

STATE OF FLORIDA



DIVISION OF THE COMMISSION CLERK & ADMINISTRATIVE SERVICES  
BLANCA S. BAYÓ  
DIRECTOR

Public Service Commission

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C O N F I D E N T I A L

**DOCKET NO.:** 980946 - TL

**DOCUMENT NO.:** 04605-99

DESCRIPTION: FPSC (LEG/B.Keating) -  
(CONFIDENTIAL) Exhibits K LW-1 through K LW-4  
to Kathy L. Welch's direct testimony. [RAR 5/12/99  
note: Based on DN 06056-99, certain pages were  
pulled from this document and moved to docket file.

**Pages remaining in confidential document are 4 and  
6 from K LW-4, which were destroyed 9/8/99.]**

ORIGINAL

**DECLASSIFIED**

*DOCKET NO.:* 980947-TL: Petitions for temporary waiver of physical collocation requirements set forth in the 1996 Telecommunications Act and the FCC's First Report and Order, for the Boca Raton Boca Teeca Central Office, by BellSouth Telecommunications, Inc.

*WITNESS:* Direct Testimony Of Kathy L. Welch, Appearing On Behalf Of Staff

*EXHIBIT:* K LW-1

**DECLASSIFIED**

~~CONFIDENTIAL~~  
(See 06056-99)

(Part 1 of 4)  
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FPSC-RECORDS/REPORTING



**FLORIDA PUBLIC SERVICE COMMISSION**

*DIVISION OF AUDITING AND FINANCIAL ANALYSIS  
BUREAU OF AUDITING*

*Miami District Office*

BELLSOUTH TELECOMMUNICATIONS, INC.

INVESTIGATION OF COLLOCATION SPACE WAIVERS

BOCA TEECA OFFICE

DOCKET NO. 980947-TL  
AUDIT CONTROL NO. 98-334-4-2

March 19, 1999

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**CONFIDENTIAL** **DECLASSIFIED**

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**DIVISION OF AUDITING AND FINANCIAL ANALYSIS  
AUDITOR'S REPORT**

**MARCH 19, 1999**

**TO: FLORIDA PUBLIC SERVICE COMMISSION AND OTHER INTERESTED  
PARTIES**

We have applied the procedures described later in this report to determine the availability of space for collocation in the central office for which a waiver was requested.

This is an internal accounting report prepared after performing a limited scope audit. Accordingly, this report should not be relied upon for any purpose except to assist the Commission staff in the performance of their duties. Substantial additional work would have to be performed to satisfy generally accepted auditing standards and produce audited financial statements for public use.

In our opinion, the waiver referred to above presents fairly, in all material respects, observations made while touring the central office. The attached findings discuss all differences and other matters which were noted during our examination.

## SUMMARY OF SIGNIFICANT PROCEDURES

Our audit was performed by examining the company's waiver and documentation that supports the assumptions which we believe are sufficient to base our opinion. Our examination did not entail a complete review of all financial transactions of the company. Our more important audit procedures are summarized below.

Read orders and rules related to collocation.

Read production of documents and interrogatories.

Interviewed switch, circuit, and common system planners for the offices involved.

Interviewed the geographical forecasters.

Toured and randomly measured the central offices.

Obtained maps showing current and future use space and compared to the applications for waiver.

Read company procedures.

Obtained supporting documents for company assumptions.

Compared the company's access line forecast to national trends. Ran models and compared to the company's. Access lines are used to forecast switch growth.

Reviewed the methodology used in the Bellcore trunk forecasting program. Trunk forecasts are used in both circuit and switch forecasts.

Determined reasons why large spaces would or would not be good candidates for collocation.

The scope of the audit was limited because our review of tools and methodology, used to determine the number of bays forecast, was not completed due to time restrictions. However, as an alternate procedure, two to three years of historical growth were compared to current forecasts for spaces considered critical to the collocation decision.

**AUDIT DISCLOSURE NO. 1****SUBJECT: SPACE PLANNING ASSUMPTIONS**

**STATEMENT OF FACT:** During our interviews of BellSouth staff and our tours of the central offices, staff identified several assumptions used by BellSouth in its space planning. These assumptions are used throughout this report, therefore, they are identified below. In addition, the documentation that these assumptions have been verified to is disclosed.

1. Seven foot aisles or a physical barrier are necessary between switch and any other equipment such as circuit (toll) equipment or power equipment. This is because when the central offices were originally designed, the decision was made to put switch equipment on an isolated ground plane to create an additional protective barrier from power interruptions or trouble. Circuit (toll) equipment is on an integrated ground plane. If a problem happens in the system and a technician is touching two types of equipment, one that has an integrated ground plane and one with an isolated ground plane they can be electrocuted and the equipment could be damaged. (See attachment 1 to this report for a more technical discussion of integrated and isolated ground planes. ) Therefore, a requirement was instituted that seven feet (based on the width of a person's arm span) be placed between circuit and toll equipment. A wall or a cage would also keep a person from touching the two types of equipment. This seven foot barrier was violated by BellSouth in two of the six central offices reviewed (Golden Glades and Boca Teeca). The company claims that other grounding precautions were taken to attempt to solve this problem.

The only reference for this requirement was found in a Bellcore publication. It states:

"All integrated ground plane conductive members located within 6 feet of the isolated ground plane shall be bonded to its MGB to minimize the surge potential difference between nearby members of the two ground planes."

No verification could be made to the National Electric Code but the potential risk was verified with engineers outside of the Bell system.

2. Plug in units are required to be in a room with fire rated walls or in fire proof cabinets that are grounded and connected to the wall. BellSouth provided the Life Safety Code Section 6-4.1.1 that states:

"Protection from any area having a degree of hazard greater than that normal to the general occupancy of the building or structure shall be provided as follows:

(a) Enclose the area with a fire barrier having a 1-hour fire resistance rating in accordance with section 6-1 without windows."

The company claims that because the circuit packs have cardboard liners, they have a high degree of risk.

Since the company is currently violating this rule in several offices, it is necessary for the company to allocate space to correct the problem before space can be considered for collocation.

3. A four foot fire aisle has to exist and be connected to two exit doors. This was verified to the Life Safety Code Handbook section 5.5-1.2 and the Standard Building Code Table 1004.

4. It is necessary to keep certain families of equipment together and therefore, the floor plans include space allocated within each type of equipment for growth in that type of equipment. The reason provided by a company representative was because over time, growth exceeded the initial space allocated for certain types of equipment. This reservation of space is called a footprint. The reason the company believes that families of equipment need to stay together is because some of the equipment has 50 foot cabling requirements, some have processors that require the other equipment to be in adjacent bays, and some would require additional cost for repeaters, cabling, and connections if they were not near other equipment. The company's reasons for needing to keep families of equipment together can be found in attachment 2.

The company exceeded the footprint for certain types of equipment in both the Daytona Port Orange office and the Boca Teeca office. The company was asked to provide the additional costs incurred to put equipment in a new line up. In answer to document request 32, the company stated that it was unable to provide this information. At the exit conference, a company representative stated that they were unable to provide because detailed equipment engineering for specific locations on individual jobs does not provide optional costs or optional locations. Therefore, the costs attributable to families of equipment being diversely located in a central office are not readily available.

Staff also observed the problem in Daytona because a bridge was created to hold the wires that connected the equipment. Because footprints have been established within the line up for each type of equipment, some equipment that goes in these groups may not be planned to be installed within the two years that are covered in this application. However, a series of bays that are empty within a series of equipment would not usually be feasible for physical collocation anyway because the space would not be large enough.

5. At least a four foot space must be maintained in front of an air handler vent and an



aisle should be maintained perpendicular to the unit for air to flow. How much space is needed is determined based on A.S.H.R.A.E. Engineering Standards which were outside the area of our expertise.

6. Physical collocation needs to be in room with fire rated walls with an exit door to the outside of the building. If the exit is not to the outside of the building or to a corridor that can be blocked from the BellSouth equipment area, an escort would be required to get access to the collocation space.

The Federal Communications Commission 47 CFR Chapter 1 51.323 (I) states "An incumbent LEC may require reasonable security arrangements to separate a collocating telecommunications carrier's space from the incumbent LEC's facilities."

FCC order 96-325 paragraph 598 states "we will continue to permit LEC's to require reasonable security arrangements to separate an entrants collocation space from the incumbents LEC facility." However, in order 98-188, they seek comment on whether incumbent LEC's should be allowed to require escorts for competitive LEC technicians (Paragraph 141).

In FCC order 98-188, paragraph 137 states "Given that space in incumbent LEC premises is limited, we tentatively conclude that we should require incumbent LEC's to offer collocation arrangements to both new entrants and any advanced services affiliate incumbent LECs establish that minimize the space needed by each competing provider in order to promote the deployment of advanced services to all Americans. Such alternative collocation arrangements include: (1) the use of shared collocation cages, within which multiple competing providers' equipment could be either openly accessible or locked within a secure cabinet; (2) the option to request collocation cages of any size without any minimum requirement, so that competing providers will not use any more space than is reasonably necessary for their needs; and (3) physical collocation that does not require the use of collocation cages ('cageless' collocation)."

However, BellSouth has submitted plans for hybrid walls within the cluster area (8 foot non-fire rated walls) in the Palmetto office and were turned down. Denials were reviewed and verified with the building and zoning department. If hybrid walls were denied within a fire rated room, it is not likely that cages would be approved.

Dade County uses the South Florida Building Code of 1994. It states in section 507.2 (a):

"In any building where rooms or spaces are occupied by separate tenants, not less than 1-hour fire-resistive construction shall be provided between tenants and between tenants and common areas.

The South Florida Building Code Chapter 12 puts telephone exchanges in Group G Division 2. The only exception that may apply to Group G, Division 2 is:

“(1) As otherwise permitted for the group of occupancy by Chapter 31 of this Code.”

Boca Raton, West Palm Beach, Daytona and Orlando are covered under a different code, the Standard Building Code, which states in paragraph 507.2 a:

“(1) In any building where rooms or spaces are occupied by separate tenants, not less than one-hour fire-resistive construction shall be provided between tenants and between tenants and common areas except as provided below:”

The exceptions that may apply to Group G, Division 2 are:

“(3) EXCEPTION: Where all tenancies within a Fire Division are of Group G, Division 2 Occupancy, such space shall be exempt from the provisions of this Sub-section if one story in height and of Type III unprotected, IV, V unprotected.

(4) EXCEPTION: Fire resistive separation between a tenant and a mall area will not be required by this sub-paragraph where the space on both sides of such wall or partition is protected by an automatic sprinkler system or by a water curtain provided at the line of separation.”

“(6) EXCEPTION: Group G, Division 2, clusters of offices less than 200 square feet served by a common reception area and internal corridor within the cluster area shall not require fire separation between offices and corridors common to the cluster.”

According to BellSouth's answer to document request 32, BellSouth was concerned that the Florida code officials were requiring fire-rated separations, which result in more complex construction. Therefore, BellSouth asked Bellcore for help. BellCore obtained a letter from the Southern Building Code Congress International supporting its position. BellSouth has talked to several municipalities and believe that several will permit cages although none have been permitted at this time.

7. BellSouth contends that the FCC rules state explicitly that relocations and renovations are not required to provide collocation space.

When asked to provide the citation that supports its contention BellSouth cited CFR 51.321. The Federal Communications Commission 47 CFR Chapter 1 51.321 (e) states “An incumbent LEC shall not be required to provide for physical collocation of equipment necessary for interconnection or access to unbundled network elements at the incumbent LEC's premises if it demonstrates to the state commission that physical collocation is not practical for technical reasons or because of space limitations.”

The definition of technically feasible according to 51.5 states "Interconnection access to unbundled network elements, collocation, and other methods of achieving interconnection or access to unbundled network elements at a point in the network shall be deemed technically feasible absent technical or operational concerns that prevent the fulfillment of a request by a telecommunications carrier for such connection, access, or methods. A determination of technical feasibility does not include consideration of economic, accounting, billing, space or site concerns, except that space and site concerns may be considered in circumstances where there is no possibility of expanding the space available. The fact that an incumbent LEC must modify its facilities or equipment to respond to such a request does not determine whether satisfying such request is technically feasible. An incumbent LEC that claims that it cannot satisfy such request because of adverse network reliability impacts must prove to the state commission by clear and convincing evidence that such interconnection, access, or methods would result in specific and significant adverse network reliability impacts"

In its application for waiver, BellSouth states, "The term 'space limitations encompasses two factors: first, ILECs are entitled to consider space already in use by the ILEC at the time the collocation request is made; second, ILECs are entitled to 'retain a limited amount of floor space for defined future uses'(Order, Par. 604)." Their citation refers only to retaining space for future use and not to being entitled to space already in use.

FCC order 98-188 paragraph 142 states: "We also ask commenters to address whether we can and should require incumbent LEC's to remove obsolete equipment and non-critical offices in central offices to increase the amount of space available for collocation."

**OPINION:** BellSouth assumptions were verified to the documentation referenced above.

No citation could be found relating to not having to reorganize the central office to accommodate except for the inquiry in Order 98-188 asking for an opinion on removing obsolete equipment and non-critical offices. CFR 51.321 requires physical collocation as long as it is technically feasible. And, the definition of technically feasible specifically states that an incumbent LEC must modify its facilities or equipment to respond to a request as long as it does not impact network reliability. Moving equipment could be costly, would involve cabling and power difficulties and does have the potential of losing service for the customers. Moving office furniture and fixed configuration furniture does not involve the same costs or risks and should be considered if the furniture is not in a location that is currently part of a footprint for growth of equipment line ups. At the exit conference, a company representative commented that the company generally tries not to put switch fixed configuration furniture in a footprint because it is intimately

related to the processor area of the switch.

If the company is required to remodel existing facilities, a determination needs to be made of who would be required to pay for the changes.

Security measures are still being addressed by the FCC.

**AUDIT DISCLOSURE NO. 2****SUBJECT: WORK STATIONS AND ADMINISTRATIVE SPACE WITHIN THE CENTRAL OFFICE SWITCH AND CIRCUIT (TOLL) AREAS**

**STATEMENT OF FACT:** In its space assessment worksheet, the company has identified areas that are for circuit (toll) equipment and areas for switch equipment. Within these areas are fixed configuration furniture which contains monitors to test equipment. In addition, there are several desks, files and printers contained within the floor space.

The floor plans for these spaces that include the footprints for the future growth of families of equipment, often show these areas being replaced by equipment.

In the time between the first tour of Golden Glades and Palm Beach Gardens and the most recent tour, much of this furniture had been moved and rearranged as lines of equipment were installed.

**OPINION:** Although the layout of the monitors and administrative spaces within the circuit and switch areas does not always appear to be efficient, it should not be an issue if there is an existing footprint in that area for future equipment. If the forecast for the footprint is reasonable, then the furniture will be moved and sometimes consolidated. If the area is large enough, meets the other requirements in disclosure 1, and does not involve footprints for equipment line ups, it will be discussed in the disclosure that proposes potential areas for collocation.

**AUDIT DISCLOSURE NO. 3****SUBJECT: SPACE ASSESSMENT WORKSHEET**

**STATEMENT OF FACT:** In its petition for waiver, BellSouth indicates that a certain number of feet in the facility is "reserved for defined future use essential for BellSouth to meet the growing needs of its customers through the year 2000." This space agrees with Section D- Reserved Space on the Space Assessment Worksheet that was attached to the petition.

The Federal Communications Commission Rules, 47 CFR Chapter 1, section 51.323 (f) (4) states "an incumbent LEC may retain a limited amount of floor space for its own specific future uses, provided, however, that the incumbent LEC may not reserve space for future use on terms more favorable than those that apply to other telecommunications carriers seeking to reserve collocation space for their own use."

Collocation applications do not indicate the time frame that the room will be filled and therefore, there is no way to determine from the documentation how much space the collocators are reserving for future use.

Only one of the six offices reviewed in this proceeding has physical collocation. The two collocators currently residing in these spaces were asked to provide detail about when the collocation space will be filled. Only one responded. The company currently has only one bay in a room that would hold six. It expects to fill the bays within two years.

BellSouth employees have indicated that it takes three years from the time a plan for an addition is initiated for a building addition to the time it is actually completed. A schedule was provided to show that a recent addition in North Florida was initialized in December of 1995 and construction was completed in December of 1998 or 36 months. Another building addition was planned in July of 1996 and construction was completed October 1998 or 28 months. The only dates that could be documented were the dates the budget was approved and when the buildings were completed. The process took 20 months and 13 months for the two additions respectively. No documentation was provided to show when the planning process began. Additions in South Florida are expected to take longer because of longer permitting time since Hurricane Andrew.

**OPINION:** Although the petition states that the reserved space is to be used by the year 2000, review of the maps of future space and documentation provided by BellSouth regarding intended use of the space indicate that some of the space does not have any forecasted use by the year 2000 and sometimes not even by 2001.

Many times, however, the spaces are in a line of bays which would not be conducive for physical collocation and are being reserved because of the principle of families of equipment. See disclosure no. 1 for a discussion of the need for families of equipment to be together.

According to the rule, BellSouth can reserve as much space as its collocators. We were unable to determine how much space the two other collocators are reserving.

Since it takes three years to get a building addition, allowing only two years of growth, could put BellSouth in a position of not being able to add capacity in time to meet the needs of its customers.

Large spaces that are for forecasted periods beyond two years are described in other disclosures to this report.

**AUDIT DISCLOSURE NO. 4****SUBJECT: OBSOLETE EQUIPMENT**

**STATEMENT OF FACT:** The company was requested to provide information on any equipment that would be changed out for new equipment that might have less space requirements.

In the Boca Raton office, an e-net conversion is forecasted which will free up 12 switch bays. Since the switch manufacturer handles the layout of the bays, BellSouth was unable to tell us where the bay would be vacated or if the space would be a contiguous space.

BellSouth's position is that the equipment it has is currently functioning and that it should not have to replace equipment with smaller, more efficient equipment because that would require an additional expenditure.

FCC order 98-188 paragraph 142 states: "We also ask commenters to address whether we can and should require incumbent LEC's to remove obsolete equipment and non-critical offices in central offices to increase the amount of space available for collocation."

BellSouth has retired 13 circuit bays and 8 switch bays in Lake Mary over the last three years; 2 circuit bays and 14 switch bays in Daytona Port Orange; 8 circuit bays in Boca Teeca, and 5 circuit and 18 switch bays in West Palm Beach Gardens. The company response to request 43 states that the information for North Dade Golden Glades and Miami Palmetto will be provided as soon as possible. It was not received.

**OPINION:** Although there is nothing in the rules that would require BellSouth to replace its equipment, it should be noted that if BellSouth were making a decision on whether or not to make a building addition, BellSouth may find it more economical to replace equipment with more efficient equipment and thus free up bays.

This was probably what happened when BellSouth petitioned the FCC in 1993 for waivers. At that time, it only showed future growth of 2100 square feet for Glades and 1000 for West Palm Beach Gardens. The new petitions ask for 4796 in Glades and 3544 in Gardens. (See order PSC-99-0060-FOF-TP p. 9-10)



**AUDIT DISCLOSURE NO. 5**

**SUBJECT:           BELLSOUTH COLLOCATION HANDBOOK  
VERSION 7.1.2, DATED January 2, 1999  
SPACE ENCLOSURE OPTIONS**

**STATEMENT OF FACTS:** The collocation handbook dated January 2, 1999 describes "BellSouth's collocation offerings, providing general information regarding the terms and conditions, ordering process, provisioning and maintenance of BellSouth's Collocation Offerings."

Section 2 defines physical collocation and states that "Physical Collocation arrangements will be placed in floor space separated from BST equipment." "When space permits, BellSouth will construct a common area for all collocations, including separate ingress/egress where feasible." "Within the collocation common area, collocation arrangements will be individually placed in either enclosed or non-enclosed space." The book also states that under certain conditions a collocator may construct power plant facilities but these must be enclosed in a fire rated wall.

Section 3 states that "Physical collocation space is assigned based on the customer's request, where space permits, with the physical collocation equipment arrangements placed in floor space separated from BellSouth equipment."

Section 3.6 addresses enclosure options. Section 3.6.1 says that BellSouth will make available a 100 square foot minimum enclosure with 50 square foot increments. When a collocator requests more than 100 square feet, BellSouth will try to use contiguous space but if contiguous space is not available, the collocator has the option of two separate enclosures and the purchase of connection through BellSouth cross-connects.

Section 3.6.2 addresses non-enclosed space within the BellSouth "common area". There is no minimum square footage requirement for non-enclosed collocation space, permitting the collocator to use space in increments less than 100 square feet.

The company representative states that the 100 square feet minimum is open for negotiation in the agreement process. However, the company claims to have signed agreements with all existing carriers requiring a minimum of 100 square feet.

**OPINION:** In disclosures in this audit, space of less than 100 square feet are discussed. Based on BellSouth's existing contracts, these spaces would not meet the minimum size requirement. If contracts with new carriers are made or if contracts are renegotiated, these spaces would need to be addressed to determine if they met other collocation requirements.

**AUDIT DISCLOSURE NO. 6**

**SUBJECT: ERRORS ON SPACE ALLOCATION WORKSHEET**

**STATEMENT OF FACT:** The Space Allocation Worksheet for the Boca Teeca Central Office identified a Corporate Communications Resource Room as 495 square feet of occupied administrative space.

The room actually contains automatic 611 switching equipment and should have been recorded as occupied switch space.

Since the space is occupied it does not have any effect on the available space.

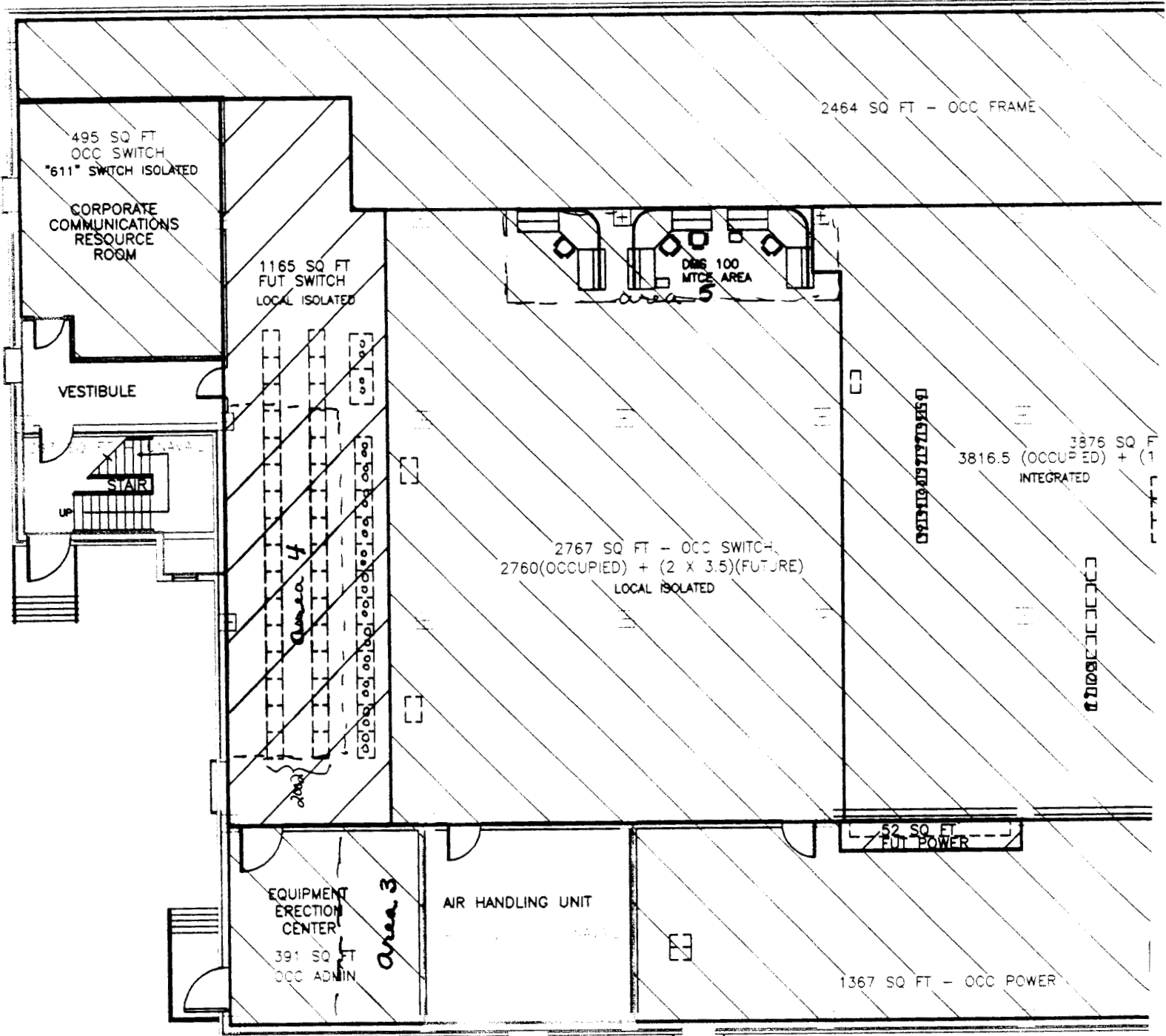
**AUDIT DISCLOSURE NO. 7****SUBJECT: REVIEW OF POTENTIAL SPACE AREAS 3, 4 & 5 BOCA TEECA**

**STATEMENT OF FACT:** Whether there is space in this office is contingent upon whether a space that is less than 100 square feet can be used for collocation (Disclosure 5) and whether the company has to relocate existing items in the office (Disclosure 1, Item 7).

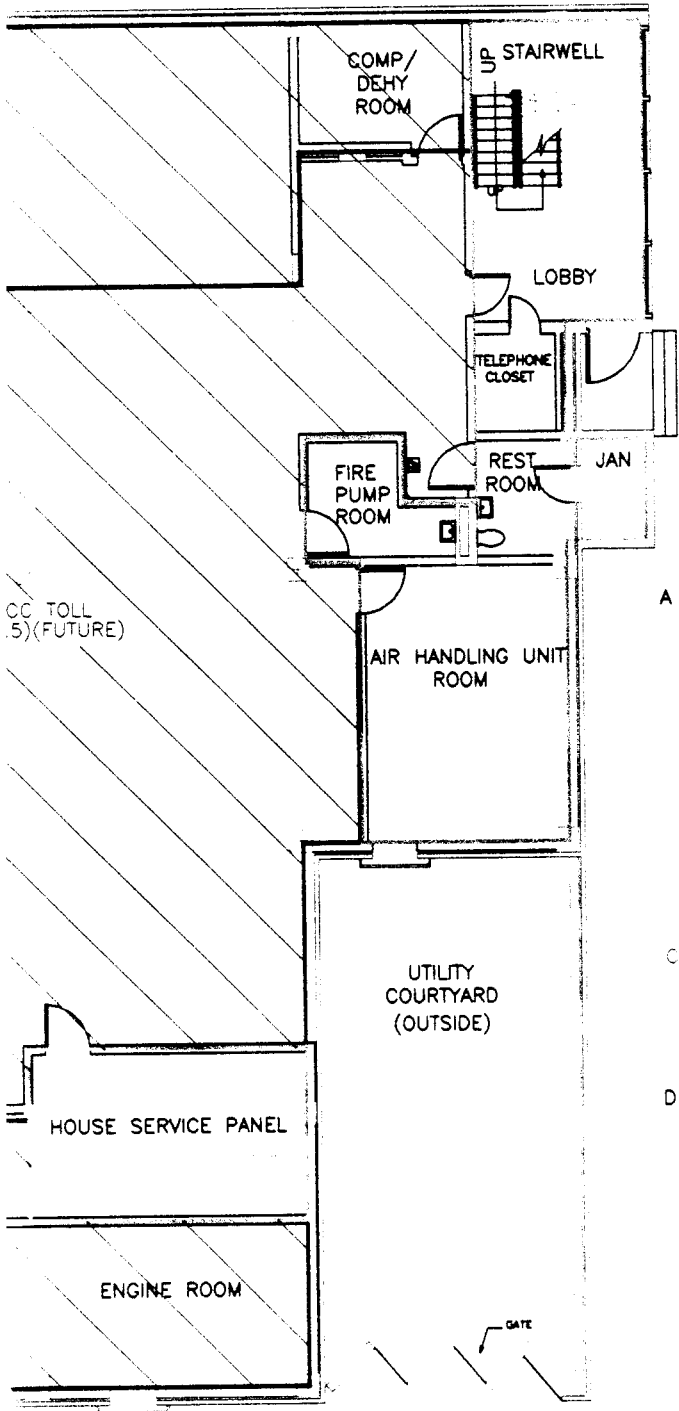
Area 4 contains approximately 127 square feet after fire aisles are considered (15' x 8' 6"). The area is forecasted for two equipment line ups of switch growth in 2002 and 2003. It is part of the isolated ground plane. (See Disclosure 1 for discussion) There are cable racks above the area. It is currently used for an administrative cubicle, book shelves and terminals, and storage. It is on an outside wall.

The company has very few bays remaining for circuit growth after year 2000 forecast is entered. If circuit equipment grows faster than forecast, there are no empty bays in the DSX1 line up or the fiber optic terminal line up. If this happens by the year 2001, BellSouth has stated that it may move the monitoring stations which are currently in area 5 to area 4. If the monitoring stations are moved as is, the space will be filled. Moving the circuit equipment to area 4 would put equipment on an integrated ground plane in an isolated ground plane area and a 7 foot aisle would be necessary, probably cutting the possible line ups from 3 to 2. If the monitoring station were moved to area 4, there would be a portion of area 5 that would probably not be used until after 2001. However, after allowing for aisles and walls this would not be a large area. In addition it has cabling racks over the area.

Area 3 is used for loading equipment and used to store new equipment coming in to the office until it can be placed. If the area were cut in half it would leave approximately 10' by 20' before a wall is constructed. This is slightly less than 200 square feet, after walls. This would accomodate one collocator at 100 square feet and a POTS area. However, the same problem would exist as in the Supra West Palm Beach Gardens case. The company's storage and erection center would be eliminated.



E8181 BOCA RATON - BOCA TEECA F



MARCH 1, 1999

A TOTAL GROSS SQ FT 14,497

STAIRWELL	2760
AIR HANDLING UNIT ROOM	495
TELEPHONE CLOSET	38.65
FIRE PUMP ROOM	2464
REST ROOM	1367
JAN	391
<b>TOTAL OCCUPIED SPACE</b>	<b>11,235.5</b>

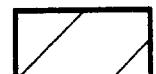


SWITCH	2760 + 495 = 3255
TOLL	38.65
FRAME	2464
POWER AND ENGINE	1367
ADMIN	391
<b>TOTAL OCCUPIED SPACE</b>	<b>11,235.5</b>



C TOTAL OCCUPIED SPACE 11,235.5

SWITCH	1165 + (2 x 3.5) = 1172
TOLL	17 x 3.5 = 59.5
POWER	52
<b>TOTAL RESERVED SPACE</b>	<b>1283.5</b>



D TOTAL RESERVED SPACE 1283.5

ISOLATED - ISOLATED GROUND PLANE  
 INTEGRATED - INTEGRATED GROUND PLANE  
 OCC - OCCUPIED  
 FUT - FUTURE  
 UNAVAIL - UNAVAILABLE  
 - BUILDING COLUMN

1ST FLOOR PLAN



**AUDIT DISCLOSURE NO. 8****SUBJECT: REVIEW OF POTENTIAL SPACE AREAS 1 & 2 BOCA TEECA**

**STATEMENT OF FACT:** Whether there is space in this office is contingent upon whether the company has to relocate existing items in the office (Disclosure 1, Item 7). Boca Teeca has a second floor which is currently used as an administrative office for Outside Plant Engineering. There are currently 43 people assigned to this space. The company projects that 59 will be assigned here by the end of the year 2000.

The space contains 18 four-people work stations( or space for 72 employees), 3 private offices, nine one person cubicles, a training room, storage room, new service observing area, a map area, a supply room and a lounge area.

The storage room had shelves that were nearly empty. The new service observing area had tables and some printers along the walls. The supply room was empty.

Area 1 contains two offices and a training room that take up approximately 472 square feet. Area 2 contains the storage room and the new service observing office. The offices take up approximately 511 square feet.

In response to our questions about using this area for collocation, the company responded:

“Outside of the FCC issues, the second problem is the code-required separations mentioned in previously submitted information. BST will be required to build fire rated walls, halls, air conditioning ducts, return air grilles. These items are not debatable. Location of cable holes and racks could be problematic but we will not know until detailed vendor study is completed.”

As discussed in Audit Disclosure 1, item 7, the company responses indicate its belief that the FCC rules state explicitly that relocation and renovations are not required to provide collocation space. The discussion on this issue can be found in that disclosure.

FCC Order number 96-325, section 570 states “Section 251(c)(6) requires physical collocation ‘at the premises of the local exchange carrier.’ In the NPRM, we tentatively concluded that the term premises includes, in addition to LEC central offices and tandem offices, all buildings or similar structures owned or leased by the incumbent LEC that house LEC network facilities. Section 573 of the same order states “In light of the 1996 Act’s procompetition purposes, we find that a broad definition of the term ‘premises’ is appropriate in order to permit new entrants to collocate at a broad range of points under the incumbent LEC’s control.” “We therefore interpret the term ‘premises’ to broadly include LEC central offices, serving wire centers, tandem offices, as well as

all buildings or similar structures owned or leased by an incumbent that house LEC network facilities, on public rights of way such as vaults containing loop concentrators, or similar structures.”

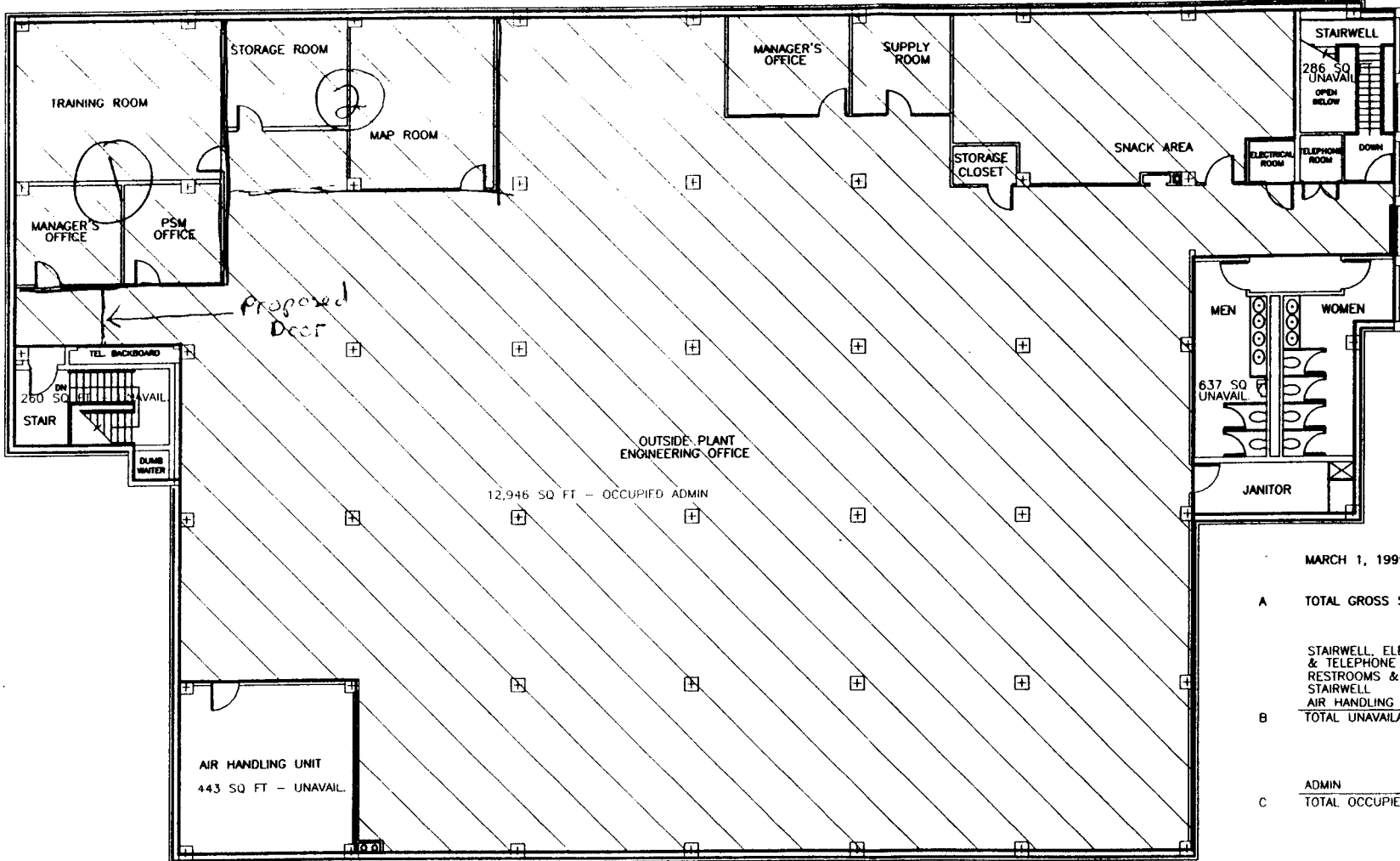
**OPINION:** If it is determined that the company has to reorganize space, the administrative area is part of a building housing network facilities and should be considered for collocation.

The administrative area is expected to house 59 employees but there are enough work spaces for 86 employees. This leaves 27 spaces unused. Therefore, there is space on the second floor if the company is required to reconfigure its space.

Each four man work station takes up approximately 20' by 20' with aisle space. If six of these are removed, approximately 2,400 square feet could be made available.

If area 1 was used as collocation space, 2 hour fire rated walls would have to be built. One exit door, the one on the map that shows as an exit from the managers office, would be allowed because travel distance is less than the 50 feet required in the code. The offices in area 1 that exist now could be incorporated into the remaining administrative space if six work stations are removed. A door could be built to block off the the entrance door to the managers office (see map) from the administrative area. This would leave 2 means of exit for the administrative space.

To use the combined areas 1 and 2, it would be necessary to build a fire rated corridor to create two exits since the travel distance is more than 50 feet.



MARCH 1, 1999

A	TOTAL GROSS SQ FT	14,572
STAIRWELL, ELECTRICAL ROOM & TELEPHONE ROOM		286
RESTROOMS & JANITOR		637
STAIRWELL		260
AIR HANDLING UNIT		443
B	TOTAL UNAVAILABLE SPACE	1626
ADMIN		12,946
C	TOTAL OCCUPIED SPACE	12,946

ADMIN - ADMINISTRATIVE  
 UNAVAIL - UNAVAILABLE  
 ⊕ - BUILDING COLUMN

E8181 BOCA RATON - BOCA TEECA SECOND FLOOR PLAN



**AUDIT DISCLOSURE NO. 9****SUBJECT: FORECAST**

**STATEMENT OF FACT:** There are two primary forecasts for each central office, switch and circuit. Access line growth is the primary driver of the switch forecast and the trunk forecast is the primary driver of the circuit equipment.

Regression analyses were run in order to determine the reasonableness of the access line forecasts. To perform the analyses, historical data from 1993 to 1998, city and county population information from 1993 to 1998, and secondary line growth statistics were used. In addition, the projected growth of network access lines was compared to the historical growth for the period 1988 to 1998.

Due to time constraints, the same type of analyses of the trunk forecast were not performed. The forecast is generated by a BellCore software package. The manual for the software was reviewed.

For each office, the area with large empty spaces was identified as either circuit or switch. Once the area was identified, historical information was obtained on how many bays were added for two years or more. The historical growth was compared to the forecast. The last two years were used because of the impact of the Internet, long distance carriers entering the market and data transmission technologies.

**OPINION:** The projected growth rates of total network access lines do not significantly differ from historical trends and represent reasonable projections.

The BellCore programs used to derive trunk traffic are based upon widely accepted statistical methods and procedures.

ATTACHMENT 1

BellSouth Telecommunications, Inc.  
FPSC Staff's Audit Request #23  
Dated: February 8, 1999  
Page 1 of 2

**REQUEST:** RE: Grounding

1. Please explain why you need two different ground planes in a central office.
2. Provide your reasons for not wanting to put a physical collocator in the middle of an isolated ground plan with and without a wall. Provide any documentation that shows the potential problems.
3. Provide company TR regarding the ground planes as we discussed at our meeting on Feb. 5, 1999. Or other information you have.

**RESPONSE:** 1. Digital switching equipment operates very constrained circuit design using micro amps of electricity with ground return. Stray ground currents induced by magnetic fields caused by electric motors, lighting, variations in commercial electric service, stray janitorial motors such as buffers and vacuum cleaners, static electric discharges built up by humidity and temperature variations, can cause service impairments or loss of service. Isolating the digital switch ground provides a measure of service protection against accidental loss of service.

Toll (circuit) equipment is not this sensitive to stray ground currents. However, toll equipment can generate its own noise. The noise can be transmitted in the grounding system much like the ignition noise in a car speaker system. The ground plane separation ensures this noise will not affect digital service.

Finally, separating the ground planes by physical barriers or adequate aisles ensures accidental contact will not transmit current between the ground planes. Different ground planes will have voltage (potential difference) by the laws of electricity. By those same laws, current will flow when the two planes are brought into contact. This current will cause the same stray current disruptions described above. This could lead to life threatening situations if the potential is large enough.

## EXHIBIT KLW-1 (PAGE 25 OF 28)

**BellSouth Telecommunications, Inc.**  
**FPSC Staff's Audit Request #23**  
**Dated: February 8, 1999**  
**Page 2 of 2**

**RESPONSE (cont'd):**

2. For all the above reasons, an integrated ground plane collocater would not be a preferable tenant in an isolated ground plane environment with or without a wall. The basic problem is that even with a wall the integrated ground plane collocater requires complete electrical separation in the overhead environment. This means none of his racking, electrical conduits, air conditioning ducts, lights, controls, can have metallic contact with any of the items in the isolated ground plane. Second, if the code officials insist on the tenant occupancy rule, BST must construct a fire rated wall through all of the overhead environment to meet this code. This wall structure can not make metal to metal contact with any of the isolated ground plane.
3. At the February 5, 1999 meeting, BellSouth and Staff discussed TR-NWT-000295, titled *Isolated Ground Planes: Definition and Application to Telephone Central Offices, Issue 2*, dated July 1992. This document is copyrighted by Bellcore. The cost to purchase a copy for Staff's use is over \$250.00. BellSouth will make this document available for Staff's review at its Brentwood office in Miami. To review the document, please contact John MacDonald at 305-622-3230.

**RESPONSE PROVIDED BY: J. D. Bloomer**

## ATTACHMENT 2

BellSouth Telecommunications, Inc.  
FPSC Staff's Audit Request #22  
Dated: February 8, 1999  
Page 1 of 3

**REQUEST:** RE: Families of Equipment

1. Explain what you mean by families of equipment.
2. What are your reasons for keeping switch equipment in their own line ups?
3. What are your reasons for keeping circuit equipment in their own line ups?
4. What are your reasons for keeping power equipment separate?
5. Provide reasons for any other family of equipment.
6. Provide documents for any of the above where available, i.e. TR's etc.

**RESPONSE:** 1. Equipment comes in four general groups, switch, power, circuit (toll), and frame. Each group contains equipment types used for specific purpose. The equipment comes in fixed configurations detailed by the manufacturers. These types are called families. The equipment vendors guard the detailed layout information as highly proprietary.

Examples of families follow:

A switch processor layout is a family.

A power plant control bay and discharge bays is a family.

A light guide terminating frame is a family of separate terminating bays.

A Digital Crossconnect System (DSX, DACS) is a family

A DSCs complex for Subscribe Line Carrier is a family.

2. Switch equipment is kept in its own area for the following reasons:  
The switch equipment is physically different in width and depth from other types. Mixing different depth equipment in the same aisles creates wasted space.

Switch equipment is considerably hotter, requires different air conditioning filters, aisle spacing, and cable rack design per manufacturer specifications.

Switch equipment is an isolated ground plane.

BellSouth Telecommunications, Inc.  
FPSC Staff's Audit Request #22  
Dated: February 8, 1999  
Page 2 of 3

**RESPONSE (cont'd):**

Switch equipment has detailed internal cabling distances used by vendor engineering forces to maximize performance. Basically, switch equipment cables to other pieces of switch equipment NOT to other groups of equipment.

3. Toll equipment is kept in its own area for the following reasons: Toll equipment varies widely in width and some families vary in depth as well. Mixing the various widths and depths makes lineup configurations space inefficient. This makes air-conditioning and cabling design difficult as well.

Toll equipment is somewhat cooler than switching equipment, but hotter than frame and power. This means we can save expense dollars by properly sizing air conditioning to match the load.

Toll equipment is integrated ground plane. This means it shares common ground with all building components, frame, and power equipment.

Toll equipment grows in configurations limited by its family membership. Various families can exist side by side as long as each can grow the manufacturer recommended layout maximum.

Toll equipment generally cables to other types of toll equipment and the main frame. Growth in one type (D4, SLC, or multiplexers) leads to growth in DSX, Fiber Optic Terminals, or DACS families as the functions are interlocking.

4. Power equipment is in its own area for the following reasons: Power equipment is defined as a hazardous occupancy by the NFPA, National Fire Protection Act, due to the batteries and resultant explosive fumes. One hour rated walls enclosing the space meet the code. BellSouth attempts to follow this code in all new buildings, and retrofits all older buildings as soon as possible. Separate air conditioning and ventilation systems are also constructed to isolate the space.

Power equipment aisles are dictated by the size of components and voltage contained in them. These aisles are significantly different from toll/switch requirements with significantly greater hazards.

**BellSouth Telecommunications, Inc.  
FPSC Staff's Audit Request #22  
Dated: February 8, 1999  
Page 3 of 3**

**RESPONSE (cont'd):**

- 5. The standby engine requires its own space for the following reasons:**

**The engine and its diesel fuel are rated a hazardous occupancy. One hour and in some cases 2 hour walls are required by NFPA and the local building code to isolate the hazard.**

**The engine is extremely noisy. Running the engine on a regular basis renders the adjoining spaces unusable.**

**Air intake and exhaust requirements create drafts and smells rendering adjoining open spaces unusable.**

**The adjoining space is impossible to air condition effectively with the large intake grilles necessary to support the engine.**

- 6. The above detail in the floor-space layout information is contained on the Web site supported by the BELLCORE organization. This paid subscription site is available to all Internet users for a fee. The information is not proprietary to the various manufacturers providing their details.**

**RESPONSE PROVIDED BY: J. D. Bloomer**

*DOCKET NO.: 981012-TL: Petitions for temporary waiver of physical collocation requirements set forth in the 1996 Telecommunications Act and the FCC's First Report and Order, for the North Dade Golden Glades Central Office, by BellSouth Telecommunications, Inc.*

*WITNESS: Direct Testimony Of Kathy L. Welch, Appearing On Behalf Of Staff*

*EXHIBIT: KLW-2*

**DECLASSIFIED**

~~CONFIDENTIAL~~  
(see 06056-99)

part 2 of 4  
04605-99



**FLORIDA PUBLIC SERVICE COMMISSION**

*DIVISION OF AUDITING AND FINANCIAL ANALYSIS  
BUREAU OF AUDITING*

*Miami District Office*

BELLSOUTH TELECOMMUNICATIONS, INC.

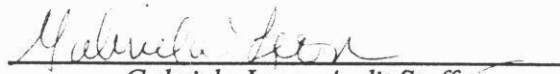
INVESTIGATION OF COLLOCATION SPACE WAIVERS

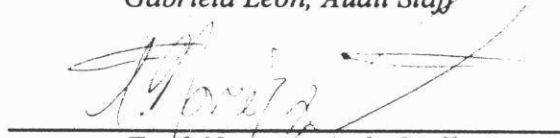
NORTH DADE GOLDEN GLADES OFFICE


DOCKET NO. 981012-TL  
AUDIT CONTROL NO. 98-334-4-5

March 19, 1999

  
Kathy L. Welch, Audit Manager

  
Gabriela Leon, Audit Staff

  
Tarik Noriega, Audit Staff

  
Paul Stallcup, Audit Staff

  
Ruth K. Young, Professional Accountant  
Specialist

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**DIVISION OF AUDITING AND FINANCIAL ANALYSIS  
AUDITOR'S REPORT**

**MARCH 19, 1999**

**TO: FLORIDA PUBLIC SERVICE COMMISSION AND OTHER INTERESTED  
PARTIES**

We have applied the procedures described later in this report to determine the availability of space for collocation in the central office for which a waiver was requested.

This is an internal accounting report prepared after performing a limited scope audit. Accordingly, this report should not be relied upon for any purpose except to assist the Commission staff in the performance of their duties. Substantial additional work would have to be performed to satisfy generally accepted auditing standards and produce audited financial statements for public use.

In our opinion, the waiver referred to above presents fairly, in all material respects, observations made while touring the central office. The attached findings discuss all differences and other matters which were noted during our examination.

## SUMMARY OF SIGNIFICANT PROCEDURES

Our audit was performed by examining the company's waiver and documentation that supports the assumptions which we believe are sufficient to base our opinion. Our examination did not entail a complete review of all financial transactions of the company. Our more important audit procedures are summarized below.

Read orders and rules related to collocation.

Read production of documents and interrogatories.

Interviewed switch, circuit, and common system planners for the offices involved.

Interviewed the geographical forecasters.

Toured and randomly measured the central offices.

Obtained maps showing current and future use space and compared to the applications for waiver.

Read company procedures.

Obtained supporting documents for company assumptions.

Compared the company's access line forecast to national trends. Ran models and compared to the company's. Access lines are used to forecast switch growth.

Reviewed the methodology used in the Bellcore trunk forecasting program. Trunk forecasts are used in both circuit and switch forecasts.

Determined reasons why large spaces would or would not be good candidates for collocation.

The scope of the audit was limited because our review of tools and methodology, used to determine the number of bays forecast, was not completed due to time restrictions. However, as an alternate procedure, two to three years of historical growth were compared to current forecasts for spaces considered critical to the collocation decision.

**AUDIT DISCLOSURE NO. 1****SUBJECT: SPACE PLANNING ASSUMPTIONS**

**STATEMENT OF FACT:** During our interviews of BellSouth staff and our tours of the central offices, staff identified several assumptions used by BellSouth in its space planning. These assumptions are used throughout this report, therefore, they are identified below. In addition, the documentation that these assumptions have been verified to is disclosed.

1. Seven foot aisles or a physical barrier are necessary between switch and any other equipment such as circuit (toll) equipment or power equipment. This is because when the central offices were originally designed, the decision was made to put switch equipment on an isolated ground plane to create an additional protective barrier from power interruptions or trouble. Circuit (toll) equipment is on an integrated ground plane. If a problem happens in the system and a technician is touching two types of equipment, one that has an integrated ground plane and one with an isolated ground plane they can be electrocuted and the equipment could be damaged. (See attachment 1 to this report for a more technical discussion of integrated and isolated ground planes. ) Therefore, a requirement was instituted that seven feet (based on the width of a person's arm span) be placed between circuit and toll equipment. A wall or a cage would also keep a person from touching the two types of equipment. This seven foot barrier was violated by BellSouth in two of the six central offices reviewed (Golden Glades and Boca Teeca). The company claims that other grounding precautions were taken to attempt to solve this problem.

The only reference for this requirement was found in a Bellcore publication. It states:

"All integrated ground plane conductive members located within 6 feet of the isolated ground plane shall be bonded to its MGB to minimize the surge potential difference between nearby members of the two ground planes."

No verification could be made to the National Electric Code but the potential risk was verified with engineers outside of the Bell system.

2. Plug in units are required to be in a room with fire rated walls or in fire proof cabinets that are grounded and connected to the wall. BellSouth provided the Life Safety Code Section 6-4.1.1 that states:

"Protection from any area having a degree of hazard greater than that normal to the general occupancy of the building or structure shall be provided as follows:

(a) Enclose the area with a fire barrier having a 1-hour fire resistance rating in accordance with section 6-1 without windows."

The company claims that because the circuit packs have cardboard liners, they have a high degree of risk.

Since the company is currently violating this rule in several offices, it is necessary for the company to allocate space to correct the problem before space can be considered for collocation.

3. A four foot fire aisle has to exist and be connected to two exit doors. This was verified to the Life Safety Code Handbook section 5.5-1.2 and the Standard Building Code Table 1004.

4. It is necessary to keep certain families of equipment together and therefore, the floor plans include space allocated within each type of equipment for growth in that type of equipment. The reason provided by a company representative was because over time, growth exceeded the initial space allocated for certain types of equipment. This reservation of space is called a footprint. The reason the company believes that families of equipment need to stay together is because some of the equipment has 50 foot cabling requirements, some have processors that require the other equipment to be in adjacent bays, and some would require additional cost for repeaters, cabling, and connections if they were not near other equipment. The company's reasons for needing to keep families of equipment together can be found in attachment 2.

The company exceeded the footprint for certain types of equipment in both the Daytona Port Orange office and the Boca Teeca office. The company was asked to provide the additional costs incurred to put equipment in a new line up. In answer to document request 32, the company stated that it was unable to provide this information. At the exit conference, a company representative stated that they were unable to provide because detailed equipment engineering for specific locations on individual jobs does not provide optional costs or optional locations. Therefore, the costs attributable to families of equipment being diversely located in a central office are not readily available.

Staff also observed the problem in Daytona because a bridge was created to hold the wires that connected the equipment. Because footprints have been established within the line up for each type of equipment, some equipment that goes in these groups may not be planned to be installed within the two years that are covered in this application. However, a series of bays that are empty within a series of equipment would not usually be feasible for physical collocation anyway because the space would not be large enough.

5. At least a four foot space must be maintained in front of an air handler vent and an

aisle should be maintained perpendicular to the unit for air to flow. How much space is needed is determined based on A.S.H.R.A.E. Engineering Standards which were outside the area of our expertise.

6. Physical collocation needs to be in room with fire rated walls with an exit door to the outside of the building. If the exit is not to the outside of the building or to a corridor that can be blocked from the BellSouth equipment area, an escort would be required to get access to the collocation space.

The Federal Communications Commission 47 CFR Chapter 1 51.323 (I) states "An incumbent LEC may require reasonable security arrangements to separate a collocating telecommunications carrier's space from the incumbent LEC's facilities."

FCC order 96-325 paragraph 598 states "we will continue to permit LEC's to require reasonable security arrangements to separate an entrants collocation space from the incumbents LEC facility." However, in order 98-188, they seek comment on whether incumbent LEC's should be allowed to require escorts for competitive LEC technicians (Paragraph 141).

In FCC order 98-188, paragraph 137 states "Given that space in incumbent LEC premises is limited, we tentatively conclude that we should require incumbent LEC's to offer collocation arrangements to both new entrants and any advanced services affiliate incumbent LECs establish that minimize the space needed by each competing provider in order to promote the deployment of advanced services to all Americans. Such alternative collocation arrangements include: (1) the use of shared collocation cages, within which multiple competing providers' equipment could be either openly accessible or locked within a secure cabinet; (2) the option to request collocation cages of any size without any minimum requirement, so that competing providers will not use any more space than is reasonably necessary for their needs; and (3) physical collocation that does not require the use of collocation cages ('cageless' collocation)."

However, BellSouth has submitted plans for hybrid walls within the cluster area (8 foot non-fire rated walls) in the Palmetto office and were turned down. Denials were reviewed and verified with the building and zoning department. If hybrid walls were denied within a fire rated room, it is not likely that cages would be approved.

Dade County uses the South Florida Building Code of 1994. It states in section 507.2 (a):

"In any building where rooms or spaces are occupied by separate tenants, not less than 1-hour fire-resistive construction shall be provided between tenants and between tenants and common areas.

The South Florida Building Code Chapter 12 puts telephone exchanges in Group G Division 2. The only exception that may apply to Group G, Division 2 is:

“(1) As otherwise permitted for the group of occupancy by Chapter 31 of this Code.”

Boca Raton, West Palm Beach, Daytona and Orlando are covered under a different code, the Standard Building Code, which states in paragraph 507.2 a:

“(1) In any building where rooms or spaces are occupied by separate tenants, not less than one-hour fire-resistive construction shall be provided between tenants and between tenants and common areas except as provided below:”

The exceptions that may apply to Group G, Division 2 are:

“(3) EXCEPTION: Where all tenancies within a Fire Division are of Group G, Division 2 Occupancy, such space shall be exempt from the provisions of this Sub-section if one story in height and of Type III unprotected, IV, V unprotected.

“(4) EXCEPTION: Fire resistive separation between a tenant and a mall area will not be required by this sub-paragraph where the space on both sides of such wall or partition is protected by an automatic sprinkler system or by a water curtain provided at the line of separation.”

“(6) EXCEPTION: Group G, Division 2, clusters of offices less than 200 square feet served by a common reception area and internal corridor within the cluster area shall not require fire separation between offices and corridors common to the cluster.”

According to BellSouth's answer to document request 32, BellSouth was concerned that the Florida code officials were requiring fire-rated separations, which result in more complex construction. Therefore, BellSouth asked Bellcore for help. BellCore obtained a letter from the Southern Building Code Congress International supporting its position. BellSouth has talked to several municipalities and believe that several will permit cages although none have been permitted at this time.

