

1 BELL SOUTH TELECOMMUNICATIONS, INC.
2 DIRECT TESTIMONY OF JAMES D. BLOOMER
3 BEFORE THE FLORIDA PUBLIC SERVICE COMMISSION
4 DOCKETS 980946-TL, 980947-TL, 980948-TL, 981011-TL,
5 981012-TL, AND 981250-TL
6 April 9, 1999
7
8

9 Q. PLEASE STATE YOUR NAME, COMPANY NAME AND ADDRESS.

10

11 A. My name is James D. Bloomer. I am employed by
12 BellSouth Telecommunications, Inc. ("BellSouth" or
13 the "Company") as a Manager - Facility Planning -
14 Property and Services Management. My business address
15 is 10JJ1 - 301 W. Bay Street, Jacksonville, FL 32202.

16

17 Q. PLEASE SUMMARIZE YOUR BACKGROUND AND EXPERIENCE.

18

19 A. I graduated from Florida State University in
20 Tallahassee Florida in 1970 with a Bachelor of
21 Science degree. I began employment with Southern
22 Bell in 1970 holding various positions in the Network
23 Distribution Department before joining the newly
24 formed Real Estate Department in 1975. In 1978, I
25 transferred to the building-planning group in

1 Property Management. In my position, I assign company
2 floor space in existing buildings and develop plans
3 for future space allocations.

4

5 Q. HAVE YOU TESTIFIED PREVIOUSLY?

6

7 A. Yes, I testified before this Commission in Docket
8 980800-TP concerning the factors to be considered in
9 determining if physical collocation space was
10 available in West Palm Beach Gardens and North Dade
11 Golden Glades.

12

13 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

14

15 A. I will provide BellSouth's position on the factors to
16 be considered in determining whether space is
17 available for physical collocation. I will also
18 comment on the Florida Public Service Commission
19 Staff's Audit Report for the six central offices
20 under discussion in these proceedings.

21

22 **ISSUE 2: WHAT FACTORS SHOULD BE CONSIDERED BY THE**
23 **COMMISSION IN MAKING ITS DETERMINATION ON BELL SOUTH'S**
24 **PETITIONS FOR WAIVER AND TEMPORARY WAIVER OF THE**

25

1 REQUIREMENT TO PROVIDE PHYSICAL COLLOCATION FOR THE
2 FOLLOWING CENTRAL OFFICES:

- 3
- 4 a) Daytona Beach Port Orange
- 5 b) Boca Raton Boca Teeca
- 6 c) Miami Palmetto
- 7 d) West Palm Beach Gardens
- 8 e) North Dade Golden Glades
- 9 f) Lake Mary
- 10

11 Q. WHAT FACTORS ARE CONSIDERED IN DETERMINING WHETHER
12 ADEQUATE SPACE IS AVAILABLE FOR PHYSICAL COLLOCATION?

13

14 A. The factors fall into four categories. I will
15 address the first two categories now and the
16 remaining factors later in my testimony.

17

18 **First,** the existing building configuration must be
19 considered. This entails consideration of the
20 existing building configuration, location of doors,
21 hallways, stairs, lounges, air handling, the building
22 outline and the physical capacity of the structure.

23

24 **Second,** space usage and forecasted demand must be
25 considered. There are several steps in this review

1 of the facility. These steps identify the amount of
2 building space available for physical collocation.
3 Space is categorized, then removed from
4 consideration. Physical collocation space
5 availability is then determined.

6

7 Q. WHAT IS THE PROCESS USED TO IDENTIFY THE CENTRAL
8 OFFICE SPACE AVAILABLE FOR PHYSICAL COLLOCATION?

9

10 A. The process follows these steps:

11

12 A) Determine the gross building space. This is the
13 total space contained in the facility.

14

15 B) From that number, unavailable space is
16 subtracted. Unavailable space is assigned to
17 building support components required to support
18 the building and its occupancies. This space
19 generally includes air handling rooms, pump
20 rooms, transformer and cable vaults, restrooms,
21 stair towers, janitor closets, main corridors,
22 vestibules, and light shafts.

23

24

25

1 C) Occupied space is determined and subtracted from
2 the answer determined in step B above. Occupied
3 space is that physically occupied by:
4
5 (1) Switching equipment, which provides dial tone
6 and calling ability to customers;
7
8 (2) Transmission (toll & circuit) equipment, which
9 provides transport of customer services from
10 one switch to another;
11
12 (3) Frame space assigned to the various
13 distributing frames in the office, which
14 provides interconnect points for switch, toll
15 or outside plant; and
16 (4) Power space assigned to the various DC power
17 plants and standby generators necessary to
18 support all equipment in the building.
19
20 D) Reserved space is determined and subtracted from
21 the answer determined in step C. Generally,
22 reserved space is held for the various space
23 usages described in step C with forecasted needs
24 for the next 2-year shipping interval. There is
25 one exception. There are several types and

1 families of equipment requiring fixed layouts.
2 That is, this equipment cannot be split up into
3 several different locations in the central office
4 without degrading service or capping the size or
5 customer service levels for that type of
6 equipment. Examples of this type of equipment are
7 switch processor frames for digital central
8 offices and control points, the Digital Signal
9 Cross Connect (DSX) family of cross connect
10 panels, the Digital Access and Cross Connect
11 Systems (DACS) family of digital toll cross
12 connect systems, and remote testing and
13 monitoring systems. Therefore, we keep these
14 equipment families together to provide the best
15 service.

16

17 E) Vacant space/unusable space is determined and
18 subtracted from the answer determined in step D.
19 Space is not usable due to configuration
20 problems, lack of exits, the size being less than
21 100 square feet, the fact that the building will
22 be demolished, etc.

23

24 F) The net space possibly available for collocation
25 is then determined.

1 Q. WHAT ABOUT ADMINISTRATIVE SPACE? HOW IS THAT TAKEN
2 INTO ACCOUNT?
3
4 A. Administrative space is any space **NOT** directly
5 supporting the installation or repair of both
6 telephone equipment and customer service. Examples of
7 this space are storerooms, lounges, shipping-
8 receiving rooms, and training areas. These rooms are
9 necessary to meet code, life safety, or contractual
10 requirements. Administrative space can also include
11 regular office space used by work groups performing
12 company functions outside of the equipment support
13 described above. BellSouth allocates space to these
14 types of administrative groups in response to changes
15 in the regulatory environment, increases or decreases
16 in company manpower requirements, or in response to
17 new service offerings.
18
19 Q. DOES BELL SOUTH USE A FORM FOR THE PROCESS OF
20 IDENTIFYING THE CENTRAL OFFICE SPACE AVAILABLE FOR
21 COLLOCATION?
22
23 A. Yes. A copy of BellSouth's space assessment work
24 sheet form is attached to my testimony as Exhibit
25 JDB-1.

1 Q. WHAT IS THE THIRD CATEGORY OF FACTORS?

2

3 A. The third category of factors to be considered in
4 determining whether adequate space is available for
5 physical collocation consists of building code and
6 regulatory considerations. There are building codes
7 at national, state, and local levels that affect
8 space allocations. For example, the National Fire
9 Protection Act provides minimum requirements, with
10 due regard to function, for the design, operation,
11 and maintenance of buildings and structures for
12 safety to life from fire and similar emergencies. The
13 Standard Building Code defines types and methods of
14 construction for various functions to protect the
15 occupants of the structure. Counties and
16 municipalities adopt the National Fire Protection Act
17 and Standard Building Code, adding new regulations,
18 restrictions, and interpretations to the existing
19 legal framework. Dade County has added enough items
20 to create a South Florida Building code.

21

22 Local codes generally govern the type of construction
23 necessary to separate the physical collocation space
24 from BellSouth occupancy. Local code officials are
25 the final interpreters of the codes. They govern the

1 width of the fire aisles, heights of walls, sizes and
2 amounts of lighting, landscaping, air conditioning
3 duct design, exterior access, interior corridors,
4 exits, etc. Local codes also affect work on the
5 outside of the building. Landscaping, Americans with
6 Disability Act provisions, building setback, height,
7 stormwater retention, and maximum site usable for
8 development are all regulated by local building code
9 officials.

10

11 Q. WHAT FIRE CODES ARE APPLICABLE FOR THE OFFICES BEING
12 ADDRESSED IN THIS HEARING?

13

14 A. The jurisdictions for all of these offices have
15 adopted an edition of the National Fire Protection
16 Association (NFPA) 101 as the minimum standard for
17 life safety. Lake Mary Central Office is located in
18 the Seminole County jurisdiction. Seminole County
19 has adopted the 1994 edition of NFPA 101. In July of
20 1999, Seminole County is expected to adopt the 1997
21 edition of NFPA 101. The Miami Palmetto Central
22 Office and the North Dade Golden Glades Central
23 Office are located within the Dade County
24 jurisdiction. Dade County has adopted the 1994
25 edition of NFPA 101. The Daytona Beach Port Orange

1 Central Office is located in the City of Port Orange
2 jurisdiction. The City of Port Orange has adopted
3 the 1997 edition of NFPA 101. The West Palm Beach
4 Gardens Central Office is located in the Palm Beach
5 Gardens jurisdiction. Palm Beach Gardens has adopted
6 NFPA 101, 1997 edition. The Boca Raton Boca Teeca
7 Central Office is located in the Boca Raton
8 jurisdiction. Boca Raton has adopted NFPA 101, 1994
9 edition.

10

11 Q. WHAT BUILDING CODES ARE APPLICABLE FOR THE OFFICES
12 BEING ADDRESSED IN THIS HEARING?

13

14 A. The Miami Palmetto Central Office and the North Dade
15 Golden Glades Central Office fall under the Dade
16 County jurisdiction. The South Florida Building
17 Code, 1997 Dade County edition, is the code utilized
18 by Dade County. The Lake Mary Central Office is
19 located in the Seminole County jurisdiction.
20 Seminole County has adopted the Standard Building
21 Code, 1997 edition. The Daytona Beach Port Orange
22 Central Office is located in the City of Port Orange
23 jurisdiction. The City of Port Orange has adopted
24 the Standard Building Code, 1997 edition. The West
25 Palm Beach Gardens Central Office is located in the

1 Palm Beach Gardens jurisdiction. Palm Beach Gardens
2 has adopted the Standard Building Code, 1997 edition.
3 The Boca Raton Boca Teeca Central Office is located
4 in the Boca Raton jurisdiction. Boca Raton had
5 adopted the Standard Building Code, 1994 edition.
6 The Standard Building Code is maintained and revised
7 by the Southern Building Code Congress International
8 (SBCCI).

9

10 Q. HAS BELLSOUTH ENCOUNTERED ANY CONFLICTS BETWEEN THE
11 FIRE AND LIFE SAFETY CODES, AND THE BUILDING CODES?

12

13 A. Yes. Under NFPA 101, Part 1, Section 28-141, a
14 telephone exchange is listed as a Special Use
15 Industrial Occupancy, which does not require fire-
16 rated separation related to exit access corridors.
17 The Standard Building Code and South Florida Code
18 refer to telephone exchanges as Group B - Business or
19 Group G - storage which requires fire rated exit
20 access corridors. The NFPA does not define a tenant.
21 Both the Standard and South Florida Codes do define
22 tenant. They also define special requirements for
23 tenant situations. The South Florida Building Code
24 (section 507.2) and the Standard Building Code
25 (section 704.3) require a fire-rated separation

1 between tenants and common areas (which includes
2 corridors). The building official can choose which
3 sections of the codes that he/she wants the BellSouth
4 plans and specifications to meet when there are
5 conflicts. For example, the Fire Marshal of Ft.
6 Lauderdale at the Main Relief CO (Central Office) and
7 the Cypress CO, has insisted that BellSouth meet the
8 separation requirements of the South Florida Building
9 Code, and the 50 foot common path of travel
10 requirement of NFPA 101. Under NFPA 101, Special Use
11 Industrial Occupancy, the corridor would not be
12 required to have rated walls. However, since the
13 building official is picking and choosing between
14 codes, he/she can require that the corridor from the
15 building be constructed of fire-rated wall
16 construction (according to the South Florida Building
17 Code). **A copy of the South Florida Building Code,**
18 **Dade County edition, the Standard Building Code and**
19 **other related building and fire code documentation**
20 **are attached as exhibit JDB-26.**

21

22 Q. WHAT IS THE FOURTH CATEGORY OF FACTORS?

23

24 A. BellSouth design practices act as another set of
25 codes specifying space allocations that meet the

1 safety needs for employees and vendors, as well as
2 customer service needs provided by the building and
3 its occupants. These practices detail maximum
4 equipment-lineup length, travel distances to exits,
5 front and rear equipment aisle widths, and the size
6 of various support components (such as air-
7 conditioning, house service panels, duct, conduit,
8 ceiling rack heights, size and number of toilet
9 facilities, lounges, storerooms, etc.). These
10 practices also dictate the separation distances
11 necessary to prevent service outages caused by
12 grounding violations. These grounding violations are
13 usually caused by people being able to work on one
14 type of equipment and touching another type. The
15 solution is to separate the equipment by the type of
16 grounding path required. This is referred to as
17 integrated and isolated grounding plane separation.

18
19 **ISSUE 3: BASED ON THE FACTORS IDENTIFIED IN ISSUE 2,**
20 **HOW MUCH SPACE SHOULD BE CONSIDERED AVAILABLE IN THE**
21 **FOLLOWING CENTRAL OFFICES:**

- 22
23 a) Daytona Beach Port Orange
24 b) Boca Raton Boca Teeca
25 c) Miami Palmetto

- 1 d) **West Palm Beach Gardens**
- 2 e) **North Dade Golden Glades**
- 3 f) **Lake Mary**

4

5 Q. HAVE YOU PERFORMED AN ASSESSMENT OF THE NORTH DADE
6 GOLDEN GLADES CENTRAL OFFICE?

7

8 A. Yes. I reviewed the building based on
9 configuration, presently occupied space, reserved
10 space, and municipal and company code applications. I
11 then verified the findings by several site visits.
12 There is still no space available in this office for
13 physical collocation.

14

15 The Space Assessment Worksheet, attached as Exhibit
16 JDB-3, details the analysis performed in the review.
17 A sketch of the building is attached as Exhibit JDB-2
18 and depicts the building configuration and space
19 relationships. A summary of this information follows:

20

21 A) The Golden Glades facility is a first and partial
22 second-floor facility built on an irregular
23 shaped site in northern Dade County. The building
24 contains 27,762 gross square feet. It is a major
25 switching center with a large interoffice

1 trunking presence. There have been previous
2 collocation requests at this location. The
3 building sits on three of the four code required
4 setbacks. The site already contains the maximum
5 developed improved area set by code.

6

7 B) There are 4,754 square feet of unavailable space.
8 This is composed of non-assignable areas
9 including entrance lobbies, main corridors, hall
10 spaces, inside stairways, fire towers, all toilet
11 rooms, cable vault, and all space necessary for
12 building operations.

13

14 C) There are 19,080.5 square feet of occupied space.
15 The space is allocated to the following groups:

16

17 7,804.5 Sq. Ft. Local switch, tandems, operator
18 services switch, and Signal
19 Transfer Point (STP) & Signal
20 Control Point (SCP) machines

21 4,270 Sq. Ft. Transmission: Virtual
22 collocation, toll & circuit,
23 and digital cross-connect frame

24 1,434 Sq. Ft. Frame

25

1 3,862 Sq. Ft. Power: DC power plants and
2 engine
3 1,710 Sq. Ft. Administrative: Shipping and
4 receiving, training room and
5 break room, restoration center
6 and work area

7
8 D) There are 3,403.5 square feet of reserved space.
9 This is space held for currently forecasted
10 equipment shipments through 1Q2001. These space
11 reservations include the floor space required for
12 the equipment and the necessary aisles to
13 properly enter and exit the equipment area.
14 Locating the space reservations is done with the
15 input of the Network Common Systems Planners, who
16 act as a gathering point for the information.

17
18 The total space reserved by category is as
19 follows:

20
21 1,529.5 Sq. Ft. Expansion of the local switch,
22 tandems, operator services
23 switch, and STP & SCP machines

24
25

1	1,343 Sq. Ft.	Expansion of the virtual
2		collocation, toll & circuit
3		digital cross-connect frame
4	None	Frame
5	404 Sq. Ft.	Expansion of the power plant
6	None	Administrative
7	127 Sq. Ft.	Other: Future elevator shaft

8

9 E) There are 524 square feet in two areas determined
 10 as unusable at this location. The configuration
 11 restricts their use. 389 square feet is
 12 configured in an exit aisle and is used for trash
 13 container storage and return air grilles. The 135
 14 square feet is between the isolated and
 15 integrated ground planes. The space serves as
 16 required separation between ground planes. An
 17 equipment installation in this aisle would
 18 violate these ground planes.

19

20 Q. WHAT DOES YOUR PREVIOUS EXPERIENCE WITH MIAMI DADE
 21 CODE REVIEW OF PHYSICAL COLLOCATION INDICATE WOULD BE
 22 REQUIRED AT THIS LOCATION?

23

24 A. Miami Dade takes the position that physical
 25 collocation is a leased multi-tenant occupancy

1 requiring a full fire rated wall from floor to
2 ceiling served by a fire rated corridor to the two
3 exit doors. We are trying to change this opinion.
4 The testimony of BellSouth's witness Milner addresses
5 this issue. Fire rated construction is very difficult
6 to construct inside an equipment area.

7

8 Q. WHY IS THE CONSTRUCTION SO DIFFICULT?

9

10 A. To achieve the rating, the wall must cross through
11 the entire overhead racking, duct, and conduit runs.
12 A wall opening is constructed around each rack, duct,
13 or conduit into or through the space. This may
14 require completely dismantling some of the conduit
15 and duct. Each wall opening must be completely sealed
16 at all times to maintain the rating. In addition,
17 each air conditioning duct must be cut open and fire
18 dampers installed to control smoke spread.

19

20 Q. HAVE YOU PERFORMED AN ASSESSMENT OF THE WEST PALM
21 BEACH GARDENS CENTRAL OFFICE?

22

23 A. Yes. I reviewed the building based on
24 configuration, presently occupied space, reserved
25 space, and municipal and company code applications. I

1 verified my findings with several site visits. There
2 is no space available for physical collocation in
3 this office.

4

5 The Space Assessment Worksheet, attached as Exhibit
6 JDB-5, details the analysis performed in the review.
7 The sketch, attached as Exhibit JDB-4, depicts the
8 space allocations and building configuration. A
9 summary of this information follows:

10

11 A) The West Palm Beach Gardens Central Office
12 facility is a single floor facility built on a
13 rectangular shaped site in southern Palm Beach
14 County. The building contains 20,314 gross square
15 feet. It is a major switching center with a
16 large interoffice trunking presence. There have
17 been previous physical collocation requests at
18 this location.

19

20 B) There are 2,264 square feet of unavailable space.
21 This is composed of non-assignable area including
22 entrance lobbies, main corridors, hall spaces,
23 inside stairways, fire towers, all toilet rooms,
24 and all space necessary for building operations.

25

1 C) There are 15,406 square feet of occupied space.
2 The space is allocated to the following groups:
3
4 7,333 Sq. Ft. Local switch, tandems, operator
5 services switch, and STP & SCP
6 machines
7 3,927 Sq. Ft. Transmission: Virtual
8 collocation, toll & circuit,
9 digital cross-connect frame
10 1,406 Sq. Ft. Frame
11 2,096 Sq. Ft. Power: DC power plants and engine
12 644 Sq. Ft. Administrative: Shipping and
13 receiving, training room and
14 break room
15
16 C) There are 2,644 square feet of reserved space.
17 This is space held for currently forecasted
18 equipment shipments through the year 2001. These
19 space reservations include the floor space
20 required for the equipment and the necessary
21 aisles to properly enter and exit the equipment
22 area. Locating the space reservations is done
23 with the input of the Network Common Systems
24 Planners who act as a gathering point for the
25 information.

1 The total space reserved by category is as
2 follows:
3
4 1,619 Sq. Ft. Expansion of the local switch,
5 tandems, operator services
6 switch, and STP & SCP machines
7 687 Sq. Ft. Transmission: Expansion of the
8 virtual collocation, toll &
9 circuit digital cross-connect
10 frame
11 None Frame
12 338 Sq. Ft. Power: Expansion of the power
13 plant required to serve
14 equipment
15 None Administrative

16
17 D) There is no unusable space at this location.
18

19 Q. WHAT DOES YOUR PREVIOUS EXPERIENCE WITH PALM BEACH
20 CODE REVIEW OF PHYSICAL COLLOCATION INDICATE WOULD BE
21 REQUIRED AT THIS LOCATION?
22

23 A. Palm Beach County and Palm Beach Gardens take the
24 position that collocation is a leased multi-tenant
25 occupancy requiring a full fire rated wall from floor

1 to ceiling, served by a fire rated corridor to the
2 two exit doors. Fire rated construction is very
3 difficult to construct inside an equipment area.

4

5 Q. WHY IS THE CONSTRUCTION DIFFICULT?

6

7 A. The construction is difficult for the same reasons as
8 I discussed earlier in my testimony.

9

10 Q. HAVE YOU PERFORMED AN ASSESSMENT OF THE LAKE MARY
11 CENTRAL OFFICE?

12

13 A. Yes. I reviewed the building based on
14 configuration, presently occupied space, reserved
15 space, and municipal and company code applications. I
16 verified my findings with several site visits. There
17 is no space available for physical collocation in
18 this office.

19

20 The Space Assessment Worksheet, attached as Exhibit
21 JDB-7, details the analysis performed in the review.
22 The sketch, attached as Exhibit JDB-6, depicts the
23 space allocations and building configuration. A
24 summary of this information follows:

25

1 A) The Lake Mary Central Office is a single floor
2 facility built on a triangular shaped section of
3 the Heathrow development utility easement. The
4 building contains 5,195 gross square feet. It
5 serves a small local switch with a large
6 interoffice trunking presence. There have been
7 previous collocation requests at this location.
8 We share the site with Seminole County water
9 pumps, wells, and treatment tank. The entire
10 site drains into a retention pond adjacent to our
11 building. The building is built against the
12 setback lines. BellSouth has just been released
13 from the North and West setbacks in order to
14 expand the building. We have not yet finished the
15 designs to see if we can infringe on the water
16 retention area contained in those setbacks.
17
18 B) There are 387 square feet of unavailable space.
19 This is composed of non-assignable area including
20 entrance lobbies, toilet room and all space
21 necessary for building operations.
22
23 C) There are 3,773 square feet of occupied space.
24 The space is allocated to the following groups:
25

1	1,243.5 Sq. Ft.	Local switch
2	913.5 Sq. Ft.	Transmission: Virtual
3		collocation, toll & circuit,
4		SLC digital cross-connect frame
5	671 Sq. Ft.	Frame
6	734 Sq. Ft.	Power: DC power plants and
7		engine
8	211 Sq. Ft.	Administrative: Storage
9		
10	D) There are 1,035 square feet of reserved space.	
11	This is space held for currently forecasted	
12	equipment shipments through the year 2001. These	
13	space reservations include the floor space	
14	required for the equipment and the necessary	
15	aisles to properly enter and exit the equipment	
16	area. Locating space reservations is done with	
17	the input of the Network Common Systems Planners,	
18	who act as a gathering point for the information.	
19		
20	The total space reserved by category is as	
21	follows:	
22		
23	281.5 Sq. Ft.	Expansion of the local switch
24	660.5 Sq. Ft.	Transmission: Expansion of the
25		virtual collocation, toll &

1		circuit, digital cross-connect
2		frame
3	93 Sq. Ft.	Frame
4	None	Power: Expansion of the power
5		plant required to serve
6		equipment
7	None	Administrative

8

9 E) There is no unusable space at this location.

10

11 Q. WHAT DOES YOUR PREVIOUS EXPERIENCE WITH SEMINOLE
 12 COUNTY CODE REVIEW OF PHYSICAL COLLOCATION INDICATE
 13 WOULD BE REQUIRED AT THIS LOCATION?

14

15 A. BellSouth has no experience with Seminole County
 16 permitting for physical collocation at this point.
 17 Seminole County uses the Standard Building Code with
 18 some local revisions. Seminole County could take the
 19 position that collocation is a leased multi-tenant
 20 occupancy requiring a full fire rated wall from floor
 21 to ceiling served by a fire rated corridor to the two
 22 exit doors. Fire rated construction is very difficult
 23 to construct inside an equipment area.

24

25 Q. WHY IS THIS CONSTRUCTION DIFFICULT?

1 A. The construction is difficult for the same reasons as
2 I discussed earlier in my testimony.
3
4 Q. DO YOU KNOW OF ANY OTHER PERMITTING DIFFICULTIES WITH
5 CONSTRUCTION WORK IN LAKE MARY?
6
7 A. Yes, we face two further issues:
8
9 1) Any exterior renovation must pass the Heathrow
10 Development Architectural review committee.
11
12 2) The current retention pond is sized for the paved
13 and built up areas that exist. At present, we
14 cannot add sidewalk access to the side and rear
15 of the building without revising this pond with
16 the Seminole Water Management district.
17
18 Q. HAVE YOU PERFORMED AN ASSESSMENT OF THE DAYTONA BEACH
19 PORT ORANGE CENTRAL OFFICE?
20
21 A. Yes. I reviewed the building based on configuration,
22 presently occupied space, reserved space, and
23 municipal and company code applications. I verified
24 my findings with several site visits. There is no
25

1 space available for physical collocation in this
2 office.

3

4 The Space Assessment Worksheet, attached as Exhibit
5 JDB-9, details the analysis performed in the review.
6 The sketch, attached as Exhibit JDB-8, depicts the
7 space allocations and building configuration. A
8 summary of this information follows:

9

10 A) The Daytona Beach Port Orange central office is a
11 single floor facility built on a regular shaped
12 property in a residential area of the Daytona
13 Beach Port Orange community. The central office
14 shares the site with a small building serving our
15 installation and maintenance forces. The entire
16 site drains into a retention pond adjacent to the
17 parking area. The building is built against the
18 front and side setback lines. The building
19 contains 13,331 gross square feet. It serves a
20 combined local/tandem switch with a large
21 interoffice trunking presence. There is
22 considerable Digital Line Carrier (DLC) equipment
23 installed in this office as well. There have
24 been previous collocation requests at this
25 location.

1 B) There are 2,378 square feet of unavailable space.
2 This is composed of non-assignable area including
3 entrance lobbies, hallway, all toilets, house
4 service panel room, air handling units and all
5 space necessary for building operations.
6
7 C) There are 8,623 square feet of occupied space.
8 The space is allocated to the following groups:
9
10 2,870.5 Sq. Ft. Local/Tandem switch
11 1,716.5 Sq. Ft. Transmission: Virtual
12 collocation, toll & circuit,
13 DLC digital cross connect frame
14 2,020 Sq. Ft. Frame
15 1,586 Sq. Ft. Power: DC power plants and
16 engine
17 430 Sq. Ft. Administrative: Storage
18
19 D) There are 2071 square feet of reserved space.
20 This is space held for currently forecasted
21 equipment shipments through 1Q2001. These space
22 reservations include the floor space required for
23 the equipment and the necessary aisles to
24 properly enter and exit the equipment area.
25 Locating space reservations is done with the

1 input of the Network Common Systems Planners, who
2 act as a gathering point for the information.

3

4 The total space reserved by category follows:

5

6 987.5 Sq. Ft. Expansion of the local switch

7 430.5 Sq. Ft. Transmission: Expansion of the
8 virtual collocation, toll &
9 circuit, and digital cross
10 connect frame

11 653 Sq. Ft. Power: Equipment additions to
12 serve ultimate building size

13

14 E) There is 259 square feet unusable space at this
15 location.

16

17 Q. WHAT DOES YOUR PREVIOUS EXPERIENCE WITH VOLUSIA
18 COUNTY AND PORT ORANGE CODE REVIEW OF PHYSICAL
19 COLLOCATION INDICATE WOULD BE REQUIRED AT THIS
20 LOCATION?

21

22 A. In regard to physical collocation, BellSouth has no
23 experience with Volusia County and/or Port Orange
24 permitting at present. Volusia County and Port
25 Orange use the Standard Building code with some local

1 revisions. Volusia County and Port Orange could take
2 the position that collocation is a leased multi-
3 tenant occupancy requiring a full fire rated wall
4 from floor to ceiling served by a fire rated corridor
5 to the two exit doors. Fire rated construction is
6 very difficult to construct inside an equipment area.

7

8 Q. WHY IS THE FIRE RATED CONSTRUCTION SO DIFFICULT?

9

10 A. Fire rated construction is difficult for the same
11 reasons as I discussed earlier in my testimony.

12

13 Q. HAVE YOU PERFORMED AN ASSESSMENT OF THE BOCA RATON
14 BOCA TEECA CENTRAL OFFICE?

15

16 A. Yes. I reviewed the building based on configuration,
17 presently occupied space, reserved space, and
18 municipal and company code applications. I verified
19 my findings with several site visits. There is no
20 space available for physical collocation in this
21 office.

22

23 The Space Assessment Worksheet, attached as Exhibit
24 JDB-11, details the analysis performed in the review.
25 The sketch, attached as Exhibit JDB-10, depicts the

1 space allocations and building configuration. A
2 summary of this information follows:
3
4 A) The Boca Raton Boca Teeca central office is a two
5 floor facility built on a rectangular shaped site
6 in southern Palm Beach County. The building
7 contains 29,069 gross square feet. It serves a
8 DMS switch with a large interoffice trunking
9 presence. There have been previous physical
10 collocation requests at this location. The
11 building's second floor serves as the
12 administrative offices for BellSouth Outside
13 Plant Engineers, Property Management, and Network
14 Area Management.
15
16 B) There are 3,546 square feet of unavailable space.
17 This is composed of non-assignable area including
18 entrance lobbies, main corridors, hall spaces,
19 inside stairways, fire towers, all toilet rooms
20 and all space necessary for building operations.
21
22 C) There are 24,239.5 square feet of occupied space.
23 The space is allocated to the following groups:
24
25

1	3,255 Sq. Ft.	Local switch, "611" regional
2		number switch
3	3,816.5 Sq. Ft.	Transmission: Virtual
4		collocation, toll and circuit,
5		and digital cross connect frame
6	2,464 Sq. Ft.	Frame
7	1,367 Sq. Ft.	Power: DC power plants and
8		engine
9	391 Sq. Ft.	Administrative: 1 st Floor
10		Shipping and receiving
11	12,946 Sq. Ft.	Administrative: 2 nd Floor
12		
13	C) There are 1,283.5 square feet of reserved space.	
14	This is space held for currently forecasted	
15	equipment shipments through 1Q2001. These space	
16	reservations include the floor space required for	
17	the equipment and the necessary aisles to	
18	properly enter and exit the equipment area.	
19	Locating space reservations is done with the	
20	input of the Network Common Systems Planners, who	
21	act as a gathering point for the information.	
22		
23	The total space reserved by category is as	
24	follows:	
25		

1	1,172 Sq. Ft.	Expansion of the local switch
2	59.5 Sq. Ft.	Transmission: Expansion of the
3		virtual collocation, toll and
4		circuit, and digital cross
5		connect frame
6	None	Frame
7	52 Sq. Ft.	Power: Expansion of the power
8		plant required to serve
9		equipment
10	None	Administrative

11

12 E) There is no unusable space at this location.

13

14 Q. WHAT DOES YOUR PREVIOUS EXPERIENCE WITH PALM BEACH

15 CODE REVIEW OF PHYSICAL COLLOCATION INDICATE WOULD BE

16 REQUIRED AT THIS LOCATION?

17

18 A. Palm Beach County officials take the position that

19 collocation is a leased multi-tenant occupancy

20 requiring a full fire rated wall from floor to

21 ceiling served by a fire rated corridor to the two

22 exit doors. Fire rated construction is very difficult

23 to construct inside an equipment area.

24

25 Q. WHY IS THE CONSTRUCTION SO DIFFICULT?

1 A. The construction is difficult for the same reasons I
2 discussed earlier in my testimony.

3

4 Q. WHAT WOULD THE PALM BEACH CODE OFFICIALS REQUIRE IF
5 EQUIPMENT AREAS ARE CREATED ON THE SECOND FLOOR?

6

7 A. BellSouth visited with local architects who discussed
8 the matter with local officials informally for our
9 own planning. The code officials correctly decided
10 that the equipment area and the administrative space
11 are different occupancies by the Standard Building
12 Code and the National Fire Protection Act. The
13 different occupancies **MUST** be separated by fire rated
14 walls of at least 2-hour rating. In addition, a fire
15 rated corridor must be constructed through the middle
16 of space providing safe exitway for all occupants of
17 both spaces.

18

19 Q. WHY ARE THESE ADMINISTRATIVE FORCES LOCATED ON THE
20 SECOND FLOOR OF THIS CENTRAL OFFICE?

21

22 A. This floor was originally designed for an older, more
23 space-consuming switch technology. After the space
24 was built, and before the equipment was ordered,
25 technology changed and equipment innovation resulted

1 in a reduction in its size, and the space was not
2 needed for equipment purposes. Telephone equipment
3 has never been located on this floor. BellSouth's
4 Small Business service representatives occupied the
5 second floor in the early 1990's. This group was
6 consolidated to another location and the space was
7 again vacant. The engineering forces were moved to
8 the second floor, since it was already set up for
9 administrative space, had adequate code-required
10 parking and was in the center of the booming activity
11 in this district.

12

13 Q. IS THERE ANY OTHER BELLSOUTH CONTROLLED SPACE, EITHER
14 OWNED OR LEASED, IN THIS AREA FOR THESE FORCES?

15

16 A. No. BellSouth has no other space in this area to
17 locate these personnel.

18

19 Q. WHAT DOES BELLSOUTH PLAN TO DO WHEN ITS OWN EQUIPMENT
20 NEEDS EXCEED THE SPACE AVAILABLE ON THE FIRST FLOOR?

21

22 A. We are actively studying the matter right now. There
23 is major growth reflected in the administrative
24 forecast over the next three years as well as
25 equipment growth. The most immediate problem is toll

1 and power growth space on the first floor. At some
2 point, it is conceivable that both floors will no
3 longer serve the needs of their occupants. Studies
4 are underway attempting to quantify the costs for all
5 the possible combinations of solutions.

6

7 Q. WHAT CAN YOU TELL US ABOUT THE STUDY SO FAR?

8

9 A. We have deduced the following, with all costs shown
10 as \$*1000 and all rents reflected as an annual total:

11

12 The study term is ten years.

13		<u>Cap</u>	<u>Exp</u>	<u>Rent</u>
14	Creation of an equipment suite			
15	on the 2 nd Floor (minimal size)	250	44	0
16				
17	Creation of a larger equipment			
18	area on 2 nd Floor (Includes			
19	rearranging some Engineering			
20	spaces and small addition			
21	to 1 st Floor for power	1,450	144	0
22				
23	Move Engineering, lease new space			
24	and rearrange 2 nd floor for equip.			
25	(Would include collocation suite)	821	190	192

1 Create large addition to 1st Floor
2 for all equipment 3,600 300 0

3
4 BellSouth is analyzing these preliminary results and
5 will have a study completed in time to make a space
6 allocation decision to meet its customer needs.

7

8 Q. HAVE YOU PERFORMED AN ASSESSMENT OF THE MIAMI
9 PALMETTO CENTRAL OFFICE?

10

11 A. Yes. I reviewed the building based on configuration,
12 presently occupied space, reserved space, and
13 municipal and company code applications. I verified
14 my findings with several site visits. There is no
15 space available for physical collocation in this
16 office.

17

18 The Space Assessment Worksheet, attached as Exhibit
19 JDB-13, details the analysis performed in the review.
20 The sketch, attached as Exhibit JDB-12, depicts the
21 space allocations and building configuration. A
22 summary of this information follows:

23

24 A) The Miami Palmetto Central Office is a one floor
25 facility built on a rectangular shaped site in

1 Dade County. The building contains 24,398 gross
2 square feet. It serves a switch with a large
3 interoffice trunking presence. There are physical
4 collocation arrangements already equipped, with
5 other requests pending at this location.

6

7 B) There are 1,636 square feet of unavailable space.
8 This is composed of non-assignable area including
9 entrance lobbies, main corridors, hall spaces,
10 all toilet rooms, air handling rooms and all
11 space necessary for building operations.

12

13 C) There are 18,780.5 square feet of occupied space.
14 The space is allocated to the following groups:

15

16	4,371 Sq. Ft.	Local switch
17	5,768.5 Sq. Ft.	Transmission: Virtual
18		collocation, toll and circuit,
19		digital cross connect frame
20	800 Sq. Ft.	Physical Collocation
21	3,216 Sq. Ft.	Frame
22	3,263 Sq. Ft.	Power: DC power plants and
23		engine
24	1,362 Sq. Ft.	Administrative: 1 st Floor
25		Shipping and receiving

1 D) There are 3,580.5 square feet of reserved space.
2 This is space held for currently forecasted
3 equipment shipments through 1Q2001. These space
4 reservations include the floor space required for
5 the equipment and the necessary aisles to
6 properly enter and exit the equipment area.
7 Locating space reservations is done with the
8 input of the Network Common Systems Planners, who
9 act as a gathering point for the information.
10
11 The total space reserved by category is as
12 follows:
13
14 1,317 Sq. Ft. Expansion of the local switch
15 Some of this space is limited
16 by ground buss loop length for
17 digital equipment. This could
18 force the use of the
19 maintenance area or manager's
20 administrative area to provide
21 switch growth space. BellSouth
22 will not have all necessary
23 information, until detailed
24 vendor engineering is completed
25

1		for the jobs to install those
2		bays.
3	2,263.5 Sq. Ft.	Transmission: Expansion of the
4		virtual collocation, toll and
5		circuit, and digital cross
6		connect frame
7	None	Frame
8	None	Power
9	None	Administrative

10

11 There will be a need to convert administrative space
 12 to air handling rooms when the existing units cannot
 13 handle the equipment heat loads. This is anticipated
 14 in the 2000/2001 time frame.

15

16 E) There is 401 square feet of unusable space at
 17 this location.

18

19 Q. WHAT DOES YOUR PREVIOUS EXPERIENCE WITH MIAMI DADE
 20 CODE OFFICIALS ON PHYSICAL COLLOCATION INDICATE WOULD
 21 BE REQUIRED AT THIS LOCATION?

22

23 A. The Miami Dade code officials have taken the position
 24 that collocation is a leased multi-tenant occupancy
 25 requiring a full fire rated wall from floor to

1 ceiling served by a fire rated corridor to the two
2 exit doors, unless the room travel distance would
3 dictate one exit was sufficient. The existing
4 collocation space is built to this standard. Fire
5 rated construction is very difficult to construct
6 inside an equipment area.

7

8 Q. WHY IS THE CONSTRUCTION SO DIFFICULT?

9

10 A. The construction is difficult for the same reasons I
11 discussed earlier in my testimony.

12

13 **COMMENTS ON THE PUBLIC SERVICE COMMISSION STAFF AUDIT**

14

15 Q. THE PSC STAFF AUDITORS COMPLETED A REVIEW OF THE
16 FOLLOWING BELLSOUTH CENTRAL OFFICES: NORTH DADE
17 GOLDEN GLADES, WEST PALM BEACH GARDENS, LAKE MARY,
18 DAYTONA BEACH PORT ORANGE, BOCA RATON BOCA TEECA, AND
19 MIAMI PALMETTO. DOES BELLSOUTH HAVE ANY COMMENTS
20 CONCERNING THE RESULTS OF THESE AUDIT REPORTS?

21

22 A. Yes. I will give my opinion of those findings on a
23 building-by-building basis at this time.

24

25 **NORTH DADE GOLDEN GLADES**

1 Exhibit JDB-14 has pictures of each area from the
2 Staff Audit. Exhibit JDB-20 is a building sketch
3 depicting the audit area locations for reference. The
4 first two pictures show the outside of the building
5 and starting point of the walkthrough. The next photo
6 shows the main entry lobby. The Audit Report areas
7 are discussed in the same order as the report. The
8 last pictures depict typical cable rack congestion
9 and work stations used by BellSouth personnel.

10

11 **Area 1** - Page 4 depicts the STP maintenance center.
12 The Audit Staff says the space should be relocated.
13 BellSouth disagrees with the findings. Mr. Milner
14 will discuss BellSouth's policy on the relocation of
15 furniture and equipment to implement physical
16 collocation. The basic space problem is that
17 BellSouth would have to move these rooms somewhere
18 else in the facility. The Audit Staff recommends that
19 the functions of Area 1 relocate to Area 11. Area 11
20 is used for Tandem, TOPS, and STP growth. It is
21 already identified as too small for physical
22 collocation and we agree. In addition, establishing a
23 maintenance workstation in Area 11 would block the
24 building fire aisles traversing the building.

25

1 **Area 2:** Page 5 depicts the manager's very small
2 private office on the first floor. The Audit Staff
3 recommends the manager's office relocate to Area 7 on
4 the far corner of the second floor. BellSouth
5 disagrees with the findings. Mr. Milner will discuss
6 BellSouth's policy for relocation of furniture and
7 equipment to implement physical collocation. The
8 building problem is that moving the office to Area 7,
9 or any other space, sets off a multiple-move chain
10 reaction similar to musical chairs where one of
11 BellSouth's legitimate usages ends up without a home.

12

13 **Area 7:** Page 6 depicts the centralized computer based
14 training room. The Audit Staff eliminates this space.
15 BellSouth disagrees with the finding. Mr. Milner will
16 discuss BellSouth's policy for relocation of
17 furniture and equipment necessary to implement
18 physical collocation. The space problem is that the
19 staff does not recommend where the computer-based
20 training should be relocated. Significant equipment
21 activity in this critical building makes this the
22 logical training building. The training is intensive
23 and self-paced.

24

25

1 A quiet area is a necessity for this intensive
2 training. This training is necessary to maintain a
3 proficient work force able to master ever-changing
4 technology. A central office is not quiet. Telephones
5 ring for multiple lines, while printers and fax
6 machines run. There is loud background level noise of
7 fans, air conditioning, and alarms of sundry volume,
8 duration and pitch. In addition, other work teams
9 call to each other while running cable, installing
10 racking, and cleaning up debris. Loudspeakers blare
11 requests for test assistance and wiring information
12 for customer service needs. This is all very
13 distracting. Sending the technician out of the
14 building for training does not allow him/her to be
15 available in case of service emergency to help fix a
16 critical problem.

17

18 **Areas 3, 4 and 5:** Pages 7-12 depict the new plug-in
19 storage area, the office exit hall, and the office
20 store room. The Audit Staff recommends taking all of
21 Area 3 and Area 5 and redesigning part of Area 4.
22 BellSouth disagrees with the finding. BellSouth is
23 using Area 3 to start correcting a significant
24 violation of municipal codes and our own design
25 standards requiring fire rated storage for plug-ins

1 and other items. This effort is ongoing, as seen in
2 the exhibits. Area 5 will be utilized for this
3 storage as well. The amount of plug-in space
4 necessary is derived as follows.

5
6 Proper plug-in inventory levels vary from central
7 office to central office. The correct inventory level
8 is stated in dollars as a percent (%) of the total
9 equipment inventory in dollars for the central
10 office. In 1998 inventory levels were set at \$4
11 dollars in spares for every \$100 of investment. The
12 1999 target level is \$2 of spares for each \$100 of
13 investment. The total number of spares is rising at
14 North Dade Golden Glades, even as the percent (%) of
15 investment shrinks. Constant growth and new
16 technology going into service at this location
17 constantly raises the inventory value. The number of
18 plug-ins required to support the new technology rises
19 as does the space required to house them. Area 4 is
20 unusable space. It is the required fire exit path for
21 the central office. It is used now for container
22 storage and air grilles necessary to support the
23 building air conditioning. Area 5 is the current
24 storage room. BellSouth is clearing out this area to

25

1 serve the growing plug-in inventory as described in
2 Area 3 above.

3

4 **Areas 6, 8, 9, 10 and 11:** Pages 13-20 depict the
5 workstations, maintenance centers, switch growth
6 areas, power room and Tandem/STP growth areas. The
7 Audit Staff finds these areas not appropriate for
8 physical collocation. BellSouth agrees with the audit
9 findings.

10

11 **Pictures 21 and 22** are included as separate
12 illustrations of cable congestion and work stations
13 used by BellSouth personnel.

14

15 **WEST PALM BEACH GARDENS**

16

17 Exhibit JDB-15 has pictures of each area from the
18 Staff Audit. Exhibit JDB-21 is a building sketch
19 depicting the audit area locations for reference. The
20 first two pictures show the outside of the building
21 and starting point of the walkthrough. The Audit
22 Report areas are then discussed in the same order as
23 the audit. The last three pictures are typical cable
24 congestion patterns in this area.

25

1 Areas 10, 10a, 11 and 2: Pages 4-8 depict the part of
2 the shipping and receiving room, an adjacent
3 maintenance area, and the equipment staging area. The
4 Staff Auditors suggest using these spaces for
5 physical collocation. BellSouth disagrees with the
6 audit findings. Mr. Milner will discuss BellSouth's
7 policy for relocation of furniture and equipment
8 necessary to implement physical collocation. The
9 space problem is that using Area 10 and/or Area 10a
10 renders the rest of the receiving room unusable,
11 except for a very narrow storage area. The reason is
12 that part of this room would be required for a new
13 exit aisle. The existing exit arrangement through
14 this room is grandfathered under existing codes. Any
15 construction permit for physical collocation in this
16 room would require a new exit hall for the BellSouth
17 building area. If the Commission orders the entire
18 room be used for physical collocation, BellSouth must
19 construct a whole new exit and equipment delivery
20 area. The most likely space for the new exit would be
21 Area 11, making it unusable for physical collocation.
22 However, Area 11 is a working maintenance area,
23 meaning that BellSouth would have to relocate that
24 workstation to another location. If Areas 10, 10a
25 and 11 are utilized for physical collocation,

1 BellSouth will lose the remaining adjacent
2 maintenance center for the new exit and equipment
3 delivery area. This would severely inhibit
4 BellSouth's ability to maintain service to its
5 customers.

6
7 Area 2 is simply too narrow for any use other than a
8 BellSouth equipment area. The area is not wide enough
9 to support the fire rated enclosure necessary for
10 either a physical collocater or an equipment
11 uncrating and storage area.

12
13 **Area 12:** Page 9 depicts the TOPS growth area. The
14 Staff Auditors do not make a specific recommendation.
15 BellSouth does not think the area is appropriate for
16 physical collocation. This is the only growth space
17 available for the Operator Services switch handling
18 all BellSouth and ALEC contracted operator assisted
19 calls in the South East Florida LATA. Using its
20 growth space restricts BellSouth's long term ability
21 to provide service for all Florida customers (both
22 BellSouth's customers and the ALEC's customers).

23
24 **Area 1:** Pages 10-14 depict the STP/SCP maintenance
25 centers and scattered individual blank bay spaces.

1 The Audit Staff suggests these spaces are not
2 appropriate for physical collocation. BellSouth
3 agrees with the audit findings.
4

5 **Area 3, 4, 5, 8, 9:** Pages 15-22 depict future switch,
6 future Digital Switch, Digital Signal cross connect
7 frames, future toll, and future Signal Transfer Point
8 (STP) - Customer Switched Network areas. The Audit
9 Staff suggest these spaces are not appropriate for
10 physical collocation. BellSouth agrees with the audit
11 findings.
12

13 **Area 6 and 7:** Pictures 23-24 depict the future power
14 area. The Staff Auditors suggest the space is
15 inappropriate for physical collocation. BellSouth
16 agrees with the audit findings.
17

18 **Pictures 25-27** depict typical cable rack congestion
19 in the central office near the main frame and power
20 areas.
21

22 **LAKE MARY**
23
24
25

1 Mr. Milner's testimony addresses BellSouth's policy
2 on the relocation of furniture and equipment to
3 implement physical collocation.

4
5 Exhibit JDB-16 has pictures of each area from the
6 staff audit. Exhibit JDB-22 is a building sketch
7 depicting the audit area locations for reference. The
8 first two pictures show the outside of the building
9 and starting point of the walkthrough. The last
10 picture depicts the cable congestion in the office.

11
12 **Area 1:** Pictures 3-4 depict the vendor work space.
13 The Staff Auditors recommend the space is
14 inappropriate for physical collocation. BellSouth
15 agrees with the audit findings.

16
17 **Area 2:** Picture 5 depicts the switch growth area.
18 The Staff Auditors recommend the space is
19 inappropriate for physical collocation. BellSouth
20 agrees with the audit findings.

21
22 **Area 3:** Picture 6 depicts the toll growth/temporary
23 break area. The Staff Auditors recommend the space is
24 inappropriate for physical collocation. BellSouth
25 agrees with the audit findings.

1 **Picture 7** depicts the cable rack congestion in the
2 Digital Signal cross connect area and the main frame.

3

4 **DAYTONA BEACH PORT ORANGE**

5

6 Exhibit JDB-17 has pictures of each area from the
7 Staff Audit. Exhibit JDB-23 is a building sketch
8 depicting the audit area locations for reference. The
9 first two pictures show the outside of the building
10 and starting point of the walkthrough. The last three
11 pictures depict cable rack congestion and an example
12 of an equipment family.

13

14 **Areas 2, 3, 4, and 11:** Pictures 3-7 depict the power
15 room spaces. The Staff Auditors recommend the space
16 is inappropriate for physical collocation. BellSouth
17 agrees with the audit findings. Furthermore,
18 BellSouth would argue that the power room space is
19 for the ultimate building size design for all
20 equipment requirements, including those for the
21 ALECs. Using this space would drastically reduce the
22 life of the plant and its capacity to serve all
23 customers.

24

25

1 **Area 7,8:** Pictures 8-9 depict the very small break
2 room and the outside of Area 8. There is no roof,
3 finished floor or outside access in Area 8. The
4 Staff Auditors recommend these areas be considered
5 for physical collocation. BellSouth disagrees that
6 Area 7 and Area 8 can be combined for a small
7 physical collocation area. Area 7 is the only
8 BellSouth employee break room area in Port Orange for
9 use by BellSouth personnel, both assigned to the
10 building and the outside area. Area 8 is an unroofed
11 part of the building previously used as an engine
12 exhaust. Significant expense would be required to
13 construct a roof and finish the inside for equipment
14 space. The area is too small to be marginally able to
15 handle equipment with code required aisles.

16
17 **Area 5,6,12:** Pictures 10-16 depict the future switch,
18 future toll, and the maintenance center. The Staff
19 Auditors suggest the space is appropriate for
20 physical collocation. BellSouth disagrees with the
21 audit findings. Mr. Milner will discuss BellSouth's
22 policy on relocations necessary for implementing
23 physical collocation. The basic building problems are
24 shown in the exhibits. There are significant ground
25 plane separations, difficulty in constructing fire

1 rated enclosures, and residual fire aisles included
2 in these areas. Significant effort and construction
3 will be required to put together this space.
4

5 **Area 9:** Pictures 17-18 depicts the manager's
6 temporary office. The Staff Auditors recommend the
7 space is inappropriate for physical collocation.
8 BellSouth agrees with the audit findings.
9

10 **Area 1:** Pictures 19-23 depict the scattered empty
11 spaces in the central office. The Staff Auditors
12 recommend the spaces are inappropriate for physical
13 collocation. BellSouth agrees with the audit
14 findings.
15

16 **Area 10:** Picture 24 depicts the virtual collocation
17 and miscellaneous toll growth area. The Staff
18 Auditors recommend the space is inappropriate for
19 physical collocation. BellSouth agrees with the audit
20 findings.
21

22 **Pictures 25-27** depict cable rack congestion and some
23 families of equipment.
24

25 **BOCA RATON BOCA TEECA**

1 Exhibit JDB-18 has pictures of each area from the
2 Staff Audit. Exhibit JDB-24 is a building sketch
3 depicting the audit area locations for reference. The
4 first two pictures show the outside of the building
5 and starting point of the walkthrough.
6
7 **Areas 3,4 and 5:** Pictures 3-9 depict the shipping and
8 receiving room, future switch growth area, and
9 maintenance areas. The Staff Auditors recommend the
10 areas are not appropriate for physical collocation.
11 BellSouth agrees with the findings.
12
13 **Pictures 10-12** depict the cable rack congestion near
14 Area 5 in the toll area and near the main frame.
15
16 **Area 1 and 2:** Pictures 13-18 depict the second floor
17 management offices, training, storage, and map rooms
18 used by BellSouth engineering forces. Pictures 18-25
19 tour the large area's open office space design. The
20 Staff Auditors recommend the spaces are appropriate
21 for physical collocation. The finding is based in
22 part on an office space capacity calculation.
23 BellSouth disagrees with the audit findings of
24 administrative space capacity and the appropriateness
25 of the space for physical collocation. Mr. Milner

1 will discuss BellSouth's policy on relocations
2 necessary to implement physical collocation.
3 BellSouth administrative personnel occupy this entire
4 floor. Contrary to the Staff Audit Report assertion,
5 floor space capacity is not just a measurement of the
6 cubicle area. Square footage per cubicle must include
7 one-half ($\frac{1}{2}$) the code required access aisle; a
8 prorated allocation for the fire rated hallways; and
9 allocations for support space like copy, storage, and
10 file rooms. In a central office, there is one further
11 consideration. Please notice in the exhibits, the
12 large columns supporting the roof. These columns are
13 in a pattern measuring 20 feet by 20 feet in each
14 direction.

15
16 These columns occupy floor space, blocking aisles,
17 widening corridors, eliminating entire cubicles for
18 use by people, thus enlarging the total space
19 allocation for each person. The following calculation
20 of administrative capacity for the second floor is
21 more accurate.

22

23 **Aisle calculation:**

24

25 A Standard cubicle is 100 square feet.

1 A 100 square foot cubicle plus 20 feet (10' cubicle
2 length X 2') for aisle (if on one side) = 120 square
3 feet.

4

5 Cubicles with aisles on two sides are 140 square
6 feet.

7

8 **Support space calculation:**

9

10 The 120 square foot cubicle allocation increased by
11 30% for support space (file, conference, storage
12 areas, exit aisles, etc.) = 156 square feet

13

14 **Column effect:**

15

16 The 156 square feet is expanded for columns
17 (increased by 25% to cover the column structure)
18 = 195 square feet.

19

20 The actual space capacity for the second floor is
21 12,946 square feet divided by 195 square feet per
22 employee = 66 total employees.

23

24

25

1 Currently, BellSouth plans to have 59 people on site
2 by 2001. Continuing that rate of growth means the
3 space will exhaust in 2002.

4

5 **MIAMI PALMETTO**

6

7 Exhibit JDB-19 has pictures of each area from the
8 Staff Audit. Exhibit JDB-25 is a building sketch
9 depicting the audit area locations for reference. The
10 first two pictures show the outside of the building
11 and starting point of the walkthrough.

12

13 **Areas 1, 2, 3, 4 and 10:** Pictures 3-14 depict the
14 scattered empty bays, cable rack congestion areas,
15 future Digital Signal cross connect area, part of the
16 current plug-in storage area, and a large exit
17 hallway. The Staff Auditors recommend that the space
18 is not appropriate for physical collocation.
19 BellSouth agrees with the audit findings.

20

21 **Areas 5 and 6:** Pictures 15-19 depict the joint-use
22 manager office/conference/training room and the
23 maintenance center. The Staff Auditors recommend
24 these areas are appropriate for physical collocation.
25 BellSouth does not agree with the audit findings.

1 Area 5 is the manager's private office. It is used
2 for personnel management and facility planning
3 functions. It is required for the following reasons:
4 (1) There is a large work group assigned to this
5 location; (2) It is difficult to conduct proper
6 interview and performance counseling without privacy;
7 and (3) This area also doubles as a training,
8 conference, and meeting area. This space is required
9 on an ongoing basis for dissemination of information
10 necessary to maintain service. The Staff Audit
11 Report states the manager uses additional space.
12 However, this other space is a desk in the middle of
13 a work area in a future equipment space. This desk
14 will be removed when equipment growth dictates. From
15 a facility planning perspective, Area 5 is the fall-
16 back position for either the air handling unit growth
17 in this office or, in conjunction with Area 6, switch
18 growth. The Staff Auditors recognize this need for
19 air handling relief space. Area 6 is the existing
20 maintenance center. This area would be consolidated
21 at some time to provide switch growth. Switch growth
22 is occurring in Area 9 right now. This area is at the
23 ground buss limits of the existing power plant. This
24 buss limit deals with the power plant ground wires.
25 The ground wires cannot exceed a certain distance, as

1 discussed in the Switch Capacity Panel testimony.
2 This means the switch cannot grow any further south.
3 Any switch growth must then come back to the front of
4 the building. Area 5 and Area 6 are immediately
5 adjacent to the existing switch and provide the last
6 resort for growth.

7
8 **Areas 7, 8 and 9:** Pictures 20-25 depict the Titan
9 5500 growth, Titan 5500 initial installation, an area
10 for use for switching equipment, if ground buss
11 limits are not exceeded, or Titan/Toll growth. The
12 Staff Auditors recommend the space is not appropriate
13 for physical collocation. BellSouth agrees with the
14 audit findings.

15
16 **Area 11:** Picture 26 depicts the shipping and
17 receiving room. The Staff Auditors recommend part of
18 this room is appropriate for physical collocation.
19 BellSouth disagrees with the audit findings. Mr.
20 Milner will discuss BellSouth's policy for
21 relocations necessary to implement physical
22 collocation.

23
24 The building problems with this area are similar to
25 those discussed at other locations. The exit path

1 for physical collocators and BellSouth traverse this
2 area. The code officials should have called for a
3 rated hallway from the existing BellSouth door and
4 the physical collocator door, but did not. BellSouth
5 believes this oversight must be corrected if any
6 further work is done in this area OR if the
7 storage/uncrating area is relocated to Area 10. Fire
8 rated construction in Area 10 was discussed earlier.
9 The Staff Auditors recommended that Area 10 is not
10 appropriate for physical collocation. BellSouth
11 maintains that the fire rated construction for a
12 shipping and receiving area suggested in Area 11
13 would be just as intrusive as a physical collocation
14 area. This work would cause a major shift in exit
15 corridors, loss of documented equipment growth area,
16 and air conditioning redesign in the existing
17 equipment areas.

18
19 **Area 12 and 13:** Pictures 27-30 depict the small areas
20 for circuit equipment families and work stations. The
21 Staff Auditors found the areas inappropriate for
22 physical collocation. BellSouth agrees with the
23 findings.

1 **Areas 14, 15, 16, 17 and 18:** Pictures 31-34 depict
2 the existing physical collocation areas. Please note
3 the fire rated construction required by Miami Code
4 officials buttressing BellSouth's assertions
5 concerning these codes.

6
7 **Pictures 35-40** depict a back view of the cabling
8 necessary to wire a Digital Signal cross connect
9 frame family and typical cable rack congestion in
10 this office.

11
12 **Adjacent Buildings:** The adjacent buildings are a
13 Service Operations Center and old Coin Center. These
14 buildings contain **NO** Network Facilities.

15
16 **ISSUE 4: IF SPACE IS CONSIDERED AVAILABLE IN ANY OF**
17 **THESE CENTRAL OFFICES, IS THE SPACE SUFFICIENT FOR**
18 **PHYSICAL COLLOCATION?**

19
20 Q. IF THE COMMISSION DETERMINES THAT SPACE IS AVAILABLE
21 IN ANY OF THE SIX CENTRAL OFFICES UNDER DISCUSSION IN
22 THESE PROCEEDINGS, WOULD THERE BE SUFFICIENT SPACE
23 FOR PHYSICAL COLLOCATION IN THE NORTH DADE GOLDEN
24 GLADES, WEST PALM BEACH GARDENS, LAKE MARY, DAYTONA

25

1 BEACH PORT ORANGE, BOCA RATON BOCA TEECA, OR MIAMI
2 PALMETTO CENTRAL OFFICE?

3

4 A. No. For the reasons previously discussed in my
5 testimony, there would not be sufficient space for
6 physical collocation in any of the six central
7 offices in these proceedings.

8

9 Q. DOES THIS CONCLUDE YOUR TESTIMONY?

10

11 A. Yes, it does.

12

13

14

15

16

17

18

19

20

21

22

23

24

25

SPACE ASSESSMENT WORK SHEET

[EVALUATION OF CENTRAL OFFICE SPACE AVAILABLE FOR PHYSICAL COLLOCATION]

CENTRAL OFFICE CLLI: _____

ADDRESS: _____

A. TOTAL GROSS SQ. FT. A.

SQ. FT.

B. UNAVAILABLE SPACE*:

_____ B.

--

* 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) _____

Transmission Equipment _____

Other (Specify) FRAME _____

POWER _____
ADMINISTRATIVE _____

TOTAL ASSIGNED - OCCUPIED SPACE C.

0

SPACE ASSESSMENT WORK SHE

D. RESERVED SPACE

Switching Equipment Growth through Year of _____

For: _____

Transmission Equipment Growth through year of _____

For: _____

Turnaround Space for replacement of _____: Year: _____

(Switch Type)

Other (Virtual Collacation) _____: Year: _____

(Switch Type)

Power _____: Year: _____

(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.

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.

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

F.

SPACE ASSESSMENT WORK SHE

G. FUTURE AVAILABLE SPACE

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:

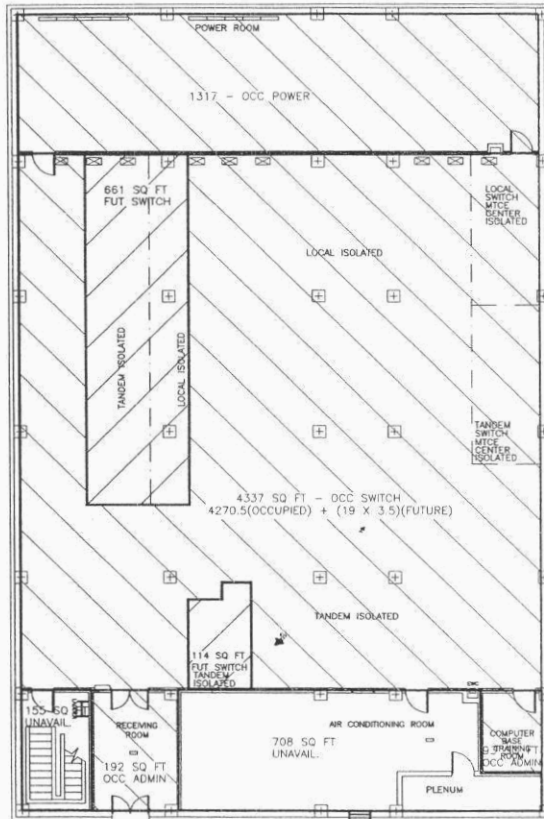
(PRINT NAME AND TITLE)

TEL. NO. _____

AUTHORIZED BY:

(Paygrade 59 or above)

TEL. NO. _____

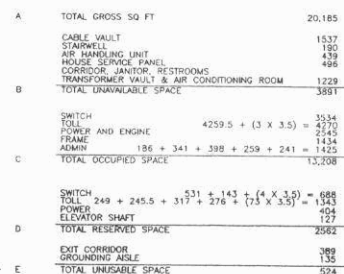


A	TOTAL GROSS SQ FT	7577
B	STAIRWELL AIR CONDITIONING ROOM AND PLENUM TOTAL UNAVAILABLE SPACE	155 708 863
C	SWITCH POWER ADMIN TOTAL OCCUPIED SPACE	4270.5 1317 192 + 93 = 285 5872.5
D	SWITCH TOTAL RESERVED SPACE	661 + 114 + (19 X 3.5) = 841.5 841.5



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

M6506 NORTH DADE GOLDEN GLADES SECOND FLOOR PLAN



M6506 NORTH DADE GOLDEN GLADES FIRST FLOOR PLAN

SPACE ASSESSMENT WORK SHE

[EVALUATION OF CENTRAL OFFICE SPACE AVAILABLE FOR PHYSICAL COLLOCATION]

CENTRAL OFFICE CLLI: _____NDADFLGG

ADDRESS: _____18400 NE 5TH AVE, MIAMI, FL 33162

A.	TOTAL GROSS SQ. FT.	A.	<div style="border: 1px solid black; padding: 2px;">SQ. FT.</div> <div style="border: 1px solid black; padding: 2px;">27,762</div>
B.	UNAVAILABLE SPACE*: _____1st FL - stairwell, air handling unit, house service panel, _____corridor, janitor, restrooms, transformer vault, _____air conditioning room and cable vault - 3891 _____2nd FL - stairs, air conditioning rm & plenum - 863	B.	<div style="border: 1px solid black; padding: 2px;">4754</div>
<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, & 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) _____1st fl - 3534, 2nd fl - 4270.5 _____ Transmission Equipment _____ _____1st floor Other (Specify) FRAME _____ POWER _____1st fl - 2545, 2nd fl - 1317 ADMINISTRATIVE _____1st - 1425, 2nd - 285		<div style="border: 1px solid black; padding: 2px;">7804.5</div> <div style="border: 1px solid black; padding: 2px;">4270</div> <div style="border: 1px solid black; padding: 2px;">1434</div> <div style="border: 1px solid black; padding: 2px;">3862</div> <div style="border: 1px solid black; padding: 2px;">1710</div>
	TOTAL ASSIGNED - OCCUPIED SPACE	C.	<div style="border: 1px solid black; padding: 2px;">19,080.50</div>

SPACE ASSESSMENT WORK SHEET

D. RESERVED SPACE

Switching Equipment Growth through Year of _____ 1529.5

For: _____ 1st fl - 688, 2nd fl - 841.5

Transmission Equipment Growth through year of _____ 1343

For: _____

Turnaround Space for replacement of _____: Year: _____

(Switch Type)

Other (Future Elevator Shaft) 127

(Switch Type)

Power _____: Year: _____ 404

(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. 3403.5

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:

Space too narrow for equipment and required for exit aisle
 Grounding Aisle

 389
 135

TOTAL VACANT SPACE/NOT USABLE E. 524

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

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

SPACE ASSESSMENT WORK SHEET

[EVALUATION OF CENTRAL OFFICE SPACE AVAILABLE FOR PHYSICAL COLLOCATION]

CENTRAL OFFICE CLLI: _____WPBHFLGR

ADDRESS: _____3700 RCA BLVD, WEST PALM BEACH, FL 33410

A.	TOTAL GROSS SQ. FT.	A.	<table border="1"><tr><td>SQ. FT.</td></tr><tr><td>20314</td></tr></table>	SQ. FT.	20314
SQ. FT.					
20314					

B. UNAVAILABLE SPACE*:

_____Air conditioning rooms, house service panel, lobby,
_____janitor and restrooms

B.	<table border="1"><tr><td>2264</td></tr></table>	2264
2264		

* 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) _____

7333

Transmission Equipment _____

3927

Other (Specify) FRAME _____

1406

POWER _____

2096

ADMINISTRATIVE _____

644

TOTAL ASSIGNED - OCCUPIED SPACE

C.	<table border="1"><tr><td>15406</td></tr></table>	15406
15406		

SPACE ASSESSMENT WORK SHE

D. RESERVED SPACE

Switching Equipment Growth through Year of _____ 1619

For: _____

Transmission Equipment Growth through year of _____ 687

For: _____

Turnaround Space for replacement of _____: Year: _____

(Switch Type)

Other _____: Year: _____

(Switch Type)

Power _____: Year: _____ 338

(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. 2644

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

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:

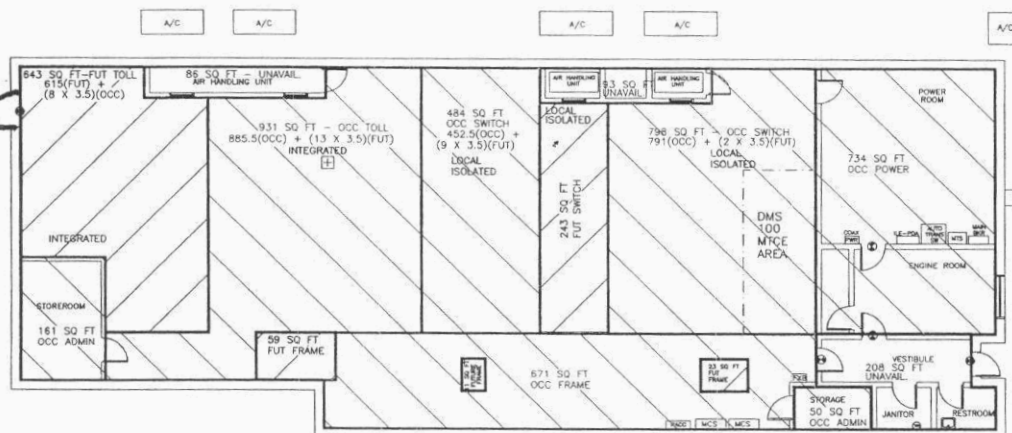
_____ Jenine Williams
(PRINT NAME AND TITLE)

TEL. NO. (904) 350-4217

AUTHORIZED BY:

_____ Jim D. Bloomer
(Paygrade 59 or above)

TEL. NO. (904) 350-3428



39280 LAKE MARY FIRST FLOOR PLAN

A	TOTAL GROSS SQ FT	5195
	AIR HANDLING UNIT	86
	AIR HANDLING UNITS	93
B	VESTIBULE, JANITOR & RESTROOMS	208
	TOTAL UNAVAILABLE SPACE	387
	SWITCH	452.5 + 791 = 1243.5
	TOLL	885.5 + (8 X 3.5) = 913.5
	FRAME	671
	POWER & ENGINE	734
	ADMIN	161 + 50 = 211
C	TOTAL OCCUPIED SPACE	3773
	SWITCH	243 + (11 X 3.5) = 281.5
	TOLL	615 + (13 X 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

SPACE ASSESSMENT WORK SHE

[EVALUATION OF CENTRAL OFFICE SPACE AVAILABLE FOR PHYSICAL COLLOCATION]

CENTRAL OFFICE CLLI: _____ LKMYFLMA

ADDRESS: _____ 365 INTERNATIONAL DRIVE, LAKE MARY, FL 32746

A. TOTAL GROSS SQ. FT.	A. <table border="1" style="display: inline-table;"><tr><td style="text-align: center;">SQ. FT. 5195</td></tr></table>	SQ. FT. 5195
SQ. FT. 5195		

B. UNAVAILABLE SPACE*:

_____ Air handling units, vestibule, janitor and restrooms

B.

387

* 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) _____	<table border="1" style="display: inline-table;"><tr><td style="text-align: center;">1243.5</td></tr></table>	1243.5
1243.5		

Transmission Equipment _____	<table border="1" style="display: inline-table;"><tr><td style="text-align: center;">913.5</td></tr></table>	913.5
913.5		

Other (Specify) FRAME _____	<table border="1" style="display: inline-table;"><tr><td style="text-align: center;">671</td></tr></table>	671
671		
POWER _____	<table border="1" style="display: inline-table;"><tr><td style="text-align: center;">734</td></tr></table>	734
734		
ADMINISTRATIVE _____	<table border="1" style="display: inline-table;"><tr><td style="text-align: center;">211</td></tr></table>	211
211		

TOTAL ASSIGNED - OCCUPIED SPACE	C. <table border="1" style="display: inline-table;"><tr><td style="text-align: center;">3773</td></tr></table>	3773
3773		

SPACE ASSESSMENT WORK SHEET

G. FUTURE AVAILABLE SPACE

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:

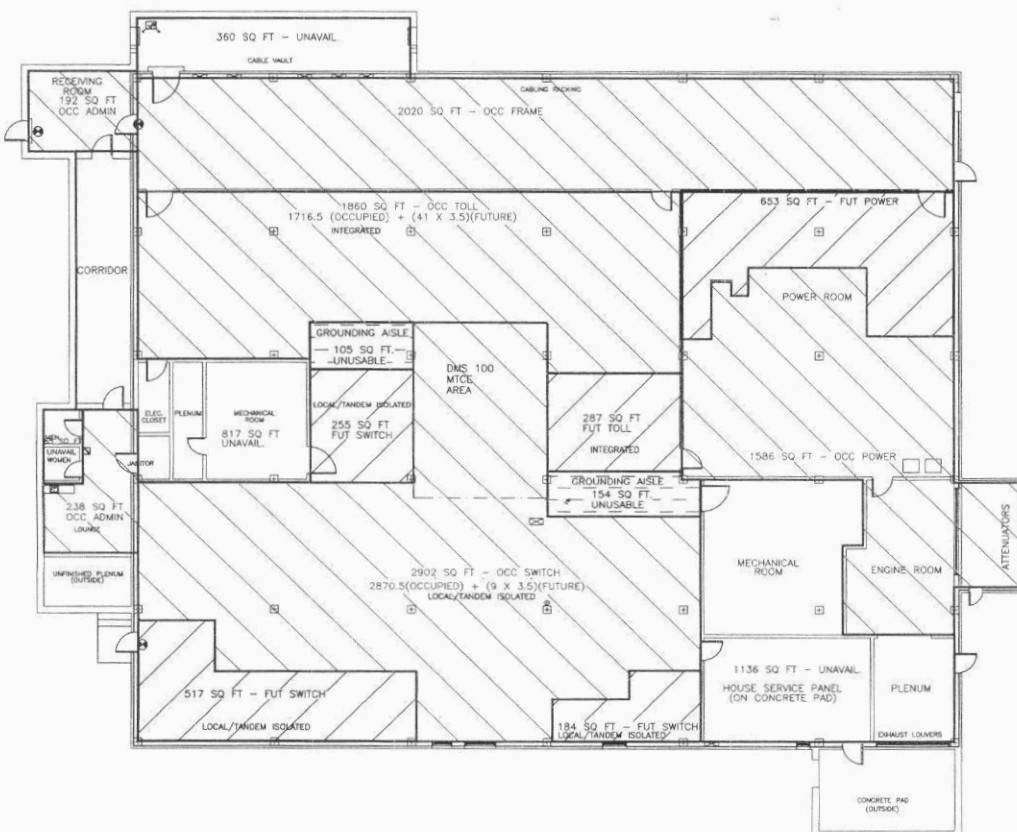
_____ Jenine Williams/North FL CAD Librarian
(PRINT NAME AND TITLE)

TEL. NO. (904) 350-4217

AUTHORIZED BY:

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

TEL. NO. (904) 350-3428



A	TOTAL GROSS SQ FT	13,331	
	CABLE VAULT	360	
	RESTROOMS	65	
	JAN, ELEC CLOSET, MECH RM, PLENUM & CORRIDOR	817	
	HOUSE SERVICE PANEL, MECH RM & PLENUM	1136	
B	TOTAL UNAVAILABLE SPACE	2378	
	SWITCH	2870.5	
	TOLL	1716.5	
	FRAME	2020	
	POWER AND ENGINE	1586	
	ADMINISTRATIVE	238 + 192 = 430	
C	TOTAL OCCUPIED SPACE	8623	
	SWITCH	184 + 517 + 255 + (9 X 3.5) = 987.5	
	TOLL	287 + (41 X 3.5) = 430.5	
	POWER	653	
D	TOTAL RESERVED SPACE	2071	
E	TOTAL UNUSABLE SPACE	105 + 154 = 259	

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

33850 DAYTONA BEACH - PORT ORANGE FIRST FLOOR PLAN

SPACE ASSESSMENT WORK SHEET

[EVALUATION OF CENTRAL OFFICE SPACE AVAILABLE FOR PHYSICAL COLLOCATION]

CENTRAL OFFICE CLLI: _____DYBHFLPO

ADDRESS: _____829 ORANGE AVE, DAYTONA BEACH, FL 32117

A. TOTAL GROSS SQ. FT.	A. <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">SQ. FT.</td></tr><tr><td style="text-align: center;">13,331</td></tr></table>	SQ. FT.	13,331
SQ. FT.			
13,331			
B. UNAVAILABLE SPACE*:			
_____Cable vault, restrooms, janitor, electrical closet,			
_____mechanical rooms, house service panel & plenums			

_____	B. <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">2378</td></tr></table>	2378	
2378			
<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, & 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) _____	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">2870.5</td></tr></table>	2870.5	
2870.5			

Transmission Equipment _____	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">1716.5</td></tr></table>	1716.5	
1716.5			

Other (Specify) FRAME _____	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">2020</td></tr></table>	2020	
2020			
POWER AND ENGINE _____	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">1586</td></tr></table>	1586	
1586			
ADMINISTRATIVE _____	<table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">430</td></tr></table>	430	
430			
TOTAL ASSIGNED - OCCUPIED SPACE	C. <table border="1" style="display: inline-table; vertical-align: middle;"><tr><td style="text-align: center;">8623</td></tr></table>	8623	
8623			

SPACE ASSESSMENT WORK SHEET

G. FUTURE AVAILABLE SPACE

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:

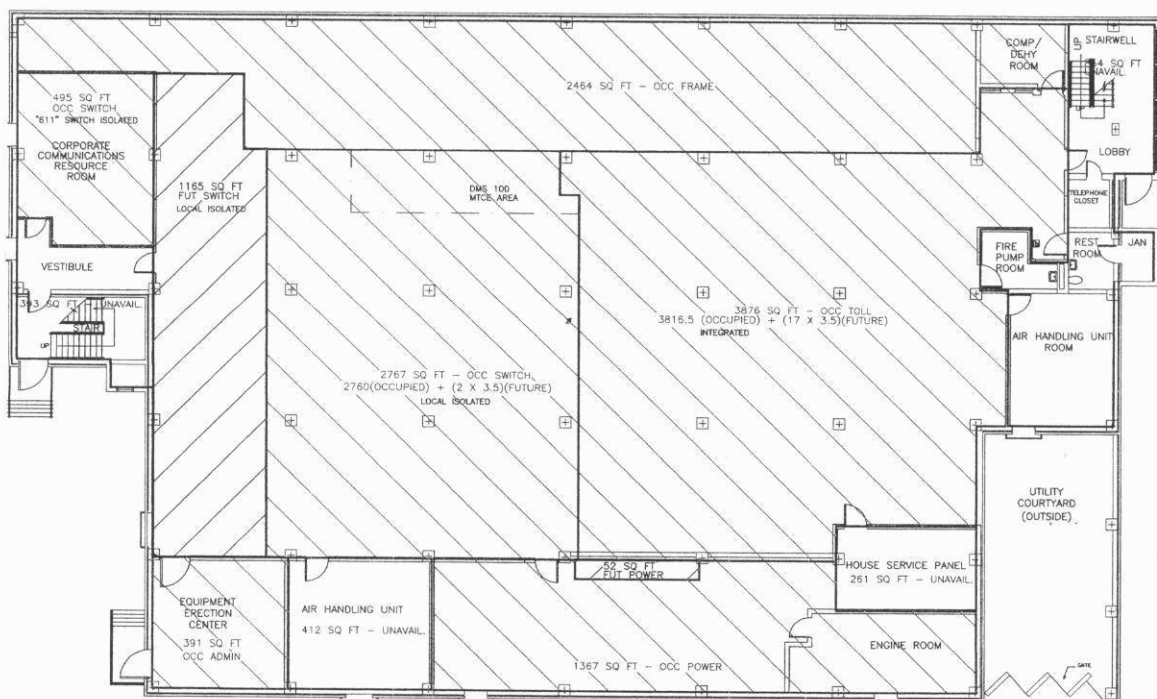
_____ Jenine Williams/North Florida CAD Librarian
(PRINT NAME AND TITLE)

TEL. NO. _(904) 350-4217

AUTHORIZED BY:

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

TEL. NO. _(904) 350-3428



A	TOTAL GROSS SQ FT	14,497	
	STAIRWELL	393	
	AIR HANDLING UNIT	412	
	HOUSE SERVICE PANEL	261	
	STAIRWELL, LOBBY, JANITOR		
	TELEPHONE CLOSET, RESTROOM & FIRE PUMP ROOM	854	
B	TOTAL UNAVAILABLE SPACE	1920	
	SWITCH	2760 + 495 = 3255	
	TOLL	3876	
	FRAME	2464	
	POWER AND ENGINE	1367	
	ADMIN	391	
C	TOTAL OCCUPIED SPACE	11,293.5	
	SWITCH	1155 + (2 X 3.5) = 1172	
	TOLL	17 X 3.5 = 59.5	
	POWER	52	
D	TOTAL RESERVED SPACE	1283.5	

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

E8181 BOCA RATON - BOCA TEECA FIRST FLOOR PLAN

SPACE ASSESSMENT WORK SHEET

[EVALUATION OF CENTRAL OFFICE SPACE AVAILABLE FOR PHYSICAL COLLOCATION]

CENTRAL OFFICE CLLI: _____ BCRTFLBT

ADDRESS: _____ 5140 CONGRESS AVE, BOCA RATON, FL 33487

A.	TOTAL GROSS SQ. FT.	A.	<div style="border: 1px solid black; padding: 2px;">SQ. FT. 29,069</div>
----	---------------------	----	--

B.	UNAVAILABLE SPACE*: _____ 1st FL: Stairwells, air handling unit, house service panel, lobby, _____ restroom, janitor, telephone closet & fire pump room - 1920 sq ft _____ 2nd FL: stairwells, electrical room, telephone room, _____ restrooms, janitor and air handling unit - 1626 sq ft	B.	<div style="border: 1px solid black; padding: 2px;">3546</div>
----	---	----	--

* 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) _____ local switch	<div style="border: 1px solid black; padding: 2px;">2760</div>
	_____ "611" switch	<div style="border: 1px solid black; padding: 2px;">495</div>

Transmission Equipment _____	<div style="border: 1px solid black; padding: 2px;"></div>
_____	<div style="border: 1px solid black; padding: 2px;">3816.5</div>

Other (Specify) FRAME _____	<div style="border: 1px solid black; padding: 2px;">2464</div>
POWER _____	<div style="border: 1px solid black; padding: 2px;">1367</div>
ADMINISTRATIVE _____ 1st FL 391 + 2nd FL 12946	<div style="border: 1px solid black; padding: 2px;">13337</div>

TOTAL ASSIGNED - OCCUPIED SPACE	C.	<div style="border: 1px solid black; padding: 2px;">24239.5</div>
---------------------------------	----	---

SPACE ASSESSMENT WORK SH

D. RESERVED SPACE

Switching Equipment Growth through Year of _____ 1172

For: _____

Transmission Equipment Growth through year of _____ 59.5

For: _____

Turnaround Space for replacement of _____: Year: _____

(Switch Type)

Other (Virtual Collocation) _____: Year: _____

(Switch Type)

Power _____: Year: _____ 52

(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. 1283.5

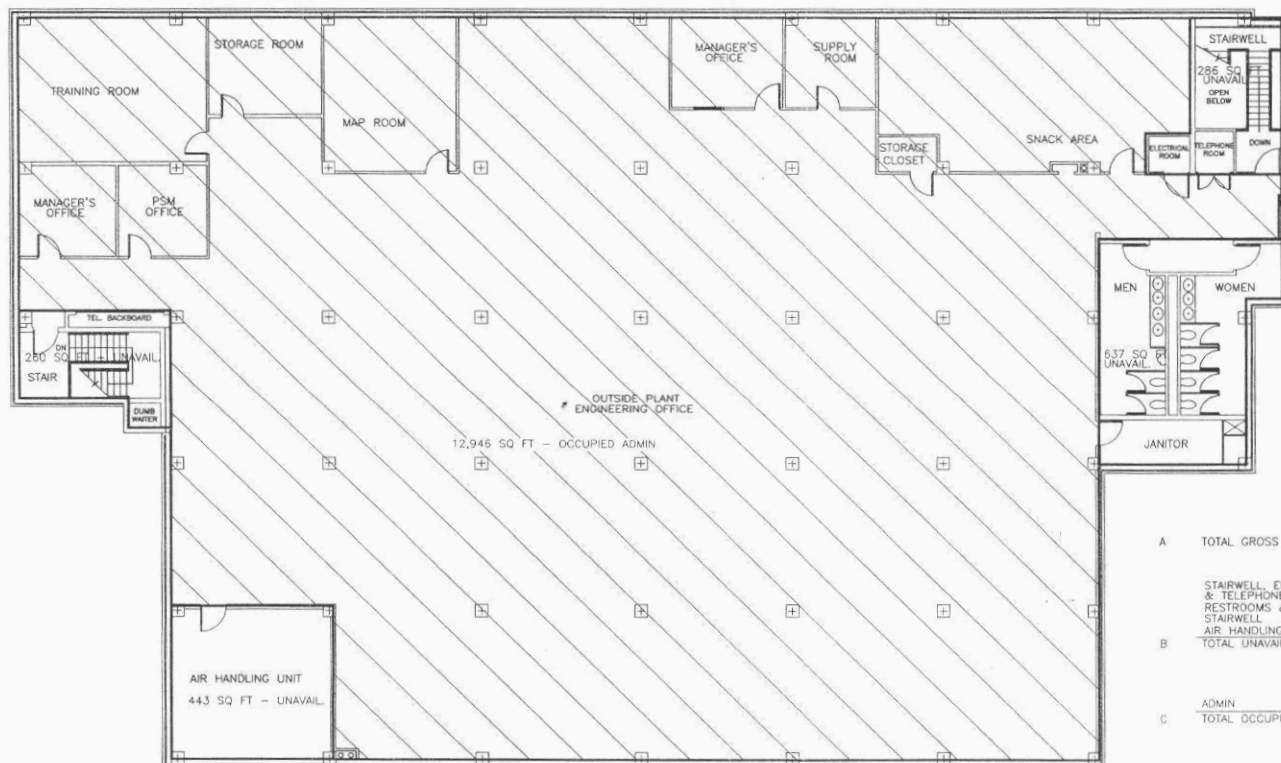
E. VACANT SPACE/NOT USABLE (I.e., flooding, no access to fire exits, configuration problems, space less than 100 sq. ft., building to be vacated)

** 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



A TOTAL GROSS SQ FT 14,572

STAIRWELL, ELECTRICAL ROOM
 & TELEPHONE ROOM 286
 RESTROOMS & JANITOR 637
 STAIRWELL 280
 AIR HANDLING UNIT 44.3
 B TOTAL UNAVAILABLE SPACE 1626

C ADMIN 12,946
 TOTAL OCCUPIED SPACE 12,946

ADMIN - ADMINISTRATIVE
 UNAVAIL - UNAVAILABLE
 [] - BUILDING COLUMN

E8181 BOCA RATON - BOCA TEECA SECOND FLOOR PLAN

SPACE ASSESSMENT WORK SHEET

G. FUTURE AVAILABLE SPACE

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



A	TOTAL GROSS SQ FT	24,598	
	AIR CONDITIONING ROOM AND VESTIBULE	448	
	AIR HANDLING UNIT, PLenum, RESTROOMS AND JANITOR	1190	
B	TOTAL UNFINISHED SPACE	1836	
	SWITCH	4308 + (18 X 3.5) = 4371	
	TOL	3210	
	FRAME	3210	
	POWER AND ENGINE	3210	
	ADAIN	316 + 273 + 413 + 360 = 1362	
	COLLOCATION	820 + 292 = 1112	
C	TOTAL OCCUPIED SPACE	18,760.5	
	SWITCH	1286 + (14 X 3.5) = 1317	
	TOL	646 + 265 + 457 + 248 = 1616	
	FRAME	402 + 167 X 3.5) = 985.5	
D	TOTAL RESERVED SPACE	3568.5	
E	AIR RETURN	133	
	GROUNDING AISLE	288	

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

SPACE ASSESSMENT WORK SHEET

[EVALUATION OF CENTRAL OFFICE SPACE AVAILABLE FOR PHYSICAL COLLOCATION]

CENTRAL OFFICE CLLI: _____MIAMFLPL

ADDRESS: _____9056 NW 41st St. Miami, FL 33166

	SQ. FT.
A. TOTAL GROSS SQ. FT.	A. <input type="text" value="24398"/>
B. UNAVAILABLE SPACE*:	
_____ Air conditioning room, vestibule, air handling unit,	
_____ plenum, restrooms and janitor	
_____	B. <input type="text" value="1636"/>
<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, & 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) _____	<input type="text" value="4371"/>

Transmission Equipment _____	<input type="text" value="5768.5"/>
_____ Physical Collocation	<input type="text" value="800"/>
Other (Specify) FRAME _____	<input type="text" value="3216"/>
POWER _____	<input type="text" value="3263"/>
ADMINISTRATIVE _____	<input type="text" value="1362"/>
TOTAL ASSIGNED - OCCUPIED SPACE	C. <input type="text" value="18780.5"/>

SPACE ASSESSMENT WORK SH

D. RESERVED SPACE

Switching Equipment Growth through Year of _____ 1317

For: _____

Transmission Equipment Growth through year of _____ 2263.5

For: _____

Turnaround Space for replacement of _____: Year: _____
 (Switch Type)

Other (Virtual Collocation) _____: Year: _____
 (Switch Type)

Power _____: Year: _____
 (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. 3580.5

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:

 _____ Air Return 133
 _____ Grounding Aisle 268

TOTAL VACANT SPACE/NOT USABLE E. 401

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

SPACE ASSESSMENT WORK SH

G. FUTURE AVAILABLE SPACE

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:

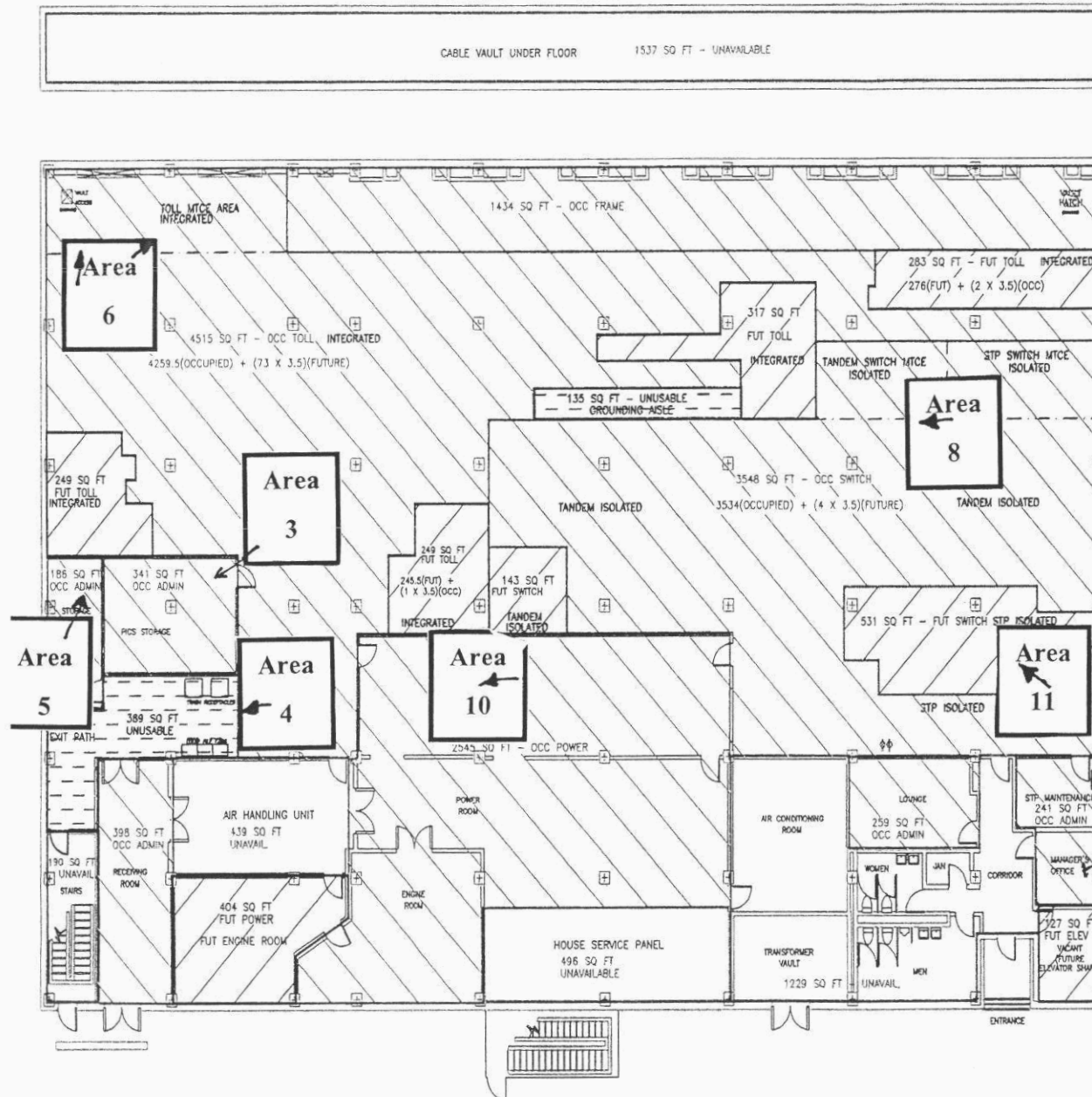
_____ Jenine Williams
(PRINT NAME AND TITLE)

TEL. NO. _(904) 350-4217

AUTHORIZED BY:

_____ Jim D. Bloomer
(Paygrade 59 or above)

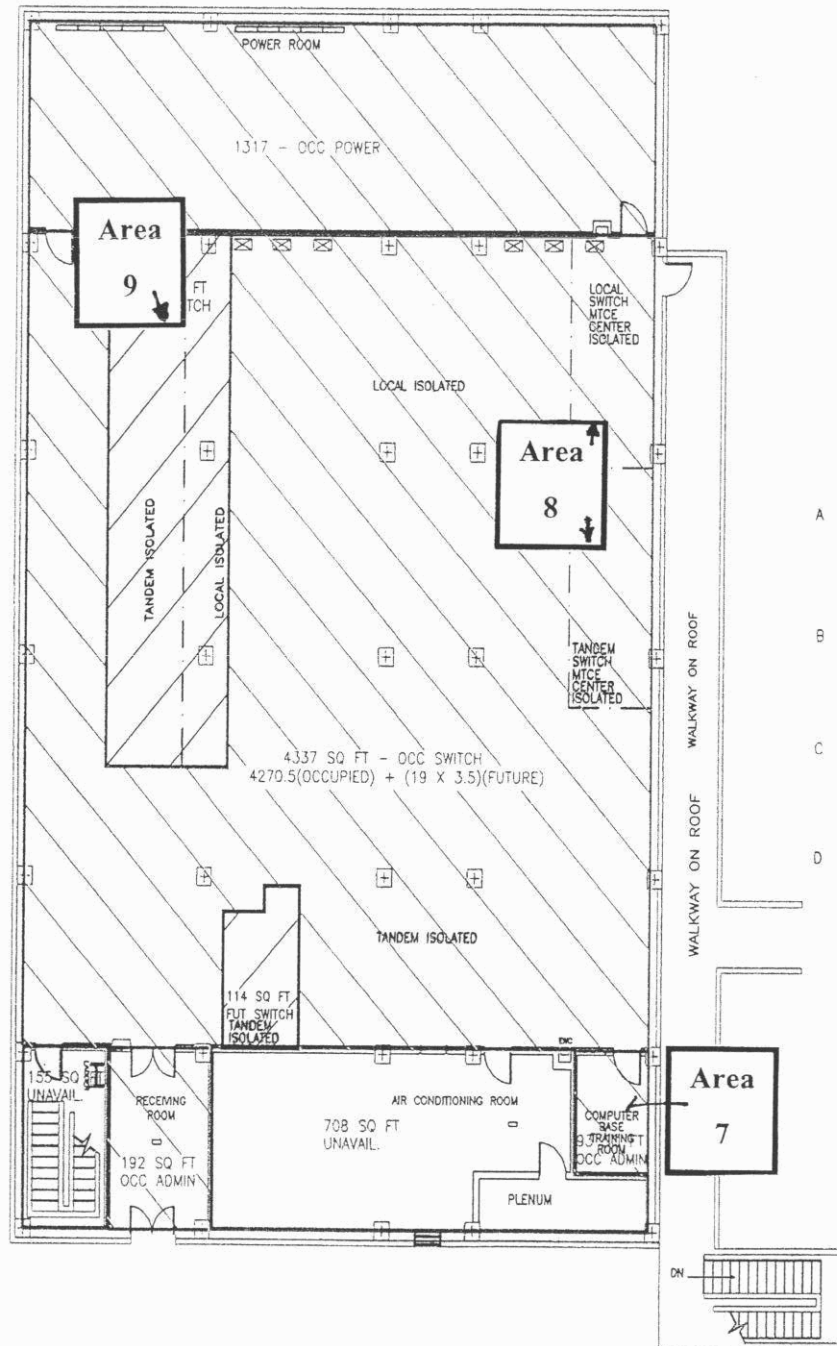
TEL. NO. _(904) 350-3428



A	TOTAL GROSS SQ FT	20,185
	CABLE VAULT	1537
	STAIRWELL	190
	AIR HANDLING UNIT	439
	HOUSE SERVICE PANEL	496
	CORRIDOR, JANITOR, RESTROOMS	
	TRANSFORMER VAULT & AIR CONDITIONING ROOM	1229
B	TOTAL UNAVAILABLE SPACE	3891
	SWITCH	
	TOLL	4259.5 + (3 X 3.5) = 3534
	POWER AND ENGINE	4270
	FRAME	2545
	ADMIN	186 + 341 + 398 + 259 + 241 = 1425
	TOTAL OCCUPIED SPACE	13,208
	SWITCH	
	TOLL	531 + 143 + (4 X 3.5) = 688
	POWER	249 + 245.5 + 317 + 276 + (73 X 3.5) = 1343
	ELEVATOR SHAFT	404
	TOTAL RESERVED SPACE	2562
	EXIT CORRIDOR	389
	GROUNDING AISLE	135
	TOTAL UNUSABLE SPACE	524

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

M6506 NORTH DADE GOLDEN GLADES FIRST FLOOR PLAN



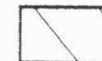
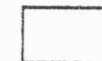
A TOTAL GROSS SQ FT 7577

B STAIRWELL 155
 AIR CONDITIONING ROOM AND PLENUM 708
 TOTAL UNAVAILABLE SPACE 863

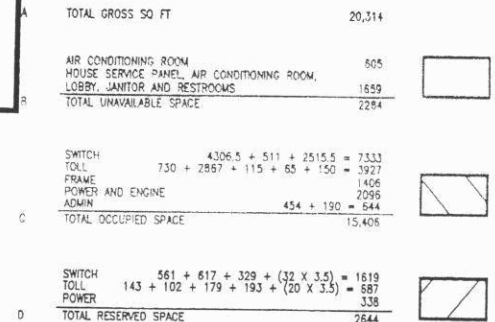
C SWITCH 4270.5
 POWER 1317
 ADMIN 192 + 93 = 285
 TOTAL OCCUPIED SPACE 5872.5

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

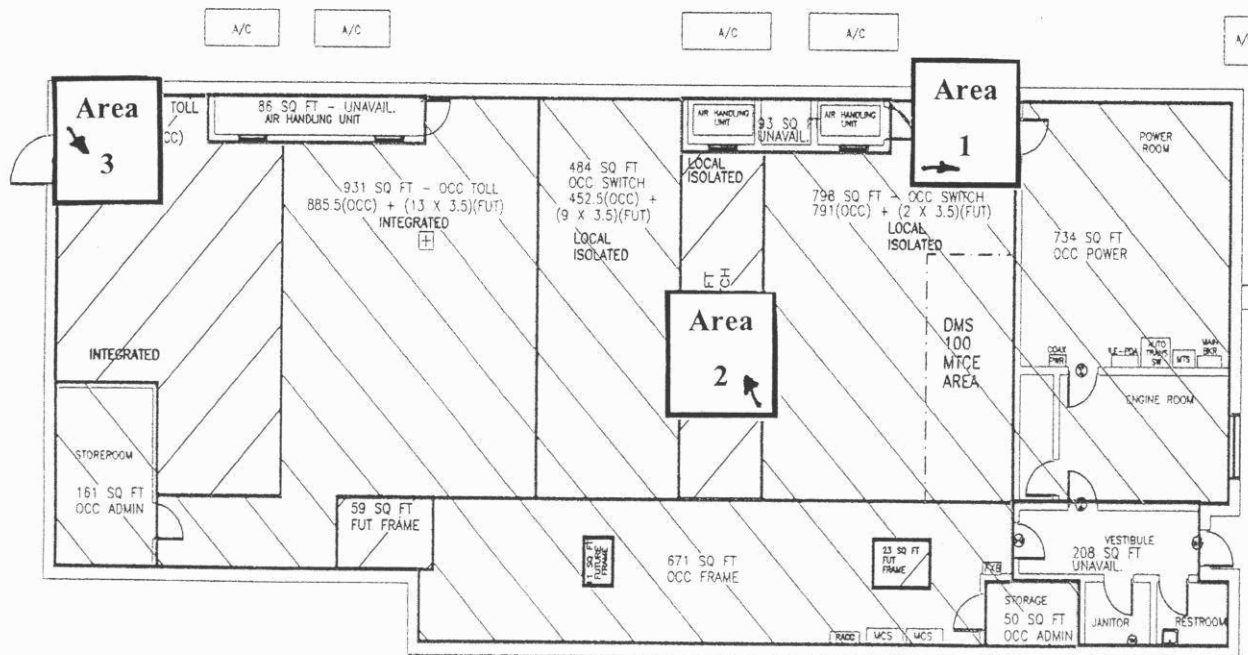
ISOLATED - ISOLATED GROUND PLANE
 INTEGRATED - INTEGRATED GROUND PLANE
 OCC - OCCUPIED
 FUT - FUTURE
 UNAVAIL - UNAVAILABLE
 ⊕ - BUILDING COLUMN



M6506 NORTH DADE GOLDEN GLADES SECOND FLOOR PLAN



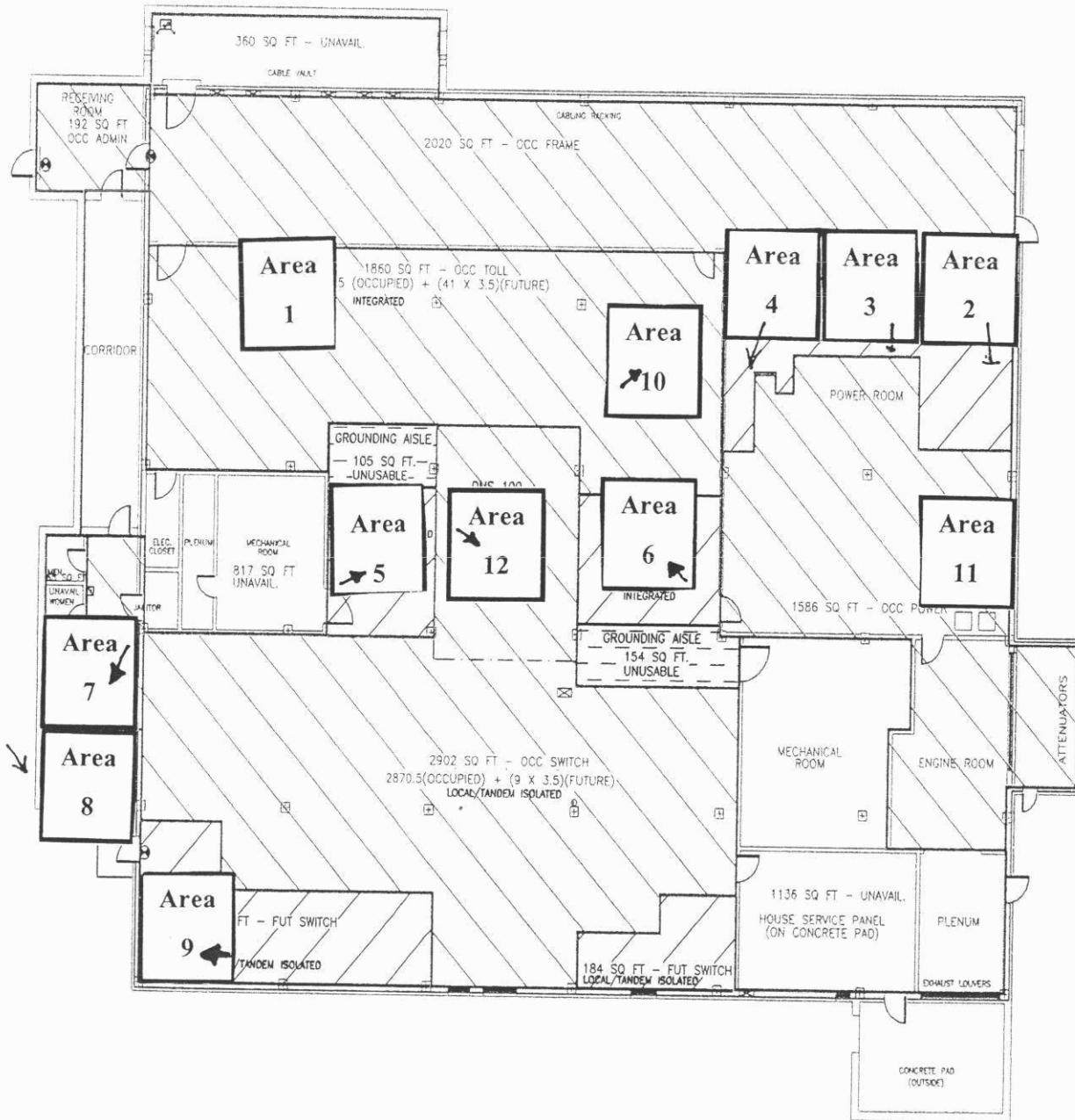
E8519 WEST PALM BEACH GARDENS FIRST FLOOR PLAN



39280 LAKE MARY FIRST FLOOR PLAN

A	TOTAL GROSS SQ FT	5195
	AIR HANDLING UNIT	86
	AIR HANDLING UNITS	93
B	VESTIBULE, JANITOR & RESTROOMS	208
	TOTAL UNAVAILABLE SPACE	387
	SWITCH	452.5 + 791 = 1243.5
	TOLL	885.5 + (8 X 3.5) = 913.5
	FRAME	671
	POWER & ENGINE	734
	ADMIN	161 + 50 = 211
C	TOTAL OCCUPIED SPACE	3773
	SWITCH	243 + (11 X 3.5) = 281.5
	TOLL	615 + (13 X 3.5) = 660.5
	FRAME	11 + 23 + 59 = 93
D	TOTAL RESERVED SPACE	1035

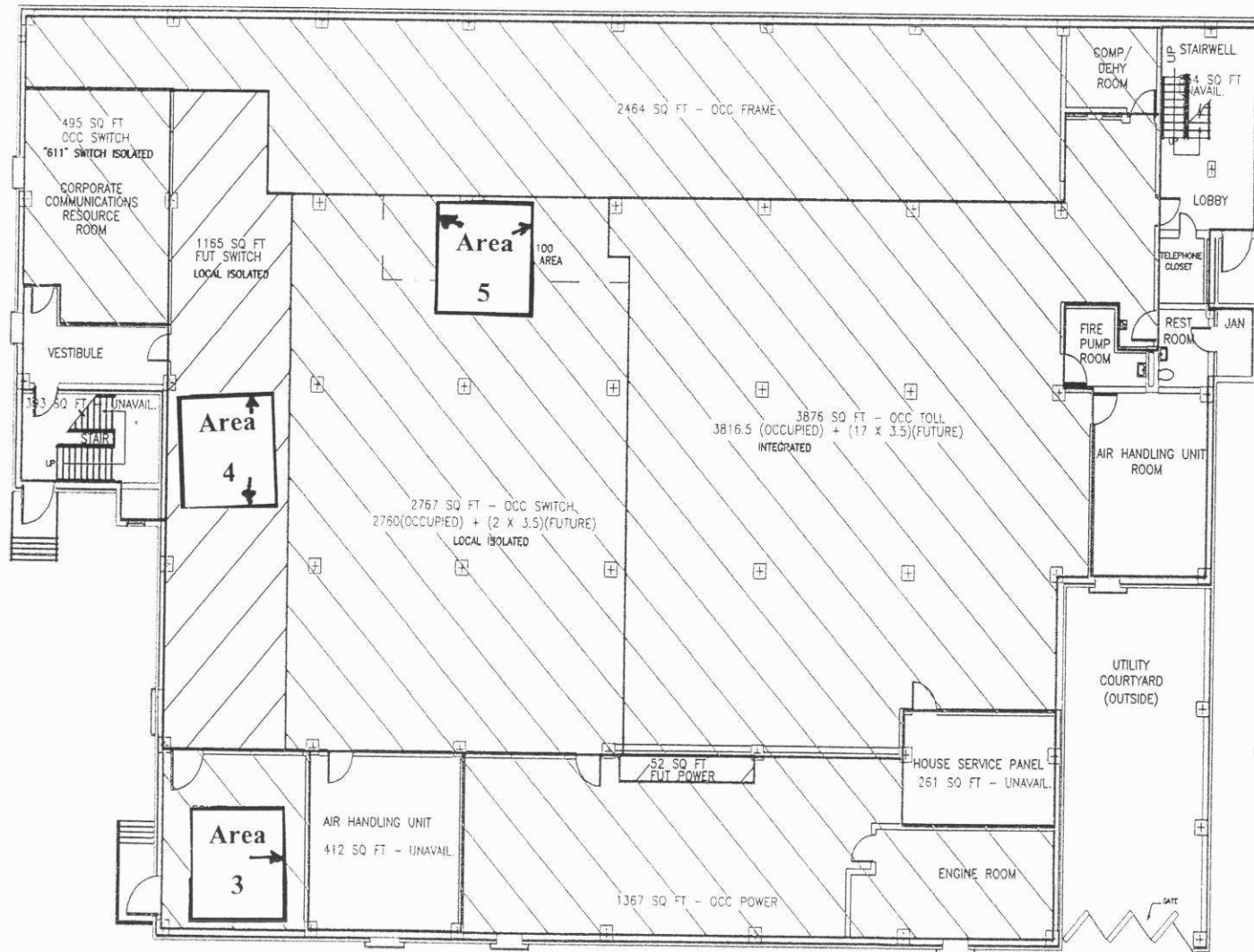
ISOLATED - ISOLATED GROUND PLANE
 INTEGRATED - INTEGRATED GROUND PLANE
 OCC - OCCUPIED
 FUT - FUTURE
 UNAVAIL - UNAVAILABLE
 ■ - BUILDING COLUMN



A	TOTAL GROSS SQ FT	13,331	
	CABLE VAULT	360	
	RESTROOMS	65	
	JAN, ELEC CLOSET, MECH RM, PLENUM & CORRIDOR	817	
	HOUSE SERVICE PANEL, MECH RM & PLENUM	1136	
B	TOTAL UNAVAILABLE SPACE	2378	
	SWITCH	2870.5	
	TOLL	1716.5	
	FRAME	2020	
	POWER AND ENGINE	1586	
	ADMINISTRATIVE	238 + 192 = 430	
C	TOTAL OCCUPIED SPACE	8623	
	SWITCH	184 + 517 + 255 + (9 X 3.5) = 987.5	
	TOLL	287 + (41 X 3.5) = 430.5	
	POWER	653	
D	TOTAL RESERVED SPACE	2071	
E	TOTAL UNUSABLE SPACE	105 + 154 = 259	

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

33850 DAYTONA BEACH - PORT ORANGE FIRST FLOOR PLAN



A TOTAL GROSS SQ FT 14,497

STAIRWELL 393
 AIR HANDLING UNIT 412
 HOUSE SERVICE PANEL 261
 STAIRWELL, LOBBY, JANITOR
 TELEPHONE CLOSET, RESTROOM &
 FIRE PUMP ROOM 854

B TOTAL UNAVAILABLE SPACE 1920

SWITCH 2760 + 495 = 3255
 TOLL 3816.5
 FRAME 2464
 POWER AND ENGINE 1367
 ADMIN 391

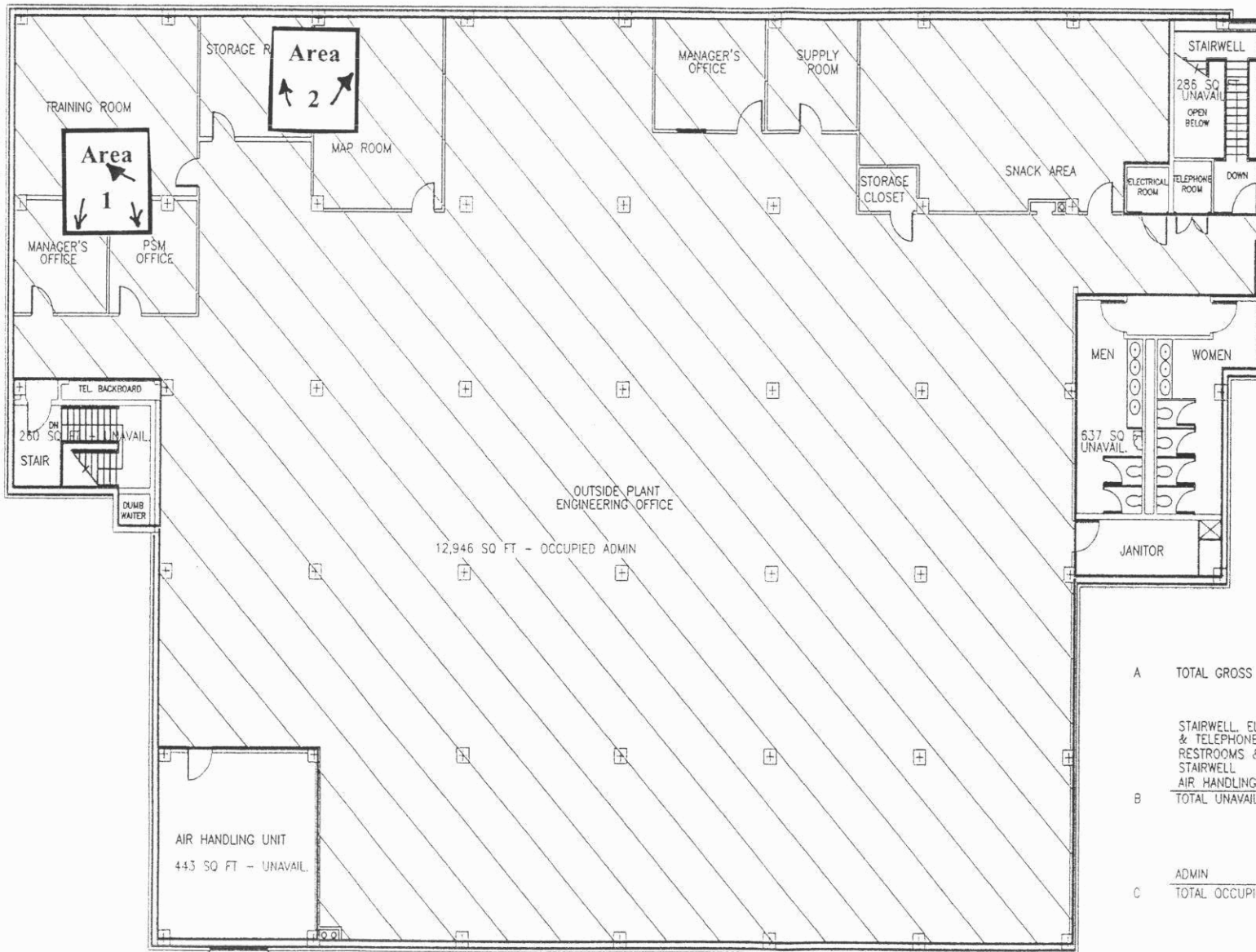
C TOTAL OCCUPIED SPACE 11,293.5

SWITCH 1165 + (2 X 3.5) = 1172
 TOLL 17 X 3.5 = 59.5
 POWER 52

D TOTAL RESERVED SPACE 1283.5

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

E8181 BOCA RATON - BOCA TEECA FIRST FLOOR PLAN



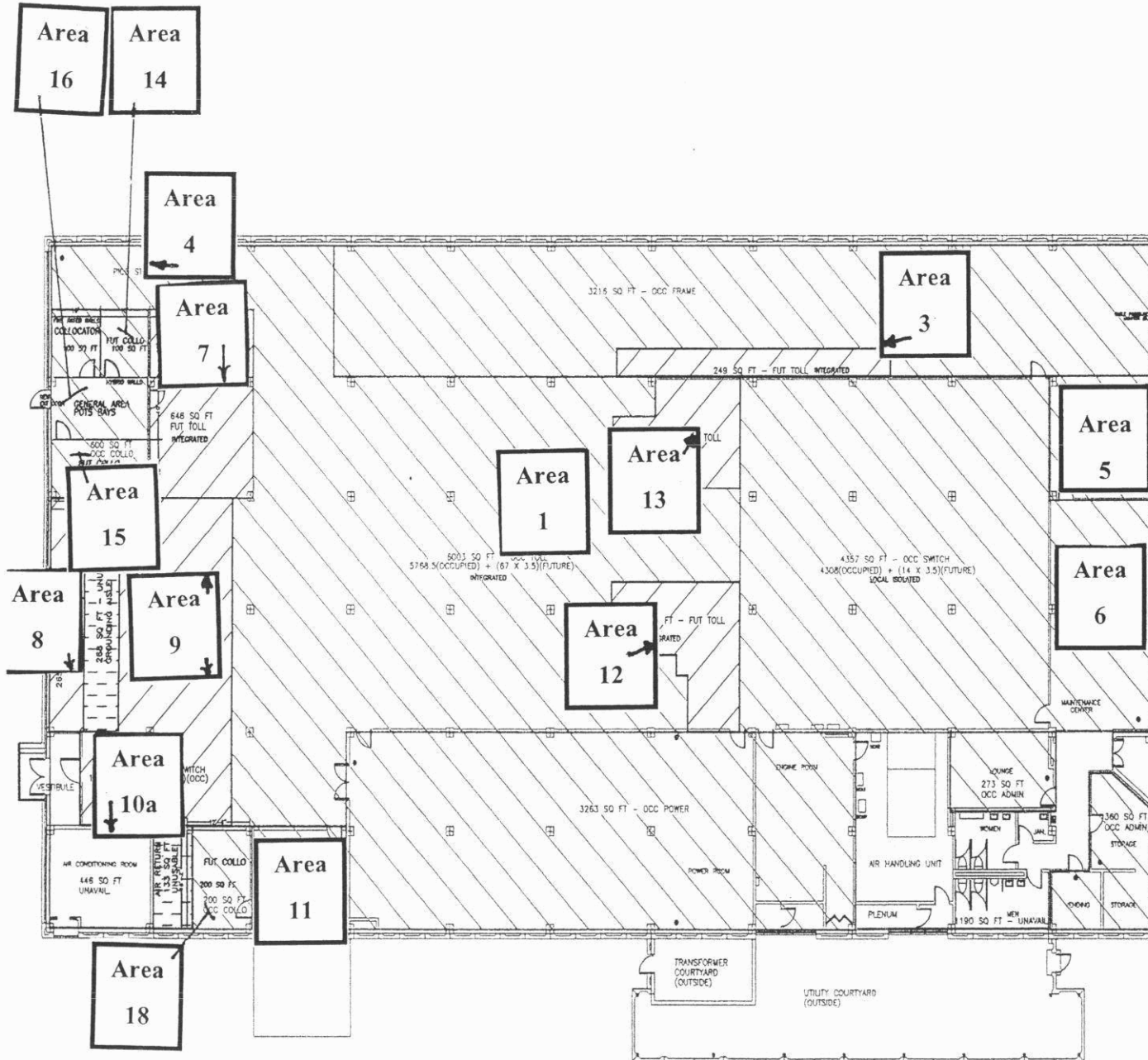
A TOTAL GROSS SQ FT 14,572

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



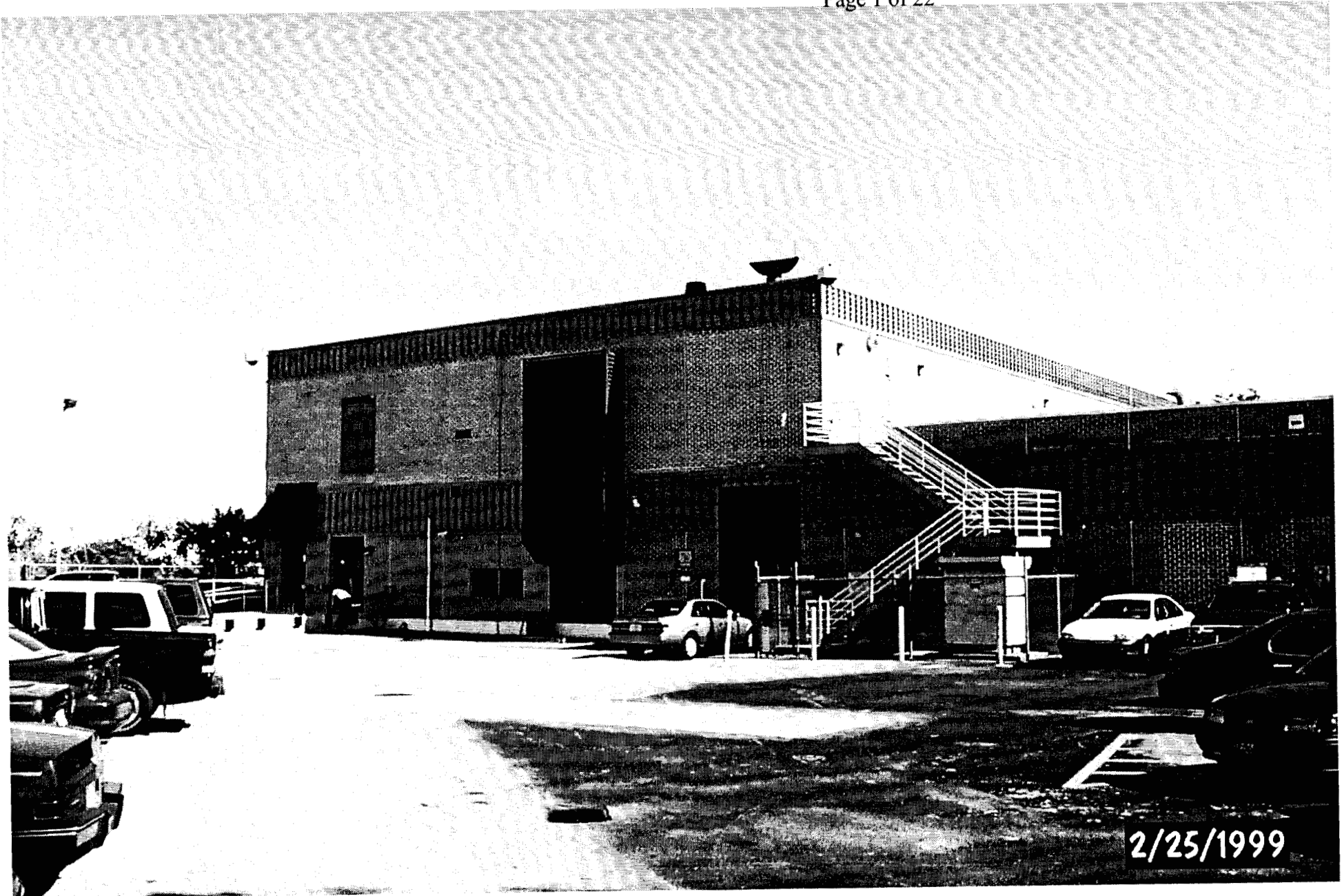
M6121 MIAMI PALMETTO FIRST FLOOR PLAN

A	TOTAL GROSS SQ FT	24,298	
	AIR CONDITIONING ROOM AND VESTIBULE	448	
	AIR HANDLING UNIT, PLENUM, RESTROOMS AND JANITOR	1190	
B	TOTAL UNAVAILABLE SPACE	1836	
	SWITCH	4308 + (14 X 3.5) = 4371	
	TOLL	5768.5	
	FRAME	3218	
	POWER AND ENGINE	3283	
	ADMIN	1962	
	COLLOCATION	800 + 200 = 1000	
C	TOTAL OCCUPIED SPACE	18,780.5	
	SWITCH	1268 + (14 X 3.5) = 1317	
	TOLL	846 + 265 + 487 + 249 + 402 + (67 X 3.5) = 2283.5	
D	TOTAL RESERVED SPACE	3580.5	
E	AIR RETURN	133	
	GROUNDING AISLE	268	
	TOTAL UNUSABLE SPACE	401	

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

Golden Glades Central Office

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 1 of 22



Golden Glades Central Office

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 2 of 22



Golden Glades Leading to Area 1 & 2

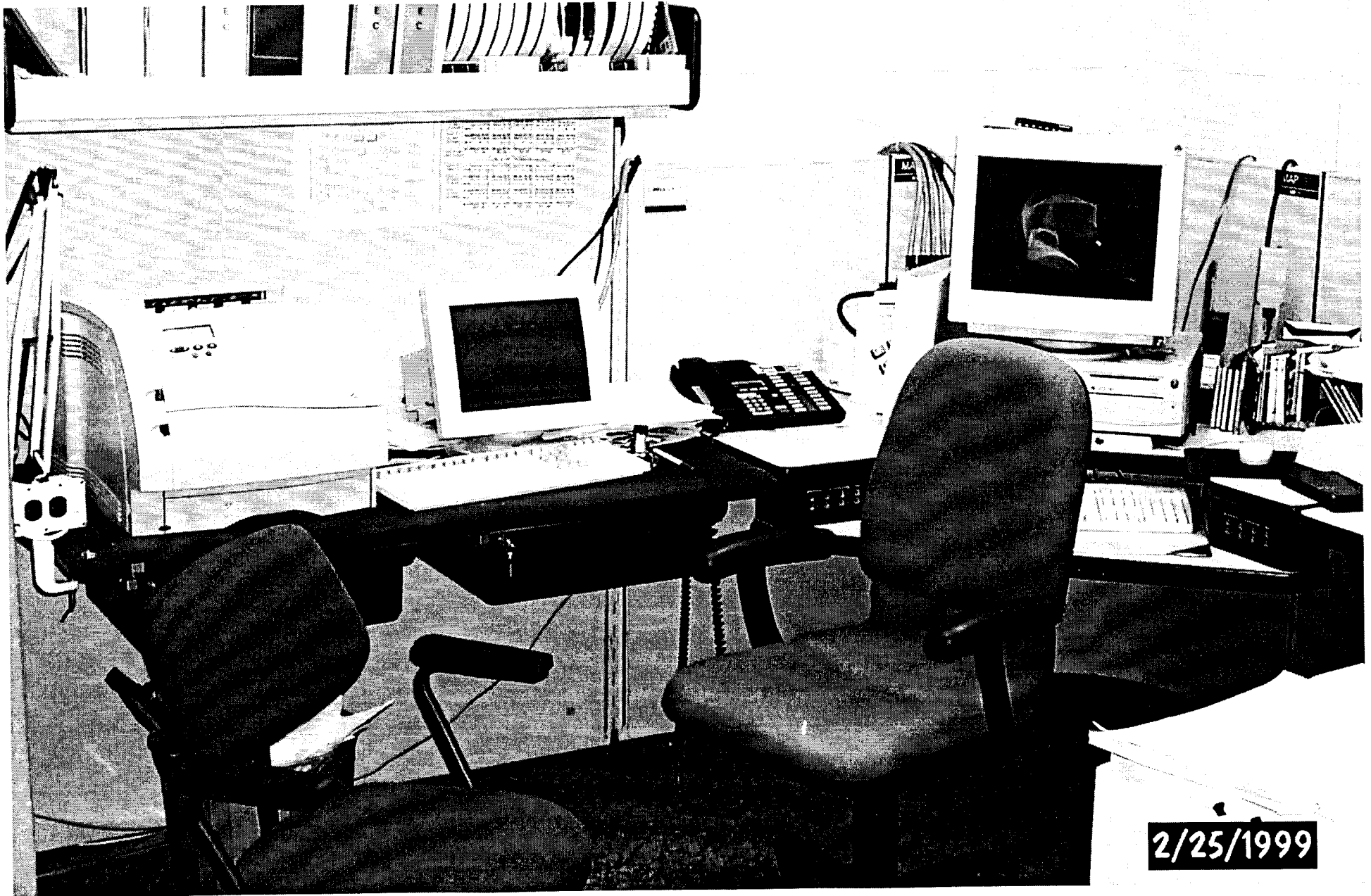
BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 3 of 22



2/25/1999

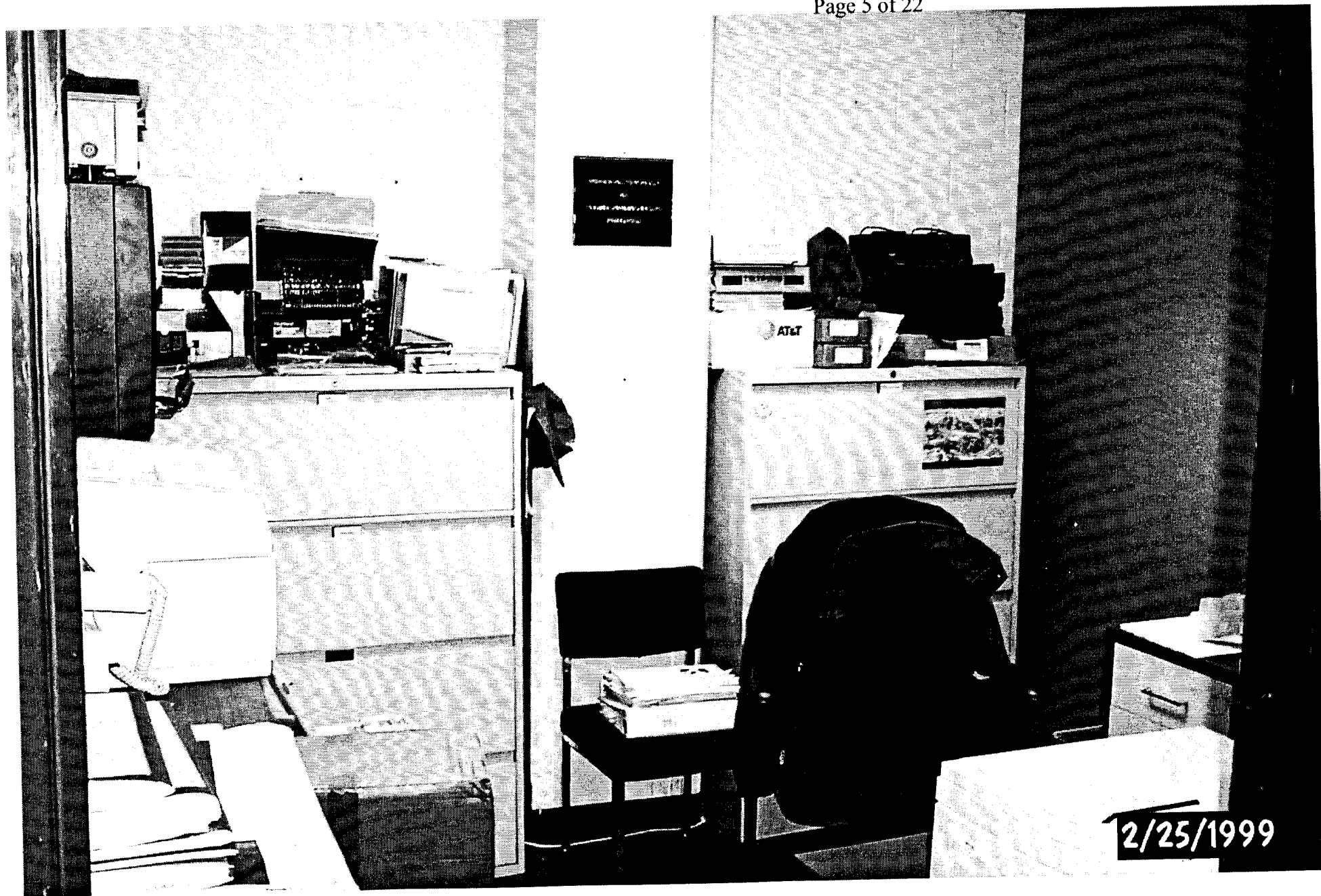
Golden Glades Area 1

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 4 of 22



Golden Glades Area 2

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 5 of 22



Golden Glades Area 7

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 6 of 22



Golden Glades Area 3

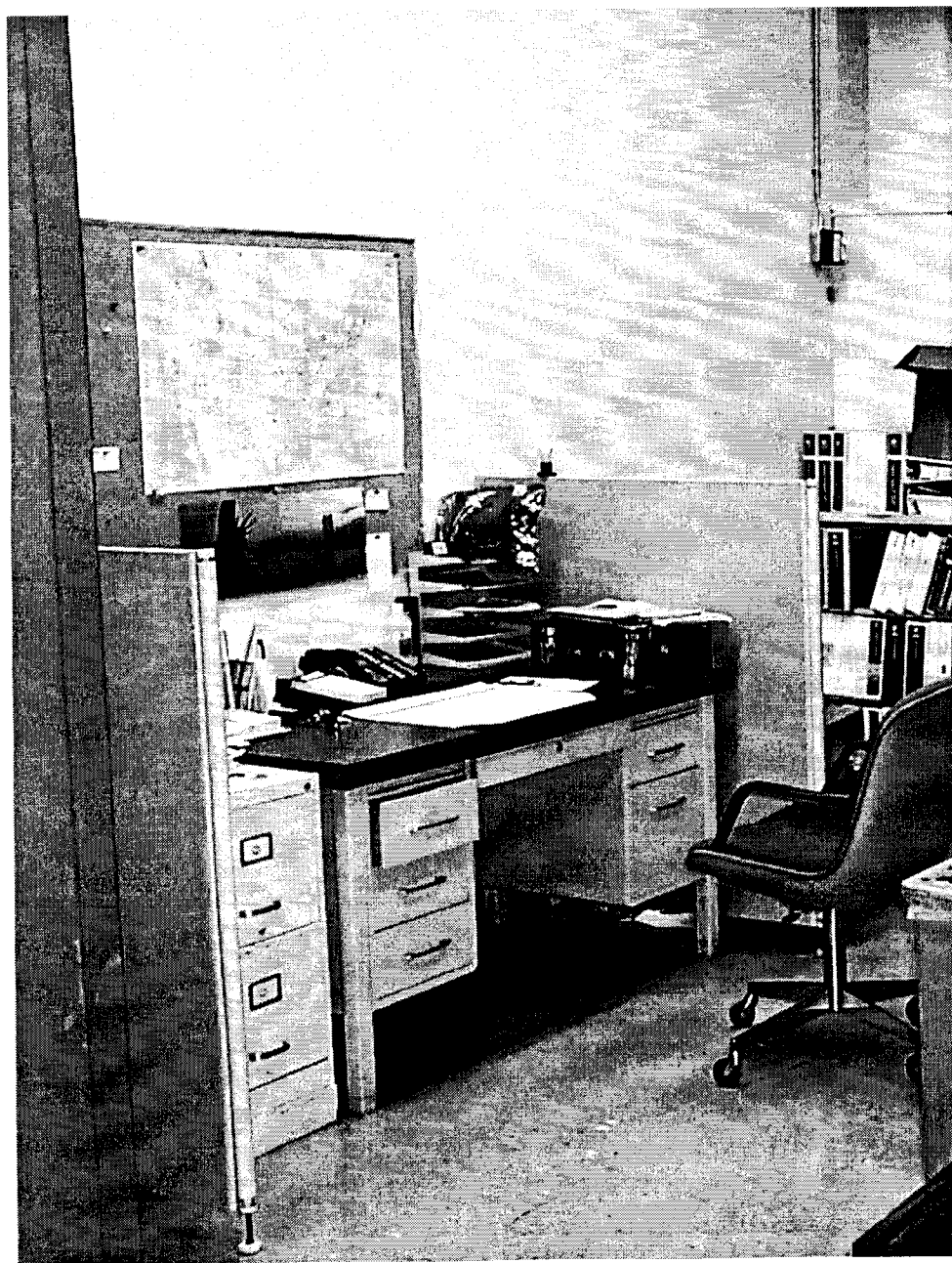
BellSouth Telecommunications, Inc.

FPSC Docket No. 980946-TL, 980947-TL, 980948-TL

981011-TL, 981012-TL, 981250-TL

Exhibit JDB-14

Page 7 of 22



Golden Glades Area 4a

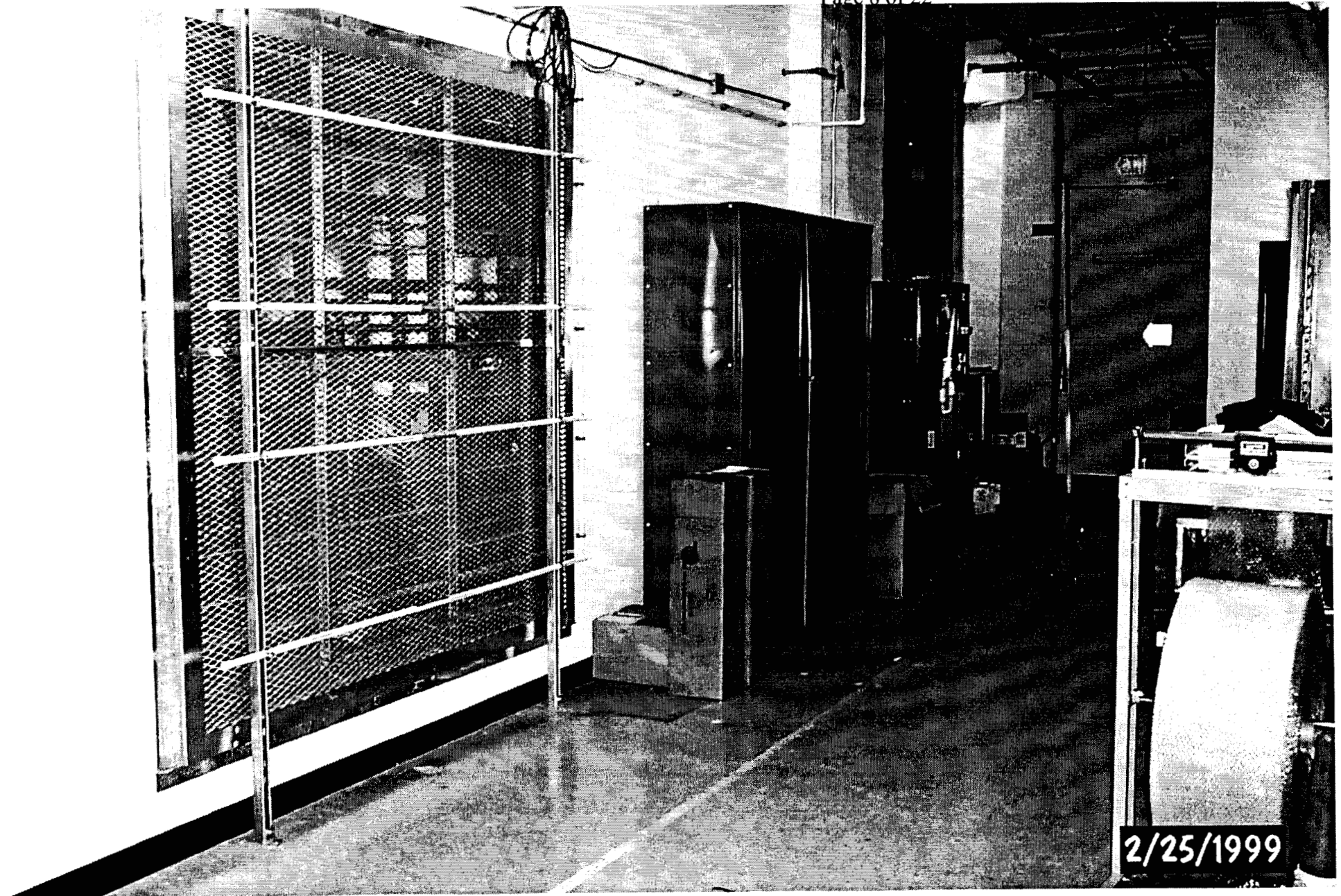
BellSouth Telecommunications, Inc.

FPSC Docket No. 980946-TL, 980947-TL, 980948-TL

981011-TL, 981012-TL, 981250-TL

Exhibit JDB-14

Page 8 of 22



Golden Glades Area 4b

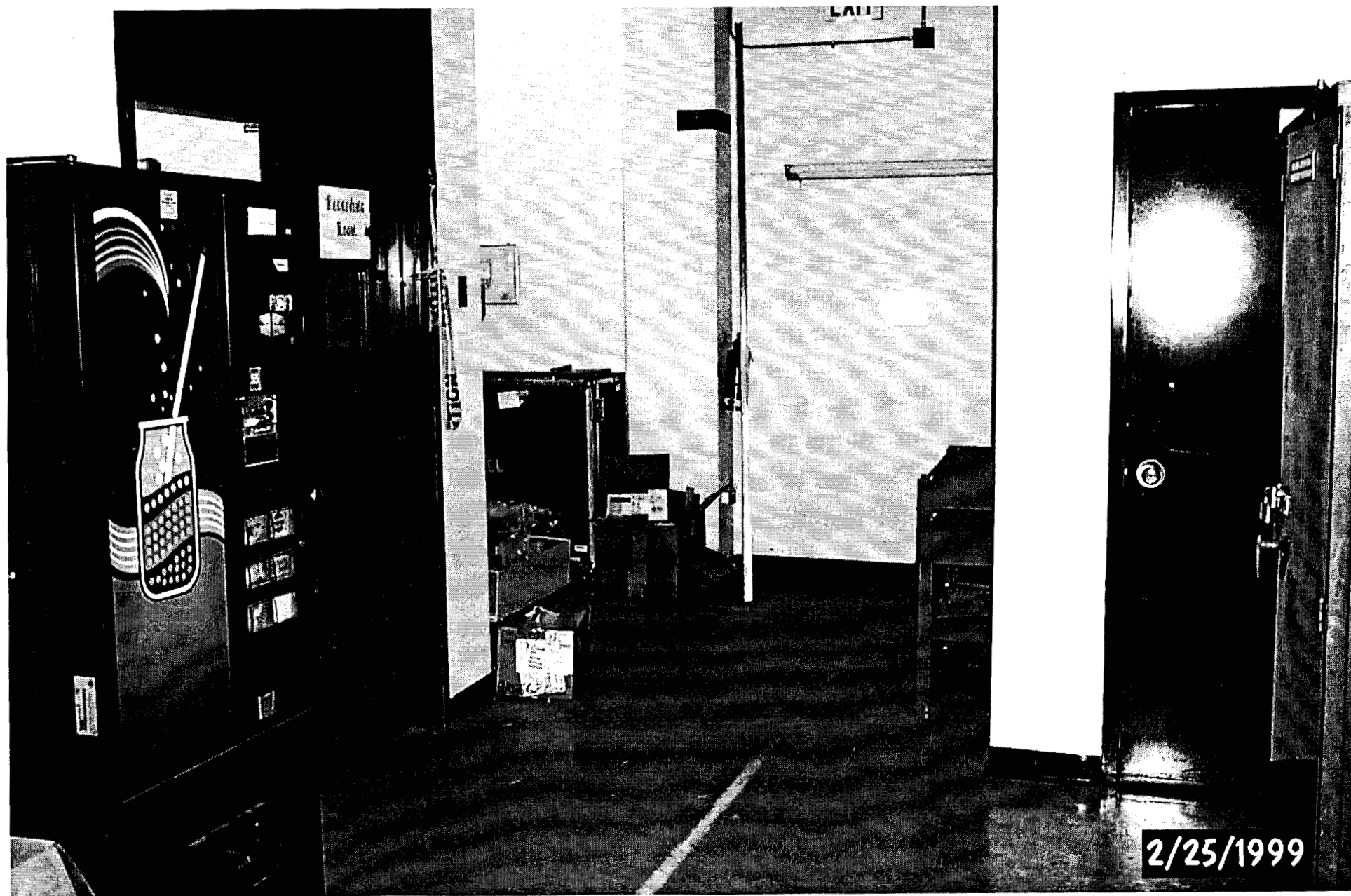
BellSouth Telecommunications, Inc.

FPSC Docket No. 980946-TL, 980947-TL, 980948-TL

981011-TL, 981012-TL, 981250-TL

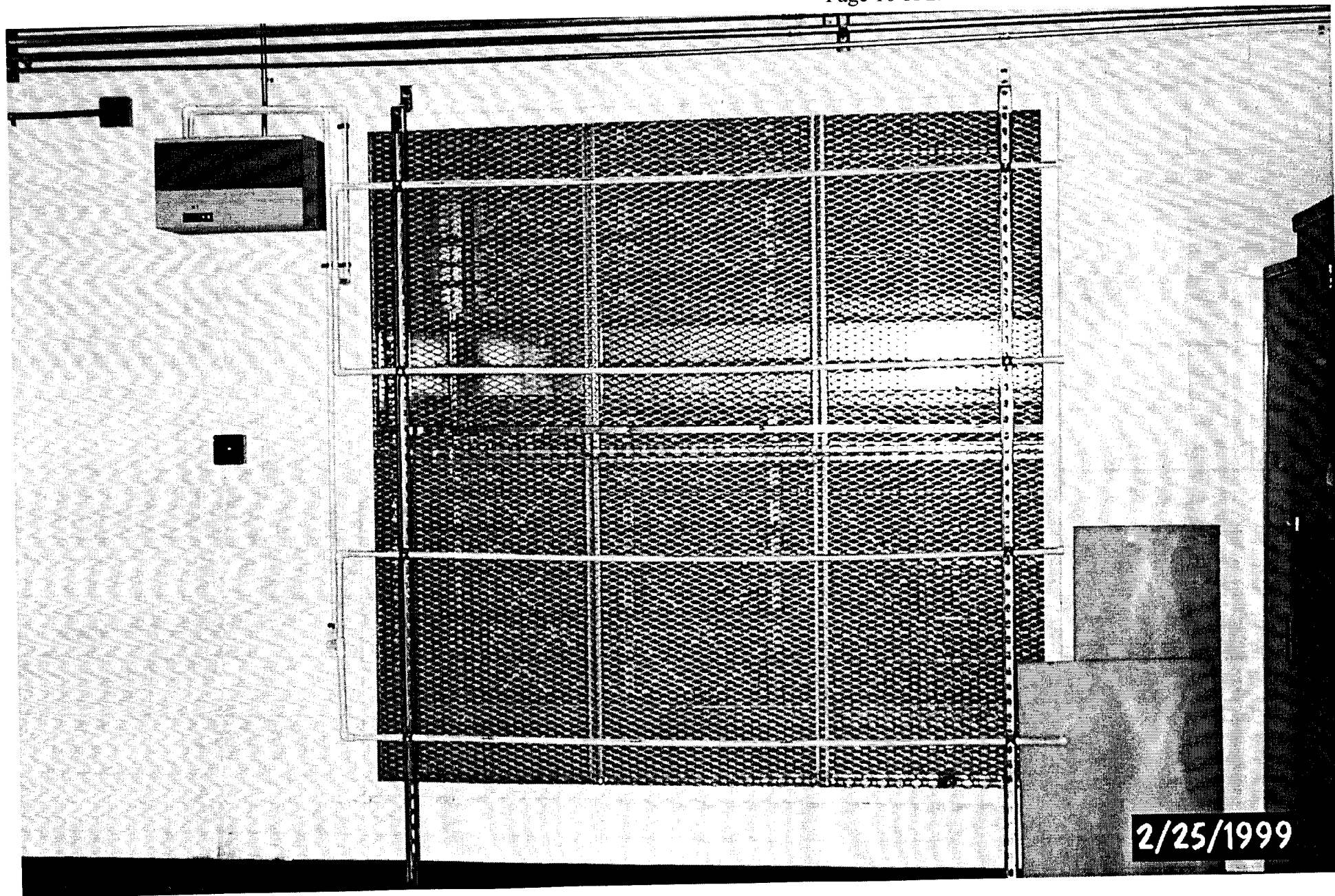
Exhibit JDB-14

Page 9 of 22



Golden Glades Area 4c

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 10 of 22



Golden Glades Area 5a

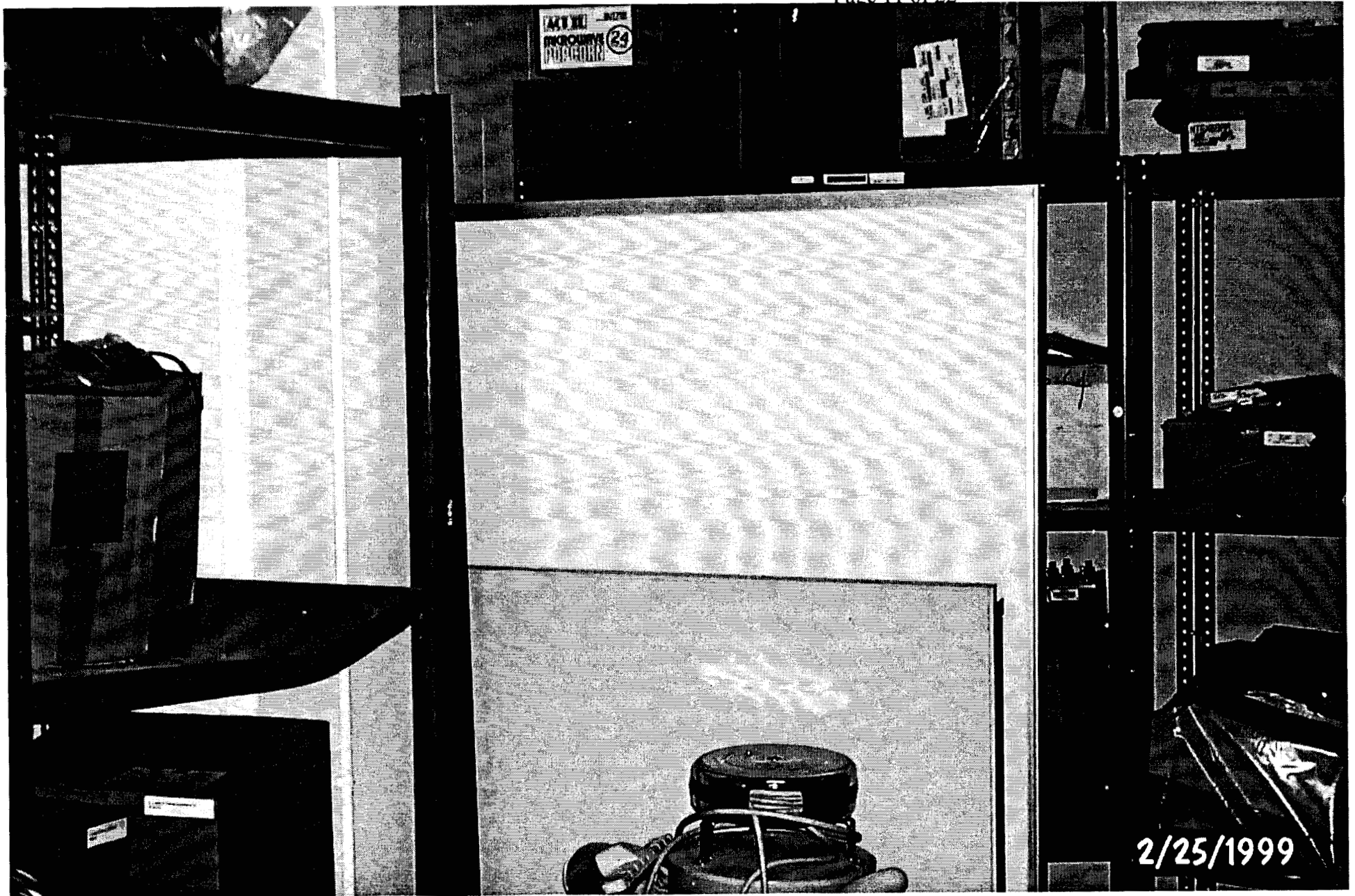
BellSouth Telecommunications, Inc.

FPSC Docket No. 980946-TL, 980947-TL, 980948-TL

981011-TL, 981012-TL, 981250-TL

Exhibit JDB-14

Page 11 of 22



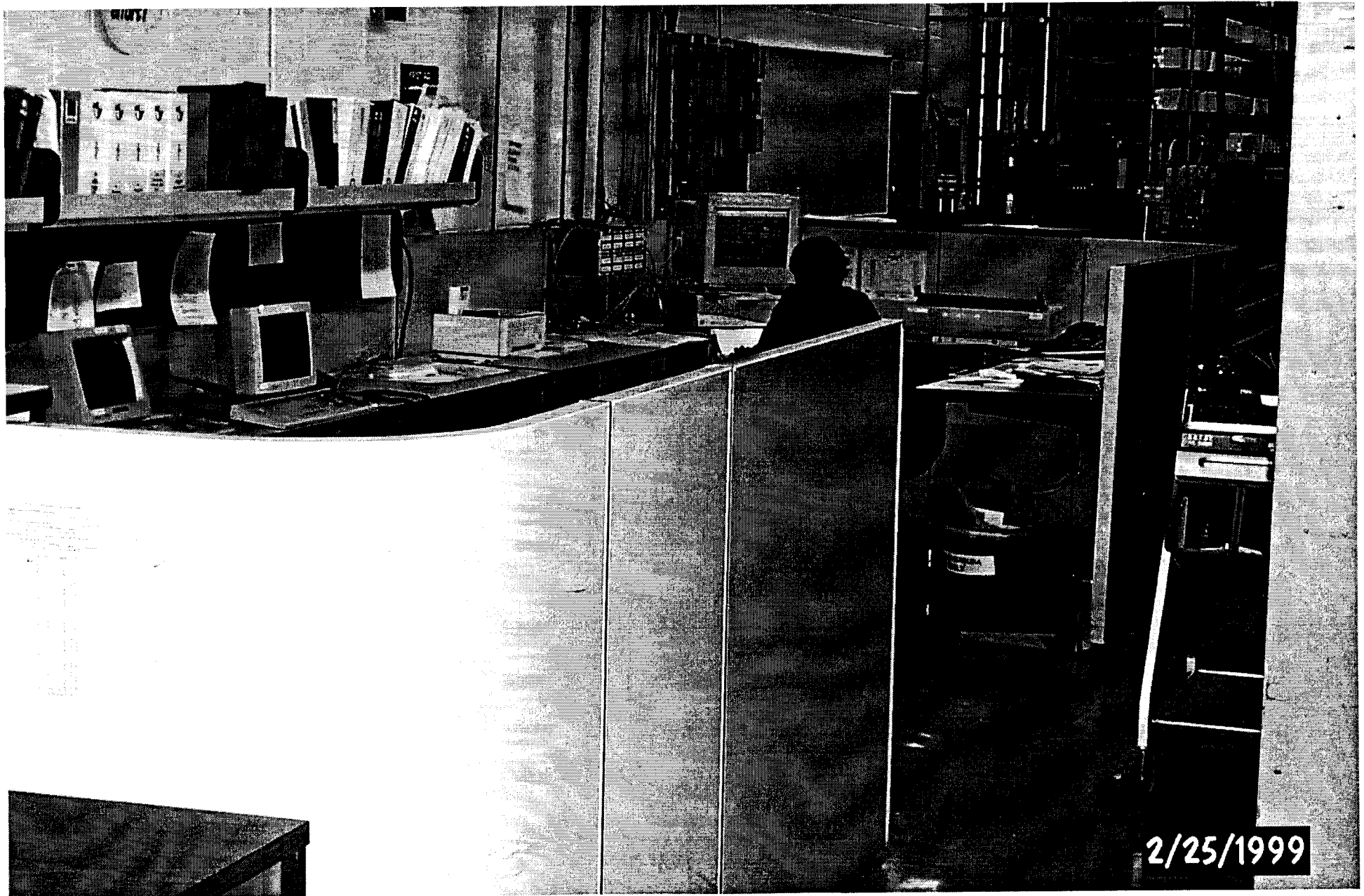
Golden Glades Area 5b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 12 of 22



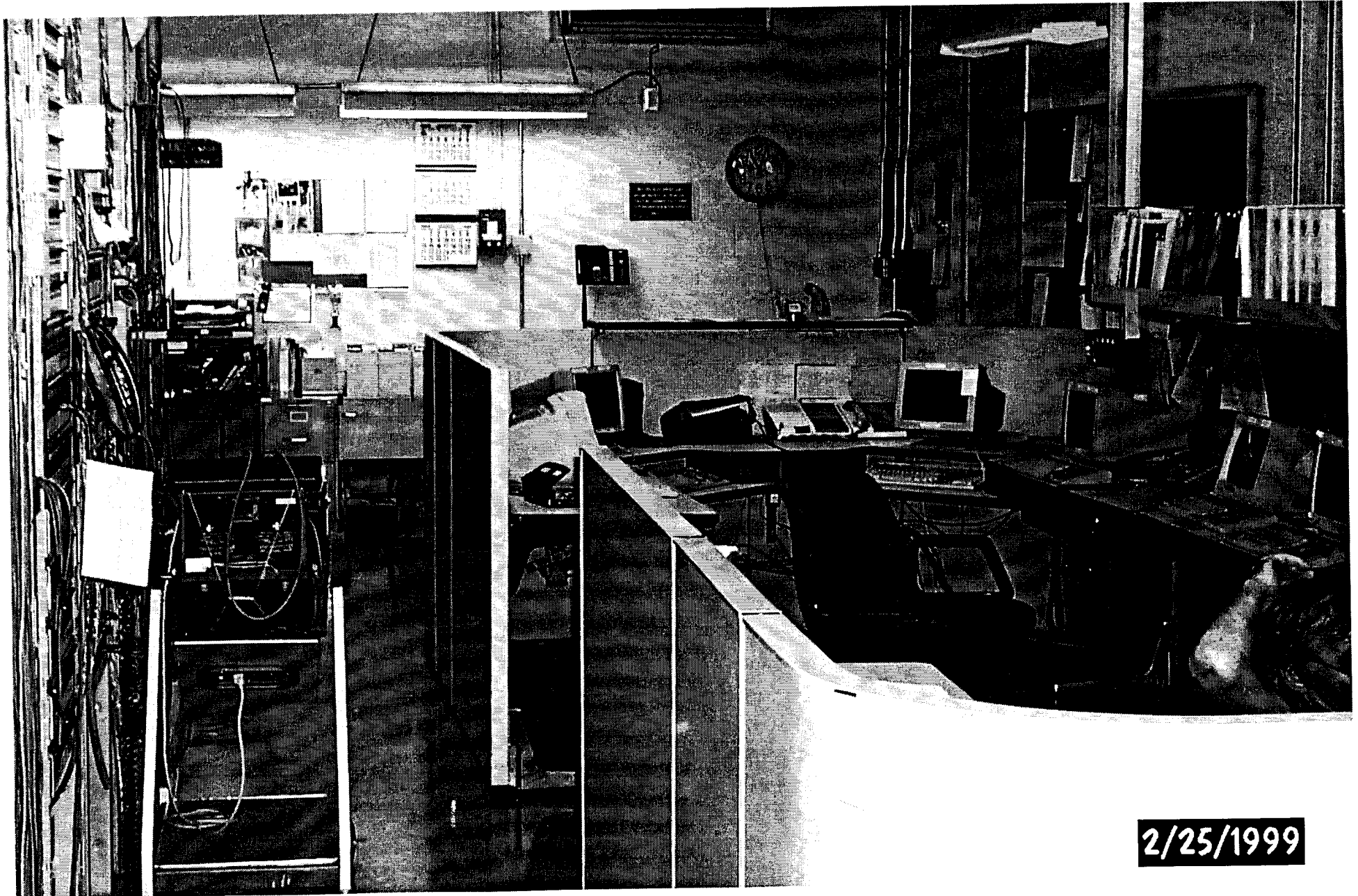
Golden Glades Area 6a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 13 of 22



Golden Glades Area 6b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 14 of 22



2/25/1999

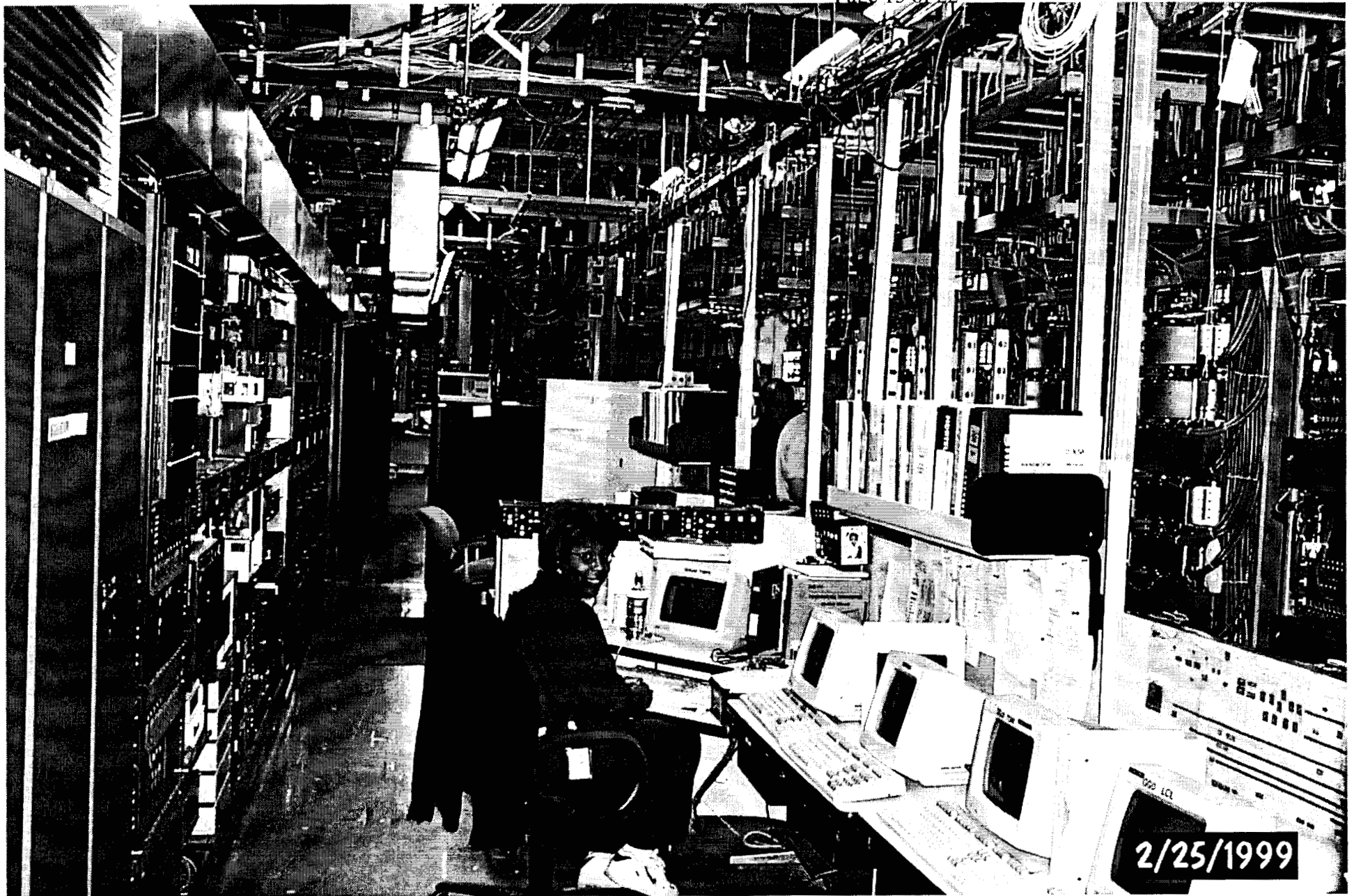
Golden Glades Area 8 (downstairs)

BellSouth Telecommunications, Inc.

FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL

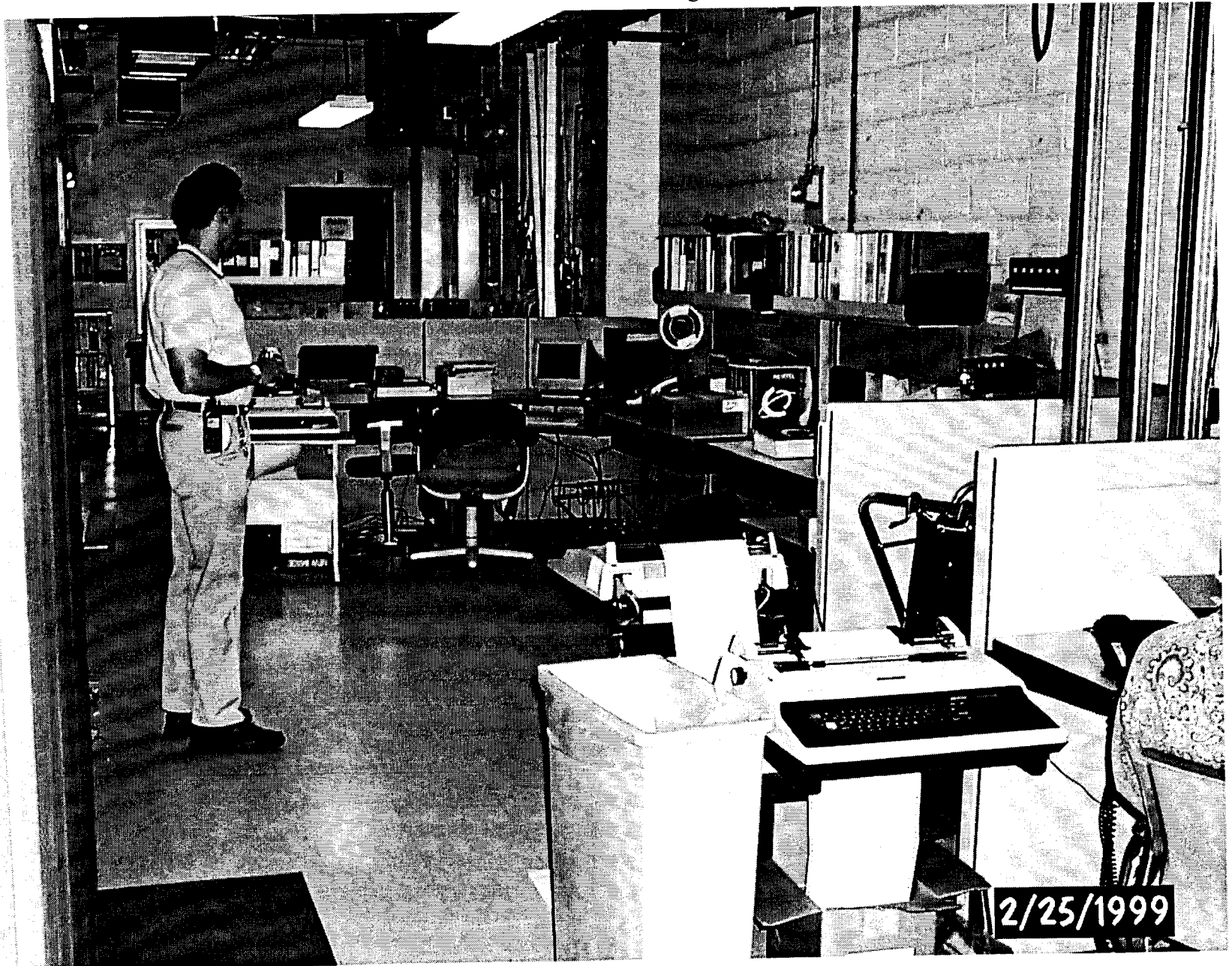
Exhibit JDB-14

Page 15 of 22



Golden Glades Area 8 (upstairs)

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 16 of 22



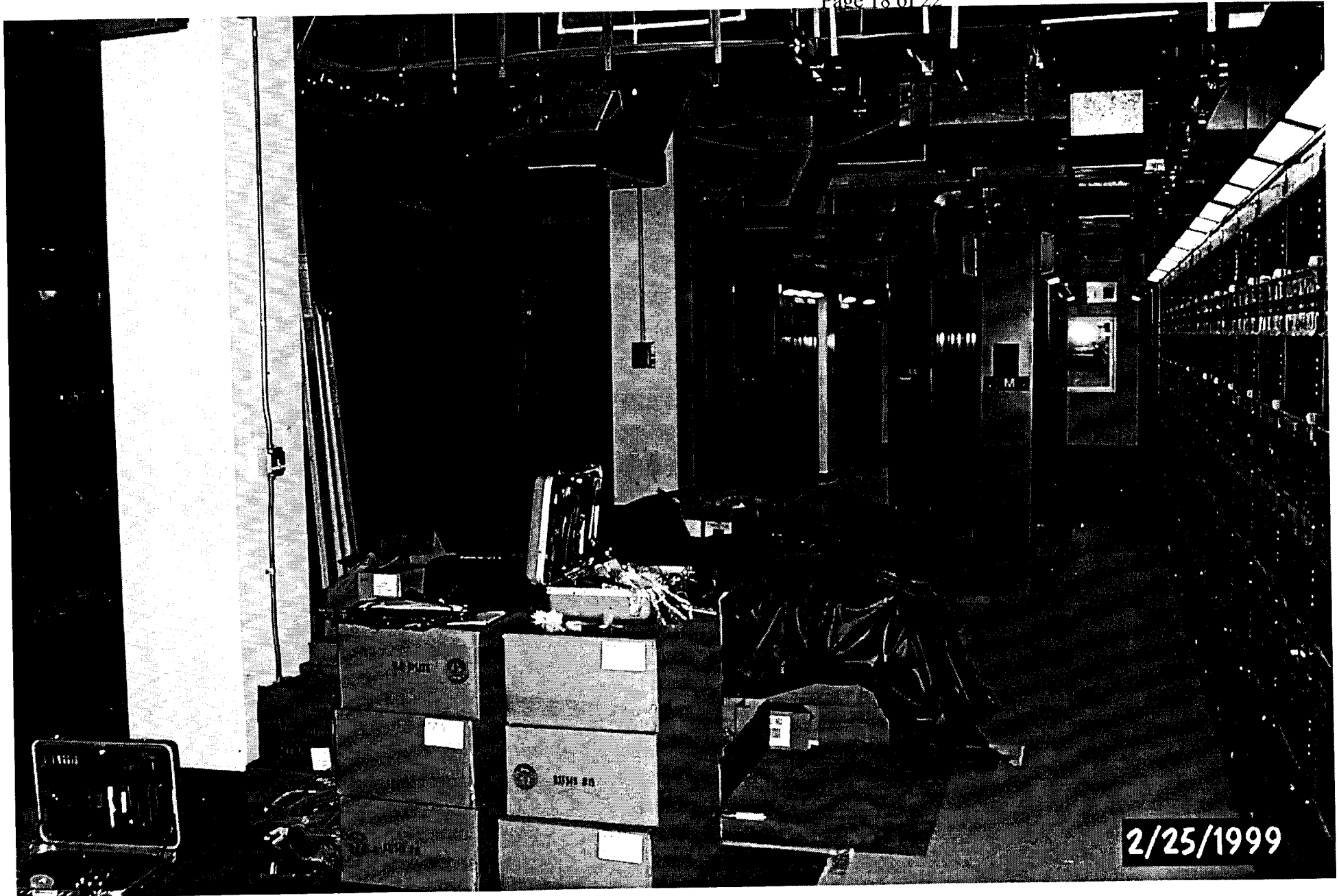
Golden Glades Area 9a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 17 of 22



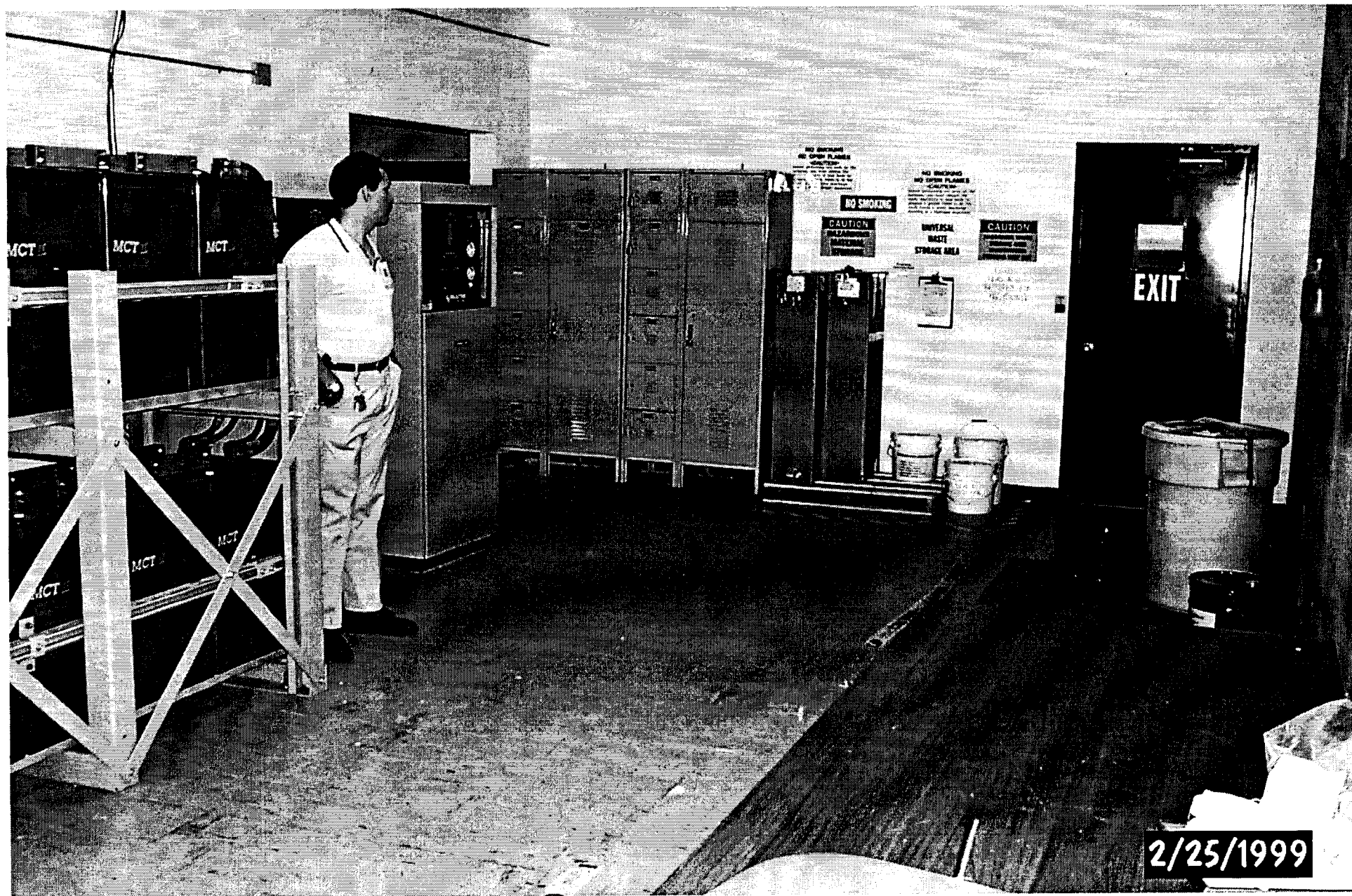
Golden Glades Area 9b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 18 of 22



Golden Glades Area 10

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 19 of 22



Golden Glades Area 11

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 20 of 22



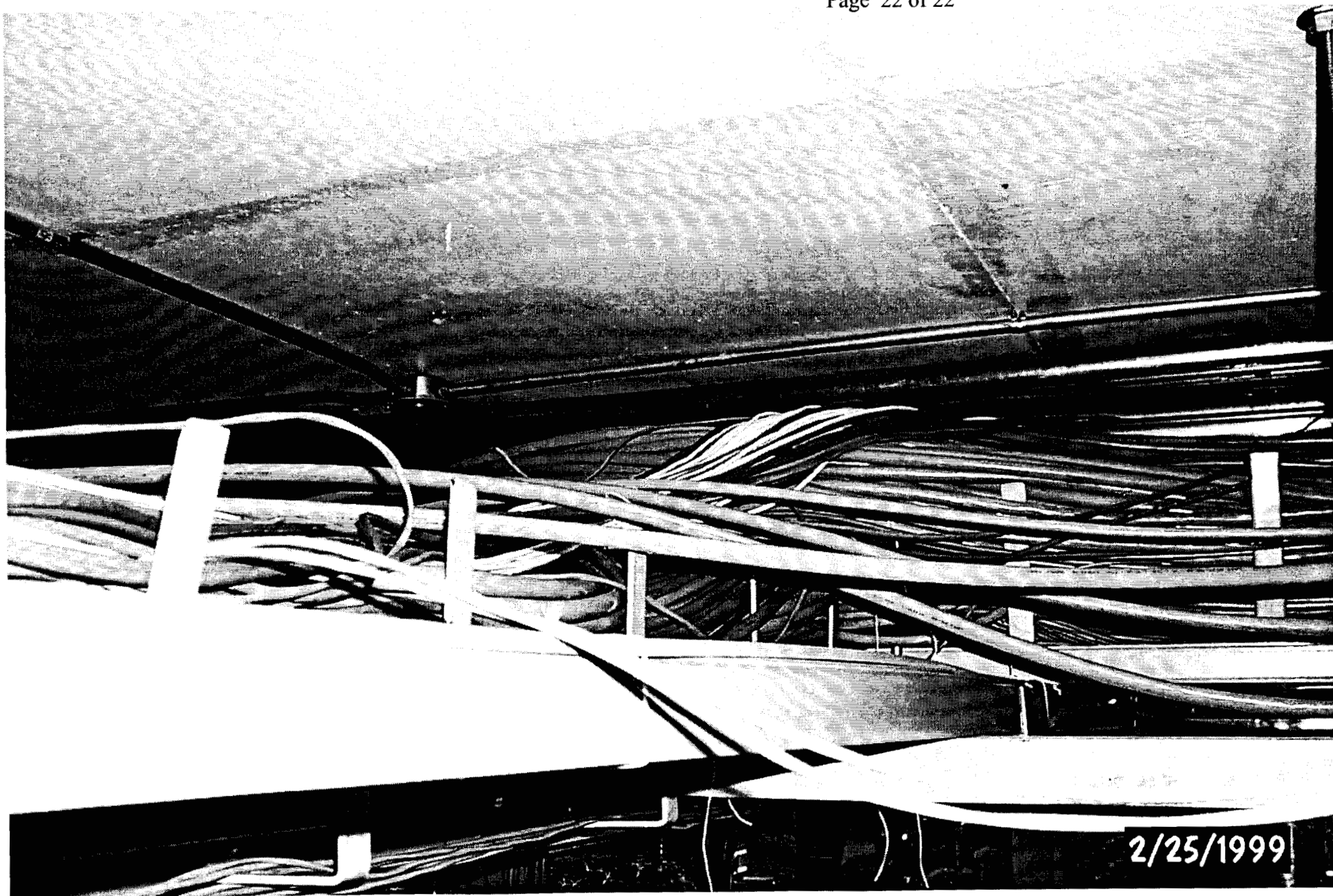
Golden Glades Scattered Bay Growth

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 21 of 22



Golden Glades Cable Congestion

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-14
Page 22 of 22



2/25/1999

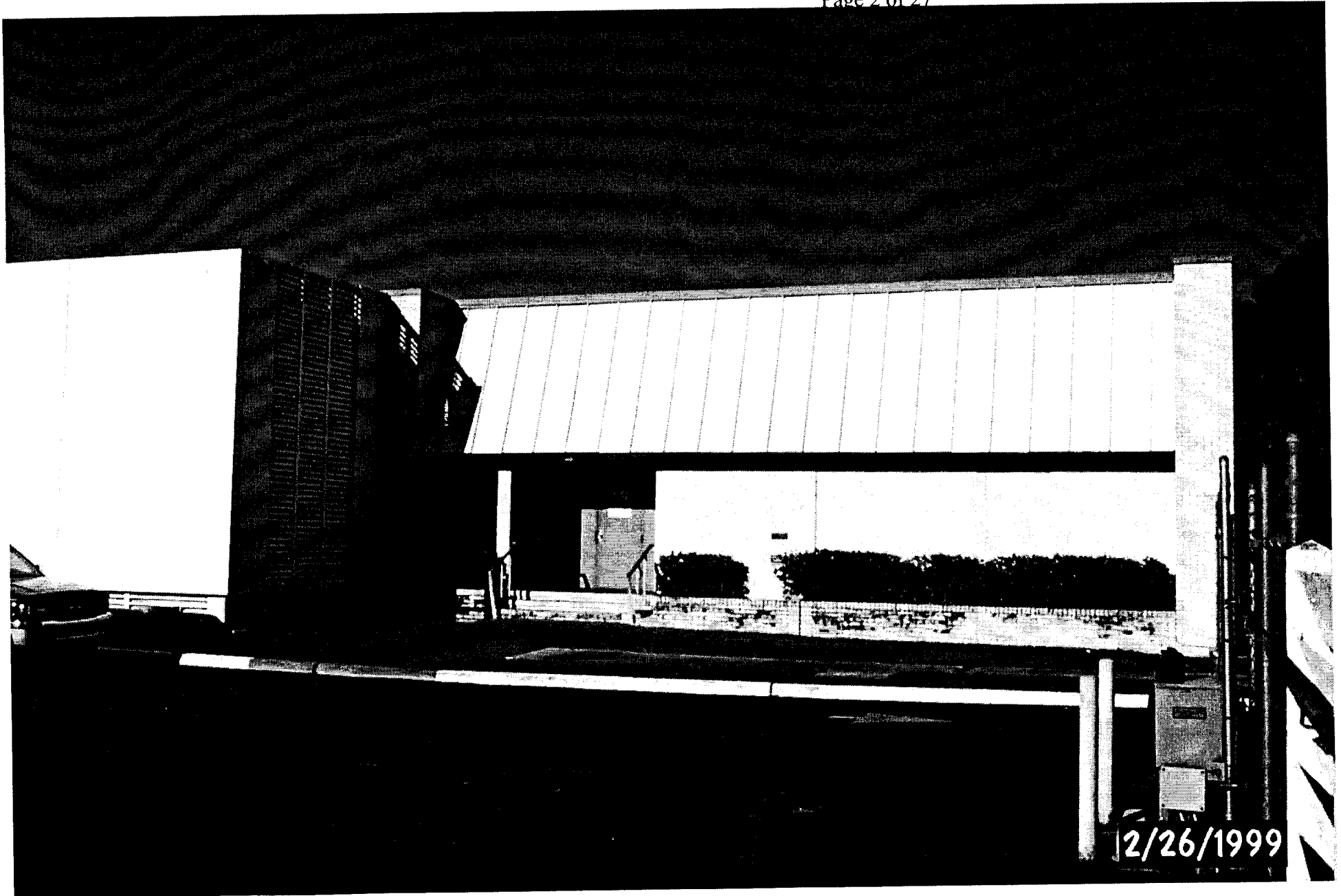
Garden Central Office

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 1 of 27



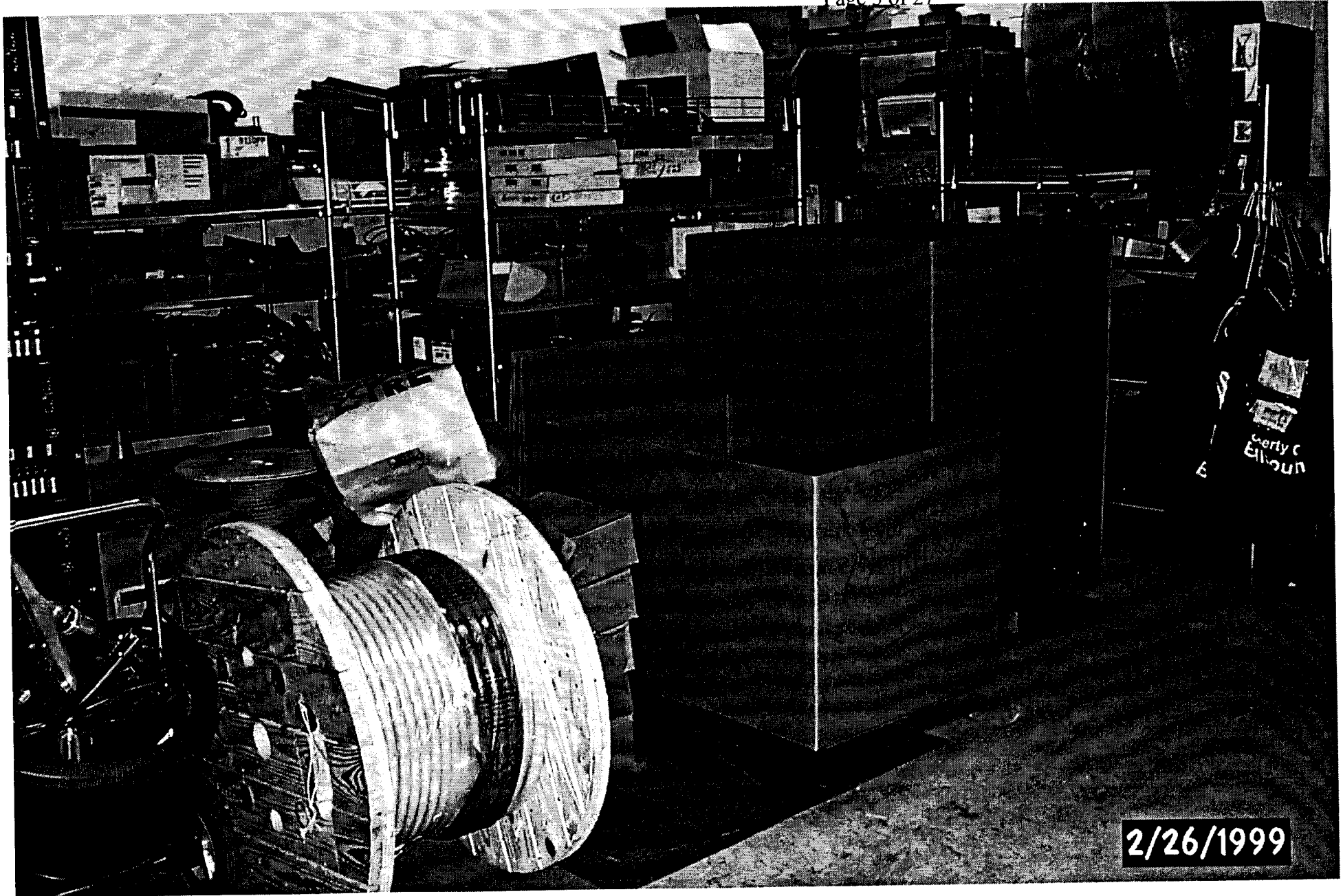
Garden Central Office

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 2 of 27



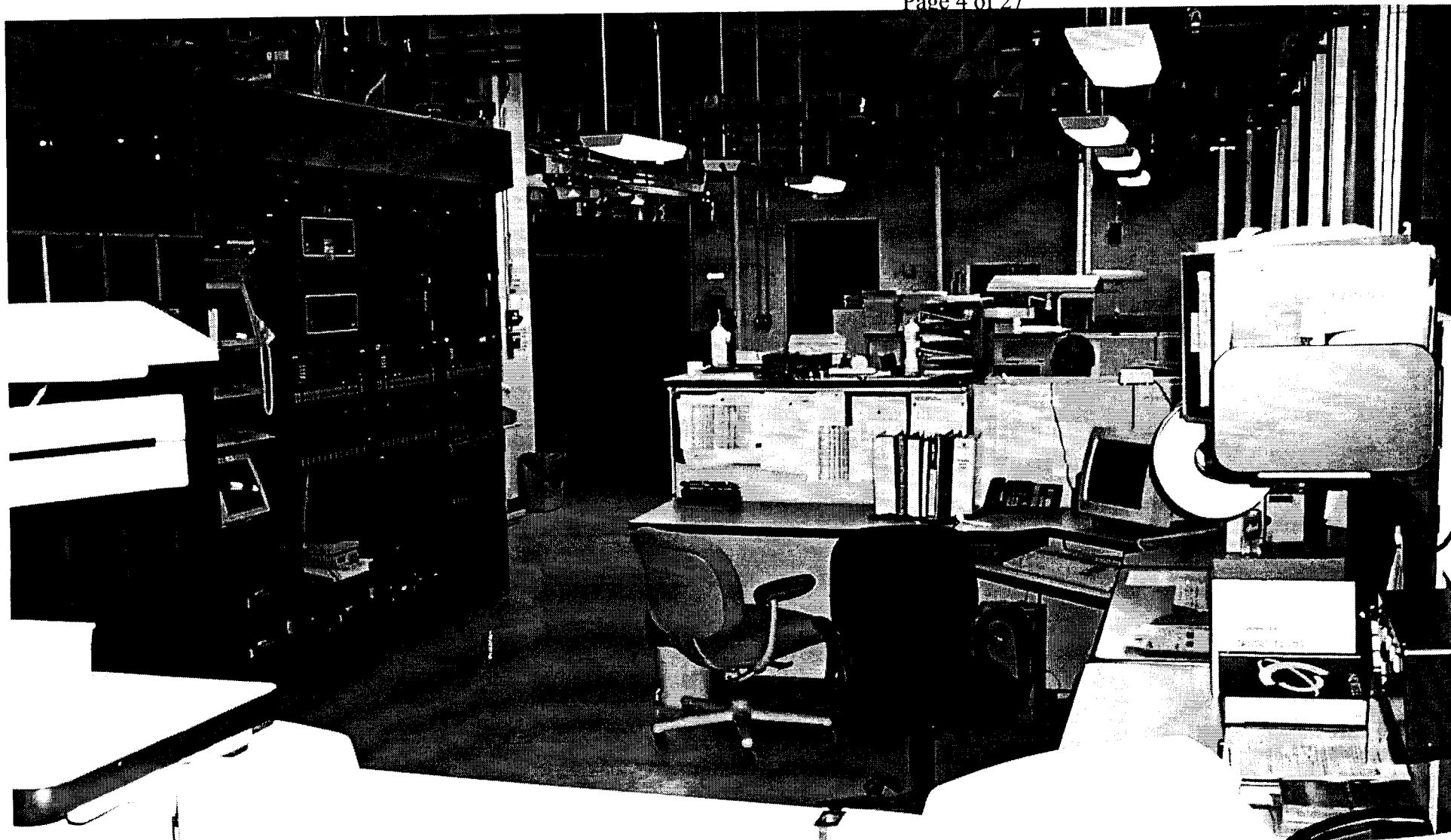
Garden Area 10 & 10a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 3 of 27



Garden Area 11a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 4 of 27



2/26/1999

Garden Area 11b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 5 of 27



Garden Area 11c

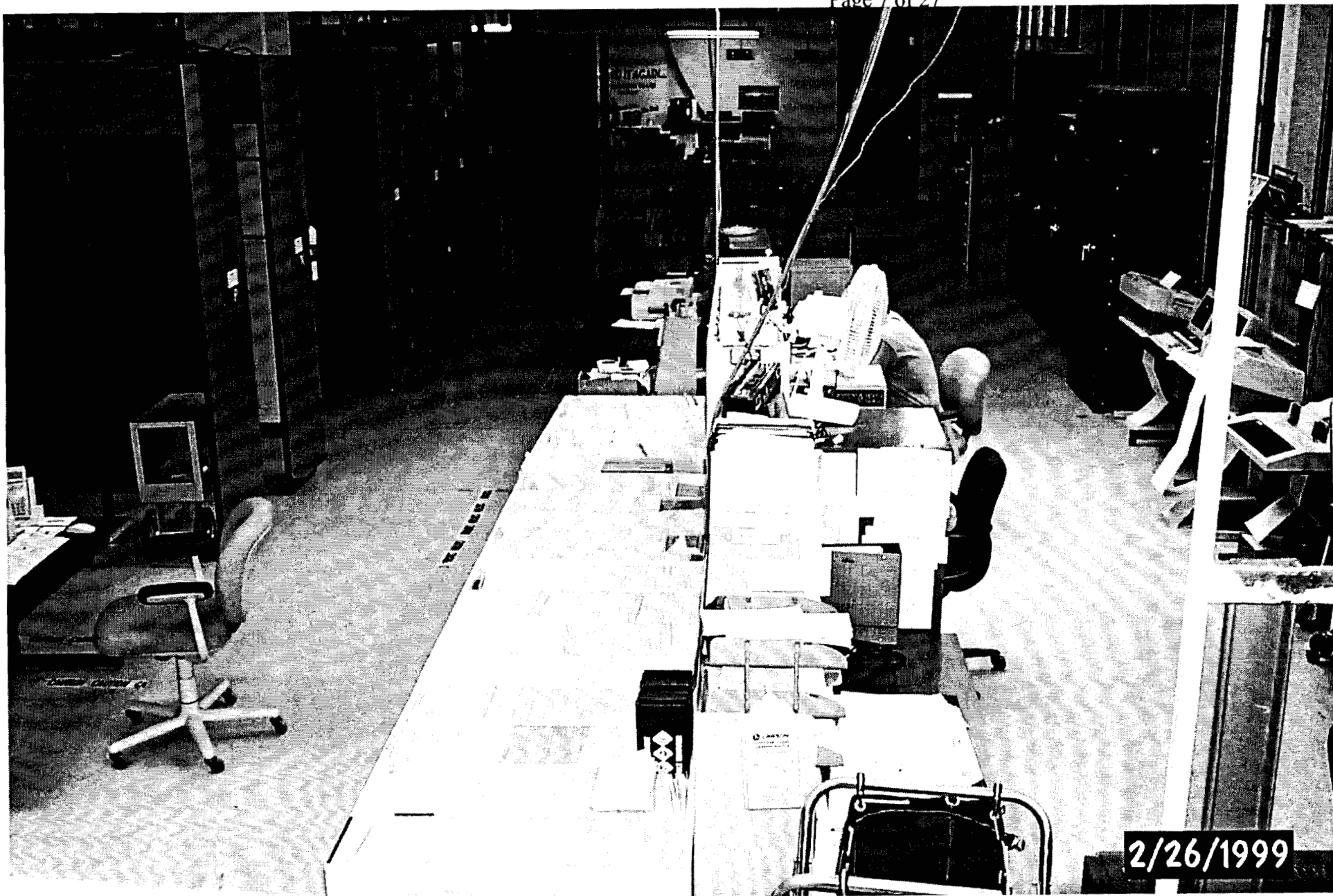
BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 6 of 27



2/26/1999

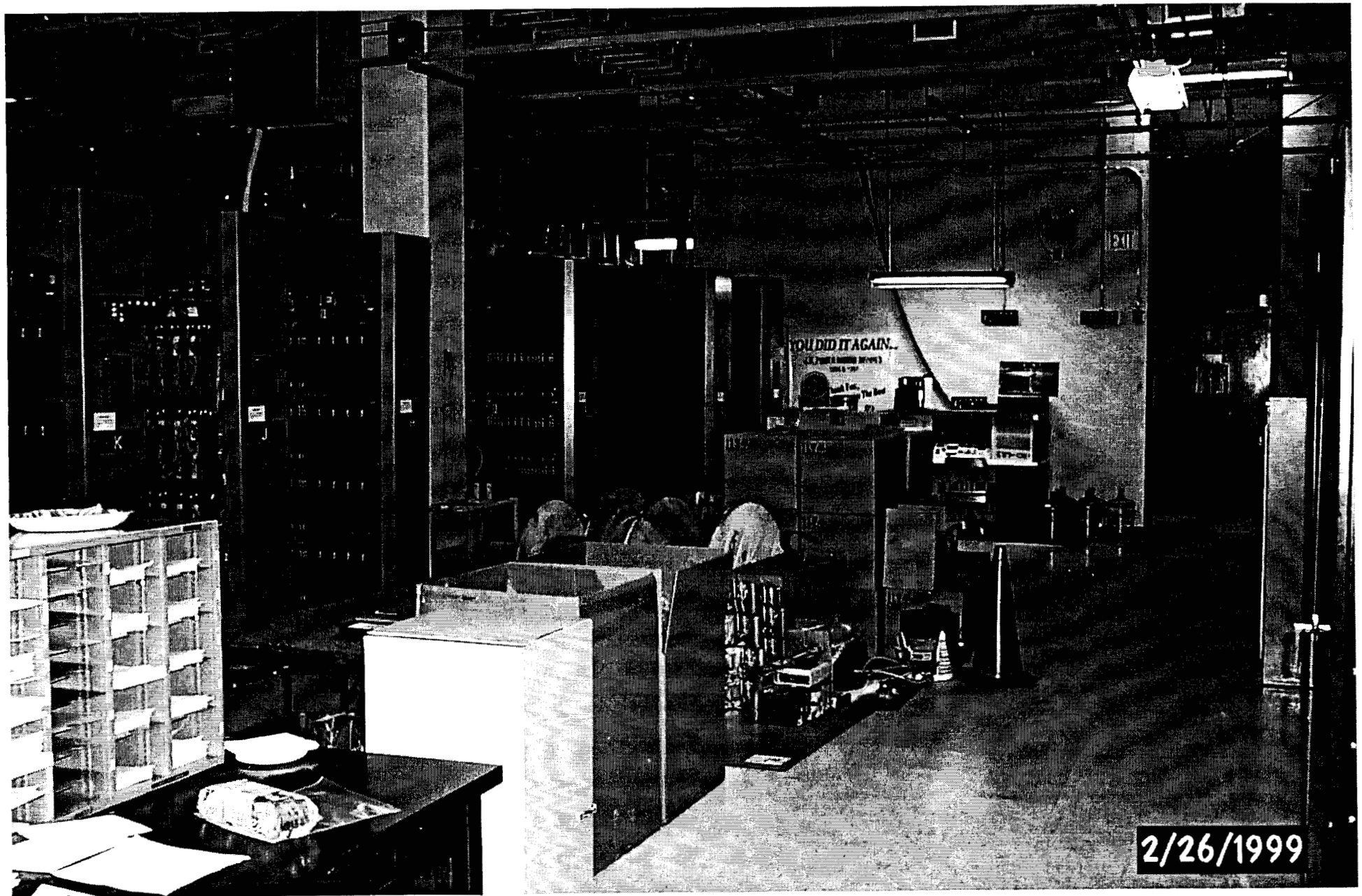
Garden Area 2a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 7 of 27



Garden Area 2b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 8 of 27



2/26/1999

Garden Area 12

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 9 of 27



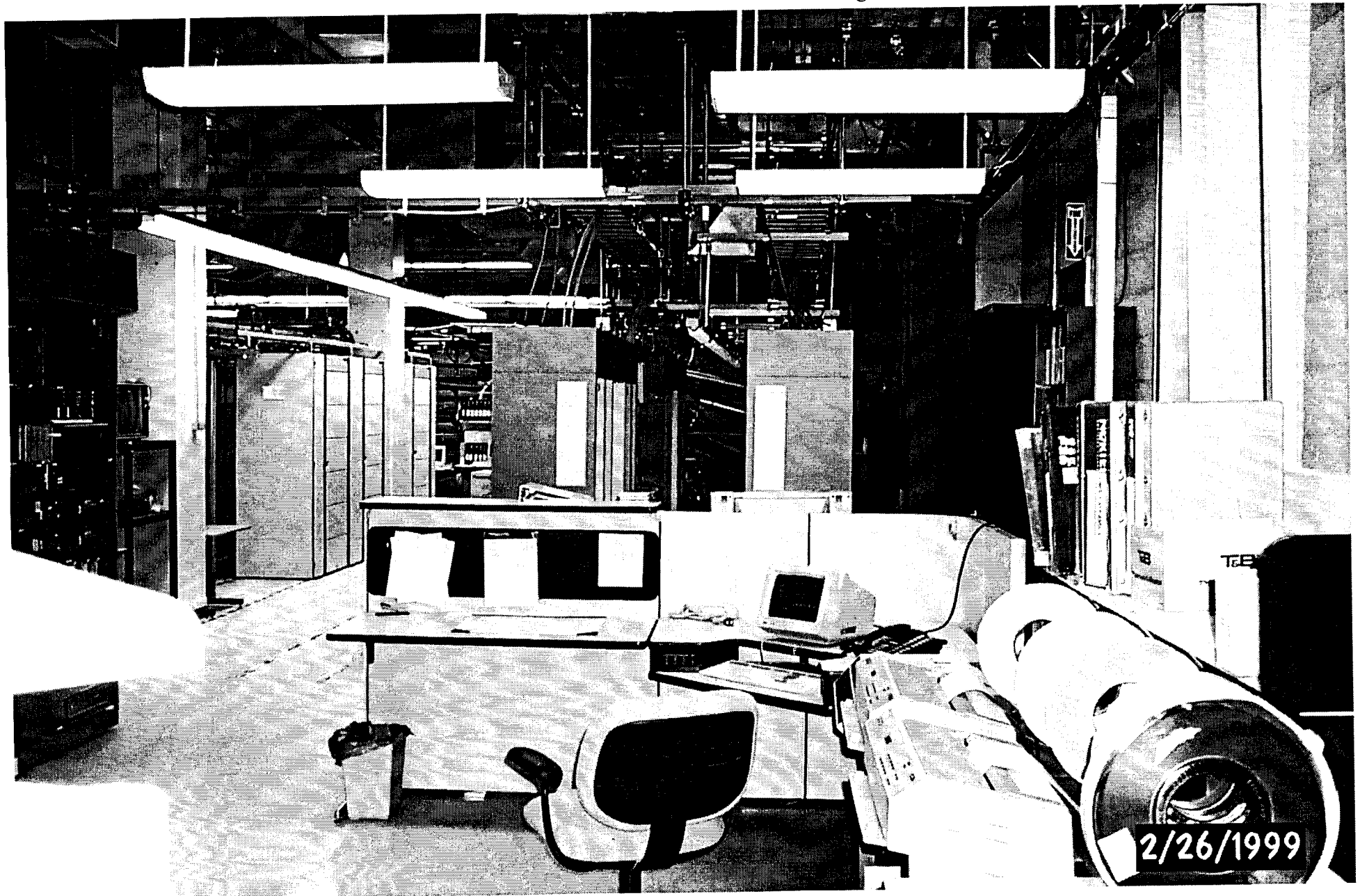
Garden Area 1a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 10 of 27



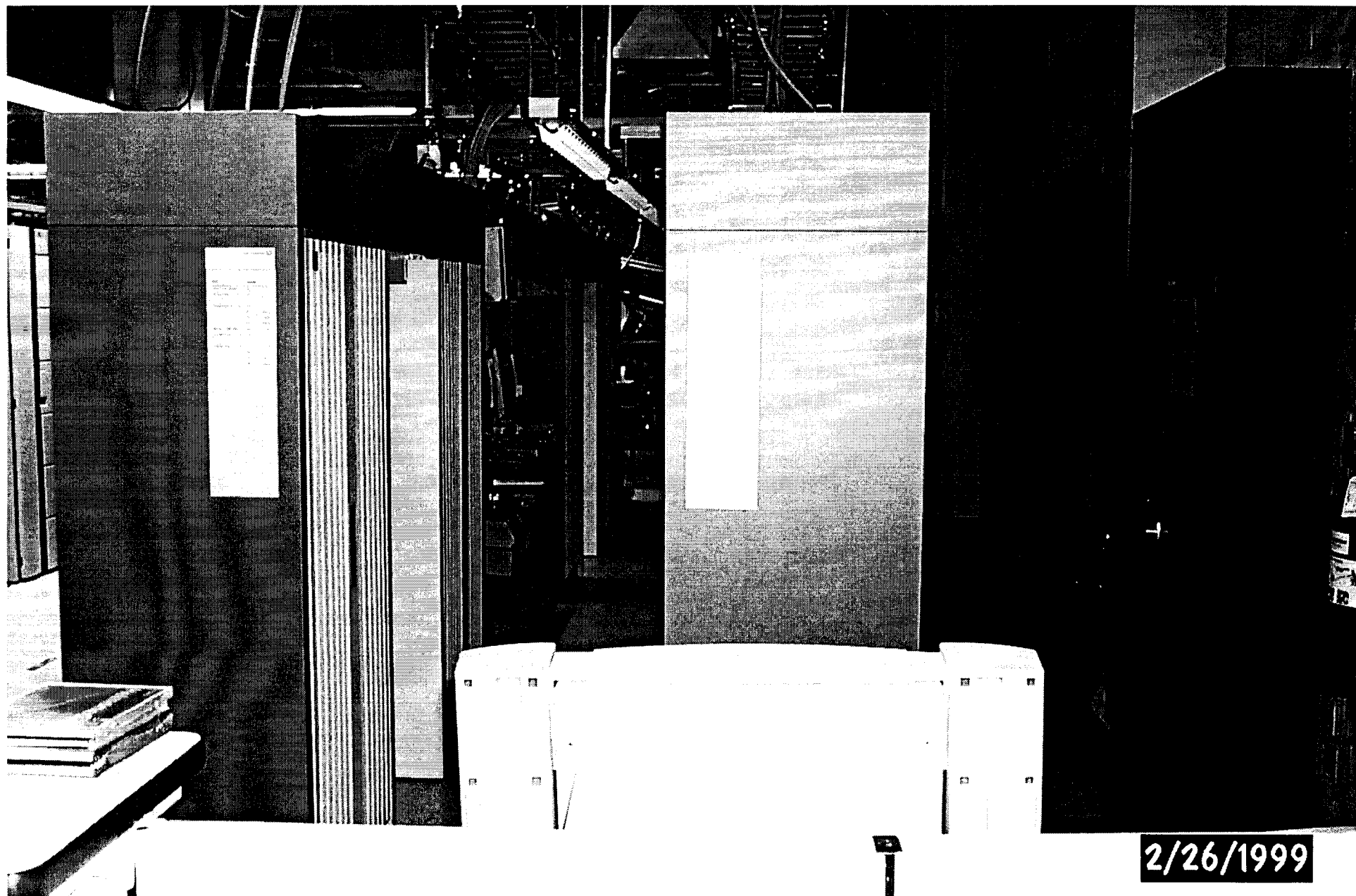
Garden Area 1b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 11 of 27



Garden Area 1c

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 12 of 27



Garden Area 1d

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 13 of 27



Garden Area 1e

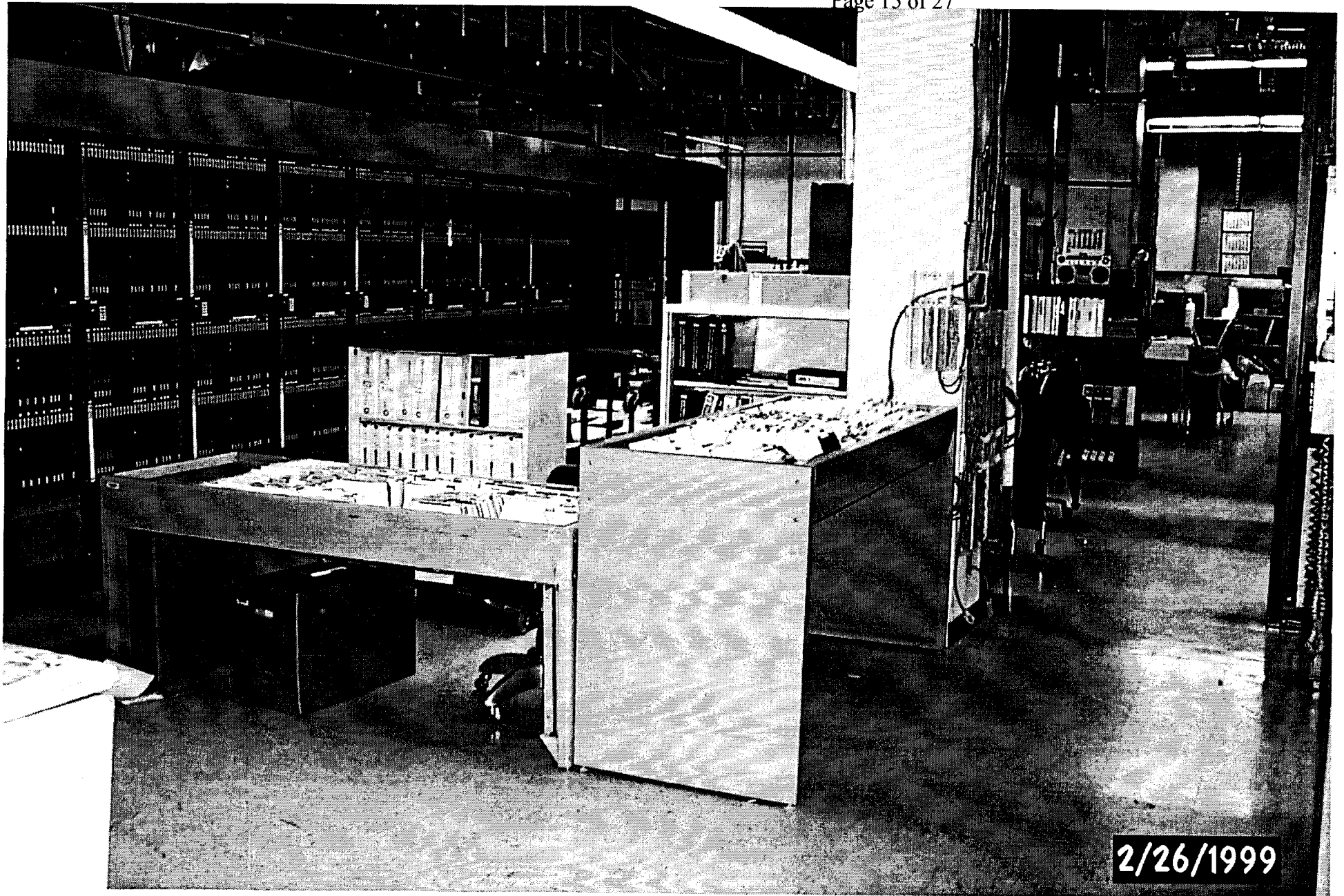
BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 14 of 27



2/26/1999

Garden Area 3a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 15 of 27



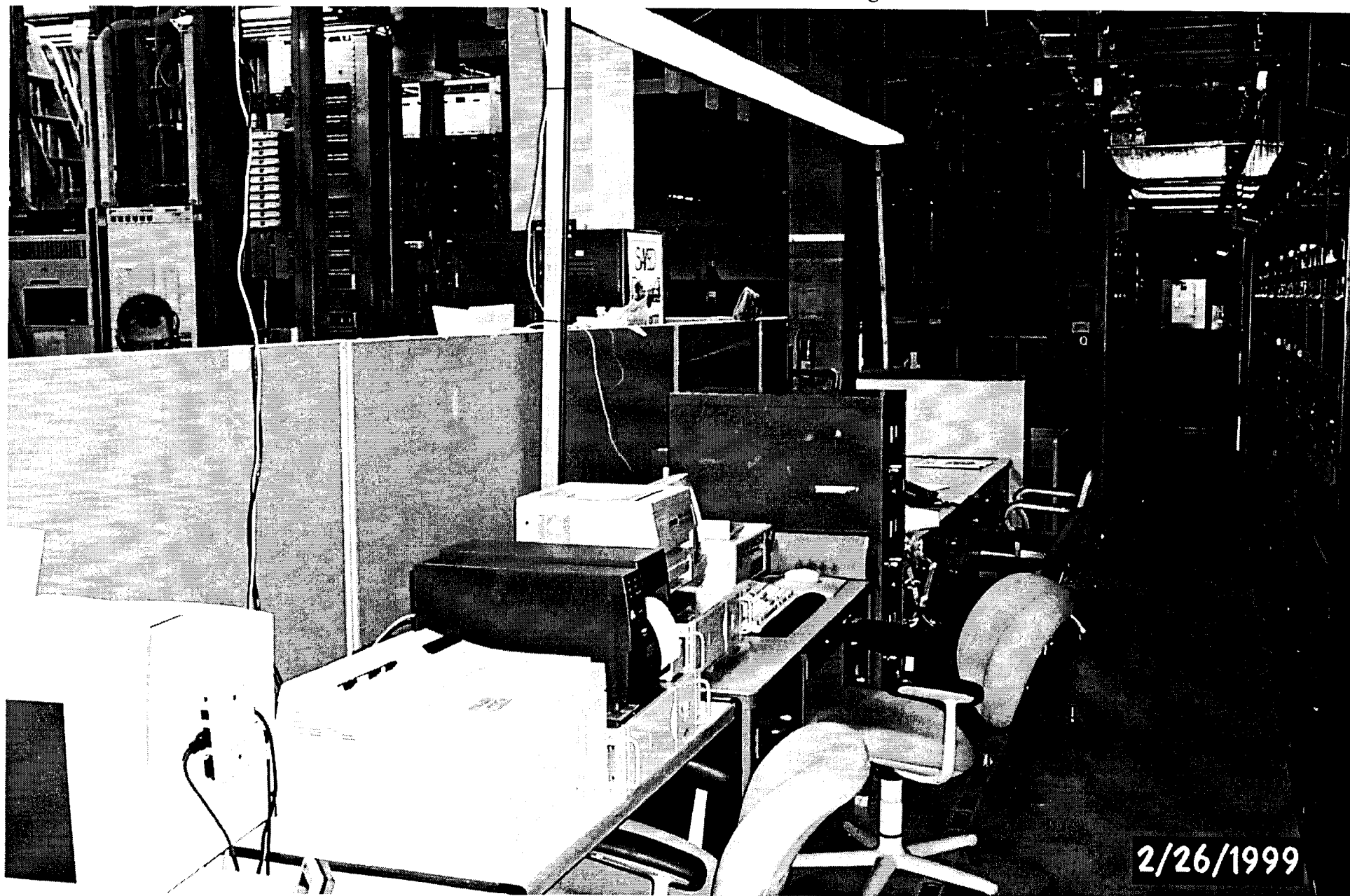
Garden Area 3b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 16 of 27



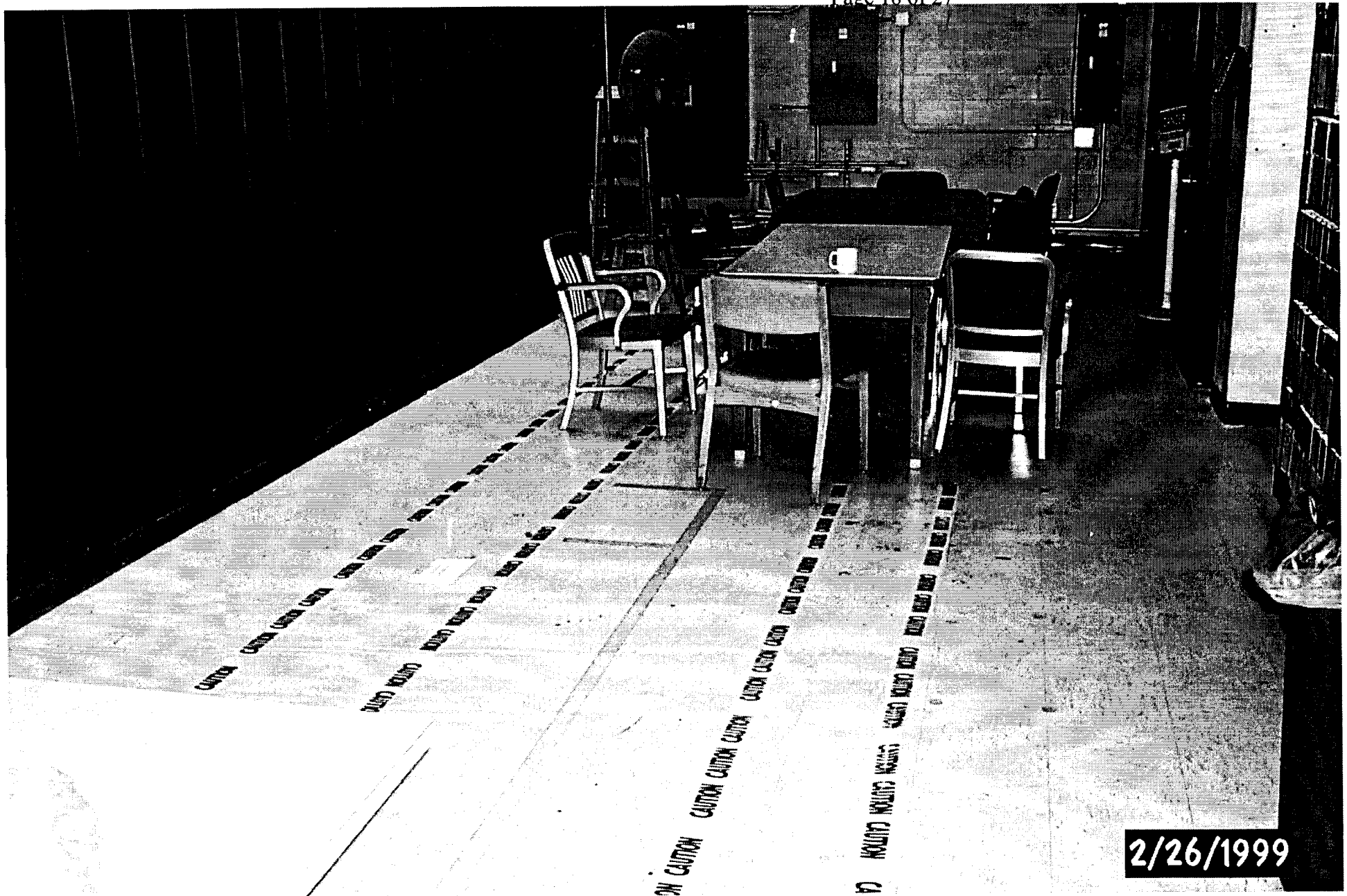
Garden Area 3c

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 17 of 27



Garden Area 4

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 18 of 27



Garden Area 5a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 19 of 27



Garden Area 5b

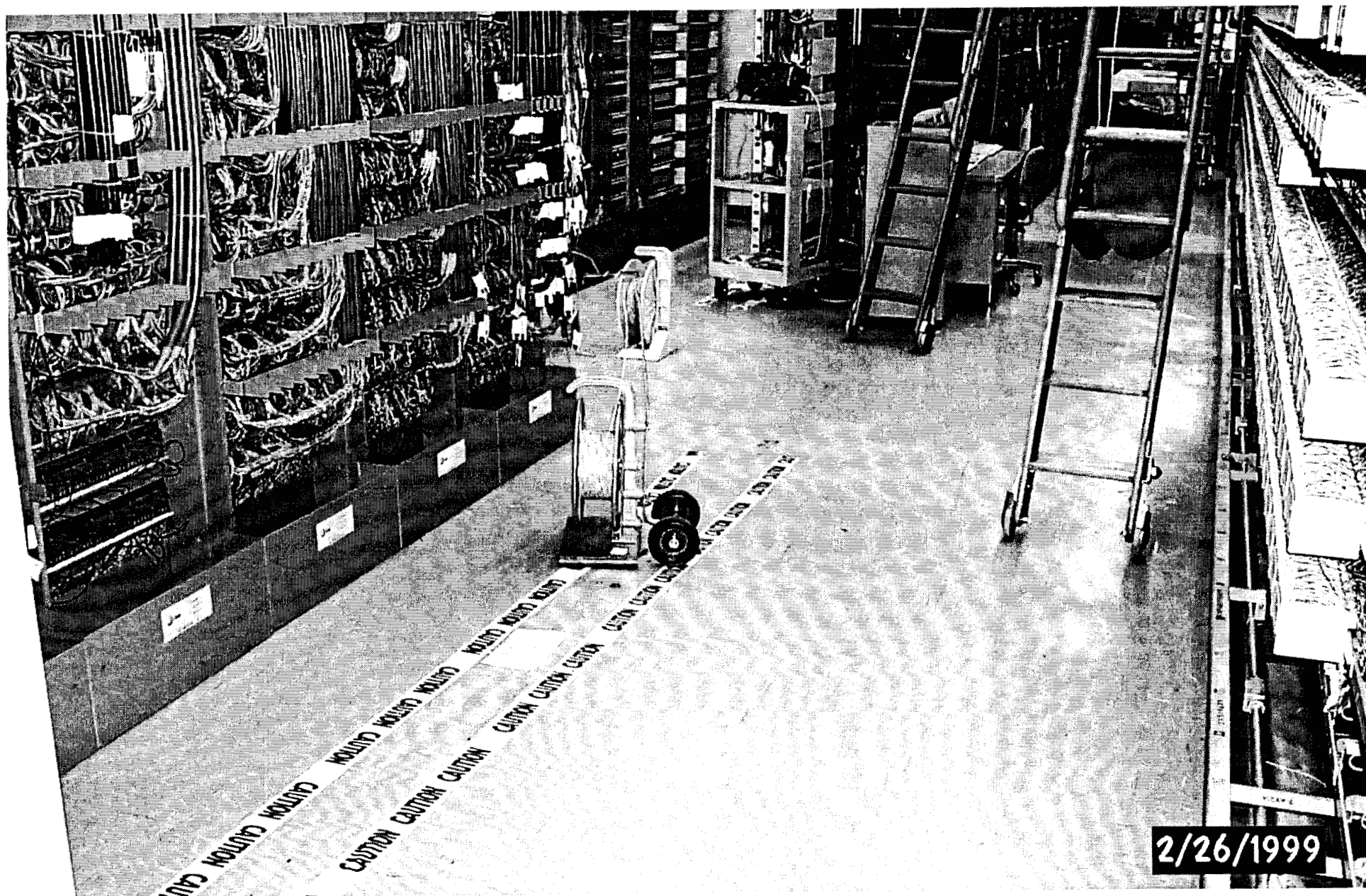
BellSouth Telecommunications, Inc.

FPSC Docket No. 980946-TL, 980947-TL, 980948-TL

981011-TL, 981012-TL, 981250-TL

Exhibit JDB-15

Page 20 of 27



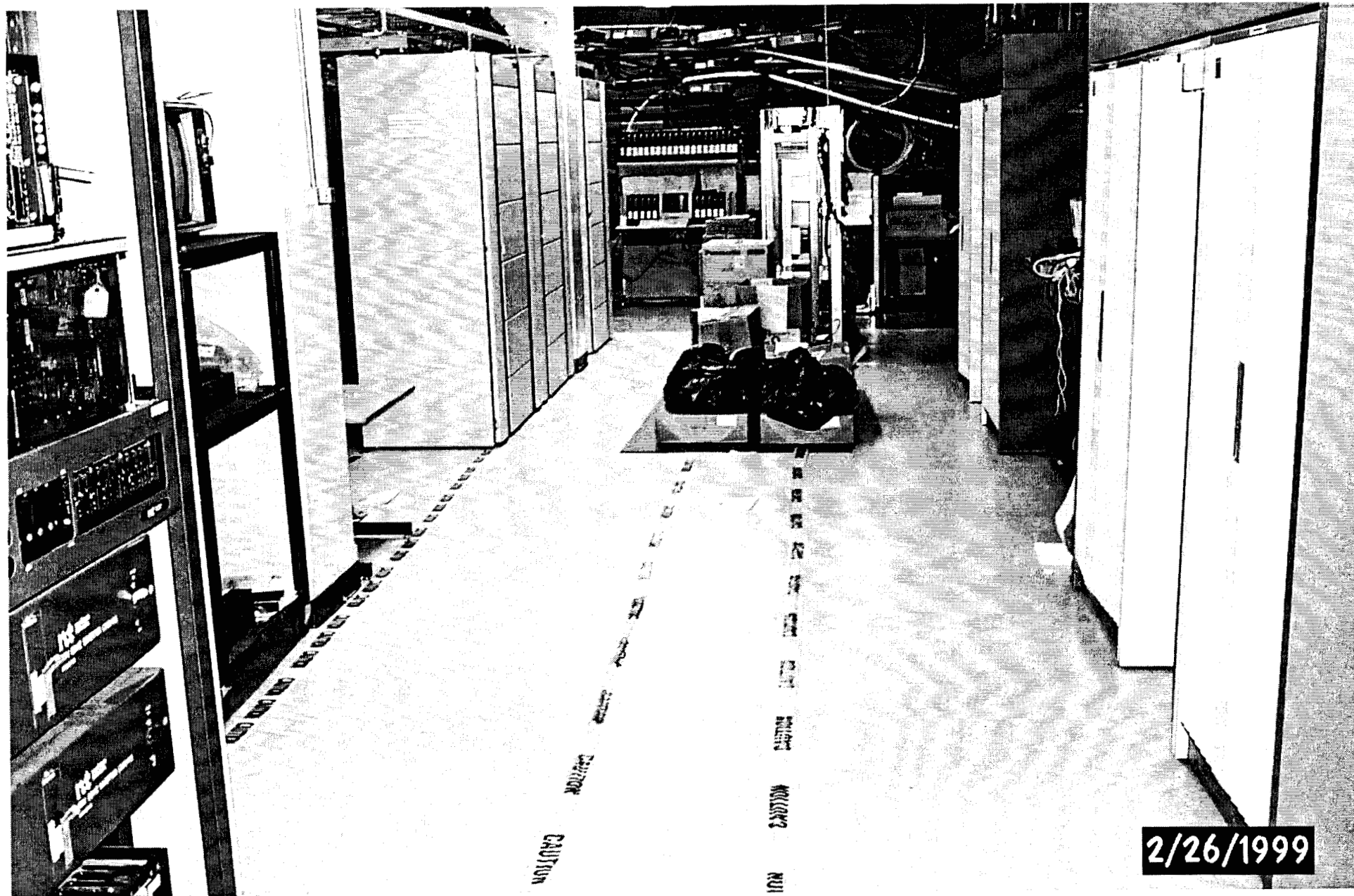
Garden Area 8

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 21 of 27



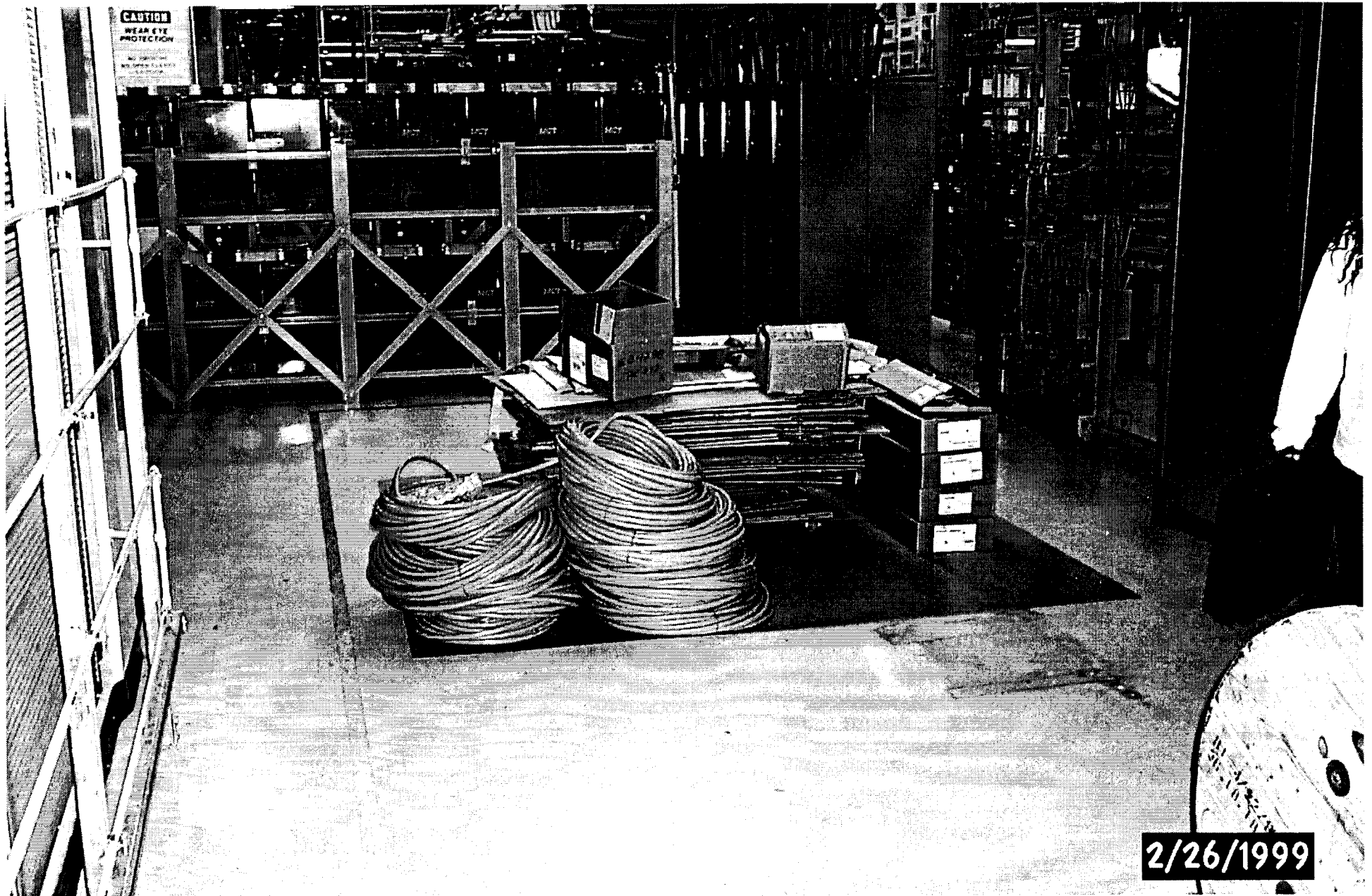
Garden Area 9

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 22 of 27



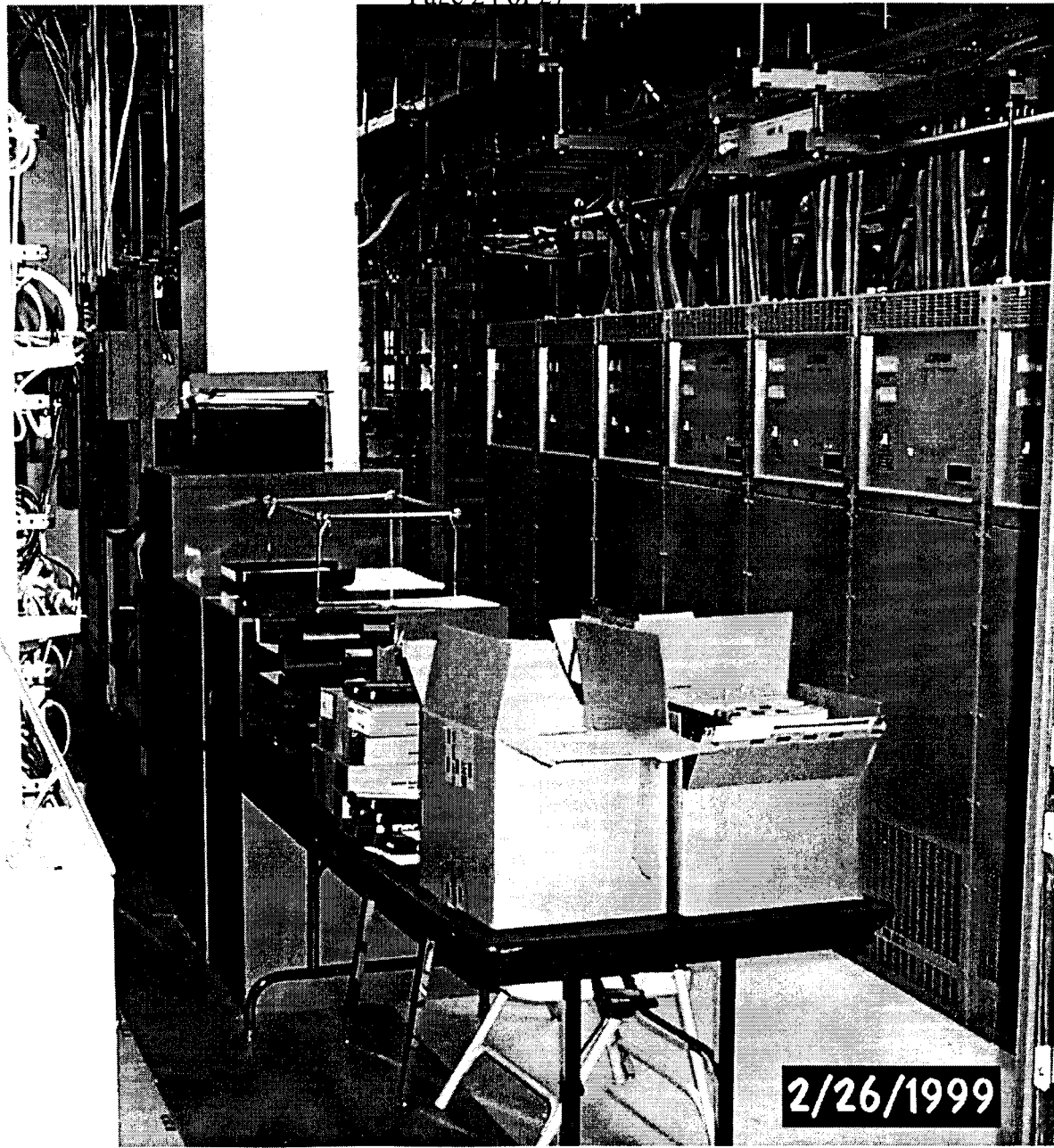
Garden Area 6

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 23 of 27



Garden Area 7

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 24 of 27



Garden Cable Congestion a

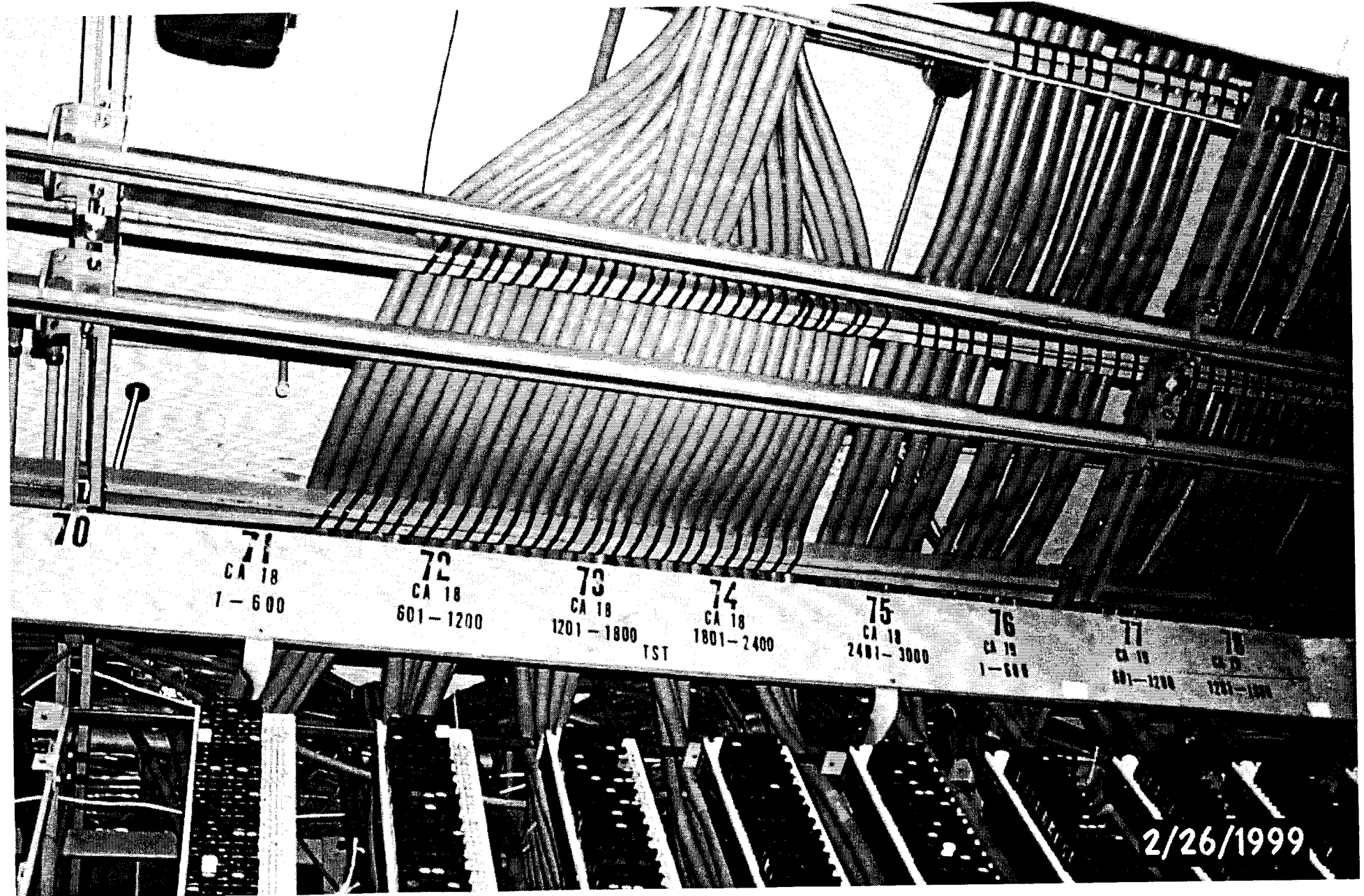
BellSouth Telecommunications, Inc.

FPSC Docket No. 980946-TL, 980947-TL, 980948-TL

981011-TL, 981012-TL, 981250-TL

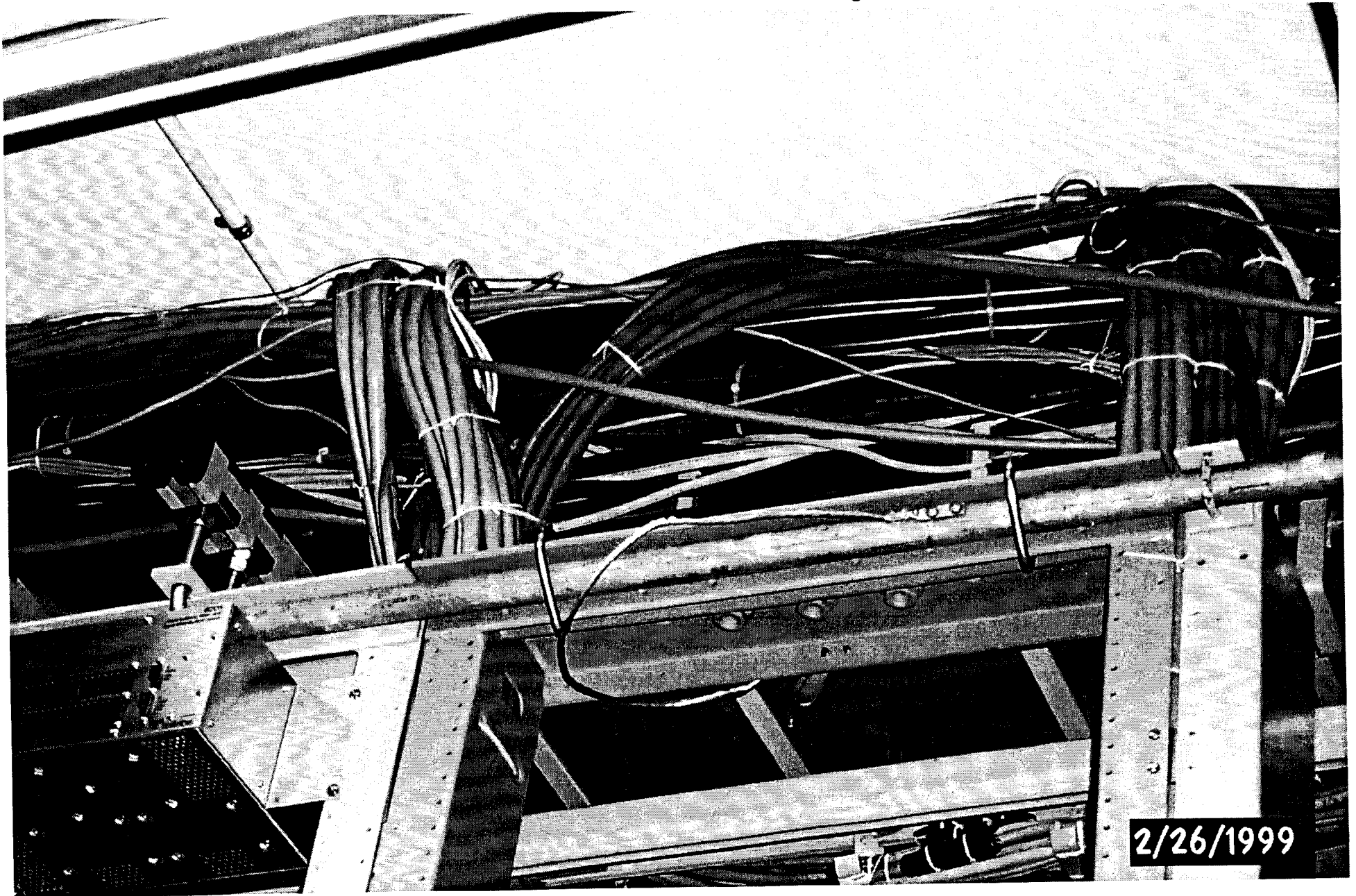
Exhibit JDB-15

Page 25 of 27



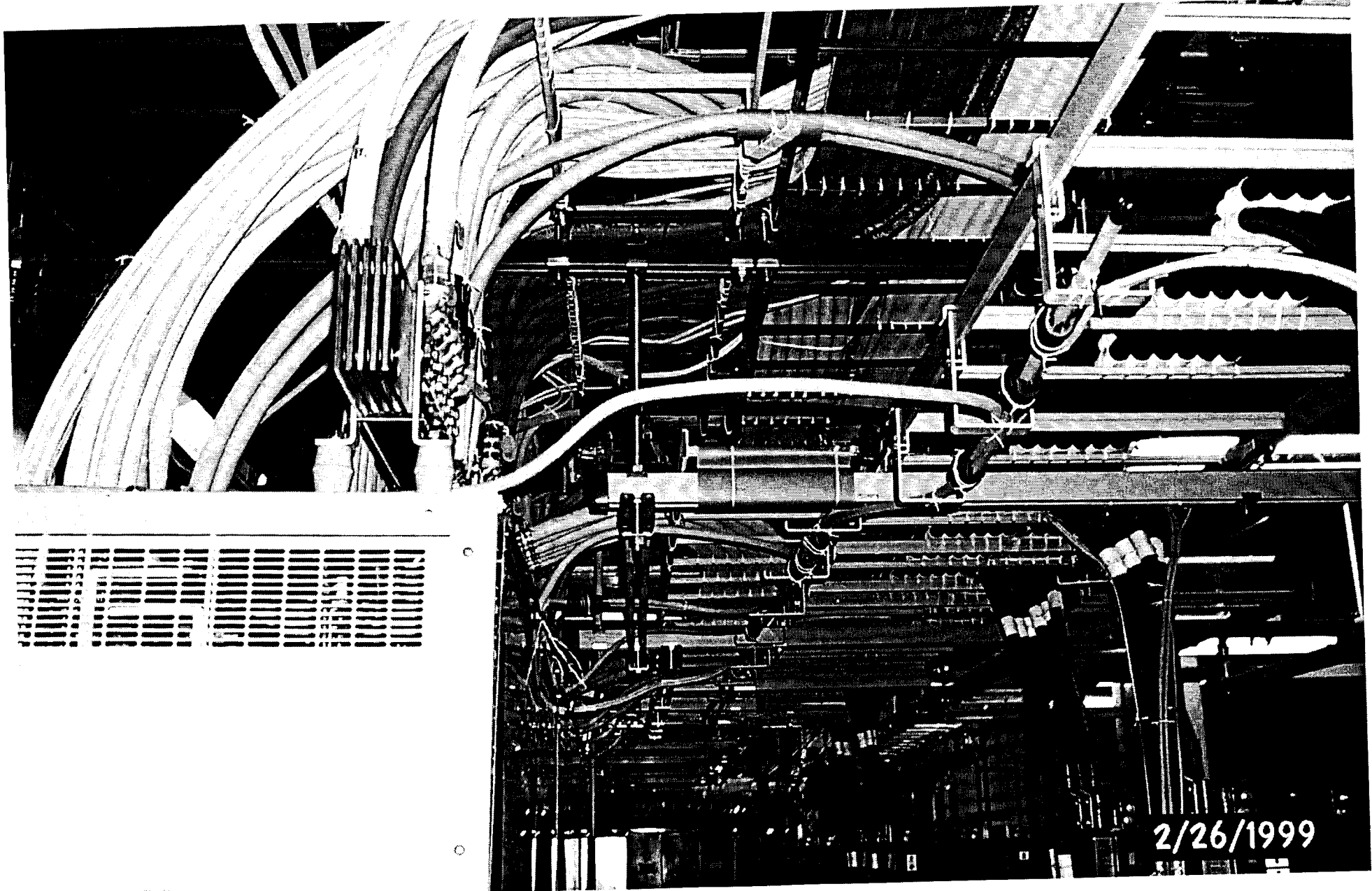
Garden Cable Congestion b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 26 of 27



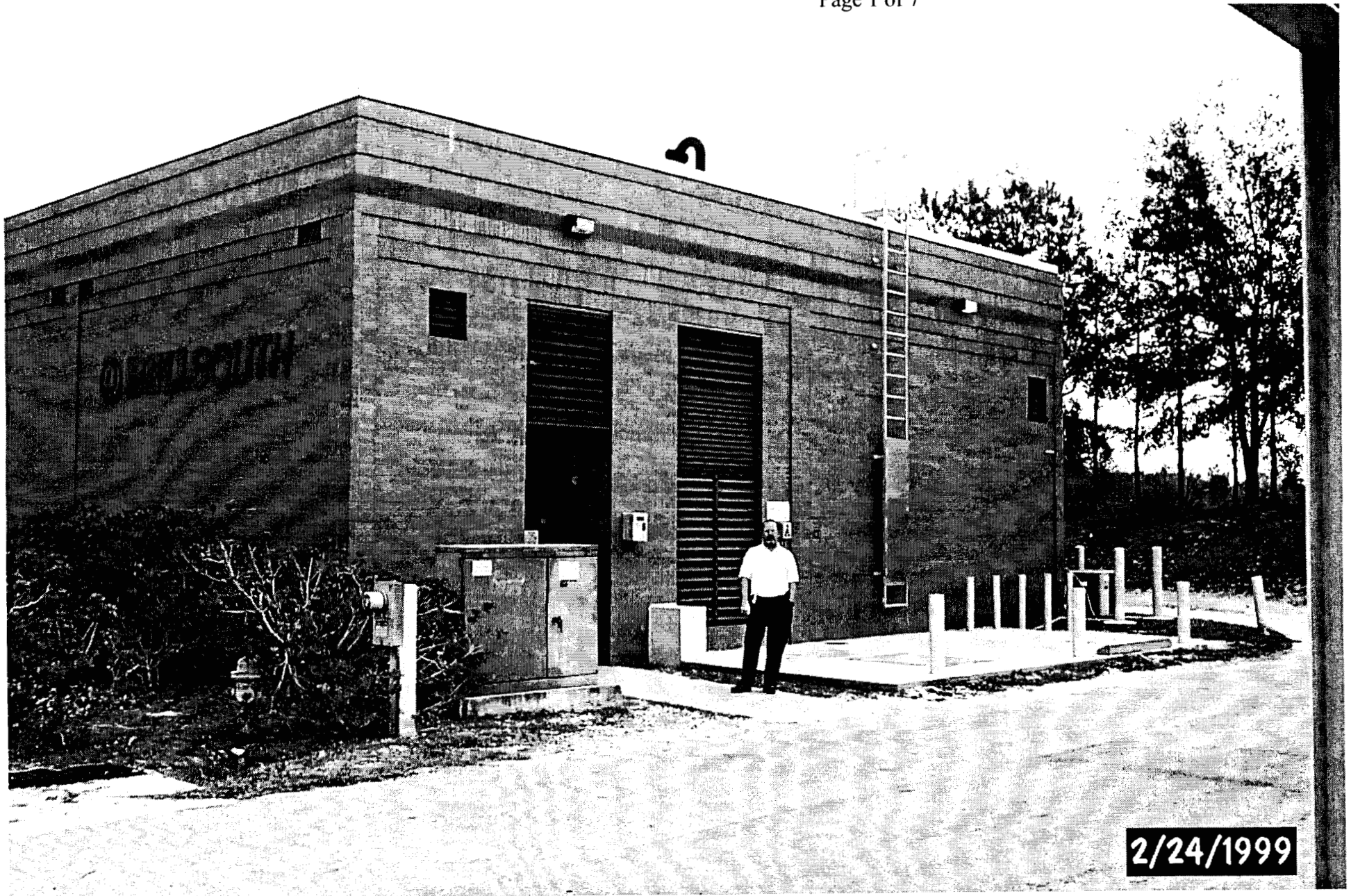
Garden Cable Congestion c

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-15
Page 27 of 27



Lake Mary Central Office

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-16
Page 1 of 7



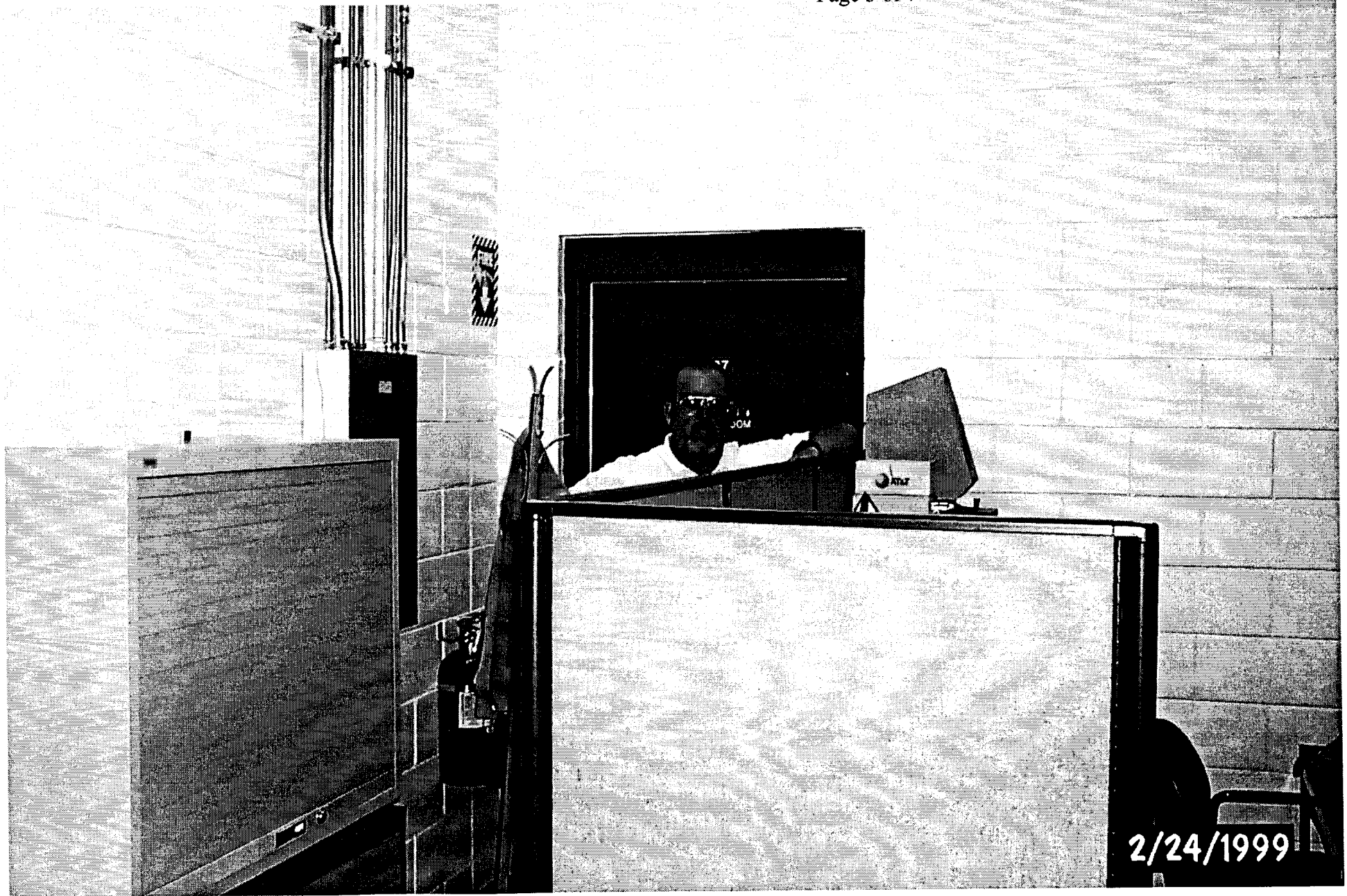
Lake Mary Central Office

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-16
Page 2 of 7



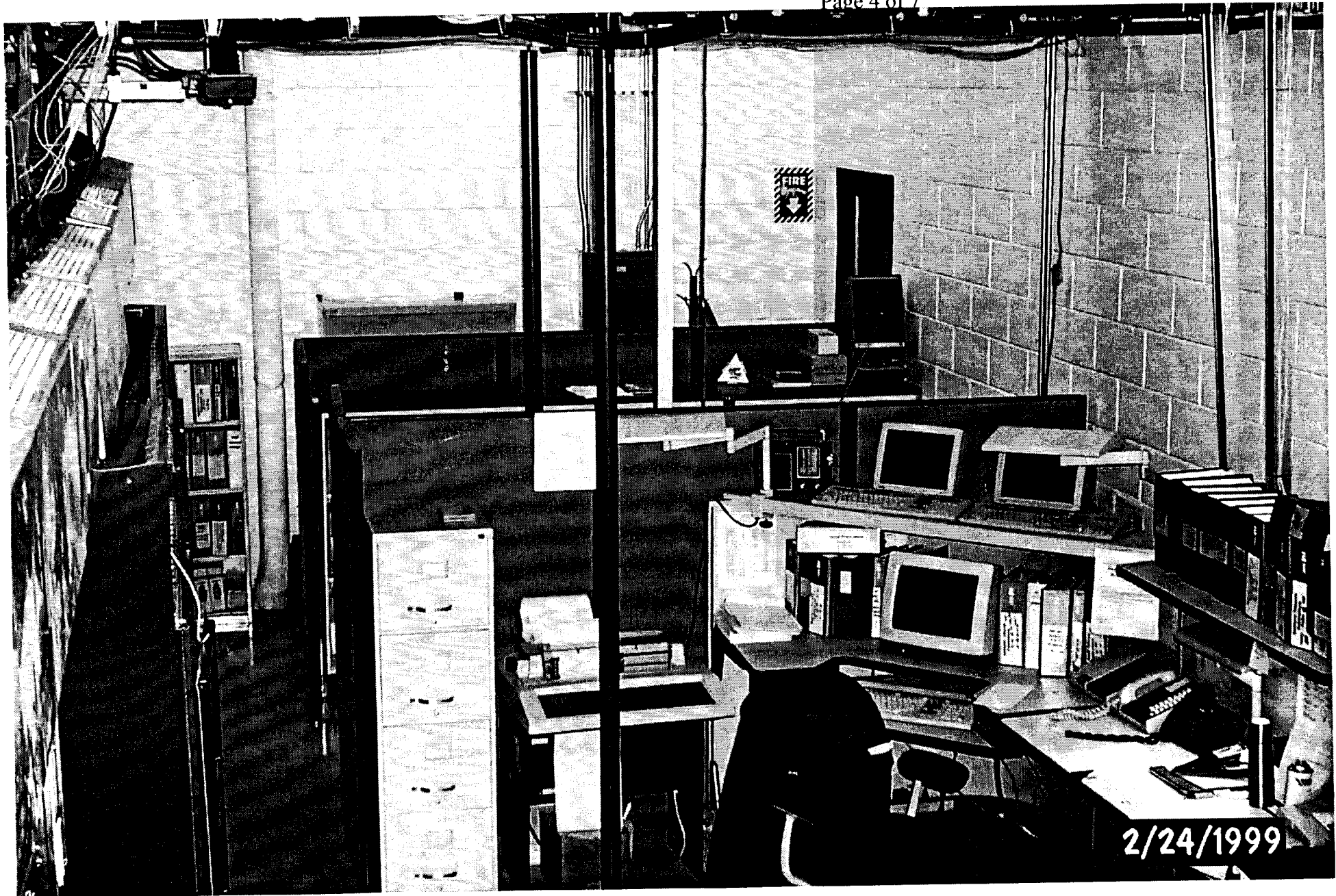
Lake Mary Area 1a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-16
Page 3 of 7



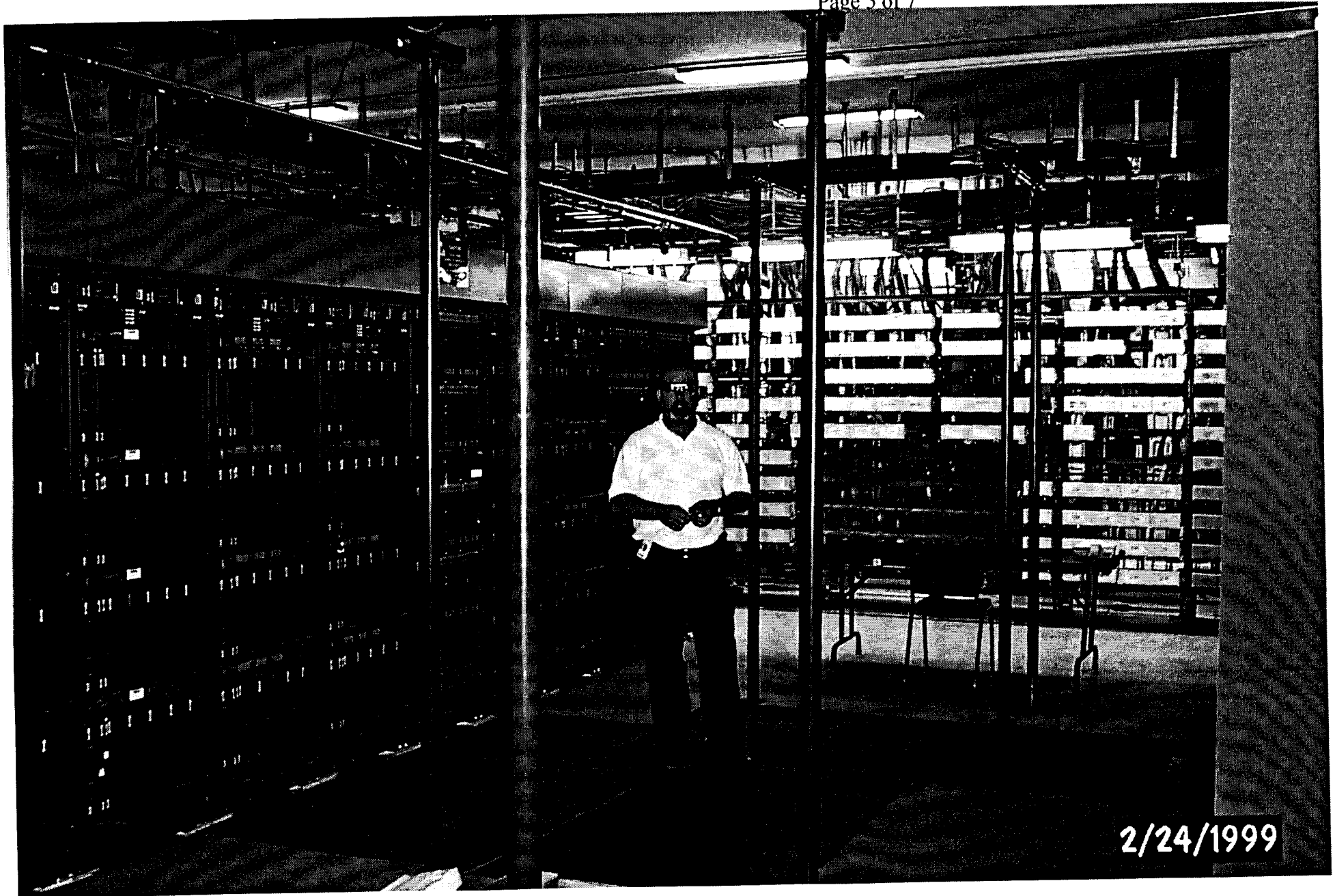
Lake Mary Area 1b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-16
Page 4 of 7



Lake Mary Area 2

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-16
Page 5 of 7



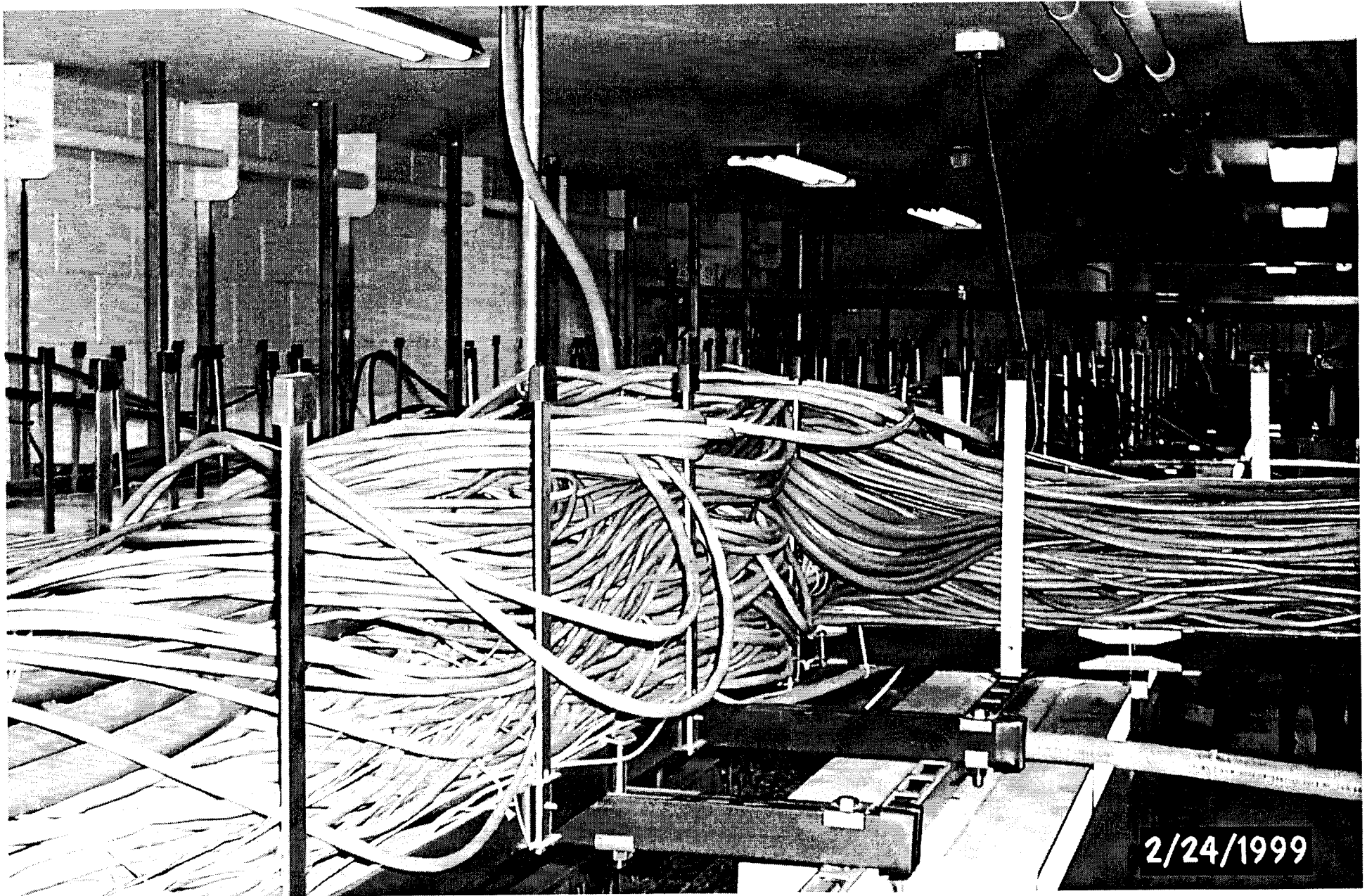
Lake Mary Area 3

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-16
Page 6 of 7



Lake Mary Cable Congestion

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-16
Page 7 of 7



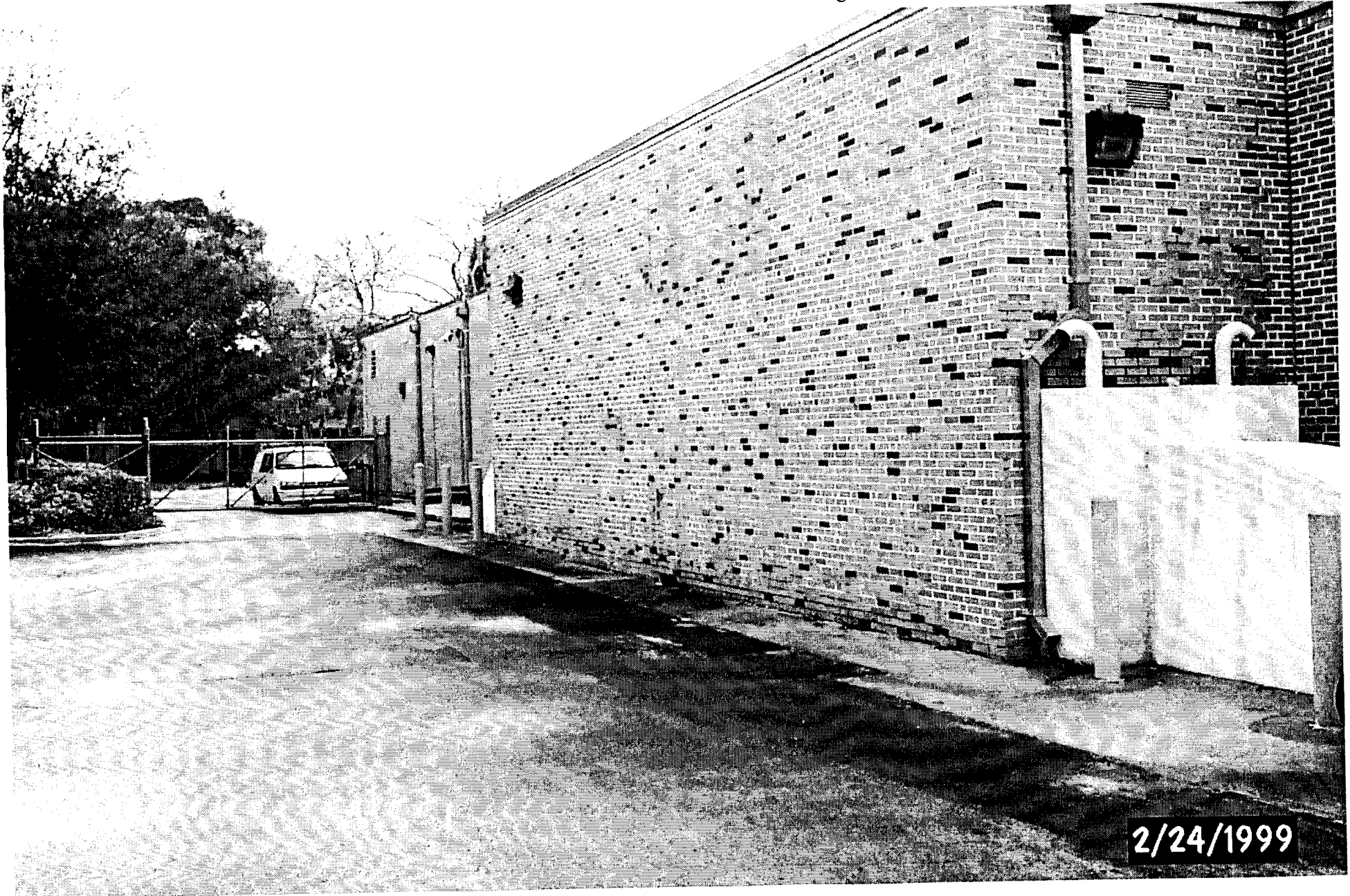
Port Orange Central Office

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 1 of 28



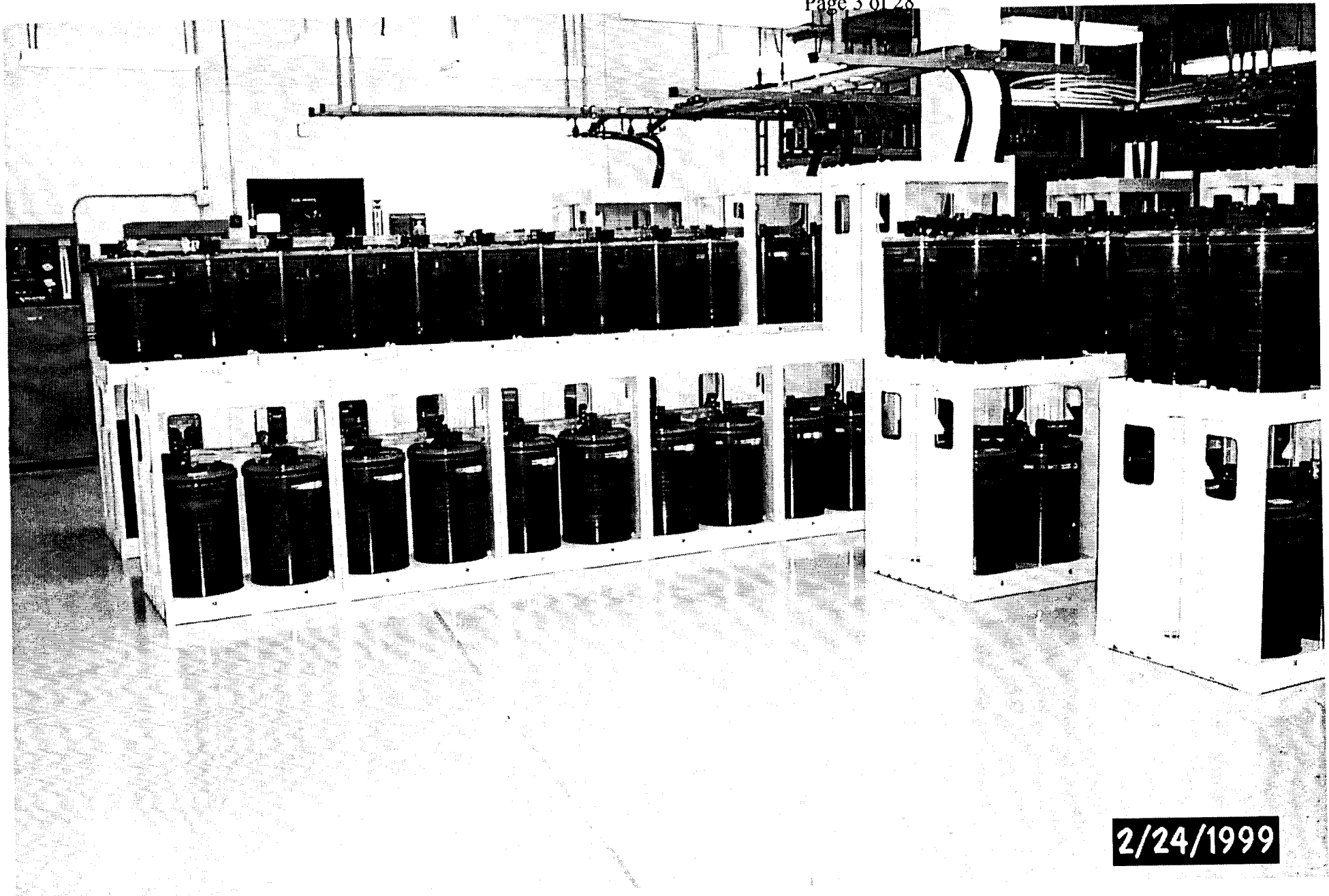
Port Orange Central Office

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 2 of 28



Port Orange Area 2

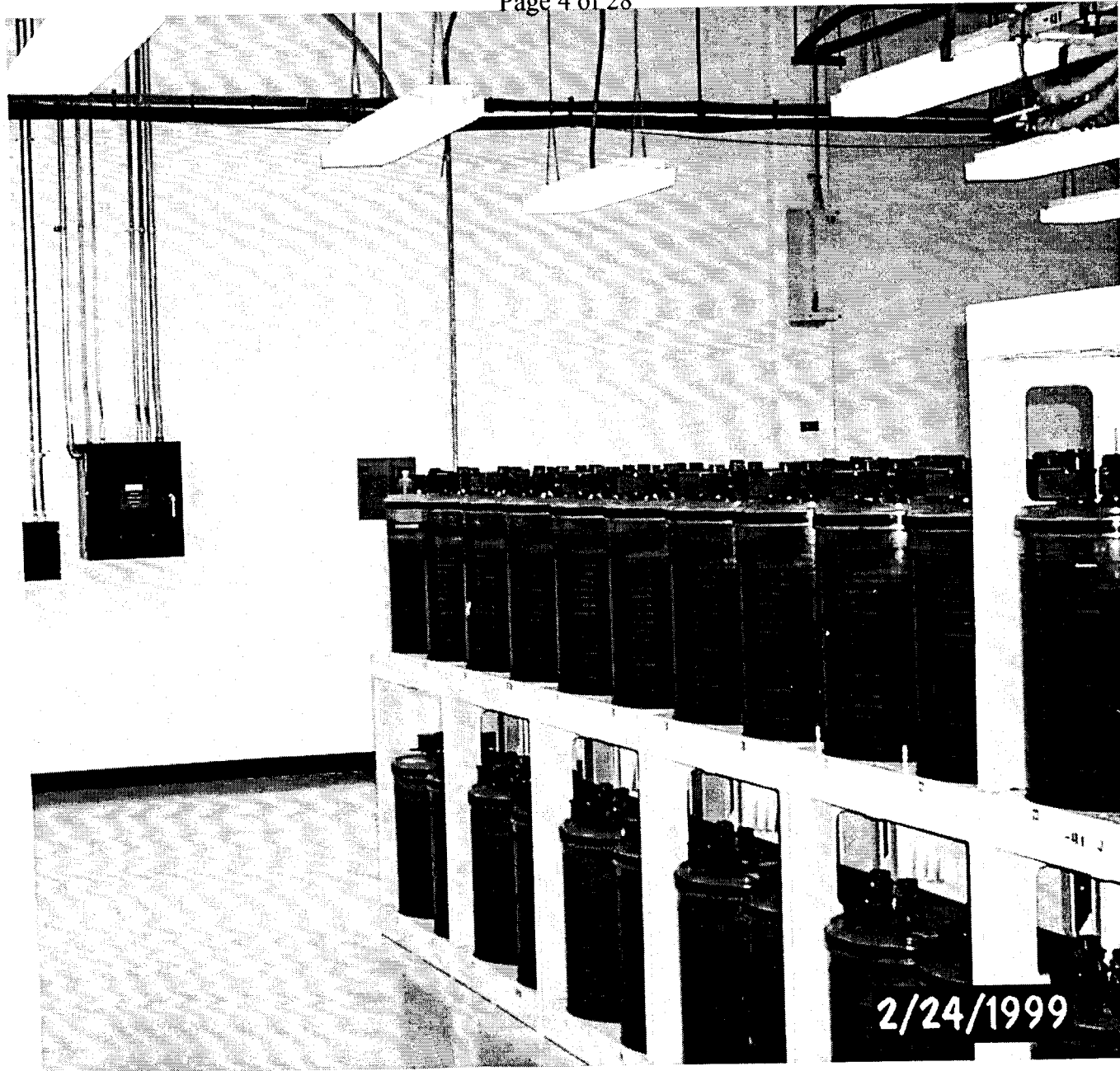
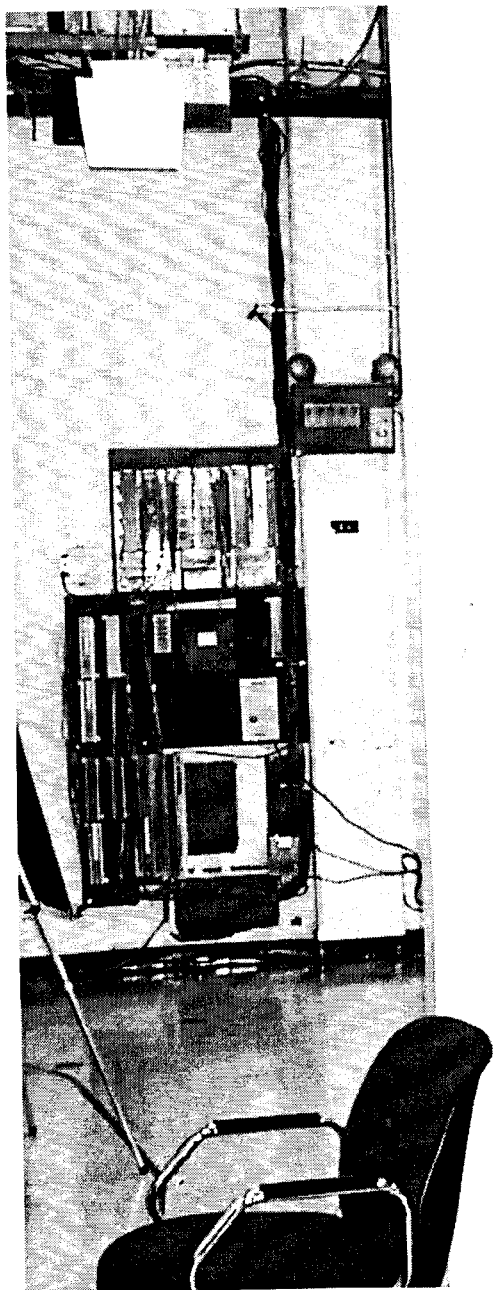
BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 3 of 28



2/24/1999

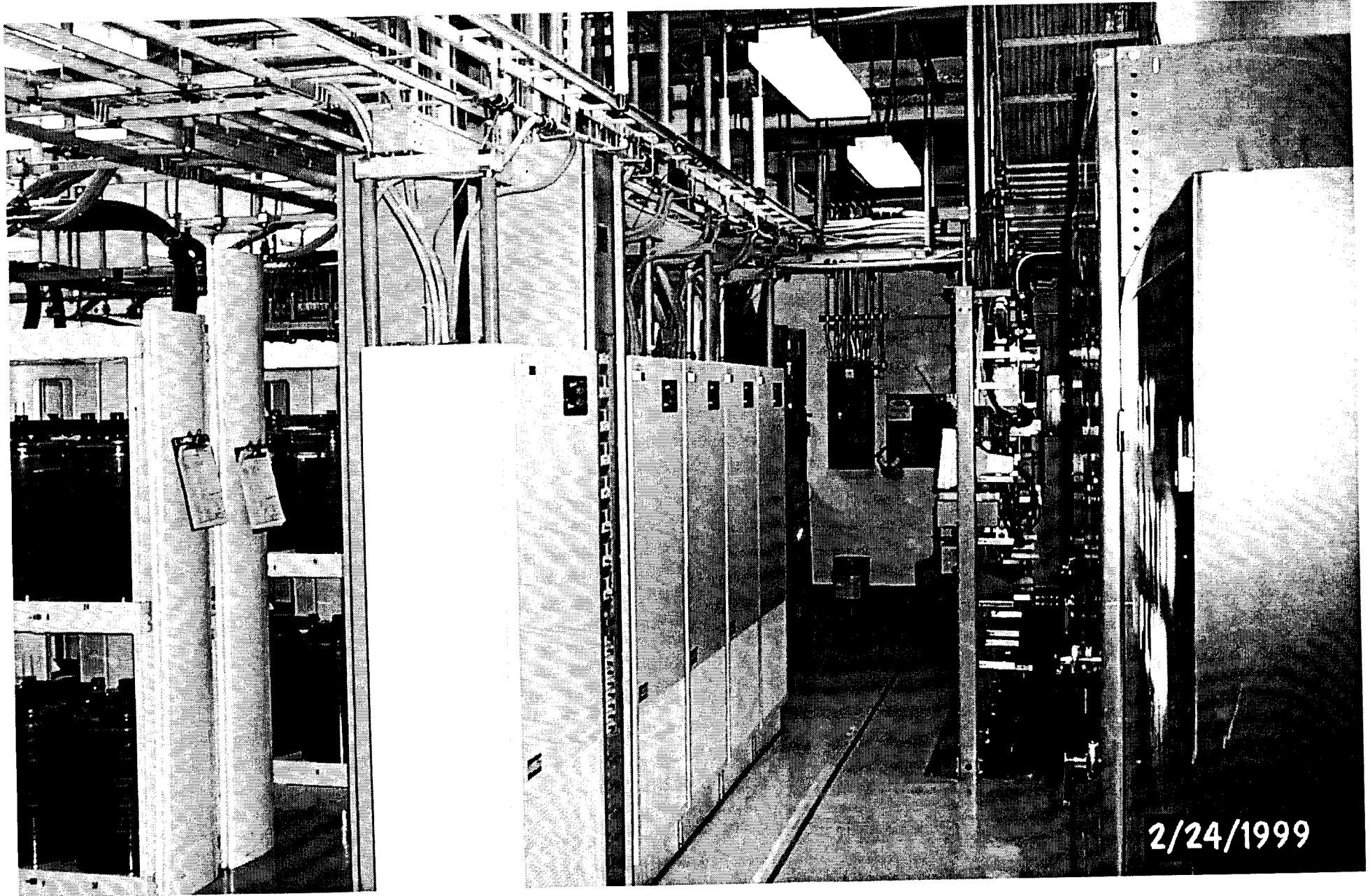
Port Orange Area 2 & 3

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 4 of 28



Port Orange Area 4

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 5 of 28



Port Orange Area 11a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 6 of 28



Port Orange Area 11b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 7 of 28



Port Orange Area 7

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 8 of 28



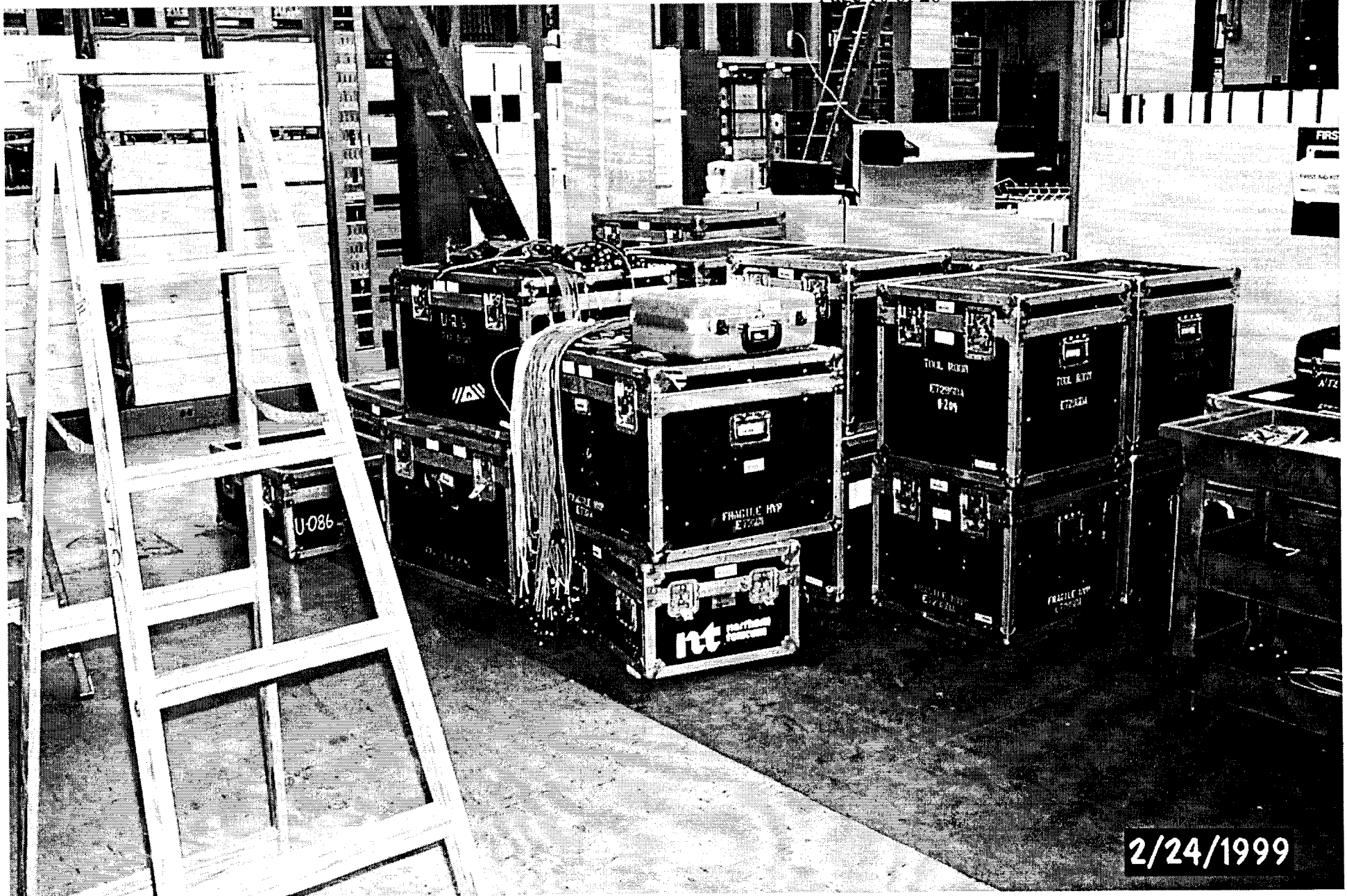
Port Orange Area 7 & 8

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 9 of 28



Port Orange Area 5a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 10 of 28



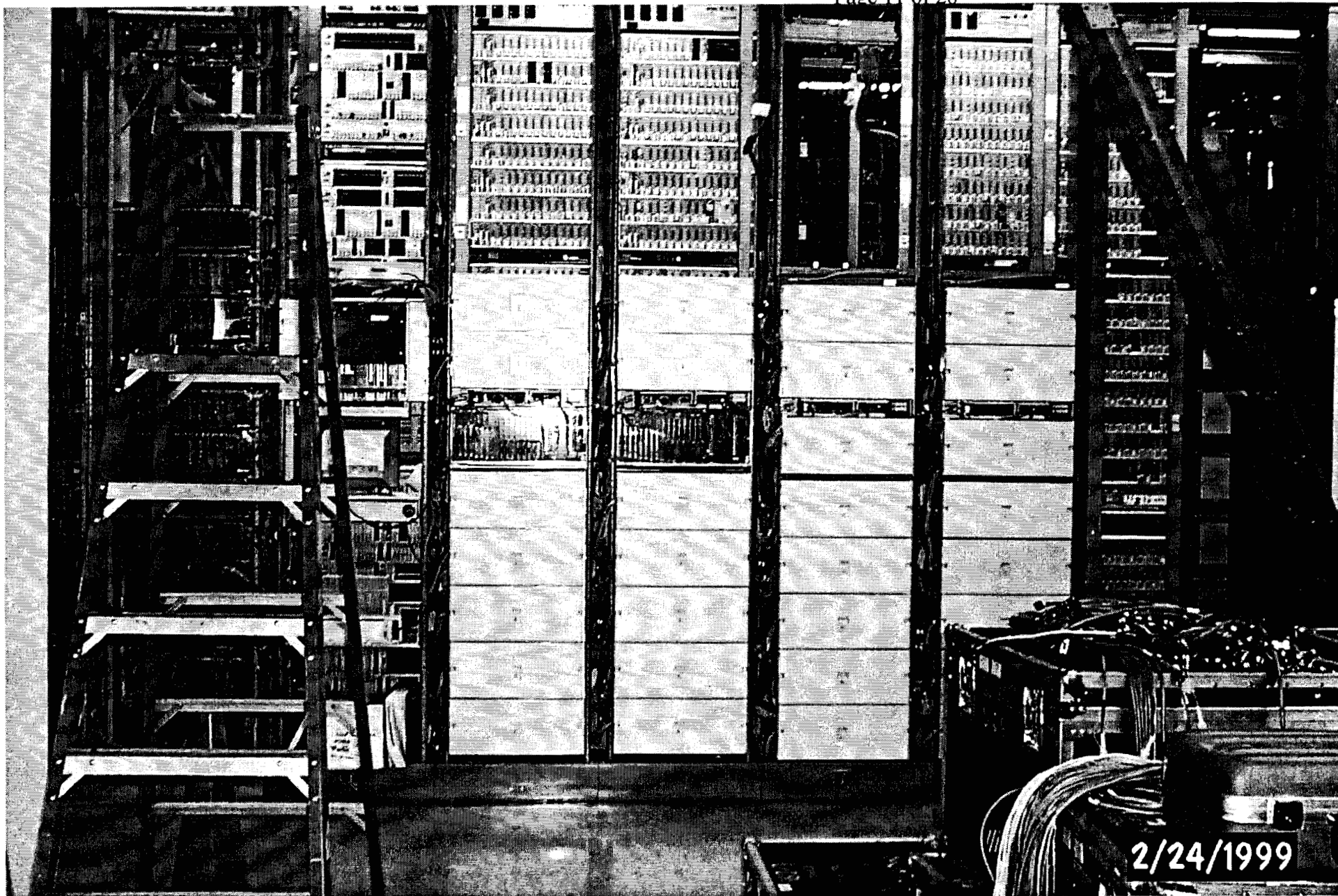
Port Orange Area 5b (& grounding isle)

BellSouth Telecommunications, Inc.

FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL

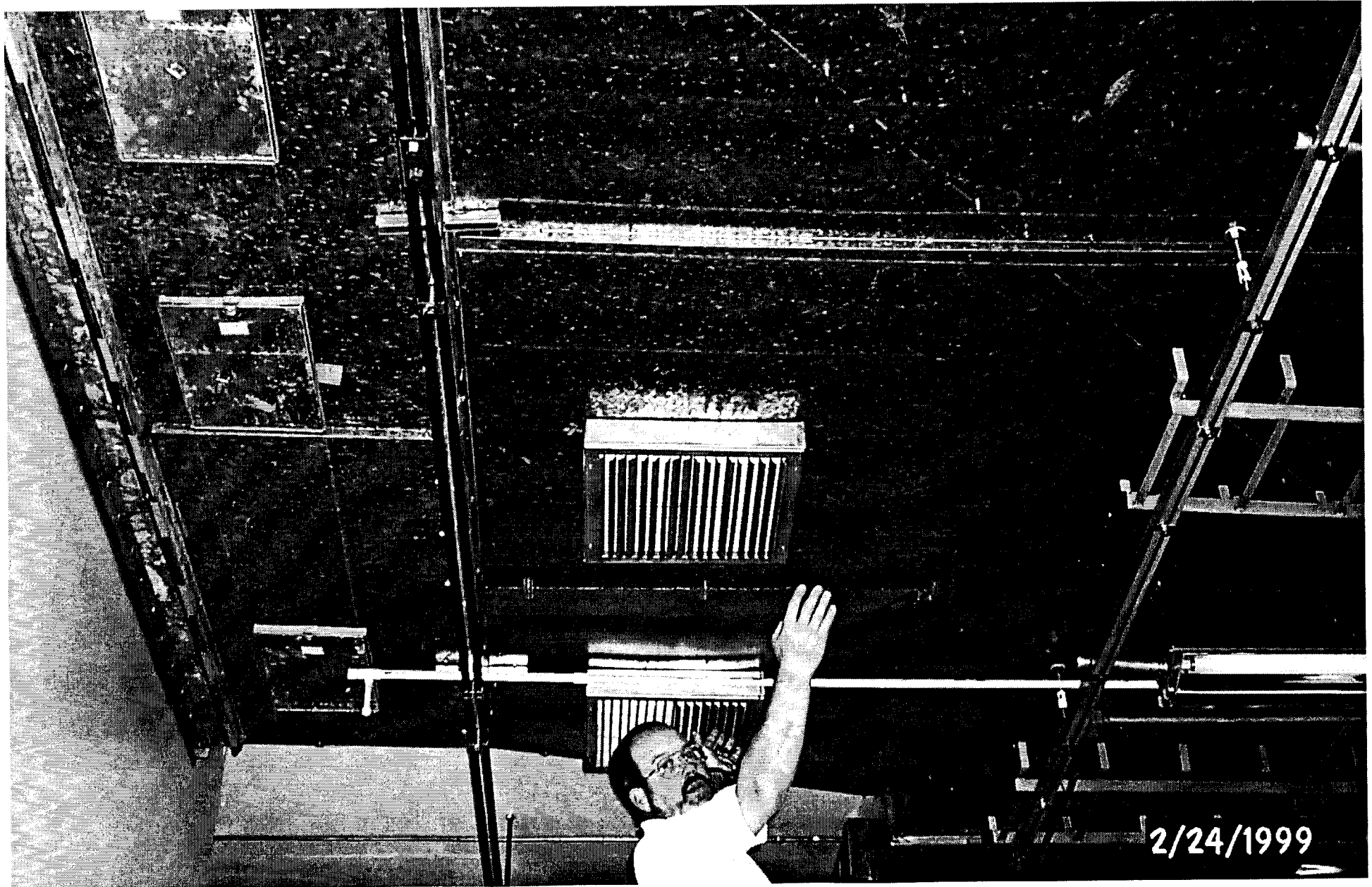
Exhibit JDB-17

Page 11 of 28



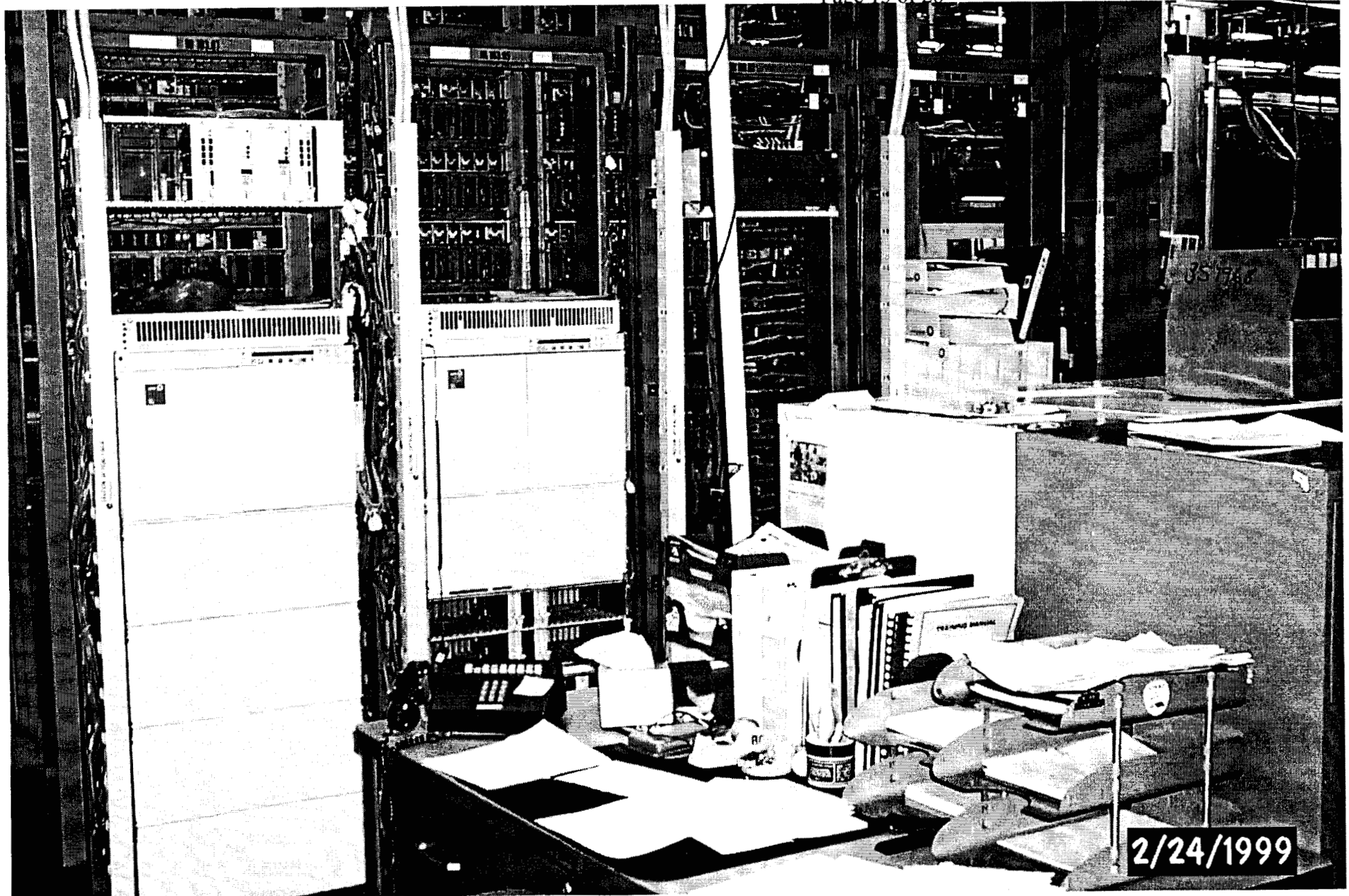
Port Orange Area 5c (air conditioning duct)

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 12 of 28



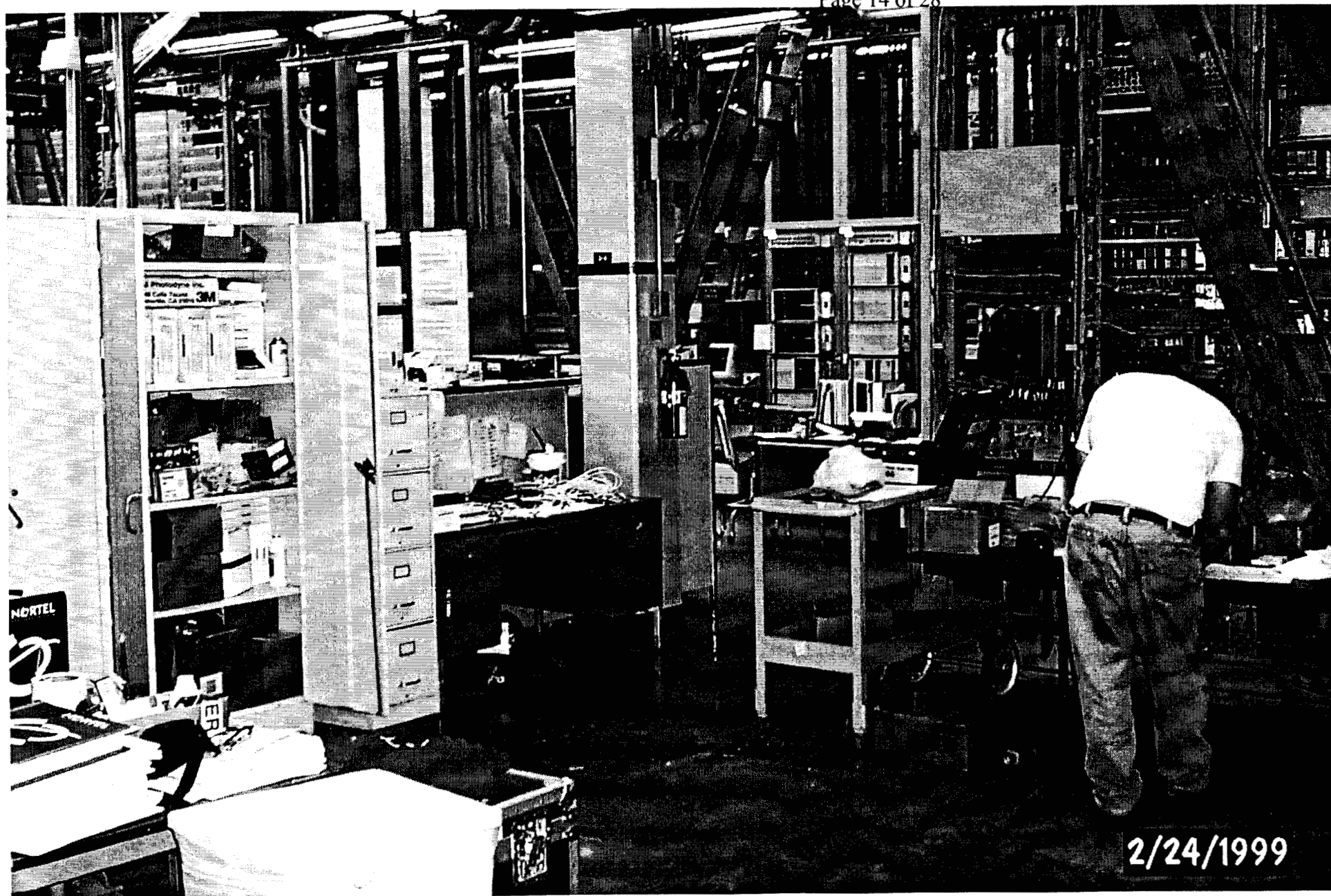
Port Orange Area 6a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 13 of 28



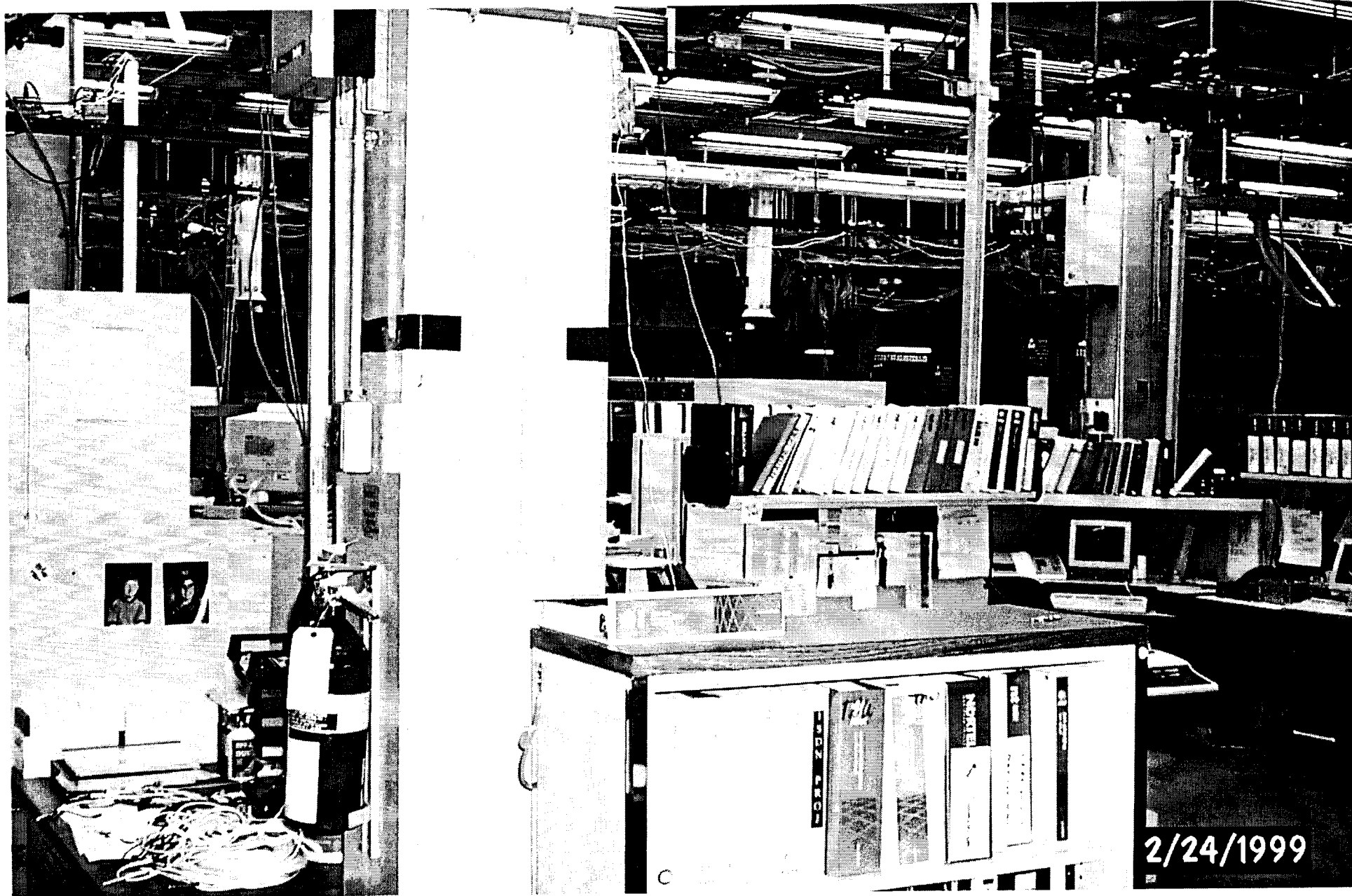
Port Orange Area 6b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 14 of 28



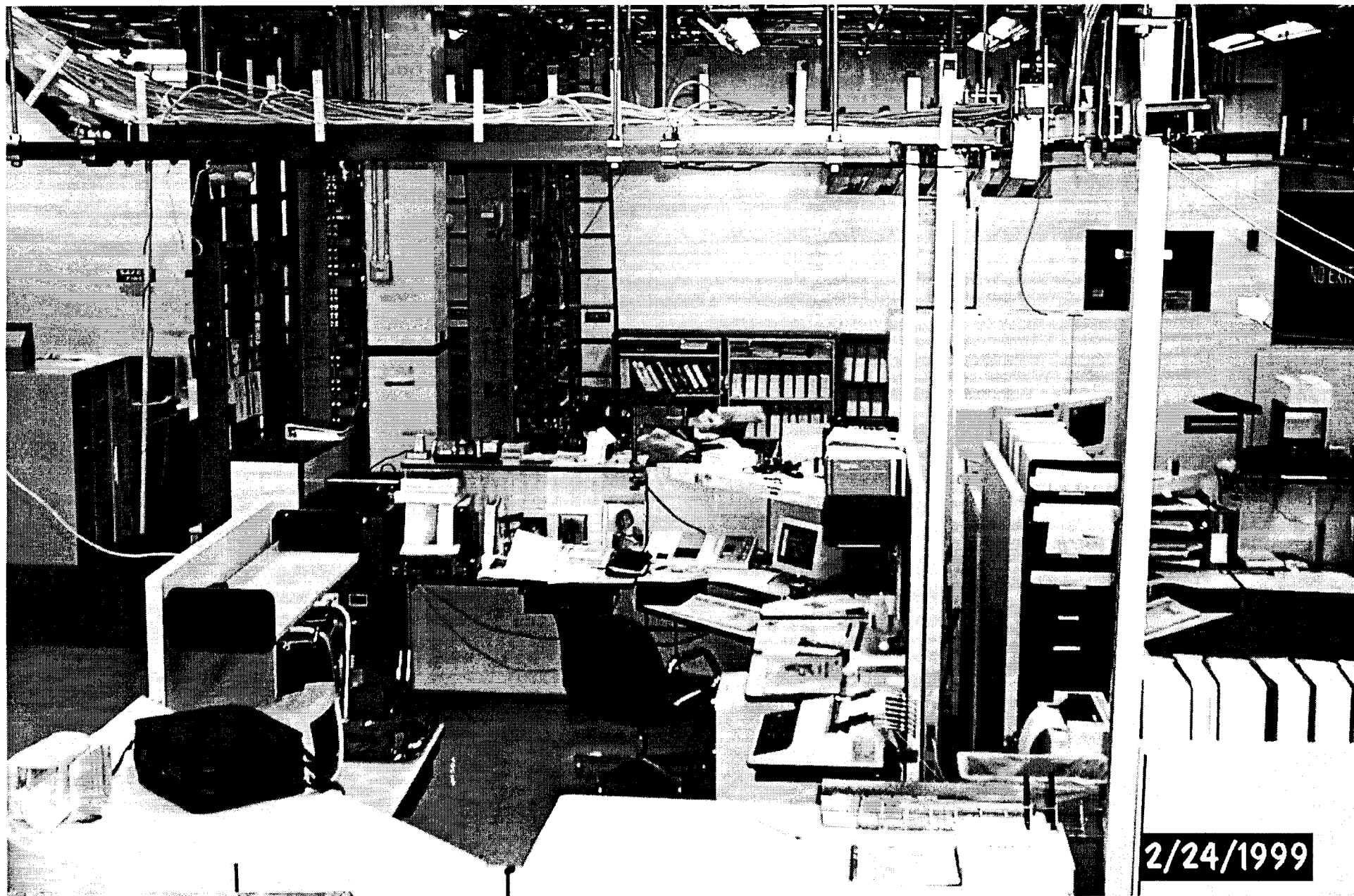
Port Orange Area 12a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 15 of 28



Port Orange Area 12b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 16 of 28



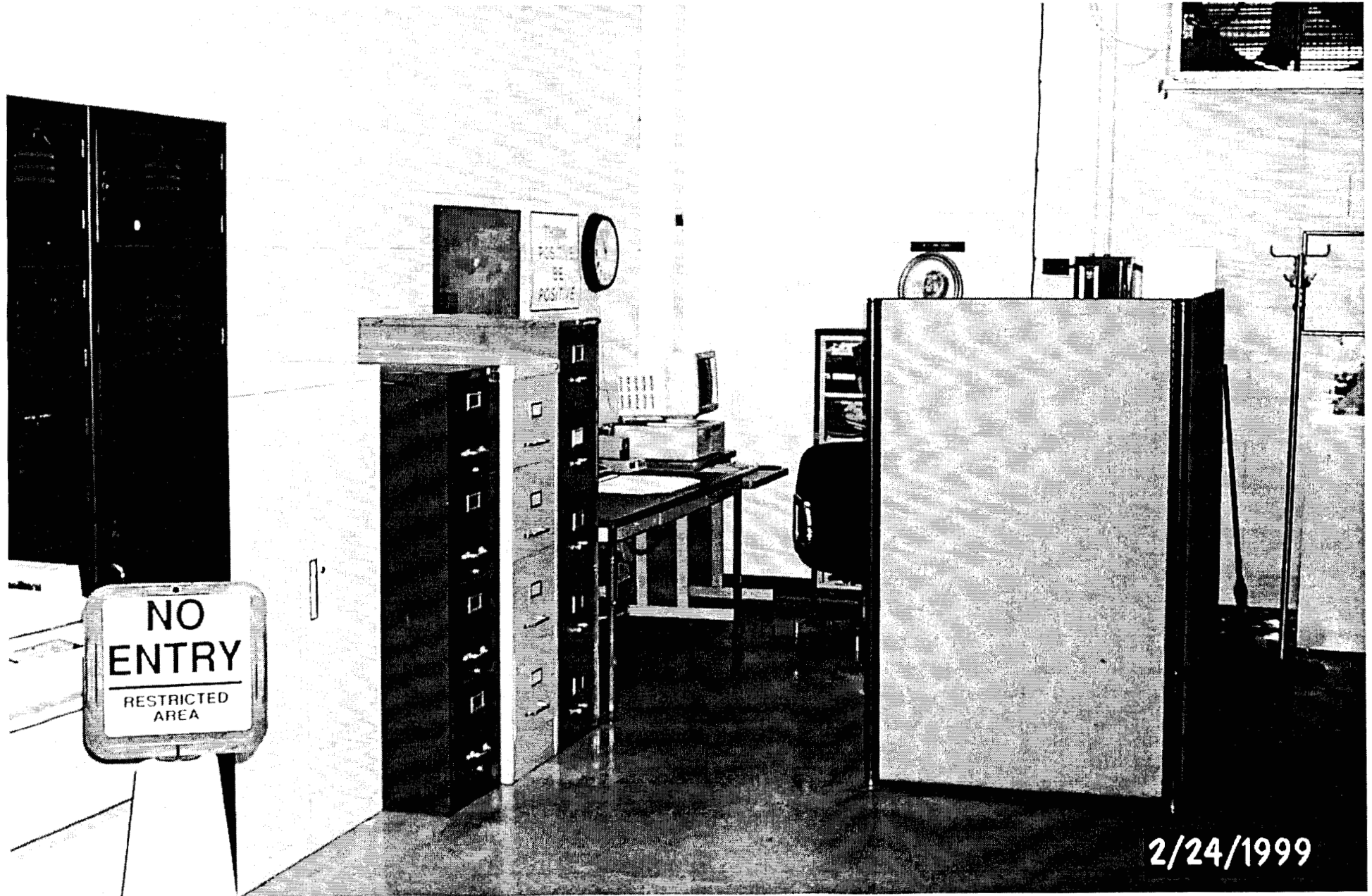
Port Orange Area 9a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 17 of 28



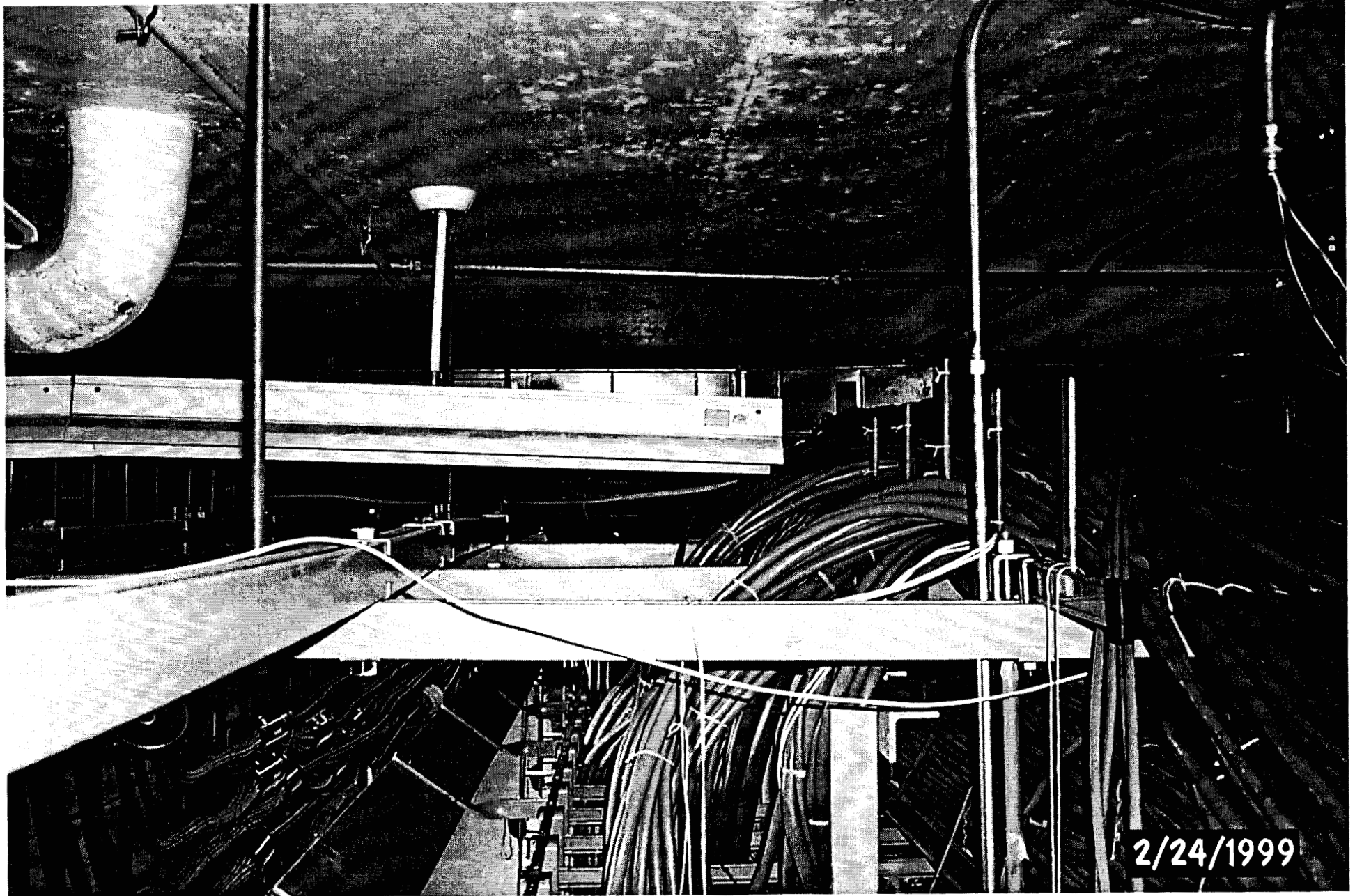
Port Orange Area 9b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 18 of 28



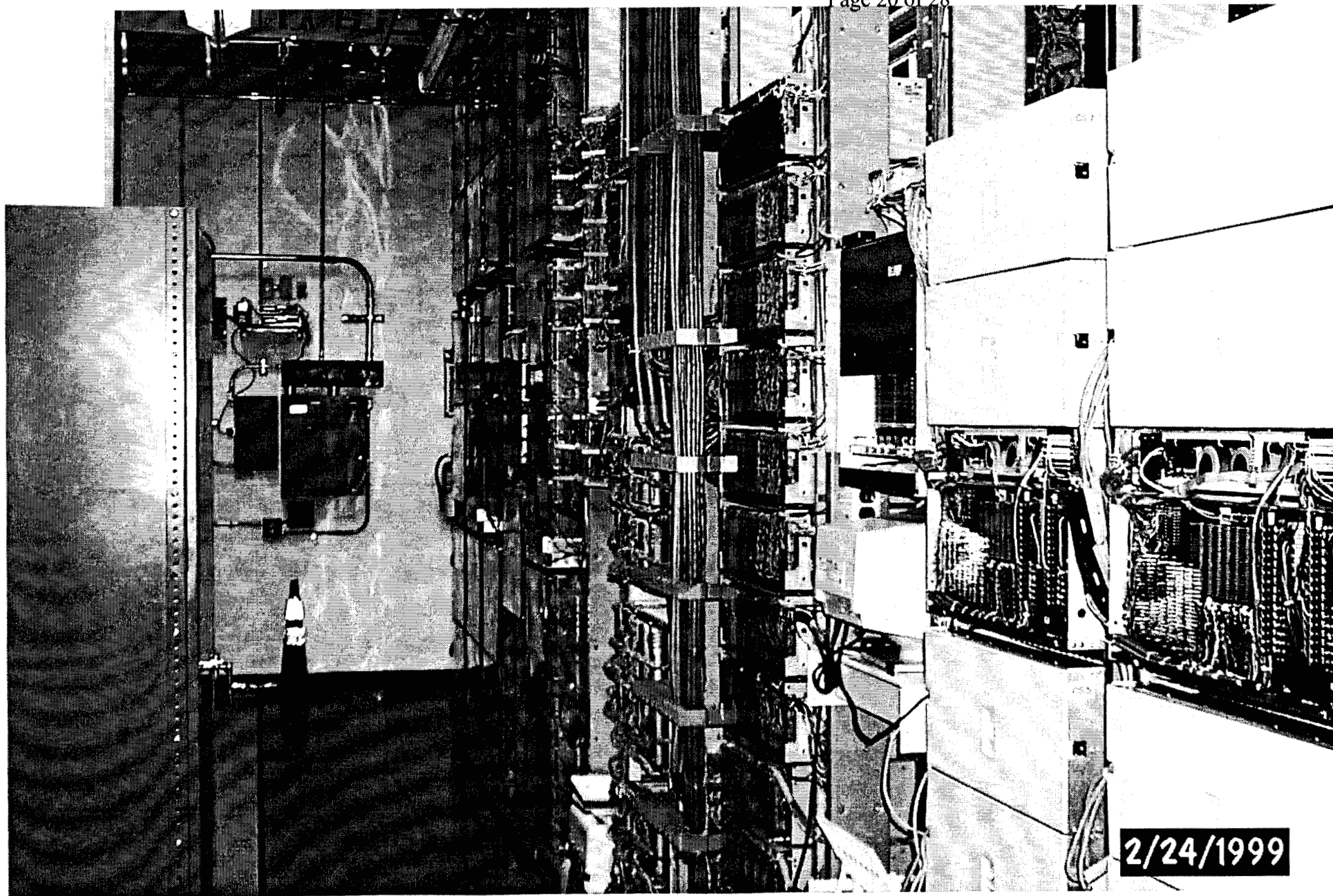
Port Orange Area 1a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 19 of 28



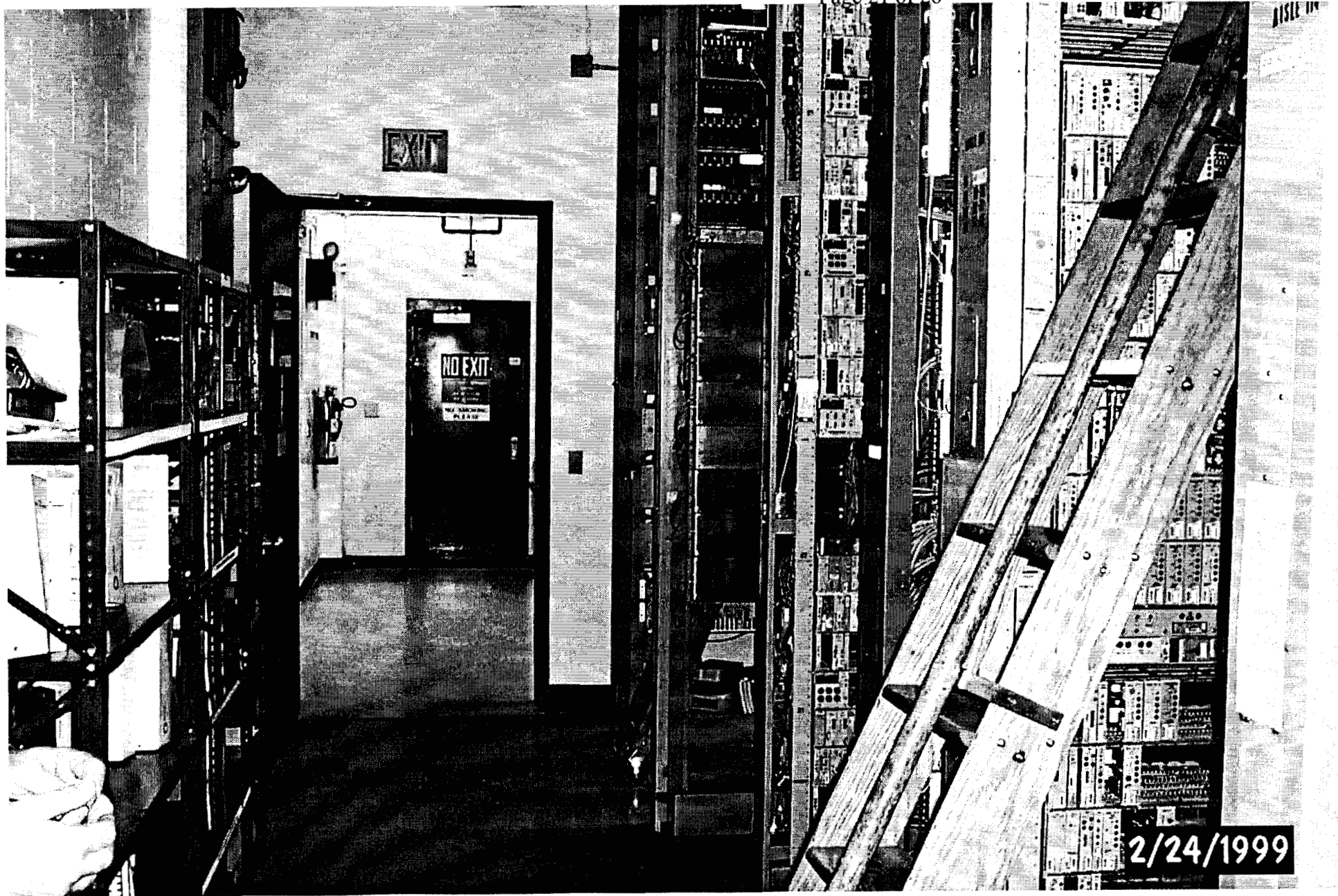
Port Orange Area 1b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 20 of 28



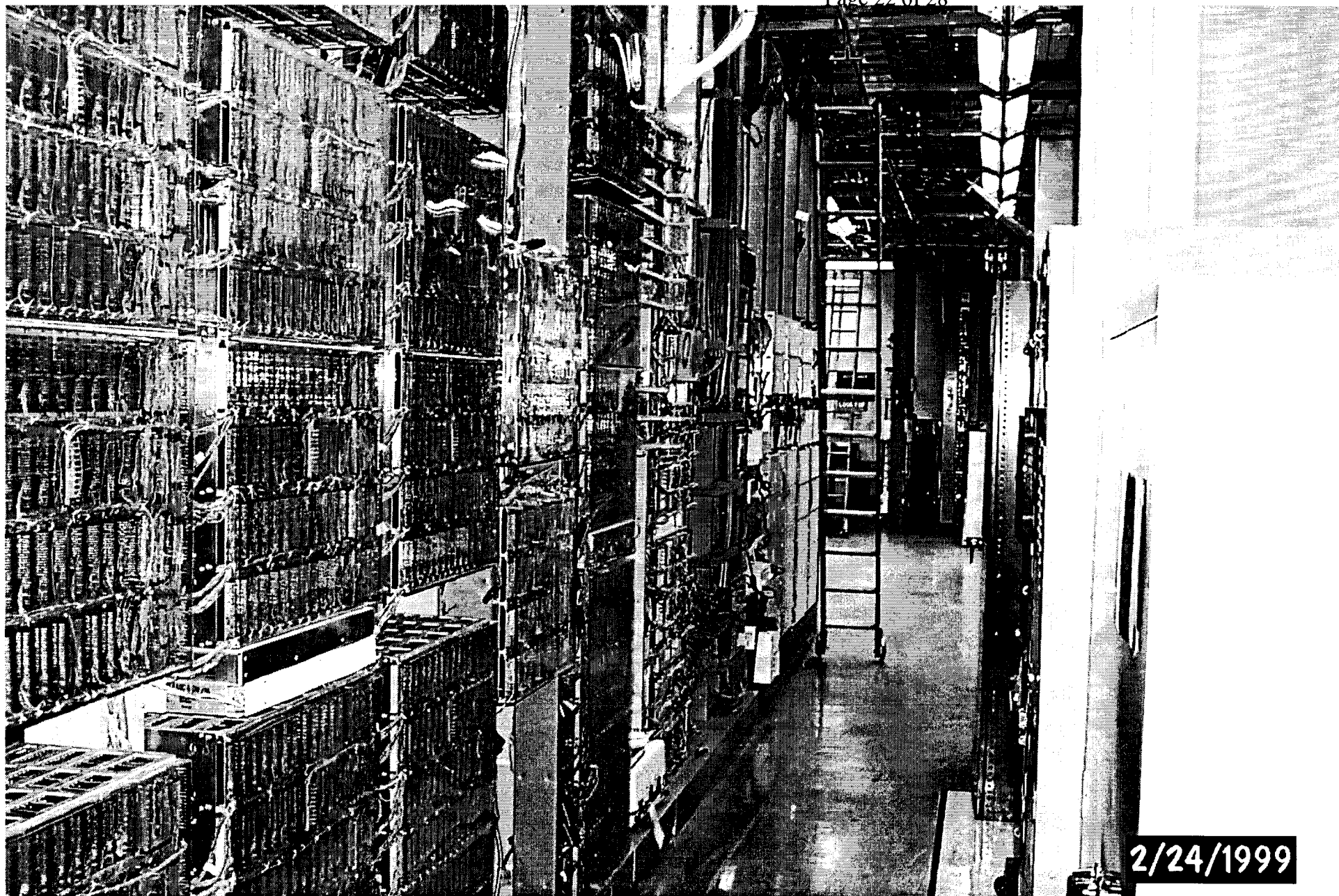
Port Orange Area 1c

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 21 of 28



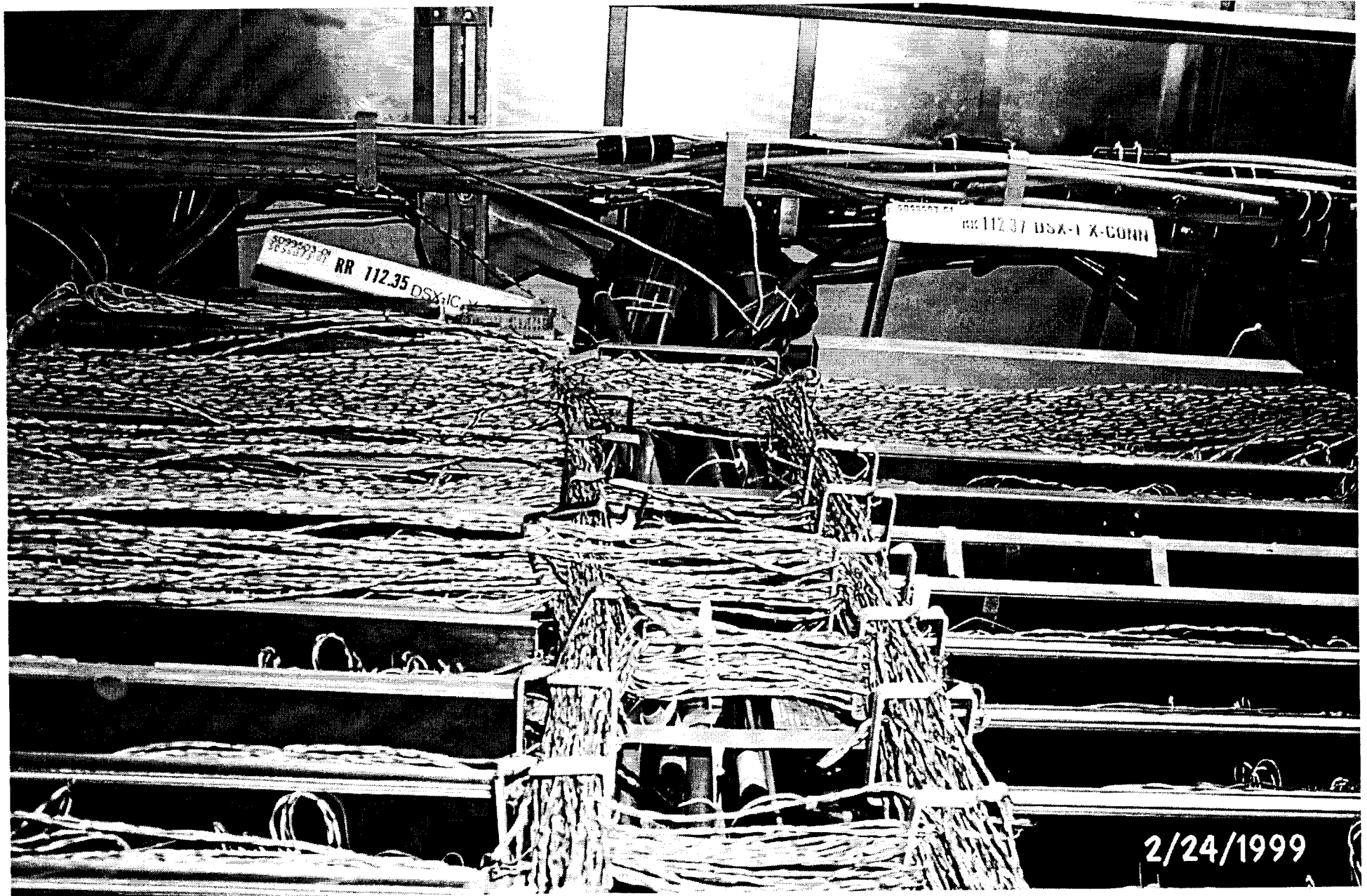
Port Orange Area 1d

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 22 of 28



Port Orange Area 1e

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 23 of 28



Port Orange Area 1f (family of equipment)

BellSouth Telecommunications, Inc.

FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL

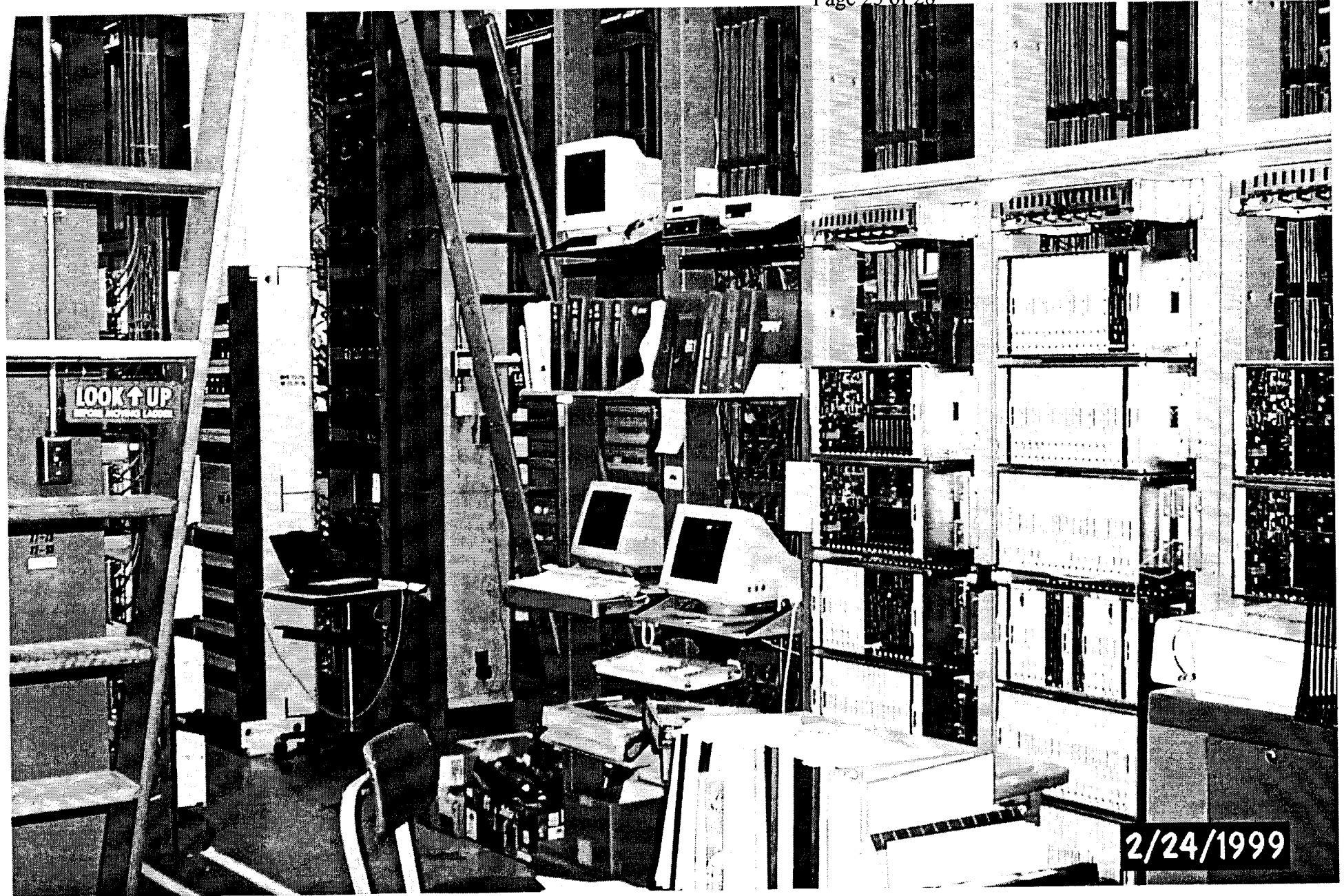
Exhibit JDB-17

Page 24 of 28



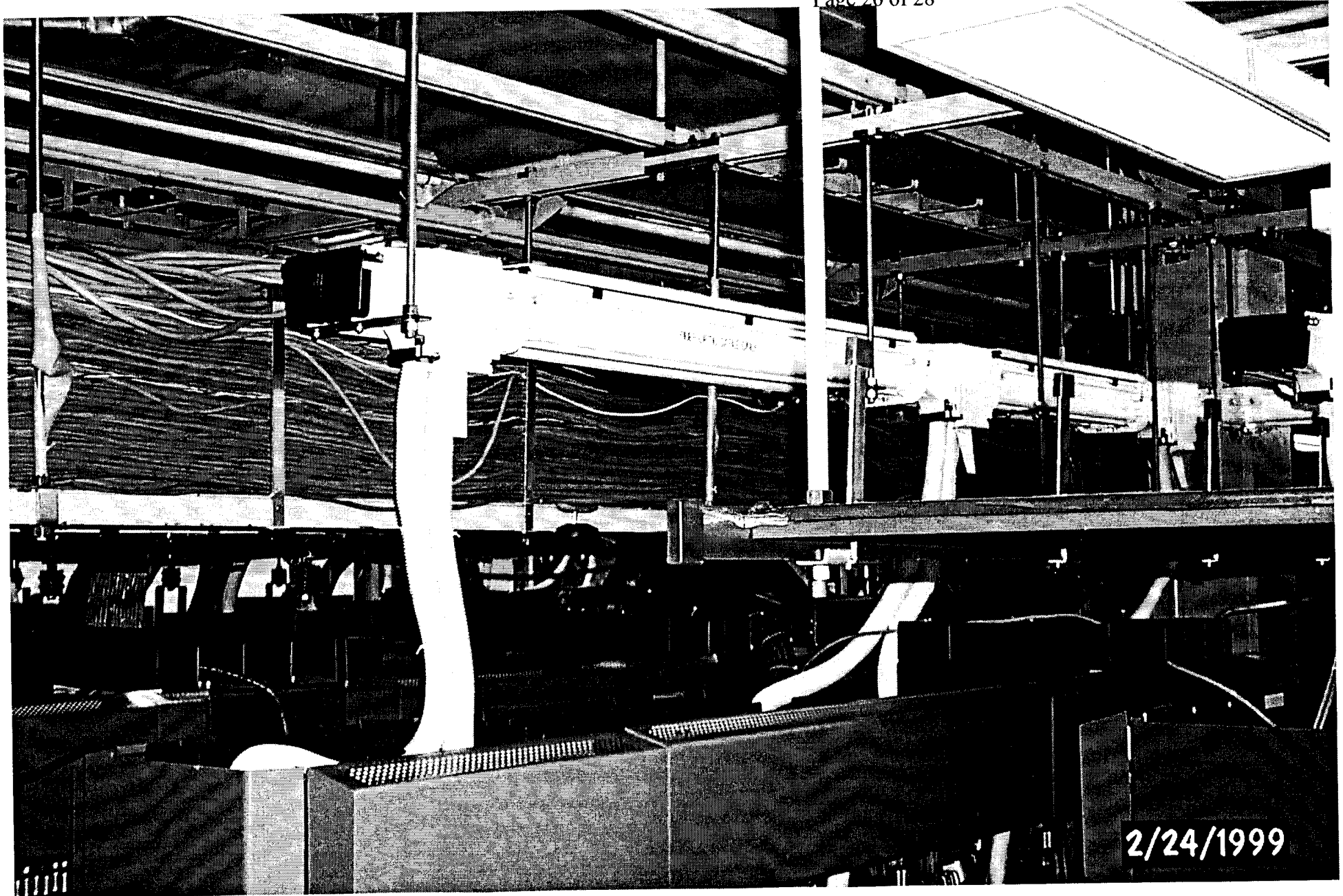
Port Orange Area 10

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 25 of 28



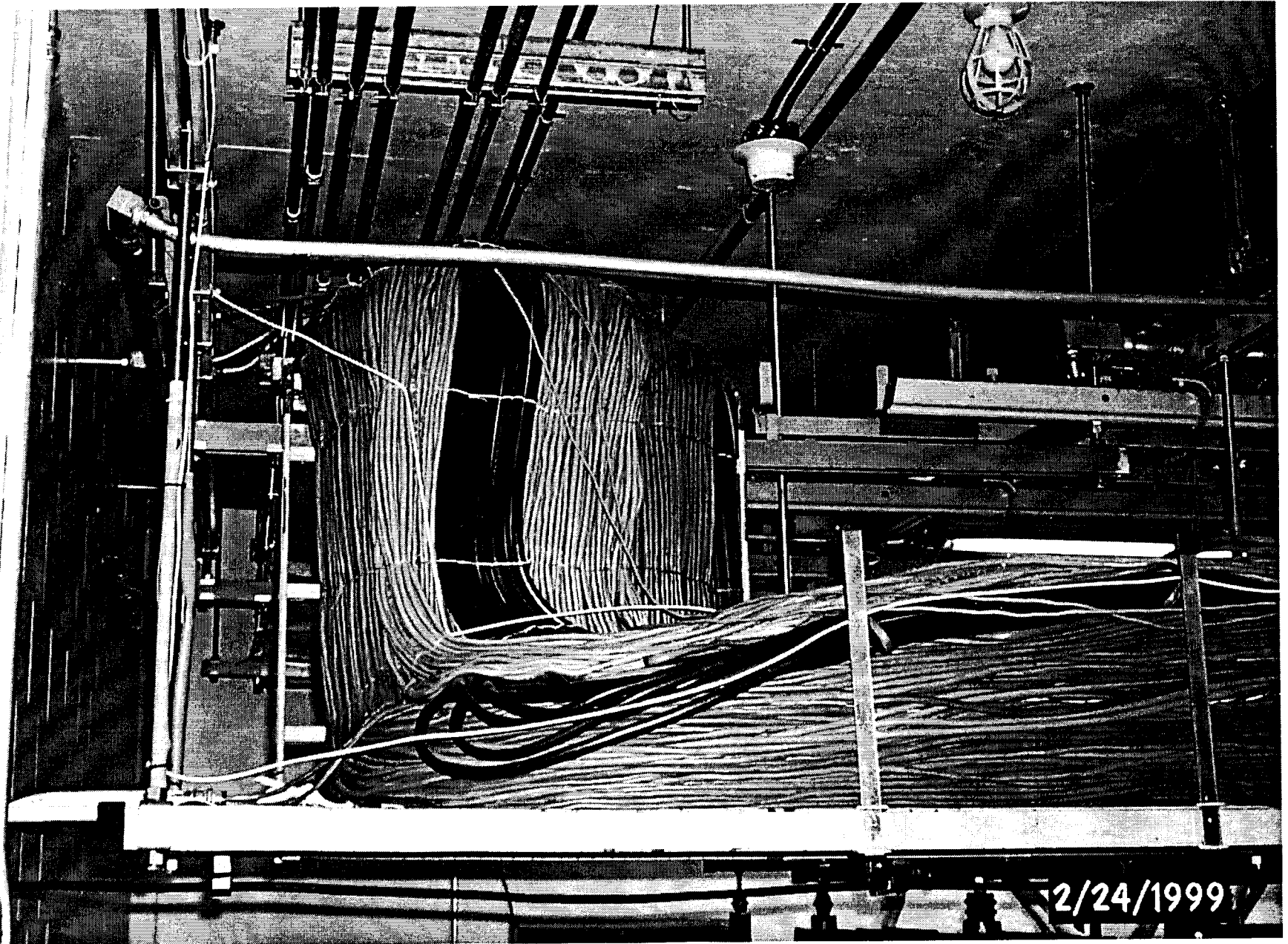
Port Orange Cable Congestion a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 26 of 28



Port Orange Cable Congestion b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-17
Page 27 of 28



Port Orange Family of Equipment

BellSouth Telecommunications, Inc.

FPSC Docket No. 980946-TL, 980947-TL, 980948-TL

981011-TL, 981012-TL, 981250-TL

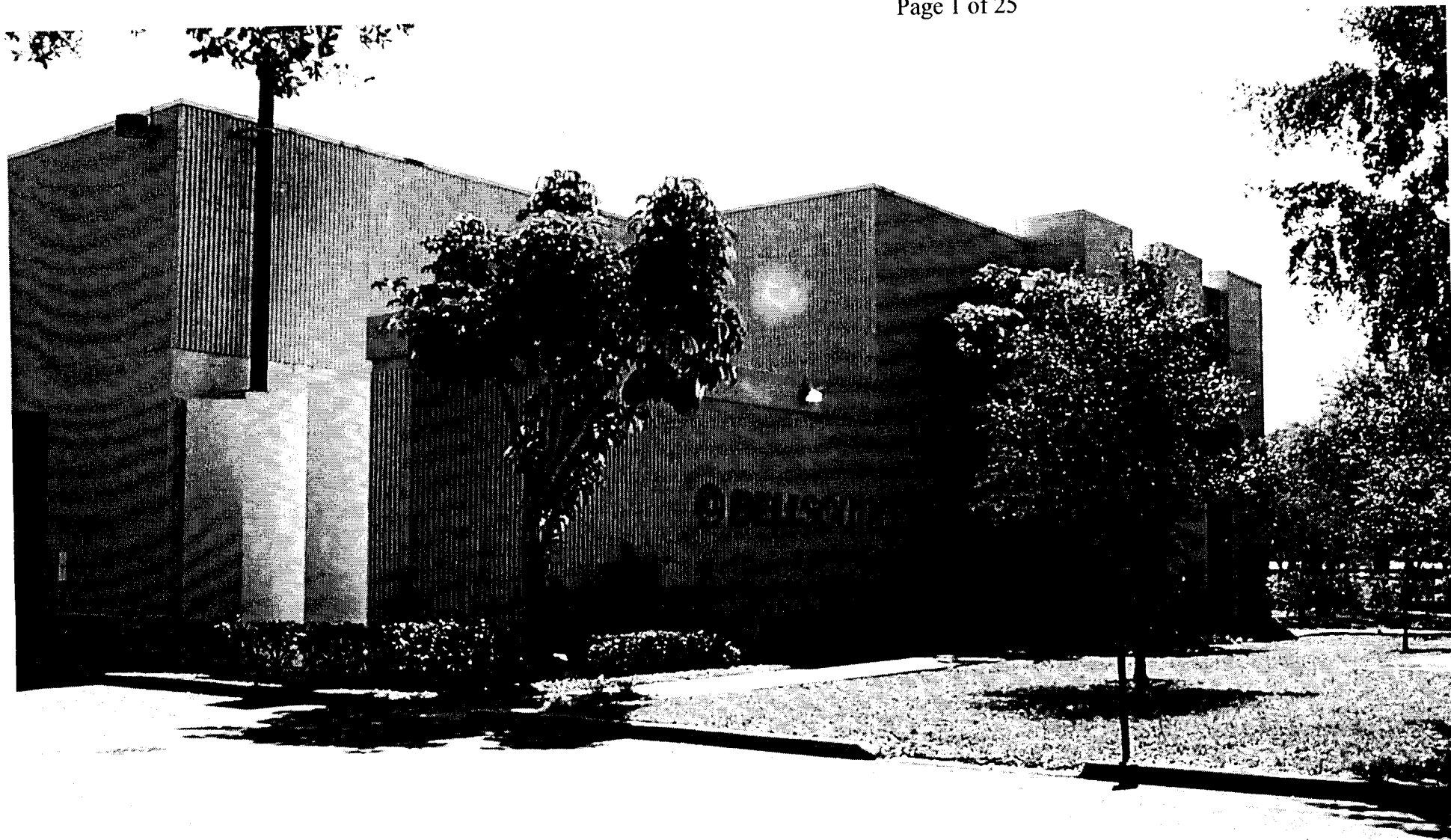
Exhibit JDB-17

Page 28 of 28



Boca Teeca

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 1 of 25

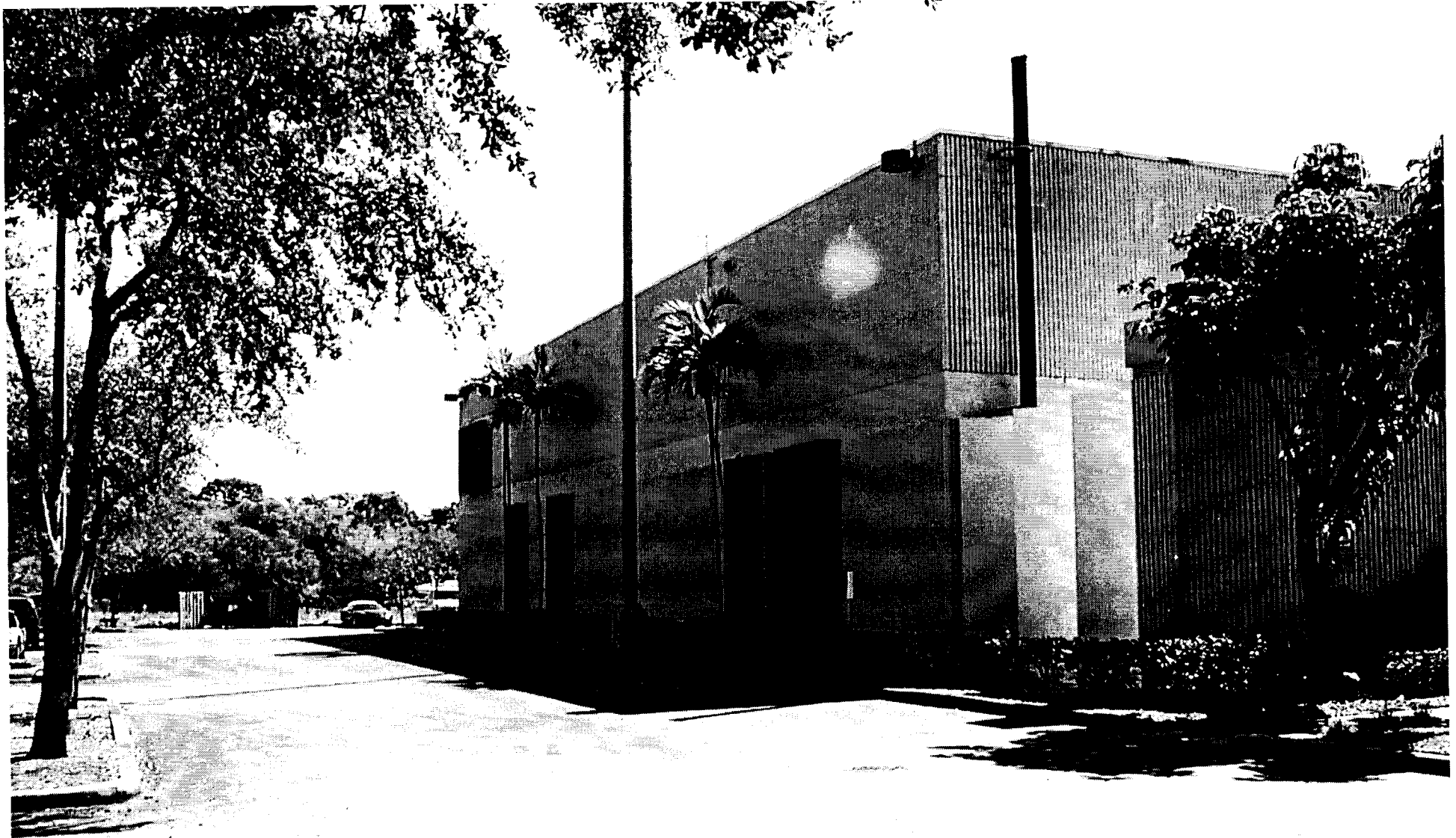


BellSouth Telecommunications, Inc.

2/26/1999

Boca Teeca

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 2 of 25



2/26/1999

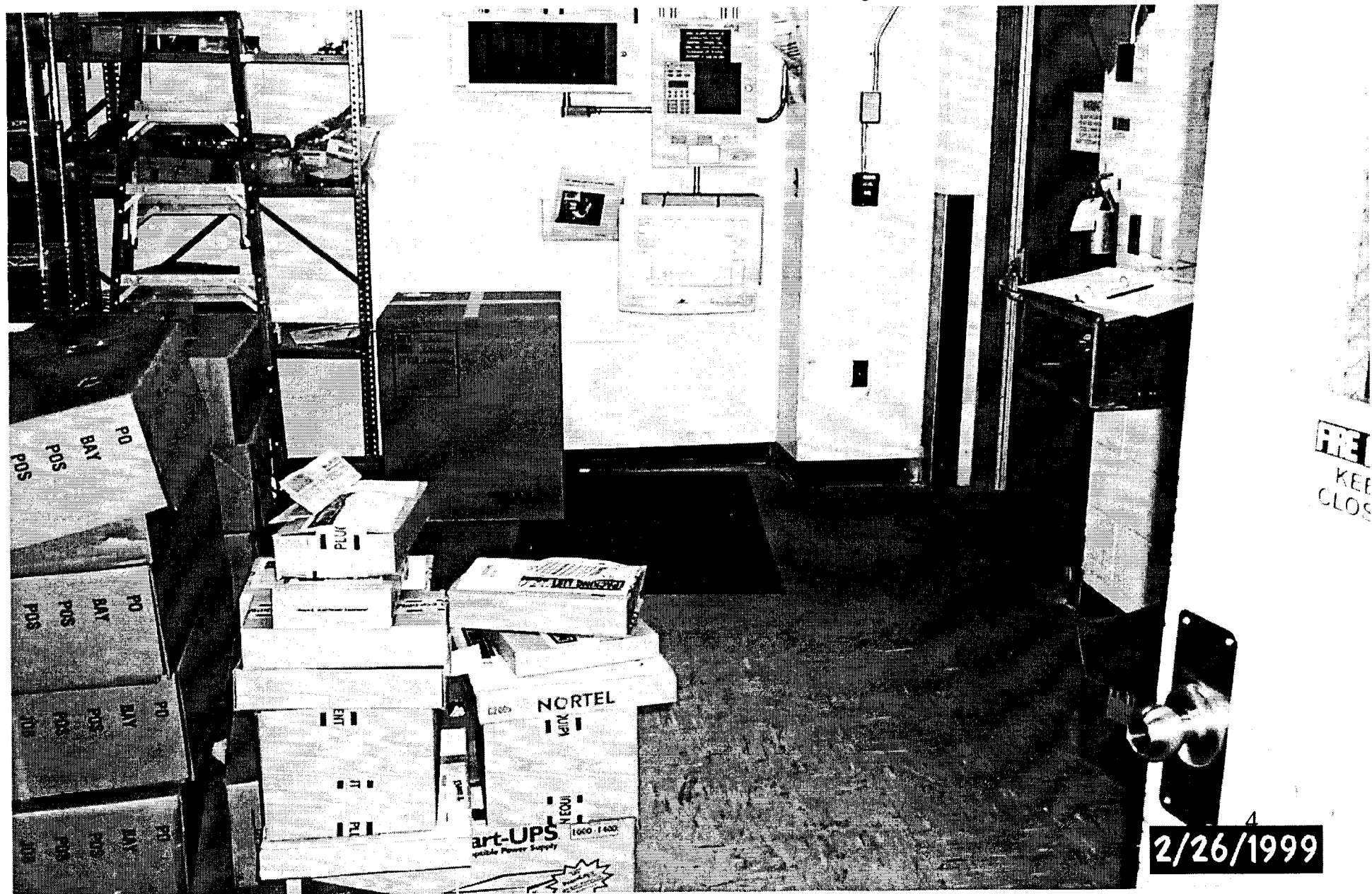
Boca Teece Area 3a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 3 of 25



Boca Teeca Area 3b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 4 of 25



Boca Teeca Area 3c

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 5 of 25



Boca Teeca Area 4a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 6 of 25



Boca Teeca Area 4b

BellSouth Telecommunications, Inc.

FPSC Docket No. 980946-TL, 980947-TL, 980948-TL

981011-TL, 981012-TL, 981250-TL

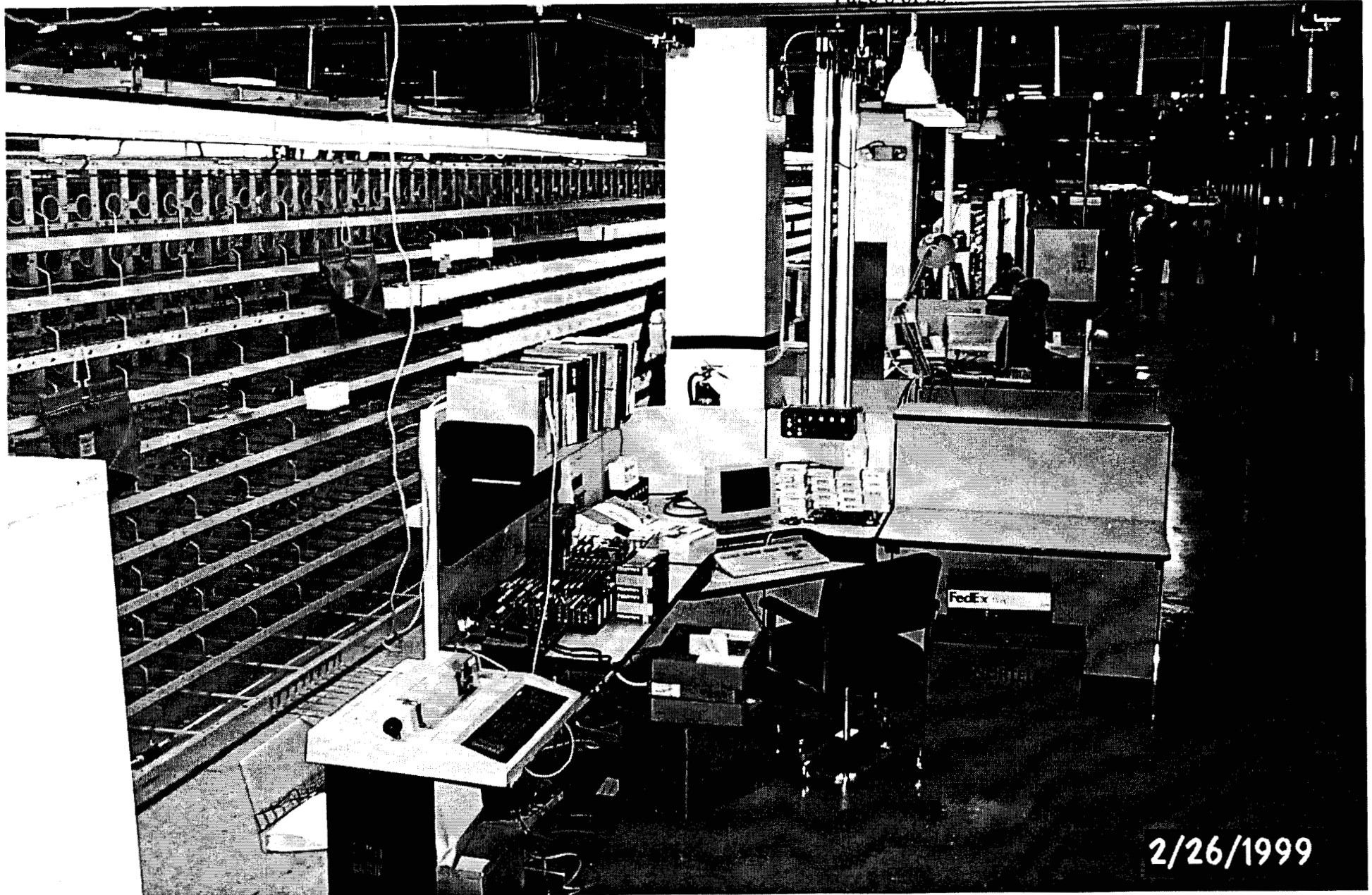
Exhibit JDB-18

Page 7 of 25



Boca Teeca Area 5a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 8 of 25



Boca Teeca Area 5b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 9 of 25



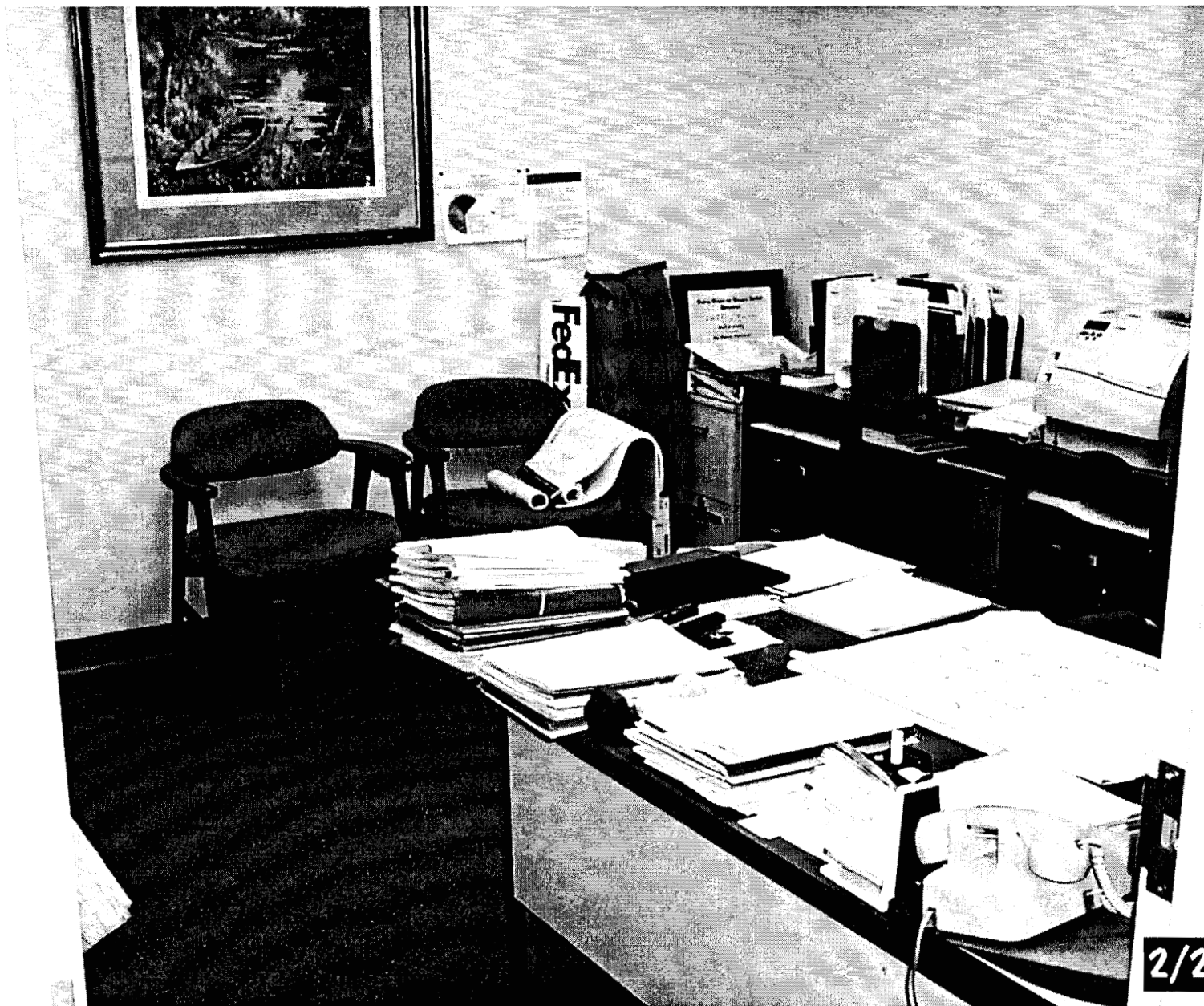
Boca Teeca Area 1a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 10 of 25



Boca Teeca Area 1b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 11 of 25



Boca Teeca Area 1c

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 12 of 25



12
2/26/1999

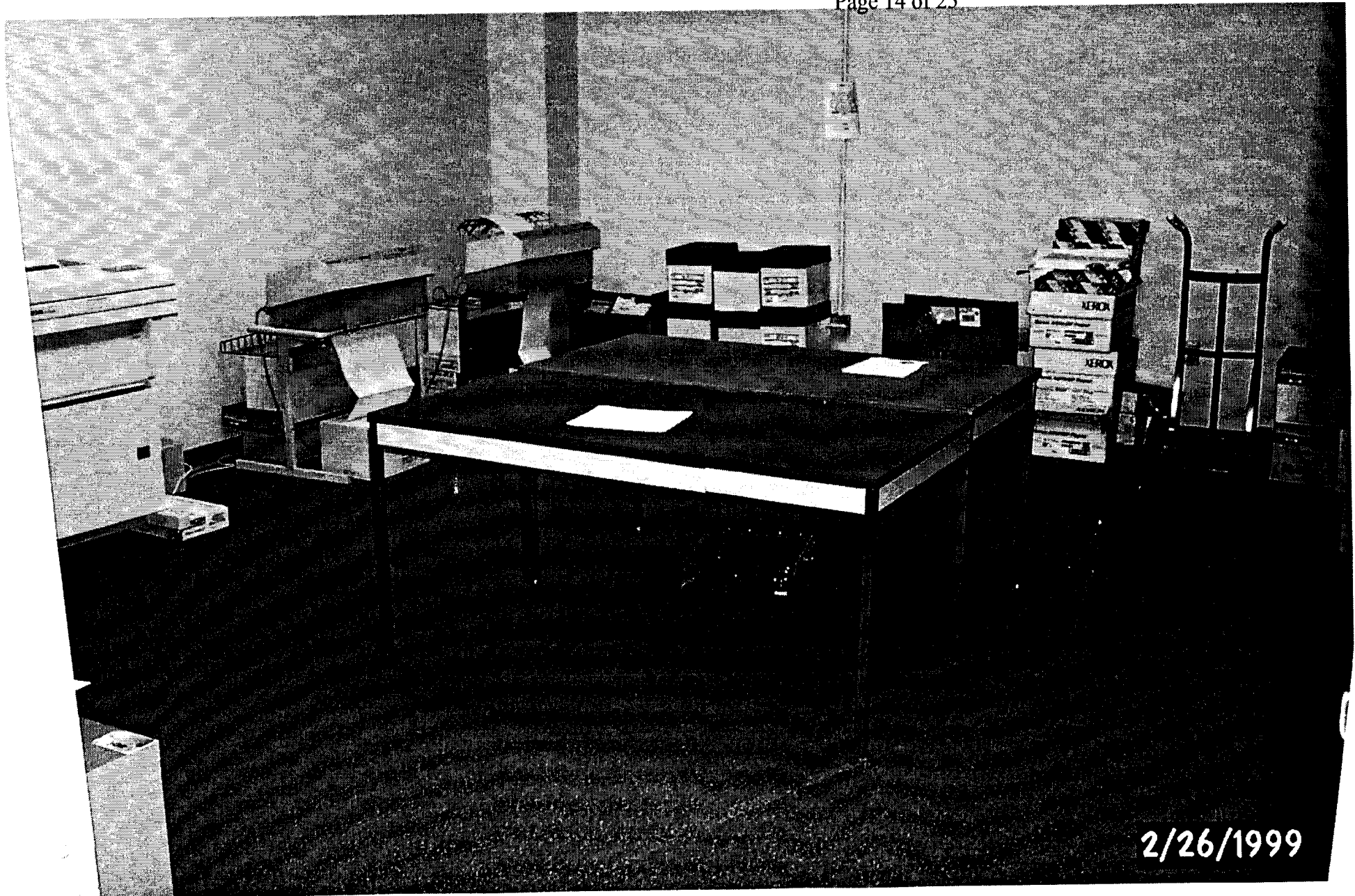
Boca Teeca Area 2a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 13 of 25



Boca Teeca Area 2b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 14 of 25



Boca Teeca Area 2c

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 15 of 25



Boca Teeca Area 2d

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 16 of 25



Boca Teeca Area 2e

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 17 of 25



2/26/1999

Boca Teeca Area 2f

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 18 of 25



Boca Teeca Area 2g

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 19 of 25



2/26/1999

Boca Teeca Area 2h

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 20 of 25



Boca Teeca Area 2i

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 21 of 25



Boca Teeca Area 2j

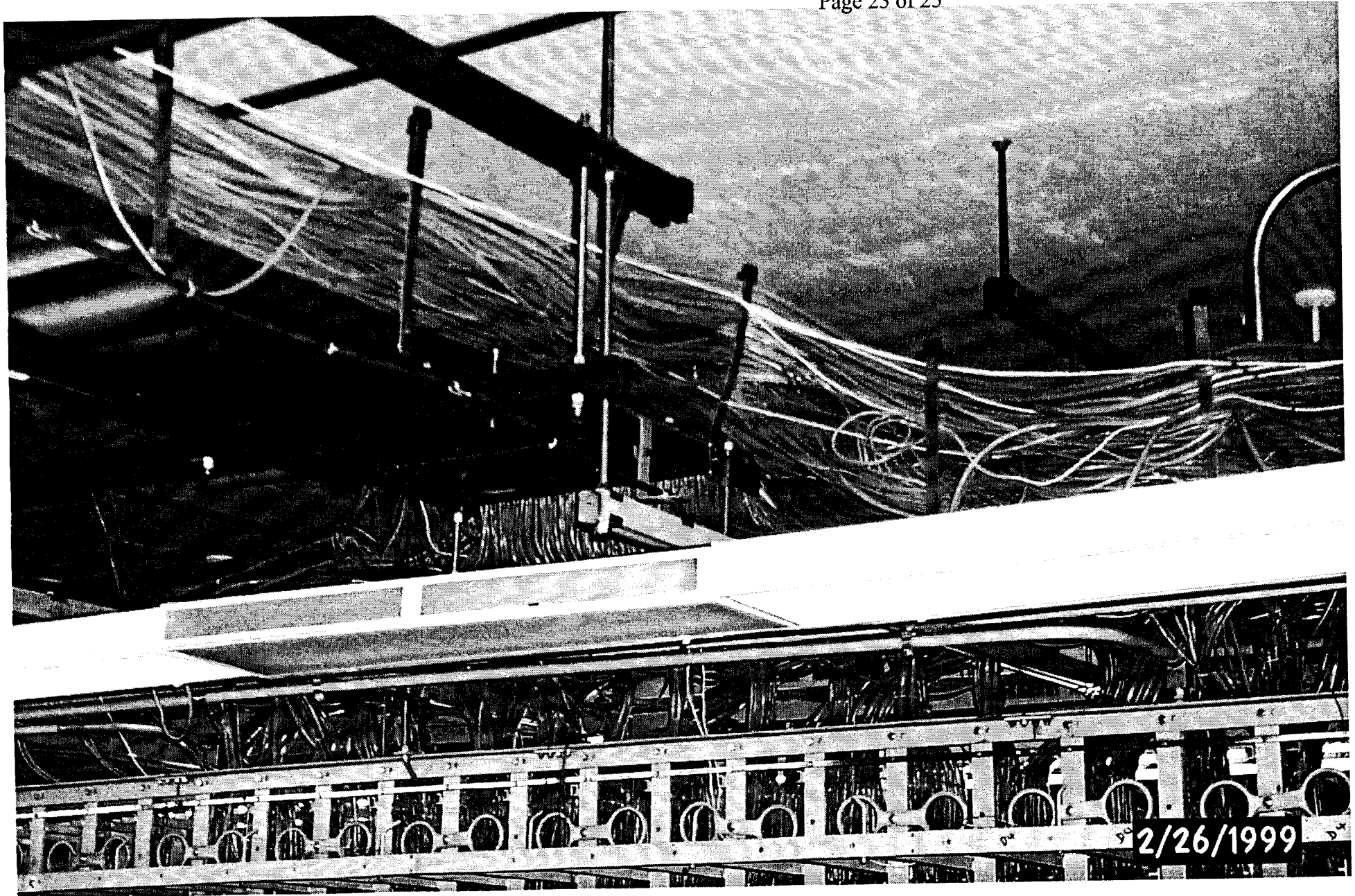
BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 22 of 25



2/26/1999

Boca Teeca Cable Congestion a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 23 of 25



Boca Teeca Cable Congestion b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 24 of 25



Boca Teeca Cable Congestion c

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-18
Page 25 of 25



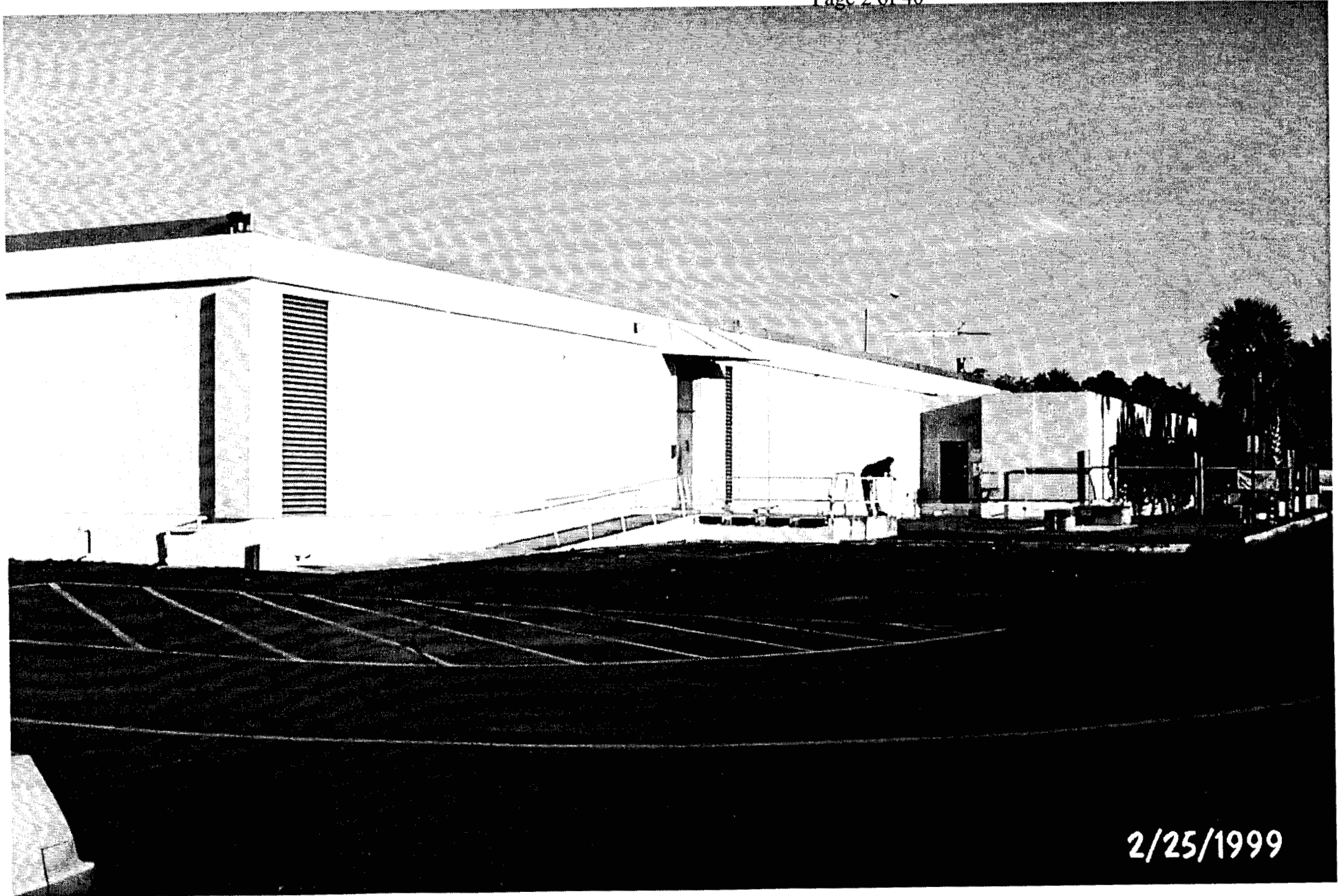
Palmetto Central Office

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 1 of 40



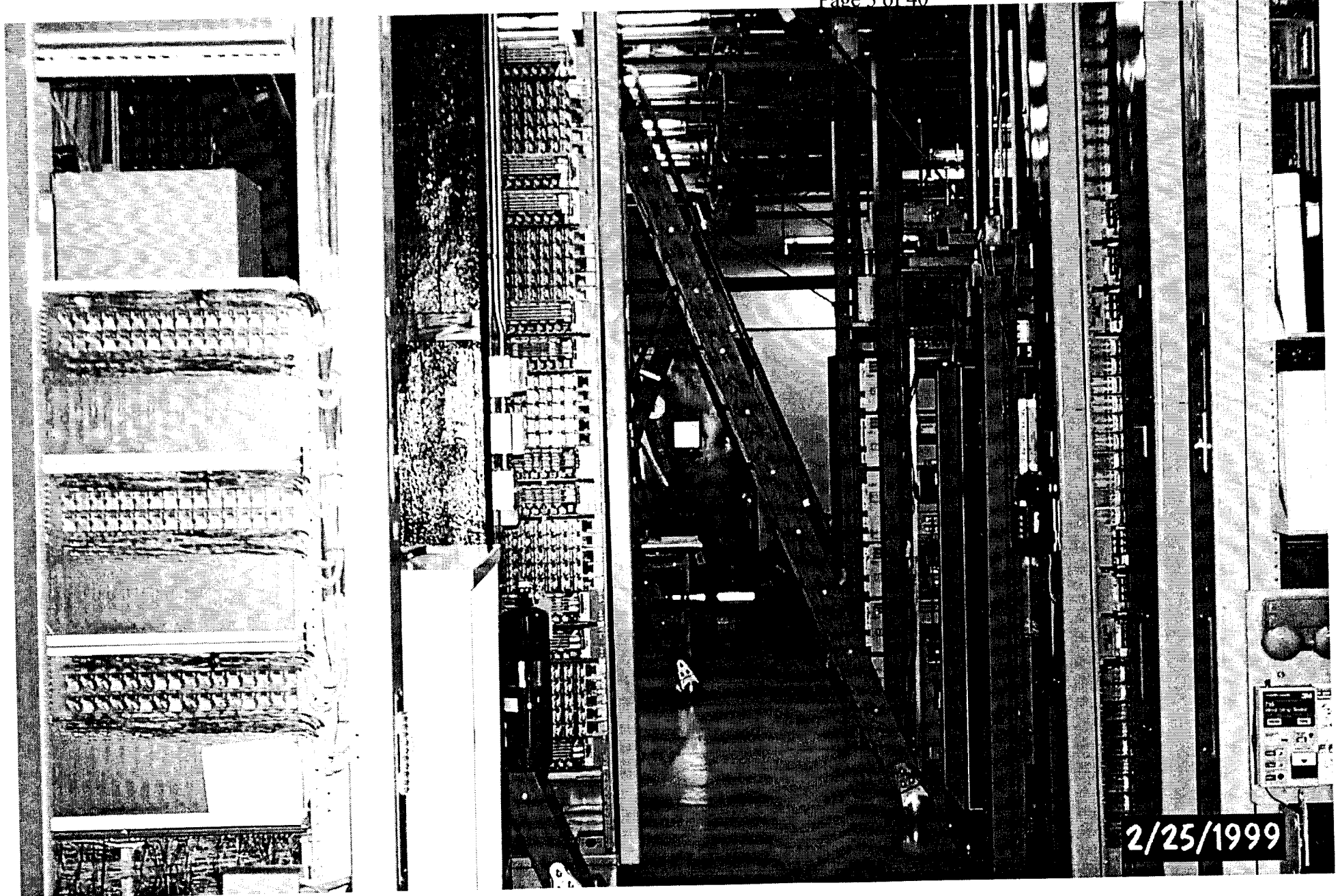
Palmetto Central Office

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 2 of 40



Palmetto Area 1a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 3 of 40



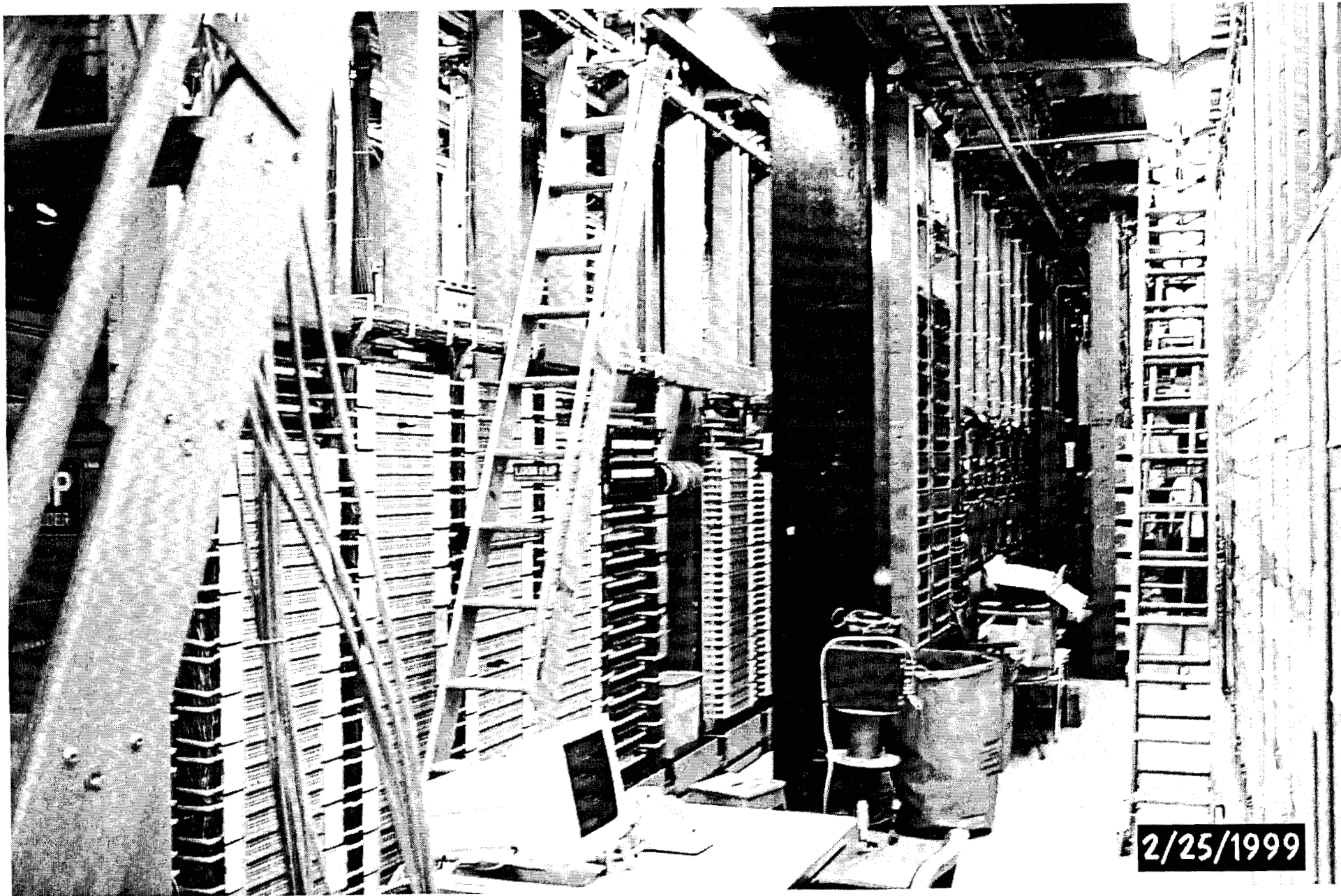
Palmetto Area 1b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 4 of 40



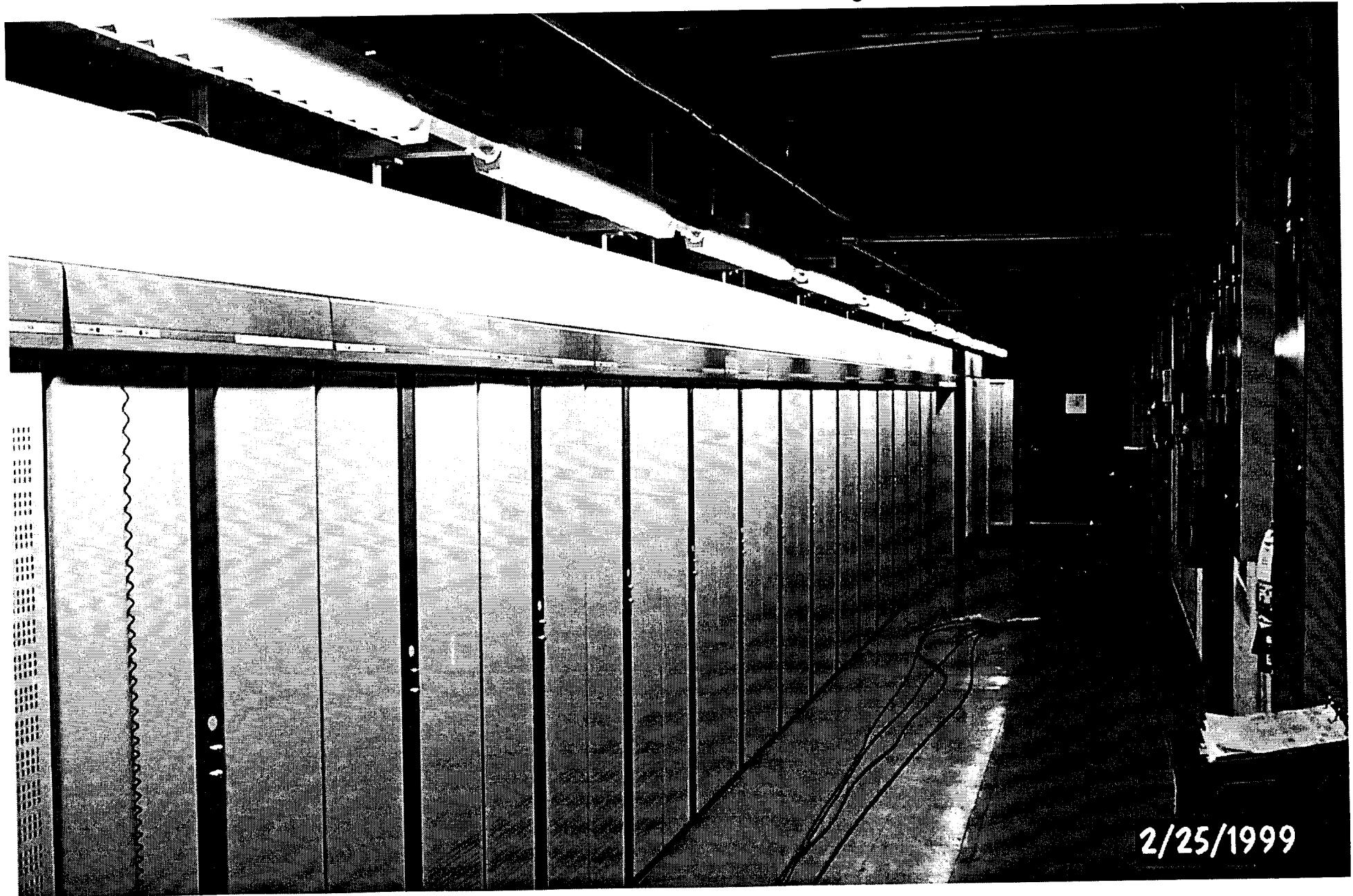
Palmetto Area 1c

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 5 of 40



Palmetto Area 1d

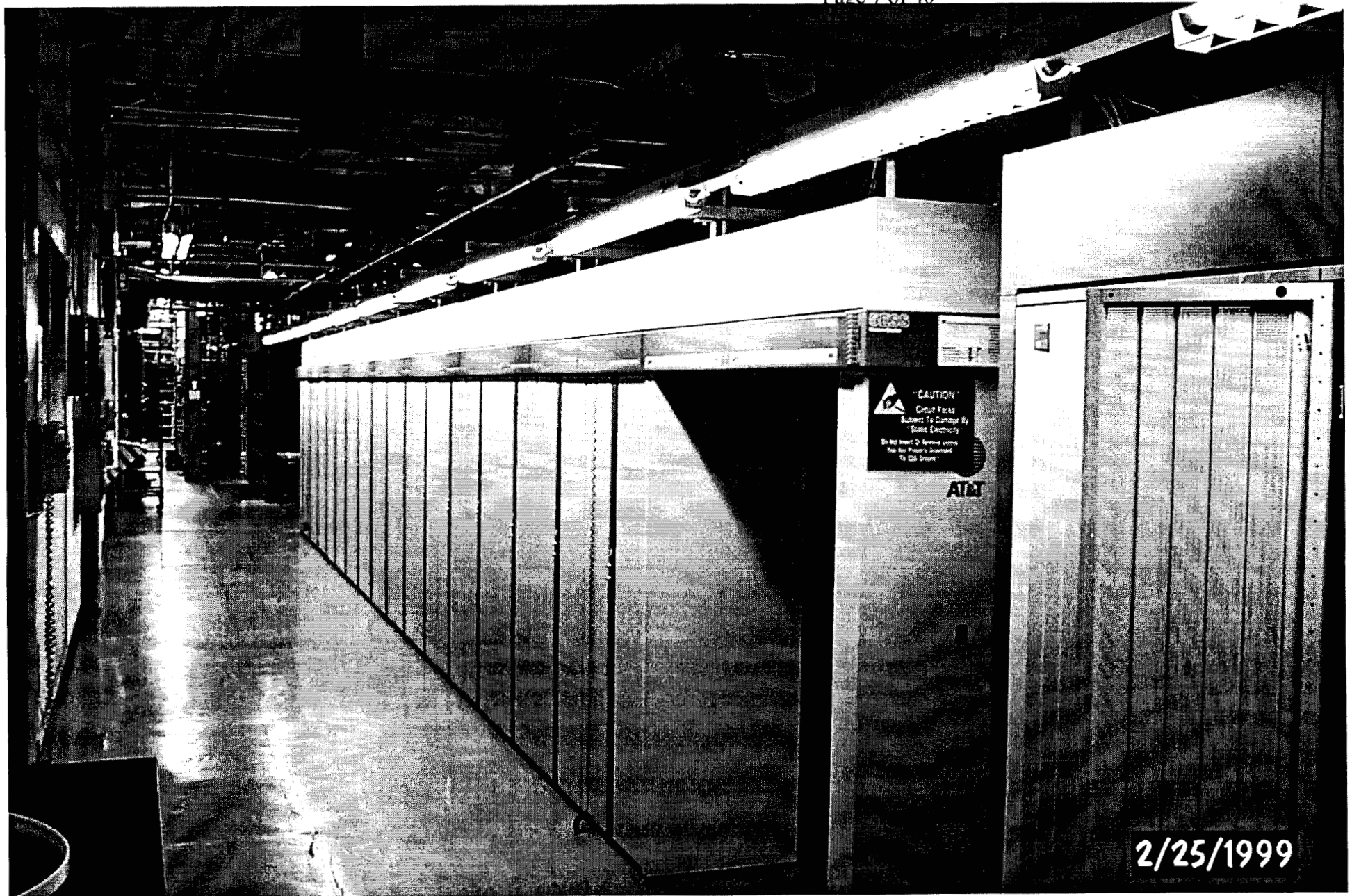
BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 6 of 40



2/25/1999

Palmetto Area 1e

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 7 of 40



Palmetto Area 1f

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 8 of 40



2/25/1999

Palmetto Area 3

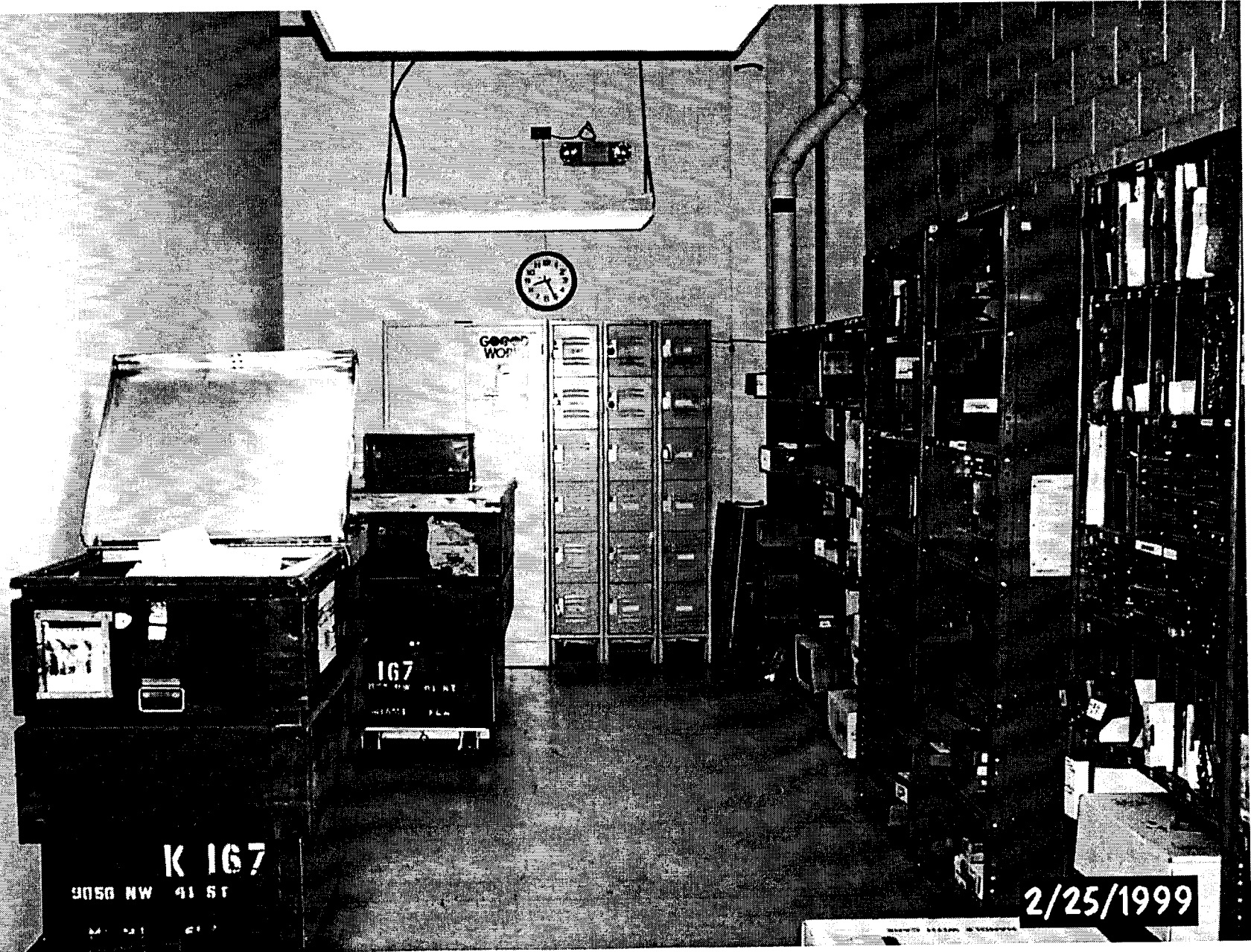
BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 9 of 40



2/25/1999

Palmetto Area 4

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 10 of 40



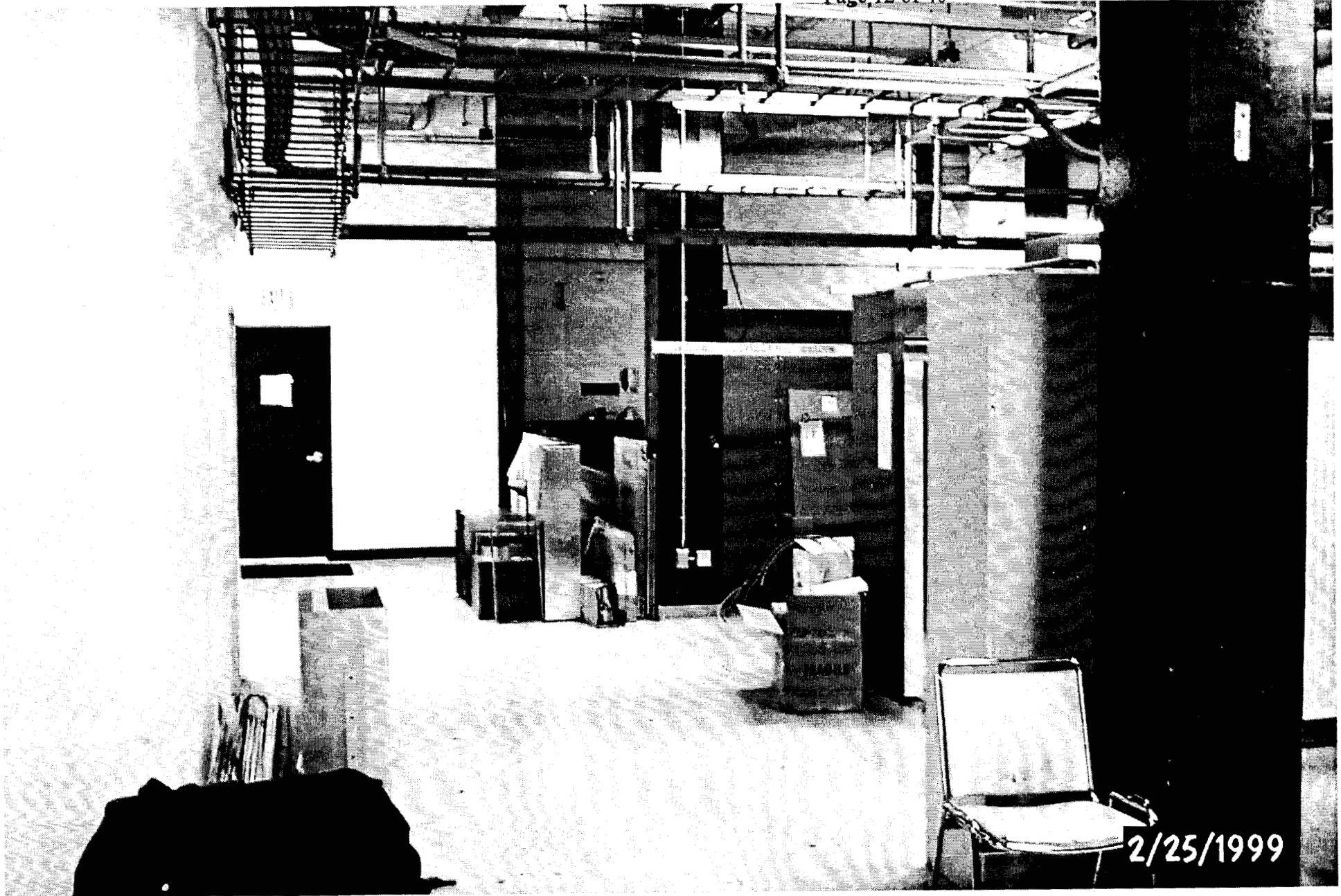
Palmetto Area 10a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 11 of 40



Palmetto Area 10b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 12 of 40



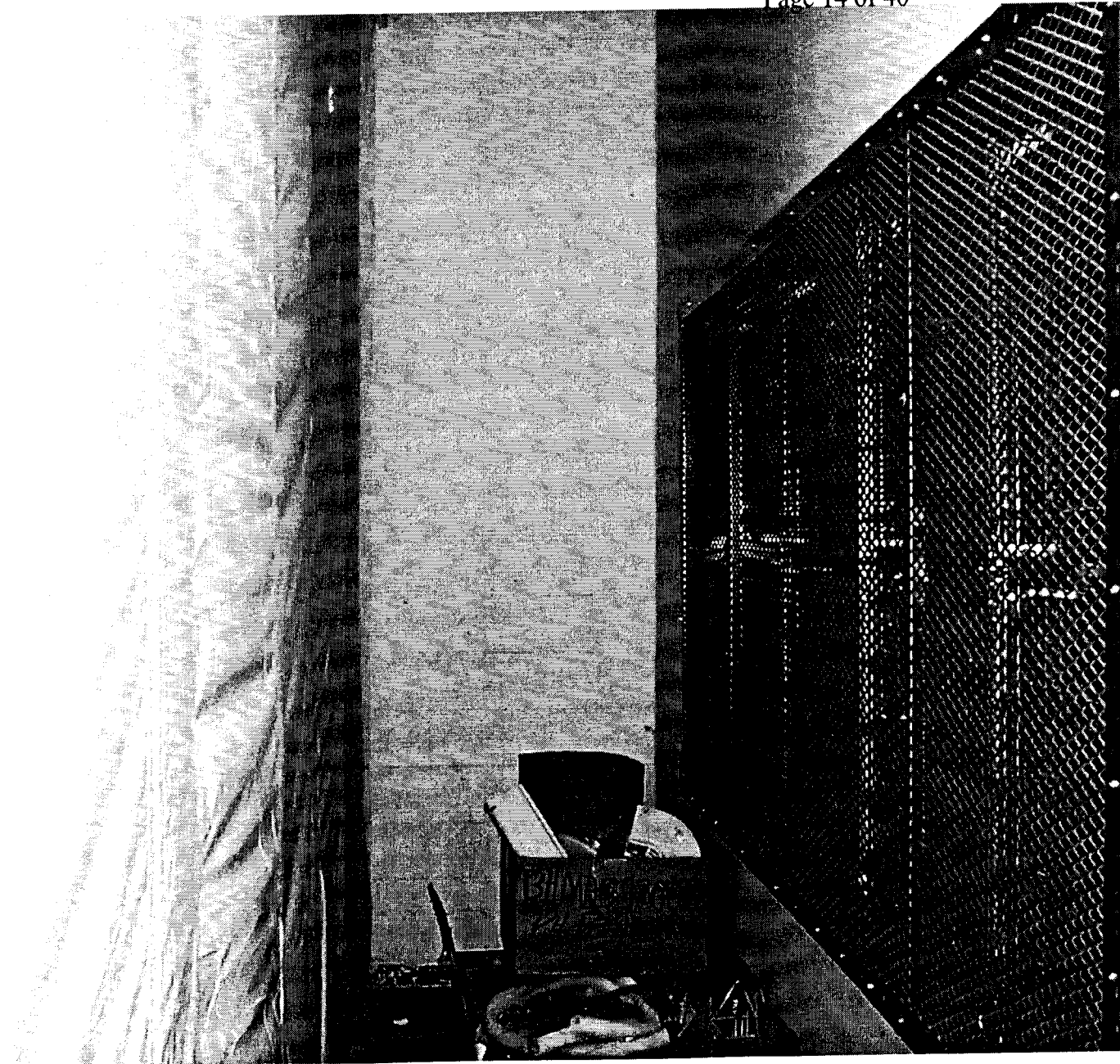
Palmetto Area 10c

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 13 of 40



Palmetto Area 10d

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 14 of 40



2/25/1999

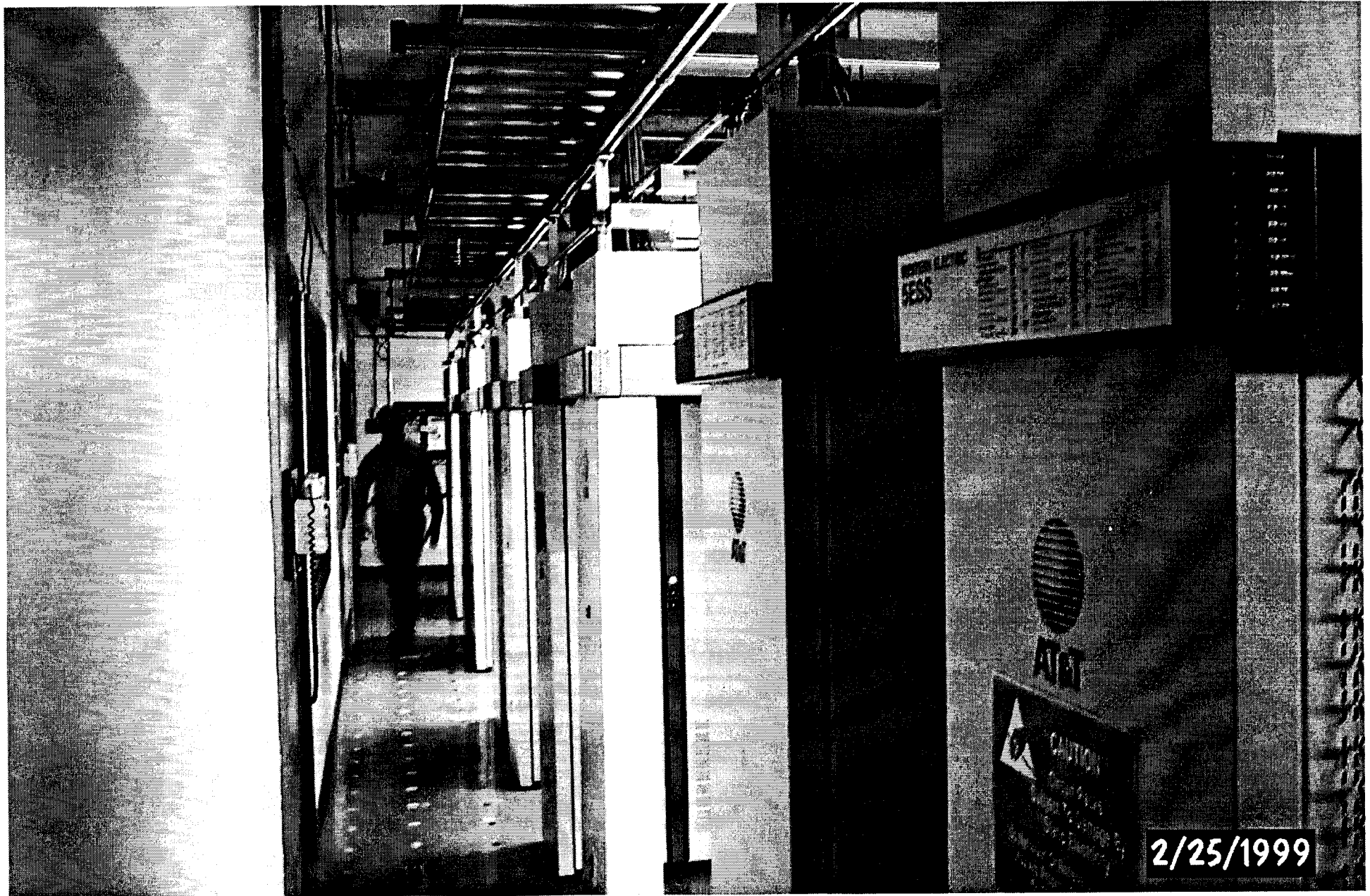
Palmetto Area 5a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 15 of 40



Palmetto Area 5b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 16 of 40



Palmetto Area 6a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 17 of 40



Palmetto Area 6b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 18 of 40



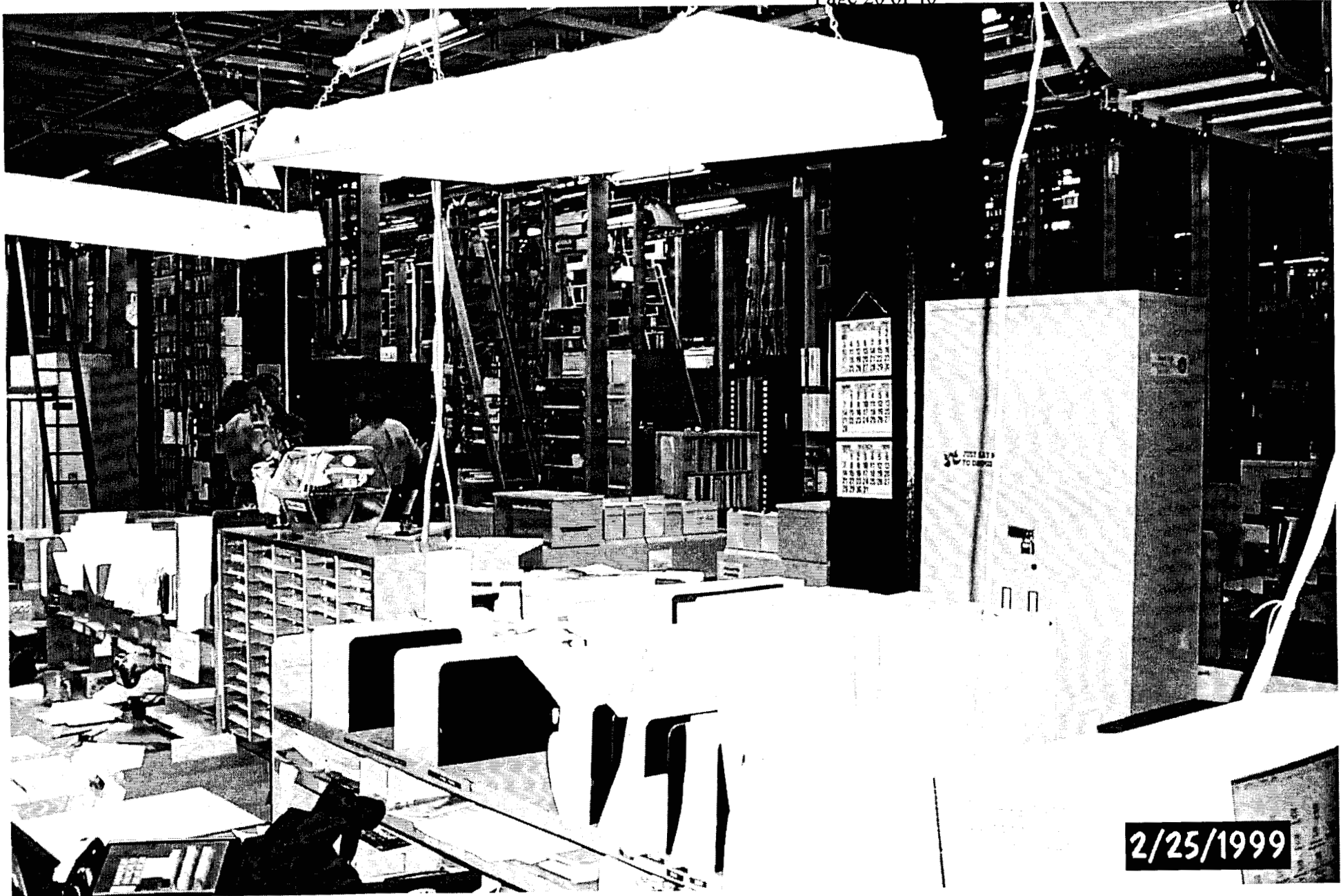
Palmetto Area 6c

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 19 of 40



Palmetto Area 7a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 20 of 40



Palmetto Area 7b

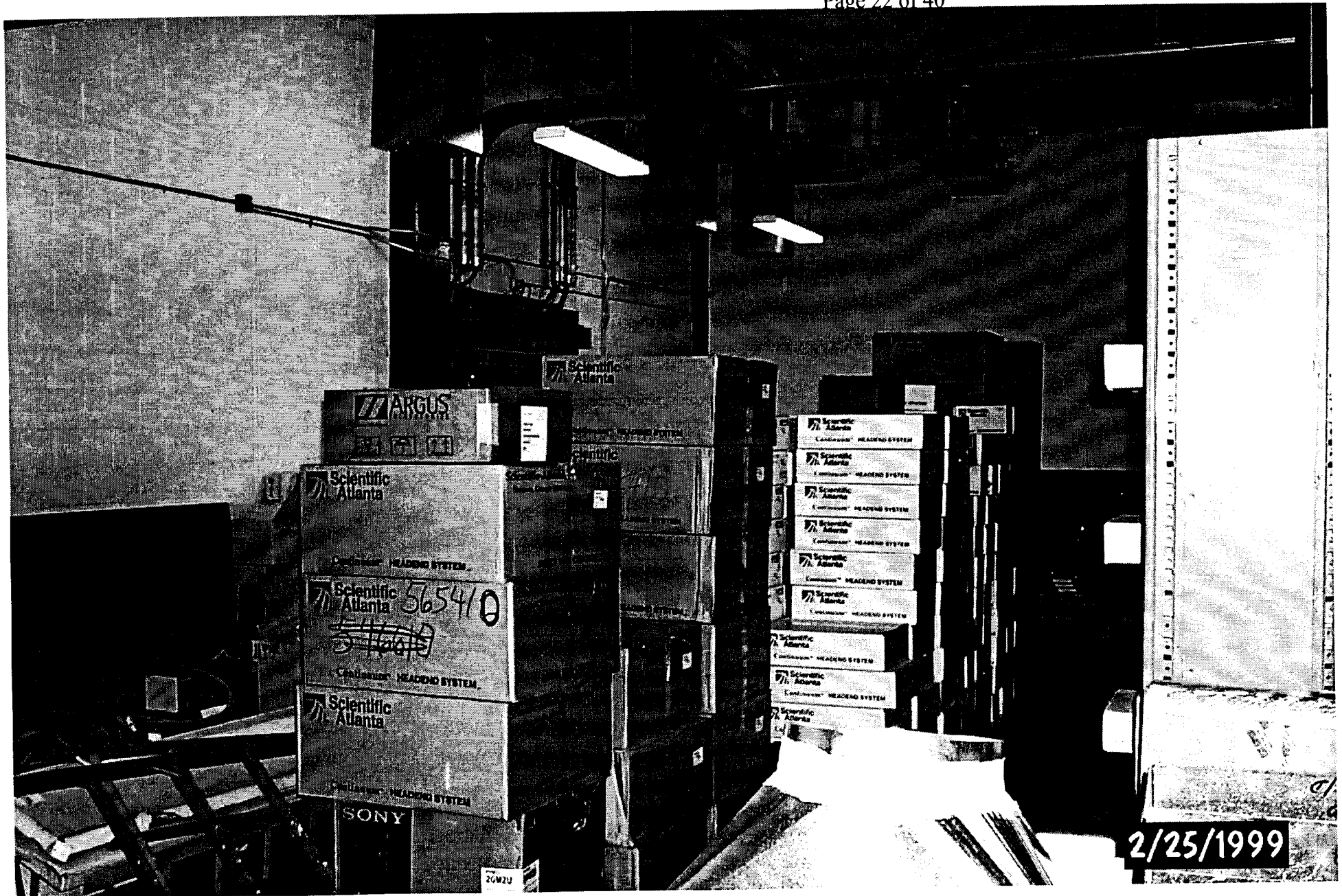
BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 21 of 40



2/25/1999

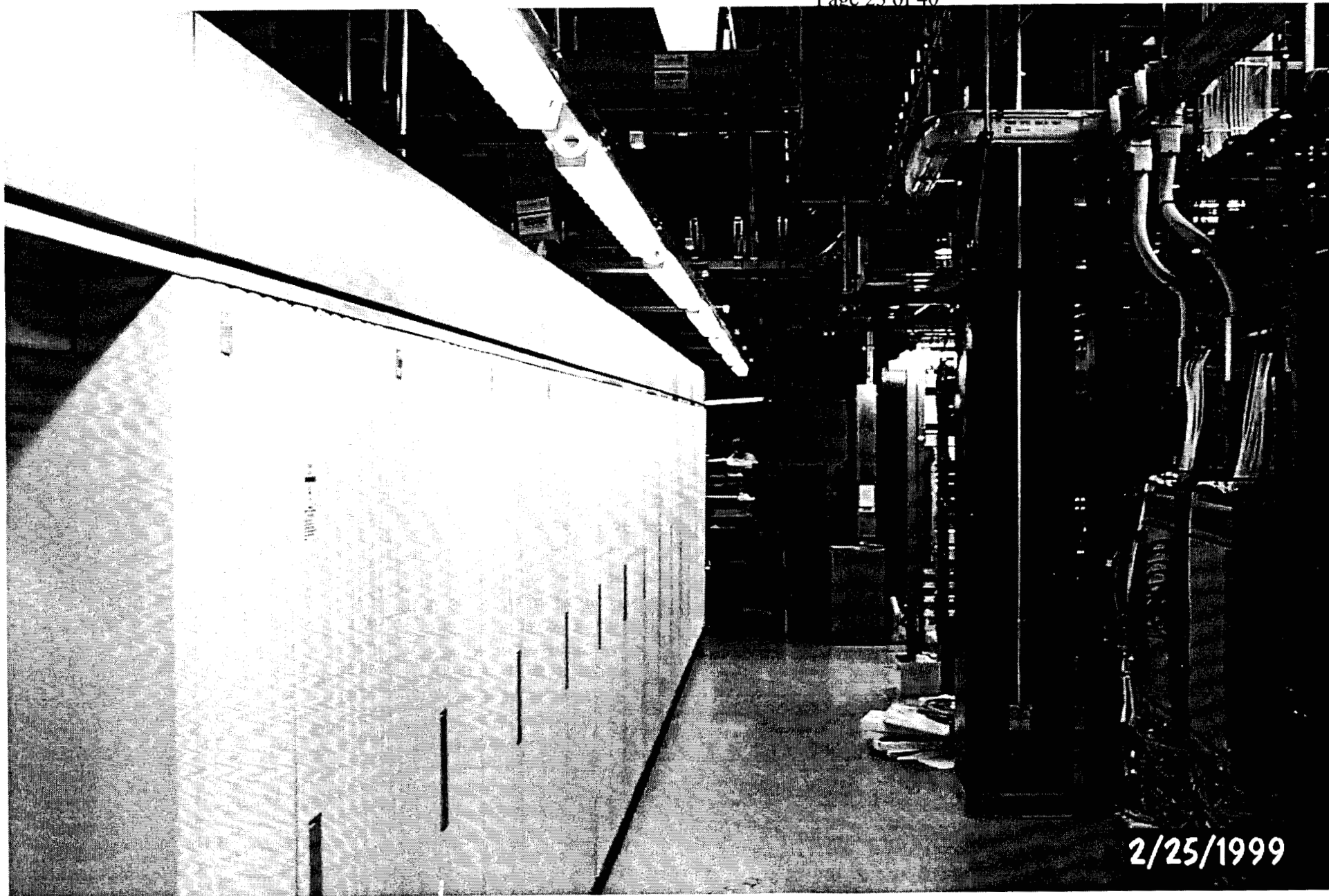
Palmetto Area 8

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 22 of 40



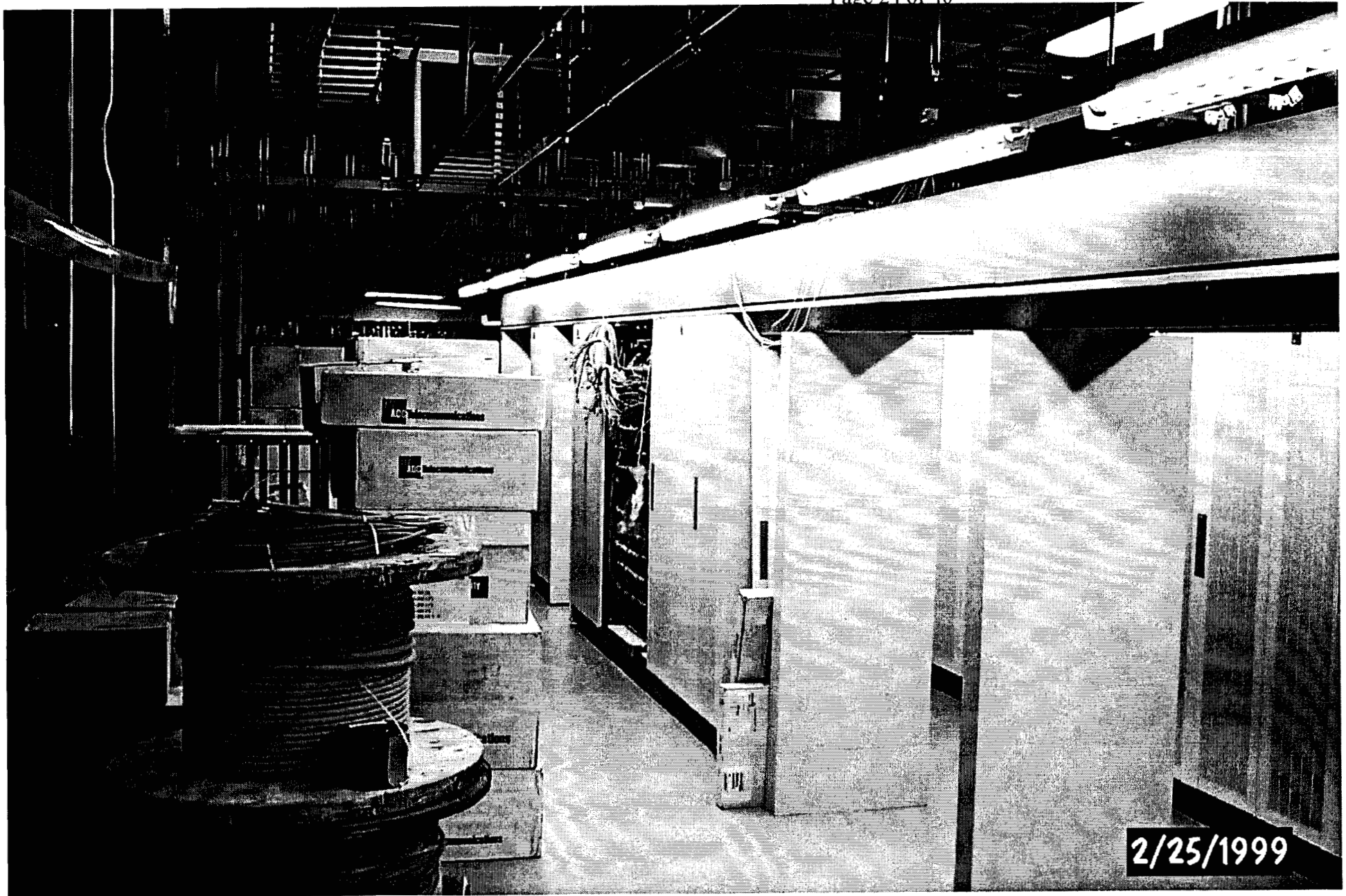
Palmetto Area 9a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 23 of 40



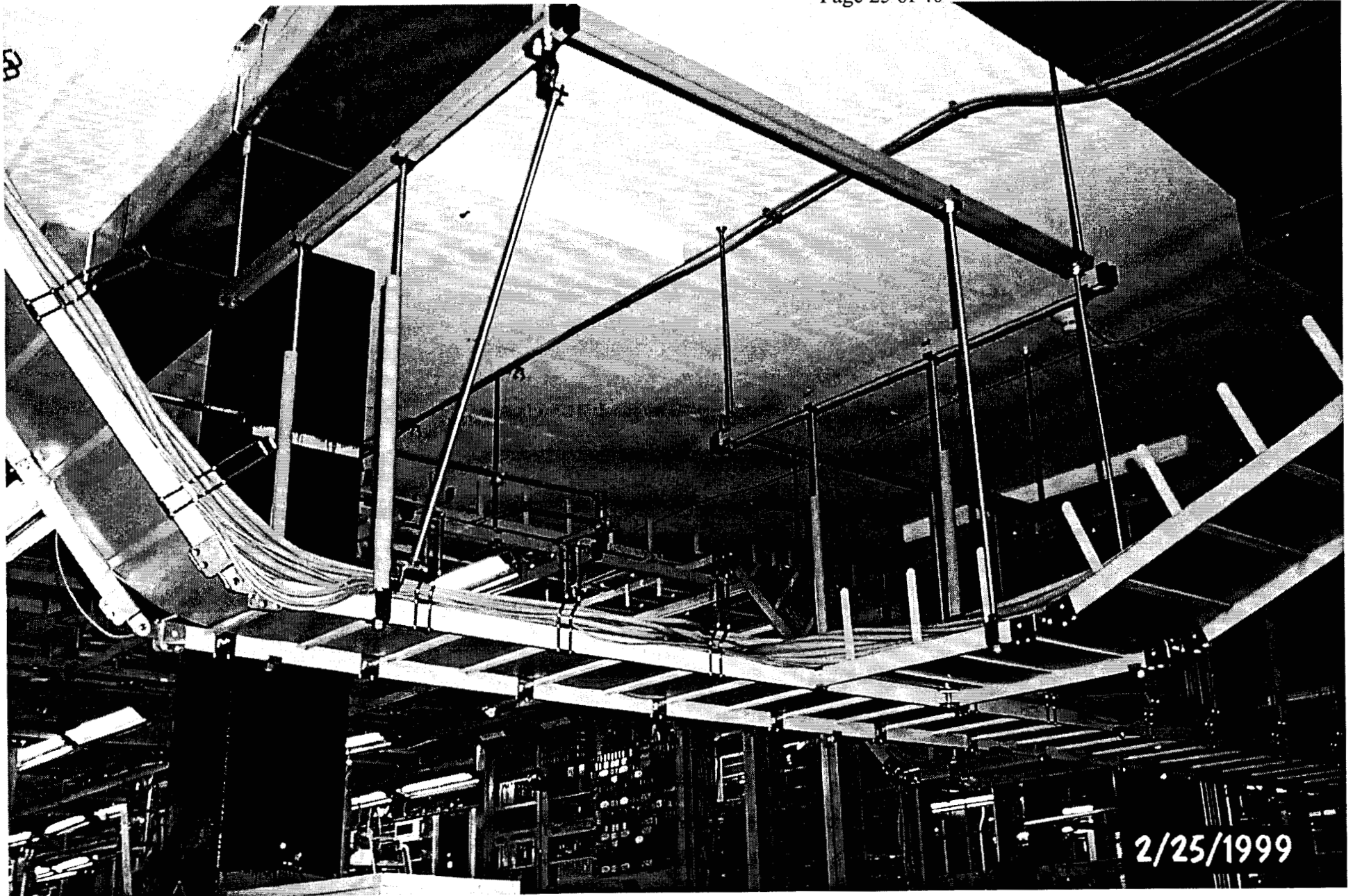
Palmetto Area 9b,c,d

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 24 of 40



Palmetto Area 9

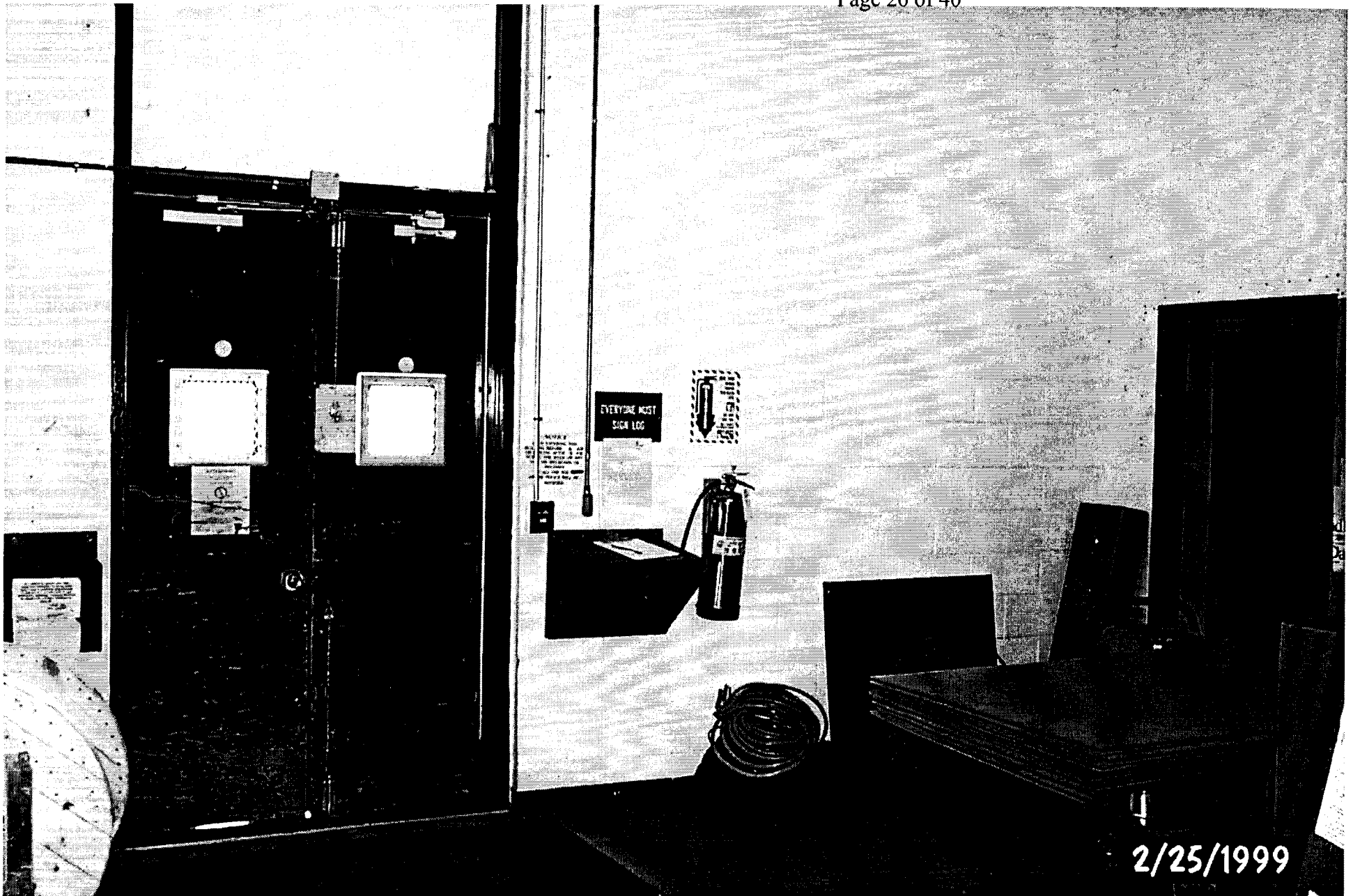
BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 25 of 40



2/25/1999

Palmetto Area 11

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 26 of 40



Palmetto Area 12a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 27 of 40



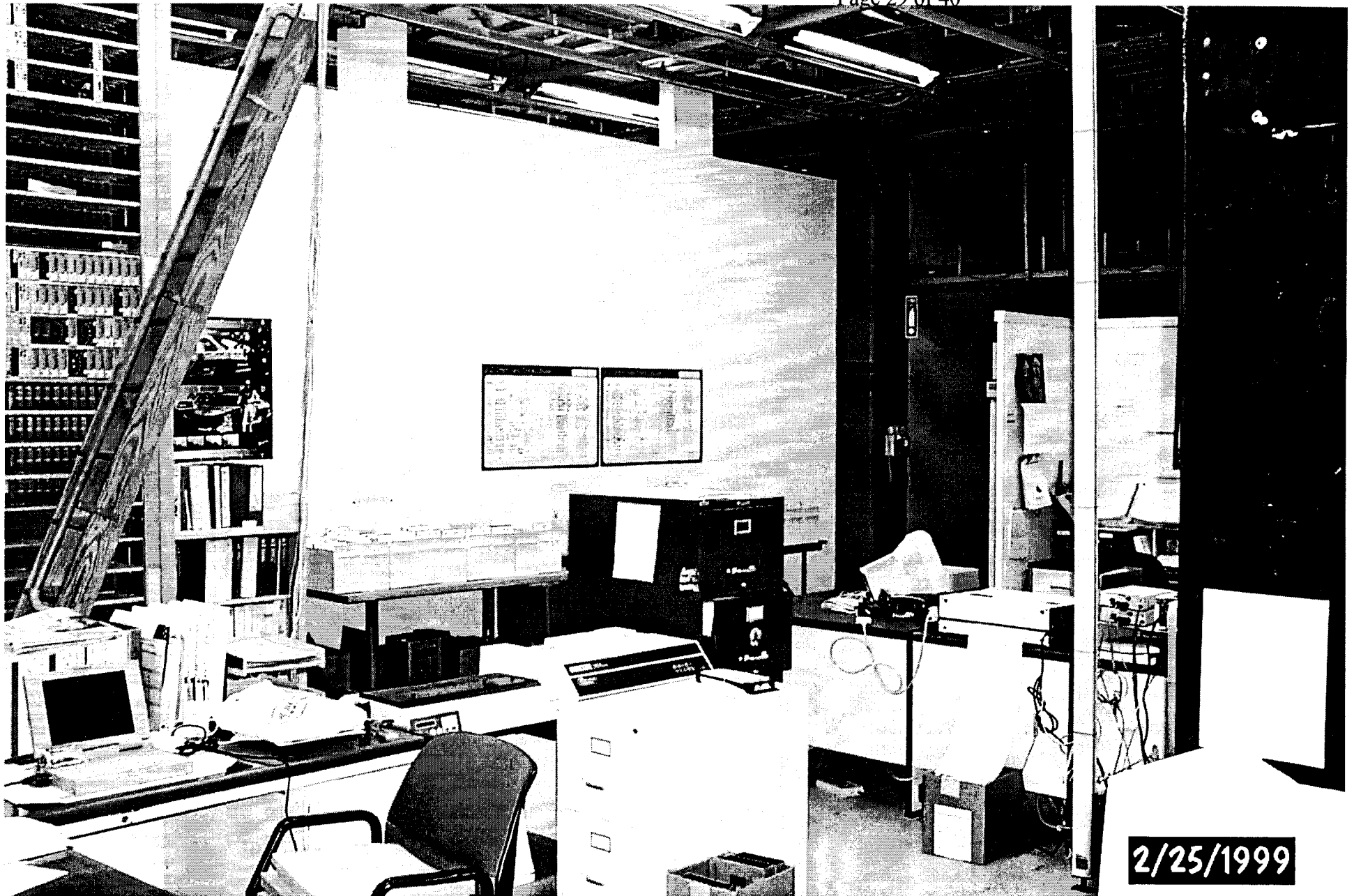
Palmetto Area 12b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 28 of 40



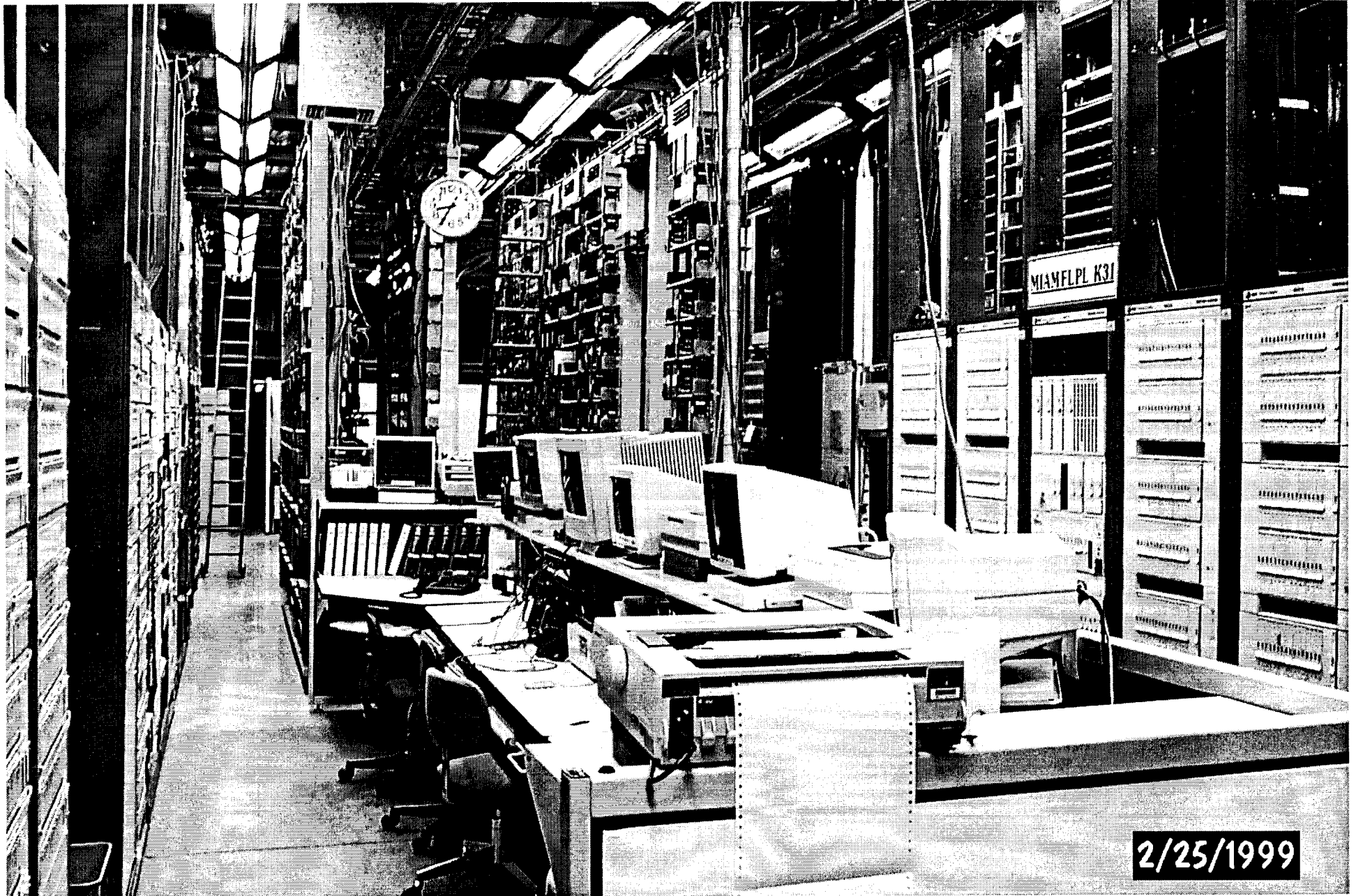
Palmetto Area 13a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 29 of 40



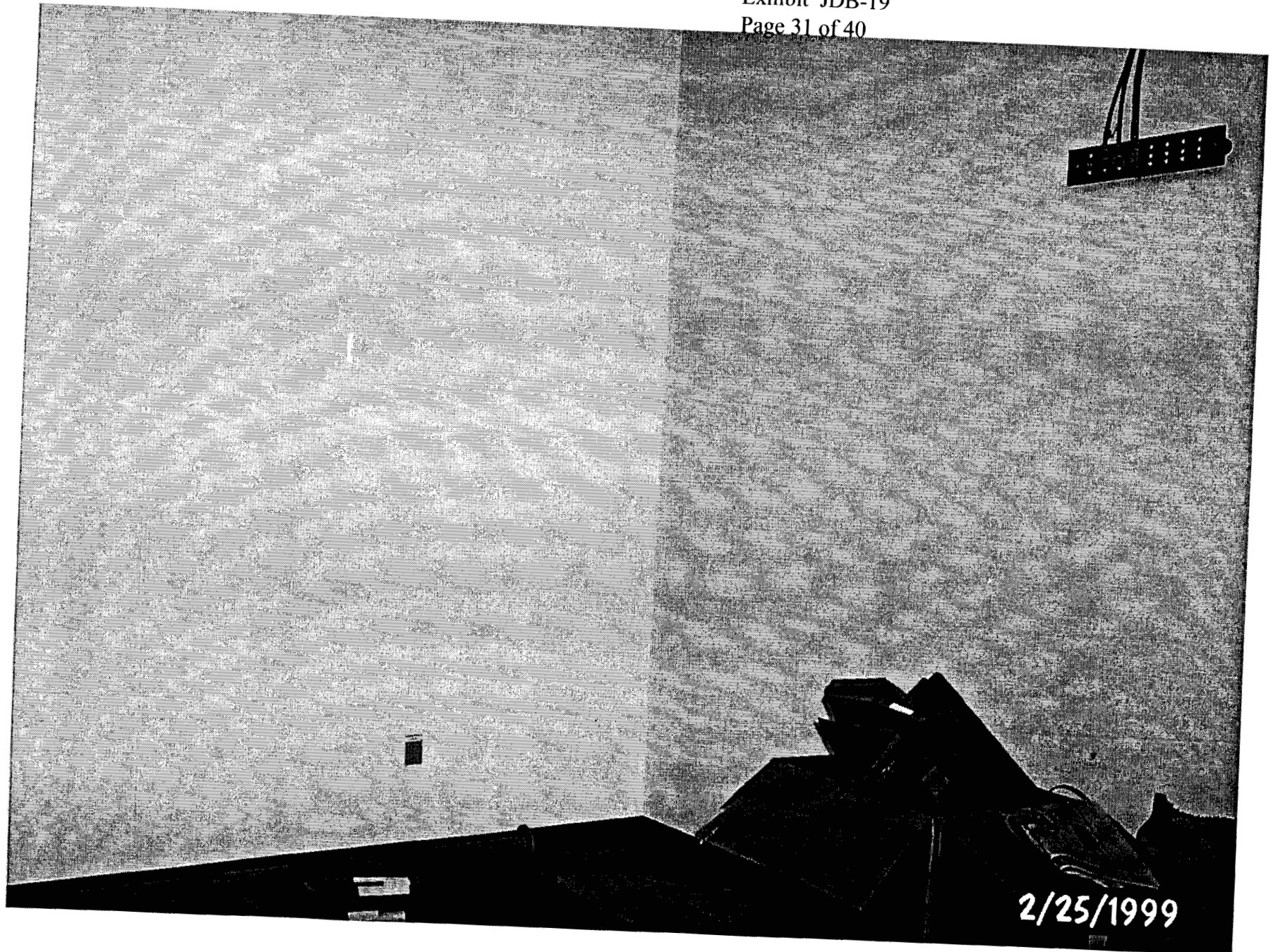
Palmetto Area 13b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 30 of 40



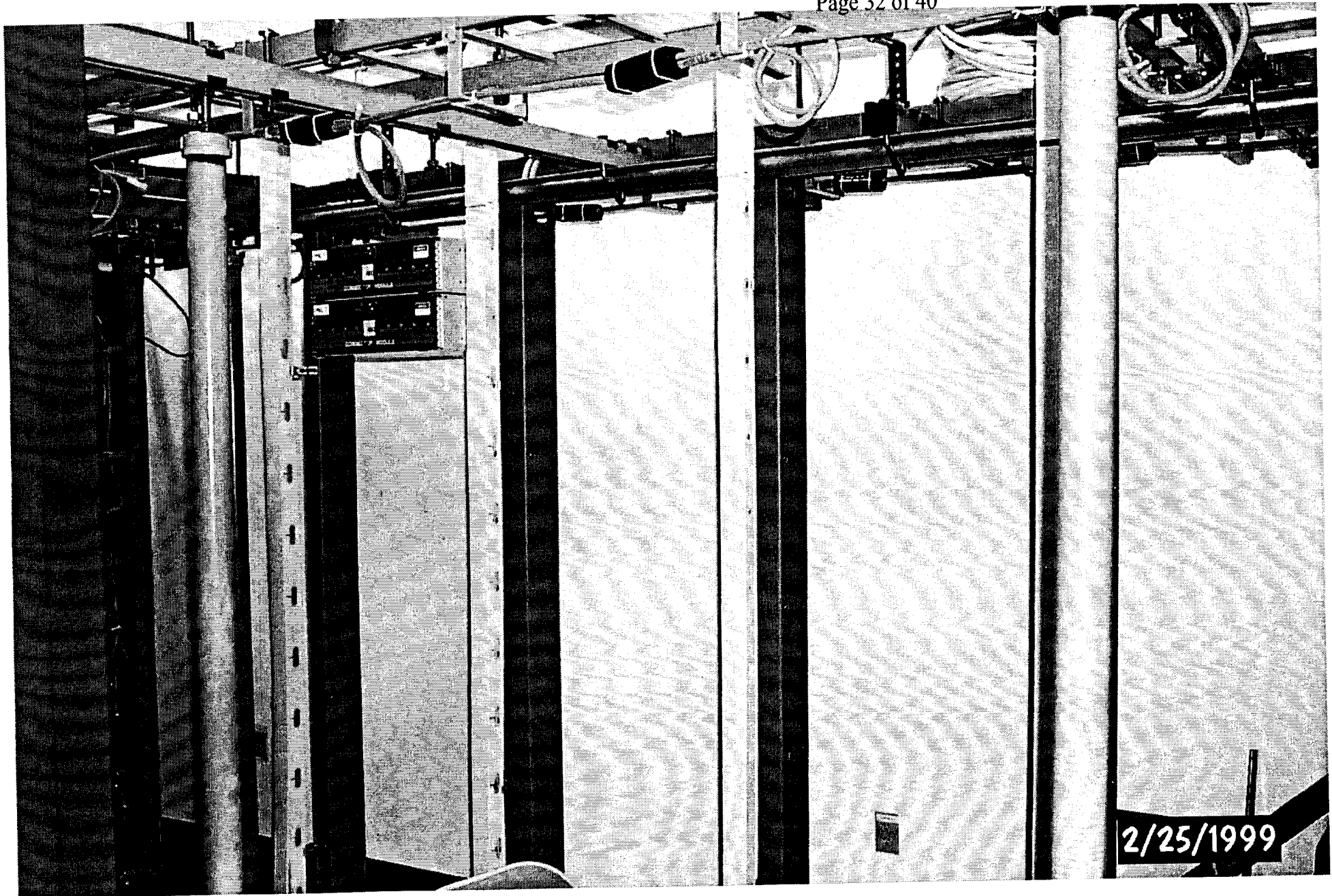
Palmetto Area 14

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 31 of 40



Palmetto Area 15

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 32 of 40



Palmetto Area 16

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 33 of 40



2/25/1999

Palmetto Area 18

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 34 of 40



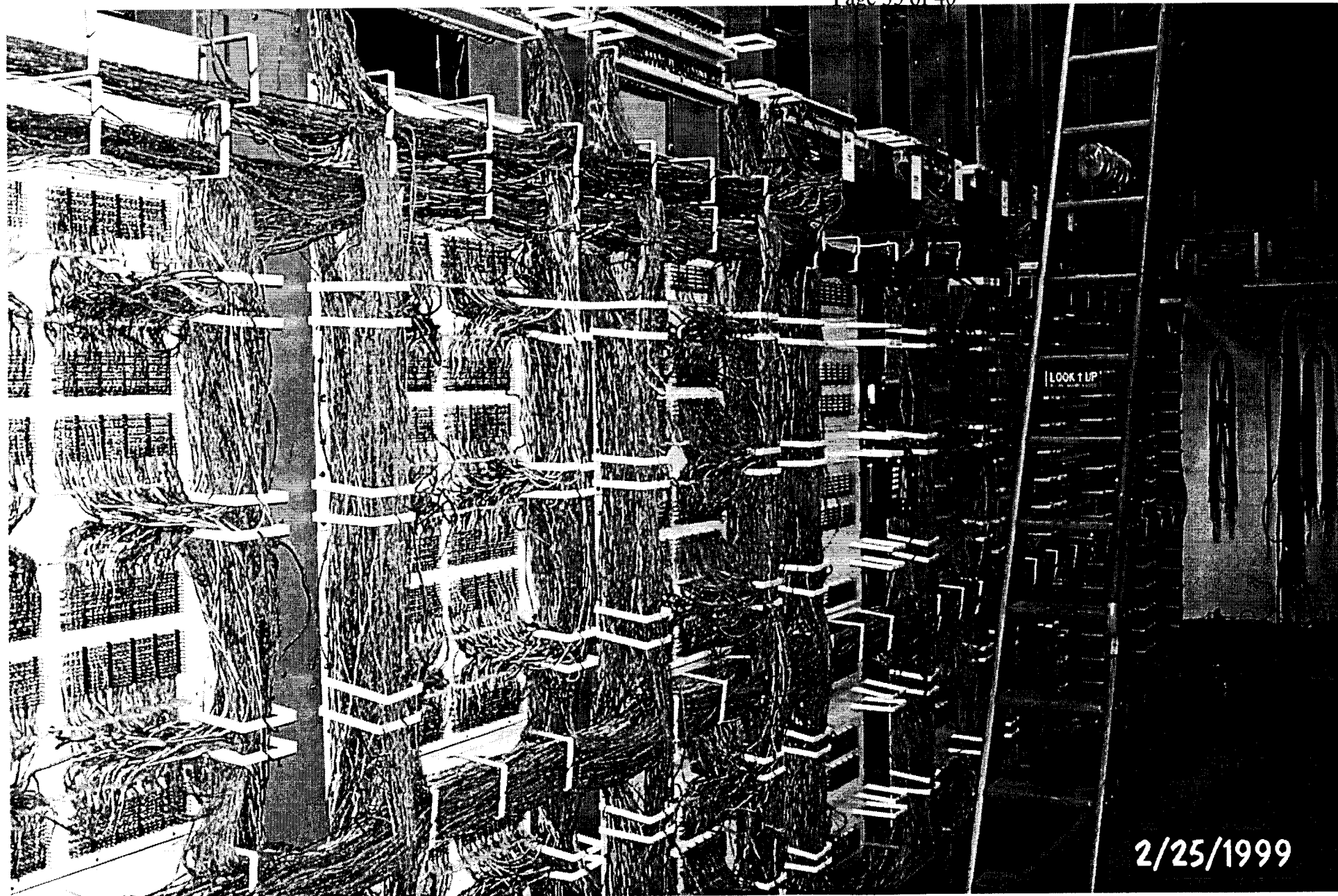
Palmetto (Family of grouping)

BellSouth Telecommunications, Inc.

FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL

Exhibit JDB-19

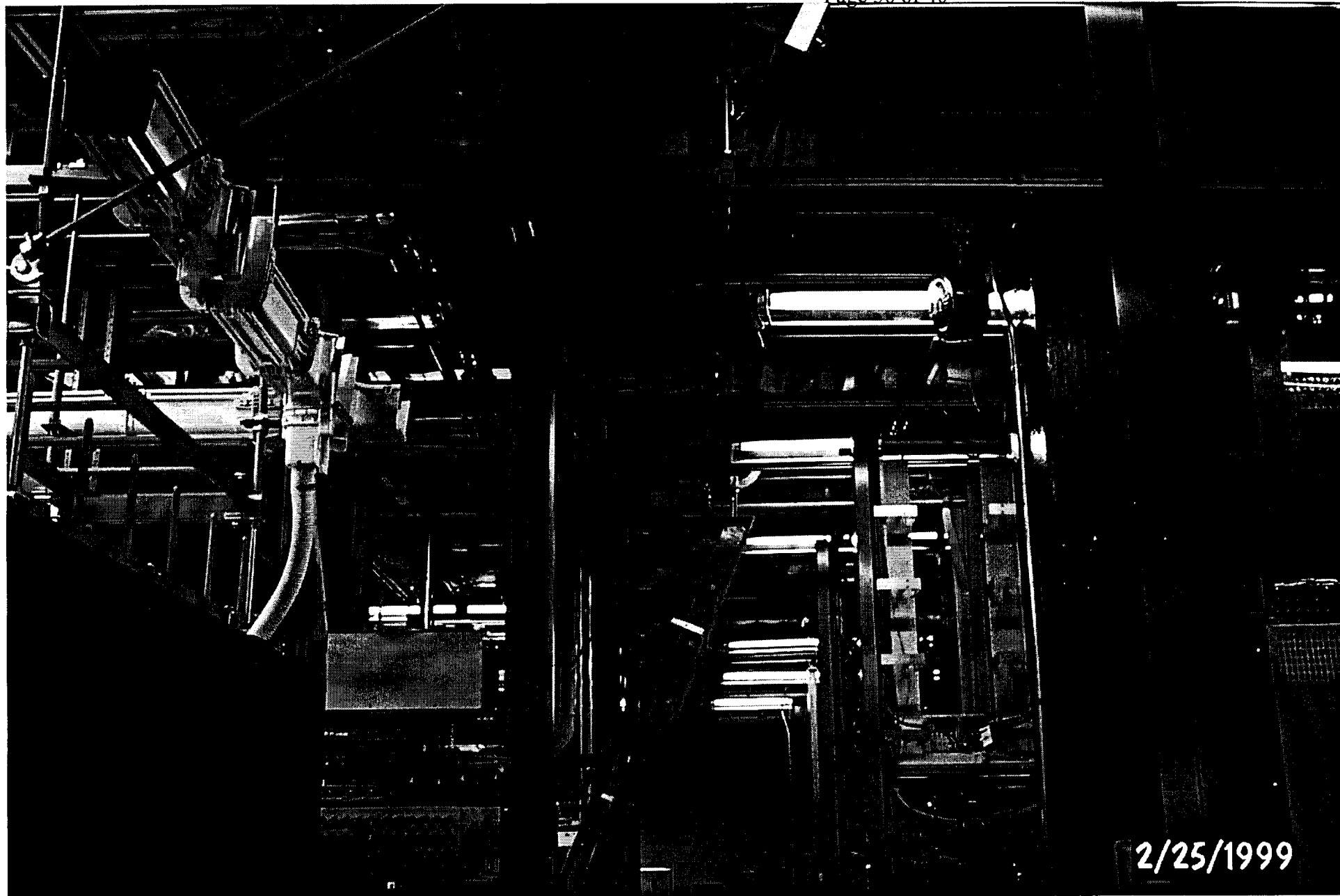
Page 35 of 40



2/25/1999

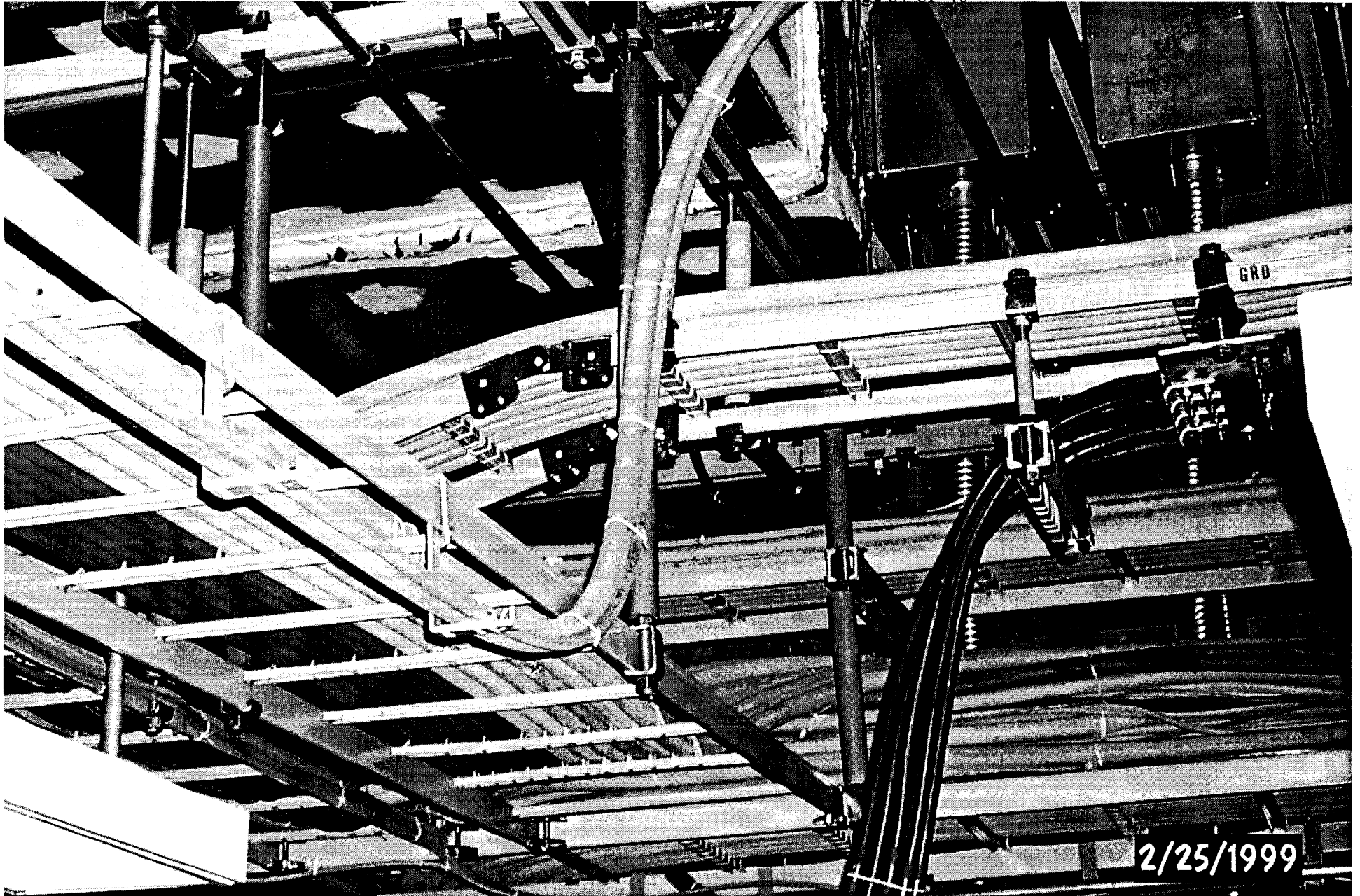
Palmetto Cable Congestion a

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 36 of 40



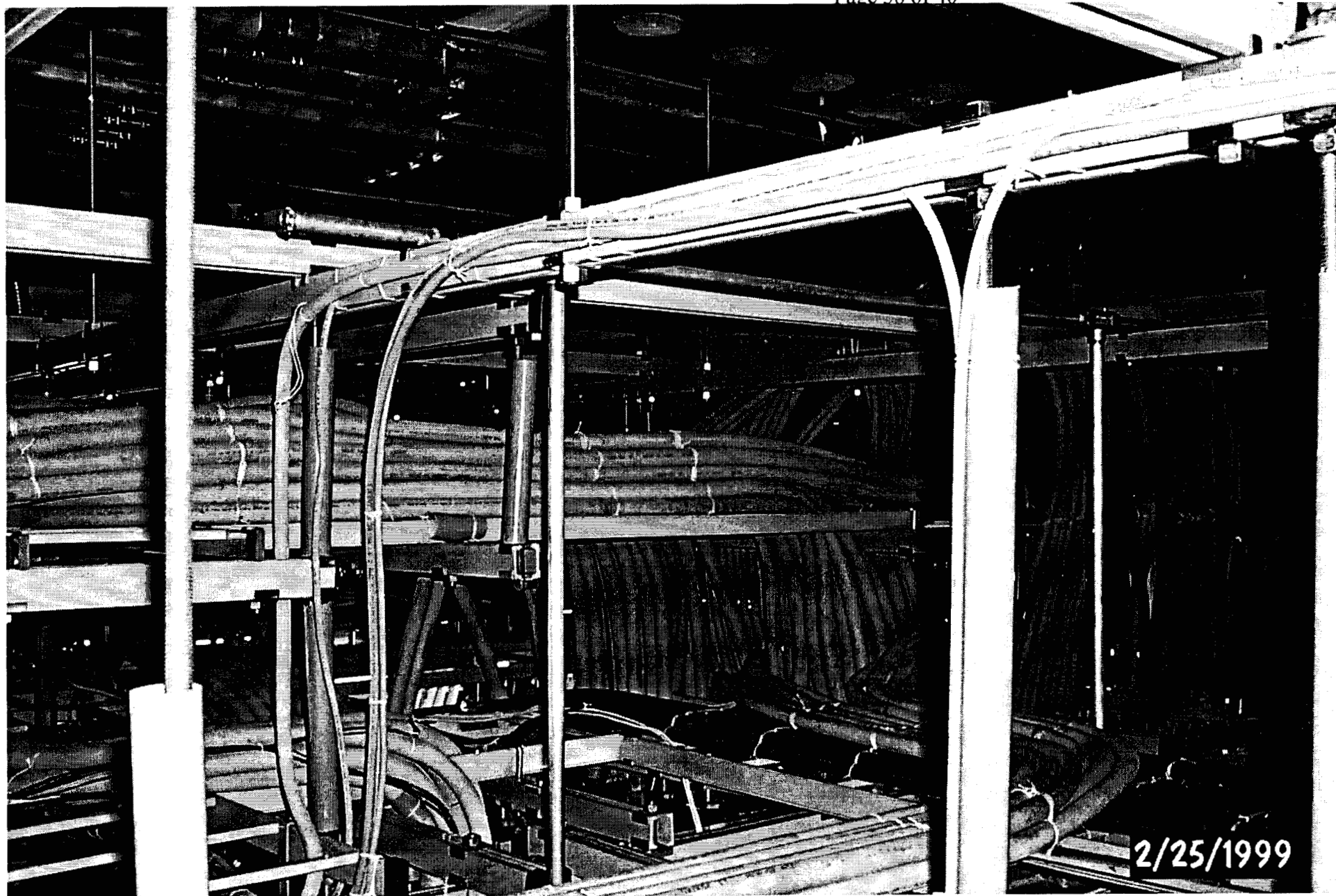
Palmetto Cable Congestion b

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 37 of 40



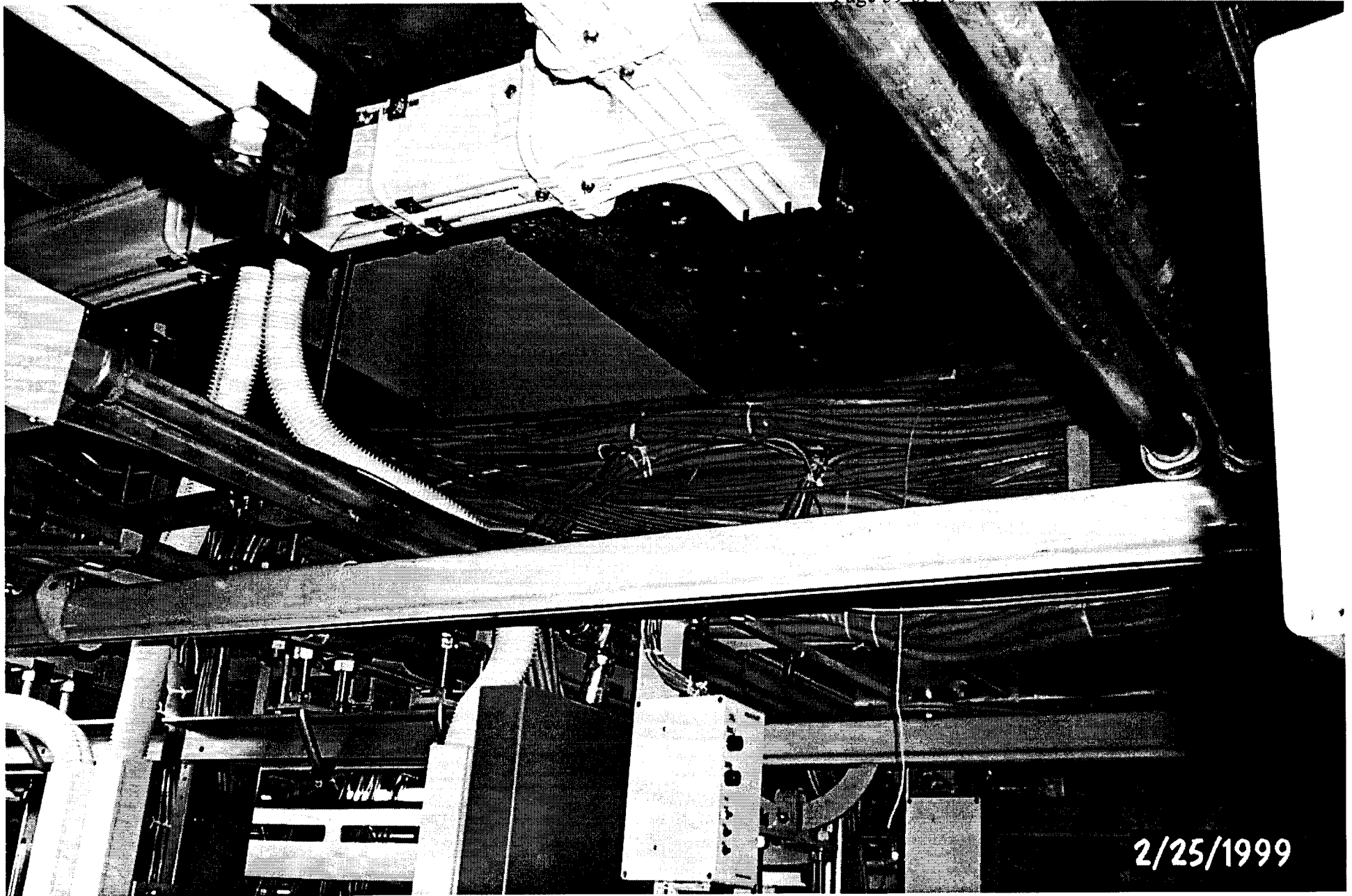
Palmetto Cable Congestion c

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 38 of 40



Palmetto Cable Congestion d

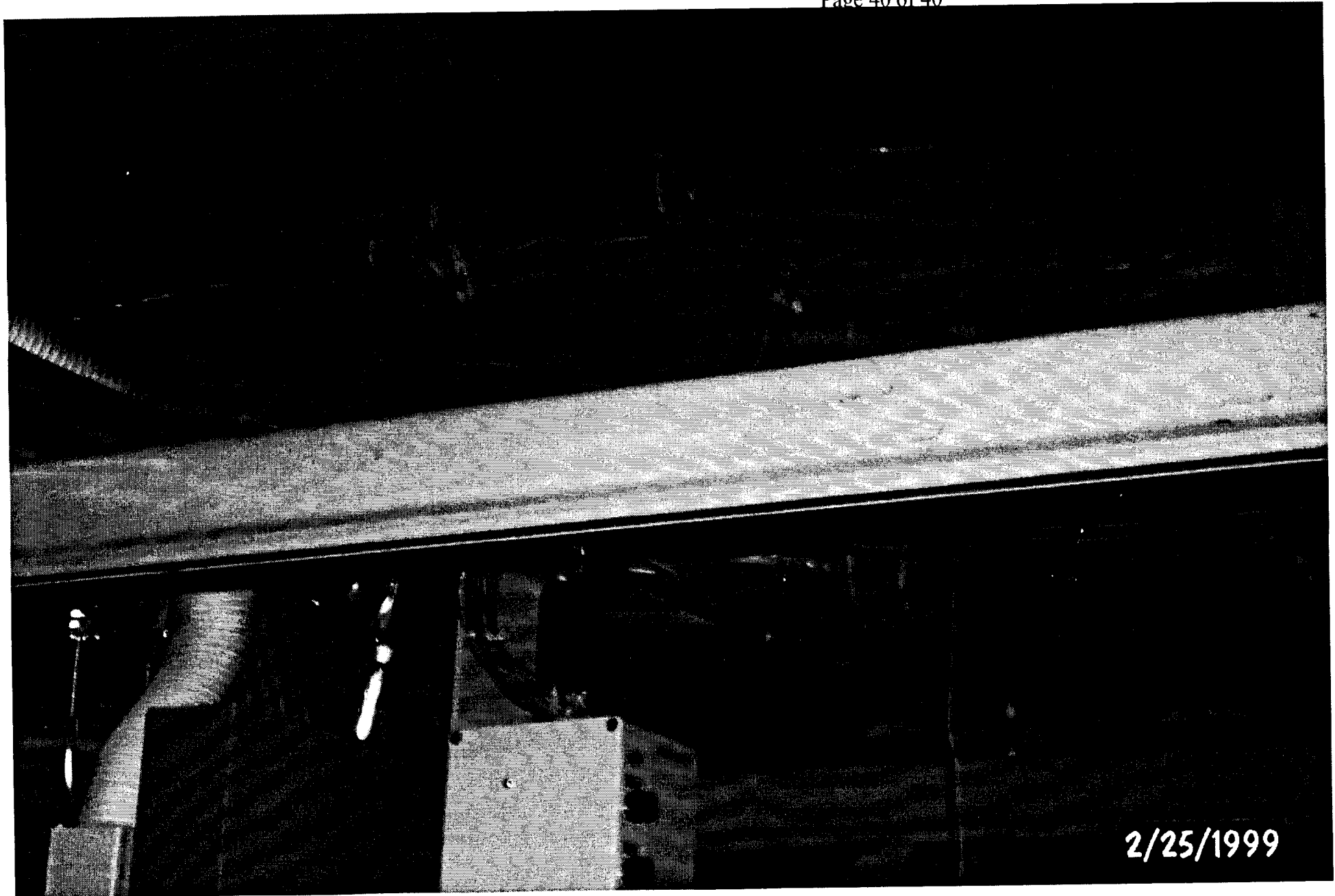
BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 39 of 40



2/25/1999

Palmetto Cable Congestion e

BellSouth Telecommunications, Inc.
FPSC Docket No. 980946-TL, 980947-TL, 980948-TL
981011-TL, 981012-TL, 981250-TL
Exhibit JDB-19
Page 40 of 40



2/25/1999

SOUTH FLORIDA BUILDING CODE 1998

DADE COUNTY EDITION

BellSouth Telecommunications, Inc.
FPSC Docket Nos. 980946-TL, 980947-TL,
980948-TL, 981011-TL, 981012-TL & 981250-TL
Exhibit JDB - 26, Page 1 of 71

Chapter: 05 Section: 00

□

501	GENERAL REQUIREMENTS
502	OCCUPANCY CLASSIFIED
503	CHANGE IN USE
504	OCCUPANT LOAD
505	ADJOINING OCCUPANCY
506	FIRE DIVISIONS
507	PARTY WALLS
508	OCCUPANCY SEPARATIONS
509	SPECIAL HAZARD PROTECTION
510	MIXED OCCUPANCIES
511	LOCATION ON PROPERTY
512	SANITATION
513	CEILING HEIGHTS
514	ALLOWABLE AREA
515	FACILITIES FOR PHYSICALLY DISABLED
516	SAFEGUARDS

Chapter: 05 Section: 01

□

0501.1

The intent of this Code is that buildings shall be of one type of construction required for the occupancies contained therein.

0501.2

No building or structure shall be erected nor any lot or portion of a lot be subdivided or sold nor any lot line moved by sale of land or otherwise in such a manner as to eliminate, nullify or reduce any required spaces for light and ventilation or means of egress or in any way to create violations of any of the provisions of this Code.

Chapter: 05 Section: 02

□

0502.1

(a) Every building or portion thereof, whether existing or hereafter erected, shall be classified by the Building Official according to its use or the character of its occupancy, as a building of Group A, B, C, D, E, F, G, H, I or J Occupancy, as defined in Chapters 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15 respectively.

(b) (1) Where minor accessory uses do not occupy more than 10 percent of the area of any floor of a building, nor more than 10 percent of the basic area permitted by occupancy, the major use of the building shall determine the occupancy classification.

(2) In buildings of Group G, Division 1 Occupancy, rooms for storing, sorting and unpacking goods held for retail sales shall be considered and classified the same as retail sales display areas.

(c) Minor accessory buildings not exceeding 10 percent of the area of the ground floor of the primary building, nor 1500 sq. ft., whichever is larger, and constructed of unprotected incombustible materials may, where complying with Subsection 1701.6 herein, be constructed without changing the limiting areas based on group of occupancy classification.

0502.2

Any occupancy not specifically mentioned shall be classified by the Building Official in the Group it most nearly resembles.

0502.3

Unless otherwise classified, accessory buildings shall conform to the requirements of the occupancy to which the building is accessory.

0502.4

When an occupancy is located in an unusual structure, such as within a vehicle or vessel, or a structure which is windowless or underground, the occupancy and the applicable portions of this Code and NFPA 101, including chapter 30 of NFPA 101.

Chapter: 05 Section: 03

☐

0503.1

No change in the character of occupancy of a building shall be made except as set forth in Subsection 104.7.

0503.2

No change in the character of occupancy of a building shall be made without a Certificate of Occupancy, as required in Section 307 of this Code.

0503.3

Buildings in existence at the time of the passage of this Code shall comply with Subsection 104.8 herein.

Chapter: 05 Section: 04

☐

0504.1

The occupant load shall be computed as set forth in Paragraph 3102.2(d) of this Code.

Chapter: 05 Section: 05

☐

0505.1

Adjoining units of different occupancies within a fire division shall be separated by a separation at least as fire-resistive as set forth in Section 508 of this Code.

0505.2

Two or more units of different occupancy may be contained within a fire division, but all such units shall conform to the provisions of Chapters 6 through 15 of this Code for the most restrictive of the occupancies so contained except as otherwise set forth

in Subsection 502.1 hereinabove.

Chapter: 05 Section: 06

☐

0506.1

Where in this Code and particularly in Chapters 6 through 15 of this Code, specific maximum allowable areas are set forth, the building may be separated into fire divisions and each such fire division shall be considered a separate building and be of the maximum allowable area provided the fire division separation walls (fire barriers) comply with this section.

0506.2

(a) Fire division separation walls shall be not less than 4-hour fire barriers in buildings of Type I, 3-hour fire barriers in buildings of Type II, and 2-hour fire barriers in buildings of Types III, IV, and V Construction.

(b) The total width of all openings in such walls shall not exceed 25 percent of the length of the wall in each story.

(c) Openings shall be protected as required in Section 1807 and Chapter 31, both of this Code.

0506.3

Fire barriers used for division separation need not extend to the outer edge of horizontal projecting elements such as balconies, roof overhangs, canopies, marquees, or ornamental projections provided that the exterior wall at the termination of the fire division separation wall and the projecting elements are not less than 1-hour fire resistive construction for a width equal to the depth of the projecting elements, but such fire protection need not extend more than 10'-0" on either side of the termination. Wall openings within such widths shall be protected by not less than 3/4-hour fire-resistive assemblies.

0506.4

Fire division separation walls shall extend from the foundation to a point at least 30" above the roof.

EXCEPTIONS:

1. 4-hour and 3-hour fire division separation walls may terminate at the bottom of the roof deck provided the roof deck is of incombustible construction for the area within 40 feet on each side of the wall.

2. 2-hour fire division separation walls (other than townhouses) may terminate at the underside of roof deck provided that the roof is of at least one-hour fire resistive construction on each side of the fire division separation wall termination.

3. 2-hour fire division separation walls for townhouses shall extend a minimum of 10" above the finished roof surface provided that the roof is of at least one-hour fire resistive construction on each side of the fire division wall. Instead of the 10" extension, the Building Official may accept such other method of design or construction which allows for the independence of the sheathing, structural and roof components of adjacent townhouse units.

0506.5

Where a fire division separation wall separates portions of a building having different heights, such wall may terminate at a point 30" above the lower roof level provided the exterior wall for a height of 10'-0" above the lower roof is one hour fire-resistive construction with openings protected by 3/4 hour fire-resistive assemblies.

EXCEPTION: The fire division separation wall may terminate at the deck of the lower roof provided the lower roof is a of at least one-hour fire-resistive construction for the width of 10'-0", without openings, measured from the wall.

0506.6

Fire dampers in ducts passing through fire division separation walls shall be required as set forth in Section 4905 of this Code.

Chapter: 05 Section: 07

☐

0507.1 EXTERIOR WALLS:

Subject to the applicable legal provisions of common ownership, a wall may be used as a PARTY WALL when conforming to the following requirements.

(a) Where the Type or Types of Construction used and/or combined floor areas of an existing and a proposed building are such that a separation into fire divisions is required, such walls shall meet the requirements for fire walls under this Code.

(b) Where not required as a fire wall but used to separate Occupancies, such wall shall conform with the requirements for separations of Occupancies under this Code.

(c) Such wall in all its parts shall conform to the engineering regulations of this Code or shall be made to conform therewith.

(d) Party walls used as common walls between separately owned buildings shall be incombustible and rated a minimum of two hours and shall meet the provisions of Subsection 506.4 hereinabove.

0507.2 SEPARATION BETWEEN TENANTS:

(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.

EXCEPTIONS:

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

(2) Fire separation will not be required between tenants or between tenants and common areas of Group A, B, F, G, Division 1, H, and J Occupancies where walls or partitions are omitted or where visual intercommunication through separation walls or partitions is provided for 50 percent or more of the area of the wall or partition.

(3) Group F, Division 1 tenancies 400 sq. ft. and less in area shall not be required to meet the provisions of the Subsection when one story in height provided fire division walls are constructed for each 10,000 sq. ft. of building area.

(b) Fire-resistive separation between tenants shall be continuous between fire barriers. Where exposed combustible materials are used in an attic or ceiling the separation between tenants shall be continuous to the deck above such space and shall include any eaves or overhangs.

EXCEPTION: A barrier required for an occupied space below interstitial space is not required to extend through the interstitial space provided the construction assembly forming the bottom of the interstitial space has a fire resistance rating equal to that of the fire barrier.

(c) Openings in fire-resistive separations between tenants shall be protected as set forth in Section 1807 of this Code by assemblies complying with Section 3706 of this Code and air movement openings shall be provided with smoke and/or fire dampers, as required therein.

(d) Walls or partitions required by this Code to be fire-resistive based on group of occupancy, type of construction, occupancy separation in Section 503 herein, draft stopping as set forth under types of construction, or protection of means of egress in Chapter 31 of this Code, may serve as separation between tenants where such walls and partitions also comply with this subsection.

Chapter: 05 Section: 08

☐

0508.1

Occupancy separations shall be provided between the various groups and divisions of occupancies as specified herein and in Table No, 5-A, but shall be not less fire-resistive than required for the type of construction.

(Click on the "FIGURE" button to view the appropriate tables or figures associated with this Code Section)

0508.2 FORM OF OCCUPANCY SEPARATION:

Occupancy separations shall be in the form of fire barriers which may be vertical, horizontal or inclined, depending upon the geometry and relative position of the portions to be separated, and shall consist of a system of walls, partitions, floors or other construction of such materials and construction, so arranged as to provide a complete, secure and continuous firebreak of the required fire-resistive rating between the portions of the building so separated.

0508.3 CLASSIFICATIONS OF OCCUPANCY SEPARATION:

(a) Fire barrier separations between occupancies within a fire division and between fire divisions shall be classified, each classification designated by the number of hours of fire-rating as set forth herein.

(b) A four-hour fire barrier separation shall be of not less than 4-hour fire-resistive construction and openings therein shall be protected in accordance with Paragraph 506.2(c) herein.

(c) (1) A 3-hour fire barrier separation shall be of not less than 3-hour fire-resistive construction.

(2) All openings in walls of 3-hour fire barrier separations shall be protected by a fire assembly having a 3-hour fire barrier rating.

(3) The total width of all openings in any 3-hour fire barrier in any one story shall not exceed 25 percent of the length of the wall in that story and no single opening shall have an area greater than 120 sq. ft.

(4) All openings in floors forming a 3-hour fire barrier separation shall be protected by vertical enclosures extending above and below such openings. The walls of such vertical enclosures shall be of not less than 2-hour fire-resistive construction and all openings therein shall be protected by a fire assembly having a 1-1/2 hour fire protection rating.

(d) A 2-hour fire barrier separation shall be for not less than 2-hour fire-resistive construction. All openings in such separation shall be protected by a fire assembly having a one and one-half hour fire protection rating.

(e) A 1-hour fire barrier separation shall be of not less than 1-hour fire resistive construction. All openings in such separation shall be protected by a fire assembly having a 3/4 hour fire protection rating.

EXCEPTION: As otherwise permitted by the group of occupancy or Section 1807 of this Code.

(f) A 3/4 -hour fire barrier shall be of not less than 3/4-hour fire resistive construction and openings therein shall be protected with assemblies of not less than a 20-minute fire protection rating.

(g) A 20-minute fire barrier shall be of not less than 20-minute fire resistive construction, and openings therein shall be protected with assemblies of not less than a 20 minute fire protection rating.

0508.4 DESIGN AND MATERIAL OF OCCUPANCY SEPARATION:

Walls which form separations between occupancies or between fire divisions shall also conform with the provisions of PART VI as they pertain to design and materials.

Chapter: 05 Section: 09

☐

0509.1

Protection shall be provided from any area having a degree of hazard greater than that normal to the general occupancy of the building or structure, such as storage of combustibles or flammables, heat-producing appliances, or maintenance purposes, as set forth in this section.

(a) Enclosures with construction in accordance with Section 1807 of this Code with a fire resistance rating as specified by the group of occupancy, but not less than 1 hour without windows and with doors of 3/4 -hour fire protection rating, or

(b) Protection with automatic extinguishing systems in accordance with Chapter 38 of this Code as required for the group of occupancy.

(c) Both (a) and (b) above when specified for the group of occupancy by Chapter 38 or 31 both of this Code.

0509.2

Where hazardous processes or storage are of such a character as to introduce an explosion potential, explosion venting or an explosion suppression system specifically designed for the hazard involved shall be provided as set forth in Chapter 41 and 49 of this Code.

0509.3 HAZARDOUS UTILITIES:

(a) GENERAL: Individual feeders and shut-offs shall be provided for every separate fire division in every building.

(b) ELECTRIC: Where electricity is served to multiple tenants (more than 2), the provisions of Paragraph 4506.1 (d) of this Code shall be satisfied.

(c) GAS: Where gas is served to separated fire divisions or occupancies, there shall be individual valves, and valves and meters shall be located on the exterior of the building in a conspicuous and accessible place. Installation shall be as set forth in Chapter 47 of this Code.

(d) OTHER: Other utilities which may constitute hazards shall, in general, be governed by the provisions of this section and shall be subject to such additional requirements as the Building Official may prescribe.

Chapter: 05 Section: 10

☐

0510.1

Where two or more types of occupancy occur within the same building or structure, and are so intermingled that separate safeguards are impracticable, means of egress facilities, construction, protection and other requirements shall comply with the most restrictive life safety requirements of the occupancies involved.

0510.2

Where two or more types of occupancy occur in different parts or separate floors of the same building, the combined width of means of egress at any floor or part, other than the first or ground floor, shall not be less than required for the specific occupancy considered separately and the occupant content of only that floor or part of the building. See also Subsection 3102.2 of this Code.

0510.3

Additional requirements for mixed occupancies shall be as set forth in Chapter 31 of this Code.

Chapter: 05 Section: 11

☐

0511.1

The location of all buildings and/or structures shall conform to the provisions of applicable zoning.

0511.2

The location of all buildings and the protection of certain openings shall conform to the requirements of the group of occupancy in which such building is classified in this Code, according to the use or the character of the occupancy.

0511.3 SEPARATION FROM THE METROMOVER:

New construction of buildings and structures shall not be located within 5 feet horizontal separation from the Metromover. Horizontal separation shall mean the distance from the exterior wall of such building or structure to the Metromover when projected on a horizontal plane. The Building Official and the Metro Dade Transit Agency may approve locations for new construction of buildings and structures that are less than 5 feet horizontally from the Metromover where the portions of the building and/or structure within 5 feet of the Metromover are separated by means of 4 hour fire rated walls. When openings are permitted in required 4 hour fire rated walls separating buildings and/or structures from the Metromover, they shall be protected with Class A fire door assemblies and arranged as horizontal exit separations.

Chapter: 05 Section: 12

☐

0512.1 WASTE STORAGE:

Adequate permanent enclosures shall be provided for the storage of waste within the lines of the lot or lots occupied.

0512.2 TOILET ROOMS:

(a) Toilet facilities shall be provided on each floor for each sex using that floor and shall be located to be readily accessible except that in a building where the two lower levels, such as a first floor and mezzanine, or the first floor and second floor where there is no mezzanine, are occupied by a single tenant and the toilet facilities are not for public use, the combined total toilet facilities required for these two levels may be located in either the first or second level. Toilet facilities in Group A or B Occupancies, such as restaurants, bars, transportation terminals and similar locations, will be permitted this two-level exception when the travel distance from the remote corner of one level to the entrance door of the toilet facility of the other level does not exceed 150'-0".

(b) Minimum toilet facilities shall be a toilet room having one water closet and one lavatory, which may serve both sexes but not more than nine persons.

(c) Water closets for public use, except within the residence or apartment of a single family, shall be of an elongated type and shall be equipped with open front seats, and shall be separated from the rest of the room, and from each other, by stalls of impervious materials. Such stalls shall be equipped with self-closing doors and shall be open at the top and at least 12" from the floor for ventilation.

(d) The floors and walls of the public toilet rooms, to a height of 5'-0", shall be tile or similar impervious materials.

(e) Toilet rooms connected to rooms where food is prepared or served to the public shall be separated therefrom by a vestibule with close-fitting doors.

EXCEPTION: Toilet rooms, connected to rooms where food is served, that are completely enclosed, have close fitting, self-closing doors and mechanical ventilation that causes a negative pressure relative to areas of food service.

(f) Toilet rooms connected to public rooms or passageways shall have a vestibule or shall otherwise be arranged or screened to insure decency and privacy.

(g) Public toilets shall bear signs plainly indicating for which sex and/or group such room is intended.

(h) Required facilities in public buildings shall be available to employees and the public without charge.

(i) Warehouses or storage buildings renting or leasing bays or stalls of not more than 500 sq. ft. and that do not have separate electric service for the purpose of determining the required toilet facilities only, such buildings shall be considered as a single tenant. Toilet facilities shall be provided with a travel distance not to exceed 500'-0".

(j) Requirements for plumbing fixtures and systems shall be as set forth in Chapter 46 of this Code.

0512.3 SCREENING:

(a) Food-storage and preparation rooms shall have outside openings screened with 18-mesh-wire screening. Screen doors shall be equipped with self-closing devices.

(b) Public dining rooms, restaurants, tearooms and similar places for serving food to the public shall be completely screened with 18-mesh wire to effectively prevent the entrance of insects. This requirement for screening or installation of fans in public dining shall not be construed to prevent the serving of food to the public in outdoor areas.

Chapter: 05 Section: 13

□

0513.1 GENERAL:

(a) Headroom shall be defined as the minimum ceiling height from the finished floor surface to the lowest point of the ceiling or other overhead obstruction. The minimum headroom in means of egress shall be 7'-6".

EXCEPTIONS:

(1) Headroom on stairs may be 6'-8", measured as specified in Paragraph 3102.1(b) of this Code.

(2) Pipes, ducts and stationary mechanical appurtenances may be permitted to reduce the headroom at a point to not less than 6'-8". For corridors serving as exit access, the term "point" shall be taken to mean a section of the ceiling not exceeding two feet in the direction of exit travel.

(3) The headroom under mechanical appurtenances with exposed moving parts, including any ceiling fan, shall be not less than 7'-0".

(b) Small storage closets, slop-sink closets, storage space under a stair and similar small areas where persons do not generally walk into shall not be limited to height.

(c) Doors connecting space where minimum ceiling heights are herein regulated shall be of not less than 6'-8" in height.

(d) The minimum height of entrances for pedestrian or vehicular traffic and for parking spaces under or within a building shall be 6'-8".

EXCEPTION: As otherwise set forth in (b), above.

(e) The ceiling height of a limited storage mezzanine or area where persons may infrequently be and only for the purpose of placing or removing stored materials shall not be limited.

0513.2 CEILING HEIGHTS BY SPECIFIC USE:

- (a) Ceiling heights of residential Occupancies shall comply with Sections 1305, 1405, and 3104 of this Code as applicable.
- (b) Stairways and landings shall have headroom as set forth in Subsection 3102.1 of this Code.
- (c) The maximum headroom of parking garages for passenger cars, where the design is based on a reduced live load, shall not exceed 7'-6" fixed.
- (d) Headroom under roof signs shall comply with Subsection 4206.4 of this Code

Chapter: 05 Section: 14

☐

0514.1 BASIC FLOOR AREA:

- (a) (1) The area of a one-story building in Fire Zones 1 and 2 shall not exceed the limits set forth in Chapters 6 through 15 of this Code except as provided in Subsection 514.2 herein.
- (2) Buildings in Fire Zone 3 may have basic areas of one-third more than the limits set forth in Chapters 6 through 15 of this Code and the basic areas so computed may be further increased as provided in Subsection 514.2 herein.
- (b) Basements and cellars need not be included in the total allowable area provided they do not qualify as a story or exceed the area permitted for a 1-story building.
- (c) The total area of all floors of a multi-story building shall not exceed twice the area allowed for one-story buildings.
- (d) No single floor area shall exceed that permitted for 1-story buildings.

0514.2

- (a) **BASIC AREA INCREASES:** The basic areas provided in Subsection 514.1 hereinabove may be increased by the percentages set forth in one of the following:

- (1) Where public space, streets, or yards more than 20'-0" in width extend along and adjoin two sides of a building, the basic floor area may be increased at a rate of 1-1/4 percent for each 1'-0" by which such space, street, or yard exceeds 20'-0", but such increase shall not exceed 50 percent.
- (2) Where public space, streets, or yards more than 20'-0" in width extend along and adjoin three sides of a building, the basic floor area may be increased at a rate of 2-1/2 percent for each foot by which such space, street, or yard exceeds 20'-0", but such increase shall not exceed 100 percent.

(3) (aa) Where public space, streets, or yards more than 20'-0" in width extend on all sides of a building and adjoin the entire perimeter, the basic floor area may be increased at a rate of 5 percent for each 1'-0" by which such space, street, or yard exceeds 20'-0".

(bb) Such increases shall not exceed 100 percent, except as provided in Paragraph 514.2(b) herein.

(4) Floor areas so computed are the maximum allowable except where unlimited as provided in Paragraph 514.2(b) or except in buildings provided with automatic fire extinguishing systems as set forth in Paragraph 514.2(c) herein.

(b) UNLIMITED AREA:

(1) The areas of buildings of Groups F and G Occupancy shall not be limited where such buildings do not exceed 2 stories in height, are entirely surrounded by public space, streets, or yards not less than 60'-0" in width, and are provided with an approved automatic fire extinguishing system throughout as set forth in Chapter 38 of this Code.

(2) The areas of 1-story buildings of Groups F and G Occupancy Type II, Type III (Protected), or Type IV Construction shall not be limited where such buildings are entirely surrounded and adjoined by public space, streets, or yards not less than 60'-0" in width.

(c) AUTOMATIC FIRE EXTINGUISHING SYSTEMS:

(1) The basic areas provided in Subsection 514.1 hereinabove may be tripled in 1-story buildings and doubled in buildings more than 1-story where such buildings are provided with approved automatic fire extinguishing systems throughout, as set forth in Chapter 38 of this Code.

(2) In buildings of Group E occupancy, the area increases permitted in the Sub-paragraphs of paragraph 514.2 (a) hereinabove applied to the advised basic area.

(d) PUBLIC SPACE , STREETS, OR YARDS: where the width of public space, streets, or yards is used to increase floor area, such space, street or yard shall remain unobstructed to provide permanent access not less than 20'-0" in width for fire-fighting equipment to serve each building.

Chapter: 05 Section: 15

☐

For 515 Accessibility Requirements please refer to F.S. 553.501-513
(Florida Americans with Disabilities Accessibility Implementation Act)
also

Portions of Fair Housing Act
Sections 760.22 (a)(b) - 760.23 (10), Florida Statutes

Section 515, which covers pages 5-13 through 5-25, has been deleted in its entirety.
Please discard and replace with page 5-13 of Supplement No.2.

You can get copies of above mentioned materials by contacting:

State of Florida
Department of Community Affairs

2740 Centerview Drive
Tallahassee, FL 32399
(904) 487-1824

Chapter: 05 Section: 16

□

0516.1 GENERAL:

(a) Safeguards in and around buildings and structures such as covers, railings, stair-railings, handrails, or other safeguards as defined and provided in the regulations of the Occupational Safety and Health Administration.(OSHA)29CFR Part 1910 as applied to permanent structures, set forth in Section 402 of this Code, and as provided herein.

(b) Such safeguards shall also be designed to comply with Section 515 herein and to resist the loads set forth in Subsection 2305.7 of this Code.

0516.2 WALL AND FLOOR OPENINGS:

(a) Open or glazed wall openings; open or glazed sides of balconies, landings and other walking surfaces; unenclosed floor and roof openings; roofs used for other than services for the building or structure and, except in Groups E and F Occupancies, any other abrupt differences in level exceeding 30", including yard areas, shall be provided with safeguards not less than 42" in height.

(b) Such differences in level exceeding 30" in and around Groups E and F Occupancies shall be provided with safeguards not less than 42" in height.

(c) Safeguards may be omitted at loading docks, truck wells and similar locations where it is apparent that the edge of the higher level is for loading, and on docks, seawalls and decorative fountains where the lower level is the water surface.

(d) (1) Safeguards in and around buildings of other than Groups H and I Occupancies shall be provided with additional rails, vertical pickets, or an ornamental filler below the top rail which will reject a 6" diameter object.

(2) Safeguards in and around buildings of Groups H and I Occupancies shall provide protection for children by providing additional rails, vertical pickets, or an ornamental filler below the top rail which will reject a 4" diameter object; permitting, however, such ornamental fillers to have individual openings not exceeding 64 sq. in.in area.

(3) Where a balustrade is used to comply with the requirements of this paragraph, the maximum clearance between the bottom rail of the balustrade and the adjacent surface shall not exceed 2". For safeguards on stairs, the 2" clearance shall be measured from the bottom rail of the balustrade to a line passing through the tread nosings.

(e) Intermediate rails, balusters, and panel fillers shall be designed for a uniform horizontal load of not less than 25 lb/sq.ft. over the gross area of the guard, including the area of any openings in the

guard, of which they are a part. Reactions due to this loading need not be added to the loading specified by Subparagraph 3103.3(e)(5)(dd) of this Code in designing the main supporting members of guards.

EXCEPTION: Safety glazing will be permitted as an equal alternate to pickets, if tested by an accredited laboratory to satisfy the resistance requirements of this Code for wind, live and kinetic energy impact loading conditions.

(f) Areas in all occupancies, from which the public is excluded, requiring such protection may be provided with vertical barriers having a single rail midway between a top rail and the walking surface provided the design meets the requirements of the sub-section 2305.7 of this Code.

0516.3 STAIRWAYS AND RAMPS:

Safeguards for stairways, ramps, and landings shall also meet the requirements set forth in Subsection 3103.3 of this Code.

0516.4 VEHICLE SAFEGUARD BARRIERS:

(a) Vehicle safeguard barriers are required in parking garages whenever there is a difference in level exceeding 1' - 0".

(b) Unless separate pedestrian safeguards are provided vehicle safeguard barriers shall, in addition to the requirements of this subsection, meet all other requirements of Section 516.

(c) The requirement of Subparagraph 516.2 (d) (1) for the rejection of a 6 inch diameter object shall be met when the barrier is subjected to a horizontal load of 25 lb/sq. ft., applied as specified in 516.2 (e).

(d) Vehicle safeguard barriers shall be capable of resisting a minimum horizontal ultimate load of 10,000 lb. applied 18 inches above the floor at any point in the barrier system. This load need not be applied in combination with loads specified in 516.2 (e) and in Subsection 2305.7.

(e) Vehicle safeguard barrier systems of metal framing, concrete or masonry may be designed by allowable stress design for a concentrated horizontal load of 7500 lbs. in lieu of the 10,000 lb. ultimate load specified above.

(f) Special requirements for cable safeguard barriers:

(1) Horizontal deflection under design load shall not exceed 18 inches.

(2) The design load shall be assumed to be resisted by not more than two cables.

(3) The cable system including anchors shall be protected against corrosion.

(4) Cable tension under design load shall not exceed 90% of the yield strength of the cable.

(5) The uppermost cable shall be at least 42 inches above the adjacent surface.
Cables shall not be spaced more than 6 inches apart.

(6) An installation plan prepared by the structural engineer of record shall be submitted to the Building Official for his or her approval.

(7) Installation shall be witnessed by a Special Inspector who shall certify:

(aa) That the installation has been in accordance with the approved
installation plan.

(bb) That the initial tension designated by the Structural Engineer of Record
has been provided in all cables.

(cc) That all anchors have been seated at a total load, including initial
tension, equal to 85% of the yield strength of the cable, unless a positive locking device is provided that
does not require a tension jack for the tensioning of the barrier strand.

(dd) Special inspectors shall conform with the requirement of Section 305.3
(c), (d), (e), and (f).

(8) Drawings will indicate the initial tension, the expected increase in tension under
vehicular impact, and the required maximum capacity of the strand barrier system ☐

STANDARD BUILDING CODE 1997

TABLE 600

BellSouth Telecommunications, Inc.
 FPSC Docket Nos. 980946-TL, 980947-TL,
 980948-TL, 981011-TL, 981012-TL & 981250-TL
 Exhibit JDB - 26, Page 17 of 71

TABLE 600
 FIRE RESISTANCE RATINGS
 REQUIRED FIRE RESISTANCE IN HOURS

STRUCTURAL ELEMENT	TYPE I	TYPE II	TYPE III	TYPE IV		TYPE V		TYPE VI	
				1-Hour Protected	Unprotected	1-Hour Protected	Unprotected	1-Hour Protected	Unprotected
PARTY AND FIRE WALLS (a)	4	4	4	4	4	4	4	4	4
INTERIOR BEARING WALLS (l)									
Supporting columns, other bearing walls or more than one floor	4	3	2	1	NC	1 (h)	0 (h)	1	0
Supporting one floor only	3	2	1	1	NC	1	0	1	0
Supporting roofs only	3	2	1	1	NC	1	0	1	0
INTERIOR NONBEARING PARTITIONS	See 704.1, 704.2 and 705.2								
COLUMNS (q)	(l)		See 605						
Supporting other columns or more than one floor	4	3	H(d)	1	NC	1	0	1	0
Supporting one floor only	3	2	H(d)	1	NC	1	0	1	0
Supporting roofs only	3	2	H(d)	1	NC	1	0	1	0
BEAMS, GIRDERS, TRUSSES & ARCHES (l)			See 605						
Supporting columns or more than one floor	4	3	H(d)	1	NC	1	0	1	0
Supporting one floor only	3	2	H(d)	1	NC	1	0	1	0
Supporting roofs only	1 1/2(e,p)	1(e,f,p)	H(d)	1(e,p)	NC(e)	1	0	1	0
FLOORS & FLOOR/CEILING ASSEMBLIES (l)			See 605	(n)	(n,o)	(n)	(m,n,o)		(o)
	3	2	H(o)	1	NC	1	0	1	0
ROOFS & ROOF/CEILING ASSEMBLIES (g)	1 1/2(e,p)	1(e,f,p)	See 605 H(d)	1(e,p)	NC(e)	1	0	1	0
EXTERIOR BEARING WALLS and gable ends of roof (g, i, j)	(% indicates percent of protected and unprotected wall openings permitted. See 705.1.1 for protection requirements.)								
Horizontal separation (distance from common property line or assumed property line).									
0 ft to 3 ft (c)	4(0%)	3(0%)	3(0%)(b)	2(0%)	1(0%)	3(0%)(b)	3(0%)(b)	1(0%)	1(0%)
over 3 ft to 10 ft (c)	4(10%)	3(10%)	2(10%)(b)	1(10%)	1(10%)	2(10%)(b)	2(10%)(b)	1(20%)	0(20%)
over 10 ft to 20 ft (c)	4(20%)	3(20%)	2(20%)(b)	1(20%)	NC(20%)	2(20%)(b)	2(20%)(b)	1(40%)	0(40%)
over 20 ft to 30 ft	4(40%)	3(40%)	1(40%)	1(40%)	NC(40%)	1(40%)	1(40%)	1(60%)	0(60%)
over 30 ft	4(NL)	3(NL)	1(NL)	1(NL)	NC(NL)	1(NL)	1(NL)	1(NL)	0(NL)
EXTERIOR NONBEARING WALLS and gable ends of roof (g, i, j)	(% indicates percent of protected and unprotected wall openings permitted. See 705.1.1 for protection requirements.)								
Horizontal separation (distance from common property line or assumed property line).									
0 ft to 3 ft (c)	3(0%)	3(0%)	3(0%)(b)	2(0%)	1(0%)	3(0%)(b)	3(0%)(b)	1(0%)	1(0%)
over 3 ft to 10 ft (c)	2(10%)	2(10%)	2(10%)(b)	1(10%)	1(10%)	2(10%)(b)	2(10%)(b)	1(20%)	0(20%)
over 10 ft to 20 ft (c)	2(20%)	2(20%)	2(20%)(b)	1(20%)	NC(20%)	2(20%)(b)	2(20%)(b)	1(40%)	0(40%)
over 20 ft to 30 ft	1(40%)	1(40%)	1(40%)	NC(40%)	NC(40%)	1(40%)	1(40%)	0(60%)	0(60%)
over 30 ft (k)	NC(NL)	NC(NL)	NC(NL)	NC(NL)	NC(NL)	NC(NL)	NC(NL)	0(NL)	0(NL)

For SI: 1 ft = 0.305 m.

NC = Noncombustible
 NL = No Limits
 H = Heavy Timber Sizes

Notes:

- a. See 704.5 for extension of party walls and fire walls.
- b. See 704.5 for parapets.
- c. See 705 for protection of wall openings.
- d. Where horizontal separation of 20 ft or more is provided, wood columns, arches, beams, and roof deck conforming to heavy timber sizes may be used externally.
- e. In buildings not over two stories approved fire retardant treated wood may be used.
- f. In one-story buildings, structural members of heavy timber sizes may be used as an alternate to unprotected structural roof members. Stadiums, field houses and arenas with heavy timber wood dome roofs are permitted. An approved automatic sprinkler system shall be installed in those areas where 20 ft clearance to the floor or balcony below is not provided.
- g. See 1517 for penthouses and roof structures.
- h. The use of combustible construction for interior bearing partitions shall be limited to the support of not more than two floors and a roof.
- i. Exterior walls shall be fire tested in accordance with 601.3. The fire resistance requirements for exterior walls with 5 ft or less horizontal separation shall be based upon both interior and exterior fire exposure. The fire resistance requirements for exterior walls with more than 5 ft horizontal separation shall be based upon interior fire exposure only.
- j. Where Appendix F is specifically included in the adopting ordinance, see F102.2.6 for fire resistance requirements for exterior walls of Type IV buildings in Fire District.
- k. Walls or panels shall be of noncombustible material or fire retardant treated wood, except for Type VI construction.
- l. For Group A - Large Assembly, Group A - Small Assembly, Group B, Group E, Group F, Group R occupancies and Automobile Parking Structures, occupancies of Type I construction, partitions, columns, trusses, girders, beams, and floors may be reduced by 1 hour if the building is equipped with an automatic sprinkler system throughout, but no component or assembly may be less than 1 hour.
- m. Group A - Large Assembly (no stage requiring proscenium opening protection) and Group A - Small Assembly occupancies of Type V Unprotected construction shall have 1-hour fire resistant floors over any crawl space or basement.
- n. For Group B and Group M occupancies of Type IV or Type V construction, when five or more stories in height a 2-hour fire resistant floor shall be required over the basement.
- o. For unsprinklered Group E occupancies of Type III, Type IV Unprotected, Type V Unprotected or Type VI Unprotected, floors located immediately above useable space in basements shall have a fire resistant rating of not less than 1 hour.
- p. In buildings of Group A, B, E, and R occupancies, the required fire resistance of the roof or roof/ceiling assembly including the beams, girders, trusses, or arches that support the roof only may be omitted where every part of the roof structural members have a clear height of 20 ft (6096 mm) or more above any floor, mezzanine or balcony.
- q. See 701.4.

ment in a cubic-foot box, using the shoveling procedure as outlined in ASTM C 29.

