule - NPGR Center

Rm ID: 74 **Description/Purpose:** Mechanical/Electrical/Control Room

Group: Vault

Type: Mechanical

Size: Approximately 15 x 30

Electrical Requirements: To Be Determined

Lighting Requirements: Standard room

Telephone: One outlet

Special: See Notes

Temperature: 21°C Constant

Humidity: Nominal

Fresh Air: 50% Makeup

Network Internet: One outlet

Security Level: 3

Notes: This room houses all the compressors and air handling equipment required for the vault area. All electrical, controls and HVAC systems for the vault area should be stand-alone (i.e., apart from the rest of the Center facilities).

Room Schedule - NPGR Center

Rm ID: 75 **Description/Purpose:** Ante/Access Area to Vaults

Group: Vaults

Type: General

Size: As need but no less than 8' in any direction

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: One outlet

Security Level:

Notes: This is an area used for transition from the general laboratory area into the storage vaults and associated support systems.

Room Schedule - NPGR Center

Rm ID: 76 **Description/Purpose:** Backup Generator Room - 1

Group: Vault

Type: Mechanical

Size: 15 x 15 x 10 or as needed

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone:

Special:

Temperature: Nominal 15°C – 30°C

Humidity: Nominal

Fresh Air: 20%

Network Internet: One outlet

Security Level:

Notes: This is a generator room housing the primary electrical generator. There should be only one generator in any given room. This generator should have enough fuel reserves to operate the facility for 5 - 10 days. Primary fuel reserves should be located outside the vault complex.

Room Schedule - NPGR Center

Rm ID: 77 Description/Purpose: LN2 Generator Room

Group: Vault

Type: Mechanical

Size: 15 x 15 x 10 or as needed

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone: One outlet

Special: LN2 Generator and Holding Tank

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: As needed for the LN2 system

Network Internet: One outlet

Security Level: 3

Notes: This is a room designed to house a LN2 generator plant. Phillips Corporation, Netherlands should be the supplier of the generator, which should be capable of generating 10l/hr of LN2 and have a holding LN2 of approximately 1,500 to 2,000 liters.

Room Schedule - NPGR Center

Rm ID: 78 **Description/Purpose:** Miscellaneous Small Supply Room

Group: Vault

Type: General

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: One outlet

Security Level: 3

Notes: A spare room in the vault area for miscellaneous items. This room could be used to store important documents.

Room Schedule - NPGR Center

Rm ID: 79 Description/Purpose: Data Processing Rm

Group: Genebank

Type: Office

Size: 15 x 25 x 10

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Office

Telephone: To Be Determined

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: To Be Determined

Security Level: 2

Notes: Room for five computer stations

Room Schedule - NPGR Center

Rm ID: 80 **Description/Purpose:** Germinator Room

Group: Genebank

Type: Laboratory

Size: 20 x 30 x 10

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone: To Be Determined

Special:

Temperature: 21°C Constant

Humidity: Nominal

Fresh Air: 20%

Network Internet: One outlet

Security Level: 2

Notes: Large enough for 15-20 stand-alone germinators, culture chambers. This room will have abnormally high heat loads and electrical outlet requirements. Loads to be determined.

Room Schedule - NPGR Center

Rm ID: 81 **Description/Purpose:** Wash & Sterilization Room

Group: Genebank

Type: Laboratory

Size: 15 x 20 x 10

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone: To Be Determined

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: One outlet

Security Level: 2

Notes: This room is used to wash and sterilize small laboratory equipment, trays and germinators. The room should be equipped with floor drains, hot and cold water, and steam.

Room Schedule - NPGR Center

Rm ID: 82 **Description/Purpose:** Men's Restroom

Group: Genebank

Type: General

Size: As needed

Electrical Requirements: Two outlets

Lighting Requirements: Standard Office

Telephone: To Be Determined

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: To Be Determined

Security Level: 2

Notes: This restroom should have showers and lockers in addition to standard facilities.
The showers are for safety purposes.

Room Schedule - NPGR Center

Rm ID: 83 **Description/Purpose:** Short-term (-20°C) Chamber

Group: Genebank

Type: Special

Size: 10 x 15 x 8

Electrical Requirements: To Be Determined

Lighting Requirements: To Be Determined

Telephone: To Be Determined

Special:

Temperature: -20°C Constant

Humidity: Nominal

Fresh Air: Nominal

Network Internet: To Be Determined

Security Level: 2

Notes: This room is designed to be a short-term holding area for seed materials. It should be equipped with racks so that trays of seed can be easily placed and identified. This chamber should be close to the seed evaluation area.