7. BellSouth contends that the FCC rules state explicitly that relocations and renovations are not required to provide collocation space.

When asked to provide the citation that supports its contention BellSouth cited CFR 51.321. The Federal Communications Commission 47 CFR Chapter 1 51.321 (e) states “An incumbent LEC shall not be required to provide for physical collocation of equipment necessary for interconnection or access to unbundled network elements at the incumbent LEC's premises if it demonstrates to the state commission that physical collocation is not practical for technical reasons or because of space limitations.”

The definition of technically feasible according to 51.5 states "Interconnection access to unbundled network elements, collocation, and other methods of achieving interconnection or access to unbundled network elements at a point in the network shall be deemed technically feasible absent technical or operational concerns that prevent the fulfillment of a request by a telecommunications carrier for such connection, access, or methods. A determination of technical feasibility does not include consideration of economic, accounting, billing, space or site concerns, except that space and site concerns may be considered in circumstances where there is no possibility of expanding the space available. The fact that an incumbent LEC must modify its facilities or equipment to respond to such a request does not determine whether satisfying such request is technically feasible. An incumbent LEC that claims that it cannot satisfy such request because of adverse network reliability impacts must prove to the state commission by clear and convincing evidence that such interconnection, access, or methods would result in specific and significant adverse network reliability impacts"

In its application for waiver, BellSouth states, "The term 'space limitations encompasses two factors: first, ILECs are entitled to consider space already in use by the ILEC at the time the collocation request is made; second, ILECs are entitled to 'retain a limited amount of floor space for defined future uses'(Order, Par. 604)." Their citation refers only to retaining space for future use and not to being entitled to space already in use.

FCC order 98-188 paragraph 142 states: "We also ask commenters to address whether we can and should require incumbent LEC's to remove obsolete equipment and non-critical offices in central offices to increase the amount of space available for collocation."

**OPINION:** BellSouth assumptions were verified to the documentation referenced above.

No citation could be found relating to not having to reorganize the central office to accommodate except for the inquiry in Order 98-188 asking for an opinion on removing obsolete equipment and non-critical offices. CFR 51.321 requires physical collocation as long as it is technically feasible. And, the definition of technically feasible specifically states that an incumbent LEC must modify its facilities or equipment to respond to a request as long as it does not impact network reliability. Moving equipment could be costly, would involve cabling and power difficulties and does have the potential of losing service for the customers. Moving office furniture and fixed configuration furniture does not involve the same costs or risks and should be considered if the furniture is not in a location that is currently part of a footprint for growth of equipment line ups. At the exit conference, a company representative commented that the company generally tries not to put switch fixed configuration furniture in a footprint because it is intimately



related to the processor area of the switch.

If the company is required to remodel existing facilities, a determination needs to be made of who would be required to pay for the changes.

Security measures are still being addressed by the FCC.

**AUDIT DISCLOSURE NO. 2**

**SUBJECT: WORK STATIONS AND ADMINISTRATIVE SPACE WITHIN THE CENTRAL OFFICE SWITCH AND CIRCUIT (TOLL) AREAS**

**STATEMENT OF FACT:** In its space assessment worksheet, the company has identified areas that are for circuit (toll) equipment and areas for switch equipment. Within these areas are fixed configuration furniture which contains monitors to test equipment. In addition, there are several desks, files and printers contained within the floor space.

The floor plans for these spaces that include the footprints for the future growth of families of equipment, often show these areas being replaced by equipment.

In the time between the first tour of Golden Glades and Palm Beach Gardens and the most recent tour, much of this furniture had been moved and rearranged as lines of equipment were installed.

**OPINION:** Although the layout of the monitors and administrative spaces within the circuit and switch areas does not always appear to be efficient, it should not be an issue if there is an existing footprint in that area for future equipment. If the forecast for the footprint is reasonable, then the furniture will be moved and sometimes consolidated. If the area is large enough, meets the other requirements in disclosure 1, and does not involve footprints for equipment line ups, it will be discussed in the disclosure that proposes potential areas for collocation.

**AUDIT DISCLOSURE NO. 3****SUBJECT: SPACE ASSESSMENT WORKSHEET**

**STATEMENT OF FACT:** In its petition for waiver, BellSouth indicates that a certain number of feet in the facility is "reserved for defined future use essential for BellSouth to meet the growing needs of its customers through the year 2000." This space agrees with Section D- Reserved Space on the Space Assessment Worksheet that was attached to the petition.

The Federal Communications Commission Rules, 47 CFR Chapter 1, section 51.323 (f) (4) states "an incumbent LEC may retain a limited amount of floor space for its own specific future uses, provided, however, that the incumbent LEC may not reserve space for future use on terms more favorable than those that apply to other telecommunications carriers seeking to reserve collocation space for their own use."

Collocation applications do not indicate the time frame that the room will be filled and therefore, there is no way to determine from the documentation how much space the collocators are reserving for future use.

Only one of the six offices reviewed in this proceeding has physical collocation. The two collocators currently residing in these spaces were asked to provide detail about when the collocation space will be filled. Only one responded. The company currently has only one bay in a room that would hold six. It expects to fill the bays within two years.

BellSouth employees have indicated that it takes three years from the time a plan for an addition is initiated for a building addition to the time it is actually completed. A schedule was provided to show that a recent addition in North Florida was initialized in December of 1995 and construction was completed in December of 1998 or 36 months. Another building addition was planned in July of 1996 and construction was completed October 1998 or 28 months. The only dates that could be documented were the dates the budget was approved and when the buildings were completed. The process took 20 months and 13 months for the two additions respectively. No documentation was provided to show when the planning process began. Additions in South Florida are expected to take longer because of longer permitting time since Hurricane Andrew.

**OPINION:** Although the petition states that the reserved space is to be used by the year 2000, review of the maps of future space and documentation provided by BellSouth regarding intended use of the space indicate that some of the space does not have any forecasted use by the year 2000 and sometimes not even by 2001.

Many times, however, the spaces are in a line of bays which would not be conducive for physical collocation and are being reserved because of the principle of families of equipment. See disclosure no. 1 for a discussion of the need for families of equipment to be together.

According to the rule, BellSouth can reserve as much space as its collocators. We were unable to determine how much space the two other collocators are reserving.

Since it takes three years to get a building addition, allowing only two years of growth, could put BellSouth in a position of not being able to add capacity in time to meet the needs of its customers.

Large spaces that are for forecasted periods beyond two years are described in other disclosures to this report.

**AUDIT DISCLOSURE NO. 4**

**SUBJECT: OBSOLETE EQUIPMENT**

**STATEMENT OF FACT:** The company was requested to provide information on any equipment that would be changed out for new equipment that might have less space requirements.

In the Boca Raton office, an e-net conversion is forecasted which will free up 12 switch bays. Since the switch manufacturer handles the layout of the bays, BellSouth was unable to tell us where the bay would be vacated or if the space would be a contiguous space.

BellSouth's position is that the equipment it has is currently functioning and that it should not have to replace equipment with smaller, more efficient equipment because that would require an additional expenditure.

FCC order 98-188 paragraph 142 states: "We also ask commenters to address whether we can and should require incumbent LEC's to remove obsolete equipment and non-critical offices in central offices to increase the amount of space available for collocation."

BellSouth has retired 13 circuit bays and 8 switch bays in Lake Mary over the last three years; 2 circuit bays and 14 switch bays in Daytona Port Orange; 8 circuit bays in Boca Teeca, and 5 circuit and 18 switch bays in West Palm Beach Gardens. The company response to request 43 states that the information for North Dade Golden Glades and Miami Palmetto will be provided as soon as possible. It was not received.

**OPINION:** Although there is nothing in the rules that would require BellSouth to replace its equipment, it should be noted that if BellSouth were making a decision on whether or not to make a building addition, BellSouth may find it more economical to replace equipment with more efficient equipment and thus free up bays.

This was probably what happened when BellSouth petitioned the FCC in 1993 for waivers. At that time, it only showed future growth of 2100 square feet for Glades and 1000 for West Palm Beach Gardens. The new petitions ask for 4796 in Glades and 3544 in Gardens. (See order PSC-99-0060-FOF-TP p. 9-10)

**AUDIT DISCLOSURE NO. 5**

**SUBJECT:           BELLSOUTH COLLOCATION HANDBOOK  
                      VERSION 7.1.2, DATED January 2, 1999  
                      SPACE ENCLOSURE OPTIONS**

**STATEMENT OF FACTS:** The collocation handbook dated January 2, 1999 describes "BellSouth's collocation offerings, providing general information regarding the terms and conditions, ordering process, provisioning and maintenance of BellSouth's Collocation Offerings."

Section 2 defines physical collocation and states that "Physical Collocation arrangements will be placed in floor space separated from BST equipment." "When space permits, BellSouth will construct a common area for all collocations, including separate ingress/egress where feasible." "Within the collocation common area, collocation arrangements will be individually placed in either enclosed or non-enclosed space." The book also states that under certain conditions a collocator may construct power plant facilities but these must be enclosed in a fire rated wall.

Section 3 states that "Physical collocation space is assigned based on the customer's request, where space permits, with the physical collocation equipment arrangements placed in floor space separated from BellSouth equipment."

Section 3.6 addresses enclosure options. Section 3.6.1 says that BellSouth will make available a 100 square foot minimum enclosure with 50 square foot increments. When a collocator requests more than 100 square feet, BellSouth will try to use contiguous space but if contiguous space is not available, the collocator has the option of two separate enclosures and the purchase of connection through BellSouth cross-connects.

Section 3.6.2 addresses non-enclosed space within the BellSouth "common area". There is no minimum square footage requirement for non-enclosed collocation space, permitting the collocator to use space in increments less than 100 square feet.

The company representative states that the 100 square feet minimum is open for negotiation in the agreement process. However, the company claims to have signed agreements with all existing carriers requiring a minimum of 100 square feet.

**OPINION:** In disclosures in this audit, space of less than 100 square feet are discussed. Based on BellSouth's existing contracts, these spaces would not meet the minimum size requirement. If contracts with new carriers are made or if contracts are renegotiated, these spaces would need to be addressed to determine if they met other collocation requirements.

**AUDIT DISCLOSURE NO. 6**

**SUBJECT: ERRORS ON SPACE ALLOCATION WORKSHEET**

**STATEMENT OF FACT:** The Golden Glades Space Allocation Worksheet that was attached to BellSouth's petition for waiver did not include a cable vault that is under the facility. The vault occupies approximately 1300 square feet. Since it is occupied, it should have no effect on the available space.

**AUDIT DISCLOSURE NO. 7****SUBJECT: REVIEW OF POTENTIAL SPACE AREAS 1, 2, & 7 GLADES**

**STATEMENT OF FACT:** In the central office, there are line ups and bays within the dedicated areas for switch and circuit equipment that are not forecasted to be used in 1999, 2000 or 2001. Whether there is space available in the office is contingent upon the Commission's decisions on the reasonableness of the collocation handbook requirements, on whether the company has to make rearrangements and the security issues involved with having collocators in the middle of BellSouth equipment areas.

Area 1 currently contains a monitoring station for the STP switch. Area 2 is currently the central office manager's office. Area 7 is a room on the second floor that is used for computer based training. The company uses this room so that the computer based training can be done in a quiet environment.

Area 1 is 9'5" by 10'5" or 98.76 square feet.

Area 2 is 10'3" by 10" or 102.5 square feet. The central office manager uses this space as an office. In some other offices, the managers use a partitioned area within the circuit (toll) equipment designated area for office space.

Area 7 is 7'10" by 13' or 101.79 square feet.

There is a room next to area 2 which was formerly a pump room. It is 9' 8" by 10'8" or 104.11 square feet. A company employee reported that this room will be used for an elevator when an addition is done. There is not currently a second floor over this area. There is no elevator in this office currently and no requirement to have one unless there are three floors. The company response states that "If you don't plan for the elevator ahead of time with the structural items necessary in the floors, you must, construct the new elevator outside the existing structures." "Code variance is necessary to add to the building perimeter." "The building already exists on the setback lines. Expanding the building further into the set back will require a code variance."

According to a company response, most of the monitoring equipment has a 225' cabling restriction. Moving the monitoring station for the STP equipment to the second line up outside the door of the monitoring area (Company designated aisle A), next to the forecasted STP lineup would not violate this limit. There is no growth forecast for this lineup except one bay for 1999 and one for 2000.

The company responded that it would not be able to provide any technical reasons why this computer monitor could not be moved without a detailed vendor study on the equipment capability. In addition, BellSouth responded that the space created (area 1)



appears to fail the physical-collocation guideline criteria.

The BellSouth Collocation Handbook Version 7.1.2, section 3.6 states:

“BellSouth will make available a 100 square foot minimum enclosure with 50 square foot increments.”

Area 1 and 2 could be accessed without entering the BellSouth equipment area.

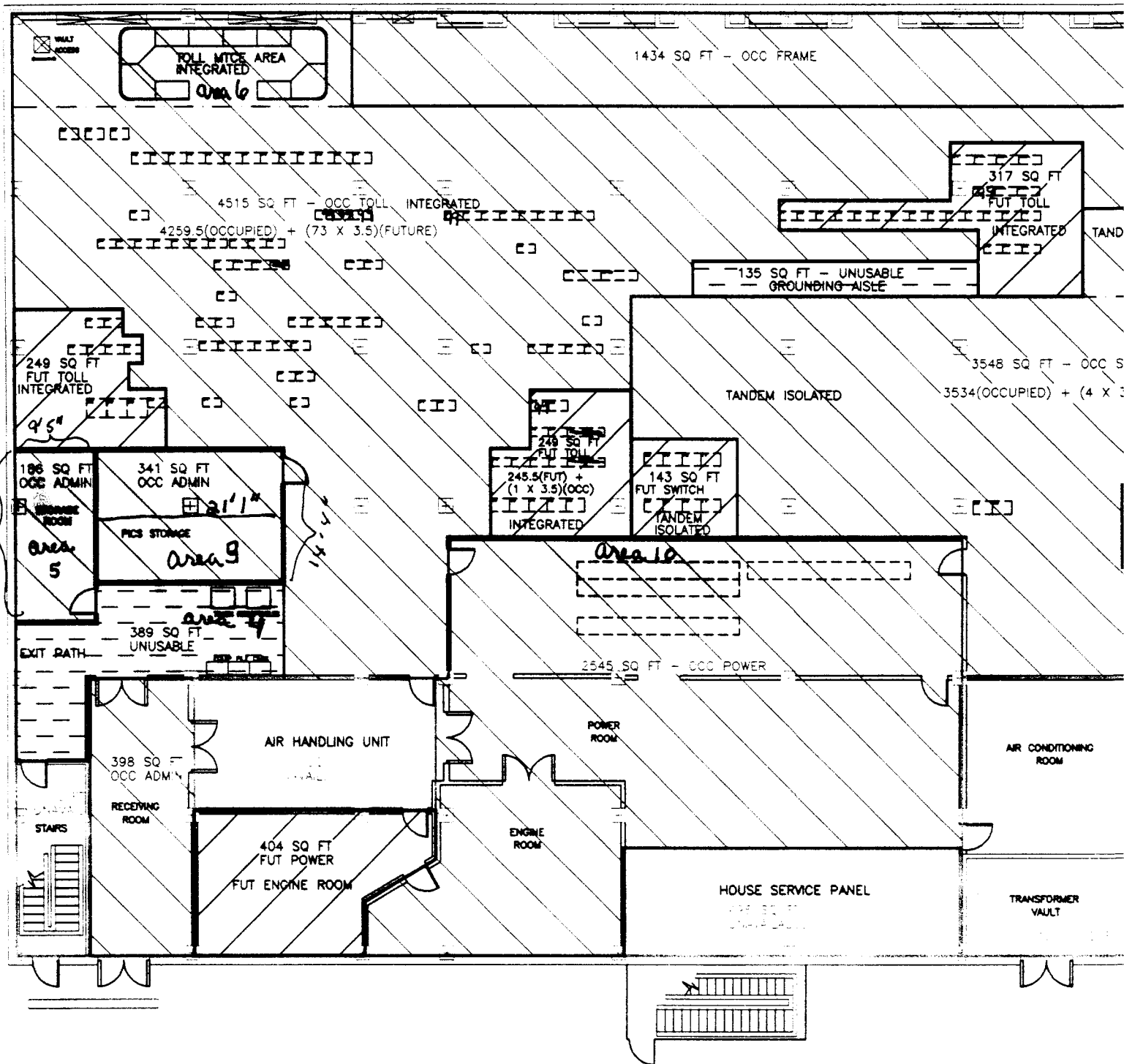
As discussed in Audit Disclosure 1, item 7, the company responses indicate its belief that the FCC rules state explicitly that relocation and renovations are not required to provide collocation space. The discussion on this issue can be found in that disclosure.

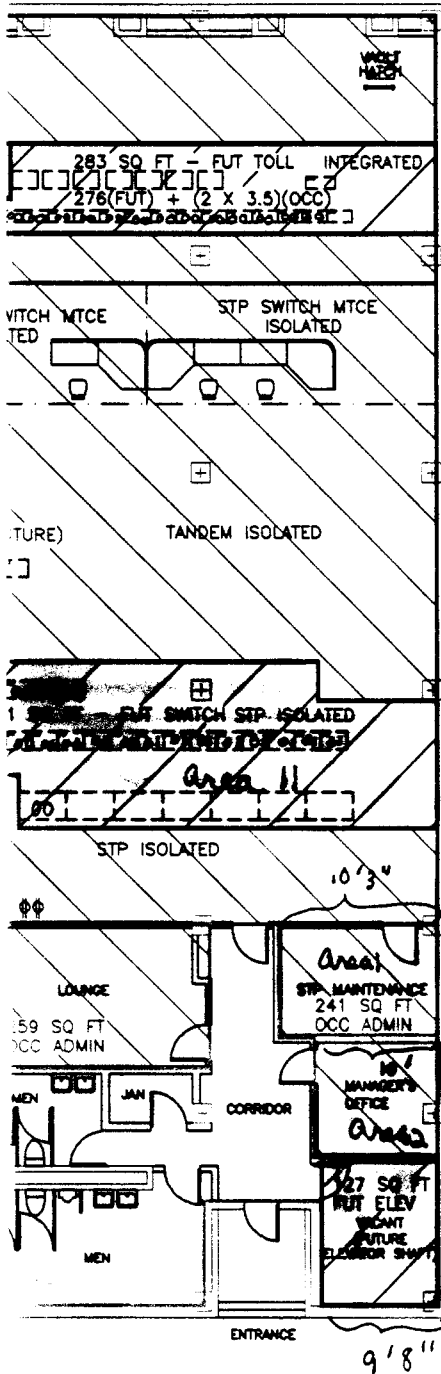
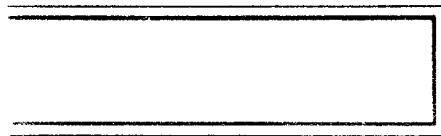
**OPINION:** Because there is space that is not expected to be used by the year 2002 that could house the monitoring station that is in area 1 and the computer based training station in area 7, the manager’s office could be moved into area 7 and therefore, area 1 and 2 could be used for collocation. This would create approximately 100 square feet for a collocator and 100 square feet of common area. Since an elevator is not required, the pump room could be added to the available space for a total slightly over 300 square feet.

If the door to the corridor that enters the equipment area is locked, and the door exiting area 1 is moved to the wall between area 1 and 2, security should not be an issue.


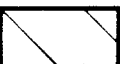



Lighting would need to be added in areas where the STP monitoring station and the computer based training equipment were moved.


CABLE VAULT UNDER FLOOR



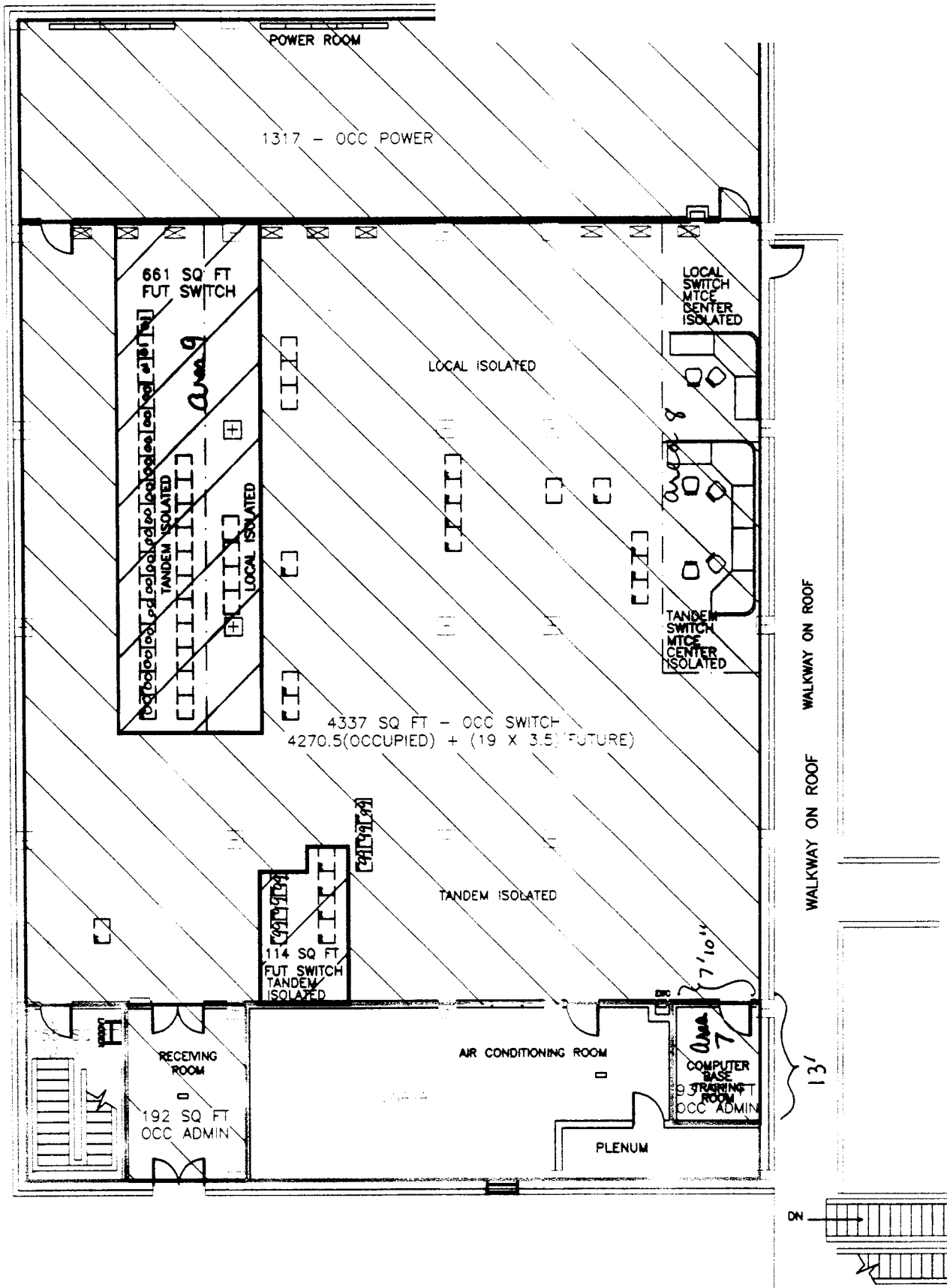


MARCH 2, 1999

A	<b>TOTAL GROSS SQ FT</b>	<b>20,185</b>	
	CABLE VAULT	1537	
	STAIRWELL	190	
	AIR HANDLING UNIT	439	
	HOUSE SERVICE PANEL	496	
	CORRIDOR, JANITOR, RESTROOMS		
	TRANSFORMER VAULT & ELECTRICAL CONTROL ROOM	1229	
	<b>TOTAL UNAVAILABLE SPACE</b>	<b>389'</b>	
	SWITCH TOLL	4259.5 + (3 X 3.5) = 3534	
	POWER AND ENGINE	2545	
	FRAME	1434	
	ADMIN	186 + 34' = 398 + 259 + 241 = 1425	
	<b>TOTAL OCCUPIED SPACE</b>	<b>13,208</b>	
	SWITCH TOLL	249 + 245.5 + 317 + 276 + (73 X 3.5) = 688	
	POWER ELEVATOR SHAFT	404	
	<b>TOTAL RESERVED SPACE</b>	<b>2562</b>	
	EXIT CORRIDOR	389	
	GROUNDING AISLE	135	
	<b>TOTAL UNUSABLE SPACE</b>	<b>524</b>	

ISOLATED - ISOLATED GROUND PLANE  
 INTEGRATED - INTEGRATED GROUND PLANE  
 OCC - OCCUPIED  
 FUT - FUTURE  
 UNAVAIL - UNAVAILABLE  
 STP - SIGNAL TRANSFER POINT  
 - BUILDING COLUMN

OR PLAN



M6506 NORTH DADE GOLDEN GLADES SECOND

MARCH 2, 1999

TOTAL GROSS SQ FT 7577

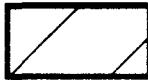
CLASSICAL ROOM AVAILABLE  
 TOTAL AVAILABLE SPACE 813



SWITCH 4270.5  
 POWER 1317  
 ADMIN 192 + 93 = 285  
 TOTAL OCCUPIED SPACE 5872.5



SWITCH 661 + 114 + (19 X 3.5) = 841.5  
 TOTAL RESERVED SPACE 841.5



ISOLATED - ISOLATED GROUND PLANE  
 INTEGRATED - INTEGRATED GROUND PLANE  
 OCC - OCCUPIED  
 FUT - FUTURE  
 UNAVAIL - UNAVAILABLE  
 - BUILDING COLUMN

LOOR PLAN



**AUDIT DISCLOSURE NO. 8****SUBJECT: REVIEW OF POTENTIAL SPACE AREAS 3, 4, & 5 GLADES**

**STATEMENT OF FACT:** Area 3 contains desks and circuit pack storage. There is a partial wall that divides it from area 5 which contain storage shelves holding computer monitors and other equipment. Area 4 is a portion of the hallway outside of area 3.

Area 3 is 21'1" by 14'4" or 302.07 square feet.

Area 4 is approximately 7' by 17' after fire aisles are included or 119 square feet.

Area 5 is 9'5" by 19'1" or 179.73 square feet.

There are currently empty spaces in equipment line ups that are not forecasted to be used in 1999, 2000, and 2001. In touring the six offices, we observed desks being used in the footprints of equipment growth areas not yet used.

According to the map, the company uses area 3 and 5 for a storage room and future work station and circuit pack storage area.

Fire codes require circuit packs to be stored in a room having fire rated walls or a fire proof cabinet. Violations were observed in several of the offices toured.

The company was requested to provide the plans for creating an appropriate storage area for circuit packs that would meet the codes, the codes themselves, the inventory level of circuit packs for the office, and how many packs can be stored on a shelf or a cabinet.

BellSouth's response was, "Codes for fire rated storage areas provided in late-filed exhibits to J. D. Bloomer's deposition in 980800-TP. Code interpretation from Steve Johnson provided earlier." This response does not contain the plan, the inventory information or potential storage information. The response was not received until late on March 1st. The company was contacted and told the response was not adequate on March 4th. We were provided with the actual inventory level of 758 plug in units on March 17.

Area 5 is on an outside wall. In addition, there is an existing door in the stairwell.

As discussed in Audit Disclosure 1, item 7, the company responses indicate BellSouth's belief that the FCC rules state explicitly that relocation and renovations are not required to provide collocation space. The discussion on this issue can be found in that disclosure.

**OPINION:** Because the company did not respond to the request, we could not evaluate the inventory needs of the company and determine if there was additional space in the area that could have been used for collocation.

Desks can be moved to the areas in the equipment line ups that do not have any forecast for the next two years.

If the inventory needs do not support use of all of area 3 and 5, and if:

1. The doors at the 2nd floor were locked.
2. A door was placed in the corridor between the stairs and receiving room and the storage room. And, another through the outside wall.
3. The door to the storage room was moved from the east wall to the south wall.
4. The existing wall between area 3 and 5 was removed.
5. A fire rated wall was built somewhere in area 3 to separate it from area 5.

This location could be made a secure area and a collocator would not have access to other BellSouth equipment.

**AUDIT DISCLOSURE NO. 9****SUBJECT: REVIEW OF POTENTIAL SPACE AREAS 6, 8, 9, 10 & 11 GLADES**

**STATEMENT OF FACT:** Several areas were looked at as possible collocation areas. A discussion of the reasons these areas were not considered possible areas follows:

Area 6 currently contains monitoring equipment.

Area 8 currently contains monitoring equipment.

Most of area 9 is forecasted for growth of the tandem and local switch.

Area 10 is forecasted for power growth in four to five years.

Most of area 11 is forecast for Operator, Toll, and STP switch equipment.

**OPINION:**

Even if the monitoring equipment could be consolidated in area 6, after fire aisles, the space is narrow and could block vault access if walls were constructed.

Even if the monitoring equipment could be consolidated in area 8, the area is only 10 feet wide. After fire aisles this leaves six feet. Leaving space for walls and room to work on the bay on each side, there would barely be room for one line up. The area is also part of an isolated ground plane. (See disclosure 1 for discussion) Even if the monitoring equipment were cut in half, there would not be space for a common area.

Most of area 9 is forecast to be used by 2001. In addition, this is an isolated ground plane area and has cabling and air conditioner ducts overhead. (See disclosure 1 for discussion)

Area 10 is in the battery space. The empty area is about 10 feet wide. Again after fire aisles, walls and work space on either side of the bay, the space would barely fit one line up. See attachment 2 item 4 for discussion of use of the power room for collocation. This may hold potential for housing fire rated cabinets for circuit packs since it will not be used for 4 to 5 years.

Most of area 11 is forecast to be used by the end of 2001. The space that is left would not be large enough. This area is also part of an isolated ground plane. (See discussion in disclosure 1). There are cables over the area that would be difficult to move.



**AUDIT DISCLOSURE NO. 10****SUBJECT: FORECASTS FOR THE GLADES OFFICE**

**STATEMENT OF FACT:** There are two primary forecasts for each central office, switch and circuit. Access line growth is the primary driver of the switch forecast and the trunk forecast is the primary driver of the circuit equipment.

Regression analyses were run in order to determine the reasonableness of the access line forecasts. To perform the analyses, historical data from 1993 to 1998, city and county population information from 1993 to 1998, and secondary line growth statistics were used. In addition, the projected growth of network access lines was compared to the historical growth for the period 1988 to 1998.

Due to time constraints, the same type of analyses of the trunk forecast were not performed. The forecast is generated by a BellCore software package. The manual for the software was reviewed.

For each office, the area with large empty spaces was identified as either circuit or switch. Once the area was identified, historical information was obtained on how many bays were added for two years or more. The historical growth was compared to the forecast. The last two years were used because of the impact of the Internet, long distance carriers entering the market and data transmission technologies.

**OPINION:** The projected growth rates of total network access lines may substantially understate future growth. Over the 1988 to 1998 time frame, access line growth averaged 2.2 percent per year. Over the forecasted period from 1999 to 2003, however, Total Network Access Lines are projected to decrease at an average annual rate of 0.3 percent. Access line growth is driven by population growth and by the adoption of new technologies that utilize central office equipment. In particular, internet access and pagers can significantly impact central office utilizations. Given the likelihood that the adoption of these technologies will continue to expand, projected access line growth may be significantly understated.

Due to time constraints, follow up to determine the reasons why the company's forecast is lower than historical access line growth was not possible. Competition may be one of the reasons that the company's projections differ from historical trends.

The BellCore programs used to derive trunk traffic are based upon widely accepted statistical methods and procedures.

ATTACHMENT 1

**BellSouth Telecommunications, Inc.**  
**FPSC Staff's Audit Request #23**  
**Dated: February 8, 1999**  
**Page 1 of 2**

**REQUEST: RE: Grounding**

1. Please explain why you need two different ground planes in a central office.
2. Provide your reasons for not wanting to put a physical collocator in the middle of an isolated ground plan with and without a wall. Provide any documentation that shows the potential problems.
3. Provide company TR regarding the ground planes as we discussed at our meeting on Feb. 5, 1999. Or other information you have.

**RESPONSE:**

1. Digital switching equipment operates very constrained circuit design using micro amps of electricity with ground return. Stray ground currents induced by magnetic fields caused by electric motors, lighting, variations in commercial electric service, stray janitorial motors such as buffers and vacuum cleaners, static electric discharges built up by humidity and temperature variations, can cause service impairments or loss of service. Isolating the digital switch ground provides a measure of service protection against accidental loss of service.

Toll (circuit) equipment is not this sensitive to stray ground currents. However, toll equipment can generate its own noise. The noise can be transmitted in the grounding system much like the ignition noise in a car speaker system. The ground plane separation ensures this noise will not affect digital service.

Finally, separating the ground planes by physical barriers or adequate aisles ensures accidental contact will not transmit current between the ground planes. Different ground planes will have voltage (potential difference) by the laws of electricity. By those same laws, current will flow when the two planes are brought into contact. This current will cause the same stray current disruptions described above. This could lead to life threatening situations if the potential is large enough.

BellSouth Telecommunications, Inc.  
FPSC Staff's Audit Request #23  
Dated: February 8, 1999  
Page 2 of 2

RESPONSE (cont'd):

2. For all the above reasons, an integrated ground plane collocator would not be a preferable tenant in an isolated ground plane environment with or without a wall. The basic problem is that even with a wall the integrated ground plane collocator requires complete electrical separation in the overhead environment. This means none of his racking, electrical conduits, air conditioning ducts, lights, controls, can have metallic contact with any of the items in the isolated ground plane. Second, if the code officials insist on the tenant occupancy rule, BST must construct a fire rated wall through all of the overhead environment to meet this code. This wall structure can not make metal to metal contact with any of the isolated ground plane.
3. At the February 5, 1999 meeting, BellSouth and Staff discussed TR-NWT-000295, titled *Isolated Ground Planes: Definition and Application to Telephone Central Offices, Issue 2*, dated July 1992. This document is copyrighted by Bellcore. The cost to purchase a copy for Staff's use is over \$250.00. BellSouth will make this document available for Staff's review at its Brentwood office in Miami. To review the document, please contact John MacDonald at 305-622-3230.

RESPONSE PROVIDED BY: J. D. Bloomer

ATTACHMENT 2

BellSouth Telecommunications, Inc.  
 FPSC Staff's Audit Request #22  
 Dated: February 8, 1999  
 Page 1 of 3

**REQUEST:** RE: Families of Equipment.

1. Explain what you mean by families of equipment.
2. What are your reasons for keeping switch equipment in their own line ups?
3. What are your reasons for keeping circuit equipment in their own line ups?
4. What are your reasons for keeping power equipment separate?
5. Provide reasons for any other family of equipment.
6. Provide documents for any of the above where available, i.e. TR's etc.

- RESPONSE:**
1. Equipment comes in four general groups, switch, power, circuit (toll), and frame. Each group contains equipment types used for specific purpose. The equipment comes in fixed configurations detailed by the manufacturers. These types are called families. The equipment vendors guard the detailed layout information as highly proprietary.
 

Examples of families follow:  
 A switch processor layout is a family.  
 A power plant control bay and discharge bays is a family.  
 A light guide terminating frame is a family of separate terminating bays.  
 A Digital Crossconnect System (DSX, DACS) is a family  
 A DSCs complex for Subscribe Line Carrier is a family.
  2. Switch equipment is kept in its own area for the following reasons:  
 The switch equipment is physically different in width and depth from other types. Mixing different depth equipment in the same aisles creates wasted space.

Switch equipment is considerably hotter, requires different air conditioning filters, aisle spacing, and cable rack design per manufacturer specifications.

Switch equipment is an isolated ground plane.

BellSouth Telecommunications, Inc.  
FPSC Staff's Audit Request #22  
Dated: February 8, 1989  
Page 2 of 3

**RESPONSE (cont'd):**

Switch equipment has detailed internal cabling distances used by vendor engineering forces to maximize performance. Basically, switch equipment cables to other pieces of switch equipment NOT to other groups of equipment.

3. Toll equipment is kept in its own area for the following reasons: Toll equipment varies widely in width and some families vary in depth as well. Mixing the various widths and depths makes lineup configurations space inefficient. This makes air-conditioning and cabling design difficult as well.

Toll equipment is somewhat cooler than switching equipment, but hotter than frame and power. This means we can save expense dollars by properly sizing air conditioning to match the load.

Toll equipment is integrated ground plane. This means it shares common ground with all building components, frame, and power equipment.

Toll equipment grows in configurations limited by its family membership. Various families can exist side by side as long as each can grow the manufacturer recommended layout maximum.

Toll equipment generally cables to other types of toll equipment and the main frame. Growth in one type (D4, SLC, or multiplexers) leads to growth in DSX, Fiber Optic Terminals, or DACS families as the functions are interlocking.

4. Power equipment is in its own area for the following reasons: Power equipment is defined as a hazardous occupancy by the NFPA, National Fire Protection Act, due to the batteries and resultant explosive fumes. One hour rated walls enclosing the space meet the code. BellSouth attempts to follow this code in all new buildings, and retrofits all older buildings as soon as possible. Separate air conditioning and ventilation systems are also constructed to isolate the space.

Power equipment aisles are dictated by the size of components and voltage contained in them. These aisles are significantly different from toll/switch requirements with significantly greater hazards.

**BellSouth Telecommunications, Inc.  
FPSC Staff's Audit Request #22  
Dated: February 8, 1999  
Page 3 of 3**

**RESPONSE (cont'd):**

5. **The standby engine requires its own space for the following reasons:**

**The engine and its diesel fuel are rated a hazardous occupancy. One hour and in some cases 2 hour walls are required by NFPA and the local building code to isolate the hazard.**

**The engine is extremely noisy. Running the engine on a regular basis renders the adjoining spaces unusable.**

**Air intake and exhaust requirements create drafts and smells rendering adjoining open spaces unusable.**

**The adjoining space is impossible to air condition effectively with the large intake grilles necessary to support the engine.**

6. **The above detail in the floor-space layout information is contained on the Web site supported by the BELLCORE organization. This paid subscription site is available to all Internet users for a fee. The information is not proprietary to the various manufacturers providing their details.**

**RESPONSE PROVIDED BY: J.D. Bloomer**

*DOCKET NO.:* 981250-TL: Petitions for temporary waiver of physical collocation requirements set forth in the 1996 Telecommunications Act and the FCC's First Report and Order, for the Lake Mary Main Central Office, by BellSouth Telecommunications, Inc.