703.10 Glass block. Glass block shall be labeled to conform to NFPA 257 or UL 9.

SECTION 704 FIRE RESISTANT SEPARATIONS

704.1 Occupancy separation requirements

704.1.1 The minimum fire resistance of construction separating any two occupancies in a building of mixed occupancy shall be the higher rating required for the occupancies being separated, as specified in Table 704.1.

TABLE 704.1
OCCUPANCY SEPARATION REQUIREMENTS

Large or Small Assembly	2 hour
Business	1 hour
Educational	2 hour
Factory-Industrial	2 hour
Hazardous	See 704.1.4
Institutional	2 hour
Mercantile	1 hour
Residential	1 hour
Storage, Moderate Hazard S1	3 hour
Storage, Low Hazard S2	2 hour
Automobile Parking Garages ¹	1 hour
Automobile Repair Garages	2 hour

Note:

1. See 411.2.6 for exceptions.

704.1.2 Accessory occupancies.

704.1.2.1 Portions of buildings used as accessory offices or for customary nonhazardous uses necessary for transacting the principal business in Group S and Group F occupancies need not be separated from the principal use. Group F occupancies producing, using or storing low hazard products listed in 312.2.2 need not be considered mixed occupancies. Height and area will be governed by the principal intended use.

704.1.2.2 The following occupancies need not be separated from the uses to which they are accessory:

1. A kitchen in a Group A occupancy does not constitute a mixed occupancy. A fire resistant separation is not required.
2. Assembly rooms having a floor area of not over 750 sq ft (70 m²).
3. Administrative and clerical offices and similar rooms which, in area per story, do not exceed 25% of the story area of the major use when not related to Group H occupancies.

Exception: Accessory uses in Group F and S occupancies conforming to 704.1.2.1.

4. Rooms or spaces used for customary storage of nonhazardous materials in Group A, Group B, Group E, Group F, Group M, and Group R,

which in aggregate do not exceed one-third of the major occupancy floor area in which they are located.

5. Portions of buildings which are less than 3,000 sq ft used as accessory small businesses to and open for business simultaneously with the principal retail sales occupant, only in a Group M occupancy.

Exception: Item 5 shall not apply to separation walls between tenants and malls in covered mall buildings.

704.1.2.3 A 1-hour occupancy separation shall be permitted in assembly rooms greater than 750 sq ft (70 m²) but less than 2,000 sq ft (186 m²) in area when all of the following are met:

1. The occupant content does not exceed 300 persons calculated in accordance with Table 1003.1.
2. The assembly room does not constitute the major occupancy classification of the building.
3. The assembly room is not associated with a hazardous or Group S1 occupancy.
4. The assembly room is not associated with a kitchen.
5. The assembly room is not a theater or restaurant.

704.1.3 Special occupancy separations.

704.1.3.1 Assembly and educational. Fire resistance separation shall not be required between Sunday school rooms and a church auditorium of Group A - Small Assembly occupancy, and between classrooms in day schools and auditoriums, gymnasiums, cafeterias, and libraries of small assembly occupancy, which are used only as accessory uses to the education occupancy.

704.1.3.2 Automobile parking garages. A separation between an automobile parking garage used exclusively for the storage of passenger vehicles that will accommodate not more than nine passengers and any other occupancy having a rating of 2 hours or more in Table 704.1 shall be 2 hours.

704.1.3.3 Boiler and machinery rooms

704.1.3.3.1 Every central heating boiler as defined in the Standard Mechanical Code, installed in any building other than a one or two family dwelling or Group F, shall be separated from the rest of the building by not less than 1-hour fire resistant construction.

704.1.3.3.2 A central heating boiler installed in a Group A or H occupancy shall be separated from the rest of the building by construction having a fire resistance rating of not less than 2 hours.

704.1.3.3.3 Steam boilers. Every steam boiler carrying more than 15 psi (103 kPa) pressure with a rating in excess of 10 boiler horsepower (98 kW)

installed in a building other than one of Group F occupancy, shall be located in a separate room or compartment, shall not be located under a means of egress and shall be separated from the rest of the building by construction having at least 2-hour fire resistance. This rating may be reduced in accordance with the hazard existing when in the opinion of the building official it is desirable to provide for explosion venting upward.

704.1.3.3.4 Refrigerant system machinery rooms. Where required by the Standard Mechanical Code due to refrigerant type, amount, system classification and occupancy, a Level 2 machinery room shall be of noncombustible construction. A minimum of 1-hour construction shall separate the machinery room from other occupied spaces. A minimum of 3/4-hour C-labeled doors shall be used when separating from other occupancies.

704.1.4 Hazardous occupancies

704.1.4.1 The separation of a hazardous occupancy from other occupancies shall be in accordance with Table 704.1.4.

TABLE 704.1.4
 HAZARDOUS OCCUPANCY SEPARATION REQUIREMENTS

OCCUPANCY	H1	H2	H3	H4
A	NP	4	4	4
B	NP	2	2	1
E	NP	4	4	4
F	NP	2	1	1
H1	—	NP	NP	NP
H2	NP	—	1	2
H3	NP	1	—	1
H4	NP	2	1	—
I	NP	4	4	4
M	NP	2	2	2
R1,2,3, and 4	NP	4	4	4
S1,2	NP	2	2	2

Note:

NP = H1 occupancies not permitted to be attached to other occupancies or other H subclassifications.

704.1.4.2 The separation of a hazardous occupancy subclassification shall only apply to storage areas.

704.1.4.3 Building areas intended for the use, processing, manufacture or generation of materials having different hazard classifications, all of them being Group H, need not be separated further within the confines of the Group H occupancy provided the requirements for each hazard are met.

704.1.4.4 Accessory areas, other than assembly occupancies, that do not exceed 10% of the allowable area for the hazardous occupancy subclassification in Table 500 and that do not exceed 1,500 sq ft (139 m²) shall not be required to comply with 704.1. Where accessory areas are separated from hazardous occupancies by

partitions, the partitions shall be not less than 1-hour fire resistant construction with an opening protection rating not less than 3/4-hour. Opening protection shall be either self-closing or automatic-closing in accordance with 705.1.3.2.3.

704.2 Interior wall and partition fire separation requirements

704.2.1 General

704.2.1.1 This section shall apply to the fire separation requirements of interior walls and partitions for the various occupancies and types of construction. Partitions of higher fire resistance rating required by other sections of this code may also serve to meet the requirements of this section.

704.2.1.2 All partitions enclosing vertical openings such as stairways, utility shafts and elevator shafts which are required to have a fire resistance rating shall extend from floor to floor or floor to roof. These walls shall be continuous through all concealed spaces such as the space above a suspended ceiling. The supporting structure shall have a fire resistance rating equal to or greater than the fire resistance rating required for the vertical enclosure. Where the openings are offset at intermediate floors, the offset and floor construction shall be of construction having a fire resistance of not less than that required for the enclosing partitions.

704.2.1.3 All other partitions required to have a fire resistance rating shall extend from the top of the floor below to the ceiling above and shall be securely attached thereto. Where said ceiling is not a part of an assembly having a fire resistance rating at least equal to that required for the partition, the partition shall be constructed tight against the floor or roof deck above.

704.2.1.4 Corridor partitions, smokestop partitions, horizontal exit partitions, exit enclosures, and fire rated walls required to have protected openings shall be effectively and permanently identified with signs or stenciling in a manner acceptable to the authority having jurisdiction. Such identification shall be above any decorative ceiling and in concealed spaces. Suggested wording: FIRE AND SMOKE BARRIER PROTECT ALL OPENINGS.

704.2.1.5 Any required smoke barrier shall be continuous from outside wall to outside wall, from floor slab to floor slab or roof deck, from smoke barrier to smoke barrier, or a combination thereof, including continuity through all concealed spaces such as those found above suspended ceilings however, smoke barriers are not required in interstitial spaces designed and constructed with ceilings equivalent to smoke barriers. Smoke barriers shall be of 1-hour fire resistant construction. Fixed wired glass vision panels shall be permitted in such barriers provided the panels do not individually exceed an area of 1,296 sq in (0.84 m²) and are mount-

704.2.2 - 704.4.1

ed in steel frames. There is no restriction on the total number of such panels in any barrier.

Exception: Smoke barriers in Group I Restrained occupancies shall be permitted to be constructed of minimum 0.10 inch (2.5 mm) thick steel.

704.2.2 Partition requirements by occupancy

704.2.2.1 Group I Restrained

704.2.2.1.1 Smoke barriers shall be constructed in accordance with 704.2.1.5.

704.2.2.1.2 All interior partitions in Type I and Type II construction shall be of noncombustible construction.

704.2.2.2 Group I Unrestrained. Smoke barriers shall have a minimum 1-hour fire resistance rating and be constructed in accordance with 704.2.1.5.

704.2.2.3 Group R Residential. Nonfire rated partitions may be constructed within small residential care/assisted living facilities (Group R4 Small Facility), one and two family dwellings and within individual dwelling units unless required by Table 600. The tenant separation in a two family dwelling shall comply with 704.3.

Exception: Shaft enclosures in Group R4 occupancies shall be enclosed and protected in accordance with the requirements of Table 705.1.2.

704.2.3 Partitions within tenant space

704.2.3.1 Partitions dividing portions of stores, offices or similar places occupied by one tenant only, which do not establish an exit access corridor serving an occupant load of 30 persons or more, and partial partitions, may be temporary or permanent and constructed in accordance with 609 without fire resistance, provided that:

1. Their location is restricted by their method of construction or by means of permanent tracks, guides or other approved methods.
2. Flammability shall be limited to materials having an interior finish classification as set forth in Table 803.3 for rooms or areas.

704.2.4 Exit access corridors. Fire resistance rating of exit access corridors shall be in accordance with Table 704.2.4.

TABLE 704.2.4
 FIRE RESISTANCE RATING OF EXIT ACCESS CORRIDORS

OCCUPANCY	OCCUPANT LOAD	FIRE RESISTANCE RATING (hours)	
		Sprinklered	Unsprinklered
A,B,F,M,S	less than 30	0	0
A	30 or more	1	1
B,F,M,S	30 or more	0	1
R1,R2,R3	less than 10, Note 1	0	0
R1,R2	10 or more, Note 1	1/2	1
R4	16 or less	0	0
R4	more than 16, Note 1	0	1
E	Note 2	1	1
I Unrestrained	All	0	N/A
I Restrained	All	0	0, Note 3
H	All	1	1

Notes:

1. Corridors within guest rooms or dwelling units need not be rated.
2. Corridors need not be rated in Group E occupancies with rooms used either for instruction with at least one exit door directly to the exterior at ground level or for assembly purposes with at least one-half of the required exits directly to the exterior at ground level.
3. Unsprinklered use condition 5 shall have exit access corridors of 1-hour fire resistance.

704.3 Tenant fire separation

704.3.1 In a building or portion of a building of a single occupancy classification, when enclosed spaces are provided for separate tenants, such spaces shall be separated by not less than 1-hour fire resistance.

Exception: In Group B and Group S occupancies, partitions not rated for fire resistance may be used to separate tenants provided no area between partitions rated at 1 hour or more exceeds 3,000 sq ft (278.7 m²).

704.3.2 In buildings with usable crawl spaces, tenant separation walls required to have a fire resistance rating shall extend from the underside of the floor to the ground below. A suitable foundation shall be provided at grade level.

Exception: The wall need not be extended when the floor above the crawl space has a minimum 1-hour fire resistance rating.

704.4 Townhouse fire separation

704.4.1 Each townhouse shall be considered a separate building and shall be separated from adjoining townhouses by a party wall complying with 704.4.2 or by the use of separate exterior walls meeting the requirements of Table 600 for zero clearance from property lines as required for the type of construction. Separate exterior walls shall include one of the following:

1. A parapet not less than 18 inches (457 mm) above the roof line.
2. Roof sheathing of noncombustible material or fire retardant treated wood, for not less than a 4 ft (1219

mm) width on each side of the exterior dividing wall.

3. One layer of 5/8 inch (15.9 mm) Type X gypsum board attached to the underside of roof decking, for not less than a 4 ft (1219 mm) width on each side of the exterior dividing wall.

704.4.2 When not more than three stories in height, townhouses may be separated by a single wall meeting the following requirements:

1. Such wall shall provide not less than a 2-hour fire resistance rating. Plumbing, piping, ducts, electrical or other building services shall not be installed within or through the 2-hour wall, unless such materials and methods of penetration have been tested in accordance with 701.2.
2. Such wall shall be continuous from the foundation to the underside of the roof sheathing or shall have a parapet extending not less than 18 inches (457 mm) above the roof line. When such wall terminates at the underside of the roof sheathing, the roof sheathing for not less than a 4-ft (1219 mm) width on each side of the wall shall be of noncombustible material, or fire retardant treated wood, or one layer of 5/8 inch (15.9 mm) Type X gypsum wallboard attached to the underside of the roof decking.
3. Each dwelling unit sharing such wall shall be designed and constructed to maintain its structural integrity independent of the unit on the opposite side of the wall.

Exception: Said wall may be penetrated by roof and floor structural members provided that the fire resistance rating and the structural integrity of the wall is maintained.

704.5 Fire wall extensions and parapets

704.5.1 Fire wall extensions

704.5.1.1 Party walls and fire walls shall extend not less than 3 ft (914 mm) above the roof.

Exception: Fire walls shall not be required to extend above the roof where the roof is:

1. Noncombustible in Types I, II and IV construction, or
2. Noncombustible or fire retardant treated wood for an area within 40 ft (12.2 m) of each side of the wall in Types III, V and VI construction.

704.5.1.2 Party walls and fire walls shall extend not less than 18 inches (457 mm) past exterior intersecting walls of combustible construction or exterior noncombustible walls with combustible projections or veneers. The party or fire wall shall extend not less than 18 inches (457 mm) past any combustible projection or veneer. Party walls or fire walls shall extend to the inside facing of the exterior surface of noncombustible construction.

704.5.1.3 Fire walls shall be in accordance with the requirements of NCMA-TEK 5-8 or equivalency in brick or poured concrete or other nationally recognized tested systems.

704.5.2 Parapet Walls

In Type III and Type V Construction, exterior walls shall extend not less than 18 inches (457 mm) above the roof.

Exceptions:

1. Walls located more than 15 ft (4.57 m) from a common property line or centerline of a public way.
2. Where the roof slopes more than 4:12 from the back of the exterior wall.

SECTION 705 PROTECTION OF OPENINGS

705.1 Protection of wall openings

705.1.1 Protection of openings in exterior walls

705.1.1.1 The provisions of 705.1.1 do not apply to Group R3 occupancies.

705.1.1.2 Every exterior wall within 15 ft (4572 mm) of a property line shall be equipped with approved opening protectives.

Exceptions:

1. Exterior walls not required by Table 600 to have a fire resistance rating.
2. Show windows fronting on a street or public space.
3. Open parking structures meeting the requirements of 411.3.

705.1.1.3 Where openings in an exterior wall are above and within 5 ft (1524 mm) laterally of an opening of the story below, such openings shall be separated by an approved noncombustible flame barrier extending 30 inches (762 mm) beyond the exterior wall in the plane of the floor or by approved vertical flame barriers not less than 3 ft (914 mm) high measured vertically above the top of the lower opening. Such flame barriers are not required when a complete approved automatic sprinkler system is installed.

705.1.1.4 Fresh air intakes shall be protected against exterior fire exposure by means of approved fire doors, dampers, or other suitable protection in accordance with the degree of exposure hazard.

705.1.2 Protection of openings in interior walls

705.1.2.1 General. Openings in interior walls and partitions shall be protected in accordance with 705.1.2 and Table 705.1.2.

Exceptions:

1. Where fire resistance is required due to type of construction only.
2. Ducts in accordance with 705.1.2.2.
3. One and two family dwellings.

TABLE 705.1.2 - 705.1.2.3.1

TABLE 705.1.2
MINIMUM FIRE RESISTANCE OF WALLS, PARTITIONS
AND OPENING PROTECTIVES¹ (hrs)

COMPONENT	WALLS AND PARTITIONS ²	OPENING PROTECTIVES
SHAFT ENCLOSURES (including stairways, exits & elevators)		
4 or more stories	2	1 1/2
less than 4 stories	1 ²	1 ²
all refuse chutes	2	1 1/2
WALLS AND PARTITIONS		
fire walls ³	4	3
within tenant space	See 704.2.3	
tenant space (see also 704.3)	1	3/4
horizontal exit	2	1 1/2
exit access corridors	See Note 4,5	20 min. ¹⁰
smoke barriers	See 409.1.2	
refuse and laundry chute access rooms	1	3/4
incinerator rooms	2	1 1/2
refuse and laundry chute termination rooms	1	3/4
hazardous occupancy control areas	1	3/4
high rise buildings	See 412	
covered mall buildings	See 413	
assembly buildings	See Note 2	
bathrooms & restrooms	See Note 6	
OCCUPANCY SEPARATIONS⁷		
	Required Fire Resistance	
	4	3
	3	3
	2	1 1/2
	1	3/4
EXTERIOR WALLS⁸	All	3/4

Notes:

- Table 600 may require greater fire resistance of walls to insure structural stability.
- All exits and stairways in Group A and H occupancies shall be 2-hours with 1 1/2-hour door assemblies.
- See also 503.1.2.
- See 704.2.3 and 704.2.4.
- See 409 for sprinklered Group I - buildings.
- Fire rated bathroom/restroom doors are not required when opening onto fire rated halls, corridors, exit access provided:
 - no other rooms open off of the bathroom/restroom, and
 - no gas or electric appliances are located in the bathroom/restroom, and
 - the walls, partitions, floor and ceiling of the bathroom/restroom have a fire rating at least equal to the rating of the hall, corridor or exit access, and
 - the bathroom/restroom is not used for any other purpose than it is designed.

BellSouth Telecommunications, Inc.
 FPSC Docket Nos. 980946-TL, 980947-TL,
 980948-TL, 981011-TL, 981012-TL & 981250-TL
 Exhibit JDB - 23, Page 23 of 71

- See 704.1.
- See Table 600, 705.1.1 and 503.4.8.
- See 704.2.2.3 for walls and partitions in Group R4 occupancies.
- In Group R4 Large Facility occupancies, sleeping room doors shall resist the passage of smoke but closers are not required.

705.1.2.2 Fire dampers

705.1.2.2.1 Fire dampers, installed in accordance with manufacturers installation instructions, shall be provided in ducts penetrating walls or partitions having a fire resistance rating of one hour or more.

Exceptions:

- Where branch ducts connect to return risers in which the air flow is upward and subducts at least 22 inches (559 mm) long are carried up inside the riser at each inlet.
- In duct systems of any duct materials or combinations thereof allowed by Chapter 6 of the Standard Mechanical Code penetrating 1-hour walls or partitions, where the duct penetrating the rated wall or partition meets all of the following minimum requirements:
 - the duct shall not exceed 100 sq inch (0.06 m²),
 - the duct shall be of 0.0217 inch (0.55 mm) minimum steel,
 - the duct shall continue with no duct openings for not less than 5 ft (1.5 m) from the rated wall,
 - the duct shall be installed above a ceiling, and,
 - the duct does not terminate at a wall register in the rated wall.

705.1.2.2.2 Fire dampers shall comply with the requirements of UL 555 and shall bear the label of an approved testing agency. Closure shall interrupt any migratory air flow and restrict the passage of flame. Fire dampers shall be classified and identified for use in either.

- Static systems that automatically shut down in the event of fire.
- Dynamic systems that operate in the event of fire.

705.1.2.3 Smoke barriers

705.1.2.3.1 An approved damper designed to resist the passage of smoke shall be installed in accordance with the manufacturer's installation instructions at each air transfer opening or duct penetration of a required smoke barrier. The required smoke damper shall be arranged to operate automatically, controlled by a smoke detection system and manual positioning shall be permitted from a remote command station.

Adoption of the South Florida Building Code

Charter and Code of the City of Miami, Sec. 10.3

Code of the City of Coral Gables, Sec. 6-26

The Code of the City of Miami Beach, Sec. 8-1

Code of Broward County, Sec. 5-36

Monroe County Code, Sec. 6-16

Code of Ordinances of the City of Ft. Lauderdale, Sec. 9-1

Adoption of the Standard Building Code

Palm Beach County Code, Sec. 7-36

S.F.B.C. →

SOUTH FLORIDA BUILDING CODE (REVISED 1990)

"	2911	Connectors	29-28
"	2912	Wood Supporting Masonry	29-29-1
"	2913	Protection of Wood	29-30
"	2914	Fire Retardant Wood	29-32-1
"	2915	Fences	29-33-1

CHAPTER 30 - ALUMINUM			30-1
Sec.	3001	General	30-1
"	3002	Allowable Unit Stresses	30-1
"	3003	Design	30-1
"	3004	Construction Details	30-2

PART VII - DETAILED REGULATIONS

CHAPTER 31 - MEANS OF EGRESS			31-1
Sec.	3101	General	31-1

CHAPTER 32 - ELEVATORS AND ESCALATORS			32-1
Sec.	3201	Scope	32-1
"	3202	Definitions and Standards	32-1
"	3203	General	32-2
"	3204	Elevators	32-6
"	3205	Escalators, Dumbwaiters and Moving Stairways	32-7
"	3206	Transporting Assemblies	32-8
"	3207	Inclined Stairway Chairlifts and Inclined Vertical Wheelchair Lifts	32-8

CHAPTER 33 - CONSTRUCTION SAFETY AND USE OF PUBLIC PROPERTY			33-1
Sec.	3301	General	33-1
"	3302	Temporary Occupancy of Public Property	33-3
"	3303	Permanent Occupancy of Public Property	33-4
"	3304	Demolition	33-6
"	3305	Excavation	33-7
"	3306	Sidewalk Sheds and Fences	33-8
"	3307	Storage of Material	33-9
"	3308	Hoisting Machinery	33-10
"	3309	Derricks and Cranes	33-10
"	3310	Cables, Ropes, Chains and Blocks	33-12
"	3311	Platform Hoists	33-12
"	3312	Holst Towers	33-12
"	3313	Temporary Flooring	33-13
"	3314	Floor Openings	33-13
"	3315	Runways and Ramps	33-14
"	3316	Temporary Stairs	33-15
"	3317	Ladders	33-16
"	3318	Scaffolds	33-17
"	3319	Safeguards	33-18
"	3320	Temporary Light and Power	33-18
"	3321	First Aid	33-19
"	3322	Sanitation	33-19
"	3323	Welding and Cutting	33-19

BellSouth Telecommunications, Inc.
FPSC Docket Nos. 980946-TL, 980947-TL,
980948-TL, 981011-TL, 981012-TL & 981250-TL
Exhibit JDB - 26, Page 26 of 71

CHAPTER 31

MEANS OF EGRESS

3101 GENERAL

3101 GENERAL

3101.1 SCOPE This chapter adopts minimum Standards for means of egress for all buildings and structures regulated by this Code.

3101.2 APPLICATION:

(a) , Every building, structure or portion thereof shall be provided with means of egress as set forth in this Chapter.

(b) Pursuant to F. S. 633.05, the requirements of this Chapter are superseded for buildings in which the State Fire Marshal has established uniform fire safety requirements.

(c) Where conflict exists in this Code between a general provision and specific provision for an occupancy, the specific requirement shall supersede.

3101.3 STANDARDS: Pursuant to the provisions of Subsection 402.2 of this Code, the requirements for new construction of the National Fire Protection Association Life Safety Code, NFPA 101, are hereby adopted as a mandatory minimum standard for life safety.

3101.4 WORKMANSHIP: Means of egress shall be in conformance with the tolerances, quality and methods of construction, if any, specified in the Standards set forth in Subsection 3101.3 above.

SOUTH FLORIDA BUDG CODE LADE

CITY OF PORT ORANGE

BellSouth Telecommunications, Inc.
FPSC Docket Nos. 980946-TL, 980947-TL,
980948-TL, 981011-TL, 981012-TL & 981250-TL
Exhibit JDB - 26, Page 27 of 71

GENERAL PLAN REVIEW COMMENTS

March 1999

THE FOLLOWING CODES ARE IN EFFECT FOR THE CITY OF PORT ORANGE

SBCCI	The Southern Building Code Congress International
SBC	The Standard Building Code 1997 edition
SMC	The Standard Mechanical Code 1997 edition
SPC	The Standard Plumbing Code 1994 edition
SGC	The Standard Gas Code 1997 edition
SFPC	The Standard Fire Prevention Code 1997 edition
NEC	The National Electrical Code 1996 edition
NFPA	The National Fire Protection Association
LS 101	The Life Safety Code 1997 edition

SBCE 1997

BellSouth Telecommunications, Inc.
 FPSC Docket Nos. 980946-TL, 980947-TL,
 980948-TL, 981011-TL, 981012-TL & 9812
 Exhibit JDB - 26, Page 28 of 71

704.2.4 - 704.3.2

for exit access purposes, they do not serve 30 people or more;

5. The partitions do not block exits without providing alternate means of exiting;
6. The location of the partitions is restricted by their methods of construction or fixed by permanent tracks or guides; and
7. The flammability of the partitions is in accordance with Table 603.3.

If a corridor is established, thereby limiting access to an exit through a restricted path, and that corridor serves 30 people or more, the exit access corridor would have to be fire resistant, full height, and permanent. (See also 704.2.4.) Partitions meeting all of the other conditions, and which establish a corridor that serves less than 30 people, do not have to be fire resistant, full height, or permanent. (See also 413.3.1 and 413.4.5.) Partial partitions are not considered as forming corridors, by definition.

704.2.4 Exit access corridors. Fire resistance rating of exit access corridors shall be in accordance with Table 704.2.4.

TABLE 704.2.4
 FIRE RESISTANCE RATING OF EXIT ACCESS CORRIDORS

OCCUPANCY	OCCUPANT LOAD	FIRE RESISTANCE RATING (hours)	
		Sprinklered	Unsprinklered
A,B,F,M,S	less than 30	0	0
A	30 or more	1	1
B,F,M,S	30 or more	0	1
R1,R2,R3	less than 10, Note 1	0	0
R1,R2	10 or more, Note 1	1/2	1
R4	16 or less	0	0
R4	more than 16, Note 1	0	1
E	Note 2	1	1
I Unrestrained	All	0	N/A
I Restrained	All	0	0, Note 3
H	All	1	1

Notes:

1. Corridors within guest rooms or dwelling units need not be rated.
2. Corridors need not be rated in Group E occupancies with rooms used either for instruction with at least one exit door directly to the exterior at ground level or for assembly purposes with at least one-half of the required exits directly to the exterior at ground level.
3. Unsprinklered use condition 3 shall have exit access corridors of 1-hour fire resistance.

Section 704.2.4 gives the fire resistance requirements for corridors based on occupancy and occupant load. The table also takes into account whether the building is sprinklered. For example, a corridor in a sprinklered hotel which serves more than 10 people is required to have a 1/2-hour fire resistant rating.

704.3 Tenant fire separation

704.3.1 In a building or portion of a building of a single occupancy classification, when enclosed spaces are provided for separate tenants, such spaces shall be separated by not less than 1-hour fire resistance.

Exception: In Group B and Group S occupancies, partitions not rated for fire resistance may be used to separate tenants provided no area between partitions rated at 1 hour or more exceeds 3,000 sq ft (278.7 m²).

A tenant is a person, agent, firm, or corporation who has temporary occupation or possession by lease or other rights of a building or portion of a building owned by another. Since the building or space is owned by another, the tenant may not have complete control over the tenant space and may have no control over the spaces of other tenants. Due to this lack of control, tenants are afforded protection from each other by a fire resistant separation for each tenant space. The code requires a fire resistant separation when the separate tenant spaces are enclosed. The separation includes partitions and floors or floor/ceiling assemblies. When the tenants are of the same occupancy group, a 1-hour fire resistant separation is required between the tenant spaces. When the tenants are different occupancy groups, the fire resistant separation required is determined by 704.1. A notable exception to this general rule is provided for a building of single business or storage occupancy that does not exceed 3,000 sq ft (278.7 m²) in area. In such a building, a fire resistant wall or partition is not required between the tenant spaces when the combined area of the tenant spaces does not exceed 3,000 sq ft (278.7 m²).

704.3.2 In buildings with usable crawl spaces, tenant separation walls required to have a fire resistance rating shall extend from the underside of the floor to the ground below. A suitable foundation shall be provided at grade level.

Exception: The wall need not be extended when the floor above the crawl space has a minimum 1-hour fire resistance rating.

A usable crawl space is one designed to be used for equipment or storage. (See 202, Definitions.) When a usable crawl space occurs under tenant spaces, one of the following is required:

1. The fire resistant tenant separation wall must separate the crawl space by extending through the crawl space to a foundation at grade level; or
2. The floor above the crawl space must have a 1-hour fire resistance rating. (The crawl space then does not need to be separated with fire resistant walls.)

BellSouth Telecommunications, Inc.
FPSC Docket Nos. 980946-TL, 980947-TL,
980948-TL, 981011-TL, 981012-TL & 981250-TL
Exhibit JDB - 26, Page 29 of 71

§ 19-149

BOCA RATON CODE

Secs. 19-149—19-170. Reserved.

ARTICLE III. BUILDING CONSTRUCTION STANDARDS*

Sec. 19-171. Standard Building Code adopted by reference.

There is hereby adopted by the city for the purpose of establishing rules and regulations for the construction, modification, alteration, maintenance, repair, location, relocation, moving, removing, demolition, equipment, use and occupancy of or additions to buildings or structures and any accessory or related facilities or appurtenances associated with or connected or attached to such buildings or structures, including application for permit, issuance of permits, drawings and examination thereof, conditions of permits, permit fees and charges, inspections, certificates of occupancy or completion and related matters, that certain building code known as the Standard Building Code published by the Southern Building Code Congress International, as authorized by Chapter 558, Florida Statutes, as it may from time to time be amended, and Appendixes A, D, and H as they may from time to time be amended, and the same is hereby adopted and incorporated as fully as if set forth at length herein, except that the provisions of such code as amended or revised by ordinances to meet the specific needs of the city shall be controlling within the corporate limits of the city.
(Code 1966, § 7-8; Ord. No. 4289, § 18, 11-26-96)

Sec. 19-172. Amendments to Standard Building Code.

The Standard Building Code adopted in this article is amended as follows:

- (a) Chapters 1, 11 and 13 are deleted in their entirety.
- (b) Section 202, Definitions, is amended by adding the following definitions in their proper alphabetical order:

Accessory facility: A building or structure on the same plot as the main use building that is of secondary or subordinate importance and is not essential in itself to the main use building, but adds to the aesthetics, convenience or effectiveness of the main use building.

Accessory use: (See chapter 28 of the city Code of Ordinances.)

Agency: Means same as "applicable governing body."

Building (main use): A building that has as its primary use 1 or more of the specified permitted uses as established under the applicable zoning district regulations of the city, as distinguished from accessory facility.

Governing body: Means same as "applicable governing body."

*Cross references—Fire prevention and protection, ch. 7; buildings or structures moved in the city must comply with the building code, § 19-381.

Forwarded by Daryl L. Scott
Fire Lieutenant at City of Boca Raton Fire Rescue Services Dept.

§ 7-26

BOCA RATON CODE

NFPA	85F	1988	Pulverized Fuel Systems, Installation and Operation of
NFPA	86	1990	Ovens and Furnaces
NFPA	86C	1991	Industrial Furnaces Using a Special Processing Atmosphere
NFPA	86D	1990	Industrial Furnaces Using Vacuum as an Atmosphere
NFPA	88A	1991	Parking Structures
NFPA	88B	1991	Repair Garages
NFPA	90A	1993	Air Conditioning and Ventilating Systems, Installation of
NFPA	90B	1993	Warm Air Heating and Air Conditioning Systems, Installation of
NFPA	91	1992	Exhaust Systems for Air Conveying of Materials
NFPA	92B	1991	Smoke Management Systems
NFPA	96	1994	Ventilation Control and Fire Protection of Commercial Cooking Operations
NFPA	99	1993	Health Care Facilities
NFPA	99B	1993	Hypobaric Facilities
NFPA	101	1994	Safety to Life from Fire in Buildings and Structures— Amended as follows: Section 19-3.5.6 is deleted
NFPA	102	1992	Assembly Seating, Tents, and Membrane Structures
NFPA	110	1993	Emergency and Standby Power Systems
NFPA	111	1993	Stored Electrical Energy Emergency and Standby Power Systems
NFPA	130	1993	Fixed Guideway Transit Systems
NFPA	170	1994	Standard Fire Safety Symbols
NFPA	211	1992	Chimneys, Fireplaces, Vents and Solid Fuel-Burning Appliances
NFPA	214	1992	Water-Cooling Towers
NFPA	220	1992	Types of Building Construction
NFPA	221	1994	Fire Walls and Fire Barrier Walls
NFPA	231	1990	General Storage
NFPA	231C	1991	Rack Storage of Materials
NFPA	231D	1994	Rubber Tires, Storage of
NFPA	231F	1987	Roll Paper, Storage of
NFPA	232	1991	Records, Protection of
NFPA	241	1993	Construction, Alteration and Demolition Operations.
NFPA	251	1990	Safeguarding of Building Construction and Materials, Standard Methods of Fire Tests of
NFPA	252	1990	Door Assemblies, Standard Methods of Fire Tests of
NFPA	253	1990	Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source, Standard Method of Test for
NFPA	255	1990	Building Materials, Method of Test of Surface Burning Characteristics of Building Materials
NFPA	256	1993	Roof Coverings, Methods of Fire Tests of

BellSouth Telecommunications, Inc.
FPSC Docket Nos. 980946-TL, 980947-TL,
980948-TL, 981011-TL, 981012-TL & 9812
Exhibit JDB - 26, Page 31 of 71



CITY OF PALM BEACH GARDENS

10500 N. MILITARY TRAIL • PALM BEACH GARDENS, FLORIDA 33410-4698

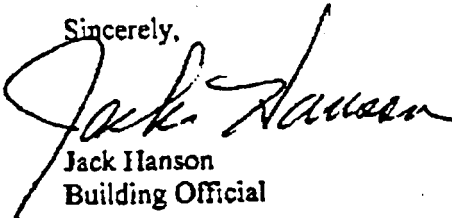
April 6, 1999

Mr. Marcello Penso
Offerle-Lerner AIA
Architects and Planners
34 SW Fourth Street
Boca Raton, FL 33432

Dear Mr. Penso,

Per your request, this letter is to advise that the City of Palm Beach Garden adheres to the 1997 SBCCI building codes and the 1997 NFPA codes.

Sincerely,


Jack Hanson
Building Official

770-458-4391

Attn: Ray

RECEIVED
APR 05 1999
SMOAK DESIGNS INC.
ARCHITECTS

Seminole County, Florida

Model Codes in effect:

1. Standard Building Code, 1994 ed.
2. Standard Plumbing Code, 1994 ed.
3. Standard Mechanical Code, 1994 ed.
4. National Electrical Code, 1996 ed.
5. Standard Fire Prevention Code, 1994 ed.
6. Life Safety Code 1994 ed.

See County Code for AMENDMENTS

CODES ENFORCED BY SEMINOLE COUNTY

RE: LAKE MARY CO.

365 INTERNATIONAL PARKWAY

JANE C BUDG DEPARTMENT

407-830-8919

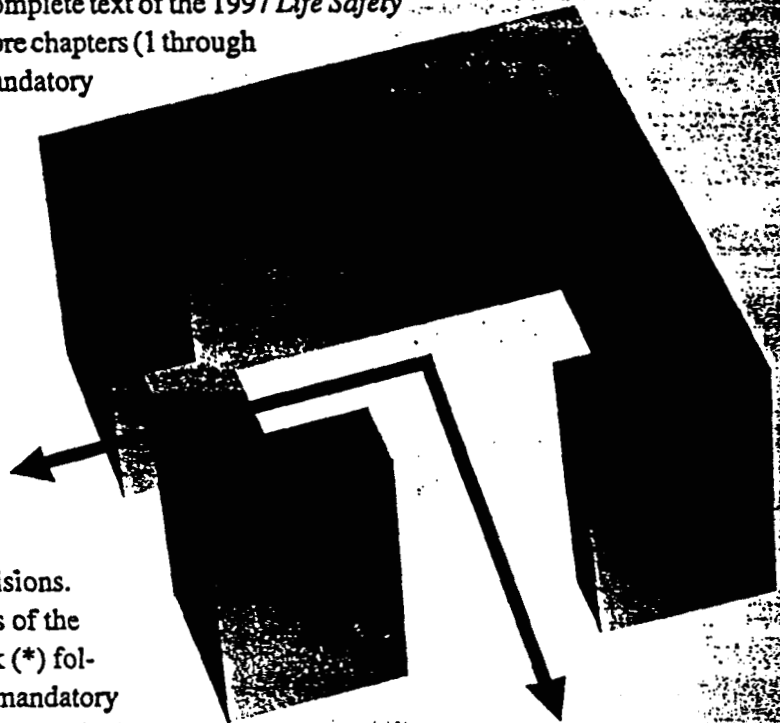
PART ONE

Life Safety Code and Commentary

Part One of this handbook includes the complete text of the 1997 *Life Safety Code*, which is made up of mandatory core chapters (1 through 33) and nonmandatory appendix material. The mandatory *Code* provisions found in Chapters 1 through 33 were prepared by the thirteen Committees on Safety to Life within the framework of NFPA's consensus standards-development system. Because these provisions are designed to be suitable for adoption into law, or for reference by other codes and standards, the text is concise, without extended explanation.

The material found in Appendix A of the *Code* was also developed by the Committees on Safety to Life within NFPA's standards system. The appendix material is designed to assist users in interpreting the mandatory *Code* provisions. It is not considered to be part of the requirements of the *Code*; it is advisory or informational. An asterisk (*) following a *Code* paragraph number indicates that mandatory material pertaining to that paragraph appears in Appendix A. For readers' convenience in this handbook, Appendix A material has been repositioned to appear immediately following its base paragraph in the body of the *Code* text.

The explanatory commentary accompanying the *Code* was prepared by the handbook editor. The commentary immediately follows the *Code* text it discusses and is easily identified by green shading. Designed to help users understand and apply *Code* provisions, it gives detailed explanations of the reasoning behind *Code* requirements, examples of calculations, applications of requirements, and tables of useful information. Over 300 drawings and photographs show practical applications of specific *Code* provisions. Used together with the *Code*, the commentary provides a rich resource for assessing the level of life safety from fires in buildings.



CHAPTER 1

General

A-1 The following is a suggested procedure for determining the *Code* requirements for a building or structure.

1. Determine the occupancy classification. Refer to the occupancy definitions in Chapter 4 and the occupancy Chapters 8 through 31. Also see 4-1.12 for buildings with more than one use.
2. Determine if the building or structure is new or existing. Refer to the definitions in Chapter 3.
3. Determine the occupant load. Refer to 5-3.1 and the -1.7 section of occupancy Chapters 8 through 31.
4. Determine the hazard of contents. Refer to Section 4-2.
5. Refer to the applicable occupancy chapter of the *Code* (Chapters 8 through 31). Refer as necessary to Chapters 1 through 7 for general information (e.g., definitions) or as directed by the occupancy chapter.
6. Determine the occupancy subclassification or special use condition, if any. Chapters 12 and 13, health care occupancies; Chapters 14 and 15, detention and correctional occupancies; Chapters 16 and 17, hotels and dormitories; Chapters 22 and 23, residential board and care occupancies; and Chapters 24 and 25, mercantile occupancies, contain subclassifications or special use definitions.
7. Proceed through the applicable occupancy chapter verifying compliance with each referenced section, subsection, paragraph, subparagraph, and referenced codes, standards, and other documents.
8. Where two or more requirements apply, the occupancy chapter generally takes precedence over the base Chapters 1 through 7.
9. Where two or more occupancy chapters apply, such as in a mixed occupancy (see 4-1.12), the most restrictive requirements apply.

The steps outlined in A-1 were developed to help the user determine which *Code* requirements may apply to a given building. Because specific occupancy requirements are detailed in separate chapters, the *Code* user should first identify the proper occupancy classification of a building. This will direct the *Code* user to the appropriate chapter(s) for that occupancy.

For example, a jewelry retail sales operation (i.e., a jewelry store) occupying all of the twelfth floor of a multitenanted building uses 5000 sq ft (465 sq m), or 95 percent, of the floor area for sales purposes. Using the occupancy definitions found in Chapter 4, the jewelry store should be classified as a mercantile occupancy. By determining that the floor is a mercantile occupancy, the *Code* user narrows the range of choice of applicable occupancy chapters from Chapters 8 through 31 to the two that specifically address mercantile occupancies—Chapter 24 or Chapter 25.

Using the definition of "existing building" found in Chapter 3, the user can determine if the building is subject to the requirements for new construction or for existing buildings. If the jewelry store used in the example was occupied subsequent to the adoption of the *Code* currently being enforced, the user would determine that the life safety features required are those applicable to new construction. Thus, the user could narrow the applicable occupancy requirements to those detailed in Chapter 24, "New Mercantile Occupancies."

Next, the *Code* user would identify the subclassification of the mercantile occupancy as Class A, Class B, or Class C based on the 5000-sq ft (465-sq m) floor area used for sales purposes. Because the jewelry store occupies more than 3000 sq ft (280 sq m), but less than 30,000 sq ft (2800 sq m), it would fall in Class B mercantile occupancy. The user would then locate the requirements of Chapter 24 that specifically

loss by fire have not been considered as the basis for any of the provisions of this *Code*.

Although the *Code* requirements were developed to provide life safety from fire, adherence to its requirements may assist in property conservation and prevention of personal injuries. For example, the automatic sprinkler systems required for life safety purposes provide substantial property protection benefits as well.

Section 1-3* Application

A-1-3 It is the intent of this section that a building addition, or alteration designed to meet the requirements of a prior edition of the *Code* be required to meet those requirements for the life of the building. Requirements for existing buildings in this edition of the *Code* would apply if those requirements are more restrictive.

There are some cases where the requirements for new construction are less restrictive, and it might be justified to allow an existing building to use the less restrictive requirements. However, extreme care needs to be exercised when making this allowance, because the less restrictive provision might be the result of a new requirements elsewhere in the *Code*. For example, in editions of the *Code* prior to 1991, corridors in new health care occupancies were required to have a 1-hour fire resistance rating. Since 1991 these corridors have been required only to resist the passage of smoke. However, this is based on the new requirement that all new health care facilities must be protected throughout by automatic sprinklers.

1-3.1 New and Existing Buildings.

The *Code* applies to both new construction and existing buildings. In various chapters there are specific provisions for existing buildings that might differ from those for new construction.

In order to provide a minimum level of life safety to all occupancies in all structures, the *Code* must be applicable to both new construction and existing buildings. There are provisions throughout the *Code* that specifically apply to existing buildings. There are requirements for new construction that have been modified to apply differently to existing buildings. The modifications were made to limit the resulting disruption and financial impact on existing buildings to those modifications necessary to provide the minimum level of life safety. The requirements

applicable to new construction are often more stringent than those for existing buildings, because providing appropriate life safety requirements is considered less disruptive and more cost-effective during construction. If no modification for existing buildings appears within a *Code* requirement, the same provision applies for new construction and existing buildings.

If the current edition of the *Code* is adopted and supersedes a previous edition, it is the *Code's* intent that existing buildings be brought into compliance with the provisions for existing buildings found in the current edition.

See also 1-3.2, 1-3.4, 1-3.7, 1-3.10, and the definitions of *building*, *existing* and *existing* in Section 3-2.

1-3.2 Time Allowed for Compliance.

A limited but reasonable time shall be allowed for compliance with any part of this *Code* for existing buildings commensurate with the magnitude of expenditure, disruption of services, and degree of hazard.

In some cases, appreciable costs—in terms of actual monetary expenditures and disruption of daily activities—may be involved in immediately bringing an existing building into *Code* compliance. Where this is true, it would be appropriate for the operator or owner of the facility to formulate a schedule, approved by the authority having jurisdiction, that allows suitable periods of time for correcting various deficiencies. However, the degree of hazard is an important consideration in this instance and, if the degree of hazard is serious enough, it may be necessary to close the building to occupancy while renovations are made to bring the building features associated with the serious hazard into compliance. Once the building is reoccupied, the authority having jurisdiction might allow some reasonable, additional time for bringing the remaining deficient features into code compliance with the requirements specifically applicable to existing buildings.

1-3.3 Authority Having Jurisdiction.

The authority having jurisdiction shall determine the adequacy of means of egress and other measures for life safety from fire in accordance with the provisions of this *Code*.

This requirement gives the authority having jurisdiction the final determination of whether or not adequate life safety is provided in a building. When the

authorities having jurisdiction. The Code has not provided for the situation encountered there in the past. The Code has not provided for the situation encountered there in the past. The Code has not provided for the situation encountered there in the past.

which might totally or partially affect the structure. The structure may actually be in a state of disrepair and may be a fire-trap building.

1-3.4* Modification of Requirements for Existing Buildings.

The requirements for existing buildings shall be permitted to be modified if their application clearly would be impractical in the judgment of the authority having jurisdiction, but only where it is clearly evident that a reasonable degree of safety is provided.

A-1-3.4 In existing buildings, it is not always practical to strictly apply the provisions of this Code. Physical limitations may require disproportionate effort or expense with little increase in life safety. In such cases, the authority having jurisdiction should be satisfied that reasonable life safety is ensured.

In existing buildings it is intended that any condition that represents a serious threat to life be mitigated by application of appropriate safeguards. It is not intended to require modifications for conditions that do not represent a significant threat to life, even though such conditions are not literally in compliance with the Code.

This provides the authority having jurisdiction with the flexibility to apply the Code in a manner that would not be practical if it were strictly applied. The authority having jurisdiction should be satisfied that a reasonable degree of safety is provided.

Paragraph 1-3.4 also allows the authority having jurisdiction the flexibility to apply the Code in a manner that would not be practical if it were strictly applied. The authority having jurisdiction should be satisfied that a reasonable degree of safety is provided.

1-3.5 Referenced Publications.

Existing buildings or installations that do not comply with the provisions of the referenced standards contained in this document (see Chapter 33) shall be permitted to be continued in service provided the lack of conformity with these standards does not present a serious hazard to the occupants as determined by the authority having jurisdiction.

1-3.6 Additions.

Additions shall conform to the provisions for new construction.

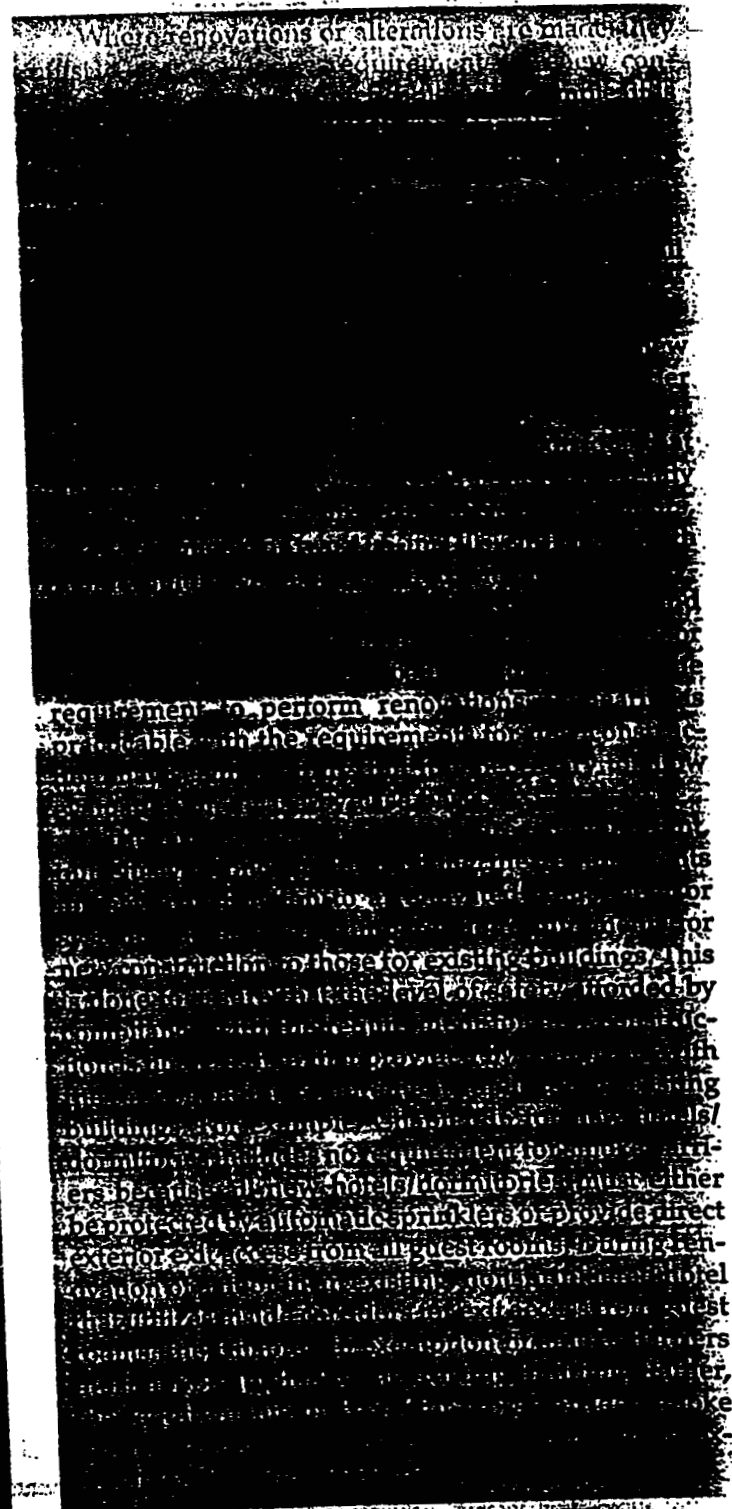
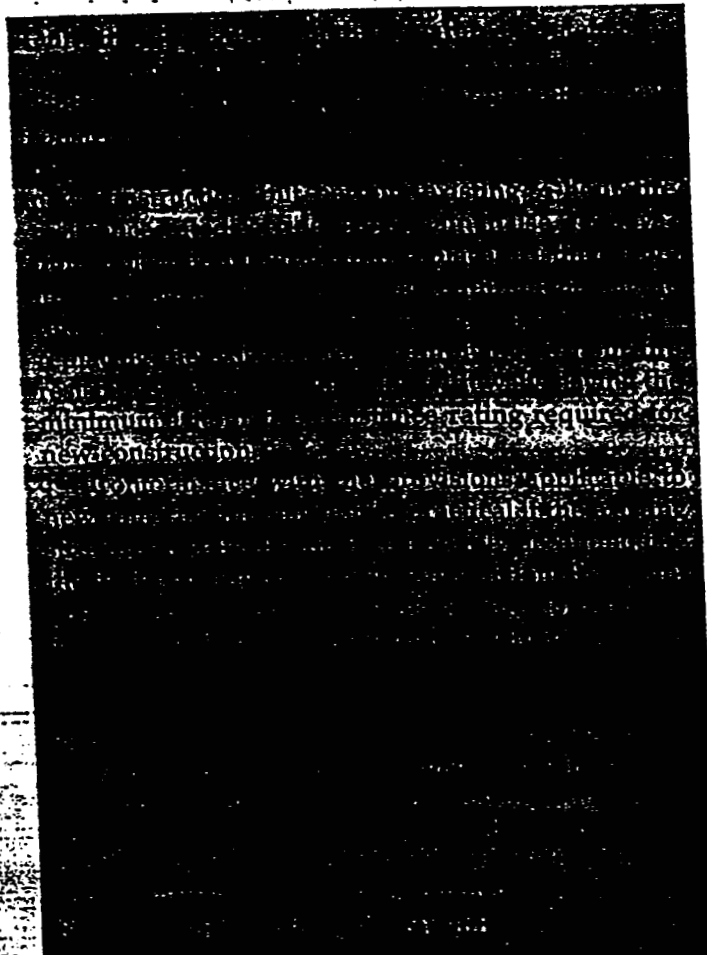
Any alteration or any installation of new equipment shall be accomplished as nearly as practicable with the requirements for new construction. Only the altered, renovated,

1-3.7* Modernization or Renovation

Any alteration or any installation of new equipment shall be accomplished as nearly as practicable with the requirements for new construction. Only the altered, renovated,

or modernized portion of an existing building, system, or individual component shall be required to meet the provisions of this Code applicable to new construction. If the alteration, renovation, or modernization adversely impacts required life safety features, additional upgrading shall be required. Existing life safety features that do not meet the requirements for new buildings, but exceed the requirements for existing buildings, shall not be diminished further. In no case shall the resulting life safety features be less than those required for existing buildings.

A-1.3.7 The following is an example of what is intended by 1-3.7. In a hospital that has 6-ft (1.8-m) wide corridors, these corridors cannot be reduced in width even though the requirements for existing hospitals do not require 6-ft (1.8-m) wide corridors. However, if a hospital has 10-ft (3-m) wide corridors, they may be reduced to 8 ft (2.4 m) in width, which is the requirement for new construction. If the hospital corridor is 3 ft (0.9 m) wide, it would have to be increased to 4 ft (1.2 m). If alterations require replacement of a portion of a hospital corridor wall, this portion of the corridor would not be required to be increased to 8 ft (2.4 m) in width unless it was practical to do so.



1-3.8 Priority of Chapter Requirements

Where specific requirements contained in Chapters 8 through 32 differ from general requirements contained in Chapters 1 through 7, the requirements of Chapters 8 through 32 shall govern.

1-3.10 Conditions for Occupancy. No new construction or existing building shall be occupied in whole or in part in violation of the provisions of this Code.

Exception: Buildings shall be permitted to remain in use, provided that

- (a) A plan of correction has been approved, and
- (b) The occupancy classification remains the same, and
- (c) No serious life safety hazard exists as judged by the authority having jurisdiction.

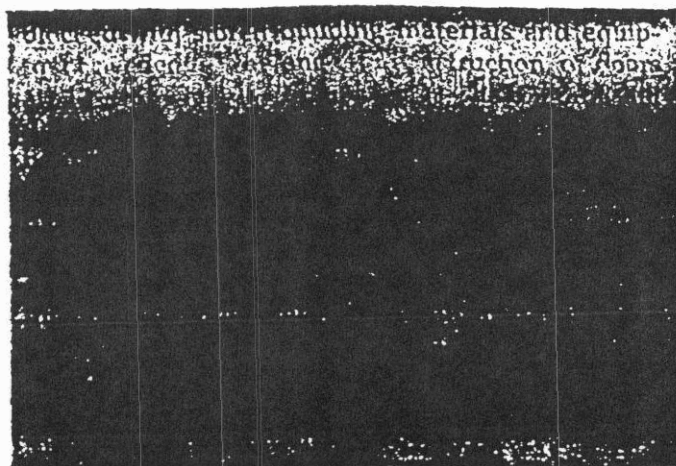
1-3.9 Provisions in Excess of Code Requirements.

Nothing in this Code shall be construed to prohibit a better type of building construction, additional means of egress, or otherwise safer conditions than those specified by the minimum requirements of this Code.

1-3.11 Construction, Repair, and Improvement Operations.

1-3.11.1* Buildings or portions of buildings shall be permitted to be occupied during construction, repair, alterations, or additions only if all required means of egress and all required fire protection features are in place and continuously maintained for the portion occupied.

A-1-3.11.1 Fatal fires have occurred when a required stair has been closed for repairs or removed for rebuilding, when a required automatic sprinkler system has been shut off to change piping, etc.



1-3.11.2* In buildings under construction, adequate escape facilities shall be maintained at all times for the use of construction workers. Escape facilities shall consist of doors, walkways, stairs, ramps, fire escapes, ladders, or other approved means or devices arranged in accordance with the general principles of the *Code* insofar as they can reasonably be applied to buildings under construction.

A-1-3.11.2 See also NFPA 241, *Standard for Safeguarding Construction, Alteration, and Demolition Operations*.

1-3.11.3 Flammable or explosive substances or equipment for repairs or alterations shall be permitted in a building of normally low or ordinary hazard classification while the building is occupied only if the condition of use and safeguards provided do not create any additional danger or impediment to egress beyond the normally permissible conditions in the building.

1-3.12* Changes of Occupancy.

In any building or structure, whether necessitating a physical alteration or not, a change from one occupancy classification to another, or from one occupancy subclassification to another subclassification of the same occupancy, shall be permitted only if such structure, building, or portion thereof conforms with the requirements of this *Code* applying to new construction for the proposed new use.

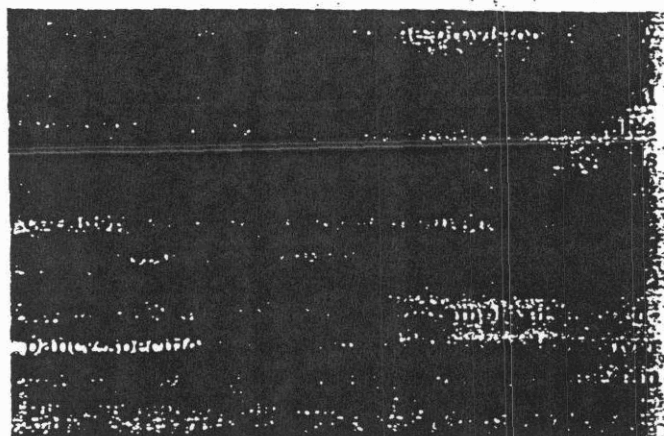
Exception: Where specifically permitted elsewhere in the *Code*, existing construction features shall be permitted to be continued in use in conversions.

A-1-3.12 Examples of changes from one occupancy subclassification to another subclassification of the same occupancy could include a change from a Class B to a Class A mercantile occupancy. Hospitals and nursing homes are both health care occupancies and are defined separately, but they are not established as separate suboccupancies, thus, a

change from one to the other does not constitute a change of occupancy subclassification.

For example, a building was used as a hospital but has been closed for four years. It is again to be used as a hospital. As long as the building was not used as another occupancy during the time it was closed, it would be considered existing.

Hotels and apartments, although both residential occupancies, are treated separately, and a change from one to the other constitutes a change of occupancy.



1-3.13 Maintenance and Testing.

1-3.13.1 Whenever or wherever any device, equipment, system, condition, arrangement, level of protection, or any other feature is required for compliance with the provisions of this *Code*, such device, equipment, system, condition, arrangement, level of protection, or other feature shall thereafter be continuously maintained in accordance with applicable NFPA requirements or as directed by the authority having jurisdiction.

Paragraph 1-3.13.1 emphasizes the importance of maintaining items required by the *Code*. It states that to have an egress door that will not close or a self-closing device that does not close the door on a sprinkler system will not maintain the system.

1-3.13.2* Existing life safety features such as, but not limited to, automatic sprinklers, fire alarm systems, standpipes, and horizontal exits, if not required by the *Code*, either shall be maintained or removed.

A-1-3.13.2 The presence of a life safety feature, such as sprinklers or fire alarm devices, creates a reasonable expectation by the public that these safety features are functional. When systems are inoperable or taken out of service, but the devices remain present, they present a false sense of safety. Also, before taking any life safety features out of

service, extreme care needs to be exercised to ensure that the feature, if not required, was not originally provided or an alternative or equivalency, or is no longer required due to other new requirements in the current *Code*. It is not intended that the entire system or protection feature be removed. Instead components such as sprinklers, initiating devices, notification appliances, standpipe hose, and exit systems should be removed to reduce the likelihood of relying on inoperable systems or features. Alternatively, signage could be provided to indicate that a system is no longer operable.

by the objective stated in 1-4.2. However, it is not the Code's intent to prevent fire protection equipment from being removed.

1-4.2*

An objective of this *Code* is to protect the occupants not intimate with the initial fire development from loss of life and to improve the survivability of those who are intimate with the fire development.

A-1-4.2 The phrase "intimate with the initial fire development" refers to the person(s) at the ignition source and not to all persons within the same room or area. *Code* provisions aimed at protecting occupants not intimate with the initial fire development may also protect those who are intimate with the initial fire development.

1-3.13.3 Equipment requiring periodic testing or operation to ensure its maintenance shall be tested or operated as specified elsewhere in this *Code* or as directed by the authority having jurisdiction.

1-3.13.4 Maintenance and testing shall be under the supervision of a responsible person who shall ensure that testing and maintenance are made at specified intervals in accordance with applicable NFPA standards or as directed by the authority having jurisdiction.

Section 1-4 Purpose

1-4.1

The purpose of this *Code* is to provide minimum requirements, with due regard to function, for the design, operation, and maintenance of buildings and structures for safety to life from fire. Its provisions will also aid life safety in similar emergencies.

1-4.3*

Protection of occupants is achieved by the combination of prevention, protection, egress, and other features with due regard to the capabilities and reliability of the features involved.

A-1-4.3 The level of life safety from fire is defined through requirements directed at the

- (a) Prevention of ignition,
- (b) Detection of fire,
- (c) Control of fire development,
- (d) Confinement of the effects of fire,
- (e) Extinguishment of fire,
- (f) Provision of refuge and/or evacuation facilities,
- (g) Staff reaction, and
- (h) Provision of fire safety information to occupants.

accomplishes its minimum level of life safety by extensively applying features (a) through (g) using a defend-in-place strategy. This strategy recognizes that the occupants are both incapable of self-preservation and difficult to move, particularly vertically to other floors or to the exterior of the building.

1-4.4

The *Code* endeavors to avoid requirements that might involve unreasonable hardships or unnecessary inconvenience or interference with the normal use and occupancy of a building, but provides for fire safety consistent with the public interest.

Buildings are normally designed to accommodate a specific functional need. The *Code* considers the normal occupancy of a building and attempts not to interfere with its regular use or to set requirements that would cause unreasonable hardship or unnecessary inconvenience to its normal functioning. For example, although self-closing devices on doors help to assure continuous fire- and smoke-compartmentation, the health care occupancy provisions of this *Code* do not require self-closing devices on patient room doors because of the day-to-day functional need for staff to monitor conditions while doors remain open. The health care occupancy chapters achieve the intended minimum level of life safety, without unduly interfering with normal operation of the facility, by combining other features and protection schemes.

Section 1-5 Assumption

1-5.1

The protection methods assume a single fire source.

Section 1-6 Equivalency

Section 1-6, Equivalency, presents a powerful design alternative that transforms what would otherwise be a typical specification code into a goal-oriented performance code where state-of-the-art life safety system design is permitted and encouraged.

1-6.1*

Nothing in this *Code* is intended to prevent the use of calculation methods, test methods, systems, methods, or devices

of equivalent or superior quality, strength, fire resistance, effectiveness, durability, and safety as alternatives to those prescribed by this *Code*, provided technical documentation is submitted to the authority having jurisdiction to demonstrate equivalency and the system, method, or device is approved for the intended purpose.

A-1-6.1 Before a particular mathematical fire model or evaluation system is used, its purpose and limitations need to be known. The technical documentation should clearly identify any assumptions included in the evaluation. Also, it is the intent of the Committee on Safety to Life to recognize that future editions of this *Code* are a further refinement of this edition and earlier editions. The changes in future editions will reflect the continuing input of the fire protection/life safety community in its attempt to meet the purpose stated in this *Code*.

With each new edition, the *Code* continues its evolution from a specification code into what is intended to be a performance-oriented document. Paragraph 1-6.1 recognizes that, although the written specification language is presented as a basis for enforcement, it should not inhibit the use of alternate or equivalent systems or design approaches to comply with *Code*-specified performance criteria. It is stipulated, however, that equivalency must be demonstrated by appropriate technical documentation. The evaluation and approval of equivalencies is the responsibility of the authority having jurisdiction.

The *Code* contemplates several forms of equivalency:

Code-specified alternative—The *Code* presents a written requirement and then provides an alternate method of obtaining the desired level of protection, usually via an exception. For example, for new educational occupancies, paragraph 10-3.6 requires that interior corridors be constructed of 1-hour fire resistance-rated assemblies. However, Exception No. 2 to 10-3.6 allows the 1-hour rating requirement to be reduced to that of a nonrated smoke-resisting assembly if the building is protected throughout by an approved, supervised automatic sprinkler system. Thus, the *Code* has judged the combination of smoke-resisting corridor partitions and sprinkler protection to be the equivalent of 1-hour fire resistance-rated corridor walls for new educational occupancies.

NFPA 101A Equivalency Methodologies—NFPA 101A, *Guide on Alternative Approaches to Life Safety*, provides a set of equivalency methodologies that may be used to assess equivalency for health care occupancies, detention and correctional occupancies, board and care occupancies, and business occupancies.

1-6.2*

Alternative systems, methods, or devices approved as equivalent by the authority having jurisdiction shall be recognized as being in compliance with this *Code*.



A-1-6.2 An equivalent method of protection is one providing an equal or greater level of safety. It is not a waiver or deletion of a *Code* requirement.

Section 1-7* Fire Exit Drills

A-1-7 The term "fire exit drill" is used to avoid confusion between drills held for the purpose of rapid evacuation of buildings and drills of fire-fighting practice that from a technical viewpoint are correctly designated as "fire drills," although this term is by common usage applied to egress drills in schools, etc.

The purpose of fire exit drills is to educate the building occupants in the fire safety features and the egress facilities available. Speed in emptying buildings, while desirable, is not the only objective.

The usefulness of a fire exit drill and the extent to which it can be carried off depends on the character of the occupancy; fire exit drills being most effective in occupancies where the occupant load of the building is subject to discipline and habitual control. For example, schools offer possibilities of more highly developed and valuable fire exit drills than other types of occupancy.

In buildings where the occupant load is of a changing character and not subject to discipline, such as hotels or department stores, no regularly organized fire exit drill, such as that which may be conducted in schools, is possible. In such cases, the fire exit drills must be limited to the regular employees, who can, however, be thoroughly schooled in the proper procedure and can be trained to properly direct other occupants of the building in case of fire. In occupancies such as hospitals, regular employees can be rehearsed in the proper procedure in case of fire; such training always is

(Log #CC78)

Committee: FUN

101-507 - (Appendix C): Accept
 SUBMITTER: Technical Committee on
 Fundamentals
 COMMENT ON PROPOSAL NO: 101-639
 RECOMMENDATION: Replace proposed Appendix
 C with the following:

APPENDIX C PROPOSED STRUCTURE FOR A PERFORMANCE-BASED DESIGN OPTION

This Appendix is not part of the requirements of this NFPA document, but is included for informational purposes.

NOTICE: This appendix provides guidance on features that will be needed when a complete performance-based design option is added to the Code. It is not complete and is not intended for regulatory use at this time. It is intended solely to introduce the subject for informational purposes and solicit proposals for further development.

NOTICE: Supplemental, advisory text that might not be suited for future placement within the body of the Code is presented within this appendix but is preceded by paragraph numbers that begin with the word "Appendix". Such text is further delineated by placing it within square brackets [].

Introduction

Future editions of this Code are expected to provide explicit fire safety goals and performance objectives. The purpose of these fire safety goals and objectives is to clearly identify the intent of the prescribed fire safety measures and facilitate the use of engineered fire safety alternatives in meeting the goals and objectives (i.e., a performance-based alternative).

This appendix has been prepared as a means to introduce the concepts of fire safety goals and objectives as they might apply to the Life Safety Code in the future. In addition, some basic concepts of performance-based fire safety design have been included to promote the development, advancement and acceptance of the concepts throughout the building and fire community. It should be noted that these concepts are not fully developed, and that the approach, definitions, concepts and criteria provided herein are provided as examples only in order to stimulate further discussion. It is not the intent of this appendix to in any way prohibit the application of performance-based design approaches that differ from the concepts introduced within this appendix.

This appendix introduces this approach, defines its structure, and presents elements in as much detail as the work to this point permits. It is the intent of the committee to encourage development of elements of this option in the peer reviewed fire protection engineering literature. The objective is to include a complete performance-based design option in the Code.

This proposed structure follows the guidelines in the July 1995 document "NFPA's Future in Performance-Based Codes and Standards: Report of the NFPA In-House Task Group".

Creating the Two Options.

It is anticipated that Chapter 1 of the Code will include a new section titled "Design Options" that will state certain chapters of the Code apply to a performance-based design option and certain chapters apply to a prescriptive-based design option. Code compliance is achieved if either option is used. Because the performance-based design option is an

elaboration of the existing and established concept of equivalency, the new section on design options will appear next to the section on equivalency or will be combined with it.

The proposed performance-based design option is not intended to be restrictive. The equivalency concepts of Section 1-5 would apply to both the prescriptive-based and performance-based design options.

It has not yet been determined whether the performance-based design option will use the traditional occupancy structure of the Code. If it does not, it will be because it has been determined that occupancy categories are not needed to specify the fire safety goals, fire scenarios, and assumptions relevant to a particular building design. If the occupancy structure is used, then the performance-based design option, like the current prescriptive-based approach, will rely on both general chapters and occupancy chapters to specify requirements.

An example of a design option section not employing the occupancy structure would be as follows:

SECTION 1-x DESIGN OPTIONS

1-x.1 Performance-Based Design Option. A design in accordance with Chapters 1 through 3 and the performance-based criteria of Chapter 4 (Performance-Based Designs) shall be considered as meeting the objectives of this Code.

1-x.2 Prescriptive-Based Design Option. A design in accordance with Chapters 1 through 3 and the prescriptive criteria of Chapters 5 through 33 shall be considered as meeting the objectives of this Code.

The following definitions would be added to Chapter 3, Section 3-2:

Performance-Based Design Option. An option within a code or standard whereby compliance is achieved by demonstrating that a proposed design will meet specified fire safety goals using referenced approved methods.

[Appendix 3-2 Performance-Based Design Option More specifically, fire safety goals are translated into performance objectives and performance criteria. Fire models and other calculation methods are used in combination with the building design specifications, specified fire scenarios, and specified assumptions, to calculate whether the performance criteria are met, in which case there is compliance with the Code under the performance-based design option.]

Prescriptive-Based Design Option. An option within a code or standard whereby compliance is achieved by demonstrating compliance with specified construction characteristics, limits on dimensions, protection systems, or other features, but without explicit reference to how these requirements collectively achieve explicitly stated fire safety goals.

The following material would appear as a new Chapter 4, entitled Performance-Based Design Option (i.e., the letter C would be replaced with the number 4 in each paragraph number).

SECTION C-1 GENERAL

C-1.1* Application. The performance-based design option is applicable to both new and existing buildings.

[Appendix C-1.1 Application — Overview of Performance-Based Design Option The fire safety goals of the Code are contained within the scope, application, and purpose sections of Chapter 1. Only

in the performance-based design options section will these fire safety goals be translated into quantitative performance objectives and performance criteria suitable for quantitative calculation and assessment.

Fire scenarios provide the fire challenge or "load" against which one determines whether the performance criteria are met. Fire models and other calculation methods are used to determine whether the building design will achieve the performance criteria, given each of the fire scenarios.

The quantitative characterization of the building design needs to be sufficiently complete and in a format to support the calculations. For example, building characteristics that affect occupant behavior (e.g., a complex, maze-like layout) must be assessed.]

C-1.2 Definitions.

Computer Fire Model. A fire model that has been adapted for use on a computer.

Fire Model.* Structured approach to predicting one or more effects of a fire.

[Appendix C-1.2 Fire Model Due to the complex nature of the principles involved, models are often packaged as computer software. Attached to the fire models will be any relevant input data, assumptions and limitations needed to properly implement the model.]

Fire Safety Goal.* Overall outcome to be achieved with regard to fire.

[Appendix C-1.2 Fire Safety Goal Goals are non-specific and are measured on a qualitative basis. They should be stated in terms of conditions (like loss avoidance) that are intrinsically desirable and do not rely on any assumptions. For example, "avoidance of flashover" would not be a goal because it relies on assumptions about what kinds of fires cause harm. Goals should be stated in terms that are potentially measurable, even if the precise measurement scale is not specified. Thus, they may be stated in terms of impact on people or property, business interruption or environmental impact.]

Fire Scenario.* Specification of fire conditions under which a proposed solution is expected to meet the fire safety goals.

[Appendix C-1.2 Fire Scenario The fire scenario describes factors critical to the outcome of the fire such as ignition sources and locations, nature and configuration of the fuel, ventilation, characteristics and locations of occupants, and condition of the supporting structure and other equipment.]

Performance Criteria.* Performance objectives for individual products, systems, assemblies or areas that are further quantified and stated in engineering terms.

[Appendix C-1.2 Performance Criteria Engineering terms include temperatures, radiant heat flux, and levels of exposure to fire products. Performance criteria provide threshold values which are treated as data for calculations used to develop a proposed solution. Examples of performance criteria include limiting a structural member to a critical temperature, limiting COHb levels to less than 25%, limiting upper layer temperatures to less than 500°C above ambient, and limiting radiant flux at floor level to less than 20 kW/m².]

Performance Objectives.* Requirements of the fire, building, or occupants which need to be met in order to achieve a fire safety goal.

[Appendix C-1.2 Performance Objectives Examples of performance objectives include prevention of structural damage, no life loss to persons not intimate with initial fire development, separating occupants from fire effects for a specified length of time, and containing the fire to the room of origin.]

In general, objectives define a series of actions necessary to make the achievement of a goal much more likely. Objectives are stated in more specific terms than goals and are measured on a more quantitative rather than qualitative basis.]

Safety Factor.* An adjustment made to reflect uncertainty in the assumptions made, the tools and methods used, and the limiting value of a parameter or item being measured.

[Appendix C-1.2 Safety Factor It should be noted that safety factors may be present in many components of an analysis or design. Careful attention should be given to both the lack of safety factors and the possibility that multiple safety factors are present.]

SECTION C-2 PERFORMANCE OBJECTIVES AND CRITERIA

C-2.1 Performance Objective. The fire safety goals of the Code, as stated in Chapter 1 are captured in the following quantitative performance objective:

A structure shall be designed, constructed and maintained to protect the occupants not intimate with the initial fire development from instantaneous or cumulative exposure to conditions that exceed approved survivability criteria for the period of time determined necessary.

C-2.2* Survivability Criteria. The performance objective above requires that specific survivability criteria be developed.

[Appendix C-2.2 Survivability criteria should include cumulative exposures to carbon monoxide, hydrogen cyanide, oxygen vitiation, convected heat, and radiant heat.]

Note that survivability criteria are only relevant when occupants are exposed to fire conditions. Oxygen levels, for example, need not be maintained above a stated threshold in any area at any time when occupant exposure is not an issue.

The specification of survivability criteria implies a judgment on acceptable risk, just as the choices in the prescriptive-based Code imply such judgments. For example, there will be people whose condition before the fire is so frail that any degradation in their environment can lead to death. Survivability criteria cannot be reasonably established to save such people.

Threshold values identified in the literature are those at which it is predicted that roughly half the exposed population will be fatally affected. More conservative criteria would be needed to assure that most people will be protected from loss of life but are more difficult to set with available evidence. Data on 50 percent lethality levels are more available than data on the distribution of lethality levels.]

C-2.3* Assumptions. All assumptions that can affect design performance shall be explicitly stated.

[Appendix C-2.3 Assumptions are any conditions or features that affect the achievement or failure to achieve performance criteria but are not part of the fire scenario or the building design specifications.]

C-2.3.1* Occupant Characteristics. Assumed characteristics of the buildings occupants that affect rate of response, susceptibility to products of

combustion, and rate of travel shall be explicitly identified.

[Appendix C-2.3.1 Assumptions regarding occupants are needed so that the assessment can calculate for each occupant whether, and if so when, the occupant will act in response to the fire; what actions the occupant will take and how effectively, with particular attention to speed of movement; and any occupant characteristics that affect survivability, e.g., fire conditions that will lead to loss of life.

Chapter 5 in NFPA 101A, *Guide on Alternative Approaches to Life Safety*, presents one approach to assessing the evacuation capability of occupants.

Occupancy categories are another way of organizing appropriate assumptions regarding occupants.]

C-2.3.2* Building Characteristics. Assumptions regarding characteristics of the building or its contents, equipment, or operations not inherent in the design specifications, but that affect occupant behavior or the rate of hazard development shall be explicitly identified.

[Appendix C-2.3.2 Such assumptions may be needed to determine how quickly fire and its effects will spread (e.g., doors normally open vs. normally closed). Issues of reliability are a major part of this group of assumptions.]

C-2.4 Safety Factors. Safety factors shall be used to account for uncertainty in assumptions, single-valued data, and deterministic models.

SECTION C-3 FIRE SCENARIOS

C-3.1* The choice of fire scenarios shall include the most common and the most severe fires to be reasonably expected in the building under evaluation.

[Appendix C-3.1 The choice of the appropriate fire scenarios is a critical step in the performance-based design option. The fire is the driving force for the development of smoke, heat and other products of combustion. It is important to select a wide range of fire scenarios to represent every type of fire that will affect the building's fire safety performance in a distinctive manner.

The fire scenario heat release rate should be based upon information related to the fuel in the area. Fire test results such as found in the Appendix of NFPA 72, *National Fire Alarm Code*, and other recognized references can be used to determine the necessary information.

There are dangers if the chosen fire scenarios are too severe or not severe enough. If a fire scenario is too severe, then a building in compliance with the prescriptive-based code will fail to achieve the fire safety goals if confronted with such a fire. This will unreasonably discourage use of the performance-based design option and shed doubt unrealistically on the adequacy of the prescriptive-based design option. There are always fires too severe for the Code (e.g., a ground-zero explosion of a strategic nuclear weapon). The challenge is to find the boundary that meets the limits of reasonable expectations. If the fire scenarios selected do not adequately reflect reasonably severe fire conditions, the resulting performance-based design might fail to achieve the needed level of fire safety.

The three fire scenarios described below illustrate a generic approach, in which many of the specific details of the scenario either need to be provided, are referenced to a more detailed guide, or are deferred to those presenting a performance-based design proposal, who must justify the reasonableness of their detailed specifications:

(a) **Common Scenario #1 - Ordinary Fire in Occupied Room.** Common scenario #1 shall be designed to be representative of a free-burning fire in ordinary combustibles, ignited by a small open-flame source, in one of the principal occupied spaces of the occupancy under consideration, with testing and modeling specifications for the scenario as specified in (whatever new NFPA standard is used to present and specify the standard scenarios).

(b) **Common Scenario #2 - Fire with Initial Smoldering Stage in Occupied Room.** Common scenario #2 shall be designed to be representative of a fire started by cigarette ignition of upholstered furniture, in one of the principal occupied spaces of the occupancy under consideration, with testing and modeling specifications for the scenario as specified in (whatever new NFPA standard is used to present and specify the standard scenarios).

(c) **High-Challenge Scenario #1 - Fire Originating in Means of Egress.** High-challenge scenario #1 shall be designed to be representative of a free-burning fire in ordinary combustibles, ignited by a small open-flame source, in the means of egress of the occupancy under consideration, with testing and modeling specifications for the scenario as specified in (whatever new NFPA standard is used to present and specify the standard scenarios).

Shown below are constructive steps to be used in specifying fire scenarios.

(1) Common scenarios can be partly specified through routine statistical analysis of fire experience in similar buildings. An advantage of common or typical scenarios is that they provide a good picture of what the buildings performance will usually be if fire occurs. Such scenarios also tend to fit easily within the scope of available fire models and calculation methods. This means the authority having jurisdiction can review results for these scenarios to obtain a basic sense of the building's level of safety and the appropriateness of the calculations.

(2) High-challenge scenarios are any scenarios that pose unusual fire challenges to the building design. High-challenge scenarios can be developed by refining common scenarios (e.g., changing the area of fire origin) to create a greater challenge. Also, high-challenge scenarios can be developed by reducing the challenge in scenarios previously identified as beyond the design expectations, i.e., too severe to use as the basis for evaluation.

Shown below are illustrative techniques for developing high-challenge scenarios from common scenarios.

(1) **Change the area of fire origin.** Consider an area (e.g., bedroom) where occupants are likely to be in a particularly vulnerable status. Consider an area (e.g., concealed spaces, external surfaces) where fire can develop outside the effective range of key fire protection features (e.g., detectors, sprinklers). Consider an area (e.g., means of egress) that is critical to occupant movement to safety.

(2) **Increase the initial size or speed of development of the fire.** This may be done by adjusting parameters in a fire growth model (e.g., increasing the alpha value in a t-squared modeled fire, reflecting a fast or ultra-fast fire, increasing the peak heat release rate value for the fire) or by increasing the assumed room fuel load or decreasing the space between major combustible items.

(3) **Assume common degradations in design assumptions.** For example, assume doors are blocked open, allowing fire passage of fire efforts to secondary

spaces; or, assume an unlimited oxygen supply for fire growth, which could result from open doors, broken windows, or other circumstances.

Developing high-challenge scenarios from scenarios beyond design expectations will involve less challenging quantitative assumptions. For example, if the bomb used in the World Trade Center incident of 1993 is deemed too severe for a high-rise office building, how small a bomb would constitute an appropriate high-challenge test? Or, if the Code cannot assure protection of occupants who are intimate with initial fire development, how close can occupants be and not be considered intimate?)

SECTION C-4 FIRE MODELS AND CALCULATION METHODS

C-4.1* The models and methods used to evaluate performance shall be appropriate to the fire scenarios selected. Use and limitations of fire models shall be determined in accordance with ASTM *Standard Guide for Determining Uses and Limitations of Fire Models*.

[Appendix C-4.1 Calculation methods are tools that permit a proposed solution to be assessed with regard to the applicable fire safety goals, assumptions and fire scenarios. Due to the complex nature of the principles and relationships involved, calculation methods are often packaged as computer software. Calculation methods contain scientific and mathematical relationships needed to model the behavior of certain aspects of a fire event, such as the growth and spread of the fire, the generation of harmful products, the response of fire protection systems, the behavior of occupants or others, or the impact of the fire on exposed people or property. Calculation methods are useful in codes and standards if they permit the user to assess whether or predict when a critical event will be reached (e.g., the achievement of the fire safety goals or the failure of the fire safety system).

Several fire models and calculation methods will typically be employed during the design and assessment process as it is unlikely that a single model will be capable of simulating all that is needed. As technology advances, it is likely that new methods will be developed to fill gaps in needed calculations or to improve on the performance of existing models. Also, existing methods are likely to be integrated into more comprehensive packages that will need to be re-evaluated in their new form.

It is not appropriate for the Code to prescribe specific methods by name. Instead, the Code should direct users to appropriate sources of accepted engineering practices for performing the needed calculations. The process of selecting and identifying fire safety goals, including objectives and criteria; assumptions about the condition and location of occupants being protected; and applicable fire scenarios will fully describe what the Code considers to be acceptable safety. When the performance objectives and criteria; and the input data of scenarios, assumptions, and the proposed design itself are stated explicitly and quantitatively, modeling can be used to predict performance.

It is anticipated that the fire protection engineering community will develop resources, in a form suitable for reference by the Code, so that a user will take from the Code clear guidance on the performance outcome values that need to be calculated and the input data to be developed and used, and then will take from the fire protection engineering resources clear guidance on how to predict performance outcomes from input data.