Room Schedule - NPGR Center

Rm ID: 84 **Description/Purpose:** Short-term (5°C) Storage Chamber

Group: Genebank

Type: Special

Size: 10 x 15 x 8

Electrical Requirements: To Be Determined

Lighting Requirements: To Be Determined

Telephone: To Be Determined

Special:

Temperature: 5°C Constant

Humidity: 20% RH

Fresh Air: Nominal

Network Internet: To Be Determined

Security Level: 2

Notes: This is a short-term chamber running at 5°C. Humidity is kept at 20% RH plus/minus 5% to nominal

Room Schedule - NPGR Center

Rm ID: 85 **Description/Purpose:** Visiting Scientist Office

Group: Genebank

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 86 **Description/Purpose:** Visiting Scientist Office

Group: Genebank

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 87 **Description/Purpose:** Visiting Scientist Office

Group: Genebank

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 88 Description/Purpose: Viability Monitoring Laboratory

Group: Genebank

Type: Laboratory

Size: 40 x 40 x 18

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone: To Be Determined

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: To Be Determined

Security Level: 2

Notes: This room is used as the primary location for testing viability of germplasm samples, mostly seed. Special workstations are to be designed (specific details of each workstation to be determined later). Each station will have normal electrical and phone requirements, plus LAN connections and a need for a vacuum line and special air handling to remove airborne dust at each station. This room has a special requirement of being central to all operations in the Genebank area, and must also have natural, indirect sunlight.

Room Schedule - NPGR Center

Rm ID: 89 **Description/Purpose:** Vault and Laboratory Equipment Monitoring

Group: Genebank

Type: Laboratory

Size: 12 x 10 x 10

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Office

Telephone: To Be Determined

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: One outlet per wall

Security Level: 2

Notes: This room is designed to hold electronic monitoring equipment for the Genebank and Vault areas.

Room Schedule - NPGR Center

Rm ID: 90 **Description/Purpose:** Sample Cleaning Laboratory

Group: Genebank

Type: Laboratory

Size: 12 x 18 x 10

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone: To Be Determined

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 100%

Network Internet: To Be Determined

Security Level: 2

Notes: This is a laboratory where germplasm materials are cleaned when necessary. This room is subject to an abnormal amount of dust, so should have a special vacuum system to collect the dust and filter it out of the air. Specialized cleaning equipment connecting to the vacuum system has yet to be determined.

Room Schedule - NPGR Center

Rm ID: 91 **Description/Purpose:** Special Services - Head Office

Group: Services

Type: Office

Size: 12 x 15 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 92 **Description/Purpose:** Special Services Secretary - Office

Group: Services

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 93 **Description/Purpose:** Visiting Scientist Office

Group: Services

Type: Office

Size: 12 x 12 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: One outlet per wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 94 **Description/Purpose:** Files/Records/Copy/Supply Room

Group: Services

Type: General

Size: 15 x 15 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network/Internet: One outlet per wall

Security Level: 2

Notes: A general room to store office supplies and files and to provide space for copy equipment.

Room Schedule - NPGR Center

Rm ID: 95 **Description/Purpose:** Small Conference Room

Group: Services

Type: Conference Working

Size: Approx 15 x 25 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: One outlet per wall

Security Level: 2

Notes: Small conference table to seat 10-15 people, plus appropriate A/V equipment

Room Schedule - NPGR Center

Rm ID: 96 **Description/Purpose:** Security Office

Group: Director General

Type: Office/Monitoring

Size: 15 x 15 x 10

Electrical Requirements: One outlet per wall

Lighting Requirements: Standard Office

Telephone: One outlet per wall

Special:

Temperature: Adjustable: 21°C Day; Night 15°- 25°C Nominal

Humidity: Nominal

Fresh Air: 20%

Network Internet: One outlet each wall

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 97 **Description/Purpose:** Security Housing

Group: Director General

Type: Housing

Size: To Be Determined

Electrical Requirements: To Be Determined

Lighting Requirements: To Be Determined

Telephone: To Be Determined

Special:

Temperature: To Be Determined

Humidity: To Be Determined

Fresh Air: To Be Determined

Network Internet: To Be Determined

Security Level: 2

Notes: Standard office furniture

Room Schedule - NPGR Center

Rm ID: 98 **Description/Purpose:** Backup Generator Room 2

Group: Vault

Type: Mechanical

Size: 15 x 15 x 10 or as needed

Electrical Requirements: To Be Determined

Lighting Requirements: Standard Laboratory

Telephone: To Be Determined

Special:

Temperature: Nominal 15°C - 30°C

Humidity: Nominal

Fresh Air: 20%

Network Internet: To Be Determined

Security Level:

Notes: