Prepared for
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Executive Summary

The Need

The pace of development of Centennial Campus accelerated significantly during the 1990s. The completion of Research IV and Partners I buildings in 1996 and 1997 respectively marked an apparent realization of “critical mass” in the growth of the campus, especially in regards to the locating of corporate/government units (hereafter referred to as “Partners”) to NC State. Prior to the construction of these two buildings, the telecommunications infrastructure strategies in use on main campus seemed satisfactory to serve the voice, data, and video communication needs of Centennial Campus tenants. However, the shared infrastructure system in use in all university buildings proved less than ideal in those two facilities, especially in meeting the needs and desires of the non-university Partners located there. After these buildings were occupied, it became apparent that these Partners desired “private” infrastructure (e.g. telecom rooms, pathways, cabling systems, etc. which are not shared with other tenants) and customized infrastructure (not necessarily in compliance with NC State’s University Wiring Standard). It also became apparent that these Partners desired much wider choice in the types of voice and data services than are provided to university departments by the Telecommunications (now Comtech – “Comtech”) Office and by the Office of Information Technology. The desire for customizable data services has led to the selection of outside service providers (called “preferred service providers”) to provide a wide variety of such services to the Partners on Centennial Campus.

The above inadequacies created the need to develop a new set of telecommunications infrastructure and service strategies for tenant buildings on Centennial Campus. This document outlines the infrastructure strategies, policies, and mechanisms for procurement of services for both appropriated campus buildings and tenant buildings on the campus.

The Approach

The basic approach to the provision of communication services for university departments housed on Centennial Campus is to have their services and infrastructure mirror that on main campus as closely as possible. The only difference is that each department in a multi-tenant building will have a dedicated telecom room and wiring system within its space (as opposed to a shared system as they would have on main campus). Within the department’s space, the infrastructure will be installed in accordance with the NCSU University Wiring Standard. These departments will obtain voice, wiring, data (network), and CATV services from Comtech. They will secure data (desktop support) services from their internal LAN personnel just as they would on main campus.

The approach to providing services for non-university Partners is to provide maximum isolation of each Partner’s infrastructure from that of other tenants. The Partners are free to wire their spaces (and have this wiring maintained) any way they see fit. The Partners will obtain voice services directly from Bell South and any system providers they choose, and they will obtain data services from one of the preferred service providers. This will allow them maximum privacy, maximum choice, and maximum flexibility in meeting their communications needs in a manner which is as close as possible to what they would have available to them in high-end private commercial parks.
Potential Hurdles

While this model for telecommunications infrastructure represents a vast improvement in meeting the needs of Centennial Campus occupants (especially Partners) over the previous model, it is not without a few hurdles to overcome. One of these is that there are currently four multi-tenant buildings on the campus which are wired to the old model. Wiring these buildings to the new model will be technically beneficial to the occupants of the buildings. This document briefly outlines the potential process to accomplish this modification, but the process could prove to be fairly costly and disruptive. Its implementation will require significant planning and coordination. The rewiring of Research II to the new model will be accomplished during a planned wiring upgrade project there. Rewiring of the other three buildings will not occur until a funding source is identified.

Due to the dynamic nature of multi-tenant buildings, and to the different infrastructure model that is used for departments and Partners, planning and coordination between Comtech, the Centennial Campus Partnership Office (CCPO), and Facilities Division will still be required. Also, since some multi-tenant buildings are owned by the university and some are owned by private developers, this coordination can be even more difficult. By contrast, however, it has proven considerably less stressful than the coordination required for the old model.

Conclusion

Although hindsight would submit that new infrastructure policies should have been implemented at the outset of the development of the campus, Centennial Campus has proven to be somewhat of a “learn by doing” endeavor for the entire university due to its unique and pioneering approach. However, the implementation of the strategies and policies outlined in this document has provided a much easier to use and more effective platform for delivery of a wide variety of communication services to the end users of the campus. The result has provided capabilities that are unparalleled on other university campuses or commercial research parks.
Section 1 – Building and Occupant Types

Centennial Campus consists of two major areas of the NC State University campus. The first is the area between Centennial Parkway and I-440 which is currently the site of clusters of buildings housing a variety of occupants. The second is the area between Hillsborough St. and Wade Ave. which is the current home of the College of Veterinary Medicine and is slated to become the Centennial Biomedical Campus.

There are three basic types of occupants of Centennial Campus buildings:

- **NCSU Departments**
  This classification applies to any occupant who pays for services via a university OUC account.