Before a particular fire model or calculation method is used, its purpose and limitations must be known.

The technical documentation needs to clearly identify any assumptions included in the evaluation.]

C-4.2 Computer Fire Models.

C-4.2.1 Documentation. Computer fire models shall be documented in accordance with ASTM E 1472, *Standard Guide for Documenting Computer Software for Fire Models*.

C-4.2.2 Predictive Capability. Computer fire models shall be evaluated for their predictive capability in accordance with ASTM E 1555, *Standard Guide for Evaluating the Predictive Capability of Fire Models*. When required by the authority having jurisdiction, such evaluation shall include scenarios specific to this application.

C-4.2.3 Data. Input data for computer fire models shall be obtained in accordance with ASTM E 1591, *Standard Guide for Data for Fire Models*.

C-4.3 Sensitivity Analysis. When required by the authority having jurisdiction, a sensitivity analysis shall be conducted to study the impact of variation of assumptions or input data.

SECTION C-5 PRESCRIPTIVE REQUIREMENTS

C-5.1* Building features that have prescribed requirements in Chapters 5-33 but are not included in the model or assumptions shall comply with Chapters 5-33 as appropriate.

[Appendix C-5.1 Some prescriptive requirements will be needed even in a performance-based design option. Some such requirements will reflect the absence of any logical alternative to the requirement (e.g., a sprinkler system requires an adequate water supply, consistent with its design). Some such requirements will be necessary to support the assumption embedded in the building design specifications (e.g., the use of listed parts assures that the building design will perform as intended) or to support other assumptions (e.g., a detector maintenance program provides assurance that an assumption of detector operability is reasonable).]

SECTION C-6 DOCUMENTATION

C-6.1* The performance-based design option shall be prepared by a person with qualifications acceptable to the authority having jurisdiction.

[Appendix C-6.1 Qualifications should include experience, education, and credentials that demonstrate knowledgeable and responsible use of applicable models and methods.]

C-6.2 The performance-based design option shall be documented in a manner acceptable to the authority having jurisdiction.

C-6.3 Documentation submitted for design approval shall include but not be limited to:

- (1) Identification of the building
- (2) List of survivability criteria with sources
- (3) List of assumptions about occupant characteristics
- (4) List of assumptions about building characteristics
- (5) List of safety factors
- (6) Descriptions of fire scenarios

(7) Description of models or methods used, including known limitations

(8) List of input data

(9) Output of model or method including sensitivity analysis when required

(10) List of prescriptive requirements complied with

(11) Computer fire model documentation if required by the authority having jurisdiction

(12) Summary of performance evaluation.

SUBSTANTIATION: The draft revision reformats the material for better presentation, responds to some of the public comments, and clarifies intent.

COMMITTEE ACTION: Accept.

NUMBER OF COMMITTEE MEMBERS ELIGIBLE TO VOTE: 8

VOTE ON COMMITTEE ACTION:

AFFIRMATIVE: 8

Figure 1-2 - Continued

advisable in all occupancies whether or not regular fire exit drills can be held.

Paragraphs 12-7.1 and 12-7.5 serve as a primer on fire exit drills. The Operating Features section of some of the occupancy codes includes fire exit drill details that directly address the characteristics of the occupancy. To help understand that the drill details have been matched to the needs of the occupants, compare those in 10-7.1—applicable to new educational occupancies—against those in 12-7.1—applicable to new health care occupancies.

1-7.1

Fire exit drills conforming to the provisions of this Code shall be conducted regularly in occupancies where specified by the provisions of Chapters 8 through 32, or by appropriate action of the authority having jurisdiction. Drills shall be designed in cooperation with the local authorities.

1-7.2*

Fire exit drills, where required by the authority having jurisdiction, shall be held with sufficient frequency to familiarize occupants with the drill procedure and to have the conduct of the drill a matter of established routine. Drills shall include suitable procedures to ensure that all persons in the building or all persons subject to the drill actually participate.

A-1-7.2 If a fire exit drill is considered merely as a routine exercise from which some persons may be excused, there is a grave danger that in an actual fire the drill will fail in its intended purpose. However, there might be some circumstances under which all occupants might not participate in a fire exit drill, for example, infirm or bedridden patients in a health care occupancy.

1-7.3

Responsibility for the planning and conduct of drills shall be assigned only to competent persons qualified to exercise leadership.

1-7.4

In the conduct of drills, emphasis shall be placed on order! evacuation under proper discipline rather than on speed.

1-7.5*

Drills shall be held at expected and unexpected times and under varying conditions to simulate the unusual condition that occur in the case of fire.

A-1-7.5 Fire is always unexpected. If the drill is always held in the same way at the same time it loses much of its value, and when for some reason during an actual fire it is not possible to follow the usual routine of the fire exit drill to which occupants have become accustomed, confusion and panic may ensue. Drills should be carefully planned to simulate actual fire conditions. Not only should they be held at varying times, but different means of exit should be used based on an assumption that, for example, some given stairway is unavailable by reason of fire or smoke, and all the occupants must be led out by some other route. Fire exit drills should be designed to familiarize the occupants with all available means of exit, particularly emergency exits that are not habitually used during the normal occupancy of the building.

Section 1-8 Units

1-8.1

Metric units of measurement in this Code are in accordance with the modernized metric system known as the International System of Units (SI).

1-8.2

If a value for measurement as given in this *Code* is followed by an equivalent value in other units, the first stated shall be regarded as the requirement. A given equivalent value may be approximate.

The metric values that appear within parentheses immediately following the U.S. Customary Units values might mistakenly appear as intentionally precise values representing the requirement rather than an approximation. For example, 5-212.2 requires that door openings in means of egress provide clear width of at least 32 in. (81 cm). Because the value 81 is not a nice round value, such as 80 or 90, it seems so precise as to be easily mistaken as the requirement. However, the value 81 is an approximation derived by multiplying 32 in. by the conversion factor of 2.54 cm per inch and rounding the resultant value of 81.28 to 81. As explained in 1-8.2, the first stated value in U.S. Customary Units is the requirement and the

equivalent value, in metric units, is the approximation.

1-8.3

The conversion procedure for the SI units has been to multiply the quantity by the conversion factor and then round the result to the appropriate number of significant digits.

Reference Cited in Commentary

NFPA 101A: *Guide on Alternative Approaches to Life Safety*, National Fire Protection Association, Quincy, MA, 1995. (Note: The 1995 edition of NFPA 101A is calibrated to measure equivalency against the requirements of the 1994 edition of the *Code*. The 1998 edition of NFPA 101A will measure equivalency against the requirements of the 1997 edition of the *Code*.)

CHAPTER 2

Fundamental Requirements

Chapter 2 outlines the fundamental concepts that are addressed in detail via the myriad requirements contained in the other chapters of the Code. Achieving these life safety fundamentals helps to ensure a reasonable level of life safety in building design and arrangement. The following are the fundamentals. Simply stated:

1. To provide for adequate safety without dependence on any single safeguard,
2. To ensure that construction is sufficient to provide structural integrity during a fire while occupants seek safe refuge within the building or egress to the building exterior,
3. To provide an appropriate degree of life safety considering the size, shape, and nature of the occupancy,
4. To ensure that the egress paths are clear, unobstructed, and unlocked,
5. To ensure that the exits and egress routes are clearly marked so as to avoid confusion and provide the cues needed for their effective use,
6. To provide adequate lighting,
7. To ensure prompt occupant response by providing early warning of fire,
8. To provide for back-up or redundant egress arrangements,
9. To ensure the suitable enclosure of vertical openings, and
10. To allow for design criteria that exceed the scope of this Code and address the normal use and needs of the occupancy in question.

2-1*

Every building or structure, new or old, designed for human occupancy shall be provided with means of egress and other

safeguards sufficient to permit the prompt escape of occupants or shall furnish other means to provide a reasonable degree of safety for occupants. The design of means of egress and other safeguards shall be such that reliance for safety to life will not depend solely on any single safeguard; additional safeguards shall be provided for life safety in case any single safeguard is ineffective due to human or mechanical failure.

A-2-1 It is not always necessary to completely evacuate the building or structure to escape from a fire or other emergency. An area of refuge formed by horizontal exits, smoke barriers, other floors, or similar compartmentation often can serve as a place for the occupants to remain in relative safety until the emergency is over. In those occupancies where access to the exits is by way of enclosed corridors, particularly those occupancies with sleeping occupants, a single fire might block access to all exits, including horizontal exits and smoke barriers. In such cases, the occupants may achieve a greater degree of safety by remaining in their rooms.

2-2

Every building or structure shall be constructed, arranged, equipped, maintained, and operated to avoid undue danger to the lives and safety of its occupants from fire, smoke, fumes, or resulting panic during the period of time reasonably necessary for escape from the building or structure or for that period of time needed to defend in place.

2-3

Every building or structure shall be provided with means of egress and other safeguards of kinds, numbers, locations, and capacities appropriate to the individual building or structure, with due regard to the character of the occupancy, the capabilities of the occupants, the number of persons exposed, the fire protection available, the height and type of construction

of the building or structure, and other factors necessary to provide all occupants with a reasonable degree of safety.

2-4

In every building or structure, means of egress shall be arranged and maintained to provide free and unobstructed egress from all parts of the building or structure at all times when it is occupied. No lock or fastening shall be installed to prevent free escape from the inside of any building. Means of egress shall be accessible to the extent necessary to ensure reasonable safety for occupants having impaired mobility.

Exception: Locks shall be permitted in mental health, detention, or correctional facilities where supervisory personnel are continually on duty and effective provisions are made to remove occupants in case of fire or other emergency.

Problems with locking devices have repeatedly been a contributing factor in multiple-fatality fires in correctional facilities. Some of these problems include malfunctioning locks, inability to locate keys in smoke or in the dark, frequently caused by smoke obscuration (or lighting), locks jammed with toothpicks and chewing gum, and lock releases made inoperative from pushing against the doors. All of these problems appear in the fire record. Prior to a fire, it might often have been assumed that, in the event of an emergency, there would be effective provisions for releasing locks and that personnel would be continually in attendance. Extreme care must be exercised to ensure that locks can and will be unlocked or that alternate methods of providing life safety that are independent of evacuation are provided. See also "The Seminole County Jail Fire" and "Fire in Prisons."²

2-5

Every exit shall be clearly visible, or the route to reach every exit shall be conspicuously indicated in such a manner that every occupant of every building or structure who is physically and mentally capable will readily know the direction of escape from any point. Each means of egress, in its entirety, shall be arranged or marked so that the way to a place of safety is indicated in a clear manner. Any doorway or passageway that is not an exit or a way to reach an exit, but is capable of being confused with an exit, shall be arranged or marked to prevent occupant confusion with acceptable exits. Every effort shall be taken to avoid occupants mistakenly traveling into dead-end spaces in a fire emergency.

2-6

Where artificial illumination is required in a building or structure, egress facilities shall be included in the lighting design in an adequate and reliable manner.

2-7

In every building or structure of such size, arrangement, or occupancy that a fire itself might not provide adequate occupant warning, fire alarm facilities shall be provided where necessary to warn occupants of the existence of fire. Fire alarms alert occupants to initiate emergency procedures and facilitate the orderly conduct of fire exit drills.

Several multiple-fatality fire incidents, especially in hotels, have shown that fire alarm sounding devices were inadequate to alert building occupants. This was because occupants either could not hear the alarm or did not recognize the alarm as a fire alarm signal. Confusion with sounds made by telephones or alarm clocks has been reported. Authorities having jurisdiction must ensure that sounding devices can be heard over ambient noise levels and can be recognized as fire alarm signals. See "Familiar Problems Cause 10 Deaths in Hotel Fire" and "Ten Die in Greece, New York Hotel Fire."^{3,4}

2-8

Two means of egress, as a minimum, shall be provided in every building or structure, section, and area where size, occupancy, and arrangement endanger occupants attempting to use a single means of egress that is blocked by fire or smoke. The two means of egress shall be arranged to minimize the possibility that both might be rendered impassable by the same emergency condition.

2-9

Every exit stair, exit ramp, and other vertical opening between floors of a building shall be suitably enclosed or protected, as necessary, to afford reasonable safety to occupants while using means of egress and to prevent spread of fire, smoke, or fumes through vertical openings from floor to floor before occupants have entered exits.

Unprotected or improperly protected vertical openings have repeatedly appeared in NFPA fire records as a major contributing factor in multiple-death fires. The following is a list of multiple-death fires in which unprotected vertical openings have been identified as a significant factor in these deaths.

November 20, 1980, Las Vegas, NV	85 dead ⁵
January 9, 1981, Keansburgh, NJ	31 dead ⁶
March 14, 1981, Chicago, IL	19 dead ⁷
October 28, 1982, Pittsburgh, PA	5 dead ⁸
April 19, 1983, Worcester, MA	7 dead ⁹
June 14, 1983, Fort Worth, TX	5 dead ¹⁰
August 31, 1983, Gwinnett, GA	8 dead ¹¹
December 31, 1986, San Juan, PR	97 dead ¹²
See also the commentary on Section 6-2.	

2-10*

Compliance with this *Code* shall not be construed as eliminating or reducing the necessity for other provisions for safety of persons using a structure under normal occupancy conditions. Also, no provision of the *Code* shall be construed as requiring or permitting any condition that might be hazardous under normal occupancy conditions.

A-2-10. The provisions of this *Code* will not necessarily provide a building suitable for use by physically handicapped people. Reference is made to CABO/ANSI A117.1, *American National Standard for Accessible and Usable Buildings and Facilities*.

References Cited in Commentary

¹ Richard Best, "The Seminole County Jail Fire," *Fire Journal*, Vol. 70, No. 1, January 1976, pp. 5-10, 17.

- ² David P. Demers, "Fire in Prisons," *Fire Journal*, Vol. 72, No. 2, March 1978, pp. 29-42.
- ³ David P. Demers, "Familiar Problems Cause 10 Deaths in Hotel Fire," *Fire Journal*, Vol. 74, No. 1, January 1980, pp. 52-56.
- ⁴ David P. Demers, "Ten Die in Greece, New York Hotel Fire," *Fire Journal*, Vol. 73, No. 4, July 1979, pp. 25-30.
- ⁵ Richard Best and David P. Demers, "Fire at the MGM Grand," *Fire Journal*, Vol. 76, No. 1, January 1982, pp. 19-37.
- ⁶ Richard Best and Steven W. Hill, "Fires in Boarding Facilities Kill 34 Residents," *Fire Journal*, Vol. 76, No. 4, July 1982, pp. 44-57, 106.
- ⁷ Steven Hill, "19 Die in Chicago Hotel Fire," *Fire Journal*, Vol. 76, No. 2, March 1982, pp. 53-55, 60-61.
- ⁸ James R. Bell, "Five Die in Pittsburgh Boarding Home Fire," *Fire Journal*, Vol. 77, No. 5, September 1983, pp. 68-71, 75.
- ⁹ Richard Best, "Fire in Community Home Causes Seven Deaths," *Fire Journal*, Vol. 78, No. 2, March 1984, pp. 19-23, 79-80.
- ¹⁰ Ron Cote, Thomas Klem, and William P. Walls, "Five Die in Fire at Texas Ramada Inn," *Fire Journal*, Vol. 78, No. 2, March 1984, pp. 55-57, 60-70.
- ¹¹ Tom Timoney, "Eight Mentally Handicapped Occupants Die in Georgia Fire," *Fire Journal*, Vol. 78, No. 3, May 1984, pp. 91-97, 134.
- ¹² Thomas J. Klem, Investigation Report on the Dupont Plaza Hotel Fire, NFPA LS-11, National Fire Protection Association, Quincy, MA, 1987.

CHAPTER 28

Industrial Occupancies

Section 28-1 General Requirements

Industrial occupancy is a broad classification. The following are examples of industrial occupancies:

Factories of all kinds	Laundries
Gas plants	Recycling plants
Laboratories	Autobody and repair shops
Refineries	Food processing plants
Dry cleaning plants	Hangars (for servicing)
Sawmills	Postal central sorting
Power plants	maintenance facilities
Pumping stations	
Telephone exchanges	

The national fire incident databases indicate that the classifications of industrial and manufacturing properties accounted for 27,500 structure fires per year as reported to U.S. fire departments from 1984 to 1988. These fires led to 45 civilian (non-fire-service personnel) deaths and 858 civilian injuries a year. Only one-fourth of the people who died in fires in those properties from 1980 to 1988 were outside the room of fire origin when the fire began.

Many industrial properties pose the particular hazard of rapid fire development as a result of explosion or flash fire. This fact is underscored each year in the detailed descriptions of multiple-death and large-loss fires. In the 1980s, eight industrial fires killed 10 or more people, although three of those fires took place in coal mines, which are addressed as special structures by the *Life Safety Code*. The other five consisted of two fireworks manufacturing plant incidents, one in Oklahoma in 1985 and one in Tennessee in 1983; a 1980 metal manufacturing plant fire

incident in New York; a 1984 refinery incident in Illinois where the 17 dead included many employees who acted as fire fighters; and a 1989 polyolefin plant incident in Texas, which also ranks as the fourth highest property loss from fire in U.S. history, after adjusting for inflation, and the highest loss to involve only one property.

28-1.1 Application.

The requirements of this chapter shall apply to both new and existing industrial occupancies. Industrial occupancies shall include factories making products of all kinds and properties used for operations such as processing, assembling, mixing, packaging, finishing or decorating, repairing, and similar operations.

Unlike most occupancies covered in the *Code*, both new and existing industrial occupancies are covered in one chapter. Where the requirements vary, it is common for exceptions that apply to existing industrial occupancies to appear or for additional requirements that are limited to new industrial occupancies to be included.

The statistics provided by the national fire incident databases demonstrate that the potential loss of life from fire in an industrial occupancy is directly related to the hazard of the industrial operation process. Most multiple-death industrial fires are the result of flash fires caused by highly combustible material or explosions involving combustible dusts, flammable liquids or gases.

Although industrial fires constitute a small percentage of the annual number of structure fires, fires have not, as a general rule, resulted in extensive loss of life. A number of operating features common

to industrial occupancies have contributed to this favorable record. Continued emphasis on proper egress design and maintenance and day-to-day attention to industrial safety and training programs can help to perpetuate this trend.

One of the major features to be considered in the design of an industrial building's life safety system is the widespread utilization of automatic sprinkler protection. Originally developed for industrial property protection, the automatic sprinkler has also been largely responsible for an excellent life safety record in industrial occupancies. This record has been recognized by the fire protection community, as evidenced by the widespread use of automatic sprinkler systems for life safety protection in buildings with significant hazards to life. Automatic sprinkler protection in industrial occupancies has been a principal factor in ensuring safety to life through the control of fire spread. Limiting the size of a fire by means of sprinklers provides sufficient time for the safe evacuation of occupants exposed to fire. The contribution of the automatic sprinkler to safety to life can be fully appreciated only when the wide range of fire risks associated with the many processes used in an industrial facility are recognized.

Employees and other occupants of industrial buildings are generally ambulatory and capable of quick response to fires. They are also able to exit rapidly once properly alerted. To capitalize on this employee capability, many industrial facilities include life safety measures in their emergency preplanning. A well-conceived plan provides a valuable tool in preventing loss of life. Provisions that should be part of the emergency preplan include measures for alerting employees, identification and posting of exit access routes, establishment of group assembly areas for occupants once they have evacuated the building, and procedures for determining that all employees have safely evacuated. Responsibilities are usually established and assigned in the preplan to ensure that the tasks necessary to facilitate safe evacuation of the building are performed. The preplan should routinely be evaluated through simulated fire exercises and drills. Only through the execution of such drills can flaws in the preplan be recognized and modified.

Although the life safety record in industry has been relatively good, a major problem may be emerging in the trend toward constructing large industrial plants that house hazardous operations. The introduction of new materials, such as extensive quantities of plastics, has increased the need for additional measures to help protect employees from fire. Com-

pared with industrial buildings of the early twentieth century, the modern industrial complex has placed a larger number of employees in a more complex and increasingly hazardous environment. This trend has increased the need for industrial management to concentrate on life safety principles, not only during the design stage, but also during day-to-day plant operations.

As part of their employee training program, most industrial firms include education in the use of first aid fire-fighting equipment, such as in-plant standpipes, hose, and portable fire extinguishers. Industrial training of this type, where fully utilized, has resulted in a major reduction in property loss and life loss. Although first aid fire-fighting measures are primarily a property protection measure, there is also a significant life safety benefit. In any situation where the spread of a fire is checked through effective employee action, employee life safety is also provided. If fire spread is restricted to the incipient stages, there is no significant threat to life safety.

28-1.2 Mixed Occupancies.

In any building occupied for both industrial and other purposes, means of egress shall comply with 4-1.12.

In addition to requiring that the means of egress comply with 4-1.12, which covers mixed occupancies, the intent of this paragraph is that the other life safety features addressed by the Code comply with 4-1.12.

28-1.3 Special Definitions.

(None.)

Although no special definitions are listed in 28-1.3, industrial occupancies are subclassified and defined in 28-1.4.1(a), (b), and (c) under the labels *general industrial occupancy*, *special purpose industrial occupancy*, and *high hazard industrial occupancy*.

28-1.4 Classification of Occupancy.

(See 4-1.9.)

The method for determining the degree of hazard to life safety posed by an industrial occupancy is a result of personal judgment and not an

science. The authority having jurisdiction must use judgment based on past experience, a review of reference materials, and full discussion with third parties to evaluate the life safety measures in an industrial occupancy. The Code establishes broad categories of occupancy classification so that the relative risks to life safety posed by various types of buildings can be assessed.

A common error made when classifying industrial occupancies is the use of hazard categories for automatic sprinklers contained in NFPA 13, *Standard for the Installation of Sprinkler Systems*,¹ to determine the hazard to life safety. While the guidelines in NFPA 13 may not differ greatly from those of the *Life Safety Code* when classifying high hazard occupancies, the remaining categories in NFPA 13 are usually not suitable for the general industrial occupancy classification of the Code. This is particularly true when classifying low hazard occupancies, which are classified differently by NFPA 13 (light hazard) than by the *Life Safety Code*. The distinction is that the life safety industrial occupancy classification is concerned with determining the overall hazard to occupants in a manufacturing building for purposes of implementing an adequate means of egress system, while the NFPA 13 classification system is concerned with defining the hazard so that a sprinkler system can be designed to meet the challenge of the hazard.

To examine the conflicts between life safety occupancy classification and classifications in other fire codes, consider a metalworking plant using a flammable solvent in a dip tank coating operation. From a life safety standpoint, the normally ordinary hazard classification of the metalworking plant should not be changed to high hazard solely because of the presence of a dip tank coater. An adequate means of safe egress leading away from the coater is needed to ensure the safety of the occupants, but additional exits and a reduction in travel distance to an exit, as specified for a high hazard area, are not required. However, if the coater is the principal piece of equipment in a separately enclosed area, that area should be considered as a high hazard industrial occupancy.

When determining the life safety hazard classification for an industrial occupancy, the authority having jurisdiction should carefully analyze the nature of that industrial operation to ensure an accurate evaluation of the hazard to occupants. A number of resources are available as aids to properly determining the degree of risk to life safety. One aid that should not be overlooked is the expertise of the industrial plant operator. The operator has available a wealth of hazard information. However, the information may

be treated as confidential material to prevent competitors from learning the details of an industrial process. An enforcing authority should earn the trust of the operator by carefully handling such material. It is vital that process data be kept confidential, because once an enforcing authority is known to be a source of data on industrial secrets, further cooperation will be difficult to obtain.

Another resource is the engineering department of the company responsible for a facility's insurance coverage. In addition, discussions with officials who oversee jurisdictions where similar facilities exist and a review of NFPA literature will provide further information on a particular process and its associated hazards.

To assess the risk to life safety in an industrial occupancy, a number of factors should be considered. It should be determined if the manufacturing process includes the handling of flammable, reactive, or explosive materials in quantities that could expose occupants to an initial fire or explosion. If so, the occupancy is a strong candidate for a high hazard classification.

It should also be determined whether the manufacturing process requires a large number of people or whether it is basically a large collection of machines or equipment occasionally attended by operators. In some instances, the operators may be clustered in one location, such as a control room. If a building is predominantly occupied by machinery or equipment and is used by few employees, the building can be classified as a special purpose industrial occupancy. See 28-1.4.1(b).

If an industrial building is used mostly for storage of materials (such as preparatory stock for assembly or finished goods), it might meet the requirements for classification as a storage occupancy. See Chapter 29.

Occupancy classification is dependent on the burning and explosive characteristics of the materials contained in a building, not on the quantity of combustibles. For example, there is no reason to classify a building as high hazard simply because it is associated with a manufacturing process that requires extensive quantities of ordinary combustible material distributed in such a manner that the process would involve a high combustible load.

The classification of an industrial occupancy for life safety purposes does not depend on the type of structure housing the industrial process. The basic purpose of the hazard classification in Chapter 28 is to evaluate the risk of contents (see Section 2-2). The classification is determined by an evaluation of the

contents and other factors in a fire's development that affect the time available for safe evacuation of the occupants. Once employees are evacuated to a safe location, the extent of fire spread in the structure becomes a threat to property. As long as life safety measures are met, the threat of heavy fire damage to a building is beyond the scope of the Life Safety Code. Also see the commentary following 28-1.4.1(b) and 28-1.4.1(c).

28-1.4.1 Subclassification of Industrial Occupancies. Each industrial occupancy shall be subclassified according to its use as follows:

(a) *General Industrial Occupancy.* Ordinary and low hazard industrial operations conducted in buildings of conventional design suitable for various types of industrial processes. Included are multistory buildings where floors are occupied by different tenants or buildings suitable for such occupancy and, therefore, subject to possible use for types of industrial processes with a high density of employee population.

(b) *Special Purpose Industrial Occupancy.* Includes ordinary and low hazard industrial operations in buildings designed for and suitable only for particular types of operations, characterized by a relatively low density of employee population, with much of the area occupied by machinery or equipment.

It can be difficult to determine if a building qualifies as a special purpose industrial occupancy. For example, a structure is often erected to protect a large machine or equipment from weather. Once constructed, authorities might try to impose exit requirements applicable to a general industrial occupancy, despite the fact that there is to be only a handful of personnel occupying the building. Steel mills, paper plants, generating plants, and other operations with large machines are examples of the types of industrial occupancies requiring massive structures for process control and weather protection. These structures often represent minimum hazards to life safety and should be classed as special purpose industrial occupancies, regardless of their more modern operation. All buildings require adequate means of egress and fire protection, which are the standards and guidelines of occupancy classification codes for all structures.

However, the code officials who are responsible for enforcing the code must also be aware of the potential danger to people working in such buildings. The code does not prohibit the building owner from installing emergency escape windows in buildings containing machinery, provided that such windows are installed in accordance with the code's intent.

BellSouth Telecommunications, Inc.
FPSC Docket Nos. 980946-TL, 980947-TL,
980948-TL, 981011-TL, 981012-TL & 981250-TL
Exhibit JDB - 26, Page 55 of 71

as justification for reducing life safety features, full number and arrangement of exits required for general industrial occupancy should be maintained. A reduction in aisles, doors, stairways, and components of the means of egress cannot be justified by the temporary classification of a building as a special purpose industrial occupancy.

(c)* *High Hazard Industrial Occupancy.* Includes buildings having high hazard materials, processes, or contents. Incidental high hazard operations in low or ordinary occupancies and protected in accordance with Section 28-3.2 shall not be the basis for overall occupancy classification.

A-28-1.4.1(c) High hazard occupancy may include occupancies where gasoline and other flammable liquids are handled, used, or stored under such conditions as to involve possible release of flammable vapors; where grain or wood flour or plastic dusts, aluminum or magnesium or other explosive dusts may be produced; where hazardous chemicals or explosives are manufactured, stored, or handled; where cotton or other combustible fibers are processed or handled under conditions that might produce flammable flyings; and other situations of similar hazard.

Chapter 28, Industrial Occupancies, and Chapter 29 Storage Occupancies, include detailed provisions on high hazard occupancy.

A high hazard occupancy classification is limited to those industrial buildings housing extremely hazardous operations. Incidental use of restricted quantities of flammable liquids in a building does not constitute a high hazard, although some additional life safety precautions may be required during the limited period of use. Refer to NFPA 30, *Flammable and Combustible Liquids Code*,² for guidance. Storage of flammable liquids, such as paint, in sealed containers does not require a high hazard occupancy classification if the operation includes mixing or blending operations that require the containers to be opened. Mixing and blending of flammable liquids can be conducted in a separate room with a fire barrier between storage and mixing areas. In this operation, the storage and blending room would be considered high hazard industrial occupancy, while the existing building separated storage area would be considered low hazard industrial occupancy or possibly general occupancy, subject to the requirements of NFPA 30. Combustible dust released from an area of manufacturing process constitutes a significant threat to life safety and might justify a high hazard occupancy classification.

sification. Major loss of life has occurred in industrial occupancies that release extensive quantities of combustible dusts. Opportunity for the quick escape of employees who work in operations releasing combustible dust should be provided to prevent injury or loss of life if a dust explosion occurs. In high hazard occupancies that are subject to explosions, the provisions of 28-3.2 require special consideration of the techniques for explosion suppression or venting to ensure the life safety of occupants. Full utilization of fire protection engineering techniques should be employed in these occupancies to minimize the risk to life safety.

The industrial occupancies that clearly require classification as a high hazard are those associated with the production of explosives or highly reactive chemicals. In some especially hazardous operations, additional exits will be necessary to ensure rapid egress to prevent loss of life in the event of an explosion or fire. Where installation of the preventive or protective measures specified in 28-3.2 is not possible due to the nature of the industrial operation, consideration should be given to operating procedures that restrict access to a limited number of people during the hazardous portion of the operation. The operating procedures would limit the potential threat to those trained personnel who are fully aware of the extent of the hazard. Procedures should also include a record of personnel who have signed in or out to ensure prompt determination of the number of personnel exposed to a hazardous operation, and thus the number who may require rescue.

28-1.5 Classification of Hazard of Contents.

Classification of hazard of contents shall be as defined in section 4-2.

28-1.6 Minimum Construction Requirements.

(No requirements.)

Some occupancy chapters, such as Chapters 12 and 13, which address the life safety needs of nonambulatory health care occupants, specify minimum building construction type requirements to help ensure structural integrity for the time period needed for a lengthy evacuation or for safe refuge within the building. There are no minimum construction requirements imposed, because industrial occupancies characteristically have ambulatory occupants and do not provide sleeping accommodations.

28-1.7* Occupant Load.

The occupant load for which means of egress shall be provided from any floor of an industrial occupancy shall be the maximum number of persons intended to occupy that floor, but not less than one person for each 100 sq ft (9.3 sq m) of gross floor area.

Exception: In a special purpose industrial occupancy, the occupant load shall be the maximum number of persons to occupy the area under any probable conditions.

A-28-1.7 In most cases, the requirements for maximum travel distance to exits will be the determining factor rather than numbers of occupants, as exits provided to satisfy travel distance requirements will be sufficient to provide egress capacity for all occupants, except in cases of unusual arrangement of buildings or high occupant load of a general manufacturing occupancy.

The occupant load of an industrial building is based on an average of 100 sq ft (9.3 sq m) of gross floor area per occupant. Many industrial users of the Code confuse this concept with the actual number of employees who use the facility. The usual complaint is that the number of potential employees calculated for egress purposes in accordance with the 100-sq ft (9.3-sq m) criterion far exceeds the anticipated or actual number of employees. Many industrial managers argue that using the larger number as a basis for egress design requires more exits, wider doors, and more passageways than are needed for emergency egress purposes, reducing productive work space and resulting in increased cost.

The concept of determining occupant load by using an occupant load factor is useful, although it does not necessarily relate directly to the actual number of building occupants. It is a means of calculating the minimum egress requirements based on the needs of an average industrial occupancy. Although actual conditions may vary in an individual location, the amount of egress width determined by the occupant load calculation will normally provide the necessary, adequate, and required means of egress for a typical industrial building with little or no penalty to the building's owner/operator.

See Figure 28-1 for examples of occupant load determination using the occupant load factor for a general industrial occupancy and using the probable number of occupants for a special purpose industrial occupancy.

In Figure 28-1, illustration (a), the general industrial occupancy must provide a means of egress for at least 2000 persons based on use of an occupant load factor of 1 person per 100 sq ft (9.3 sq m).

In Figure 28-1, illustration (b), a special purpose industrial occupancy can size its means of egress for the maximum 20 persons (actual anticipated employee population) who are apt to occupy the facility under any probable condition.

In Figure 28-1, illustration (c), the 200-person tour groups that visit this special purpose industrial occupancy on the first Monday of each month must be added to the 45 employees (actual employee population) who are normally present for a total occupant load of 245 persons.

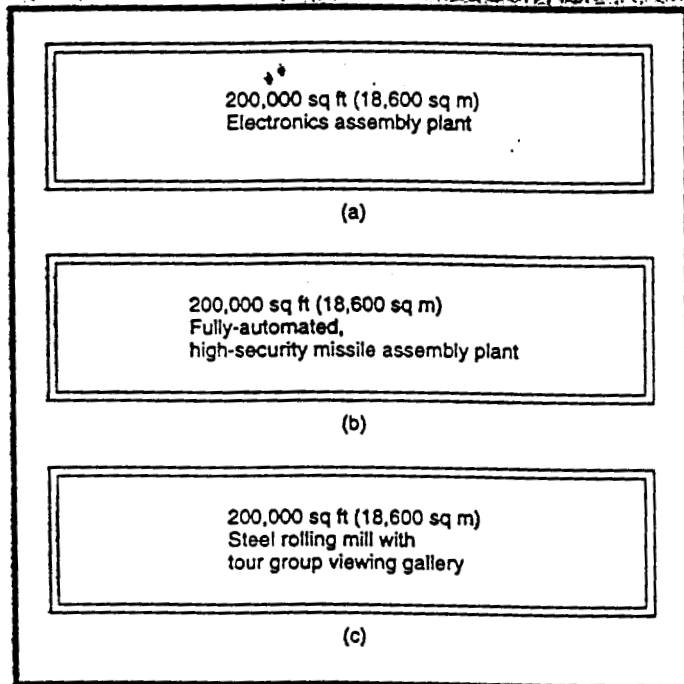


Figure 28-1. Determination of occupant load of industrial occupancies. See the commentary associated with 28-1.7.

Section 28-2 Means of Egress Requirements

28-2.1 General.

Each required means of egress shall be in accordance with the applicable portions of Chapter 5.

28-2.2 Means of Egress Components.

28-2.2.1 Components of means of egress shall be limited to the types described in 28-2.2.2 through 28-2.2.13.

28-2.2.2 Doors.

28-2.2.2.1 Doors complying with 5-2.1 shall be permitted.

28-2.2.2.2 Delayed egress locks complying with 5-2.1.6.1 shall be permitted.

Use of the delayed egress locking device covered by 5-2.1.6.1 is allowed on any door in recognition of the security needs of some industrial occupancies. In effect, the allowable 15- or 30-second delay will be experienced only under nonfire conditions or very early in a fire's growth, because the door must be unlocked immediately upon sprinkler operation, or smoke, heat detection, or loss of power controlling the locking mechanism. The building must be protected throughout by an approved automatic sprinkler system or automatic fire detection system.

28-2.2.2.3 Access-controlled egress doors complying with 5-2.1.6.2 shall be permitted.

The Code recognizes access-controlled egress doors in industrial occupancies as security measures that do not compromise the use of the means of egress system.

28-2.2.2.4 Existing horizontal sliding fire doors shall be permitted in the means of egress under the following conditions:

- They are held open by fusible links,
- The links are rated at not less than 165°F (74°C),
- The fusible links are located not more than 10 ft (3 m) above the floor,
- The fusible link is in immediate proximity to the door opening,
- The fusible link is not located above a ceiling, and
- The door is not credited with providing any protection under this Code.

Horizontal sliding fire doors exist in many industrial occupancies for property protection purposes, though the Code normally does not recognize fire doors within the required means of egress. Section 28-2.2.2.4 makes a special exemption for existing horizontal sliding fire doors by requiring the door to be positioned in immediate proximity to the opening, rated at 165°F (74°C) or higher, and not more than 10 ft (3 m) above the floor. The intent is to assure that the door will remain open in a fire, and to make it impossible to panic-close the door opening. In recognition that the door will close early in the fire development, the door shall be credited as a fire door for life safety.

However, it might serve for property protection purposes. See Figure 28-2.

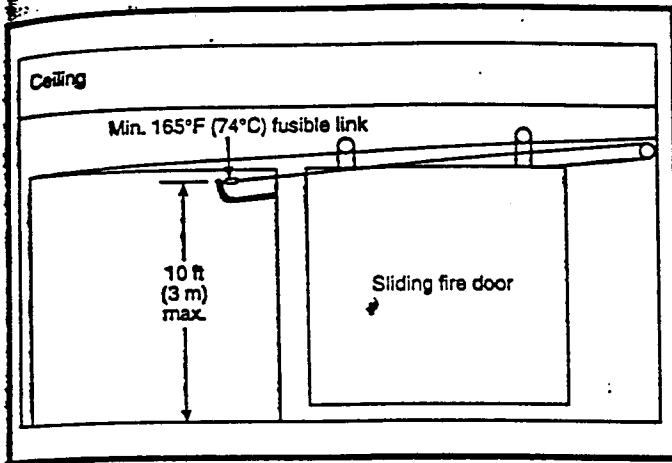


Figure 28-2. Existing horizontal sliding fire door in accordance with 28-2.2.2.4. By requiring the fusible link to be positioned in immediate proximity to the door opening, rated 165°F (74°C) or higher, and located not more than 10 ft (3 m) above the floor, the door should remain open until rising temperatures make it unsafe to pass through the door opening.

28-2.2.3 Stairs.

28-2.2.3.1 Stairs complying with 5-2.2 shall be permitted.

Exception No. 1: Noncombustible grated stair treads and landing floors.

Exception No. 2: Industrial equipment access in accordance with 28-2.5.6.

Exception No. 1 to 28-2.2.3.1 exempts stair treads and landings in industrial occupancies from the provisions of 5-2.2.3.3, which would otherwise require that all stair treads and stair landing floors be solid. Although the requirement for solid treads and landing floors is intended to prevent occupants from avoiding use of the stair because they become afraid when they are able to see through the openings to the floor or ground below, occupants of industrial occupancies are usually more familiar, and thus more comfortable with grated or expanded metal treads and landings. The grated walking surfaces provide slip resistance in what can sometimes be greasy and slippery surroundings. For consistency, an exception appears in 5-2.2.3.3 to alert the user that industrial occupancies, in accordance with Chapter 28, are exempt from the solid tread and landing provisions.

Exception No. 2 serves to remind the user that 28-2.5.6 has special provisions for industrial equip-

ment access stairs that differ from the requirements of Chapter 5. See the commentary following 28-2.5.6.

28-2.2.3.2 Spiral stairs complying with 5-2.2.2.4 shall be permitted.

Note that 5-2.2.2.4 permits spiral stairs to serve only an occupant load of five or fewer persons. Spiral stairs may be effectively used in industrial occupancies to provide exit access from small mezzanines, platforms, and equipment.

28-2.2.3.3 In existing buildings, winders complying with 5-2.2.2.5 shall be permitted.

28-2.2.4 Smokeproof Enclosures. Smokeproof enclosures complying with 5-2.3 shall be permitted.

This paragraph does not mandate the use of smokeproof enclosures. However, it does recognize a smokeproof enclosure as part of the means of egress system in an industrial occupancy only if the smokeproof enclosure meets the requirements of 5-2.3. For an example of an occupancy requiring a smokeproof enclosure, see 19-2.11 in which existing, nonsprinklered high-rise apartment buildings are required to be provided with smokeproof enclosures in accordance with 5-2.3. See 28-2.2.1.

28-2.2.5 Horizontal Exits.

28-2.2.5.1 Horizontal exits complying with 5-2.4 shall be permitted.

This paragraph does not mandate the use of horizontal exits. However, it does recognize a horizontal exit as part of the means of egress system in an industrial occupancy only if the horizontal exit meets the requirements of 5-2.4, as modified by 28-2.2.5.2. See 28-2.2.1.

28-2.2.5.2* In horizontal exits where the doorway is protected by a fire door on each side of the wall in which it is located, one fire door shall be of the swinging type as provided in 5-2.4.3.6 and the other shall be permitted to be an automatic sliding fire door that shall be kept open whenever the building is occupied.

A-28-2.2.5.2 The customary building code requirement for fire doors on both sides of an opening in a fire wall may

be met by having an automatic-sliding fire door on one side, and self-closing fire door swinging out from the other side of the wall. This arrangement qualifies only as a horizontal exit from the side of the sliding door. (For further information, see A-5-2.4.3.8.)

The Intent of 28-2.2.5.2 is to recognize the common practice of combining a horizontal exit used for life safety with a fire barrier of significant fire resistance rating used for property protection. Opening protectives for such a fire barrier can require the use of a set of doors to achieve the required fire protection rating. It is impractical for both doors to swing in the same direction without interfering with each other, yet operation of two doors that swing in opposite directions is cumbersome for daily or common usage. One swinging and one sliding door, as shown in Figure 28-3, provide an acceptable arrangement for day-to-day functioning of the building. The open sliding door does not compromise life safety, because by the time its tumbler link mechanism releases the door and allows it to close, temperatures in the vicinity of the door opening render use of the door impractical. See also the commentary on 28-2.2.2.4. The provisions of 28-2.2.2.4 also permit an existing horizontal sliding door (as depicted in Figure 28-2) to serve within the means of egress.

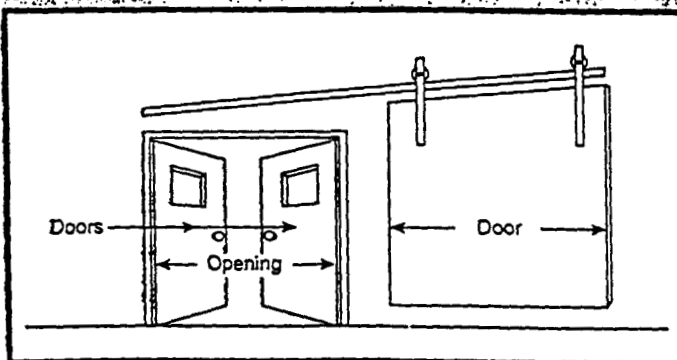


Figure 28-3. Example of combination swinging and sliding doors allowed by 28-2.2.5.2.

28-2.2.6 Ramps. Ramps complying with 5-2.5 shall be permitted.

Exception: Industrial equipment access in accordance with 28-2.5.6.

This paragraph does not mandate the use of ramps in industrial occupancies. However, it does require

BellSouth Telecommunications, Inc.
FPSC Docket Nos. 980946-TL, 980947-TL,
980948-TL, 981011-TL, 981012-TL & 981250-TL
Exhibit JDB - 26, Page 59 of 71

a ramp as part of the means of egress system if the ramp meets the requirements of 5-2.5.2.2.1.

The Exception serves to remind the user that 28-2.5.6 has special provisions for industrial equipment access ramps that differ from the requirements of Chapter 5. See the commentary following 28-2.5.6.

28-2.2.7 Exit Passageways. Exit passageways complying with 5-2.6 shall be permitted.

This paragraph does not mandate the use of exit passageways in industrial occupancies. However, it recognizes an exit passageway as part of the means of egress system only if the exit passageway meets the requirements of 5-2.6. See 28-2.2.1.

28-2.2.8 Escalators and Moving Walks. In existing buildings, previously approved escalators and moving walks complying with 5-2.7 and located within the required means of egress shall be permitted.

Note that 5-2.7 allows existing escalators and moving walks to continue to be recognized within the required means of egress if an occupancy change is allowed. In earlier editions of the Code, such escalators and moving walks may have been recognized as providing egress capacity for 75 persons. To qualify as exits, escalators and moving walks must also meet the requirements of 5-1.3.2, which addresses enclosures.

Note that escalators protected in accordance with the sprinkler-vent, spray nozzle, rolling shutter, or partial enclosure method do not constitute exits, but can continue to serve as exit access if previously approved as such.

28-2.2.9 Fire Escape Stairs. Existing fire escape stairs complying with 5-2.8 shall be permitted.

28-2.2.10 Fire Escape Ladders. Fire escape ladders complying with 5-2.9 shall be permitted.

Exception: Fixed industrial stairs in accordance with A1264.1, *Safety Requirements for Workplace Floor and Platform Openings, Stairs and Railings Systems*, minimum requirements for fixed stairs shall be permitted where fire escape ladders are permitted in accordance with 5-2.9.1.

The geometry associated with fire loads, the size and shape of surfaces, and the

placement on fire escape ladders falls within the range permitted for fixed industrial stairs. However, fixed industrial stairs meet criteria that result in a safer arrangement than that provided by the fire escape ladder detailed in 5-2.9. Therefore, the exception to 28-2.2.10 recognizes fixed industrial stairs as substitutes for fire escape ladders.

28-2.2.11 Slide Escapes. Approved slide escapes complying with 5-2.10 shall be permitted as components in 100 percent of the required means of egress for both new and existing high hazard industrial occupancies. Slide escapes shall be counted as means of egress only where regularly used in drills so that occupants are familiar with their use through practice.

The intent of 28-2.2.11 is to allow the use of slide escapes, which are a common means of egress from areas housing explosives or other highly hazardous materials in chemical industry buildings. This provision allows consideration of slide escapes as part of the required means of egress from both new and existing high hazard industrial occupancies. In many high hazard industrial occupancies, slide escapes are the only practical means of ensuring safe egress prior to an explosion or flash fire.

28-2.2.12 Alternating Tread Devices. Alternating tread devices complying with 5-2.11 shall be permitted.

The provisions of 5-2.11, in effect, limit the use of alternating tread devices to those locations where the Code recognizes the use of fire escape ladders (and fixed industrial stairs). See 28-2.2.10, Exception to 28-2.2.10, 5-2.9, and 5-2.11.

28-2.2.13 Areas of Refuge. Areas of refuge complying with 5-2.12 shall be permitted.

28-2.3 Capacity of Means of Egress.

The capacity of means of egress shall be in accordance with Section 5-3.

Editions of the Code prior to 1991 required a minimum 44-in. (112-cm) width for corridors and passageways within the required means of egress of industrial occupancies. A corridor or passageway of that minimum width would provide egress capacity for 220 persons [that is, 44 in. / 0.2 in. per person (approx-

mately 112 cm / 0.5 cm per person) in accordance with 5-3.3.1 for level travel components]. The prior requirement produced artificially large egress systems, when compared to the occupant load, for many industrial occupancies. The requirement was dropped, and the minimum 36-in. (91-cm) width requirement of 5-3.4.1, which addresses the width of any exit access, was made applicable to industrial occupancies. Exit access is required to be wider than 36 in. (91 cm) only if a corridor or passageway in an industrial occupancy is to provide capacity for more than 180 persons [that is, 36 in. / 0.2 in. per person (approximately 91 cm / 0.5 cm per person)].

Exception: In special purpose industrial occupancies, means of egress shall be sized to accommodate the occupant load as determined in accordance with the Exception to 28-1.7; spaces not subject to human occupancy because of the presence of machinery or equipment shall be excluded from consideration.

The Exception to 28-2.3 places practical limits on the number of required means of egress and on the arrangement of the means of egress in a special purpose industrial occupancy. There is no life safety purpose served by providing exits from the center of a large machine or equipment installation that is unoccupied under normal operating conditions. A number of industries provide weather shelter for large processes and equipment. Typical examples include steel rolling mills, paper extruders, and metal-working machines, all of which occupy a majority of the floor space in the sheltered building. In many of the more sophisticated operations, full process control is conducted from a remotely located control room. Personnel normally occupy the building only for maintenance and adjustment purposes, and then only on a limited basis. To provide exits from these special purpose industrial occupancies would serve no useful purpose and could unjustly impose an economic penalty in the name of safety.

The large areas normally enclosed by special purpose structures would require excessive egress width if the occupant load were calculated on the basis of 100 sq ft (9.3 sq m) per person. If provisions for the capacity of the means of egress in a special purpose industrial occupancy were based on the requirements specified for general industrial occupancies, the result would be extensive egress facilities for non-tenant occupants. Such arrangements might actually result in the requirement of exits from the interior of machinery and equipment installations, which

would be incompatible with the equipment's design. In many cases, these exits would originate from locations that, even under normal operating conditions, would be considered dangerous for humans. Poorly conceived exit facilities serve no life safety purpose and detract from an otherwise well-designed exit system.

28-2.4 Number of Means of Egress.

(See also Section 5-4.)

28-2.4.1 There shall be not less than two means of egress from every story or section, and at least one exit must be reached without traversing another story.

The provisions of 28-2.4.1, which apply to the minimum required number of means of egress for industrial occupancies clarify that, in addition to providing every story or section with access to at least two means of egress, one of the exits must be located on each floor so that the entrance to that exit (for example, a door that opens into an enclosed exit stair) can be reached without having to travel to another floor.

Exception: In low and ordinary hazard industrial occupancies, a single means of egress shall be permitted from any story or section, provided that the exit can be reached within the distance allowed as common path of travel. (See 28-2.5.3.)

This exception recognizes that there are small floors or areas in low and ordinary hazard industrial occupancies that, if provided with access to only a single exit, are no less safe than larger areas of a building that have access to two exits where an occupant must first travel through the maximum allowable common path. Where a single exit is provided, the occupant travels the 50 ft (15 m) [or 100 ft (30 m) in sprinklered buildings] of common path allowed by 28-2.5.3, enters the exit (see Figure 28-4), and is judged to have reached a point of safety. In larger buildings and larger building areas that do not meet the limited travel distance for a single exit, a minimum of two exits must be provided. By traveling to the nearer of the two exits, the occupant is permitted to travel the same 50 ft (15 m) [or 100 ft (30 m) in sprinklered buildings] of common path that the occupant of the single exit building traveled to reach the one exit, before reaching the point where travel to the two exits in different directions is possible. Although the

BellSouth Telecommunications, Inc.
FPSC Docket Nos. 980946-TL, 980947-TL,
980948-TL, 981011-TL, 981012-TL & 981250-TL
Exhibit JDB - 26, Page 61 of 71

occupant of the single-exit building has reached an exit by this point, the occupant of the multiple-exit building is then allowed an additional 150 [200 ft (60 m) if building is sprinklered] of travel before the safety of an exit must be reached. Therefore, the exception for the single-exit building provides a level of life safety at least equivalent to the multiple-exit building.

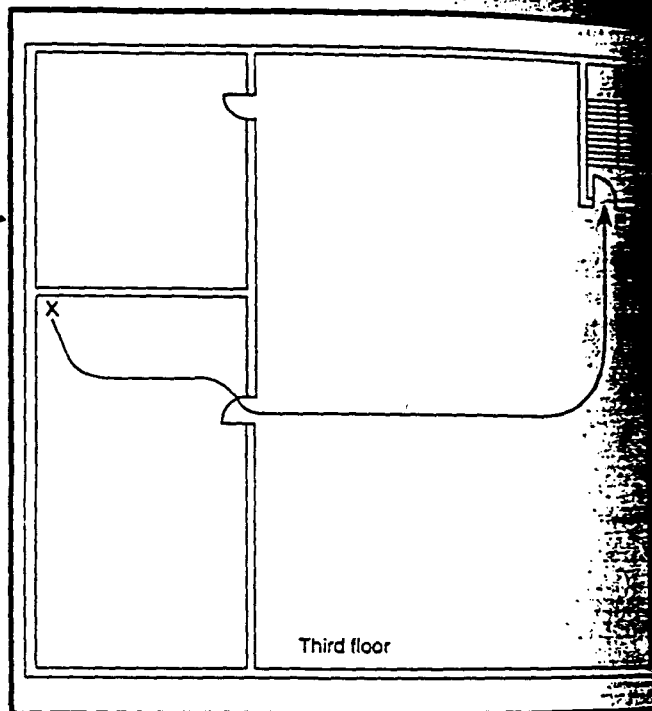


Figure 28-4. Example of single means of egress from a low or ordinary hazard industrial occupancy. This provided the distance to the single exit (X to E) does not exceed the allowable common path of travel [50 ft (15 m), or 30 m] if building is sprinklered, in accordance with 2.

28-2.4.2 Floors or portions thereof with an occupant load of more than 500 shall have the minimum number of separate and remote means of egress specified by 5-4.1.2.

Exception: Existing buildings.

Historically, the *Code* has required more exits based on occupant load for assemblies only. Third, fourth, and subsequent exits provided in industrial occupancy to maintain requirements or as a convenience for day use. Paragraph 5412.2.2.1 requires requiring three or four exits based only on all occupancies. The Exception to

in accordance with the option offered by the Exception to 28-2.5.4, exempts existing buildings from the requirement for third and fourth exits to avoid forcing existing, previously complying means of egress systems into noncompliance.

28-2.4.3 Areas with high hazard contents shall comply with Section 5-11.

Section 5-11, Special Provisions for Occupancies with High Hazard Contents, includes an adequate set of provisions for high hazard areas and is referenced by this chapter to provide commensurate protection to industrial occupancies that contain high hazard areas. The provisions of Section 5-11 are vital to life safety in high hazard occupancies. The requirement for two means of egress for all high hazard occupancies recognizes that there is the possibility that a fire or explosion might block or destroy one of the two exits. Two separate and equal means of egress from high hazard areas provide a necessary redundancy to ensure the evacuation of occupants under fire or explosion conditions and to minimize the potential for injury or loss of life. The Exception to 5-11.3 recognizes that it is not necessary to require two means of egress from very small high hazard areas [maximum 200 sq ft (18.6 sq m)], with limited occupant load (maximum 3 persons), if the room door can be reached within 25 ft (7.6 m) of travel.

28-2.5 Arrangement of Means of Egress.

28-2.5.1 Means of egress shall be arranged in accordance with Section 5-5.

28-2.5.2 Dead-end corridors in general industrial and special purpose industrial occupancies shall not exceed 50 ft (15 m).

28-2.5.3 Common paths of travel in general industrial and special purpose industrial occupancies shall not exceed 50 ft (15 m).

Exception: In buildings protected throughout by an approved, supervised automatic sprinkler system installed in accordance with Section 7-7, common paths of travel shall not exceed 100 ft (30 m).

See the discussion of dead-end corridor pockets and common path of travel in 5-5-1.6 and its associated commentary.

28-2.5.4 Common paths of travel shall be prohibited in high hazard industrial occupancies.

Exception: As permitted by the Exception to 5-11.3.

28-2.5.5 Ancillary Facilities.

28-2.5.5.1* Means of egress from ancillary facilities shall be arranged to permit travel in independent directions such that both means of egress paths are not compromised by the same fire or similar emergency.

Exception: Existing facilities.

A-28-2.5.5.1 Ancillary facilities located within industrial occupancies might include administrative office, laboratory, control, and employee service facilities that are incidental to the predominant industrial function and are of such size that separate occupancy classification is not warranted.

28-2.5.5.2* Ancillary facilities in special purpose industrial occupancies where delayed evacuation is anticipated shall have minimum 2-hr fire resistance-rated separation from the predominant industrial occupancy, and shall have one means of egress that is separated from the predominant industrial occupancy by 2-hr fire resistance-rated construction.

Exception: Existing facilities.

A-28-2.5.5.2 Occupants of ancillary facilities located within special purpose industrial occupancies might be required by administrative controls to remain in the facility when a fire occurs in the predominant industrial area to perform an orderly shutdown of process equipment in order to control the spread of the fire and minimize damage to important equipment.

The presence of ancillary facilities within an industrial occupancy can create unusual challenges to life safety. For example, the means of egress for factory office workers with little knowledge of the industrial processes and operations—and their respective hazards—might require leaving the safety of the office area and traveling across the factory production floor. In other cases, safe egress is not assured to employees assigned to a control room who might have to perform orderly shutdown of certain processes—in order to control the spread of fire—before evacuating a building. The requirements of 28-2.5.5.1 and 28-2.5.5.2 are illustrated in Figure 28-5.

In Figure 28-5, control room 1—with a single means of egress—forces the occupant to travel in one direction only into the open manufacturing area; it does not meet the requirement of 28-2.5.5.1 that egress be arranged to permit travel in independent

directions such that both means of egress paths are not compromised by the same fire or similar emergency. Control room 1 appears to need a second exit access door located remotely from the first.

Control room 2 in Figure 28-5 meets the requirements of both 28-2.5.5.1 and 28-2.5.5.3. It permits egress travel in independent directions such that both means of egress paths are not compromised by the same fire or similar emergency. Further, it provides one of the two means of egress via an exit passage-way-like arrangement separated from the predominant industrial occupancy by 2-hour fire resistance-rated construction. Also, control room 2 itself is surrounded by 2-hour fire resistance-rated construction. This permits occupants charged with special emergency duties to delay their egress and still be afforded adequate life safety.

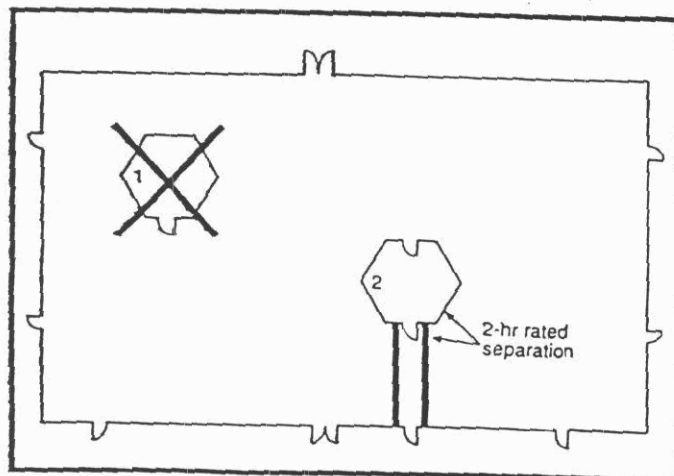


Figure 28-5. Special provisions for ancillary facilities. See the commentary following A-28-2.5.5.2.

28-2.5.6 Industrial equipment access walkways, platforms, ramps, and stairs that serve as a component of the means of egress from the involved equipment shall be permitted in accordance with the applicable provisions of Chapter 5 as modified by Table 28-2.5.6. Any such means of egress component shall not serve more than 20 people.

Paragraph 28-2.5.6 permits industrial equipment access walkways, platforms, ramps, and stairs serving not more than 20 persons to deviate from some of the usual dimensional criteria specified by Chapter 5. The dimensional criteria detailed in Table 28-2.5.6 are illustrated in Figure 28-6.

BellSouth Telecommunications, Inc.
FPSC Docket Nos. 980946-TL, 980947-TL,
980948-TL, 981011-TL, 981012-TL & 981250-TL
Exhibit JDB - 26, Page 63 of 71

Table 28-2.5.6 Equipment Access Dimensional Criteria

Minimum horizontal dimension of any walkway, landing, or platform	22 in. (55.9 cm)
Minimum stair or ramp width	22 in. (55.9 cm) between rails
Minimum tread width	22 in. (55.9 cm)
Minimum tread depth	10 in. (25.4 cm)
Maximum riser height	9 in. (22.9 cm)
Maximum height between landings	12 ft (3.7 m)
Headroom, minimum	6 ft 8 in. (203 cm)

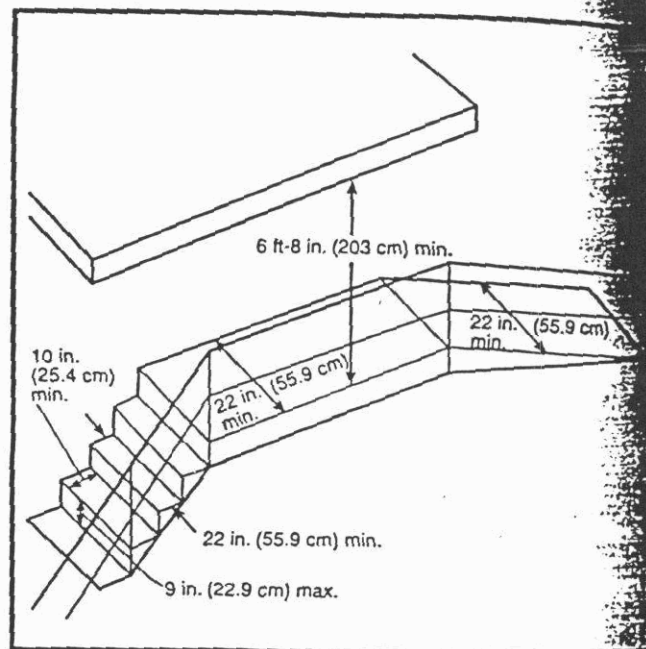


Figure 28-6. Industrial equipment access dimensional criteria. See Table 28-2.5.6.

28-2.6 Travel Distance to Exits.

28-2.6.1 Travel distance, measured in accordance with Section 5-6, shall not exceed 200 ft (60 m).

Exception No. 1: Travel distance shall not exceed 250 ft (76 m) in buildings protected throughout by an approved supervised automatic sprinkler system installed in accordance with Section 7-7.

Exception No. 2: As permitted by 28-2.6.2.

Exception No. 3: As permitted by 28-2.6.3.

Exception No. 4: Travel distance to exits in high hazard industrial occupancies shall not exceed 75 ft (23 m).

28-2.6.2 In low or ordinary hazard general industrial occupancies, travel distance shall not exceed 400 ft (122 m) if the following additional provisions are met in full:

- (a) Application shall be limited to one-story buildings.
- (b)* Smoke and heat venting shall be provided by engineered means or by building configuration to ensure that occupants shall not be overtaken by spread of fire or smoke within 6 ft (183 cm) of floor level before they have time to reach exits.

28-2.6.2(b) Smoke and heating venting should be in accordance with NFPA 204M, *Guide for Smoke and Heat Venting*.

- (c) Automatic sprinkler or other automatic fire extinguishing systems installed in accordance with Section 7-7 shall be provided. The extinguishing system shall be supervised.

The provisions of 28-2.6.2 are meant to provide flexibility in determining the layout of the means of egress system in a single-story industrial building with a large floor area that houses a low or ordinary hazard general industrial occupancy.

The construction of tunnels and elevated means of egress that originate from the center of an industrial building with an extensive floor area is rarely attempted. Only a handful of buildings have ever been provided with such egress facilities, and most were World War II airframe manufacturing buildings of massive size. In most industrial buildings, it is not practicable or economical to construct exit tunnels or overhead passageways. These special types of means of egress are not easily altered if modifications are necessary to adjust to changes in the layout of an industrial facility. In addition, the construction costs for tunnels and elevated passageways are high due to the special design features required to ensure their safety, including fire resistance-rated supports for the elevated passageways, waterproofing, and other features necessary to maintain the integrity of underground tunnels. Another negative factor in such construction is the confining nature of a tunnel or elevated passage, which tends to discourage use of these means of egress.

The use of horizontal exits that pass through firewalls is common in many industrial occupancies. Full consideration of the provisions in Chapter 5 is required to ensure the safe use of these types of exits. A common violation of the provisions of Chapter 5 is the failure to provide the proper type of fire door in a fire wall. A horizontal sliding fire door cannot be considered as an acceptable element of a means

of egress (except in existing installations in accordance with 28-2.2.2.4). Because a horizontal exit may be used from both sides of a fire wall, careful consideration of the direction of door swing is necessary to ensure that the Code will recognize this use. In many instances, two doors swinging in opposite directions will be required so that the exit may be used as a means of egress from both sides of the fire wall. See 5-2.1.4, 5-2.4.3.6, and 28-2.2.5.

The increase in allowable travel distance to 400 ft (122 m) is often applied to exits in a general purpose industrial occupancy classified as a low or ordinary hazard, in accordance with the requirements of 28-2.6.2 (a) through (c).

Subpart (a) limits use of the increased travel distance provisions to one-story buildings. Any stairs or other impediments to the rapid movement of occupants would result in slower evacuation of the building and increase the possibility of exposure to smoke or fire.

To satisfy the intent of 28-2.6.2(b), judgment must be exercised in the design of systems for smoke and heat venting. The provisions of Appendix A of the Code that recommend utilization of the guidelines of NFPA 204, *Guide for Smoke and Heat Venting*,³ should be sufficient in most instances. In addition, in accordance with the recommendations of A-7-3.1, NFPA 92B, *Guide for Smoke Management Systems in Malls, Atria, and Large Areas*,⁴ can be consulted when designing buildings with ceilings of heights approximating those of covered mall buildings and atria.

The limitation on smoke accumulation in 28-2.6.2(b) is a key factor in the design of the smoke removal system. The average evacuation speed of a person who is walking is approximately 250 ft (76 m) per minute, or a little over 4 ft (1.2 m) per second. Where this evacuation speed is applied to the 400-ft (122-m) travel distance allowed by the Code, the maximum time required to reach an exit should not exceed 2 minutes. It is an extremely rare situation in which the smoke that accumulates in an industrial building is so extensive that it fills the structure and descends to less than 6 ft (1.8 m) above the floor level in 2 minutes. The added benefit of a properly designed system for smoke and heat venting ensures that there will be little possibility that the means of egress will be blocked by smoke.

The use of available, computerized smoke-filling and evacuation time models can provide documentation that permits a designer to meet the smoke and heat venting requirements in some buildings by providing only a high ceiling and no mechanical smoke removal equipment.

The installation of a complete automatic extinguishing system as required by 28-2.6.2(c) is intended to ensure control and extinguishment of incipient fires and ultimately minimize exposure of the occupants to a fire. It is not the intent of this paragraph to allow only an automatic sprinkler system to provide the required protection, because a number of equally effective extinguishing agents and systems may be used for specific industrial fire hazards. The importance of this provision is the requirement for automatic initiation of the fire control and extinguishing system to minimize the extent of the occupants' exposure to fire. The installed system is required to be fully supervised to ensure that it will operate when a fire occurs. Adequate procedures must be provided by the building's owner or tenant to ensure the prompt correction of any impairments to the extinguishing systems. In some facilities, the degree of fire risk during the impairment period may require limitations on hazardous operations and the number of occupants so that the level of safety to life will be equivalent to that provided when the extinguishing system is operational.

28-2.6.3 In low or ordinary hazard special purpose industrial occupancies, travel distance shall not exceed 300 ft (91 m), or if the building is protected throughout by a supervised, automatic sprinkler system installed in accordance with Section 7-7, travel distance shall not exceed 400 ft (122 m).

Low and ordinary hazard special purpose industrial occupancies, which are characterized by large, specialized equipment and low occupant load, are allowed an increase in travel distance over that allowed for low and ordinary general industrial occupancies. Paragraph 28-2.6.3 permits an increase to 300 ft (91 m) if the building is not sprinklered, and to 400 ft (122 m) if the building is protected throughout by a supervised sprinkler system, without mandating the additional requirements of 28-2.6.2.

For a summary of the various travel distance allowances for industrial occupancies, see Figure 28-7.

28-2.7 Discharge from Exits.

Discharge from exits shall be in accordance with Section 5-7.

The purpose of 5-7.2 is to control the arrangement of exits from upper stories that discharge to the outside through the level of exit discharge. Paragraph 5-7.2

BellSouth Telecommunications, Inc.
FPSC Docket Nos. 980946-TL, 980947-TL,
980948-TL, 981011-TL, 981012-TL & 981250-TL
Exhibit JDB - 26, Page 65 of 71

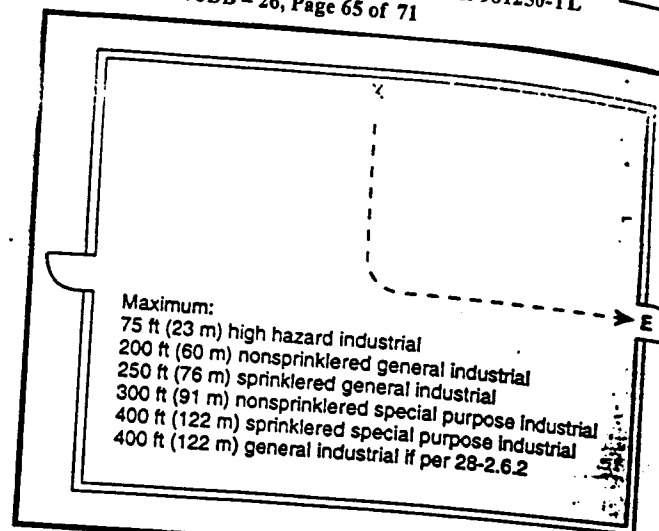


Figure 28-7. Summary of industrial occupancy travel distance options allowed by 28-2.6.1 through 28-2.6.3.

modifies the general rule for complete exits up to their point of discharge to the building, because the safeguard of 5-7.2—especially automatic sprinkler protection—the level of exit discharge—maintains safety. When the arrangement of exits in a stairway is not considered as discharging at the level of discharge if it leads to the outside an exit passageway in accordance with 5-7.2 is true despite the fact there are doors in the passageway walls—between the base of the stairway and the door to the outside on the exit discharge.

28-2.8 Illumination of Means of Egress.

Illumination of means of egress shall be provided in accordance with Section 5-8.

Exception: Structures occupied only during daylight hours, with skylights or windows arranged to provide the required level of illumination on all portions of the means of egress during these hours.

Paragraph 28-2.8 is not meant to require provision of extensive and unneeded illumination in industrial occupancies. Illumination of the exit access, which is limited to corridors and passageways that lead to the exit, is no requirement for the provision of illumination throughout the building, which in many

occupancies would involve lighting an extensive floor area. The purpose of the lighting system is to ensure that occupants are able to see the means of egress and not to illuminate the operation of production facilities.

In addition, the Code does not require illumination of the means of egress if the building is occupied during the daylight hours only. To meet the requirements of the Exception to 28-2.8, the building, including stairways, must have sufficient windows and lights to ensure natural illumination. The authority having jurisdiction should make certain that the building is not occupied after daylight hours.

28-2.9* Emergency Lighting.

All industrial occupancies shall have emergency lighting in accordance with Section 5-9.

Exception No. 1: Special purpose industrial occupancies without routine human habitation.

Exception No. 2: Structures occupied only during daylight hours, with skylights or windows arranged to provide the required level of illumination on all portions of the means of egress during these hours.

Exceptions to the requirement for emergency lighting are included in the Code for the same reasons that illumination of the means of egress is not required (see Exception to 28-2.8). An additional exception has been made for special purpose industrial occupancies that are not routinely occupied. There is no need to install an extensive and costly emergency lighting system in an unoccupied building.

A-28-2.9 The authority having jurisdiction should review the facility and determine the "designated" stairs, aisles, corridors, ramps, and passageways that should be required to be provided with emergency lighting. In large locker rooms or laboratories using hazardous chemicals, for example, the authority having jurisdiction should determine that emergency lighting is needed in the major aisles leading through those spaces.

28-2.10 Marking of Means of Egress.

Signs designating exits or ways of travel thereto shall be provided in accordance with Section 5-10.

28-2.11 Special Means of Egress Features.

(Reserved.)

Section 28-3 Protection

28-3.1 Protection of Vertical Openings.

Every stairway, elevator shaft, escalator opening, and other vertical opening shall be enclosed or protected in accordance with Chapter 5 and 6-2.4.

Exception No. 1: Unprotected vertical openings connecting not more than three floors shall be permitted in accordance with 6-2.4.5.

Exception No. 2: Atriums in accordance with 6-2.4.6 shall be permitted.

Exception Nos. 1, 2 and 6 to 28-3.1 recognize the provisions of Chapter 6, which sanction limited (maximum three-story) vertical openings, atriums, and two-story convenience openings in industrial occupancies. See 6-2.4.5, 6-2.4.6, and 6-2.4.8.

Exception No. 3: In special purpose and high hazard occupancies where unprotected vertical openings are in new or existing buildings and are necessary to manufacturing operations, they shall be permitted beyond the specified limits, provided every floor level has direct access to one or more enclosed stairs or other exits protected against obstruction by any fire or smoke in the open areas connected by the unprotected vertical openings.

Exception No. 3 to 28-3.1 strictly limits the use of unprotected vertical openings in high hazard and special purpose industrial occupancies. Direct access to one or more enclosed stairways or to other exits is required from any areas connected by unprotected vertical openings. This provision recognizes that many high hazard and special purpose industrial occupancies require openings between floor levels to accommodate piping, conveyors, and other devices and equipment essential to the orderly operation of the facility. In most of these situations, full enclosure is not practical or feasible. In high hazard occupancies, the provision of two means of egress will, in most situations, be sufficient to comply with this exception. In special purpose occupancies, additional exits or other special arrangements will normally be required for compliance with the provision that stairways and exits be protected against obstruction from fire and smoke in open areas connected by unprotected vertical openings.

Exception No. 4: Existing open stairs, existing open ramps, and existing escalators shall be permitted where connecting only two floor levels.

Exception No. 4 to 28-3.1 limits existing open stairways, existing open ramps, and existing escalators that are unenclosed or unprotected by permitting them to connect only two floors. An existing open stairway connecting three floors would have to be enclosed, protected, or permitted by another of the exceptions to 28-3.1.

Exception No. 5: In existing buildings with low or ordinary hazard contents and protected throughout by an approved, automatic sprinkler system installed in accordance with Section 7-7, unprotected vertical openings shall be permitted, provided the vertical opening does not serve as a required exit. All required exits under such conditions shall consist of outside stairs in accordance with 5-2.2, smokeproof enclosures in accordance with 5-2.3, or horizontal exits in accordance with 5-2.4.

Exception No. 5 to 28-3.1 recognizes that an existing industrial occupancy may contain unprotected vertical openings and still provide a reasonable level of safety to life if the building contains only low or ordinary hazards and is protected by a complete automatic sprinkler system. Smokeproof enclosures and outside stairways (the only types of vertical exits allowed by this exception) must be fully enclosed or protected against vertical fire spread and meet the requirements of Chapter 5. The unenclosed vertical openings may not serve as part of the means of egress, although they can remain as convenience openings and stairways to be used for normal operations.

While the major reason for allowing this provision is economic (enclosing all vertical openings in existing buildings is expensive), there is actually little effect on the life safety of occupants where the building houses low or ordinary hazards. However, some difficulties in fire control are created, because unprotected vertical openings can contribute to fire spread in buildings and result in extensive property damage and potential impact on occupants prior to evacuation. Therefore, a complete automatic sprinkler system is required.

Exception No. 6: Two-story convenience openings in accordance with 6-2.4.8 shall be permitted.

28-3.2* Protection from Hazards.

Every high hazard industrial occupancy, operation, or process shall have automatic extinguishing systems or other protection appropriate to the particular hazard, as explosion venting or suppression, protecting any subject to an explosion hazard for the purpose of minimizing danger to occupants in case of fire or other emergency before they have time to utilize exits to escape. Activation of fire extinguishing or suppression system shall initiate required building fire alarm system in accordance with 28-3.4.3.4. Hazardous areas in industrial occupancies protected by automatic extinguishing systems shall be exempt from the smoke-resisting enclosure requirement of 6-4.1.

A-28-3.2 Emergency lighting should be considered where operations require lighting to perform orderly manual emergency operation or shutdown, maintain critical services, or provide safe start-up after a power failure.

The intent of 28-3.2 is to provide for the life safety of the occupants of industrial buildings by controlling the risk associated with hazardous operations. The alternatives offered in the paragraph are not exclusive, and a proper fire protection engineering solution might not incorporate the listed provisions. The Code intends to allow for engineering judgment in a wide range of potentially hazardous situations, including some where protection may be limited. The intent of the paragraph is also broad in application because, in many highly hazardous operations, an explosion may be immediately preceded by fire or other emergency, such as an overheated vessel, an exothermic reaction, or increased pressure. Because such conditions may initiate an explosion depending upon the process and arrangement of equipment, immediate egress from the facility may be necessary. If fire or other emergencies are likely to develop rapidly into an explosion, adequate precautions are necessary for life safety.

In many modern facilities, provisions that are adequate for the life safety of occupants may be included for process control and property protection, and any additional measures will not reduce the life safety of operators to an appreciable degree.

Section 4, Chapters 13 and 14 of the *Protection Handbook* discuss the basic principles of explosion prevention, venting, and suppression. These chapters also contain an extensive bibliography on the subject. Recommendations for the design and utilization of vents to limit pressure from explosions are contained in NFPA 68, *Standard for Venting of Deflagrations*, (Standards for Venting of Deflagrations).

...systems are found in NFPA 69, Standard on
...Prevention Systems. See also the NFPA In-
...al Fire Hazards Handbook.
Paragraph 6-4.1 requires that where a hazardous
...is protected by automatic sprinklers, the hazard-
... must be enclosed by walls and doors that
... minimum smoke resistance rather than fire
... with fire barriers or...
... doors of 15-minute fire resistance rating.
... 28-3.2 exempts hazardous areas in
...ial occupancies from the requirement to
... resisting enclosures if the areas are pro-
... by automatic sprinklers. For consistency, al-
...ording appears in Exception No. 2 to 6-4.1.2.

28-3.3 Interior Finish.

28-3.3.1 Interior finish shall be in accordance with Sec-
tion 6-5.

28-3.3.2 Interior Wall and Ceiling Finish. Interior wall
and ceiling finish complying with 7-5.5 shall be Class A,
Class B, or Class C in operating areas; and interior wall and
ceiling finish shall be as required by 7-5.4 in exit enclosures.

28-3.3.3 Interior Floor Finish. (No requirements.)

28-3.4 Detection, Alarm, and Communication Systems.

28-3.4.1 General. Industrial occupancies shall be provided
with a fire alarm system installed in accordance with Sec-
tion 7-6.

Exception: If the total capacity of the building is under
100 persons and fewer than 25 persons are above or below
the level of exit discharge.

28-3.4.2 Initiation. Initiation of the required fire alarm sys-
tem shall be by manual means in accordance with 7-6.2.1(a).

Exception No. 1: Initiation shall be permitted by means
of an approved, automatic fire detection system installed in
accordance with 7-6.2.1(b) that provides protection through-
out the building.

Exception No. 2: Initiation shall be permitted by means
of an approved, automatic sprinkler system installed in ac-
cordance with 7-6.2.1(c) that provides protection throughout
the building.

28-3.4.3 Notification.

28-3.4.3.1 The required fire alarm system shall either

(a) Provide occupant notification in accordance with
7-6.3, or

(b) Sound an audible and visible signal in a constantly
attended location for the purposes of initiating emergency
action.

The requirements of 28-3.4.3.1 and 28-3.4.3.4 contain
two separate and distinct provisions for audible
alarms activated by the fire alarm system required
by 28-3.4.1. In low and ordinary hazard industrial
occupancies (see 28-3.4.3.1), the system may activate
an evacuation alarm or it may sound an alarm in a
continuously attended location for the purpose of
initiating emergency action. This provision allows an
interface between the alarm system and the plant
emergency organization. The alarm system may be
controlled from a central security console or a similar
location. The key feature is that the location from
which the alarm sounds must be continuously staffed.
This requirement need not be interpreted as mandat-
ing installation of supervisory service, such as that
connected to a central station, but the location must
be fully attended at all times when the building is
occupied.

In high hazard occupancies (see 28-3.4.3.4), the
alarm must be arranged to provide evacuation sig-
nals, because the safety of the occupants of these
areas depends on their immediate notification of a
fire.

28-3.4.3.2 A presignal system in accordance with Exception
No. 1 to 7-6.3.2 shall be permitted.

28-3.4.3.3 A positive alarm sequence in accordance with
Exception No. 2 to 7-6.3.2 shall be permitted.

28-3.4.3.4 In high hazard industrial occupancies as defined
in 28-1.4, the required fire alarm system shall automatically
initiate an occupant evacuation alarm signal in accordance
with 7-6.3.

28-3.5 Extinguishing Requirements.

(None.)

28-3.6 Corridors.

The provisions of 5-1.3.1 shall not apply.

Without the exemption to the requirements of 5-
1.3.1, all new industrial occupancy cor-
ridors serving more than 30 persons would be
required to have 1-hour fire resistance rating
openings protected by 20-minute fire protection
rated door assemblies. The exemption to 5-1.3.1

was adopted because of the ambulatory nature of occupants of industrial occupancies and the operational need for openings, even where corridors are provided.

Section 28-4 Special Provisions

28-4.1 High-Rise Buildings.

High-rise industrial occupancies shall comply with the automatic sprinkler requirements of 32-8.2.1.

Exception No. 1: Low hazard industrial occupancies.

Exception No. 2: Special purpose industrial occupancies.

Exception No. 3: Existing industrial occupancies.

This paragraph references a portion of the high-rise building provisions of Section 32-8 written to permit an occupancy chapter to mandate their use. New high-rise, general-purpose industrial occupancy buildings classified as ordinary hazard and new high-rise industrial occupancy buildings classified as high hazard are required to be protected throughout by an approved supervised automatic sprinkler system in accordance with 32-8.2.1. The remainder of Section 32-8 is not mandated for high-rise industrial occupancy buildings.

Section 28-5 Building Services

28-5.1 Utilities.

Utilities shall comply with the provisions of Section 7-1.

28-5.2 Heating, Ventilating, and Air Conditioning.

Heating, ventilating, and air conditioning equipment shall comply with the provisions of Section 7-2.

28-5.3 Elevators, Escalators, and Conveyors.

Elevators, escalators, and conveyors shall comply with the provisions of Section 7-4.

28-5.4 Rubbish Chutes, Incinerators, and Laundry Chutes.

Rubbish chutes, incinerators, and laundry chutes shall comply with the provisions of Section 7-5.

Section 28-6* Special Provisions for Aircraft Servicing Hangars

Section 28-6, Special Provisions for Aircraft Servicing Hangars, is nearly identical to Section 29-6, Special Provisions for Aircraft Storage Hangars. Because aircraft hangars are used for both storage and repair, corresponding requirements can be found in both Chapters 28 and 29.

A-28-6 For further information on aircraft hangars, see NFPA 409, *Standard on Aircraft Hangars*.

28-6.1

The requirements of Sections 28-1 through 28-5 shall be met, except as modified by 28-6.2 through 28-6.4.

28-6.2

Exits from aircraft servicing areas shall be provided at intervals of not more than 150 ft (45 m) on all exterior walls. There shall be a minimum of two means of egress from each aircraft servicing area. Horizontal exits through interior fire walls shall be provided at intervals of not more than 100 ft (30 m) along the wall.

Exception: Dwarf or "smash" doors in doors used for accommodating aircraft shall be permitted to be used for compliance with these requirements.

28-6.3

Means of egress from mezzanine floors in aircraft servicing areas shall be arranged so that the maximum travel distance to reach the nearest exit from any point on the mezzanine shall not exceed 75 ft (23 m). Such means of egress shall lead directly to a properly enclosed stair discharging directly to the exterior, to a suitable cutoff area, or to outside stairs.

28-6.4

No dead end shall be permitted to be more than 50 ft (15 m) deep.

Exception: No dead end shall be allowed for high hazard contents areas.

References Cited in Commentary

NFPA 409, *Standard on the Installation of Sprinklers*, 1996 edition, National Fire Protection Association, Quincy, MA.

- NFPA Fire Protection Handbook, 18th ed., National Fire Protection Association, Quincy, MA, 1997.
- NFPA 68, Guide for Design of Detonations, 1993 edition, National Fire Protection Association, Quincy, MA.
- NFPA 69, Standard on Explosion Prevention Systems, 1997 edition, National Fire Protection Association, Quincy, MA.
- Industrial Fire Hazards Handbook, 3rd ed., National Fire Protection Association, Quincy, MA, 1990.

This PAGE
Left Blank
Intentionally