*WITNESS:* Direct Testimony Of Kathy L. Welch, Appearing On Behalf Of Staff

*EXHIBIT:* KLW-3

**DECLASSIFIED**

~~CONFIDENTIAL~~  
(See 06056-99)

part 3 of 4  
04605-99



**FLORIDA PUBLIC SERVICE COMMISSION**

*DIVISION OF AUDITING AND FINANCIAL ANALYSIS  
BUREAU OF AUDITING*

*Miami District Office*

**BELLSOUTH TELECOMMUNICATIONS, INC.**

**INVESTIGATION OF COLLOCATION SPACE WAIVERS**

**LAKE MARY OFFICE**

**DOCKET NO. 981250-TL  
AUDIT CONTROL NO. 98-334-4-6**

**March 19, 1999**

*Kathy L. Welch, Audit Manager*

*Gabriela Leon, Audit Staff*

*Tarik Noriega, Audit Staff*

*Paul Stallcup, Audit Staff*

*Ruth K. Young, Professional  
Accountant Specialist*

**DECLASSIFIED**

**CONFIDENTIAL**



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**DIVISION OF AUDITING AND FINANCIAL ANALYSIS  
AUDITOR'S REPORT**

**MARCH 19, 1999**

**TO: FLORIDA PUBLIC SERVICE COMMISSION AND OTHER INTERESTED  
PARTIES**

We have applied the procedures described later in this report to determine the availability of space for collocation in the central office for which a waiver was requested.

This is an internal accounting report prepared after performing a limited scope audit. Accordingly, this report should not be relied upon for any purpose except to assist the Commission staff in the performance of their duties. Substantial additional work would have to be performed to satisfy generally accepted auditing standards and produce audited financial statements for public use.

In our opinion, the waiver referred to above presents fairly, in all material respects, observations made while touring the central office. The attached findings discuss all differences and other matters which were noted during our examination.

## SUMMARY OF SIGNIFICANT PROCEDURES

Our audit was performed by examining the company's waiver and documentation that supports the assumptions which we believe are sufficient to base our opinion. Our examination did not entail a complete review of all financial transactions of the company. Our more important audit procedures are summarized below.

Read orders and rules related to collocation.

Read production of documents and interrogatories.

Interviewed switch, circuit, and common system planners for the offices involved.

Interviewed the geographical forecasters.

Toured and randomly measured the central offices.

Obtained maps showing current and future use space and compared to the applications for waiver.

Read company procedures.

Obtained supporting documents for company assumptions.

Compared the company's access line forecast to national trends. Ran models and compared to the company's. Access lines are used to forecast switch growth.

Reviewed the methodology used in the Bellcore trunk forecasting program. Trunk forecasts are used in both circuit and switch forecasts.

Determined reasons why large spaces would or would not be good candidates for collocation.

The scope of the audit was limited because our review of tools and methodology, used to determine the number of bays forecast, was not completed due to time restrictions. However, as an alternate procedure, two to three years of historical growth were compared to current forecasts for spaces considered critical to the collocation decision.

**AUDIT DISCLOSURE NO. 1****SUBJECT: SPACE PLANNING ASSUMPTIONS**

**STATEMENT OF FACT:** During our interviews of BellSouth staff and our tours of the central offices, staff identified several assumptions used by BellSouth in its space planning. These assumptions are used throughout this report, therefore, they are identified below. In addition, the documentation that these assumptions have been verified to is disclosed.

1. Seven foot aisles or a physical barrier are necessary between switch and any other equipment such as circuit (toll) equipment or power equipment. This is because when the central offices were originally designed, the decision was made to put switch equipment on an isolated ground plane to create an additional protective barrier from power interruptions or trouble. Circuit (toll) equipment is on an integrated ground plane. If a problem happens in the system and a technician is touching two types of equipment, one that has an integrated ground plane and one with an isolated ground plane they can be electrocuted and the equipment could be damaged. (See attachment 1 to this report for a more technical discussion of integrated and isolated ground planes. ) Therefore, a requirement was instituted that seven feet (based on the width of a person's arm span) be placed between circuit and toll equipment. A wall or a cage would also keep a person from touching the two types of equipment. This seven foot barrier was violated by BellSouth in two of the six central offices reviewed (Golden Glades and Boca Teeca). The company claims that other grounding precautions were taken to attempt to solve this problem.

The only reference for this requirement was found in a Bellcore publication. It states:

"All integrated ground plane conductive members located within 6 feet of the isolated ground plane shall be bonded to its MGB to minimize the surge potential difference between nearby members of the two ground planes."

No verification could be made to the National Electric Code but the potential risk was verified with engineers outside of the Bell system.

2. Plug in units are required to be in a room with fire rated walls or in fire proof cabinets that are grounded and connected to the wall. BellSouth provided the Life Safety Code Section 6-4.1.1 that states:

"Protection from any area having a degree of hazard greater than that normal to the general occupancy of the building or structure shall be provided as follows:

(a) Enclose the area with a fire barrier having a 1-hour fire resistance rating in accordance with section 6-1 without windows."

The company claims that because the circuit packs have cardboard liners, they have a high degree of risk.

Since the company is currently violating this rule in several offices, it is necessary for the company to allocate space to correct the problem before space can be considered for collocation.

3. A four foot fire aisle has to exist and be connected to two exit doors. This was verified to the Life Safety Code Handbook section 5.5-1.2 and the Standard Building Code Table 1004.

4. It is necessary to keep certain families of equipment together and therefore, the floor plans include space allocated within each type of equipment for growth in that type of equipment. The reason provided by a company representative was because over time, growth exceeded the initial space allocated for certain types of equipment. This reservation of space is called a footprint. The reason the company believes that families of equipment need to stay together is because some of the equipment has 50 foot cabling requirements, some have processors that require the other equipment to be in adjacent bays, and some would require additional cost for repeaters, cabling, and connections if they were not near other equipment. The company's reasons for needing to keep families of equipment together can be found in attachment 2.

The company exceeded the footprint for certain types of equipment in both the Daytona Port Orange office and the Boca Teeca office. The company was asked to provide the additional costs incurred to put equipment in a new line up. In answer to document request 32, the company stated that it was unable to provide this information. At the exit conference, a company representative stated that they were unable to provide because detailed equipment engineering for specific locations on individual jobs does not provide optional costs or optional locations. Therefore, the costs attributable to families of equipment being diversely located in a central office are not readily available.

Staff also observed the problem in Daytona because a bridge was created to hold the wires that connected the equipment. Because footprints have been established within the line up for each type of equipment, some equipment that goes in these groups may not be planned to be installed within the two years that are covered in this application. However, a series of bays that are empty within a series of equipment would not usually be feasible for physical collocation anyway because the space would not be large enough.

5. At least a four foot space must be maintained in front of an air handler vent and an

aisle should be maintained perpendicular to the unit for air to flow. How much space is needed is determined based on A.S.H.R.A.E. Engineering Standards which were outside the area of our expertise.

6. Physical collocation needs to be in room with fire rated walls with an exit door to the outside of the building. If the exit is not to the outside of the building or to a corridor that can be blocked from the BellSouth equipment area, an escort would be required to get access to the collocation space.

The Federal Communications Commission 47 CFR Chapter 1 51.323 (I) states "An incumbent LEC may require reasonable security arrangements to separate a collocating telecommunications carrier's space from the incumbent LEC's facilities."

FCC order 96-325 paragraph 598 states "we will continue to permit LEC's to require reasonable security arrangements to separate an entrants collocation space from the incumbents LEC facility." However, in order 98-188, they seek comment on whether incumbent LEC's should be allowed to require escorts for competitive LEC technicians (Paragraph 141).

In FCC order 98-188, paragraph 137 states "Given that space in incumbent LEC premises is limited, we tentatively conclude that we should require incumbent LEC's to offer collocation arrangements to both new entrants and any advanced services affiliate incumbent LECs establish that minimize the space needed by each competing provider in order to promote the deployment of advanced services to all Americans. Such alternative collocation arrangements include: (1) the use of shared collocation cages, within which multiple competing providers' equipment could be either openly accessible or locked within a secure cabinet; (2) the option to request collocation cages of any size without any minimum requirement, so that competing providers will not use any more space than is reasonably necessary for their needs; and (3) physical collocation that does not require the use of collocation cages ('cageless' collocation)."

However, BellSouth has submitted plans for hybrid walls within the cluster area (8 foot non-fire rated walls) in the Palmetto office and were turned down. Denials were reviewed and verified with the building and zoning department. If hybrid walls were denied within a fire rated room, it is not likely that cages would be approved.

Dade County uses the South Florida Building Code of 1994. It states in section 507.2 (a):

"In any building where rooms or spaces are occupied by separate tenants, not less than 1-hour fire-resistive construction shall be provided between tenants and between tenants and common areas.

The South Florida Building Code Chapter 12 puts telephone exchanges in Group G Division 2. The only exception that may apply to Group G, Division 2 is:

“(1) As otherwise permitted for the group of occupancy by Chapter 31 of this Code.”

Boca Raton, West Palm Beach, Daytona and Orlando are covered under a different code, the Standard Building Code, which states in paragraph 507.2 a:

“(1) In any building where rooms or spaces are occupied by separate tenants, not less than one-hour fire-resistive construction shall be provided between tenants and between tenants and common areas except as provided below:”

The exceptions that may apply to Group G, Division 2 are:

“(3) EXCEPTION: Where all tenancies within a Fire Division are of Group G, Division 2 Occupancy, such space shall be exempt from the provisions of this Sub-section if one story in height and of Type III unprotected, IV, V unprotected.

“(4) EXCEPTION: Fire resistive separation between a tenant and a mall area will not be required by this sub-paragraph where the space on both sides of such wall or partition is protected by an automatic sprinkler system or by a water curtain provided at the line of separation.”

“(6) EXCEPTION: Group G, Division 2, clusters of offices less than 200 square feet served by a common reception area and internal corridor within the cluster area shall not require fire separation between offices and corridors common to the cluster.”

According to BellSouth's answer to document request 32, BellSouth was concerned that the Florida code officials were requiring fire-rated separations, which result in more complex construction. Therefore, BellSouth asked Bellcore for help. BellCore obtained a letter from the Southern Building Code Congress International supporting its position. BellSouth has talked to several municipalities and believe that several will permit cages although none have been permitted at this time.

7. BellSouth contends that the FCC rules state explicitly that relocations and renovations are not required to provide collocation space.

When asked to provide the citation that supports its contention BellSouth cited CFR 51.321. The Federal Communications Commission 47 CFR Chapter 1 51.321 (e) states “An incumbent LEC shall not be required to provide for physical collocation of equipment necessary for interconnection or access to unbundled network elements at the incumbent LEC's premises if it demonstrates to the state commission that physical collocation is not practical for technical reasons or because of space limitations.”

The definition of technically feasible according to 51.5 states "Interconnection access to unbundled network elements, collocation, and other methods of achieving interconnection or access to unbundled network elements at a point in the network shall be deemed technically feasible absent technical or operational concerns that prevent the fulfillment of a request by a telecommunications carrier for such connection, access, or methods. A determination of technical feasibility does not include consideration of economic, accounting, billing, space or site concerns, except that space and site concerns may be considered in circumstances where there is no possibility of expanding the space available. The fact that an incumbent LEC must modify its facilities or equipment to respond to such a request does not determine whether satisfying such request is technically feasible. An incumbent LEC that claims that it cannot satisfy such request because of adverse network reliability impacts must prove to the state commission by clear and convincing evidence that such interconnection, access, or methods would result in specific and significant adverse network reliability impacts"

In its application for waiver, BellSouth states, "The term 'space limitations' encompasses two factors: first, ILECs are entitled to consider space already in use by the ILEC at the time the collocation request is made; second, ILECs are entitled to 'retain a limited amount of floor space for defined future uses'(Order, Par. 604)." Their citation refers only to retaining space for future use and not to being entitled to space already in use.

FCC order 98-188 paragraph 142 states: "We also ask commenters to address whether we can and should require incumbent LEC's to remove obsolete equipment and non-critical offices in central offices to increase the amount of space available for collocation."

**OPINION:** BellSouth assumptions were verified to the documentation referenced above.

No citation could be found relating to not having to reorganize the central office to accommodate except for the inquiry in Order 98-188 asking for an opinion on removing obsolete equipment and non-critical offices. CFR 51.321 requires physical collocation as long as it is technically feasible. And, the definition of technically feasible specifically states that an incumbent LEC must modify its facilities or equipment to respond to a request as long as it does not impact network reliability. Moving equipment could be costly, would involve cabling and power difficulties and does have the potential of losing service for the customers. Moving office furniture and fixed configuration furniture does not involve the same costs or risks and should be considered if the furniture is not in a location that is currently part of a footprint for growth of equipment line ups. At the exit conference, a company representative commented that the company generally tries not to put switch fixed configuration furniture in a footprint because it is intimately



related to the processor area of the switch.

If the company is required to remodel existing facilities, a determination needs to be made of who would be required to pay for the changes.

Security measures are still being addressed by the FCC.

**AUDIT DISCLOSURE NO. 2****SUBJECT: WORK STATIONS AND ADMINISTRATIVE SPACE WITHIN THE CENTRAL OFFICE SWITCH AND CIRCUIT (TOLL) AREAS**

**STATEMENT OF FACT:** In its space assessment worksheet, the company has identified areas that are for circuit (toll) equipment and areas for switch equipment. Within these areas are fixed configuration furniture which contains monitors to test equipment. In addition, there are several desks, files and printers contained within the floor space.

The floor plans for these spaces that include the footprints for the future growth of families of equipment, often show these areas being replaced by equipment.

In the time between the first tour of Golden Glades and Palm Beach Gardens and the most recent tour, much of this furniture had been moved and rearranged as lines of equipment were installed.

**OPINION:** Although the layout of the monitors and administrative spaces within the circuit and switch areas does not always appear to be efficient, it should not be an issue if there is an existing footprint in that area for future equipment. If the forecast for the footprint is reasonable, then the furniture will be moved and sometimes consolidated. If the area is large enough, meets the other requirements in disclosure 1, and does not involve footprints for equipment line ups, it will be discussed in the disclosure that proposes potential areas for collocation.

**AUDIT DISCLOSURE NO. 3****SUBJECT: SPACE ASSESSMENT WORKSHEET**

**STATEMENT OF FACT:** In its petition for waiver, BellSouth indicates that a certain number of feet in the facility is "reserved for defined future use essential for BellSouth to meet the growing needs of its customers through the year 2000." This space agrees with Section D- Reserved Space on the Space Assessment Worksheet that was attached to the petition.

The Federal Communications Commission Rules, 47 CFR Chapter 1, section 51.323 (f) (4) states "an incumbent LEC may retain a limited amount of floor space for its own specific future uses, provided, however, that the incumbent LEC may not reserve space for future use on terms more favorable than those that apply to other telecommunications carriers seeking to reserve collocation space for their own use."

Collocation applications do not indicate the time frame that the room will be filled and therefore, there is no way to determine from the documentation how much space the collocators are reserving for future use.

Only one of the six offices reviewed in this proceeding has physical collocation. The two collocators currently residing in these spaces were asked to provide detail about when the collocation space will be filled. Only one responded. The company currently has only one bay in a room that would hold six. It expects to fill the bays within two years.

BellSouth employees have indicated that it takes three years from the time a plan for an addition is initiated for a building addition to the time it is actually completed. A schedule was provided to show that a recent addition in North Florida was initialized in December of 1995 and construction was completed in December of 1998 or 36 months. Another building addition was planned in July of 1996 and construction was completed October 1998 or 28 months. The only dates that could be documented were the dates the budget was approved and when the buildings were completed. The process took 20 months and 13 months for the two additions respectively. No documentation was provided to show when the planning process began. Additions in South Florida are expected to take longer because of longer permitting time since Hurricane Andrew.

**OPINION:** Although the petition states that the reserved space is to be used by the year 2000, review of the maps of future space and documentation provided by BellSouth regarding intended use of the space indicate that some of the space does not have any forecasted use by the year 2000 and sometimes not even by 2001.

Many times, however, the spaces are in a line of bays which would not be conducive for physical collocation and are being reserved because of the principle of families of equipment. See disclosure no. 1 for a discussion of the need for families of equipment to be together.

According to the rule, BellSouth can reserve as much space as its collocators. We were unable to determine how much space the two other collocators are reserving.

Since it takes three years to get a building addition, allowing only two years of growth, could put BellSouth in a position of not being able to add capacity in time to meet the needs of its customers.

Large spaces that are for forecasted periods beyond two years are described in other disclosures to this report.

**AUDIT DISCLOSURE NO. 4****SUBJECT: OBSOLETE EQUIPMENT**

**STATEMENT OF FACT:** The company was requested to provide information on any equipment that would be changed out for new equipment that might have less space requirements.

In the Boca Raton office, an e-net conversion is forecasted which will free up 12 switch bays. Since the switch manufacturer handles the layout of the bays, BellSouth was unable to tell us where the bay would be vacated or if the space would be a contiguous space.

BellSouth's position is that the equipment it has is currently functioning and that it should not have to replace equipment with smaller, more efficient equipment because that would require an additional expenditure.

FCC order 98-188 paragraph 142 states: "We also ask commenters to address whether we can and should require incumbent LEC's to remove obsolete equipment and non-critical offices in central offices to increase the amount of space available for collocation."

BellSouth has retired 13 circuit bays and 8 switch bays in Lake Mary over the last three years; 2 circuit bays and 14 switch bays in Daytona Port Orange; 8 circuit bays in Boca Teeca, and 5 circuit and 18 switch bays in West Palm Beach Gardens. The company response to request 43 states that the information for North Dade Golden Glades and Miami Palmetto will be provided as soon as possible. It was not received.

**OPINION:** Although there is nothing in the rules that would require BellSouth to replace its equipment, it should be noted that if BellSouth were making a decision on whether or not to make a building addition, BellSouth may find it more economical to replace equipment with more efficient equipment and thus free up bays.

This was probably what happened when BellSouth petitioned the FCC in 1993 for waivers. At that time, it only showed future growth of 2100 square feet for Glades and 1000 for West Palm Beach Gardens. The new petitions ask for 4796 in Glades and 3544 in Gardens. (See order PSC-99-0060-FOF-TP p. 9-10)

**AUDIT DISCLOSURE NO. 5**

**SUBJECT:           BELLSOUTH COLLOCATION HANDBOOK  
                      VERSION 7.1.2, DATED January 2, 1999  
                      SPACE ENCLOSURE OPTIONS**

**STATEMENT OF FACTS:** The collocation handbook dated January 2, 1999 describes "BellSouth's collocation offerings, providing general information regarding the terms and conditions, ordering process, provisioning and maintenance of BellSouth's Collocation Offerings."