- **Corporate/Government Units (Partners)**
  This classification applies to any occupant who pays for services via any means other than a university OUC account.
  (government agencies, private companies, etc.)

- **Public Users of the Campus**
  (condominium complex residents, guests, etc.)

In addition, there are several classifications of Centennial Campus buildings that are outlined in this document:

- **Appropriated Campus Buildings**
  (Textiles, Montieth Labs, Toxicology, Engineering Building I, Engineering Building II, Partners III, Friday Institute)

- **New Model Receipt Supported Multi-Tenant Office Buildings**
  (Partners II, Research I)

- **Old Model Receipt Supported Multi-Tenant Office Buildings**
  (Research II, Research III, Research IV, Partners I)

- **Receipt Supported Single Tenant Office Buildings**
  (Corporate Research I, Red Hat Building)

- **Third Party Developed Multi-Tenant Office Buildings**
  (Venture Center)

- **Third Party Developed Specialty Buildings**
  (North Shore Condominiums, Centennial Middle School)

The policies and procedures governing infrastructure vary according to both the type of building and the type of occupant considered. This creates a matrix of combinations making provision of telecommunications services potentially complex and confusing. These guidelines attempt to simplify as much as possible the infrastructure requirements for each of these combinations in order to enhance the chance for success in providing quality communications services to Centennial Campus.
Section 2 - Service Policies Affecting Infrastructure

Following are assumptions made regarding service policies that are drivers for the infrastructure policies outlined in these guidelines:

I. Infrastructure Installation

A. NCSU Departments.
   • All spaces are required to be wired in compliance with the most up-to-date version of the NCSU University Wiring Standard (UWS). Costs will be borne by the department and/or by the building shell construction project.

B. Partners.
   • University Wiring Standard wiring is not available.
   • Fiber optic cable and twisted pair copper cable will be required from the Building Distribution Frame (BDF) to an Intermediate Distribution Frame (IDF) in the Partner’s space. Costs for installation will be borne by the Partner.
   • Partners are responsible for installation of all wiring within their space (outward from their IDF).

II. Infrastructure Repair and Maintenance

A. NCSU Departments.
   • Comtech will repair and maintain all infrastructure. Cost for this service is included in the communication services rate structure.

B. Partners.
   • Partners are responsible for maintenance of all wiring within their space (outward from their IDF), and riser cables connecting their IDF to the BDF.

III. Additional Outlet Installation

A. NCSU Departments.
   • Comtech will install additional outlets per request from department. Costs will be borne by the department.

B. Partners.
   • Partners are responsible for addition of any wiring within their space (outward from their IDF).
IV. Voice Services

A. NCSU Departments.
   • All voice services (telephone, voice mail, etc.) will be required to be purchased from Comtech.
   • All voice moves, adds, and changes will be performed by Comtech with costs billed to the department.

B. Partners.
   • Comtech will not provide any voice services to the Partners. Partners will order all dial tone directly from Bell South. Partners may have key telephone systems, voice mail systems, etc. installed by outside contractors within their space. Partners will have Bell South and/or their system providers perform all moves, adds, and changes.

V. CATV Services

A. NCSU Departments.
   • CATV service will be required to be purchased from Comtech. Dean/Vice Chancellor approval is required. All costs will be borne by the department. Cost sharing will be allowed if multiple departments in the building request service.
   • All CATV moves, adds, and changes will be performed by Comtech with costs billed to the department.

B. Partners.
   • CATV services are not currently available to Partners.
   • Partners may have “DSS type” satellite TV service installed if they meet all physical and aesthetic requirements established by NCSU Facilities Division.

VI. Data Services

A. NCSU Departments.
   • All data network access services will be provided by Comtech. LAN desktop support will be provided by internal LAN support organizations (academic departments) or by Enterprise Technology Services and Support (ETSS) for administrative departments.
   • Service fees for Centennial Campus customers will be identical to those for main campus.
All data moves, adds, and changes will be performed by Comtech.
Comtech will manage all network equipment provisioning and maintenance, programmed technology rollover, Internet access and services, support at Layer 3/4 and below, and assistance with needs assessment and capacity planning.

B. Partners.
Partners may not obtain direct access to the NCSU campus data network. 
NOTE: In cases of a particular Partner having a unique need for such access due to collaborative projects with NCSU departments, that Partner should contact Comtech to develop a methodology for obtaining such access. Each request for access will be evaluated on a case-by-case basis.
Partners may obtain a wide variety of services from one of the preferred service providers. These providers have been granted special considerations (use of NCSU fiber) in order to serve Partners. They provide two types of services:
a) Carrier services (point-to-point circuits of varying types to national and international locations)
b) ISP services (high speed Internet access, email, Web hosting, etc.)
Two preferred service providers are approved for these services, hopefully providing competitive services and pricing. See Appendix 1 for the current list of approved preferred service providers. Partners may use other providers as they wish, but these will not be given the same special considerations as the preferred service providers, nor will they be allowed to install physical infrastructure to or between buildings on Centennial Campus.

VII. Interconnection of Noncontiguous Spaces

A. NCSU Departments.
Direct interconnection of departmental spaces will not be allowed. Interconnection will be performed through existing UWS wiring infrastructure in accordance with Comtech service policies and practices.

B. Partners.
Two Spaces within One Building. Point to point interconnection of spaces within a single building will be the responsibility of the Partner.
Partner spaces in two Centennial Campus buildings can be linked by the leasing of fiber pairs from Comtech from the BDF of one building to the BDF of another building. The Partner will be required to install fiber from their IDFs to each BDF. The current rate for leasing each fiber pair is $846.00/month. Fiber pair links may only be leased between Centennial Campus buildings, not from Centennial Campus buildings to main campus or to off campus locations. Copper cable pairs will not be available for leasing. Ductbank cells will not be available for leasing.
Section 3 - Infrastructure Policies and Procedures

I. Appropriated Campus Buildings (new and existing)

Overview.

The telecommunications infrastructure installed in these buildings will mirror that which is installed in all NC State buildings on main campus. This infrastructure should be designed and constructed in accordance with the latest version of the University Wiring Standard. The University departments occupying these buildings will order and receive services just as they would on main campus.
II. New Model Receipt Supported Multi-Tenant Office Buildings

These buildings are usually constructed in two phases: base building and departmental/Partner space upfits.

A. Base Building.

1. Components.
   The following components of this infrastructure will be constructed during the base building phase:
   - Entrance ductbank
   - Building Distribution Frame room (BDF)
   - Equipment racks and ladder racks in the BDF
   - Conduit and wiring for special use lines (elevator, blue light, fire alarm, etc.)
   - Blue light telephone units on project site
   - All required bonding and grounding of above
   - Stacked vertical “chase” closets for riser conduit installation
   - Riser conduits from the BDF to chase closets
   - Entrance telephone and fiber optic cables

2. Access to the BDF.
   a. Partner and Departmental Access.
      Neither Partners nor university departments will have ongoing access to the BDF. Partners will have access to install riser cables only. Partners will not be allowed to install any equipment in the BDF. BDFs will be keyed to “BEST” lock, university key system number M4C1A1 (campus telecom room master key).
   b. Service Provider Access.
      Only Bell South and the preferred service providers will be allowed access to the BDF.

3. Design.
   The base building components should be designed in accordance with the University Wiring Standard with the following exceptions:
   a. BDF Equipment.
      Four standard equipment racks should be installed. Two will be used for Comtech equipment and two for preferred service provider equipment.
   b. Telephone Terminal Installation.
      Bell South will install their telephone terminal hardware on a designated wall. Separate blue backboards will be installed by Comtech prior to acceptance of the building. A certain number of blue backboards will be designated for NCSU departments. Bell South will install RJ21X blocks
on these backboards. These will be wired to Krone blocks in one of the equipment racks. Additional blue backboards will be designated for Partners. Bell South will install RJ21X blocks on these backboards. Each Partner will run riser cables from these RJ21X blocks to their space. Bell South will run jumpers from the terminal to the appropriate RJ21X block group for each NCSU line or Partner line.

c. Vertical “Chase” Closets.
To provide for installation of riser conduits between the BDF and each departmental or Partner IDF, a series of small stacked closets should be constructed on each floor of the building. Ideally, these will be placed directly above the BDF. These rooms would be approximately 3' x 4' with a door to a corridor. This door should be keyed as mechanical rooms.

These chase closets will be constructed in the base building phase. Also in that phase, a series of 2” EMT conduits will be installed from the BDF to each of the chase closets. The quantity of conduits will be determined during the building design based on the potential number of distinct tenants.

B. NCSU Departmental Space Upfits

1. Overview.
The telecommunications infrastructure for these buildings will be designed to provide maximum isolation of a particular tenant’s infrastructure from the infrastructure serving other tenants. The telecommunications infrastructure installed for spaces in these buildings that are occupied by NCSU departments will be virtually identical to that which is installed in appropriated campus buildings. The major difference is that no shared IDF and wireway system will be installed. Instead, an IDF will be built in each departmental space that will serve only that department. This infrastructure will be completely isolated from the infrastructure serving all other building tenants.

2. Components.
The following components of this infrastructure will be constructed during the departmental upfits phase:
- One IDF in each departmental space
- Riser conduits connecting conduits in the nearest chase closet to each departmental IDF, and riser cables connecting each of the departmental IDFs to the BDF
- Equipment racks and ladder racks in the departmental IDF
- Cross-connect panels in the departmental IDF
- Wireways from the departmental IDF throughout the departmental space
- Station conduits from wireways to outlets
- Station wiring to outlets
• All required bonding and grounding of above

3. Design.
With the exceptions noted above, the infrastructure installed during these upfits should comply with UWS 2.0. In smaller tenant upfits, the cabling and associated hardware may be installed by Comtech, with all IDF and pathway components installed by the contractor.

4. Services.
Comtech will provide all voice, CATV, and data services to departments in the same manner as they would do in other campus buildings.

C. Partners Space Upfits

1. Overview.
The infrastructure serving spaces occupied by Partners will not be integrated into the infrastructure installed to serve NCSU departments. The Partners are responsible to install their own wiring within their space and copper and/or fiber riser cables from their space to the BDF.

2. Components.
The following components of the infrastructure will be constructed during the Partner’s upfit phase:

• All voice and data wiring within their space.
• Riser cabling from the Partner’s space to the BDF.

3. Design and Construction.
The design and construction of the infrastructure within the Partner’s space is the responsibility of and is at the discretion of the Partner.

4. Riser Cable Installation.
The Partners are responsible to install any required riser cables connecting their space to the BDF as part of their space upfit. For Partners desiring telephone connectivity services from Bell South, copper cable is required. For Partners desiring data connectivity services from the preferred service providers, copper cable and/or fiber optic cable is required (depending on services desired). The Partners are responsible to coordinate connection of their cables to Bell South or the preferred service providers in the BDF.

Riser cables will be routed in the conduits referenced above from the BDF up through the chase closets to the floor where the Partner is located. The Partners must extend conduit from one of the existing riser conduits in the chase closet to their space for riser cabling.

5. Partner Work within the BDF.
The Partner is responsible for any damage to existing cables, panels, etc. in the BDF caused by them or any contractors working on their behalf which
impacts service delivery to other Partners or campus departments. Comtech will retain final authority on the use of the BDF.

No Partner or contractors/service providers working for the Partner (except the preferred service providers) will be allowed to install any equipment, data electronics, telephone systems, etc. in the BDF. The Partners will not install any horizontal (station) wiring directly to the BDF. Partners located on the same floor as the BDF will be required to install “riser” cables (and only riser cables) as described above from their space to the BDF.

6. Services Provision.
   a. Infrastructure Maintenance.
      The Partners are responsible for maintenance of all wiring, both within their space and riser cables.
   b. Voice Services.
      Each Partner will order telephone service directly from Bell South. Bell South will deliver dial tone to the RJ21X blocks in the BDF only. The Partners are free to utilize these dial tones from the BDF to their space as they see fit (single lines, key systems, PBX, etc.) through installation of equipment within their space.
   c. CATV Services.
      CATV services are not available to Partners. Partners may elect to have a “DSS type” satellite dish installed on the roof of the building. The Partner will be responsible to install conduit and cable from the dish unit to the Partner space. At no point will the Partner use NCSU telecom rooms (including the BDF), raceways, conduits, etc. to install this interconnection cable. The Partner will coordinate this installation with the CCPO.
   d. Data Services.
      The Partner may contact one of the preferred service providers for the services they desire. Comtech will provide two fiber pairs from the preferred service provider’s point of presence (POP) in the CMDF to the BDF in each building. In addition, Comtech will provide one 19” wide equipment rack to each provider in the BDF in each building for equipment installation. The provider will be responsible for all necessary fiber patching in the BDF to connect their equipment to the riser fiber cables to each Partner’s space.

D. Receipt Supported Single Tenant Office Buildings.

The infrastructure model for tenant office buildings housing only one Partner will be similar to the model presented above. The only difference is that except for the BDF itself, the type of intrabuilding infrastructure installed is at the discretion of and is the responsibility of the Partner.
III. Old Model Receipt Supported Multi-Tenant Office Buildings

A. NCSU Departments.

1. Overview.
These buildings (or departmental spaces within these buildings) are, to varying degrees, wired to a version of the NCSU University Wiring Standard. Projects are proposed to upgrade some of the areas of these buildings housing university departments to be fully compliant with the UWS. For NCSU departments, the policies concerning telecommunications infrastructure and services are identical to those described in this document for appropriated buildings.

B. Partners.

1. Overview.
The long term goal for telecommunications infrastructure serving Partners in these buildings will be to have the infrastructure be identical to that described in this document for Partners in new model receipt supported multi-tenant office buildings. When that goal is met, service policies regarding Partners would also mirror those in the new buildings.

2. Survey.
Some of these Partner spaces are wired to existing NC State wireways and BDFs/IDFs in compliance with the UWS. The pathways and cabling are integrated with pathways and cabling serving NCSU departments. Other Partner spaces are wired similarly to the model for Partner spaces in new buildings. These spaces have fiber optic cable and copper riser cables installed back to the nearest Comtech BDF or IDF. As part of the infrastructure upgrade projects described above, a survey of all Partner spaces will be performed to determine how each is currently wired.

3. Reconfiguration.
Based on the type of existing infrastructure found in the above survey, two different approaches may be taken to reconfigure the existing infrastructure to meet the stated goal.

a. Spaces Wired to the UWS.
A new IDF will be built within each Partner space at a location agreed to by the Partner. Comtech and the CCPO will meet with each Partner to determine what type of horizontal pathway and wiring system they would like to distribute services within their space. Comtech will install this new infrastructure, and then remove all existing conduit and wiring serving the Partner space. In addition, Comtech will install new riser conduit and cabling as described in the previous section from the BDF to
the Partner IDF. Maintenance of all of this new wiring will be the responsibility of the Partner.

b. Spaces Not Wired to the UWS.
These spaces already have an Partner IDF serving as a copper and fiber demarcation point. Comtech will install new riser conduit and riser cabling from this IDF back to the BDF. Maintenance of this new wiring will be the responsibility of the Partner.

Until the reconfiguration described above is completed, Comtech will maintain and install additional outlets in adherence to current practice.

5. Services Until and Following Reconfiguration.
Prior to and following completion of the reconfiguration projects described above, the following plan will be enacted to maintain and modify provision of services to existing Partners:

a. Voice Services Transition.
A field survey will be conducted by Comtech to determine the location and type of existing wiring in use for all Partners. This information will be used to plan all modifications. Comtech and the CCPO will meet with each Partner currently receiving voice services from the university. This meeting will include Bell South representatives in order to plan the transition from Comtech ESSX service to Bell South service. There will be several issues to resolve in order to smoothly transition these Partners to Bell South service. These include:
- The Partner-purchased telephone sets from Comtech. These sets may not work with standard Bell South business lines.
- The features currently selected by the Partner may not match those available from Bell South.
- The Partner will need to purchase a new voice mail service.
- The Partners probably have already published their 515 exchange numbers in listings, letterhead, business cards, telephone book, Web sites, etc. The telephone numbers will no longer be in the 515 exchange.
- Other issues are certain to arise when discussions with Partners commence.
A cutover to Bell South service will be performed by Bell South and Comtech employees for each Partner. Following the reconfiguration of the wiring infrastructure described above, Partners will acquire voice services just as they would in new model multi-tenant buildings.

b. CATV Services.
Currently, no Partners receive CATV service from Comtech.
c. Data Services (access to the NCSU campus data network).
Each Partner currently receiving data services from Comtech may continue to do so under (as closely as possible) the existing equipment and wiring configuration and service agreements originally agreed to
between the two parties. Since these agreements were made prior to the completion of set university policies regarding these configurations and services, a variety of arrangements are currently in place. These include:

- Partners with their own network electronics located in NC State BDFs/IDFs cross-connected to various outlets (some have Comtech provided connections to the NCSU campus backbone).
- Partners who have purchased network electronics from Comtech which are located in NC State BDFs/IDFs providing individual campus network connections to each outlet.
- Partners who are not wired into the UWS (shared) wiring system, but who receive a campus backbone connection to their space.

Following the reconfiguration of the wiring infrastructure described above, Partners will acquire voice services just as they would in new model multi-tenant buildings.
IV. Third Party Developed Multi-Tenant Office Buildings

These buildings are usually constructed in two phases: base building and departmental/Partner space upfits.

A. Base Building

1. Components.
   The following components of this infrastructure will be constructed during the base building phase:
   - Entrance ductbank
   - Building Distribution Frame room (BDF)
   - Equipment racks and ladder racks in the BDF
   - Conduit and wiring for special use lines (elevator, blue light, fire alarm, etc.)
   - Blue light telephone units on project site
   - All required bonding and grounding of above
   - Stacked vertical “chase” closets for riser conduit installation
   - Floor sleeves from the BDF through the chase closets
   - Entrance telephone and fiber optic cables

2. Access to the BDF.
   a. Partner and Departmental Access.
      Neither Partners nor university departments will have ongoing access to the BDF. Partners will have access to install riser cables only. Partners will not be allowed to install any equipment in the BDF. BDFs will be keyed to “BEST” lock, university key system number M4C1A1 (campus telecom room master key).
   b. Service Provider Access.
      Only Bell South and the preferred service providers will be allowed access to the BDF.

3. Design.
   The base building components should be designed in accordance with the University Wiring Standard with the following exceptions:
   a. BDF Equipment.
      Four standard equipment racks should be installed. Two will be used for Comtech equipment and two for preferred service provider equipment.
   b. Telephone Terminal Installation.
      Bell South will install their telephone terminal hardware on a designated wall. Separate blue backboards will be installed by Comtech prior to acceptance of the building. A certain number of blue backboards will be designated for NCSU departments. Bell South will install RJ21X blocks on these backboards. These will be wired to Krone blocks in one of the
equipment racks. Additional blue backboards will be designated for Partners. Bell South will install RJ21X blocks on these backboards. Each Partner will run riser cables from these RJ21X blocks to their space. Bell South will run jumpers from the terminal to the appropriate RJ21X block group for each NCSU line or Partner line.

c. Vertical “Chase” Closets.

To provide for installation of riser conduits between the BDF and each departmental or Partner IDF, a series of small stacked closets should be constructed on each floor of the building. Ideally, these will be placed directly above the BDF. These rooms would be approximately 3’ x 4’ with a door to a corridor. This door should be keyed as mechanical rooms.

These chase closets will be constructed in the base building phase. Also in that phase, a series of 2” EMT conduits will be installed from the BDF to each of the chase closets. The quantity of conduits will be determined during the building design based on the potential number of distinct tenants.

B. NCSU Departmental Space Upfits.

1. Overview.

The telecommunications infrastructure for these buildings will be designed to provide maximum isolation of a particular tenant’s infrastructure from the infrastructure serving other tenants. The telecommunications infrastructure installed for spaces in these buildings that are occupied by NCSU departments will be virtually identical to that which is installed in appropriated campus buildings. The major difference is that no shared IDF and wireway system will be installed. Instead, an IDF will be built in each departmental space that will serve only that department. This infrastructure will be completely isolated from the infrastructure serving all other building tenants.

2. Components.

The following components of this infrastructure will be constructed during the departmental upfits phase:

- One IDF in each departmental space
- Riser conduits from each departmental IDF to the nearest chase closet, continuing down through the chase closets to the BDF, and riser cables connecting each of the departmental IDFs to the BDF
- Equipment racks and ladder racks in the departmental IDF
- Cross-connect panels in the departmental IDF
- Wireways from the departmental IDF throughout the departmental space
- Station conduits from wireways to outlets
- Station wiring to outlets
- All required bonding and grounding of above
3. Design.
With the exceptions noted above, the infrastructure installed during these upfits should comply with UWS 2.0. In smaller tenant upfits, the cabling and associated hardware may be installed by Comtech, with all IDF and pathway components installed by the contractor.

4. Services.
Comtech will provide all voice, CATV, and data services to departments in the same manner as they would do in other campus buildings.

C. Partners Space Upfits.

1. Overview.
The infrastructure serving spaces occupied by Partners will not be integrated into the infrastructure installed to serve NCSU departments. The Partners are responsible to install their own wiring within their space and copper and/or fiber riser cables from their space to the BDF.

2. Components.
The following components of the infrastructure will be constructed during the Partner’s upfit phase:

- All voice and data wiring within their space.
- Riser cabling from the Partner’s space to the BDF.

