



ARLINGTON COUNTY, VIRGINIA

**County Board Agenda Item
Meeting of June 11, 2011**

DATE: June 3, 2011

SUBJECTS: AT&T Telecommunications Facilities:

- A. U-3283-11-1 Use Permit for AT&T antennas and related equipment on an existing telecommunications facility located at 1125 Patrick Henry Drive. (RPC# 09-067-001).
- B. U-3286-11-1 Use Permit for AT&T antennas and related equipment on an existing telecommunications facility located at 4102 North Old Glebe Road. (RPC# 03-066-001).

Applicant:
AT&T

By:
Phil Stetler, Zoning Specialist
AT&T Authorized Agent
Site Link Wireless, LLC
10015 Old Columbia Road, Suite F-100
Columbia, Maryland 21046

C. M. RECOMMENDATION:

Approve the use permit requests to install antennas and related equipment on existing telecommunications facilities, subject to the proposed conditions of the staff report.

ISSUES: These are use permit requests for antennas and related equipment on existing telecommunications facilities. These requests were deferred at the May 17, 2011, recessed County Board meeting in order to address specific concerns raised by nearby residents. The applicant and staff have contacted the Westover and Old Glebe Civic Associations, including the concerned residents and provided detailed information addressing their issues. The Westover Civic Association stated that they do not object to the use permit request for antennas and related equipment at the Westover Baptist Church. The Old Glebe Civic Association met with the applicant to discuss the proposed antennas and related equipment for the Walker Chapel but the civic association has not taken a position regarding this request.

SUMMARY: AT&T is requesting to install antennas and related equipment on two (2) existing telecommunications facilities in Arlington County. These telecommunications facilities are

County Manager: *BMD/GA*
Staff: Marco Antonio Rivero, DCPHD, Planning Division
PLA-5914

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located on or within the church steeples of the Westover Baptist Church (U-3283-11-1) and the Walker Chapel United Methodist Church (U-3286-11-1). The installation of these new Long Term Evolution (LTE) antenna structures and related equipment is meant to offer faster data transfer speeds to cellular phone users, than the current generation of technologies and provide for more efficient customer service. The proposed antenna and equipment additions will not create an adverse visual impact on the surrounding neighborhoods. The proposal is consistent with the *Interim Guidelines for Telecommunications Facilities on County-Owned Property* (Telecommunications Guidelines), which also applies to private properties and encourages the placement of antennas on existing structures. These facilities will be unmanned and only require infrequent visits by maintenance personnel. The applicant provided staff and the concerned residents an Electromagnetic Energy (EME) report and structural report for both telecommunications facilities. The reports show that AT&T will contribute less than five (5) percent of the maximum permissible exposure (MPE) allowed, and that the proposed installation will result in an insignificant load increase and no anticipated structural problems to the church steeples at Westover Baptist Church and Walker Chapel. The church sites are also compliant with Federal Communications Commission (FCC) regulations. Furthermore, federal law prohibits localities from basing a decision on the environmental effects of radio frequency emissions if the facility complies with FCC regulations.¹ Therefore, staff recommends that the County Board approve the use permit requests to install antennas and related equipment on existing telecommunications facilities, subject to the proposed conditions of the staff report.

The following sections of the report address each site. The following statement is applicable to the cases presented in this report:

The Interim Guidelines for Placement of Telecommunications Facilities on County-Owned Property (Telecommunications Guidelines) were used to evaluate the application. The *Telecommunication Guidelines* offer direction in the way of design, visual impact, and compliance with Federal Communications Commission (FCC) regulations, among other things. The *Telecommunication Guidelines* can be applied to telecommunication facilities on privately owned as well as County-owned property. The *Telecommunications Guidelines* encourage the location of new antennas on existing structures, as opposed to constructing a new pole. The proposed antennas meet these criteria. Attached to these reports are plans depicting the location and general appearance of the proposed antennas.

A. U-3283-11-1: 1125 Patrick Henry Drive (Westover Baptist Church)

BACKGROUND: There are existing approved antennas and related equipment on the site. The most recent administrative approval for antennas occurred in April 2005 for three (3) New Cingular antennas. The following provides information about the site:

¹ 47 U.S.C. § 332(c)(7)(B)(iv): “[n]o State or local government or instrumentality thereof may regulate the placement, construction, and modification of personal wireless service facilities on the basis of the environmental effects or radio frequency emissions to the extent that such facilities comply with the Commission’s regulations concerning such emissions.”

Site: The 141,395 square foot site is located at 1125 Patrick Henry Drive (Westover Baptist Church). Immediate site boundaries include:

To the north:	Washington Boulevard
To the south:	Single-family detached homes and 11 th Street North
To the east:	Single-family detached homes and North Kentucky Street
To the west:	Swanson Middle School and Patrick Henry Drive

Zoning: The site is zoned “R-6” One Family Dwelling District.

Land Use: The site is designated on the General Land Use Plan (GLUP) as “Low Residential” (1-10 units per acre).

Neighborhood: The site is located within the Westover Village Civic Association. The civic association and a concerned resident were contacted about this request. The civic association does not object to this use permit request.

DISCUSSION: AT&T is proposing to install a total of three (3) new panel antennas that will replace three (3) existing panel antennas. There are currently a total of six (6) antennas at this telecommunications facility. Antennas are individually mounted behind stealth enclosures on the steeple of the Westover Baptist Church. Additionally, one (1) equipment cabinet will be installed within the church’s existing equipment room. The proposed antennas will not create an adverse visual impact on the surrounding area. The facility will be unmanned and only requires infrequent visits by maintenance personnel.

The applicant submitted an Electromagnetic Energy (EME) Measurement and Site Compliance report that assesses the cumulative conditions for existing and proposed antennas on the site. The report demonstrates that AT&T contributes less than five (5) percent of the maximum permissible exposure (MPE) for the area. This result indicates that there will be no increase in health risk caused by the replacement of existing antennas with three (3) Long Term Evolution (LTE) panel antennas. Furthermore, the applicant submitted a structural report produced by an independent engineering firm which determined that the project meets all engineering safety standards. The report states that the “proposed installation will result in an insignificant load increase to that currently on the steeple”. Both reports are attached to this report. Furthermore, responding to a resident’s concerns regarding lighting and noise, the antennas will not emit any light onto the church building. The proposed equipment is located within the interior of the church, producing no additional noise to the outside. The church site is also compliant with Federal Communications Commission (FCC) regulations.

B. U-3286-11-1: 4102 North Old Glebe Road (Walker Chapel United Methodist Church)

BACKGROUND: The Walker Chapel United Methodist Church is a locally designated historic district, designated by the County Board in 1978 (with designation # Z213378). There are three

(3) existing antennas and related equipment on the site that have been active since 1996. Attached to this report is the July 17, 1996 approval by the Historical Affairs and Landmark Review Board (HALRB) and a Certificate of Appropriateness to install louvered panels in the steeple of the chapel. The louvers were installed to facilitate the installation of antennas within the steeple. The following provides information about the site:

Site: The 92,900 square foot site is located at 4102 North Old Glebe Road (Walker Chapel United Methodist Church). Immediate site boundaries include:

To the north:	North Glebe Road
To the south:	Single-family detached homes and North Old Glebe Road
To the east:	Walker Chapel Cemetery
To the west:	Single-family detached homes and North Glebe Road

Zoning: The site is zoned “S-3A” Special Districts and “R-10” One Family Dwelling District.

Land Use: The site is designated on the General Land Use Plan (GLUP) as “Semi Public” Country clubs and semi-public recreational facilities. Churches, private schools and private cemeteries (*predominant use on block*).

Neighborhood: The site is located within the Old Glebe Civic Association. The civic association and other concerned residents were contacted about this request. The civic association met with the applicant regarding this use permit request and was given detailed information about the proposed antenna installations. The civic association has not taken a position regarding this use permit request.

DISCUSSION: AT&T is proposing to install a total of six (6) panel antennas on new mounts. Three (3) existing antennas will be removed. The antennas will be located behind the steeple’s windows of the Walker Chapel United Methodist Church. Additionally, one (1) equipment frame and one (1) new power cabinet will be installed within the church’s existing equipment room. The proposed antennas will not create an adverse visual impact on the surrounding area. The facility will be unmanned and only requires infrequent visits by maintenance personnel.

The applicant submitted an Electromagnetic Energy (EME) Measurement and Site Compliance report that assesses the cumulative conditions for existing and proposed antennas on the site. The report demonstrates that AT&T contributes less than five (5) percent of the maximum permissible exposure (MPE) for the area. This result indicates that there will be no increase in health risk caused by the replacement of existing antennas with six (6) Long Term Evolution (LTE) panel antennas. Furthermore, the applicant submitted a structural report produced by an independent engineering firm which determined that the project meets all engineering safety standards. The report states that the “proposed installation will result in an insignificant load increase to that currently on the steeple”. Both reports are attached to this report. The modifications to the steeple are all interior. Since there will be no exterior changes to the steeple or the church building, this application does not require review from the Historical Affairs and

Landmark Review Board (HALRB) or a Certificate of Appropriateness. The church site is also compliant with Federal Communications Commission (FCC) regulations.

CONCLUSION: The proposed use permit requests are compliant with the County's *Telecommunications Guidelines* and FCC regulations. The proposed antenna and equipment additions will not create an adverse visual impact on the areas surrounding both locations. The EME and structural reports show that AT&T will contribute less than five (5) percent of the MPE allowed, and that the proposed installation will result in an insignificant load increase and no anticipated structural problems to the churches' steeples. Therefore, staff recommends that the County Board approve the use permit requests to install antennas and related equipment on existing telecommunications facilities, subject to the proposed conditions of the staff report.

A. U-3283-11-1: 1125 Patrick Henry Drive (Westover Baptist Church)

Proposed Conditions:

1. The applicant agrees that the antennas and related equipment will be installed as shown on plans dated January 14, 2011, and approved by the County Board on June 11, 2011. The applicant agrees that any future installation of antennas or equipment cabinets may be reviewed and approved by the Zoning Administrator.
2. The applicant agrees to have an independent engineering firm conduct, at its sole expense, field measurements of its electromagnetic emissions in publicly accessible areas. The first test shall be conducted within 30 days after the applicant's equipment is installed and becomes operational. Thereafter, the test shall be conducted annually from the approval date of the special exception use permit (June 11, 2011). True and correct copies of the field measurement, certified by the engineer licensed to practice in the Commonwealth of Virginia, shall be submitted to the Zoning Administrator no later than July 1st of each year. If at any time the applicant's operations cause it to exceed Federal Communications Commission (FCC) standards, the applicant agrees to immediately cease operations until the violation can be corrected. The applicant agrees not to continue operations until such time as the system is operating with the applicable standards.
3. The applicant shall identify a community liaison that shall be available to address any concerns regarding the facility operation. The name and telephone number of the liaison shall be provided to the Westover Village Civic Association and the Zoning Administrator.
4. The applicant agrees that any AT&T antennas on the site shall be removed within ninety (90) days after any cessation of use.

B. U-3286-11-1: 4102 North Old Glebe Road (Walker Chapel United Methodist Church)

Proposed Conditions:

1. The applicant agrees that the antennas and related equipment will be installed as shown on plans dated June 1, 2011, and approved by the County Board on June 11, 2011. The applicant agrees that any future installation of antennas or equipment cabinets may be reviewed and approved by the Zoning Administrator.
2. The applicant agrees to have an independent engineering firm conduct, at its sole expense, field measurements of its electromagnetic emissions in publicly accessible areas. The first test shall be conducted within 30 days after the applicant's equipment is installed and becomes operational. Thereafter, the test shall be conducted annually from the approval date of the special exception use permit (June 11, 2011). True and correct

copies of the field measurement, certified by the engineer licensed to practice in the Commonwealth of Virginia, shall be submitted to the Zoning Administrator no later than July 1st of each year. If at any time the applicant's operations cause it to exceed Federal Communications Commission (FCC) standards, the applicant agrees to immediately cease operations until the violation can be corrected. The applicant agrees not to continue operations until such time as the system is operating with the applicable standards.

3. The applicant shall identify a community liaison that shall be available to address any concerns regarding the facility operation. The name and telephone number of the liaison shall be provided to the Old Glebe Civic Association and the Zoning Administrator.
4. The applicant agrees that any AT&T antennas on the site shall be removed within ninety (90) days after any cessation of use.

PREVIOUS COUNTY BOARD ACTIONS:

A. U-3283-11-1: 1125 Patrick Henry Drive (Westover Baptist Church)

July 13, 1948	Granted use permit (U-95-48-1) for the purpose of operating nursery school for 30 children from four (4) to six (6) years of age from September to May inclusive, five (5) days a week, for two three hour sessions a day.
June 16, 1951	Continued use permit (U-95-48-1) with a review in one (1) year.
June 28, 1952	Continued use permit (U-95-48-1) with a review in one (1) year.
October 10, 1967	Accepted withdrawal of a use permit request (U-1772-67-2) to operate a private school for 100 children ages 3 to 9 years of age.
September 12, 1970	Approved use permit (U-1846-70-3) for the purpose of operating a day care center for a maximum of 40 pre-school children, ages three (3) months to four (4) years, from 9:30 a.m. to 2:30 p.m. one day a week (Thursday).
June 5, 1971 to June 17, 1975	Annually reviewed and continued use permit (U 1846-70-3).
August 2, 1975	Approved use permit (U-2030-75-4) to increase enrollment from 40 to 50 children for the preschool and mother's day out programs with a review in one (1) year.
June 12, 1976	Continued use permit (U-2030-75-4) with a review in one (1) year.
June 4, 1977	Continued use permit (U-2030-75-4) with a review in one (1) year.
April 8, 1978	Approved use permit (U-2152-78-5) to increase enrollment of the nursery school (preschool Mother's Day Out Program) from 50 children to 68 children, ages infants through 4 year olds; during daytime hours- Monday through Friday.

June 3, 1978	Continued use permit (U-2152-78-5) with no further review.
March 5, 1983	Approved use permit request (U-2360-83-6) to operate an institution of an educational or philanthropic nature (services and office) with a review in one (1) year.
March 3, 1984	Continued use permit (U-2360-83-6) with no further review.
July 11, 1989	Accepted withdrawal of use permit (U-2646-89-7) for a preschool and child care center.
September 11, 1993	Approved use permit (U-2785-93-8) until June 30, 1995 for a temporary relocation of 175 students from Swanson Middle School.
November 21, 1995	Approved use permit (U-2867-95-8) for a private school including exercise classes at various times between 8:00 a.m. and 8:00 p.m. Mondays through Fridays. (The Fitness Break)
November 16, 1996	Continued use permit (U-2867-95-8) for a private school including exercise classes with an administrative review in three (3) years (November 1999).
April 10, 1999	Approved use permit (U-2960-99-1) for a non-profit community school of music, Mondays through Fridays from 9:00 a.m. to 9:45 p.m., and Saturdays from 9:00 a.m. to 6:00 p.m. for up to 450 students, ages infants to the elderly, with special events scheduled for Sundays that will not conflict with normal activities of the church.
April 8, 2000	Continued use permit (U-2960-99-1) for a community school of music, Mondays through Fridays from 9:00 a.m. to 9:45 p.m., and Saturdays from 9:00 a.m. to 6:00 p.m. for up to 450 students, ages infants to the elderly, with special events scheduled for Sundays, with a review in two (2) years (April 2002).

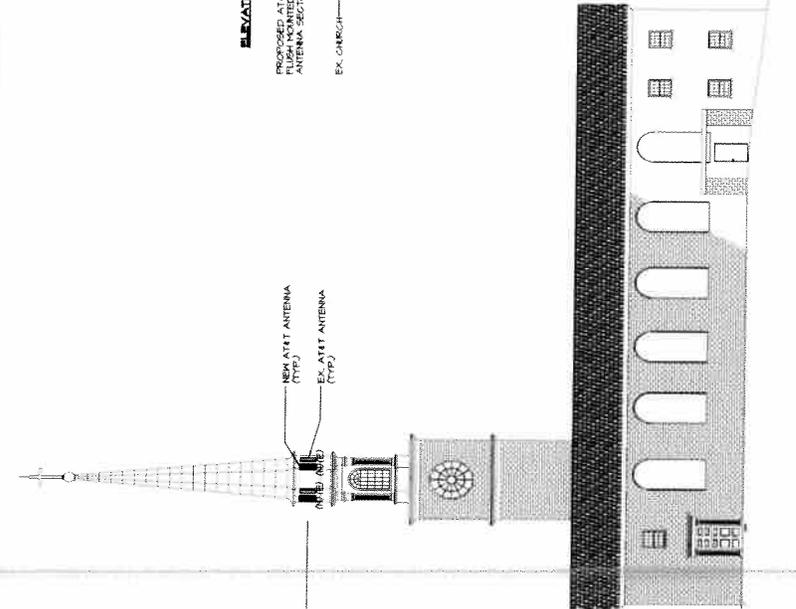
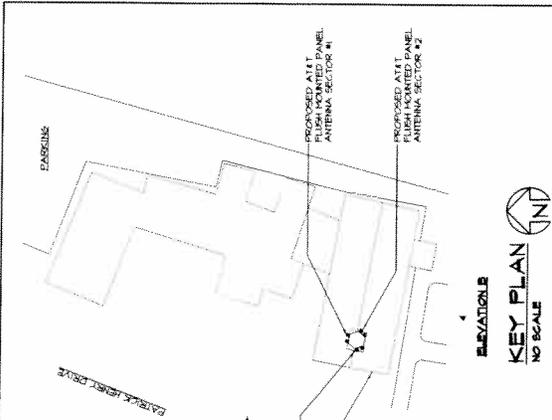
August 5, 2000	Approved use permit (U-2988-00-1) for a pediatric occupational therapy clinic at various times between 9:00 AM and 5:00 PM, Mondays through Fridays, with a review in one year (August 2001).
September 9, 2000	Approved use permit (U-2990-00-1) for a dance school, ballet for 40 to 65 students with a review in one year (September 2001).
November 18, 2000	Accepted withdrawal of use permit request (U-2995-00-1) for a developmental, educational, cognitive therapy clinic.
June 9, 2001	Approved a use permit amendment (U-2152-78-5) for a preschool for 85 children, subject to conditions and review in one (1) year (June 2002).
September 8, 2001	Continued use permit (U-2988-00-1) for a pediatric occupational therapy clinic at various times between 9:00 AM and 5:00 PM, Mondays through Fridays, with a review in three years (September 2004). Continued use permit (U-2990-00-1) for a dance school, ballet for 40 to 65 students with a review in one year (September 2002).
April 20, 2002	Renewed use permit (U-2960-99-1) for a community school of music, Mondays through Fridays from 9:00 a.m. to 9:45 p.m., and Saturdays from 9:00 a.m. to 6:00 p.m. for up to 450 students, ages infants to the elderly, with special events scheduled for Sundays, subject to all previous conditions and with a review in five (5) years (April 2007).
June 8, 2002	Renewed a use permit amendment for a preschool for 85 children (U-2152-78-5), subject to all previous conditions and County Board review in three years (June 2005).
September 14, 2002	Renewed a use permit for a dance school (U-2990-00-1) subject to all previous conditions and County Board review in three years (September 2005).
January 17, 2003	Approved a use permit (U-3051-02-10) for a literacy school subject to conditions and review in one (1) year (January 2004).

January 10, 2004	Discontinued a use permit (U-3051-02-10) for a literacy school.
September 18, 2004	Renewed a use permit (U-2988-00-1) for a pediatric occupational therapy clinic, subject to all previous conditions and County Board review in five (5) years (September 2009).
June 18, 2005	Renewed a use permit amendment for a preschool for 85 children (U-2152-78-5), subject to all previous conditions and County Board review in five (5) years (June 2010).
September 17, 2005	Renewed a use permit for a dance school (U-2990-00-1) subject to all previous conditions and County Board review in five (5) years (September 2010).
April 21, 2007	Renewed use permit (U-2960-99-1) for a music school, subject to all previous conditions, one (1) new condition, and administrative review in one (1) year (April 2008) and no further scheduled County Board review.
September 26, 2009	Renewed a use permit (U-2988-00-1) for a pediatric occupational therapy clinic, subject to all previous conditions and with no further scheduled County Board review.
June 12, 2010	Renewed a use permit amendment for a preschool for 85 children (U-2152-78-5), subject to all previous conditions and with no further County Board review.
May 17, 2011	Deferred use permit (U-3283-11-1) for AT&T antennas and related equipment on an existing telecommunications facility located at 1125 Patrick Henry Drive (Westover Baptist Church) to the June 11, 2011 County Board meeting.

B. U-3286-11-1: 4102 North Old Glebe Road (Walker Chapel United Methodist Church)

July 26, 1952	Approved use permit (U-1052-52-1) for the purpose of conducting a nursery and kindergarten.
June 27, 1953	Renewed use permit (U-1052-52-1) for the purpose of conducting a nursery and kindergarten. Renewed each year until June 30, 1962.
May 4, 1974	Approved use permit (U-1968-74-2) for the purpose of operating a day care program for 20 children, ages infants to 5 years, one day weekly, from 9 a.m. to 2 p.m. Renewed each year until June 3, 1978 with no further review (administrative increase to 25 children was approved on May 2, 1985).
November 15, 1980	Approved use permit (U-2266-80-3) for the purposes of operating a dormitory for the housing of youth groups visiting the Washington, D.C. area for up to a maximum of 50 persons at any one time.
November 14, 1981	Renewed use permit (U-2266-80-3) for the purposes of operating a dormitory for the housing of youth groups visiting the Washington, D.C. area for up to a maximum of 50 persons at any one time, with no further review.
July 19, 2008	Approved use permit for 35 secondary parking spaces for use by Marymount University faculty, subject to proposed conditions, and with a County Board review in one (1) year (July 2009).
July 11, 2009	Renewed use permit for 35 secondary parking spaces for use by Marymount University faculty, subject to all previous conditions, and with a County Board review in two (2) years (July 2011).
May 17, 2011	Deferred use permit (U-3286-11-1) for AT&T antennas and related equipment on an existing telecommunications facility located at 4102 North Old Glebe Road (Walker Chapel United Methodist Church) to the June 11, 2011 County Board meeting.

A. U-3283-11-1



KEY:
 (N) - NEW AT&T ANTENNA
 (E) - EXISTING AT&T ANTENNA

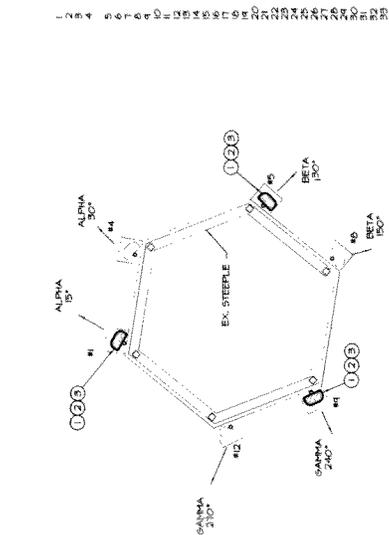
NOTE: CURRENTLY THERE ARE SIX (6) EXISTING AT&T ANTENNAS INDIVIDUALLY MOUNTED BEHIND STEALTH ENCLOSURES. THESE ANTENNAS ARE TO BE REMOVED AND REPLACED WITH THREE (3) NEW ANTENNAS OF SIMILAR SIZE AND SHAPE. ANTENNAS WILL BE REINSTALLED BEHIND EXISTING STEALTH ENCLOSURES.

 BECHTEL COMMUNICATIONS 9200 BERGER RD. COLUMBIA, MD. 21046 PHONE: (410) 948-2309	 at&t Mobility 7150 STANDARD DRIVE HANOVER, MD. 21076	SITE NAME: KENTUCKY DRIVE SITE NUMBER: 2852 1125 NORTH PATRICK HENRY DRIVE ARLINGTON, VA. 22205		1 01/14/11 PERMIT REVIEW 2 04/20/10 ISSUED FOR CONSTRUCTION 3 04/20/10 ISSUED FOR REVIEW 4 04/20/10 ISSUED FOR REVIEW 5 04/20/10 ISSUED FOR REVIEW	1 01/14/11 2 04/20/10 3 04/20/10 4 04/20/10 5 04/20/10	PERMITS CONSTRUCTION REVIEW REVIEW REVIEW	DRAWN BY: CBH 25471-180 25471-180 25471-180 25471-180 25471-180	EXAMINER NUMBER VA-2892-C3 1
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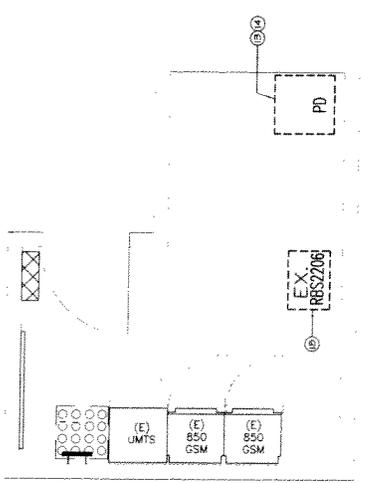
BECHTEL SCOPE OF WORK

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 **REVISIONS TO BE MADE TO THE DRAWINGS TO REFLECT THE LATEST REVISIONS TO THE BIDDING SETS FOR THE PROJECT.
 **NEEDING INFO FOR NEW SMALL ANTENNAS
 NEED MORE INFORMATION FOR FINAL SOFT FROM INVENTORY

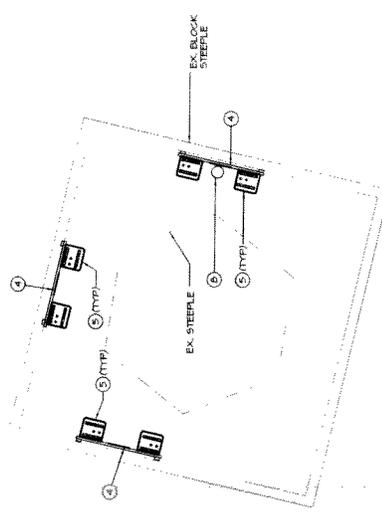
1. INSTALL (1) NEW KATHREIN LTE ANTENNA INSIDE STEALTH CANISTER - (2 TOTAL)
2. INSTALL (1) NEW KATHREIN LTE ANTENNA INSIDE STEALTH CANISTER - (2 TOTAL)
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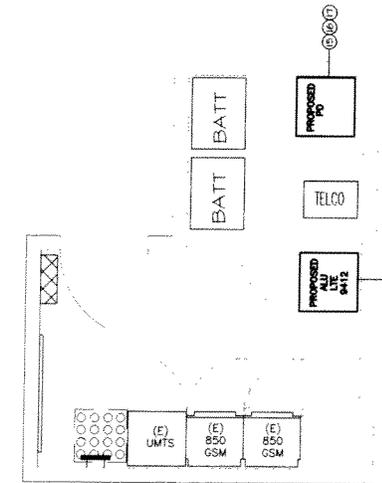
ANTENNA PLAN
NO SCALE



EQUIPMENT ROOM DEMO PLAN
SCALE: 1/2" = 1'-0"

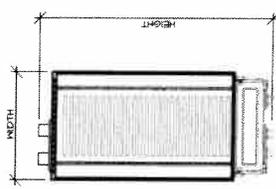


RISH MOUNTING PLAN
NO SCALE



EQUIPMENT ROOM NEW WORK PLAN
SCALE: 1/2" = 1'-0"

	BECHTEL COMMUNICATIONS 9200 BERGER RD. COLUMBIA, MD 21046 PHONE: (443) 948-2309	at&t Mobility 7130 STANDERD DRIVE HANOVER, MD 21076	SITE NAME: KENTUCKY DRIVE SITE NUMBER: 2852 1125 NORTH PATRICK HENRY DRIVE ARLINGTON, VA, 22205		PERMIT REVIEW 11/20/05 ISSUED FOR CONSTRUCTION 11/20/05 ISSUED FOR REVIEW NO DATE REVIEWS SCALE: AS NOTED TYPED: CPH DRAWN BY: CPH	NEW WORK EQUIPMENT, PART PLANS AND NOTES JOB NUMBER: VA-2852-04 DRAWING NUMBER: 1
	at&t					



RRH CABINET CLEARANCES

RRH CABINET	DEPTH	HEIGHT	HEIGHT AND BRACKET
RRH 2000 (R/N)	12.2"	19.5"	21"
RRH 2040 (R/N)	12"	4"	25"
RRH 2040 (R/N)	12"	4"	45 LBS.

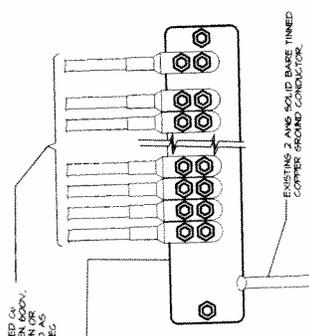
NOTE: DIMENSIONS INCLUDE MOUNTING BRACKET, SOLAR SHIELD AND CONNECTORS.

RRH CABINET CLEARANCES

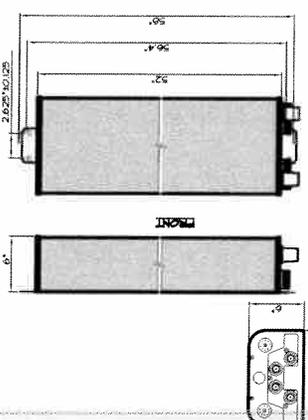
RRH CABINET	DEPTH	HEIGHT	HEIGHT AND BRACKET
RRH 2000 (R/N)	12.2"	19.5"	21"
RRH 2040 (R/N)	12"	4"	25"
RRH 2040 (R/N)	12"	4"	45 LBS.

NOTE: DIMENSIONS INCLUDE MOUNTING BRACKET, SOLAR SHIELD AND CONNECTORS.

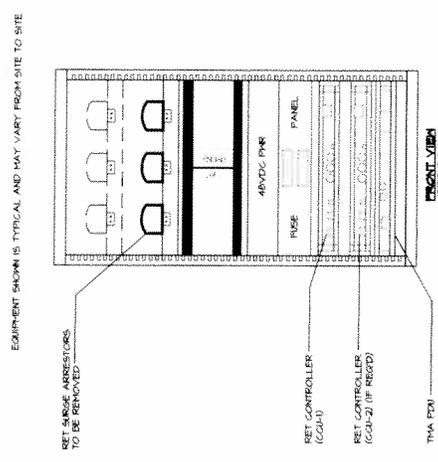
INSTALLATION OF GROUND WIRE TO COAX CABLE GROUND BAR



6 AWG STRANDED COPPER WIRE WITH GREEN BOOTS, BLACK INSULATION OR BLACK MARKING IS REQUIRED BY NEC.

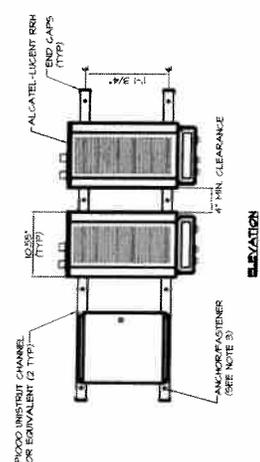


DUAL BAND DUAL POLE PANEL ANTENNA KATHREIN 800-10764

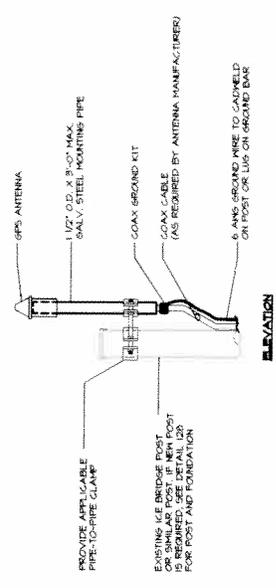


RET EQUIPMENT AND MOUNTING RACK

ALCATEL-LUCENT 9442 REMOTE RADIO HEAD (RRH)



- NOTES:
- ALCATEL-LUCENT (ALL) VIA SITE SURVEY, THE RRH MOUNTING BRACKET AND CONNECTION BOX WITH SEALABLE WEATHERS OF COPPER ANCHORS SHALL BE SUPPLIED. ALL OTHER MATERIALS AND INSTALL ALL MOUNTING HARDWARE INCLUDING ALL RRH CABLE TERMINATIONS.
 - A SUPPORT FOR A SINGLE RRH SHALL HAVE A MINIMUM OF TWO ANCHORS/FASTENERS FOR EACH UNISTRUT CHANNEL.
 - INSTALL ANCHORS/FASTENERS A MAXIMUM OF 2'-0" ON CENTERS.
 - CONCRETE - 1/4" x 6" HELIX BOLT WITH EPOXY IN HOLES
 - THROUGH BOLT - 1/4" x 6" ASH/ASTOT THREADED ROD WITH NUTS AND WASHERS.
 - MOUNT RRH MOUNTING BRACKET TO UNISTRUT WITH 3/8" UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET. SUBCONTRACTOR SHALL SUPPLY.



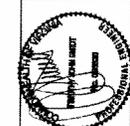
- NOTES:
- LOCATION OF ANTENNA MUST HAVE CLEAR VIEW OF SOUTHERN SKY UNOBSCURED BY TREES OR BUILDINGS. ANTENNA MUST BE MOUNTED ON THE SURFACE AREA OF A HERSHORE AROUND THE GPS ANTENNA.
 - ALL GPS ANTENNA LOGS SHOULD BE MADE BY AN INDIVIDUAL WHO CAN CLEAR SIGNALS FROM A MINIMUM OF FOUR (4) SATELLITE SIGNALS. VERIFY WITH HANDHELD GPS BEFORE FINAL LOCATION OF GPS ANTENNA.

DETAIL - ALCATEL-LUCENT 9341 REMOTE RADIO HEAD (RRH) WALL MOUNT

BECHTEL COMMUNICATIONS
 5230 BERGER RD.
 COMPTON, MD 21046
 PHONE: (443) 546-2309

at&t
 Mobility
 7150 STANDARD DRIVE
 HANOVER, MD 21076

SITE NAME: KENTUCKY DRIVE
 SITE NUMBER: 2852
 1125 NORTH PATRICK HENRY DRIVE
 ARLINGTON, VA 22205



NO.	DATE	REVISIONS	BY	CHK APP	SCALE	AS NOTED	YEAR	LOOKUP	DRAWN BY	CHK
1	07/04/11	PERMIT REVIEW	BLN	TJS	LJS					
2	02/20/12	ISSUED FOR CONSTRUCTION	BLN	TJS	LJS					
3	02/20/12	ISSUED FOR REVIEW	BLN	TJS	LJS					

at&t
 LITE DETAILS
 JOB NUMBER: 2852
 DRAWING NUMBER: 2852-06
 REV: 1

B. U-3286-11-1

PROJECT DESCRIPTION

THIS PROJECT CONSISTS OF INSTALLING NEW EQUIPMENT IN AN EXISTING EQUIPMENT SHELTER AND NEW ANTENNAS WITH ASSOCIATED SUPPORT EQUIPMENT INSIDE STEEPLE.

PROJECT INFORMATION

APPLICANT ADDRESS: AT&T
7150 STANDARD DRIVE
HANOVER, MD 21076

JURISDICTION: ARLINGTON COUNTY, VA

PROPERTY OWNER: CHAPEL UNITED METHODIST

LATITUDE: N 38.92168° (NAD 83)

LONGITUDE: W 77.12875° (NAD 83)

RF DATA SHEET

DATE ISSUED: 11/26/2010 VERSION: LTE_V04.2

PROJECT CONTACTS

1. AT&T PROJECT MANAGER: STEVEN SAFIRE
PHONE: (301) 489-3378
2. SITE OWNER: JAMES N EARLEY
703-538-5200

DRAWING INDEX

- T1-VA-2856-01 TITLE SHEET
- T1-VA-2856-01A SITE PLAN
- T1-VA-2856-02 ROOFTOP PLAN AND GENERAL NOTES
- T1-VA-2856-03 EQUIPMENT LAYOUT AND SCOPE OF WORK
- T1-VA-2856-04 BUILDING ELEVATION
- T1-VA-2856-05 WIRING DIAGRAM
- T1-VA-2856-06 SYSTEM DIAGRAM
- T1-VA-2856-07 DETAILS
- T1-VA-2856-08 DETAILS
- T1-VA-2856-09 DETAILS
- T1-VA-2856-10 DETAILS
- T1-VA-2856-11 RET CONTROL DIAGRAM
- T1-VA-2865-12 ANTENNA DETAILS

REV

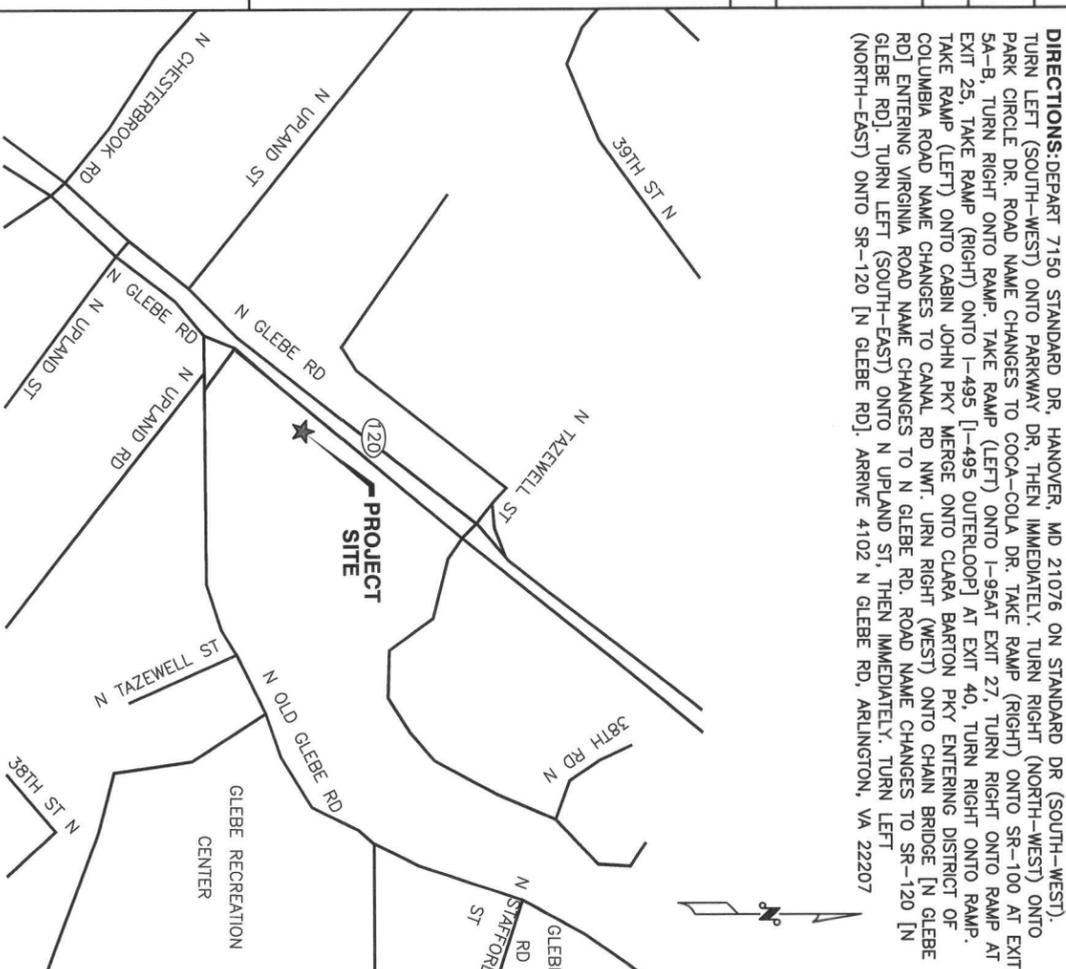
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at&t
Mobility

SITE NAME: WALKER CHAPEL CHURCH
SITE ID NO.: 2856

VICINITY MAP



APPLICABLE BUILDING CODES AND STANDARDS

SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

BUILDING CODE: [INTERNATIONAL BUILDING CODE] IBC 2006 (VIRGINIA UNIFORM STATEWIDE BUILDING CODE)
ELECTRICAL CODE: [NATIONAL ELECTRICAL CODE] NEC 2005 (VIRGINIA UNIFORM STATEWIDE BUILDING CODE)
[FIRE/LIFE SAFETY CODE] IFC 2006 (VIRGINIA STATEWIDE FIRE PREVENTION CODE)

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:
AMERICAN CONCRETE INSTITUTE (ACI) 318, BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC), MANUAL OF STEEL CONSTRUCTION, ASD, NINTH EDITION
ANSI/TIA 222-G, STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWER AND ANTENNA SUPPORTING STRUCTURES;
TIA 607, COMMERCIAL BUILDING GROUNDING AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS

INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS (IEEE) 81, GUIDE FOR MEASURING EARTH RESISTIVITY, GROUND IMPEDANCE, AND EARTH SURFACE POTENTIALS OF A GROUND SYSTEM (IEEE 1100 (1999) RECOMMENDED PRACTICE FOR POWERING AND GROUNDING OF ELECTRONIC EQUIPMENT
IEEE C2 NATIONAL ELECTRIC SAFETY CODE, LATEST VERSION
TELECORDIA GR-1275, GENERAL INSTALLATION REQUIREMENTS
ANSI T1.311, FOR TELECOM - DC POWER SYSTEMS - TELECOM, ENVIRONMENTAL PROTECTION

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.



BECHTEL COMMUNICATIONS
5295 WESTVIEW DRIVE
FREDERICK, MD. 21703
PHONE: (301) 228-6000

SITE NAME: WALKER CHAPEL CHURCH

SITE ID No.: 2856
4102 N. OLD GLEEBE ROAD
ARLINGTON, VA 22207



7150 STANDARD DRIVE
HANOVER, MD 21076

NO.	DATE	ISSUED FOR CONSTRUCTION	REVISIONS	DESIGNED BY: SHW	DRAWN BY: SHW
3	6/1/11	REVISED AS SHOWN	WJK RWF BRK		
2	5/3/11	REVISED AS SHOWN	ALM RWF BRK		
1	2/9/11	REVISED AS NOTED	MAK RWF BRK		
0	10/11/10	ISSUED FOR CONSTRUCTION	SHW RWF BRK		



25471-430	TITLE SHEET	DRIVING NUMBER	11-VA-2856-01	REV	3
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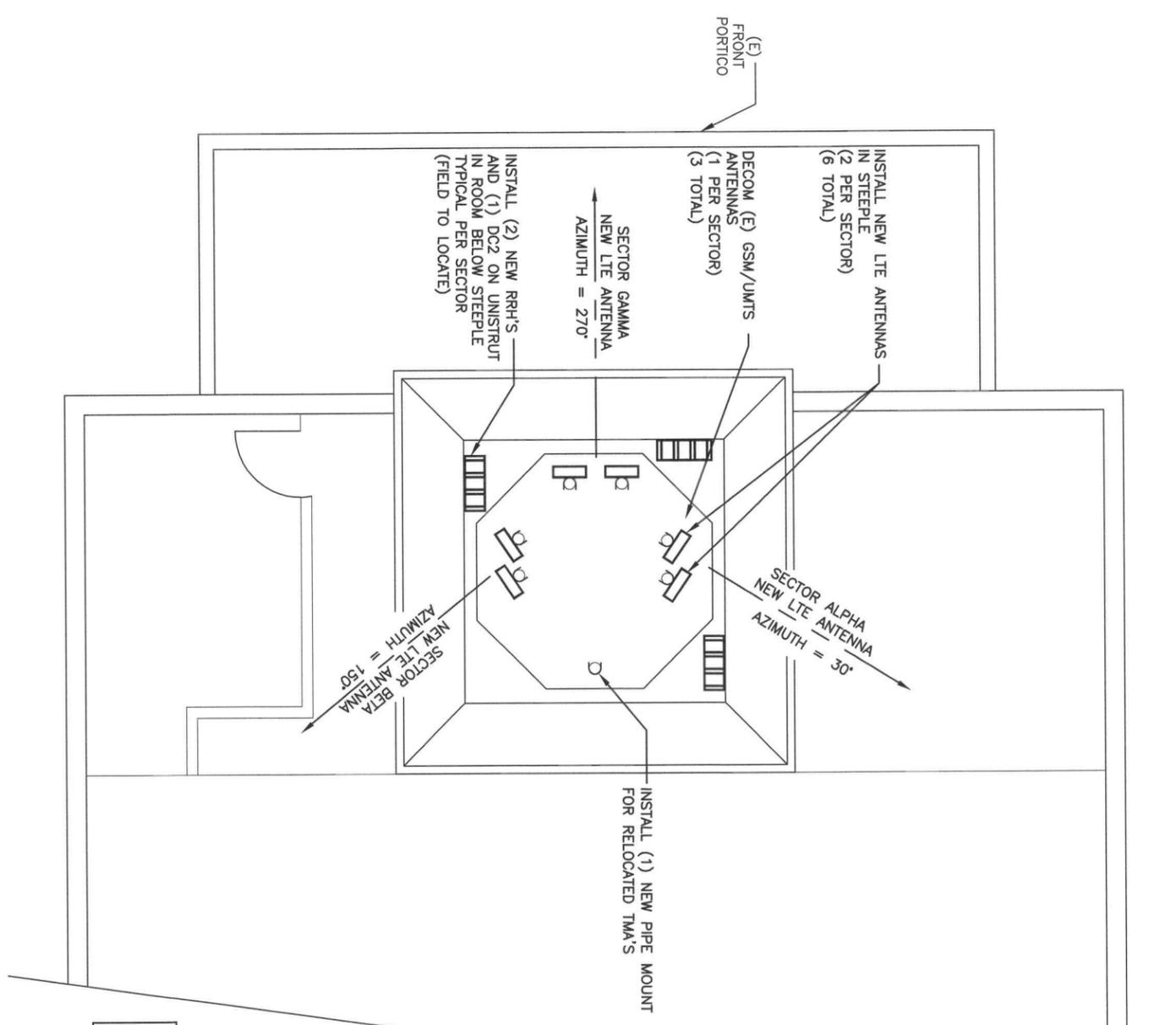
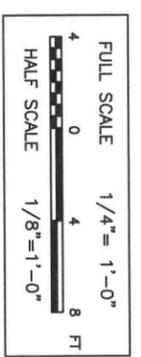
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2

22 x 34 1/2" SIZE

GENERAL NOTES

1. THE SUBCONTRACTOR SHALL GIVE ALL NOTICES AND REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.
2. THE ARCHITECT/ENGINEER HAVE MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE SUBCONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID SUBCONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.
3. THE SUBCONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE AT&T REPRESENTATIVE (BECHTEL) OF ANY CONFLICTS, ERRORS OR OMISSIONS PRIOR TO THE SUBMISSION OF SUBCONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK. IN THE EVENT OF DISCREPANCIES, THE SUBCONTRACTOR SHALL PRICE THE MORE COSTLY OR EXTENSIVE WORK, UNLESS DIRECTED IN WRITING OTHERWISE.
4. THE SCOPE OF WORK SHALL INCLUDE FURNISHING ALL MATERIALS, EQUIPMENT, LABOR AND ALL OTHER MATERIALS AND LABOR DEEMED NECESSARY TO COMPLETE THE WORK/PROJECT AS DESCRIBED HEREIN.
5. THE SUBCONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
6. THE SUBCONTRACTOR SHALL OBTAIN AUTHORIZATION TO PROCEED WITH CONSTRUCTION PRIOR TO STARTING WORK ON ANY ITEM NOT CLEARLY DEFINED BY THE CONSTRUCTION DRAWINGS/CONTRACT DOCUMENTS.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S/VENDOR'S SPECIFICATIONS UNLESS OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.
8. THE SUBCONTRACTOR SHALL PROVIDE A FULL SET OF CONSTRUCTION DOCUMENTS AT THE SITE UPDATED WITH THE LATEST REVISIONS AND ADDENDUMS OR CLARIFICATIONS AVAILABLE FOR THE USE BY ALL PERSONNEL INVOLVED WITH THE PROJECT.
9. THE SUBCONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE SUBCONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL THE CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
10. THE SUBCONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS WHICH MAY BE REQUIRED FOR THE WORK BY THE ARCHITECT/ENGINEER, THE STATE, COUNTY OR LOCAL GOVERNMENT AUTHORITY.
11. THE SUBCONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS, EASEMENTS, PAVEMENTS, CURBING, ETC. DURING CONSTRUCTION. UPON COMPLETION OF WORK, THE SUBCONTRACTOR SHALL REPAIR ANY DAMAGE THAT MAY HAVE OCCURRED DUE TO CONSTRUCTION ON OR ABOUT THE PROPERTY.
12. THE SUBCONTRACTOR SHALL MAINTAIN THE GENERAL WORK AREA AS CLEAN AND HAZARD FREE DURING CONSTRUCTION AND DISPOSE OF ALL DIRT, DEBRIS, RUBBISH AND REMOVE EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY. PREMISES SHALL BE LEFT IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE.
13. THE SUBCONTRACTOR SHALL COMPLY WITH ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJECT.
14. THE SUBCONTRACTOR SHALL NOTIFY THE AT&T REPRESENTATIVE (BECHTEL) WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE SUBCONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE AT&T REPRESENTATIVE (BECHTEL).
15. THE SUBCONTRACTOR SHALL VERIFY ALL DIMENSIONS, ELEVATIONS, PROPERTY LINES, ETC. ON THE JOB.



NOTE:
(N) INSTALL (1) GPS ANTENNA MOUNT NEXT TO (E) GPS ANTENNA

NOTE:
TELCO-MT-
1) S/D INSTALL AND PROVISIONING
2) INSTALLATION OF (2) FIBER JUMPERS 10 METERS
3) INSTALL (2) 10 METER FIBER JUMPERS FROM TELCO TO BBU'S

THE STRUCTURAL QUALIFICATION OF THE STEEPLE ANTENNAS IS PROVIDED BY BECHTEL CALC 25471-430-A3C-EF-000054

ROOFTOP PLAN
SCALE: 1/4" = 1'-0"

BECHTEL COMMUNICATIONS
5295 WESTVIEW DRIVE
FREDERICK, MD. 21703
PHONE: (301) 228-6000

SITE NAME: WALKER CHAPEL CHURCH
SITE ID No.: 2856
4102 N. OLD GLEBE ROAD
ARLINGTON, VA 22207

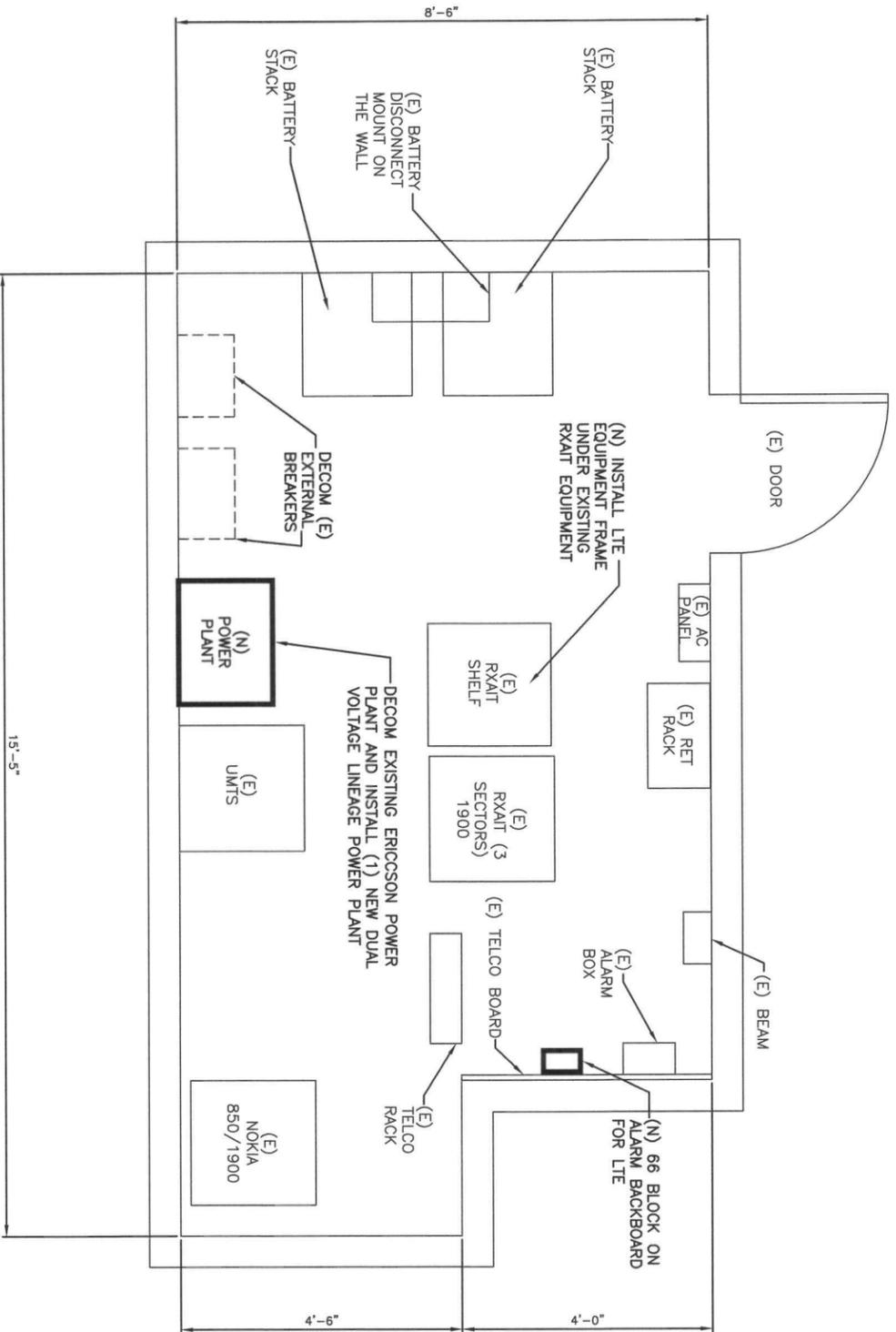
at&t Mobility
7150 STANDARD DRIVE
HANOVER, MD 21076

NO.	DATE	ISSUED FOR CONSTRUCTION	REVISIONS	BY	CHK	APP'D
2	6/1/11	REVISED AS NOTED		WJK	RWF	RRK
1	2/9/11	REVISED AS NOTED		WJK	RWF	RRK
0	10/11/10	ISSUED FOR CONSTRUCTION		SHW	RWF	RRK

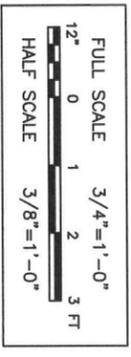
SCALE: AS SHOWN DESIGNED BY: SHW DRAWN BY: SHW



at&t
ROOFTOP PLAN AND GENERAL NOTES
DRAWING NUMBER: 25471-430
T1-VA-2856-02
REV: 2



EQUIPMENT LAYOUT
SCALE: 3/4" = 1'-0"



BECHTEL COMMUNICATIONS
5295 WESTVIEW DRIVE
FREDERICK, MD. 21703
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SITE ID No.: 2856
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7150 STANDARD DRIVE
HANOVER, MD 21076

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2	6/1/11	REVISED AS NOTED			
1	2/9/11	REVISED AS NOTED			
0	10/11/10	ISSUED FOR CONSTRUCTION			



NO.	DATE	ISSUED FOR CONSTRUCTION	REVISIONS	DESIGNED BY: SHW	DRAWN BY: SHW
2					

SCOPE OF WORK

- WALKER CHAPEL
STEEPLE, TI, SWAP UMTS / GSM ANTENNA FOR NEW 2' MODEL, NEED 2' KAT 840
10525 MODEL ANTENNA, NEW DUAL VOLTAGE POWER PLANT
7/28/2010: RFDS V2.1 7/20 --- RRH'S ATOP
EXISTING AZIMUTH - 30-150-270 PER FEED LITE AZ - 355-120-240 NEED TO
REDLINE TO MATCH EXISTING AZIMUTH
- REPLACE EXISTING 265 ANTENNAS WITH NEW 2' ANTENNA FOR GSM / UMTS (3 TOTAL)
 - INSTALL (4) (2) NEW KATHREIN LTE ANTENNA IN STEEPLE (3 TOTAL) (6 TOTAL)
 - DECOM EXISTING 5M RET CABLE BETWEEN EACH ANTENNA PER SECTOR (3 TOTAL)
 - INSTALL (1) NEW 5M RET CABLE BETWEEN NEW LTE ANTENNA TO (E) ANTENNA (6 TOTAL)
 - INSTALL (1) NEW 1M RET CABLE ON LTE ANTENNA BETWEEN MOTORS (3 TOTAL)
 - REPLACE (1) (E) GROUND BAR WITH (N) AT SECTOR MOUNT (3 TOTAL)
 - PREP 3 NEW UNISTRUT FRAMES INSIDE STEEPLE FOR RRH'S
 - PREP FOR RRH'S ON NEW FRAMES (IE GROUNDS)
 - HANG (6) RRH'S ON NEW FRAMES
 - INSTALL (12) JUMPERS TOPSIDE FOR LTE
 - INSTALL (12) DC LOADS ON END OF JUMPERS
 - INSTALL (1) DC2 AT EACH SECTOR (3 TOTAL)
 - INSTALL (1) 12 PAIR FIBER (75LF) FROM TI TO DC2
 - INSTALL (2) 3 PAIR DC CABLE (75LF) TI TO DC2
 - INSTALL (6) FIBER JUMPERS FROM DC2 TO RRH (197LF)
 - INSTALL (6) DC CIRCUITS FROM DC2 TO RRH (197LF)
 - DECOM EXISTING ERICSSON POWER PLANT
 - DECOM (2) EXTERNAL BREAKER PANELS
 - INSTALL (1) NEW DUAL VOLTAGE LINEAGE POWER PLANT
 - COMPLETE (1) GSM DC PREP
 - COMPLETE (1) UMTS DC PREP
 - INSTALL (1) NEW LTE EQUIPMENT UNDER / ON (E) RXAIT EQUIPMENT RACK
 - INSTALL (1) NEW RAYCAP DC6 UNIT IN LTE FRAME
 - INSTALL (6) NEW 15A BREAKERS FOR SECTORS / RRHS
 - INSTALL (1) NEW FIBER TRAY IN LTE BAY
 - INSTALL (1) 66 BLOCK ON ALARM BACKBOARD FOR LTE
 - INSTALL (2) 10A BREAKERS FOR BBU'S WITH DC DROPS
 - INSTALL (1) GPS ANTENNA MOUNT NEXT TO (E) GPS ANTENNA
 - INSTALL (100LF) OF 1/2" COAX FOR NEW GPS
 - INSTALL ALL GROUNDS AS REQUIRED FOR NEW EQUIPMENT
 - SET ANTENNA DOWNLIFTS FOR UMTS / GSM / LTE PER RFDS
 - INSTALL WEATHERPROOFING AS REQUIRED
 - COMPLETE PSAP CALL TESTING
 - DECOM (3) EXISTING ANTENNA

A

B

C

D

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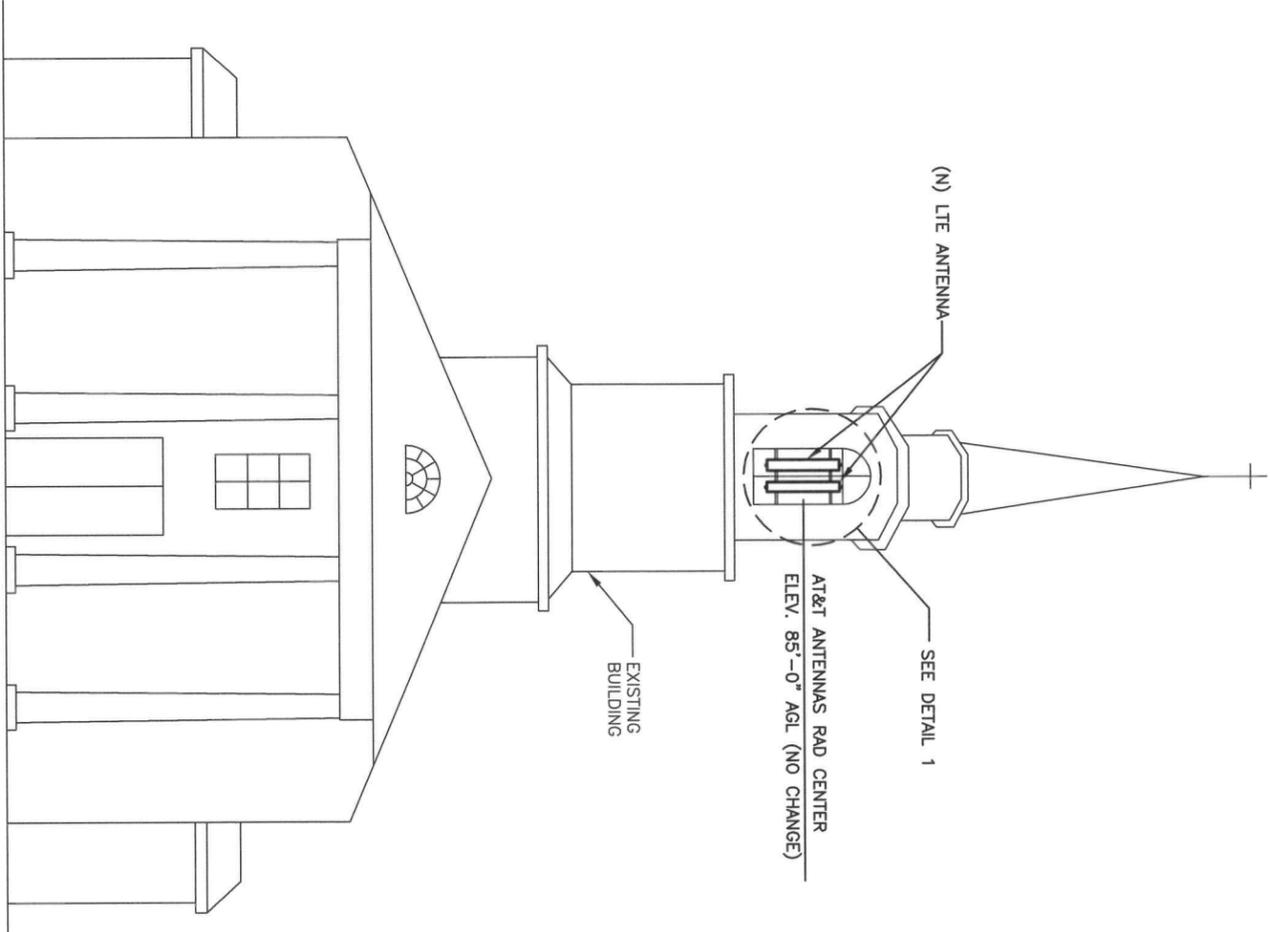
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22 x 34 1/2" SIZE



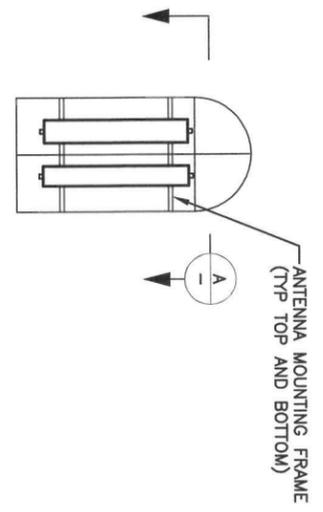
EQUIPMENT LAYOUT AND SCOPE OF WORK

25471-430 T1-VA-2856-03

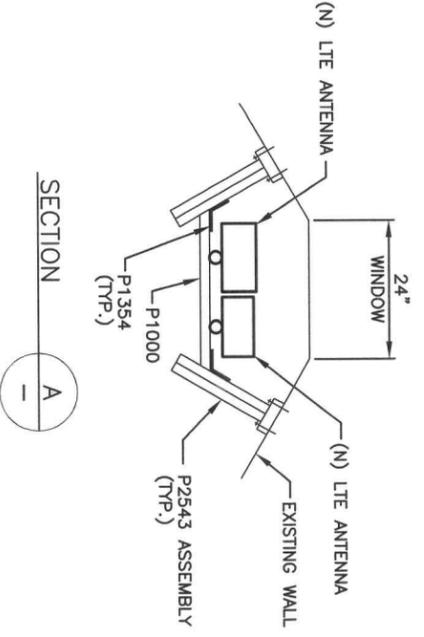


TOWER ELEVATION
SCALE: NTS

THE STRUCTURAL QUALIFICATION OF THE STEEPLE ANTENNAS IS PROVIDED BY BECHTEL CALC 25471-430-A3C-EF-00054



DETAIL 1
NTS



SECTION A-A



BECHTEL COMMUNICATIONS
5295 WESTVIEW DRIVE
FREDERICK, MD. 21703
PHONE: (301) 228-6000

SITE NAME: WALKER CHAPEL CHURCH
SITE ID No.: 2856
4102 N. OLD GLEBE ROAD
ARLINGTON, VA 22207



7150 STANDARD DRIVE
HANOVER, MD 21076

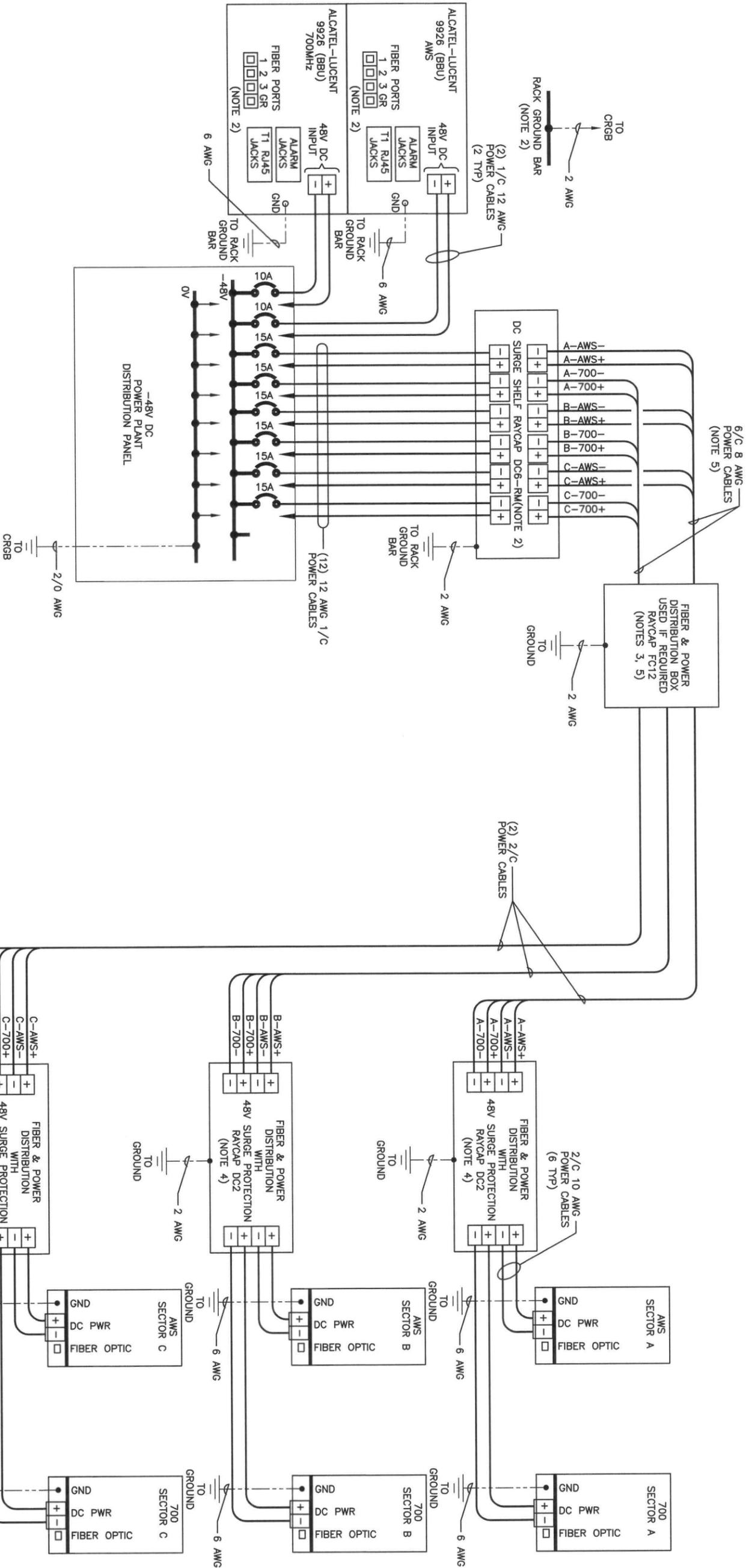
NO.	DATE	REVISIONS	BY	CHK	APP'D
2	6/1/11	REVISED AS NOTED	WLR	RWF	RFK
1	2/9/11	REVISED AS NOTED	WLR	RWF	RFK
0	10/11/10	ISSUED FOR CONSTRUCTION	SHW	RWF	RFK

SCALE: AS SHOWN
DESIGNED BY: SHW
DRAWN BY: SHW



at&t
BUILDING ELEVATION
DRAWING NUMBER: T1-VA-2856-04
25471-430

6 5 4 3 2 22 x 34 1/2" SIZE



- NOTES**
1. LABEL THE DC POWER CABLES AT BOTH ENDS OF EVERY WIRE AND IN ANY PULL BOX IF USED. LABEL SHALL BE DURABLE, SELF ADHESIVE, WRAPPED LONGITUDINALLY ALONG THE CABLE AND STATE THE SECTOR, FREQUENCY BAND AND POLARITY; I.E. 'A-AWS+'.
 2. INSTALL ON LTE EQUIPMENT RACK.
 3. SEE DETAIL 1417 FOR INTERNAL WIRING.
 4. SEE DETAIL 1411 FOR INTERNAL WIRING.
 5. WHEN DISTRIBUTION BOX IS NOT USED, INSTALL 3 RUNS OF TWO (2) 2/C CABLES IN CONDUIT, 1 EACH FROM DC SURGE SHELF TO DC2s.

WIRING DIAGRAM, INDOOR
 BASE BAND AND RRHS ON TOWER/ROOFTOP
 -48V DC POWER PLANT, DC2

DETAIL 1415A
 NTS

BECHTEL COMMUNICATIONS
 5295 WESTVIEW DRIVE
 FREDERICK, MD. 21703
 PHONE: (301) 228-6000

SITE NAME: WALKER CHAPEL CHURCH
 SITE ID No.: 2856
 4102 N. OLD GLEBE ROAD
 ARLINGTON, VA 22207

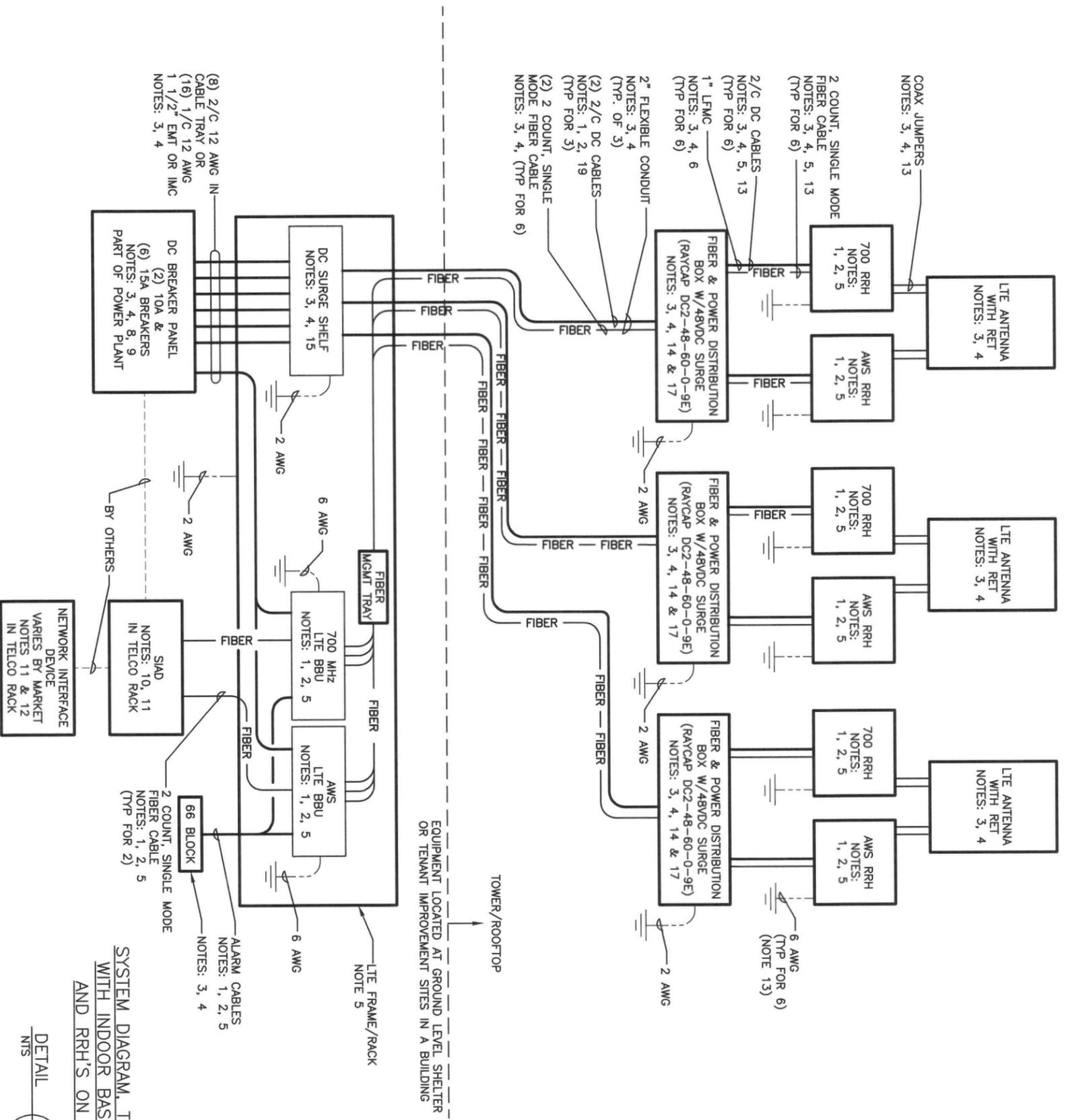
at&t Mobility
 7150 STANDARD DRIVE
 HANOVER, MD 21076

NO.	DATE	ISSUED FOR CONSTRUCTION	REVISIONS	BY	CHK	APP'D
1	6/1/11	REVISED AS SHOWN		WJK	RWF	RFK
0	10/11/10	ISSUED FOR CONSTRUCTION		SHW	RWF	RFK

SCALE: AS SHOWN
 DESIGNED BY: SHW
 DRAWN BY: SHW

COMMISSIONED BY: WALKER CHAPEL CHURCH
 PROJECT MANAGER: ROBERT F. KAIN
 LICENSE NO. 00841
 6/17/2011
 PROFESSIONAL ENGINEER

at&t WIRING DIAGRAM
 DRAWING NUMBER: T1-VA-2856-05
 25471-430
 22 x 34" SIZE



- NOTES:**
- FURNISHED BY ALU.
 - INSTALLED BY ALU.
 - FURNISHED BY BECHTEL.
 - INSTALLED BY BECHTEL.
 - FINAL CONNECTION BY ALU.
 - OPEN END OF CONDUIT TO BE LEFT WEATHERPROOFED UNTIL TERMINATION BY ALU.
 - DELETED.
 - PART OF DC POWER PLANT, BREAKERS SPECIFIED SEPARATELY.
 - BREAKERS TO BE TAGGED AND LOCKED OUT.
 - SIAD IS FURNISHED AND INSTALLED BY OTHERS AND INCLUDES POWER CONNECTIONS AND FIBER TO THE UNIT.
 - EQUIPMENT LOCATED ON (E) TELCO RACK.
 - LEG TO FURNISH AND INSTALL NETWORK INTERFACE DEVICE.
 - LEAVE COILED AND PROTECTED FOR ALU.
 - FIBER AND POWER DISTRIBUTION BOX W/48V DC SURGE SHALL BE RAYCAP MODEL DC2-48-60-0-9E. SEE DETAIL 1409 FOR INTERNAL WIRING DIAGRAM.
 - FIBER AND POWER DISTRIBUTION BOX SHALL BE RAYCAP FC-12-PC6-10E.
 - SEE DETAIL 1411 FOR INTERNAL WIRING DIAGRAM.
 - SEE DETAIL 1417 FOR INTERNAL WIRING DIAGRAM.
 - SEE DETAIL 1408 FOR CABLE SIZES.
 - CONDUIT TO BE USED ON A SELF SUPPORT TOWER IF THE RRH IS MORE THAN 10' FROM THE DISTRIBUTION UNIT.
 - DC POWER CABLES SHALL BE UL LISTED FOR 90°C DRY/75°C WET INSTALLATIONS.

SYSTEM DIAGRAM, TOWER/ROOFTOP SITE WITH INDOOR BASE BAND ON GRADE AND RRH'S ON TOWER/ROOFTOP

DETAIL 1401A MODIFIED



BECHTEL COMMUNICATIONS
 5295 WESTVIEW DRIVE
 FREDERICK, MD. 21703
 PHONE: (301) 228-6000

SITE NAME: WALKER CHAPEL CHURCH
 SITE ID No.: 2856
 4102 N. OLD GLEBE ROAD
 ARLINGTON, VA 22207



7150 STANDARD DRIVE
 HANDOVER, MD 21076

NO.	DATE	ISSUED FOR CONSTRUCTION	REVISIONS	DESIGNED BY: SHW	DRAWN BY: SHW
1	6/1/11	REVISED AS SHOWN			
0	10/11/10	ISSUED FOR CONSTRUCTION			



NO.	DATE	ISSUED FOR CONSTRUCTION	REVISIONS	DESIGNED BY: SHW	DRAWN BY: SHW
1	6/1/11	REVISED AS SHOWN			



SYSTEM DIAGRAM
 DRAWING NUMBER
 25471-430 T1-VA-2856-06

6

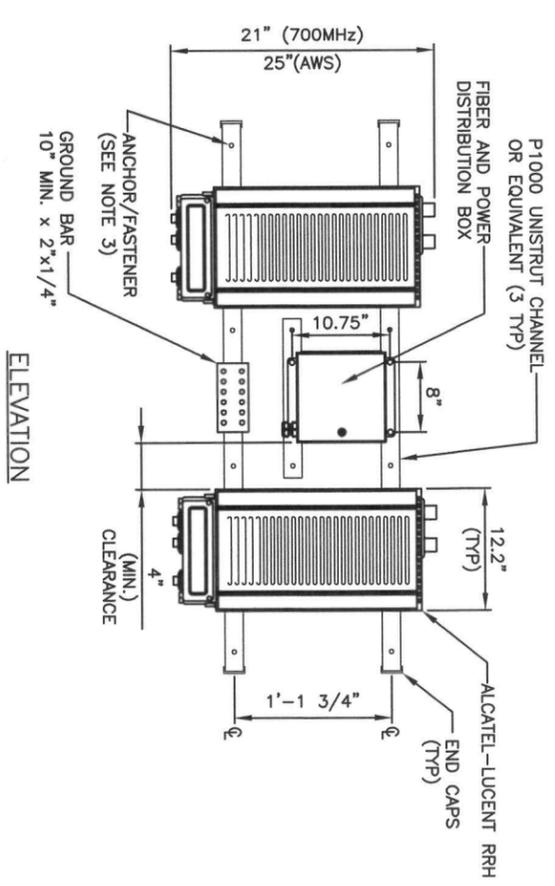
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2

22 x 34 1/2 SIZE

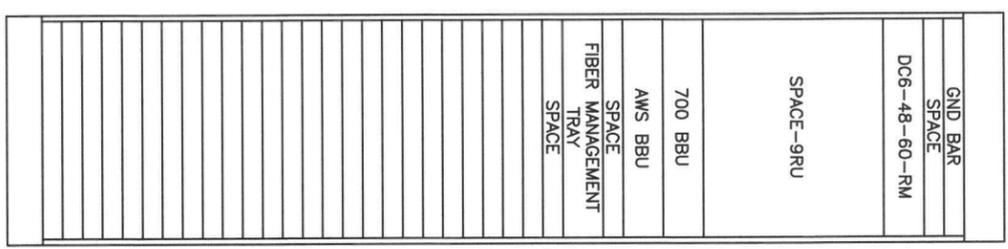


NOTES:

1. ALCATEL-LUCENT (ALU) VIA AT&T SUPPLIES THE RRH. SUBCONTRACTOR SHALL SUPPLY ALL OTHER MATERIALS AND INSTALL ALL MOUNTING HARDWARE. ALU INSTALLS RRH AND MAKES CABLE TERMINATIONS.
2. A SUPPORT FOR A SINGLE RRH SHALL HAVE A MINIMUM OF TWO ANCHORS/FASTENERS FOR EACH UNISTRUT CHANNEL.
3. INSTALL ANCHORS/FASTENERS A MAXIMUM OF 2'-0" ON CENTERS.
 - WOOD STUDS - 1/4" LAG BOLT W/ 1" EMBEDMENT IN WOOD
 - CONCRETE - 1/4" HILTI KWIK BOLT III W/ 1-1/2" EMBEDMENT OR EQUIVALENT
 - THROUGH BOLT - 1/4" A36/A307 THREADED ROD W/ NUTS AND WASHERS
 ANCHORS AND UNISTRUT CHANNEL SHALL HAVE HOT-DIPPED GALVANIZED FINISH.
4. MOUNT RRH TO UNISTRUT WITH 3/8" UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET. SUBCONTRACTOR SHALL SUPPLY.
5. MOUNT FIBER AND POWER DISTRIBUTION BOX WITH FOUR (4) 1/4" UNISTRUT BOLTING HARDWARE AND SPRING NUTS.

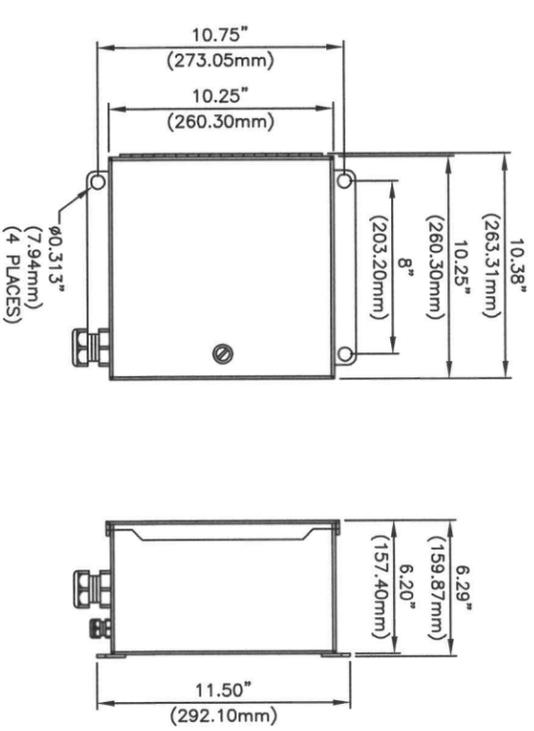
ALCATEL-LUCENT 9442
 REMOTE RADIO HEAD (RRH) AND
 DISTRIBUTION BOX WALL MOUNT

DETAIL 1103A
 NTS



RACK LAYOUT FOR LTE EQUIPMENT
 WITH SURGE SUPPRESSORS
 AND WITHOUT CONVERTER

DETAIL 1118A
 NTS



SECTOR FIBER & POWER DISTRIBUTION BOX
 DC2-48-60-0-9E

DETAIL 1100
 NTS

SIZE AND WEIGHT TABLE

RRH	WIDTH	DEPTH	HEIGHT W/O CABLE MANAGEMENT COVER	WEIGHT W/O BRACKET
RRH 700 MHz 2X40 (80W)	12.2"	10.8"	21"	51 LBS.
RRH AWS 2X40 (80W)	12"	9"	25"	43 LBS. (W/O SOLAR SHIELD)

NOTE: DIMENSIONS INCLUDE MOUNTING BRACKET, SOLAR SHIELD AND CONNECTORS.

MINIMUM CLEARANCE TABLE

RRH CABINET	CLEARANCES (INCHES)	COMMENTS
FRONT	36"	INSTALLATION ACCESS
REAR	2"	ZERO REAR CLEARANCE IS ALLOWED USING SUPPLIED MOUNTING BRACKETS
RIGHT	4"	AIR FLOW
LEFT	4"	AIR FLOW
TOP	12"	AIR FLOW
BOTTOM	12"	CONDUIT ROUTING

ALCATEL-LUCENT 9442
 REMOTE RADIO HEAD (RRH)

DETAIL 1104
 NTS



BECHTEL COMMUNICATIONS
 5295 WESTVIEW DRIVE
 FREDERICK, MD. 21703
 PHONE: (301) 228-6000

SITE NAME: WALKER CHAPEL CHURCH
 SITE ID No.: 2856
 4102 N. OLD GLEBE ROAD
 ARLINGTON, VA 22207



7150 STANDARD DRIVE
 HANOVER, MD 21076

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	6/1/11	REVISED AS SHOWN	SHW	RWF	RFK
0	10/11/10	ISSUED FOR CONSTRUCTION	SHW	RWF	RFK

SCALE:	AS SHOWN	DESIGNED BY:	SHW	DRAWN BY:	SHW
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DETAILS	DRAWING NUMBER	REV
25471-430	T1-VA-2856-07	1

6

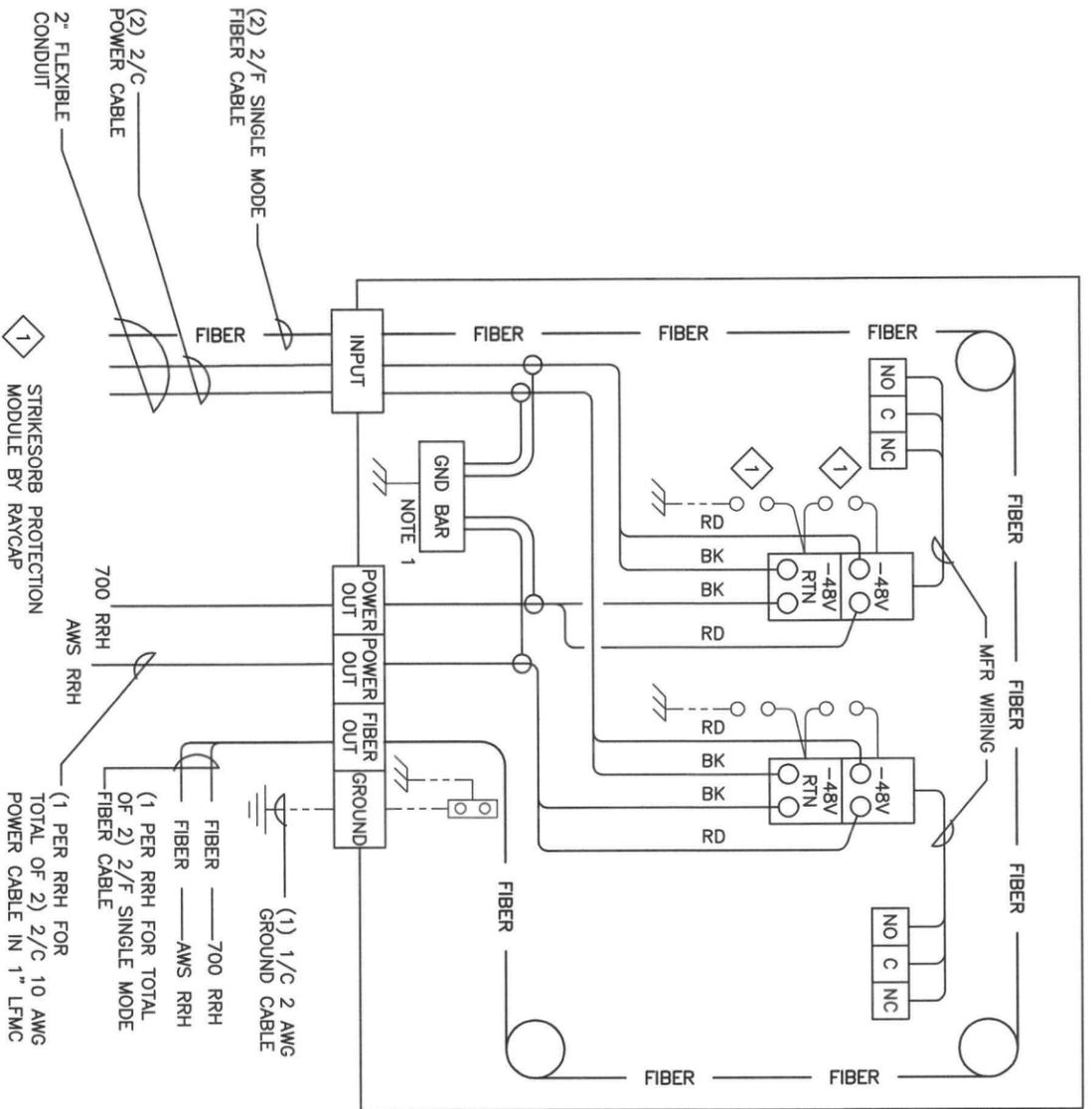
5

4

3

2

22 x 34" SIZE



CONNECTION DIAGRAM DC SURGE PROTECTION BOX
DC2-48-60-0-9E (BY RAYCAP)

DETAIL 1411
NTS

NOTES:

- FIELD INSTALL GROUND BAR TO ENCLOSURE PANEL SQUARE D PK7GTA OR SIMILAR.

1 STRIKESORB PROTECTION MODULE BY RAYCAP

(1) PER RRH FOR TOTAL OF 2) 2/F SINGLE MODE FIBER CABLE
700 RRH
FIBER — AWS RRH
FIBER — AWS RRH
(1) PER RRH FOR TOTAL OF 2) 2/C 10 AWG POWER CABLE IN 1" LFMC

(1) 1/C 2 AWG GROUND CABLE

700 RRH
FIBER — AWS RRH

(1) PER RRH FOR TOTAL OF 2) 2/F SINGLE MODE FIBER CABLE

AC POWER PANEL No. 1												
120/208 VOLTS, 3-PHASE, 4-WIRE, 200A												
SYSTEM VOLTAGE (M) : 208												
DESCRIPTION	VA	cmc	BKR	POSN	L1	L2	L3	POSN	BKR	cmc	VA	DESCRIPTION
RECTIFIER 1-1*	1550	c	30	1	3100			2	30	c	1550	RECTIFIER 2-1*
RECTIFIER 1-2*	1550	c	30	3	3100			4	30	c	1550	RECTIFIER 2-2* (FUTURE)
RECTIFIER 1-3*	1550	c	30	5	3100			6	30	c	1550	RECTIFIER 2-3* (FUTURE)
RECTIFIER 1-4*	1550	c	30	7	3100			8	30	c	1550	RECTIFIER 2-4* (FUTURE)
SMOKE DETECTOR	1550	c	30	9	3100			10	30	c	1550	OUTLETS
LIGHTS	240	c	20	13	600			14	20	nc	360	OUTLETS
AHU	720	nc	20	15		1080		16	20	nc	360	AIR COND
SPARE	312	nc	40	17				18	80	nc	3120	SPARE
RECTIFIER 1-1*	1550	c	30	20	3432			21	20	0	0	RECTIFIER 2-4* (FUTURE)
RECTIFIER 1-2*	1550	c	30	23	3100			24	30	c	1550	SPACE
RECTIFIER 1-3*	1550	c	30	25	3100			26	30	c	1550	SPACE
RECTIFIER 1-4*	1550	c	30	27				28	30	---	---	SPACE
SPACE	---	---	---	29				30	---	---	---	SPACE
PHASE TOTALS (VA):					13332	7280	12732					
CURRENT PER PHASE (A):					131	74	125	Legend: c = continuous, nc = non-continuous				
PANEL TOTAL (VA):					33344							

PANEL CAPACITY (kVA): 54.0

CONNECTED LOAD (kVA): 33.3

PANEL LOADING (100% non-cont. load) (kVA): 8.3

CONNECTED LOAD (kVA): 33.3

PANEL LOADING (125% continuous load) (kVA): 31.3

CONNECTED LOAD (kVA): 33.3

PANEL LOADING (TOTAL) (kVA): 39.6

CONNECTED LOAD (kVA): 33.3

SPARE CAPACITY (kVA): 14.4

CONNECTED LOAD (kVA): 33.3

- NOTES:
- RECTIFIERS ARE LINEAGE INFINITY 0 NE10DACC24. INPUT CURRENT IS 14.9A @208V.
 - NEW CIRCUITS ARE SHOWN IN BOLD WITH ASTERISK (*).
 - REPLACE EXISTING BREAKERS WITH BREAKERS RATED AS SHOWN FOR NEW CIRCUITS
 - NEW BREAKERS SHALL MATCH EXISTING BREAKER SHORT CIRCUIT RATING
 - DECOMMISSION EXISTING C&D DC POWER PLANT AND REMOVE BRANCH CIRCUIT WIRING FROM PANELBOARD
 - UPDATE PANEL DIRECTORY TO REFLECT NEW ARRANGEMENT



BECHTEL COMMUNICATIONS
5295 WESTVIEW DRIVE
FREDERICK, MD. 21703
PHONE: (301) 228-6000

SITE NAME: WALKER CHAPEL CHURCH
SITE ID No.: 2856
4102 N. OLD GLEBE ROAD
ARLINGTON, VA 22207

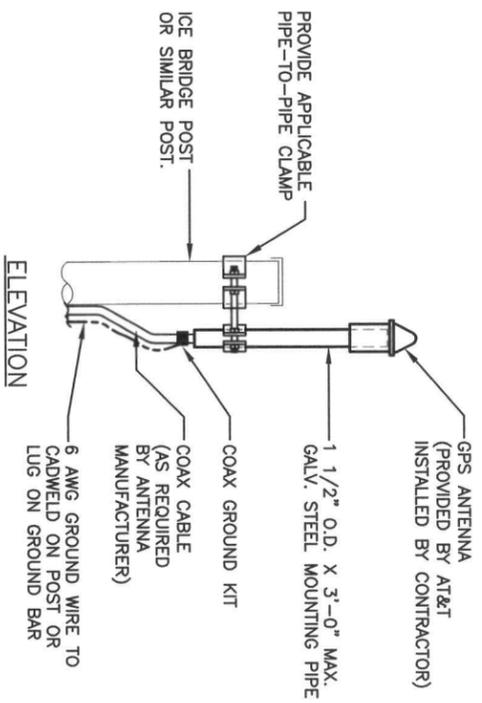


7150 STANDARD DRIVE
HANOVER, MD 21076

NO.	DATE	REVISIONS	DESIGNED BY: SHW	DRAWN BY: SHW
1	6/1/11	REVISED AS SHOWN	WJK	RWF
0	10/11/10	ISSUED FOR CONSTRUCTION	SHW	RWF



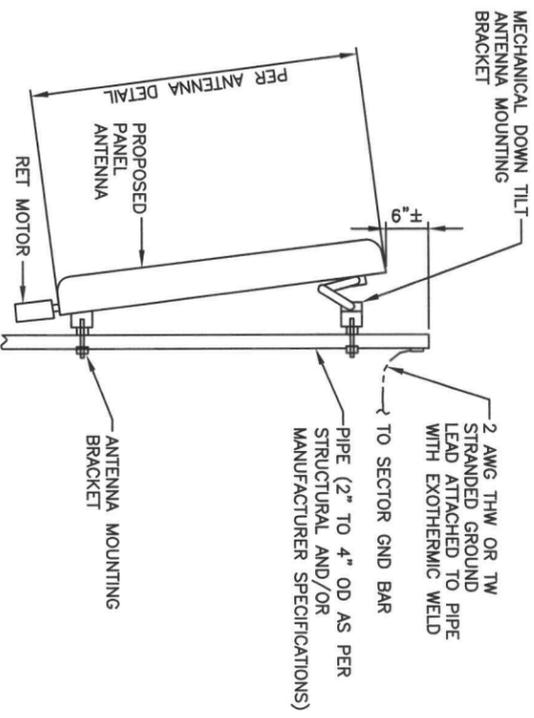
at&t
DETAILS
DRAWING NUMBER
25471-430
T1-VA-2856-08
REV 1



- NOTES:**
1. LOCATION OF ANTENNA MUST HAVE CLEAR VIEW OF SOUTHERN SKY AND CANNOT HAVE ANY BLOCKAGES EXCEEDING 25% OF THE SURFACE AREA OF A HEMISPHERE AROUND THE GPS ANTENNA.
 2. ALL GPS ANTENNA LOCATIONS MUST BE ABLE TO RECEIVE CLEAR SIGNALS FROM A MINIMUM OF FOUR (4) SATELLITES. VERIFY WITH HANDHELD GPS BEFORE FINAL LOCATION OF GPS ANTENNA.

**E911-GPS ANTENNA
PIPE MOUNT**

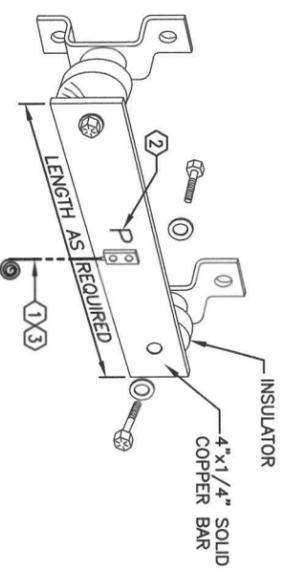
DETAIL 1121
NTS



ANTENNA MOUNTING DETAIL

DETAIL 1520
NTS

EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.



CONNECTION FOR:
COAXIAL CABLE SHIELD
CABLE ENTRY PORTS (HATCH PLATES)
24V & 48V DC POWER RETURN BAR
TELCO GROUND BAR

COAXIAL CABLE SURGE SUPPRESSORS
RECTIFIER FRAMES
GENERATOR FRAME WORK
MASTER GROUND BAR

DETAIL NOTES:

1. TWO-HOLE LONG BARREL COMPRESSION LUG WITH 2 AWG STRANDED COPPER CONDUCTOR AND GREEN THW INSULATION TO GROUND BAR. ROUTE CONDUCTOR AS APPLICABLE TO BURIED GROUND CONDUCTOR OR MASTER GROUND BAR AND CONNECT WITH TWO-HOLE LUG TO "P" SECTION.
2. USE PERMANENT MARKER TO LABEL THE WHOLE BAR AS "P" WITH 1" HIGH LETTERS.
3. FOR GROUND BAR LOCATED OUTDOORS, ON-GRADE ONLY, EXOTHERMICALLY WELD A 2 AWG BARE TINNED COPPER CONDUCTOR TO GROUND BAR AND EXOTHERMICALLY WELD TO BURIED GROUND CONDUCTOR.

SUPPLEMENTAL/SECTOR GROUND BAR

DETAIL 1124
NTS



BECHTEL COMMUNICATIONS
5295 WESTVIEW DRIVE
FREDERICK, MD. 21703
PHONE: (301) 228-6000

SITE NAME: WALKER CHAPEL CHURCH
SITE ID No.: 2856
4102 N. OLD GLEBE ROAD
ARLINGTON, VA 22207



7150 STANDARD DRIVE
HANOVER, MD 21076

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	6/1/11	REVISED AS SHOWN	WJK	RWF	RFK
0	10/11/10	ISSUED FOR CONSTRUCTION	SHW	RWF	RFK

SCALE: AS SHOWN
DESIGNED BY: SHW
DRAWN BY: SHW



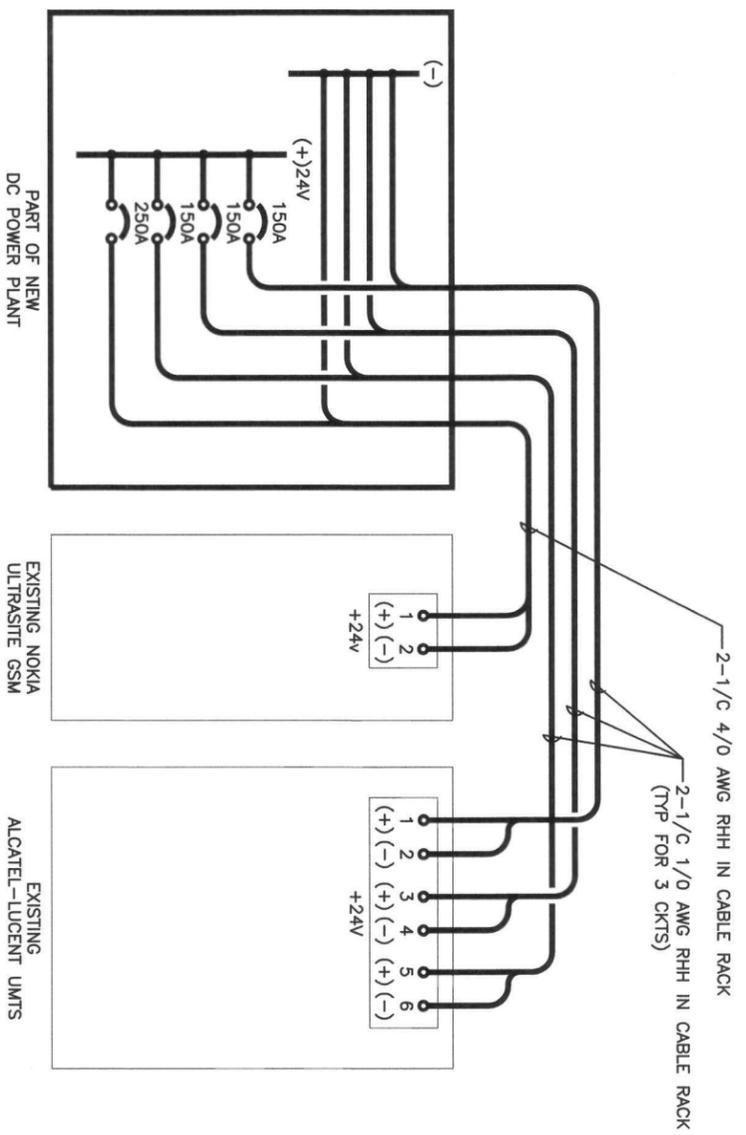
REV	DATE	DESCRIPTION
1	25471-430	T1-VA-2856-09



DETAILS

DRAWING NUMBER
T1-VA-2856-09

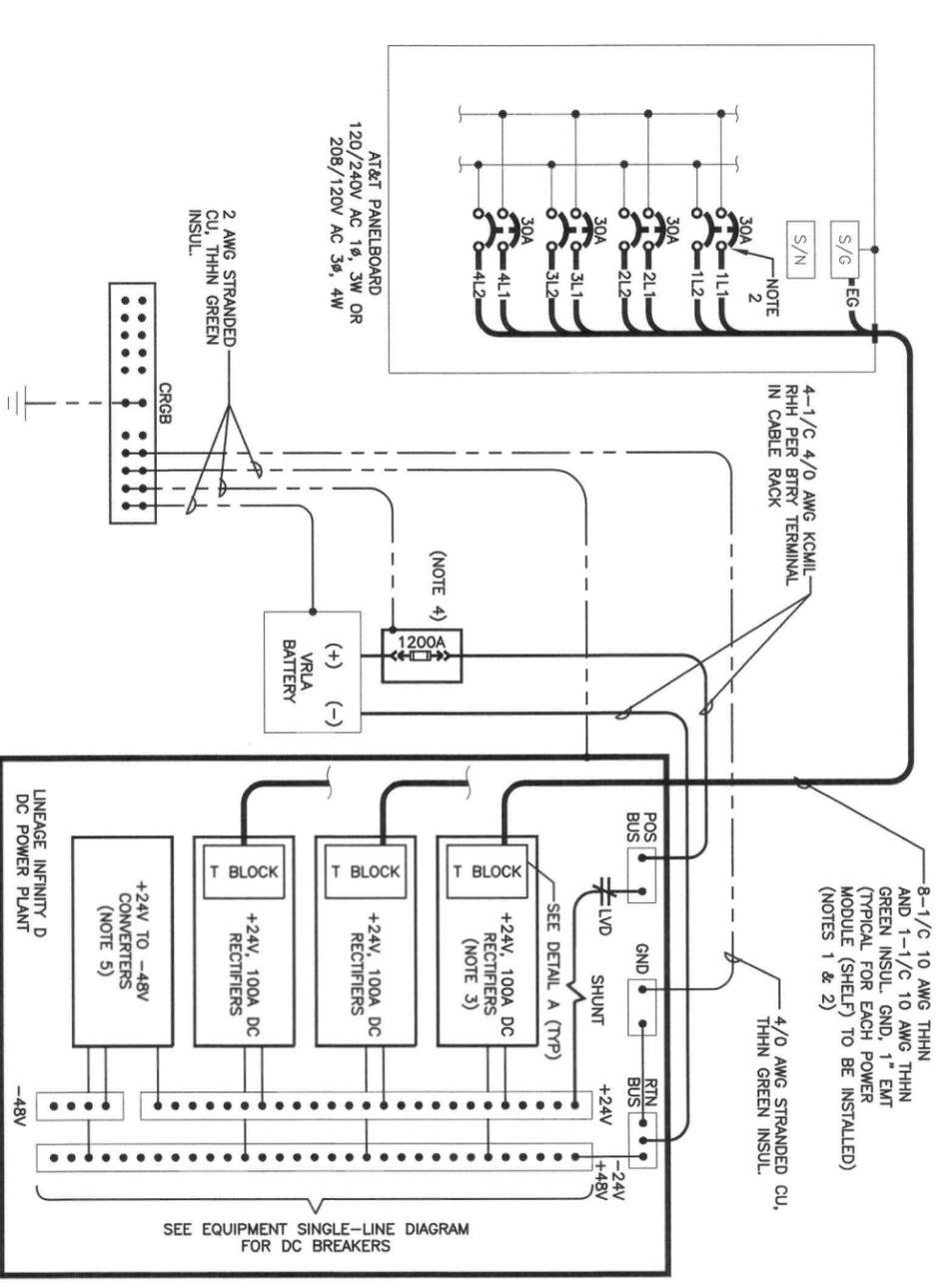
22 x 34" SITE



- NOTES:
1. CABLING SHOWN IS TYPICAL FOR EACH CABINET EXISTING AT THE SITE.
 2. PROVIDE (1) 250A BREAKER FOR EACH GSM CABINET AND (3) 150A BREAKERS FOR EACH UMTS CABINET.
 3. CABLE TO BTS SHALL BE FIRE RESISTANT HALOGEN-FREE, LOW-SMOKE RHH, COPPER FLEXIBLE CLASS B STRANDED, OR APPROVED EQUAL.
 4. DC POWER CABLES SHALL BE COLOR CODED AS FOLLOWS:
+24V SYS: POS = RED, RETURN (NEG) = GRAY
 5. MAXIMUM TOTAL FEEDER LENGTH OF UP TO 33 FEET FOR GSM & 35 FEET FOR UMTS. (CABLE LENGTHS ARE BASED ON 1.0 VOLT DROP MAXIMUM BETWEEN DC POWER PLANT AND BTS CABINET). FOR DISTANCES BETWEEN DC POWER PLANT & BTS EQUIPMENT EXCEEDING THESE LENGTHS, CONTACT ENGINEERING FOR RESOLUTION.

DC CABLE REPLACEMENT
TO EXISTING GSM & UMTS CABINETS

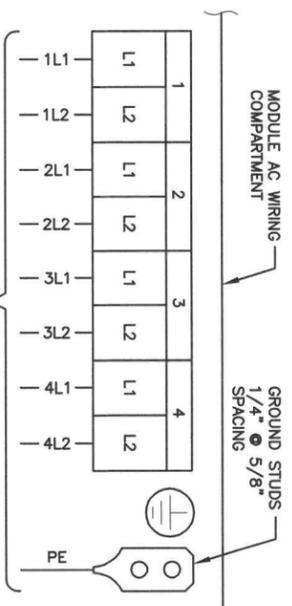
DETAIL 1427
NTS



- NOTES:
1. EACH POWER MODULE (SHELF) HAS (4) POSITIONS FOR RECTIFIERS. INSTALL CONDUIT AND CONNECT WIRING TO ALL FOUR RECTIFIER POSITIONS. THE QUANTITY OF ACTIVE RECTIFIERS SHALL BE DETERMINED BY OTHERS.
 2. INSTALL ONE 30A CIRCUIT BREAKER FOR EACH RECTIFIER TO BE INSTALLED. REFER TO PANEL SCHEDULE. UNTERMINATED WIRES IN THE PANELBOARD SHALL BE CAPPED AND COILED. BREAKER INTERRUPTING RATING SHALL MATCH PANELBOARD.
 3. DRAWING SHOWS ONE POWER MODULE (SHELF) AS A TYPICAL, PER MODULE, CIRCUIT DESIGN. SEE MWR/KITTING LIST FOR QUANTITY OF POWER MODULES TO BE DEPLOYED.
 4. INSTALL BATTERY FUSE OR BREAKER DISCONNECT AS SHOWN, UNLESS PROVIDED AS PART OF DC POWER PLANT.
 5. DC/DC CONVERTERS, IF REQUIRED, SEE MWR/KITTING LIST FOR QUANTITY OF CONVERTERS TO BE DEPLOYED.

AC SINGLE LINE DIAGRAM
FOR LINEAGE DC POWER PLANT
INDIVIDUAL FEED

DETAIL 1425
NTS



DETAIL A
TERMINAL BLOCK WIRING



BECHTEL COMMUNICATIONS
5295 WESTVIEW DRIVE
FREDERICK, MD. 21703
PHONE: (301) 228-6000

SITE NAME: WALKER CHAPEL CHURCH
SITE ID No.: 2856
4102 N. OLD GLEBE ROAD
ARLINGTON, VA 22207



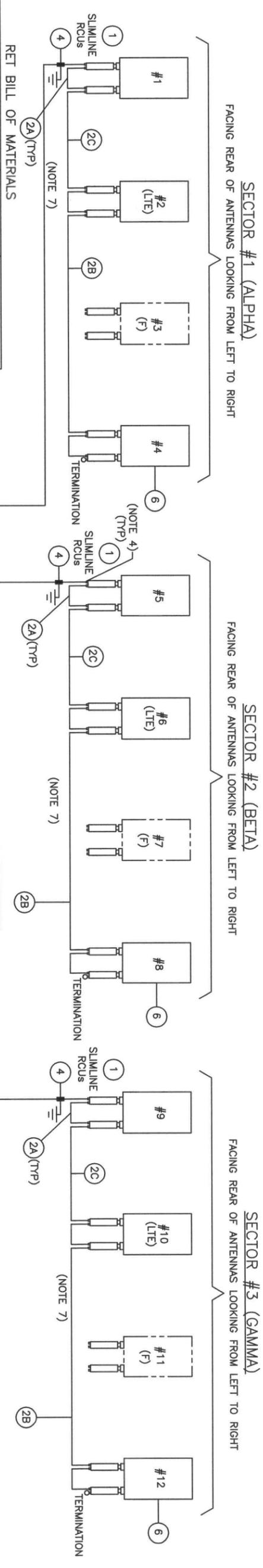
at&t Mobility
7150 STANDARD DRIVE
HANOVER, MD 21076

NO.	DATE	REVISIONS	DESIGNED BY: SHW	DRAWN BY: SHW
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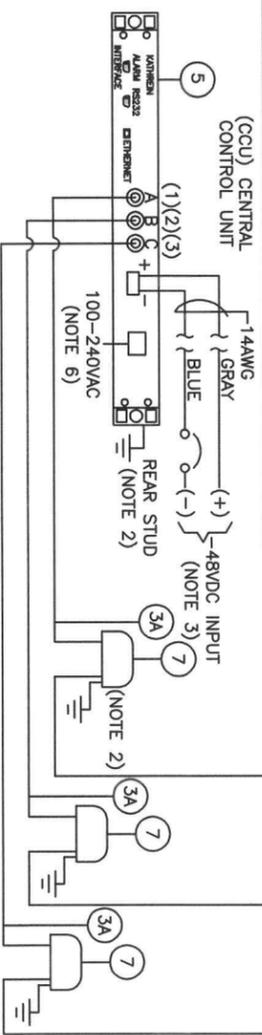


REV	DATE	DESCRIPTION	BY	CHK	APP'D
1					

SCALE: AS SHOWN
DRAWING NUMBER: 25471-430
DETAILS: T1-VA-2856-10
REV: 1



ITEM	DESCRIPTION	PART #	QTY.
1	REMOTE CONTROL UNIT (RCU) WITH DAISY CHAIN TERMINATION	NOTE 8	2 EACH PER ANTENNA
2A	RCUC--1G CONTROL CABLE ASSEMBLY BETWEEN RCU (1 M)	860-10056	1 PER ANTENNA
2B	RCUC--5G CONTROL CABLE ASSEMBLY BETWEEN ANTENNAS (5 M)	860-10059	AS REQ. BETWEEN ANTENNAS
2C	RCUC--2G CONTROL CABLE ASSEMBLY BETWEEN ANTENNAS (2 M)	860-10057	AS REQ. BETWEEN ANTENNAS
3	RCUC CONTROL CABLE ASSEMBLY	860-10007	1 PER SECTOR LENGTH AS REQUIRED
	RCU CABLE 3.3 FT. (1M)	860-10008	
	RCU CABLE 6.6 FT. (2M)	860-10009	
	RCU CABLE 16.4 FT. (5M)	860-10010	
	RCU CABLE 32.8 FT. (10M)	860-10011	
	RCU CABLE 82.7 FT. (25M)	860-10012	
	RCU CABLE 131.2 FT. (40M)	860-10033	
	RCU CABLE 1164.0 FT. (50M)	860-10013	
	RCU CABLE 196.9 FT. (60M)	860-10014	
	RCU CABLE 262.5 FT. (80M)	860-10015	
3A	CONTROL CABLE ASSEMBLY, LIGHTNING DEVICE TO CCU (2M) (NOTE 9)	ANT. 11439 860-10008	1 EACH PER SECTOR
4	CABLE GROUNDING KITS, 2FT., 6AWG FOR ASG CABLE	860-10031	3 PER SECTOR
5	CENTRAL CONTROL UNIT (CCU), -48VDC/100-240VAC	CEO. 25507 860-10006	1 EACH PER SITE
6	ANTENNAS: SEE RF DATA SHEET FOR APPROVED KATHREIN ADT ANTENNAS		AS REQUIRED
7	LIGHTNING PROTECTION DEVICE FOR RET	ANT. 11418 860-10030	1 EACH PER SECTOR



NOTE: REFER TO LATEST RF DATA REPORT FOR CORRECT POSITION OF LTE ANTENNAS.

TOWER TOP OR ROOF TOP

NOTES:

- SUPPORT RET CONTROL CABLE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS.
 - USE 16MM (6 AWG) STRANDED TO TELCO RACK GROUND BAR IF EXISTING. OTHERWISE CONNECT TO MGB (INDOOR SITES).
 - ROUTE DC POWER IN WIREWAY OR 3/4" IMC TO EXISTING -48VDC DISTRIBUTION PANEL. PROVIDE 5 AMP PROTECTIVE DEVICE WHEN DIRECTLY SUPPLYING CCU. DO NOT INSTALL ANY SINGLE CONDUCTOR WIRE SIZE 1 AWG OR SMALLER IN CABLE RACK.
 - APPLY ADHESIVE LINED 1" SHRINK TUBING 6" LONG (BLACK) TO EACH RET LIGHTNING CONTROL CABLE CONNECTION FROM APPROVED VENDOR.
 - TO FACILITATE WEATHERPROOFING OF ANTENNA CONNECTORS, THE RF COAX CABLES SHOULD BE INSTALLED AND WEATHERPROOFED PRIOR TO INSTALLING THE RET UNITS. TORQUE RET ANTENNA WITH 41MM WRENCH. MIN TORQUE 16 Nm MAX TORQUE 18Nm.
 - THE CCU IS TO BE POWERED WITH -48VDC WHENEVER POSSIBLE TO PROVIDE CONTINUOUS OPERATION IF BATTERY BACKUP ON THE DC PLANT IS AVAILABLE. THE AC POWER CONNECTION IS TO BE USED ONLY WHEN -48VDC IS NOT AVAILABLE.
 - INSTALLER TO USE EXTREME CAUTION WHEN MATING ASG CONNECTORS. OBSERVE THAT THE KEYPED CONNECTORS ARE ALIGNED BEFORE MATING AND TIGHTENING THE CONNECTOR TO THE REQUIRED TORQUE.
 - RET MOTORS CAN BE FACTORY INSTALLED IN KATHREIN ANTENNAS. PART NO. VARIES BY ANTENNA TYPE.
 - USE A MINIMUM 2 METER CABLE BETWEEN THE CCU AND LIGHTNING PROTECTOR TO ACHIEVE THE REQUIRED DECOUPLING.
 - FOR LENGTH OF CONTROL CABLES SEE SITE SPECIFIC DRAWINGS.
- (F) - FUTURE ANTENNA

RET CONTROL CABLE ASSEMBLY (CCU) CONTROL UNIT
 DIRECT CONNECTION CONFIGURATION
 3 SECTORS - 3 ANTENNA / SECTOR

DETAIL 1419



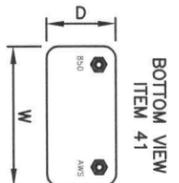
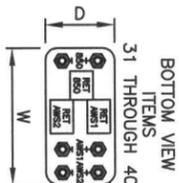
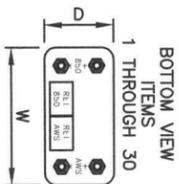
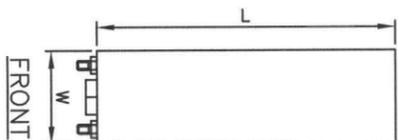
SITE NAME: WALKER CHAPEL CHURCH
 SITE ID No.: 2856
 4102 N. OLD GLEBE ROAD
 ARLINGTON, VA 22207



NO.	DATE	ISSUED FOR CONSTRUCTION	REVISIONS	DESIGNED BY	DRAWN BY
1	6/1/11	REVISED AS SHOWN		WJK	RWF
0	10/11/10	ISSUED FOR CONSTRUCTION		SHW	RWF



RET CONTROL DIAGRAM
 DRAWING NUMBER: T1-VA-2856-11
 REV: 1

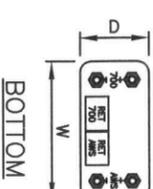
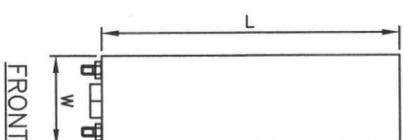


BOTTOM

ITEM#	MANUFACTURER	MODEL	BAND	FREQUENCIES, MHZ	POLARIZATION	RET	L, IN	W, IN	D, IN	WEIGHT, LB
22	ANDREW	DBXLH-6565B-VTM	DUAL	824-960 1710-2180	DUAL	COMPATIBLE	76.2	10.6	5.2	41.9
23	ANDREW	DBXLH-6565C-R2M	DUAL	824-960 1710-2180	DUAL	INSTALLED	101.3	10.6	5.2	48.8
24	ANDREW	DBXLH-6565C-VTM	DUAL	824-960 1710-2180	DUAL	COMPATIBLE	101.3	10.6	5.2	47.8
25	KATHREIN	742-264	DUAL	824-960 1710-2180	DUAL	COMPATIBLE	51.8	10.3	5.5	36.4
26	KATHREIN	742-265	DUAL	824-960 1710-2180	DUAL	COMPATIBLE	75.4	10.3	5.5	48.5
27	KATHREIN	742-266	DUAL	824-960 1710-2180	DUAL	COMPATIBLE	99.1	10.3	5.5	59.5
28	KATHREIN	800-10121	DUAL	824-960 1710-2180	DUAL	COMPATIBLE	54.5	10.3	5.9	46.3
29	KATHREIN	800-10122	DUAL	824-960 1710-2180	DUAL	COMPATIBLE	75.5	10.3	5.9	59.5
30	KATHREIN	800-10123	DUAL	824-960 1710-2180	DUAL	COMPATIBLE	103.7	10.3	5.9	72.8
31	KATHREIN	800-10292	DUAL	806-960 1710-2180	Dual x 3	COMPATIBLE	106.1	10.3	5.9	79.4
32	KATHREIN	742-241	DUAL	824-960 1710-2170	Dual x 3	COMPATIBLE	103.5	10.3	5.3	75.0
33	POWERWAVE	7780.00	DUAL	824-960 1710-2170	Dual x 3	COMPATIBLE	55.0	11.0	4.0	30.0
34	POWERWAVE	RA31.7780.00	DUAL	824-960 1710-2170	Dual x 3	INSTALLED	63.5	11.0	5.0	35.2
35	POWERWAVE	7782.00	DUAL	824-960 1710-2170	Dual x 3	COMPATIBLE	80.0	11.0	4.0	39.0
36	POWERWAVE	RA31.7782.00	DUAL	824-960 1710-2170	Dual x 3	INSTALLED	93.5	11.0	5.0	42.2
37	POWERWAVE	7785.00	DUAL	824-960 1710-2170	Dual x 3	COMPATIBLE	104.0	11.0	4.0	49.0
38	POWERWAVE	RA31.7785.00	DUAL	824-960 1710-2170	Dual x 3	INSTALLED	112.5	11.0	5.0	55.2
39	ANDREW	TBXLH-6565A-VTM	DUAL	824-960 1710-2180	Dual x 3	COMPATIBLE	52.1	18.3	6.2	40.9
40	ANDREW	TBXLH-6565A-R2M	DUAL	824-960 1710-2180	Dual x 3	INSTALLED	52.1	18.3	6.2	42.4
41	POWERWAVE	7850.00	DUAL	806-966 1850-1990	VERTICAL	NONE	52.0	11.0	5.0	26.4

850/AWS DUAL BAND DUAL POLARIZATION ANTENNA (TYP)

DETAIL 1501
NTS MODIFIED



BOTTOM

MANUFACTURER	MODEL	BAND	FREQUENCIES, MHZ	POLARIZATION	RET	L, IN	W, IN	D, IN	WEIGHT, LB
ANDREW	DBXNH-6565A-R2M	DUAL	698-896 1710-2180	DUAL	INSTALLED	50.8	11.9	7.1	34.2
ANDREW	DBXNH-6565B-R2M	DUAL	698-896 1710-2180	DUAL	INSTALLED	72.7	11.9	7.1	46.3
ANDREW	DBXNH-8565A-R2M	DUAL	698-896 1710-2180	DUAL	INSTALLED	51.1	11.9	7.1	32.0
ANDREW	DBXNH-8565B-R2M	DUAL	698-896 1710-2180	DUAL	INSTALLED	72.8	11.9	7.1	46.2
KATHREIN	800-10765 K	DUAL	698-894 1710-2170	DUAL	INSTALLED	75.5	11.8	6.0	51.8
KATHREIN	800-10721 K	DUAL	698-894 1710-2170	DUAL	INSTALLED	54.9	11.8	6.0	45.2
KATHREIN	800-10764 K	DUAL	698-894 1710-2170	DUAL	INSTALLED	55.2	11.8	6.0	40.8
KATHREIN	800-10722 K	DUAL	698-894 1710-2170	DUAL	INSTALLED	72.0	11.8	6.0	57.2
KATHREIN	800-10766 K	DUAL	698-894 1710-2170	DUAL	INSTALLED	96.0	11.8	6.0	61.7
KATHREIN	800-10723 K	DUAL	698-894 1710-2170	DUAL	INSTALLED	93.2	11.8	6.0	69.3
POWERWAVE	P65-15-XLH-RR	DUAL	698-894 1710-2170	DUAL	INSTALLED	51.0	12.0	5.0	30.0
POWERWAVE	P65-16-XLH-RR	DUAL	698-894 1710-2170	DUAL	INSTALLED	72.0	12.0	6.0	53.0
POWERWAVE	P90-14-XLH-RR	DUAL	698-894 1710-2170	DUAL	INSTALLED	48.0	12.0	6.0	30.0

LTE/UMTS/GSM DUAL BAND
DUAL POLARIZATION ANTENNA (TYP)

DETAIL 1500
NTS



BECHTEL COMMUNICATIONS
5295 WESTVIEW DRIVE
FREDERICK, MD, 21703
PHONE: (301) 228-6000

SITE NAME: WALKER CHAPEL CHURCH
SITE ID No.: 2856
4102 N. OLD GLEBE ROAD
ARLINGTON, VA 22207



7150 STANDARD DRIVE
HANOVER, MD 21076

NO.	DATE	ISSUED FOR CONSTRUCTION	REVISIONS	DESIGNED BY: SHW	DRAWN BY: SHW
1	6/1/11	REVISED AS SHOWN			
0	2/9/11	ISSUED FOR CONSTRUCTION			



ANTENNA DETAILS	DRAWING NUMBER	REV
25471-430	T1-VA-2856-12	1

6

5

4

3

2

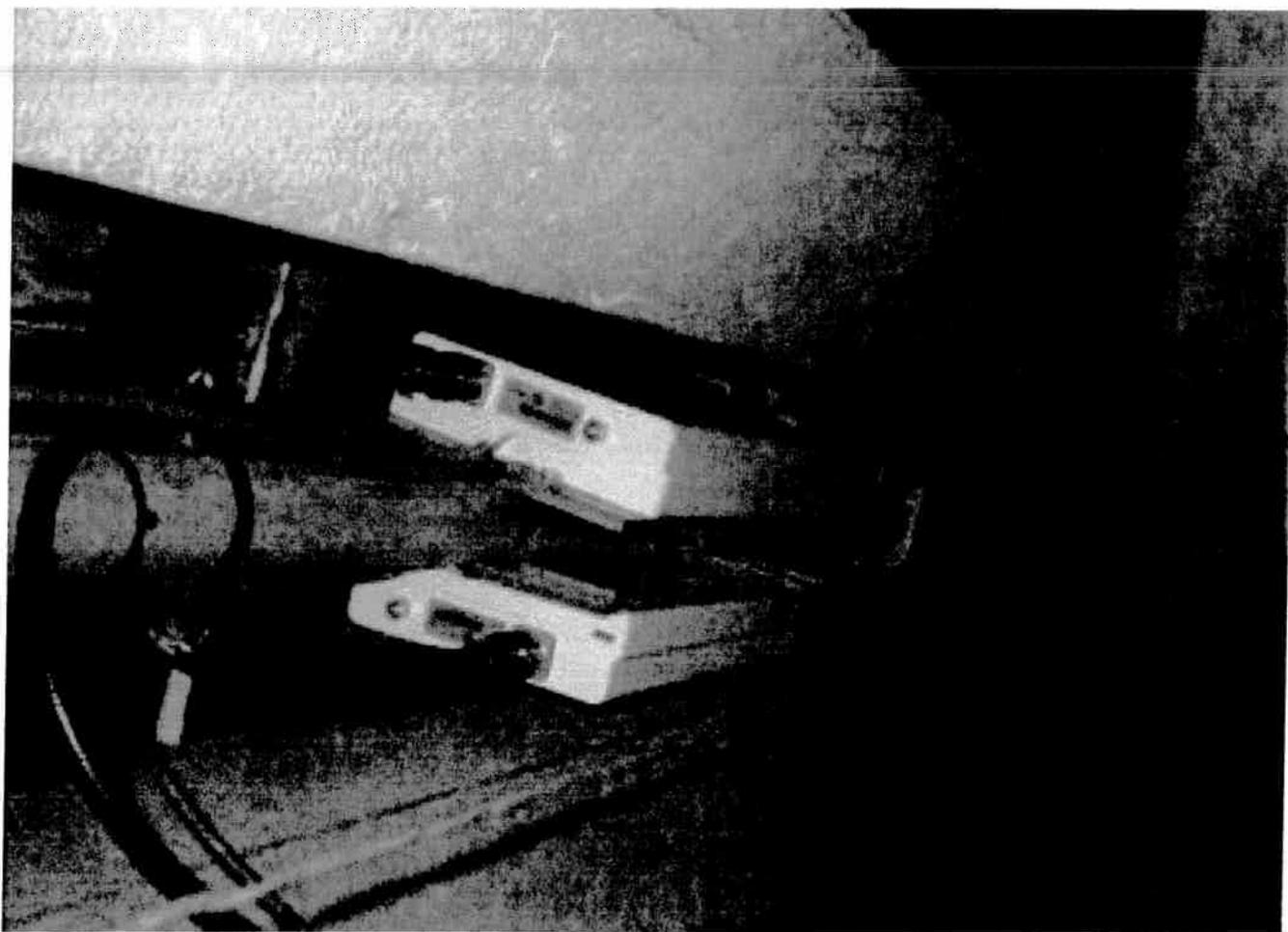
22 x 34 1/2 SIZE

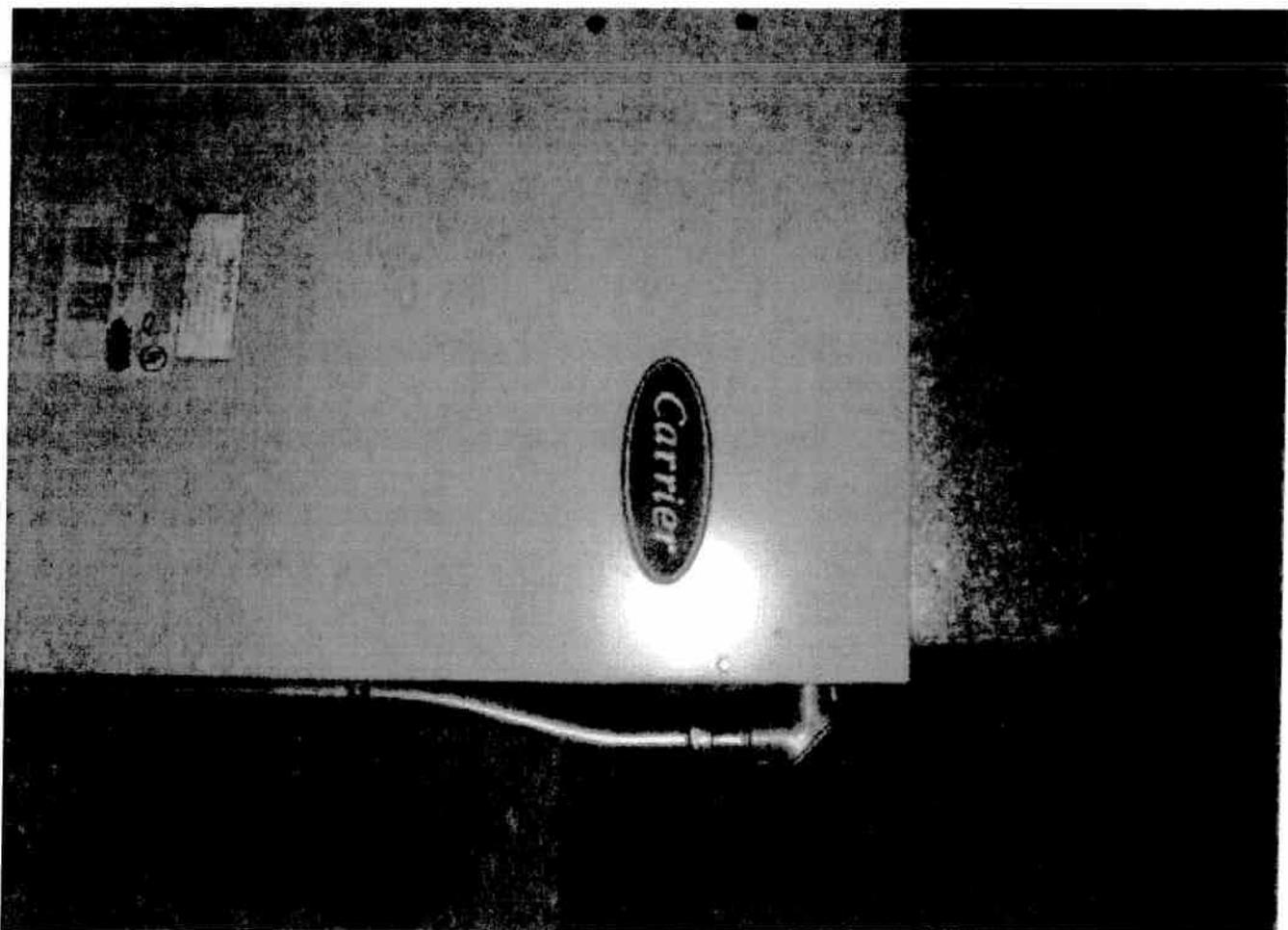
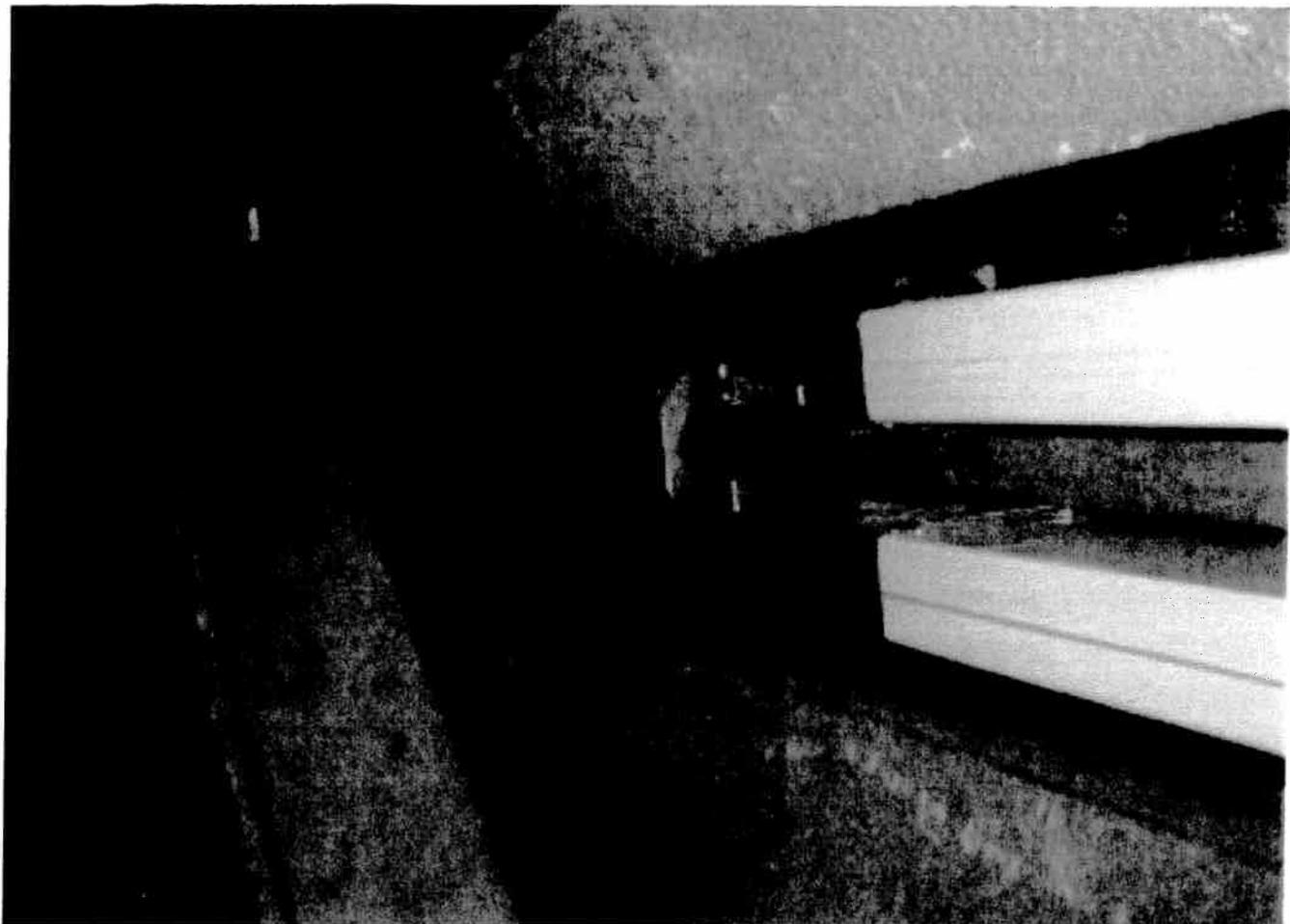
A

B

C

D





Electromagnetic Energy (“EME”) Measurement and Site Compliance Report



Prepared for



Site Information

US ID: 4056
Site Name: KENTUCKY DR
Address: 1125 NORTH PATRICK HENRY DRIVE,
ARLINGTON, VA, 22205

Survey Date: July 29, 2010
Surveyed By: Javad Jarrahi
M-RFSC: Sean Miller

Report Date: March 09, 2011



AT&T

US ID: 4056

Site Name: KENTUCKY DR

**Electromagnetic Energy (“EME”)
Measurement and Site Compliance Report**



**1125 NORTH PATRICK HENRY DRIVE,
ARLINGTON, VA, 22205**



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1 Summary

1.1 Introduction

AT&T has installed RF transmitting antennas at the following location (the “wireless telecommunications facility”):

Street Address: 1125 NORTH PATRICK HENRY DRIVE, ARLINGTON, VA, 22205

US ID: 4056

Construction ID: 2852

Latitude / Longitude: 38.881847 / -77.138189

Telnet, Inc performed an RF emission survey of the RF environment surrounding the facilities installed by AT&T at this location. The facility is located on a Church steeple.

AT&T is licensed by the Federal Communications Commission (“FCC”) to provide wireless communications services. As required by the FCC, wireless system operators perform an assessment of the potential human exposure to radio frequency emissions emanating from transmitting antennas at the site.

The physical survey verified antenna placement and technical specifications for accurate recommendations to determine compliance with FCC guidelines. Antenna specifications presented herein are based on direct evidence from an antenna or transmitter cabinet, information from the site manager or building manager, information from the licensees, educated estimates by the field technician or a combination of some or all of these sources.

1.2 Statement of Compliance

After evaluation of the total RF emission levels from all the operators and a thorough review of the site access procedures, signage and observable antenna locations, Telnet has determined that:

This site is compliant with FCC Policy.

AT&T contributes less than 5% of the maximum permissible exposure (MPE) based on theoretical modeling using the parameters supplied by the client.

The compliance determination is based on General Public MPE levels due to predicted and measured levels based on Spatial Averaging, RF signage placement, and the level of restricted access to the antennas at the site.



1.3 Safety Recommendations & Site Compliance Actions

This site is compliant with the FCC rules and regulations and no further steps are required at this time. Since AT&T contributes less than 5% of the MPE, should this site be non-compliant for any reason, all other operators who contribute greater than 5 % would all be liable to bring the site into compliance.

During the field visit, Telnet documented the presence and location of signs and barriers. Areas that require that action in order to meet AT&T corporate policy are listed below. No action means the location is compliant with the company policy.

Site Access Locations

No Action required

Alpha Sector Location

No Action required

Beta Sector Location

No Action required

Gamma Sector Location

No Action required

1.3.1 Lockout/Tagout Procedures for Antenna, Transmission Line and Power Amplifier Maintenance

Whenever anyone is working on an antenna, transmission line, high power amplifier (HPA), or multi-channel power amplifier (MCPA), the transmitter (power amplifier) MUST be turned off. This can be accomplished either locally by flipping a circuit breaker(s) or remotely by command from the NMC/NOC.

The person initiating or requesting the transmitter shutdown is the ONLY person authorized to restore the transmitter to service. This person is responsible for making sure that ALL work has been completed, that ALL cables have been properly reconnected, and that EVERYONE is clear of the work area before the transmitter is reactivated. Generally, this person is considered to be the one actually performing the work. In the case of a contractor working at an active site, the FE/Technician may initiate the request on behalf of the contractor.



1.3.2 Lockout/Tagout Procedure, Local Shutdown

After securing permission to shut the transmitter down, the Field Engineer (FE)/Field Technician (FT) will turn off the circuit breaker and verify that the correct transmitter was deactivated. The FE/FT will then place a locking device(s) over the circuit breaker(s) to prevent accidental activation by an unauthorized person and place a TAG on, or in the immediate vicinity of, the circuit breaker(s). The tag should state "Do Not Operate." At the NMC/NOC the same note, including date and time and location, must be entered in the computer or a tag must be placed on the monitor frame in such a manner that the console operator will be made aware that the transmitter can not be activated without permission from the person who initiated the maintenance request.

The FE/FT will turn the key(s) over to the person performing the work. Upon completion of the work, this person performing the task will return the key(s). As a precautionary measure, prior to reactivating the transmitter, the FE/FT MUST verify, to the extent possible, that all connections have been made and that the work area is clear of personnel.

1.3.3 Lockout/Tagout Procedure, Remote Shutdown

After requesting the NMC/NOC to shut the transmitter down, the FE/FT will verify that the correct transmitter was deactivated. The FE/FT will then place a TAG on or in the immediate vicinity of transmitter. The tag should state "Do Not Operate." At the NMC/NOC the same note, including date/time, must be entered in the computer or a tag must be placed on the monitor frame in such a manner that the console operator will be made aware that the transmitter can not be activated unless the following conditions are met: 1) The tag has been removed by the person performing the work; and 2) Permission is provided by the person who initiated the maintenance request.

Upon completion of the work, the person performing the task will remove the tag and notify the FE/FT that the work is completed. As a precautionary measure, prior to requesting reactivation of the transmitter, the FE/FT MUST verify, to the extent possible, that all connections have been made and that the work area is clear of personnel.

Note: Even though normal procedures call for a remote shutdown, if it is possible to turn off the circuit breaker without causing a software reload or other similar problems the FE/FT should follow the local shut down procedure.



1.4 Site Measurements

The site survey crew has provided the sketch of the rooftop with a visual representation of the RF environment at the site and depict antenna locations and rooftop structures. Figure 3 depict the surveyed measurements in percentage of MPE limits for General Population standards. Percentages greater than 100% exceed the FCC MPE limits. Section 4.5 contains actual spatially averaged MPE measured at each reference point.

Additional Information in the Site Layout Diagram

The RF emissions diagram provides indications of RF Signage, barriers and locked doors.

RF Signage & Barrier Key					
RF Signage			Barriers		
Type	Existing Location	Recommended Location	Type	Existing Location	Recommended Location
Notice	NE	NR	Locked Door	LE	LR
Caution	CE	CR	Fencing	RE	RR
Warning	WE	WR	Rope Chain		
Information Sign 1	I1E	I1R	Paint Stripes		
Information Sign 2	I2E	I2R	Tape		
Information Sign 3	I3E	I3R			
Information Sign 4	I4E	I4R			

Table 1
RF Signage & Barrier Key

1.5 Roof Level Measurements

Figure 1 represents the actual readings at various points on the rooftop. These measurements depicts the energy levels that can be encountered by an individual at the site.