Section 2 defines physical collocation and states that "Physical Collocation arrangements will be placed in floor space separated from BST equipment." "When space permits, BellSouth will construct a common area for all collocations, including separate ingress/egress where feasible." "Within the collocation common area, collocation arrangements will be individually placed in either enclosed or non-enclosed space." The book also states that under certain conditions a collocator may construct power plant facilities but these must be enclosed in a fire rated wall.

Section 3 states that "Physical collocation space is assigned based on the customer's request, where space permits, with the physical collocation equipment arrangements placed in floor space separated from BellSouth equipment."

Section 3.6 addresses enclosure options. Section 3.6.1 says that BellSouth will make available a 100 square foot minimum enclosure with 50 square foot increments. When a collocator requests more than 100 square feet, BellSouth will try to use contiguous space but if contiguous space is not available, the collocator has the option of two separate enclosures and the purchase of connection through BellSouth cross-connects.

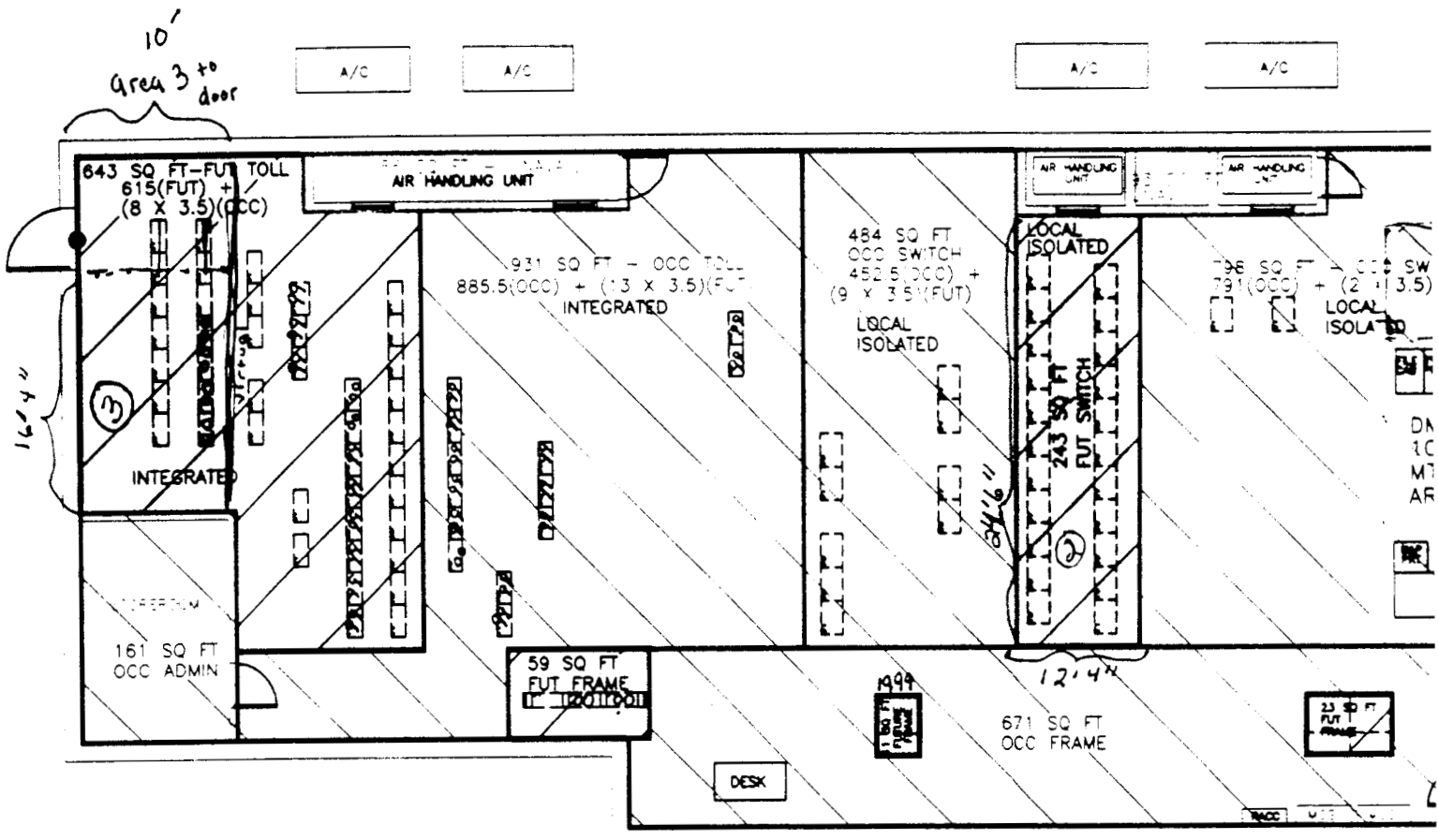
Section 3.6.2 addresses non-enclosed space within the BellSouth "common area". There is no minimum square footage requirement for non-enclosed collocation space, permitting the collocator to use space in increments less than 100 square feet.

The company representative states that the 100 square feet minimum is open for negotiation in the agreement process. However, the company claims to have signed agreements with all existing carriers requiring a minimum of 100 square feet.

**OPINION:** In disclosures in this audit, space of less than 100 square feet are discussed. Based on BellSouth's existing contracts, these spaces would not meet the minimum size requirement. If contracts with new carriers are made or if contracts are renegotiated, these spaces would need to be addressed to determine if they met other collocation requirements.

**AUDIT DISCLOSURE NO. 6****SUBJECT: LAKE MARY AREA 1**

**STATEMENT OF FACTS:** Area 1 is currently a contractors office and a monitoring station for the switch access computer. The space is approximately 8' by 9' and is located next to the switch equipment on an isolated ground plane (See disclosure 1 for discussion). It cannot be moved to the outside wall because of the fire aisle needed from the power room. Whether this space could be used or not is contingent on whether a space that is less than 100 square feet can be used for collocation. A common area would have to be placed in another location in the office. The company representatives stated that existing agreements require a minimum of 100 square feet. It would not be accessible without an escort. Lastly it is contingent upon whether the company has to relocate existing items in the office. (See disclosure 1, Item 7)

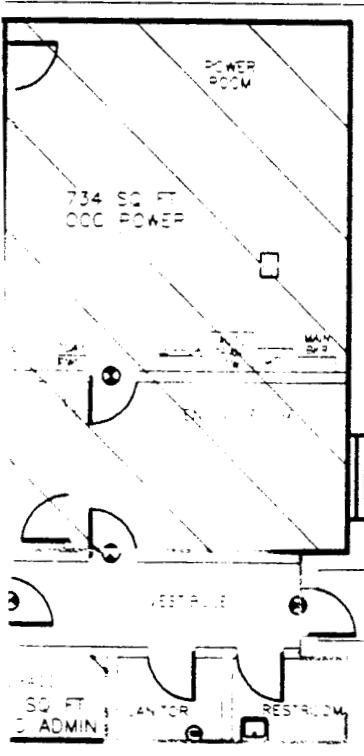


39280 LAKE MARY FIRST FLOOR F



AVC

FEBRUARY 24, 1999



A TOTAL GROSS SQ FT 5195

SWITCH  $885 + 18 \times 3.5 = 1048$

TOLL  $161 + 18 \times 3.5 = 224$

FRAME 734

POWER & ENGINE 211

ADMIN

C TOTAL OCCUPIED SPACE 3773

SWITCH  $243 + (11 \times 3.5) = 281.5$

TOLL  $615 + (13 \times 3.5) = 660.5$

FRAME  $11 + 23 + 59 = 93$

D TOTAL RESERVED SPACE 1035

ISOLATED - ISOLATED GROUND PLANE  
 INTEGRATED - INTEGRATED GROUND PLANE  
 OCC - OCCUPIED  
 FUT - FUTURE  
 UNAVAIL - UNAVAILABLE  
 - BUILDING COLUMN



**AUDIT DISCLOSURE NO. 7****SUBJECT: LAKE MARY AREA 2**

**STATEMENT OF FACTS:** Area 2 is a space that is 12'4" by 24'6". There are no current forecasts for this area, however it is footprinted for switch growth. It is on an isolated ground plain (See disclosure 1). There are cable racks over the area.

**OPINION:** Whether this space could be used or not is contingent on whether a space that is less than 100 square feet can be used for collocation. The company representatives stated that existing agreements require a minimum of 100 square feet. It would not be accessible without an escort. Lastly it is contingent upon whether the company has to relocate existing items in the office. (See disclosure 1, Item 7)

If circuit equipment was placed in this area there would have to be a 7' aisle on each side of the equipment. The aisles would be wider than the space available. If the area were walled, a four foot fire aisle would have to be maintained around the walls. Eliminating 4 feet from each side leaves an area only 4'4" excluding the width of walls. This would barely fit one line up of bays. Because it is in the middle of BellSouth equipment security would be an issue.

**AUDIT DISCLOSURE NO. 8****SUBJECT: LAKE MARY AREA 3**

**STATEMENT OF FACTS:** Area 3 is currently used for a lounge. It is not separated by a fire wall. The area to the outside door and fire aisle is 10' by 16'4". It is accessible to an outside door. The space has footprints for two line ups of seven bays each. During the tour it was determined that two of these bays block the fire aisle and would have to be eliminated. Therefore, there would be footprints for two line ups of six bays each.

According to a company response, two bays in one line up are forecast for fiber MUX equipment in 2000.

Two bays were also forecast for SLC/DLC equipment.

The other 8 bays footprint for this area did not have an existing forecast.

**OPINION:** Whether this space could be used or not is contingent on whether a space that is less than 100 square feet can be used for collocation. The company representatives stated that existing agreements require a minimum of 100 square feet. Lastly it is contingent upon whether the company has to relocate existing items in the office (See disclosure 1, Item 7).

The company does have a forecast for part of the area. If fire walls were installed the area would be less than 10' wide.

The supporting documentation for circuit forecasts did not show enough growth for the line ups that have already been started.

The company does eventually intend to expand the building behind the door that exits from this area. This would put the area in the middle of BellSouth equipment and not against an outside wall.

**AUDIT DISCLOSURE NO. 9****SUBJECT: FORECAST**

**STATEMENT OF FACT:** There are two primary forecasts for each central office, switch and circuit. Access line growth is the primary driver of the switch forecast and the trunk forecast is the primary driver of the circuit equipment.

Regression analyses were run in order to determine the reasonableness of the access line forecasts. To perform the analyses, historical data from 1993 to 1998, city and county population information from 1993 to 1998, and secondary line growth statistics were used. In addition, the projected growth of network access lines was compared to the historical growth for the period 1988 to 1998.

Due to time constraints, the same type of analyses of the trunk forecast were not performed. The forecast is generated by a BellCore software package. The manual for the software was reviewed.

For each office, the area with large empty spaces was identified as either circuit or switch. Once the area was identified, historical information was obtained on how many bays were added for two years or more. The historical growth was compared to the forecast. The last two years were used because of the impact of the Internet, long distance carriers entering the market and data transmission technologies.

**OPINION:** The projected growth rates of total network access lines do not significantly differ from historical trends and represent reasonable projections.

The BellCore programs used to derive trunk traffic are based upon widely accepted statistical methods and procedures.

ATTACHMENT 1

**BellSouth Telecommunications, Inc.**  
**FPSC Staff's Audit Request #23**  
**Dated: February 8, 1999**  
**Page 1 of 2**

**REQUEST: RE: Grounding**

1. Please explain why you need two different ground planes in a central office.
2. Provide your reasons for not wanting to put a physical collocater in the middle of an isolated ground plan with and without a wall. Provide any documentation that shows the potential problems.
3. Provide company TR regarding the ground planes as we discussed at our meeting on Feb. 5, 1999. Or other information you have.

**RESPONSE:**

1. Digital switching equipment operates very constrained circuit design using micro amps of electricity with ground return. Stray ground currents induced by magnetic fields caused by electric motors, lighting, variations in commercial electric service, stray janitorial motors such as buffers and vacuum cleaners, static electric discharges built up by humidity and temperature variations, can cause service impairments or loss of service. Isolating the digital switch ground provides a measure of service protection against accidental loss of service.

Toll (circuit) equipment is not this sensitive to stray ground currents. However, toll equipment can generate its own noise. The noise can be transmitted in the grounding system much like the ignition noise in a car speaker system. The ground plane separation ensures this noise will not affect digital service.

Finally, separating the ground planes by physical barriers or adequate aisles ensures accidental contact will not transmit current between the ground planes. Different ground planes will have voltage (potential difference) by the laws of electricity. By those same laws, current will flow when the two planes are brought into contact. This current will cause the same stray current disruptions described above. This could lead to life threatening situations if the potential is large enough.

BellSouth Telecommunications, Inc.  
FPSC Staff's Audit Request #23  
Dated: February 8, 1999  
Page 2 of 2

**RESPONSE (cont'd):**

2. For all the above reasons, an integrated ground plane collocator would not be a preferable tenant in an isolated ground plane environment with or without a wall. The basic problem is that even with a wall the integrated ground plane collocator requires complete electrical separation in the overhead environment. This means none of his racking, electrical conduits, air conditioning ducts, lights, controls, can have metallic contact with any of the items in the isolated ground plane. Second, if the code officials insist on the tenant occupancy rule, BST must construct a fire rated wall through all of the overhead environment to meet this code. This wall structure can not make metal to metal contact with any of the isolated ground plane.
3. At the February 5, 1999 meeting, BellSouth and Staff discussed TR-NWT-000295, titled *Isolated Ground Planes: Definition and Application to Telephone Central Offices, Issue 2*, dated July 1992. This document is copyrighted by Bellcore. The cost to purchase a copy for Staff's use is over \$250.00. BellSouth will make this document available for Staff's review at its Brentwood office in Miami. To review the document, please contact John MacDonald at 305-622-3230.

**RESPONSE PROVIDED BY: J. D. Bloomer**

ATTACHMENT 2

BellSouth Telecommunications, Inc.  
 FPSC Staff's Audit Request #22  
 Dated: February 8, 1999  
 Page 1 of 3

**REQUEST:** RE: Families of Equipment

1. Explain what you mean by families of equipment.
2. What are your reasons for keeping switch equipment in their own line ups?
3. What are your reasons for keeping circuit equipment in their own line ups?
4. What are your reasons for keeping power equipment separate?
5. Provide reasons for any other family of equipment.
6. Provide documents for any of the above where available, i.e. TR's etc.

**RESPONSE:**

1. Equipment comes in four general groups, switch, power, circuit (toil), and frame. Each group contains equipment types used for specific purpose. The equipment comes in fixed configurations detailed by the manufacturers. These types are called families. The equipment vendors guard the detailed layout information as highly proprietary.

Examples of families follow:

A switch processor layout is a family.

A power plant control bay and discharge bays is a family.

A light guide terminating frame is a family of separate terminating bays.

A Digital Crossconnect System (DSX, DACS) is a family

A DSCs complex for Subscribe Line Carrier is a family.

2. Switch equipment is kept in its own area for the following reasons:  
 The switch equipment is physically different in width and depth from other types. Mixing different depth equipment in the same aisles creates wasted space.

Switch equipment is considerably hotter, requires different air conditioning filters, aisle spacing, and cable rack design per manufacturer specifications.

Switch equipment is an isolated ground plane.

BellSouth Telecommunications, Inc.  
 FPSC Staff's Audit Request #22  
 Dated: February 8, 1999  
 Page 2 of 3

**RESPONSE (cont'd):**

Switch equipment has detailed internal cabling distances used by vendor engineering forces to maximize performance. Basically, switch equipment cables to other pieces of switch equipment NOT to other groups of equipment.

3. Toll equipment is kept in its own area for the following reasons: Toll equipment varies widely in width and some families vary in depth as well. Mixing the various widths and depths makes lineup configurations space inefficient. This makes air-conditioning and cabling design difficult as well.

Toll equipment is somewhat cooler than switching equipment, but hotter than frame and power. This means we can save expense dollars by properly sizing air conditioning to match the load.

Toll equipment is integrated ground plane. This means it shares common ground with all building components, frame, and power equipment.

Toll equipment grows in configurations limited by its family membership. Various families can exist side by side as long as each can grow the manufacturer recommended layout maximum.

Toll equipment generally cables to other types of toll equipment and the main frame. Growth in one type (D4, SLC, or multiplexers) leads to growth in DSX, Fiber Optic Terminals, or DACS families as the functions are interlocking.

4. Power equipment is in its own area for the following reasons: Power equipment is defined as a hazardous occupancy by the NFPA, National Fire Protection Act, due to the batteries and resultant explosive fumes. One hour rated walls enclosing the space meet the code. BellSouth attempts to follow this code in all new buildings, and retrofits all older buildings as soon as possible. Separate air conditioning and ventilation systems are also constructed to isolate the space.

Power equipment aisles are dictated by the size of components and voltage contained in them. These aisles are significantly different from toll/switch requirements with significantly greater hazards.



BellSouth Telecommunications, Inc.  
FPSC Staff's Audit Request #22  
Dated: February 8, 1999  
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**RESPONSE (cont'd):**

5. **The standby engine requires its own space for the following reasons:**

**The engine and its diesel fuel are rated a hazardous occupancy. One hour and in some cases 2 hour walls are required by NFPA and the local building code to isolate the hazard.**

**The engine is extremely noisy. Running the engine on a regular basis renders the adjoining spaces unusable.**

**Air intake and exhaust requirements create drafts and smells rendering adjoining open spaces unusable.**

**The adjoining space is impossible to air condition effectively with the large intake grilles necessary to support the engine.**

6. **The above detail in the floor-space layout information is contained on the Web site supported by the BELLCORE organization. This paid subscription site is available to all Internet users for a fee. The information is not proprietary to the various manufacturers providing their details.**

**RESPONSE PROVIDED BY: J. D. Bloomer**

## SPACE ASSESSMENT WO.

[EVALUATION OF CENTRAL OFFICE SPACE AVAILABLE FOR PHYSICAL COLLOCATION]

CENTRAL OFFICE CLLI: \_\_\_\_\_ BCRTFLBT

ADDRESS: \_\_\_\_\_ 5140 CONGRESS AVE, BOCA RATON, FL

		SQ. FT.
A. TOTAL GROSS SQ. FT.	A.	29144
B. UNAVAILABLE SPACE*:		
_____ 1st FL: Stairwells, air handling units, house service panels, _____ restrooms and lobby - 1995 sq ft		
_____ 2nd FL: stairwells, electrical and telephone rooms, _____ restrooms and air handling unit - 1626 sq ft	B.	3621
* Unavailable space is all Non-Assignable area and is comprised of entrance lobbies, main corridors, hall spaces, inside stairways, fire towers, vertical shafts(light, vent, power, dumbwaiters, & elevators), all toilet rooms (except those associated with private offices) and all space necessary for building operations.		
C. OCCUPIED SPACE: (Space Computed as Block of Assigned Space - (Future Bays - 3.5)		
Central office Switch(es) _____		2200.5
Transmission Equipment _____		3666
Other (Specify) FRAME _____		2464
POWER _____		1234
ADMINISTRATIVE _____ 1st FL 886 + 2nd FL 12946		13832
TOTAL ASSIGNED - OCCUPIED SPACE	C.	23396.5

# DECLASSIFIED

PRIVATE

THE INFORMATION CONTAINED HEREIN SHOULD NOT BE DISCLOSED TO UNAUTHORIZED PERSONS. IT IS MEANT SOLELY FOR USE BY AUTHORIZED BELLSOUTH EMPLOYEES

~~CONFIDENTIAL~~  
(S.O. 06056-99)

*part 4 of 4*  
*04605-99*  
*5-1.3*

### SPACE ASSESSMENT WORK SHEET

**D. RESERVED SPACE**

Switching Equipment Growth through Year of \_\_\_\_\_ 1731.5

For: \_\_\_\_\_

Transmission Equipment Growth through year of \_\_\_\_\_ 210

For: \_\_\_\_\_

Turnaround Space for replacement of \_\_\_\_\_ : Year: \_\_\_\_\_    
 (Switch Type)

Other (Virtual Collacation) \_\_\_\_\_ : Year: \_\_\_\_\_    
 (Switch Type)

Power \_\_\_\_\_ : Year: \_\_\_\_\_ 185  
 (Switch Type)

Frame \_\_\_\_\_ : Year: \_\_\_\_\_    
 (Switch Type)

Administrative (Space reserved for Administrative use, service center(s), or non-wire center functions)

\_\_\_\_\_ : Year: \_\_\_\_\_    
 \_\_\_\_\_ : Year: \_\_\_\_\_    
 \_\_\_\_\_ : Year: \_\_\_\_\_  

**TOTAL VACANT SPACE RESERVED FOR FUTURE USE** D. 2126.5

**E. VACANT SPACE/NOT USABLE** (I.e., flooding, no access to fire exits, configuration problems, space less than 100 sq. ft., building to be vacated)

\*\* If building is to be vacated, what CLLI will replace the facilities served by CLLI being vacated.