3. Design and Construction.
The infrastructure within the Partner’s space is the responsibility of and is at the discretion of the Partner.

4. Riser Cable Installation.
The Partners are responsible to install any required riser cables connecting their space to the BDF as part of their space upfit. For Partners desiring connectivity services from Bell South, copper cable is required. For Partners desiring data connectivity services from the preferred service providers, copper cable and/or fiber optic cable is required (depending on services desired). The Partners are responsible to coordinate connection of their cables to Bell South or the preferred service providers in the BDF. Riser cables will be routed through the floor sleeves referenced above from the BDF up through the chase closets to the floor where the Partner is located.

5. Partner Work within the BDF.
The Partner is responsible for any damage to existing cables, panels, etc. in the BDF caused by them or any contractors working on their behalf which impacts service delivery to other Partners or campus departments. The Comtech office and the developer will retain final authority on the use of the BDF.

No Partner or contractors/service providers working for the Partner (except for the preferred service providers) will be allowed to install any equipment,
data electronics, telephone systems, etc. in the BDF. The Partners will not install any horizontal (station) wiring directly to the BDF. Partners located on the same floor as the BDF will be required to install “riser” cables (and only riser cables) as described above from their space to the BDF.

6. Services Provision.
   a. Infrastructure Maintenance.
      The Partners are responsible for maintenance of all wiring, both within their space and riser cables.
   b. Voice Services.
      Each Partner will order telephone service directly from Bell South. Bell South will deliver dial tone to the RJ21X blocks in the BDF only. The Partners are free to utilize these dial tones from the BDF to their space as they see fit (single lines, key systems, PBX, etc.) through installation of equipment within their space.
   c. CATV Services.
      CATV services are not available to Partners. Partners may elect to have a “DSS type” satellite dish installed on the roof of the building. The Partner will be responsible to install conduit and cable from the dish unit to the Partner space. At no point will the Partner use NCSU telecom rooms (including the BDF), raceways, conduits, etc. to install this interconnection cable. The Partner will coordinate this installation with the CCPO.
   d. Data Services.
      The Partner may contact one of the preferred service providers for the services they desire. Comtech will provide two fiber pairs from the preferred service provider’s point of presence (POP) in the CMDF to the BDF in each building. In addition, Comtech will provide one 19” wide equipment rack to each provider in the BDF in each building for equipment installation. The provider will be responsible for all necessary fiber patching in the BDF to connect their equipment to the riser fiber cables to each Partner’s space.
V. Third Party Developed Specialty Buildings

A. Overview.

These are various new buildings that are to be built by outside developers. They generally house service providers who are providing a variety of services to NC State faculty, staff, students, and the general public. Examples include restaurants, hotels, condominium, retail, etc. Each building may house only one service provider or a multitude of providers. The current assumption is that all of these providers will be outside companies, agencies, etc. (not NCSU departments). Due to the uniqueness of each building, telecommunications infrastructure strategies may vary from building to building. However, following are some principles that should transcend all buildings within this classification.

As with third party developed multi-tenant office buildings, these buildings are to be designed based on the goal of minimizing the amount of infrastructure, space, and cost required for the outside developer.

B. Model.

The infrastructure and services model for these buildings should mimic that used in third party developed multi-tenant office buildings.
Appendix 1 - Preferred Service Providers of Data Network Services

Updated 4/1/06

Partners (groups other than NCSU departments) may elect to purchase high-end data network services from a group of outside service providers selected by Comtech. These preferred service providers have been granted special considerations (mainly access to university fiber infrastructure) in order to offer their services to Partners located on Centennial Campus.

Below are the current preferred service providers. Partners on Centennial Campus should contact these providers directly for information regarding specific service offerings, pricing, etc.

A. Copper-based services. These services include providing telephone lines (dial tone) and lower speed data services which can be delivered via copper (dial-up, DSL, T-1, etc.). Only Bell South is allowed to provide copper-based services on the campus.

B. Fiber-based carrier services. These include high speed “point-to-point type” circuits to allow Partners on Centennial Campus to connect to their own intranets (either nationally or internationally) or to connect to the Internet. Typical services include leased line, frame relay, DS3, etc.

Preferred service providers: Bell South and Time Warner Cable

C. Fiber-based ISP services. These include Internet access at variety of higher speeds as well as typical ISP services like email, web hosting, etc.

Preferred service providers: Bell South and Time Warner Cable