Explain each item in detail:

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_  

**TOTAL VACANT SPACE/NOT USABLE** E. 0

**F. NET AVAILABLE SPACE (A -B -C -D -E -F) =** F. 0

~~CONFIDENTIAL~~ **DECLASSIFIED**

2  
PRIVATE

THE INFORMATION CONTAINED HEREIN SHOULD NOT BE DISCLOSED TO UNAUTHORIZED PERSONS. IT IS MEANT SOLELY FOR USE BY AUTHORIZED BELLSOUTH EMPLOYEES

5-1-04

### SPACE ASSESSMENT WORK SHEET

#### G. FUTURE AVAILABLE SPACE

SQ. FT.

Completion of Switch Replacement: \_\_\_\_\_  
(Qtr/Yr.)

Sq. Ft. =

Removal of Retired Equipment: \_\_\_\_\_  
(Qtr/Yr.)

Sq. Ft. =

OTHER (Specify) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
(Qtr/Yr.)

#### H. IF PHYSICAL SPACE IS NOT AVAILABLE, VIRTUAL WILL BE OFFERED. (EXPLAIN IN DETAIL IF VIRTUAL COLLOCATION CANNOT BE OFFERED,)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

#### NAME OF PERSON FILLING OUT FORM:

\_\_\_\_\_ Jenine Williams/North FL CAD Librarian  
(PRINT NAME AND TITLE )

TEL. NO. (904) 350-4217

#### AUTHORIZED BY:

\_\_\_\_\_ Jim D. Bloomer/Facility Planner  
(Paygrade 59 or above)

TEL. NO. (904) 350-3428

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EXHIBIT KLW-4  
(Workpapers)  
Document No. 04605-99

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ON BELLSOUTH'S APRIL 30, 1999 REQUEST FOR CONFIDENTIAL TREATMENT

ATTACHMENT 3

~~BellSouth Telecommunications, Inc.~~  
FPSC Staff's Audit Request  
Dated: February 8, 1999  
Item 25  
Page 1 of 2.

**REQUEST:**

1. In our discussions on Feb 5, it was sited that adding an isolated collocator to a BST isolated ground could be a potential problem and that it would be better if a small power plant were installed for a physical collocator. Please site your potential problems. Would they be the same if a collocator were installed in an integrated ground? Explain yes or no. What was done in Palmetto CO (Was a separate power plant installed for the physical collocators)? If so, why? If not, why?
2. Provide the information and or correspondence documenting the increase in temperature in the Palmetto central office and any plans you have for upgrading the air handling units.

**RESPONSE:**

1. The potential problems arise from the fact that we have no control over the collocators equipment or any piece of equipment that their equipment interfaces with. If tied to our isolated ground plane their equipment could introduce 'noise' to the ground plane that could lead to service interruptions. If the collocator in some fashion breeches the isolated ground plane then it is compromised for the entire grounding arrangement. The purpose of isolated ground is to not have any direct path to ground in the event of a lightning strike. For these reasons we do not wish to have any other equipment other than our own tied to the isolated ground bar. Collocators have typically installed equipment classified as 'circuit' or transport equipment and by definition this type equipment is grounded on the integrated ground plane. In Palmetto no separate power plant was installed for the collocators. They are all part of the integrated ground.

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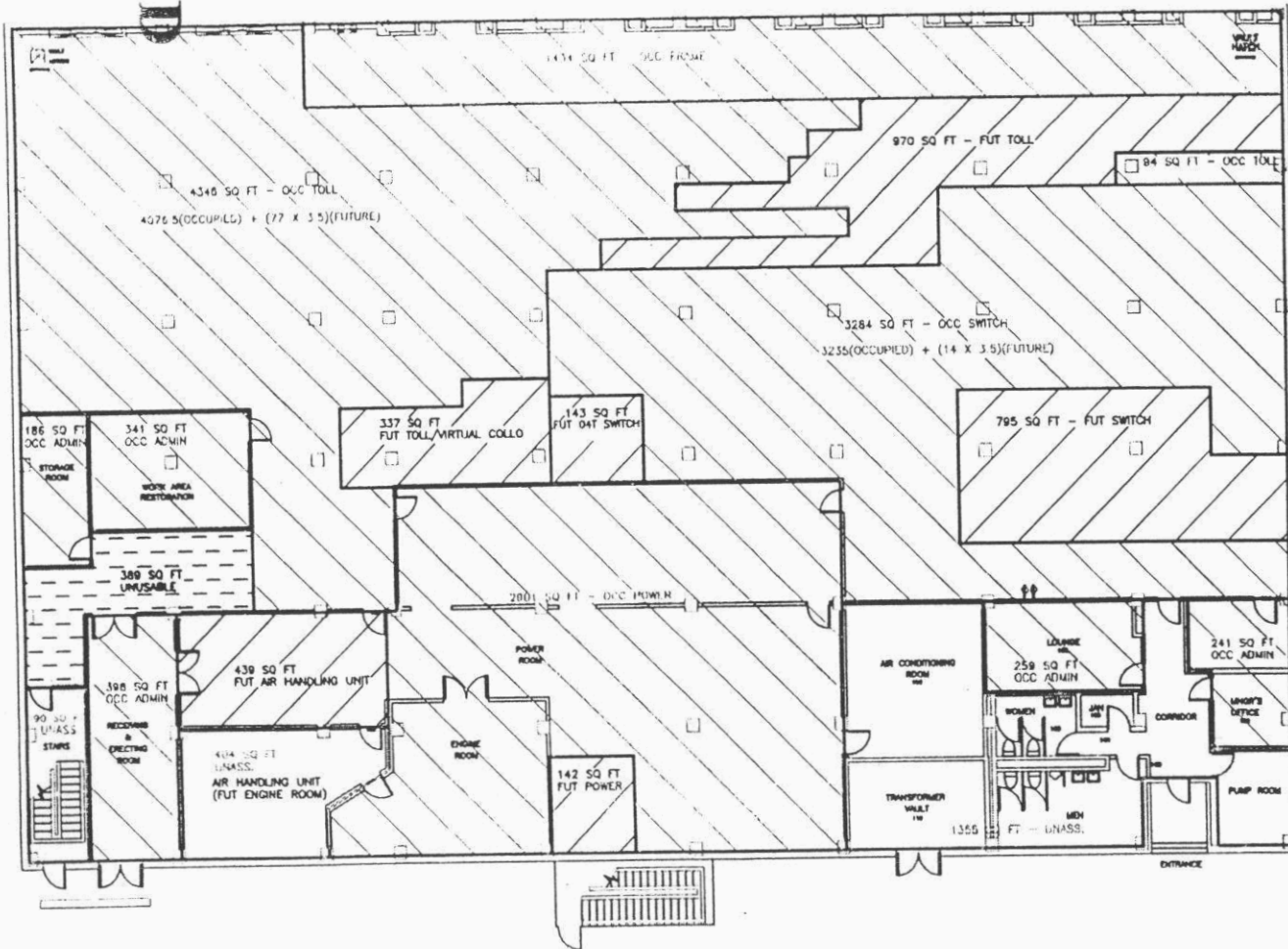
EXHIBIT KLW-4  
(Workpapers)  
Document No. 04605-99

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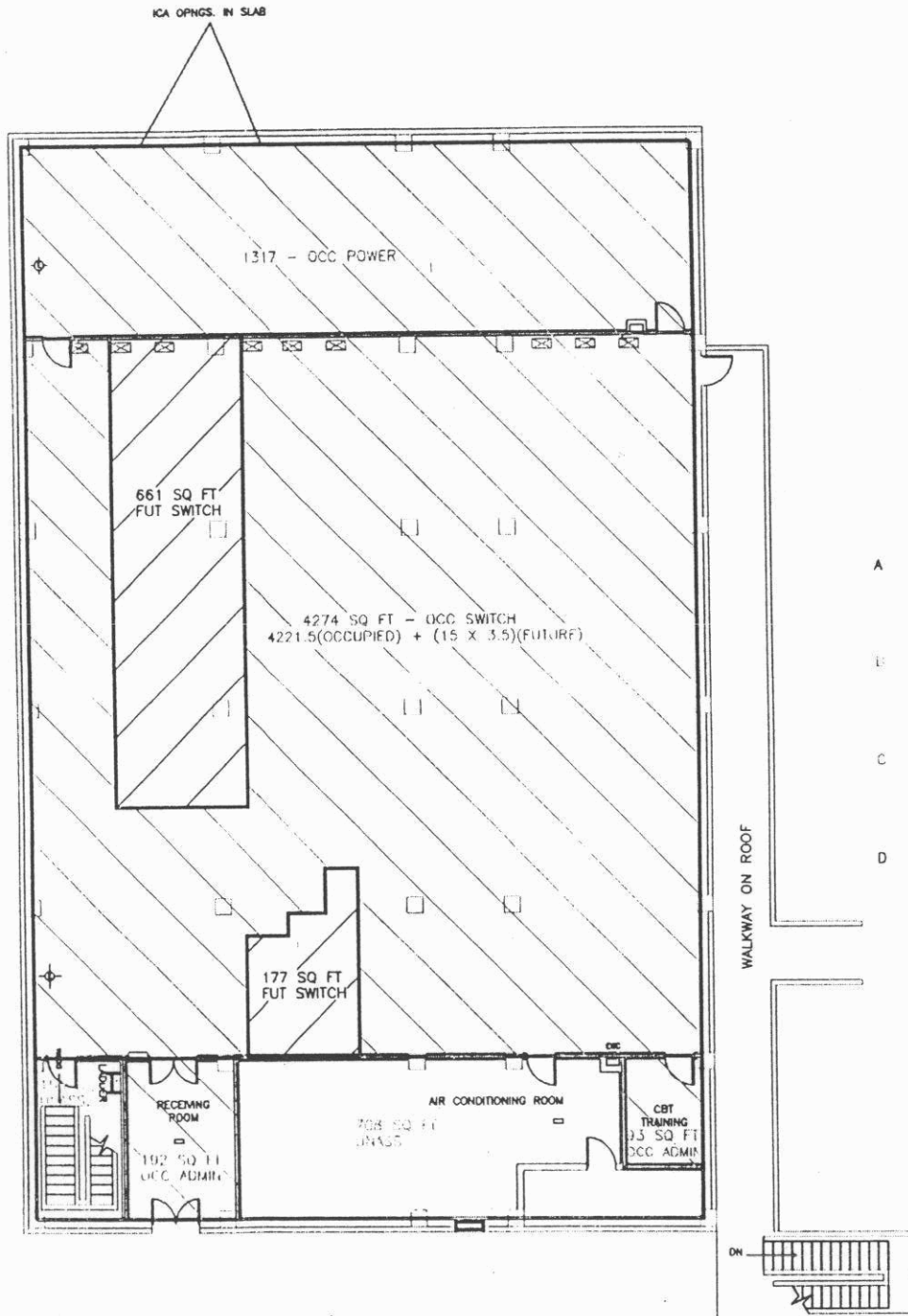
A	TOTAL GROSS SQ FT	1-348
	STAIRWELL	.90
	AIR HANDLING UNIT	104
	PUMP ROOM, CORRIDOR, JANITOR, RESTROOMS	55.5
B	TOTAL UNASSIGNABLE SPACE	449
	SWITCH	.155
	TOLL	4076.5 + 94 = 4170.5
	POWER AND ENGINE	142
	FRAME	134
	ADMIN	186 + 341 + 398 + 259 + 241 = 1325
C	TOTAL OCCUPIED SPACE	1785.5
	SWITCH	795 + 143 + (14 X 3.5) = 867
	TOLL	970 + 337 + (77 X 3.5) = 1078.5
	POWER	142
	AIR HANDLING UNIT	139
D	TOTAL RESERVED SPACE	144.5
E	TOTAL UNUSABLE SPACE	389

M6506 NORTH DADE GOLDEN GLADES FIRST FLOOR PLAN



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NOTES:

1. 10'-0" CLEAR CEILING HEIGHT MINIMUM.
2. PROVIDE LIGHTING IN MCC AREA BOUNDED BY COL'S B10, C10, C7, C10. RECEIVING AREA WILL BE WECCO EQUIPMENT FRAME MOUNTED LIGHTING.
3. ☼ EMERGENCY LIGHT.
4. CEILING INSERTS ARE NOT TO BE PLACED IN AHU ROOM OR STAIRWELL.
5. FHC - FIRE HOSE CABINET.
6. (E) FIRE EXTINGUISHER
7. ☐ CEILING MOUNTED JUNCTION BOX WITH 9-115V AC CIRCUITS FUSED AT 15 AMPS ON ESSENTIAL BUS.
8. ☒ CEILING MOUNTED JUNCTION BOX WITH 9-115V AC CIRCUITS FUSED AT 15 AMPS ON ESSENTIAL BUS.
9. ☒ CEILING MOUNTED JUNCTION BOX WITH 3-115V AC CIRCUITS FUSED AT 15 AMPS ON ESSENTIAL BUS.

A	TOTAL GROSS SQ FT	7577	
	STAIRWELL	155	
	AIR CONDITIONING ROOM	708	
	TOTAL UNASSIGNABLE SPACE	863	
	SWITCH	4221.5	
	POWER	1317	
	ADMIN	192 + 93 = 285	
	TOTAL OCCUPIED SPACE	5823.5	
	SWITCH	661 + 177 + (15 X 3.5) = 890.5	
	TOTAL RESERVED SPACE	890.5	

[EVALUATION OF CENTRAL OFFICE SPACE AVAILABLE FOR PHYSICAL COLLOCATION]

CENTRAL OFFICE CLLI: \_\_\_\_\_NDADFLGG

ADDRESS: \_\_\_\_\_18400 NE 5TH AVE, MIAMI, FL 33162

	SQ. FT.
A. TOTAL GROSS SQ. FT.	A. <span style="border: 1px solid black; padding: 2px;">26225</span>
B. UNAVAILABLE SPACE*: _____ 1st FL - stairwell, air handling unit, pump room, _____ corridor, janitor, restrooms, transformer vault & _____ air conditioning room _____ 2nd FL - stairwell & air conditioning room	B. <span style="border: 1px solid black; padding: 2px;">2812</span>
<p>• Unavailable space is all Non-Assignable area and is comprised of entrance lobbies, main corridors, hall spaces, inside stairways, fire towers, vertical shafts(light, vent, power, dumbwaiters, &amp; elevators), all toilet rooms (except those associated with private offices) and all space necessary for building operations.</p>	
C. OCCUPIED SPACE: (Space Computed as Block of Assigned Space - (Future Bays - 3.5)	
Central office Switch(es) _____	<span style="border: 1px solid black; padding: 2px;">7456.5</span>
Transmission Equipment _____	<span style="border: 1px solid black; padding: 2px;">4170.5</span>
Other (Specify) FRAME _____	<span style="border: 1px solid black; padding: 2px;">1434</span>
POWER _____	<span style="border: 1px solid black; padding: 2px;">4218</span>
ADMINISTRATIVE _____	<span style="border: 1px solid black; padding: 2px;">1710</span>
TOTAL ASSIGNED - OCCUPIED SPACE	C. <span style="border: 1px solid black; padding: 2px;">18989</span>

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# SPACE ASSESSMENT WO

**D. RESERVED SPACE**

Switching Equipment Growth through Year of \_\_\_\_\_ 1877.5  
 For: \_\_\_\_\_

Transmission Equipment Growth through year of \_\_\_\_\_ 1576.5  
 For: \_\_\_\_\_

Turnaround Space for replacement of \_\_\_\_\_ : Year: \_\_\_\_\_    
 (Switch Type)

Other (Future Air Handling Unit) \_\_\_\_\_ 439  
 (Switch Type)

Power \_\_\_\_\_ : Year: \_\_\_\_\_ 142  
 (Switch Type)

Frame \_\_\_\_\_ : Year: \_\_\_\_\_    
 (Switch Type)

Administrative (Space reserved for Administrative use, service center(s), or non-wire center functions)

\_\_\_\_\_ : Year: \_\_\_\_\_    
 \_\_\_\_\_ : Year: \_\_\_\_\_    
 \_\_\_\_\_ : Year: \_\_\_\_\_  

**TOTAL VACANT SPACE RESERVED FOR FUTURE USE** D. 4035

**E. VACANT SPACE/NOT USABLE** (I.e., flooding, no access to fire exits, configuration problems, space less than 100 sq. ft., building to be vacated)

\*\* If building is to be vacated, what CLLI will replace the facilities served by CLLI being vacated.

Explain each item in detail:

Space too narrow for equipment and required for exit aisle    
 \_\_\_\_\_ 389

**TOTAL VACANT SPACE/NOT USABLE** E. 389

**F. NET AVAILABLE SPACE (A -B -C -D -E -F) =** F. 0

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*PH*

# SPACE ASSESSMENT WO

## G. FUTURE AVAILABLE SPACE

SQ. FT.

Completion of Switch Replacement: \_\_\_\_\_  
(Qtr/Yr.)

Sq. Ft. =

Removal of Retired Equipment: \_ \_\_\_\_\_  
(Qtr/Yr.)

Sq. Ft. =

OTHER (Specify) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
(Qtr/Yr.)

## H. IF PHYSICAL SPACE IS NOT AVAILABLE, VIRTUAL WILL BE OFFERED. (EXPLAIN IN DETAIL IF VIRTUAL COLLOCATION CANNOT BE OFFERED,)

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

### NAME OF PERSON FILLING OUT FORM:

\_\_\_\_\_ Jenine Williams/North FL CAD Librarian  
(PRINT NAME AND TITLE )

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