Maximum value for Occupational Standard based on Spatial Averaging: 0.11%

Maximum value for General Population Standard based on Spatial Averaging: 0.55%

Result Summary : AT&T is Compliant with FCC Policy based on General Public Maximum Permissible Exposure

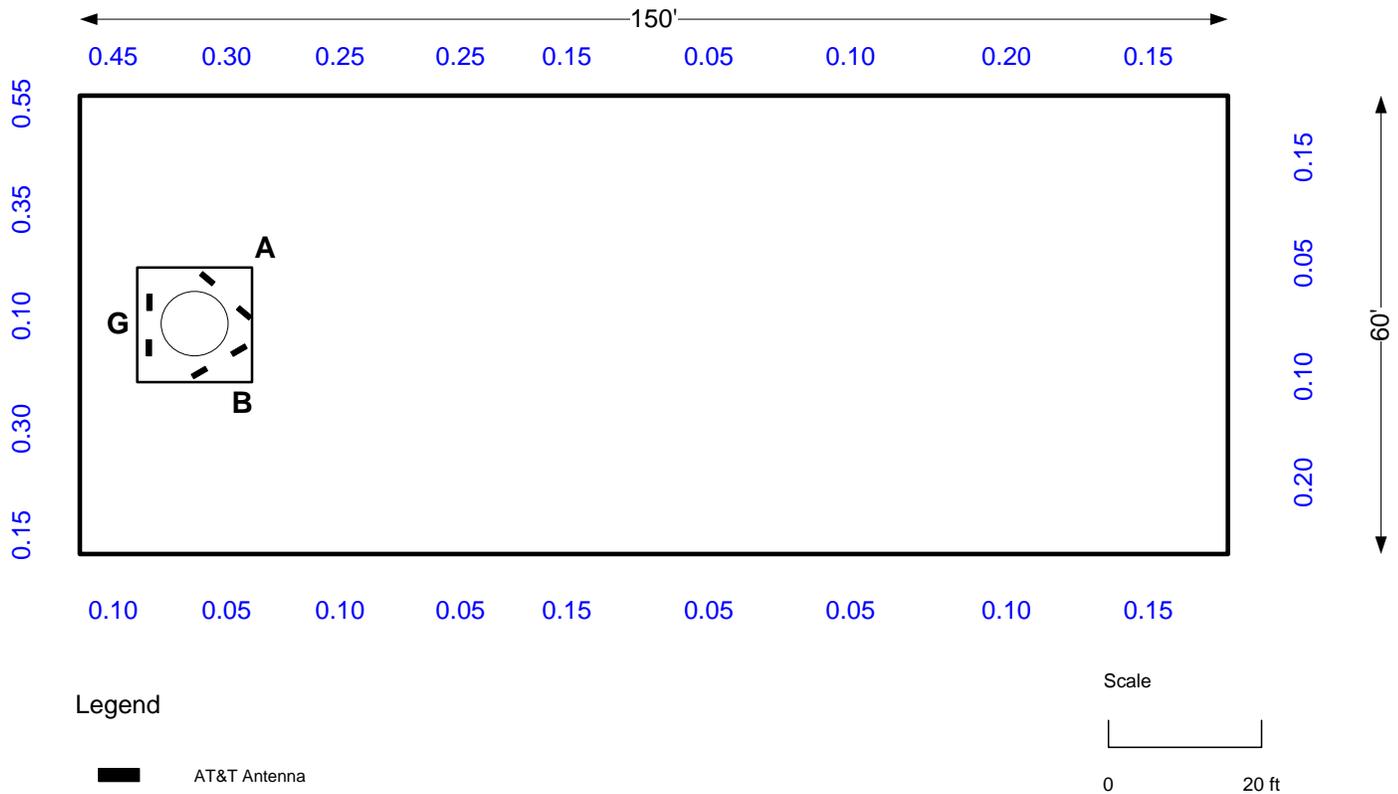


Figure 1
Numbers in Blue are the Percentage (%) of MPE Limits for General Population Standard



1.6 RF Modeling

The modeling calculations assume that the antennas are operating at 100% capacity; that all antenna channels are transmitting simultaneously and that the radio transmitters are operating at full power. Obstructions (trees, buildings etc) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the measurement conclusions.

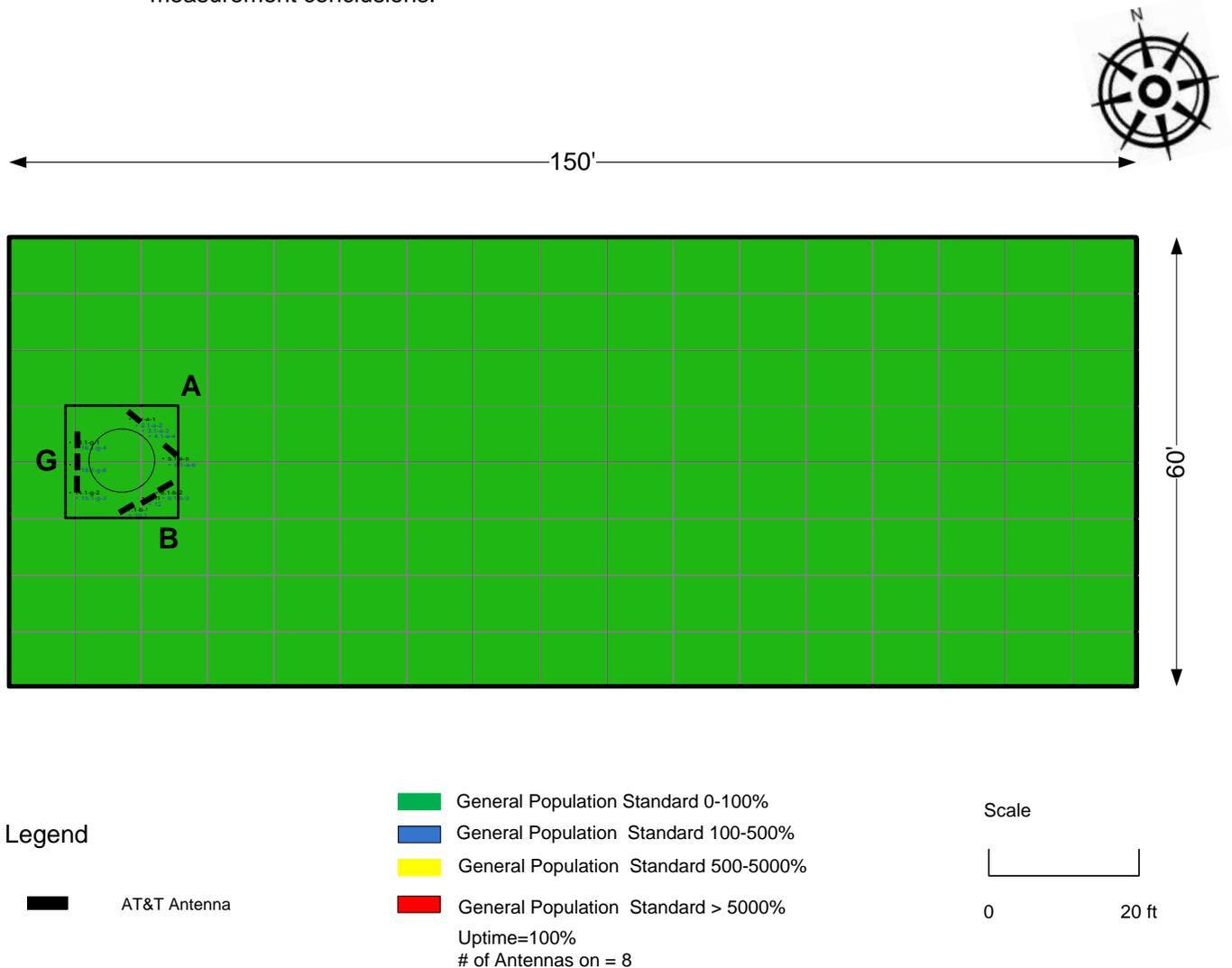
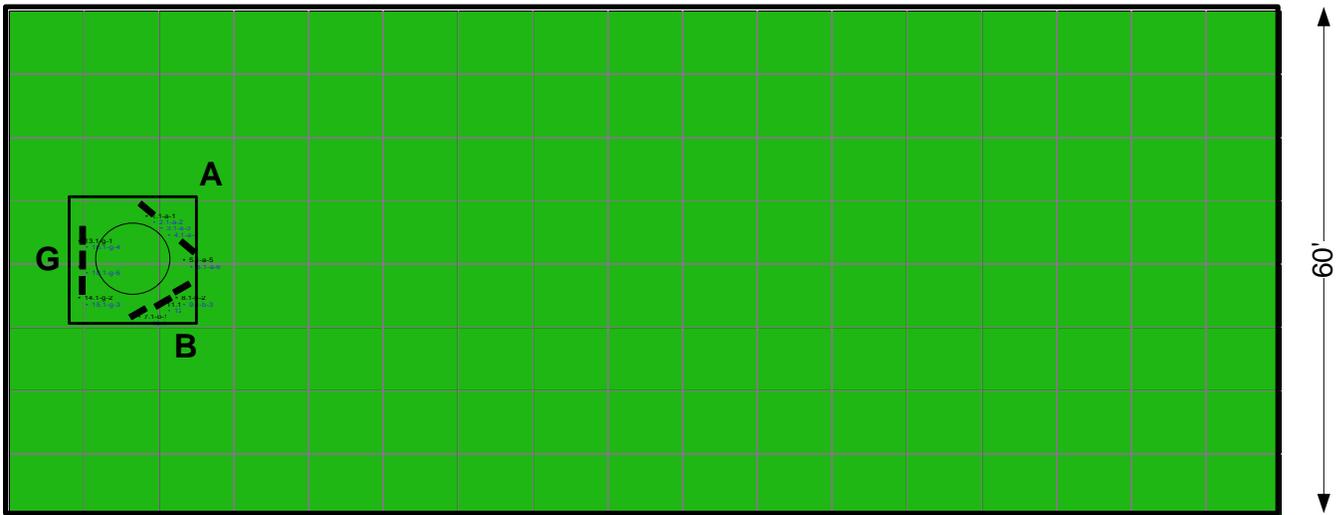


Figure 2
Percent of FCC General Population Exposure Limit, All carriers including proposed LTE



← 150' →



Legend

-  AT&T Antenna
 -  General Population Standard 0-5%
 -  General Population Standard >5%
- Uptime=100%
of Antennas on = 8

Scale



Figure 3
5% FCC Exposure Limit, AT&T



2 Site Configuration

A survey was performed on 07/29/2010 to determine the RF emission levels present at the site. Measurements were performed on the areas considered accessible to the occupational population. At this site, additional steps were taken to assess areas accessible to the general population. The results of the measurements were the combined energy levels of AT&T antennas. To measure the RF emissions within the vicinity, Telnet, inc, utilized NARDA E Field Probe Model EA5091, Frequency Range 300 KHz - 50 GHz with NARDA Electromagnetic Survey Meter Model NBM-550. Calibration was performed by Narda Safety Test Solutions on July 07, 2009 for a total interval of 24 month.

Relevant administrative and compliance-related information about the antenna site rooftop area is summarized in the table below :

Rooftop Access	
Access Method	Stairs lead to the steeple
Access to Keys	Yes
Door Locked	Yes
Collocation Status	
	Not Collocated
Rooftop Area Classification	
	General Population
Weather Conditions	
	Sunny / Clear

2.1 Antenna Inventory

The Antenna Inventory shows all transmitting antennas on the site (see Table 1). This inventory was verified on site and was used by Telnet to perform software modeling of RF emissions . The inventory coincides with the site diagrams on this report, identifying each antennas location at the site.

For other carriers at the site, the use of “Generic” as an antenna model, or “ Unknown” for an operator means the information with regard to the carrier, their FCC license and / or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



Antenna Number	Operator	Type	TX Freq (MHz)	ERP (Watts)	Gain (dBd)	Model	Azimuth (deg.)	Length (ft)	Horizontal Beam-width (Deg.)	X	Y	Z
1-a-1	AT&T	Panel	850	208.3	8.80	Kathrein SP-13445	30	6.3	65	19	48	130
1-a-2	AT&T	Panel	1900	335.0	11.2	Kathrein SP-13445	30	6.3	65	19	48	130
1-a-3	AT&T	Panel	850	368.7	8.80	Kathrein SP-13445	30	6.3	65	19	48	130
1-a-4	AT&T	Panel	1900	593.0	11.2	Kathrein SP-13445	30	6.3	65	19	48	130
1-a-5	AT&T	Panel	700	398.1	8.40	Kathrein 84010525-700	15	2.0	65	24	41	130
1-a-6	AT&T	Panel	2100	966.1	10.7	Kathrein 84010525-AWS	15	2.0	65	24	41	130
1-b-1	AT&T	Panel	850	208.3	8.80	Kathrein SP-13445	150	6.3	65	18	32	130
1-b-2	AT&T	Panel	1900	335.0	11.2	Kathrein SP-13445	150	6.3	65	23	35	130
1-b-3	AT&T	Panel	850	368.7	8.80	Kathrein SP-13445	150	6.3	65	23	35	130
1-b-4	AT&T	Panel	1900	593.0	11.2	Kathrein SP-13445	150	6.3	65	18	32	130
1-b-5	AT&T	Panel	700	398.1	8.40	Kathrein 84010525-700	135	2.0	65	21	34	130
1-b-6	AT&T	Panel	2100	966.1	10.7	Kathrein 84010525-AWS	135	2.0	65	21	34	130
1-g-1	AT&T	Panel	850	208.3	8.80	Kathrein SP-13445	270	6.3	65	10	44	130
1-g-2	AT&T	Panel	1900	335.0	11.2	Kathrein SP-13445	270	6.3	65	10	35	130
1-g-3	AT&T	Panel	850	368.7	8.80	Kathrein SP-13445	270	6.3	65	10	35	130
1-g-4	AT&T	Panel	1900	593.0	11.2	Kathrein SP-13445	270	6.3	65	10	44	130
1-g-5	AT&T	Panel	700	398.1	8.40	Kathrein 84010525-700	255	2.0	65	10	40	130
1-g-6	AT&T	Panel	2100	966.1	10.7	Kathrein 84010525-AWS	255	2.0	65	10	40	130

**Table 2
Antenna Inventory
RFDS Version: LTE_V04.0**



2.2 AT&T Site Specifications

AT&T will be operating in four different frequency bands – the 700 MHz, 850 MHz, 1900 MHz & 2100 MHz- and plans to use three different technologies called GSM, UMTS, LTE.

The table below summarizes the relevant technical data for the site.

Wireless Provider	AT&T
Frequency	850 Mhz
Antenna Manufacture & Model	Kathrein-SP-13445
Maximum Gain	10.95 dBi
RF Channels Per Sector (Max)	8 (GSM), 2 (UMTS)
Max. Trans Power / RF Channel	46 Watts
Antenna Centerline Postion Above Ground Level (A,B,G)	131', 131', 131'
Antenna Orientation	30, 150, 270 degrees
Wireless Provider	AT&T
Frequency	1900 Mhz
Antenna Manufacture & Model	Kathrein-SP-13445
Maximum Gain	13.39 dBi
RF Channels Per Sector (Max)	8 (GSM), 2 (UMTS)
Max. Trans Power / RF Channel	46 Watts
Antenna Centerline Postion Above Ground Level (A,B,G)	131', 131', 131'
Antenna Orientation	30, 150, 270 degrees
Wireless Provider	AT&T
Frequency	700 Mhz
Antenna Manufacture & Model	Kathrein-84010525-700
Maximum Gain	13.15 dBi
RF Channels Per Sector (Max)	1 (LTE)
Max. Trans Power / RF Channel	46 Watts
Antenna Centerline Postion Above Ground Level (A,B,G)	131', 131', 131'



Antenna Orientation	15, 135, 255 degrees
Wireless Provider	AT&T
Frequency	2100 Mhz
Antenna Manufacture & Model	Kathrein-84010525-AWS
Maximum Gain	17 dBi
RF Channels Per Sector (Max)	1 (AWS)
Max. Trans Power / RF Channel	46 Watts
Antenna Centerline Postion Above Ground Level (A,B,G)	131', 131', 131'
Antenna Orientation	15, 135, 255 degrees

**Table 3
Site Specifications**

3 Photos of Rooftop and Antennas

3.1 AT&T Existing Sectors



AT&T Sector 1



AT&T Sector 2



AT&T Sector 3



AT&T BTS on the ground / inside church building



3.2 Signs and Access to the Site

Required RF signs include an information sign and all access locations were checked.

Pictures below show the access door.



Steeple access door 1



Steeple access door 2



4 Modeling Summary and Assumptions

4.1.1 General Model Assumptions

In this report, it is assumed that all antennas are operating at full power at all times. Software modeling was performed for all transmitting antennas located on the site. Telnet, Inc has further assumed a 100% duty cycle and maximum radiated power.

The site has been modeled with these assumptions to show the maximum RF energy density. Telnet Inc believes this to be a worst case analysis, based on best available data.

If at any time power density measurements were to be made, Telnet Inc believes the real time measurements would indicate levels below those shown in this report. By modeling in this way, we have conservatively shown exclusion areas (areas not to be entered without a personal RF monitor, carriers reducing power or performing real time measurements to show real time exposure levels).

4.1.2 Use of Generic Antennas

For the purposes of this report, the use of 'Generic' as an antenna model, or 'Unknown' for a wireless carrier, means that the information about the carrier, their FCC license and/ or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Telnet will use our industry specific knowledge of equipment, antenna models and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, remodeling of the site is recommended. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.



4.1.3 Statistical Summary

Statistical Summary		
%MPE	SQ. FT	%SQ. FT.
	13600	100.00 % of total ROOF Area
0-100	13600	100.00 % of Selected Area
101 - 500	0	0.00 % of Selected Area
501 - 5000	0	0.00 % of Selected Area
> 5000	0	0.00 % of Selected Area
<p>Roof Area 13600 sq. ft. Max %MPE 3.1 % Min %MPE 0.0 % Using Near/Far Spatial Avg Model With FCC 1997 Public Standard</p>		

Table 4 Percent of FCC General Population Exposure Limit, All carriers

Statistical Summary		
%MPE	SQ. FT	%SQ. FT.
	13600	100.00 % of total ROOF Area
0-5	13600	100.00 % of Selected Area
6 - 500	0	0.00 % of Selected Area
501 - 5000	0	0.00 % of Selected Area
> 5000	0	0.00 % of Selected Area
<p>Roof Area 13600 sq. ft. Max %MPE 3.1 % Min %MPE 0.0 % Using Near/Far Spatial Avg Model With FCC 1997 Public Standard</p>		

Table 5 Percent of FCC General Population Exposure Limit, AT&T proposed



5 Survey Methodology

5.1 Sampling Description

The rooftop area of the site under evaluation was laid out in a grid of measurement points. Measurements were performed every 5-10' at various locations on the rooftop. The measurements were performed using industry-accepted techniques described in FCC Bulletin OET-65. At each measurement point identified where measurement was over 20%, a spatially averaged measurement is collected over the height of an average human body. The survey meter performs a time average measurement while the user slowly moves the probe over a distance range of 0 cm to 200 cm (about six feet) above the rooftop level. The results recorded at each measurement location include the average values over the spatial distance. The analysis included all emitters aggregated by carrier and height that were indicated to be present.

6 Analysis and Computation

Based on emission patterns of the antennas at this location most of the energy emitted is spread towards the horizon. This assumes the antennas have a zero downtilt. If a mechanical downtilt other than zero is applied to the antennas then the maximum energy emitted will need to be calculated using the information below.

The following formulas can be used for calculating the power density.

Power density is calculated by dividing the surface area of the sphere or the unit area normal to the direction of the propagation. This information is usually shown in units of microwatts per square centimeter (uW/cm²), milliwatt per square centimeters (mW/cm²), or watts per square meter (W/m²).

6.1 Analysis

$$S = \frac{(P \times KFact)}{(2\pi Rh)}$$

where :

S = power density (mW/cm²)

P = total power input to the antenna (mW)

K = antenna correction factor / numeric factor for antenna discrimination

R = straight line distance of the antenna from a 6 ft. human (cm)

h = distance between the roof level and the bottom of the antenna (cm) or the vertical distance from the tip of the antenna to the roof level where a 6 ft. human being is assumed standing directly from the antenna (also equal to R at 0)

MPE% = Calculated exposure level, as a percentage of the FCC MPE limit for continuous exposure of the general population



7 FCC Limits for MPE

The FCC guidelines for human exposure to RF electromagnetic fields were derived from the recommendations of two expert organizations, the National Council on Radiation Protection and Measurements (“NCRP”) and the Institute of Electrical and Electronics Engineers (“IEEE”). The exposure guidelines are based on thresholds for known adverse effects and they incorporate appropriate margin of safety. The federal health and safety agencies such as: the Environmental Protection Agency (“EPA”), the Food and Drug Administration (“FDA”), the National Institute on Occupational Safety and Health (“NIOSH”) and the Occupational Safety and Health Administration (“OSHA”) have also been actively involved in monitoring and investigating issues related to RF exposure.

The FCC’s MPE limits are based on exposure limits over a wide range of frequencies recommended by the NCRP and the exposure limits developed by the IEEE and adopted by the American National Standards Institute (“ANSI”) to replace the 1982 ANSI guidelines. The limits for localized absorption are based on the recommendations of both the ANSI/IEEE and the NCRP. The potential hazard associated with the RF electromagnetic fields is discussed in OET Bulletin No. 56 “Questions and Answers about the Biological Effects and Potential Hazards of RF Electromagnetic Fields”. This document can be obtained on the FCC website at <http://www.fcc.gov>.

Sections 7.1, 7.2 and 7.3 represent the FCC limits for both occupational and general population exposures to different radio frequencies:

7.1 (A) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6



7.2 (B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz

*Plane-wave equivalent power density

NOTE 1: **Occupational/controlled** limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2: **General population/uncontrolled** exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

7.3 Controlled and Uncontrolled Exposure Limits

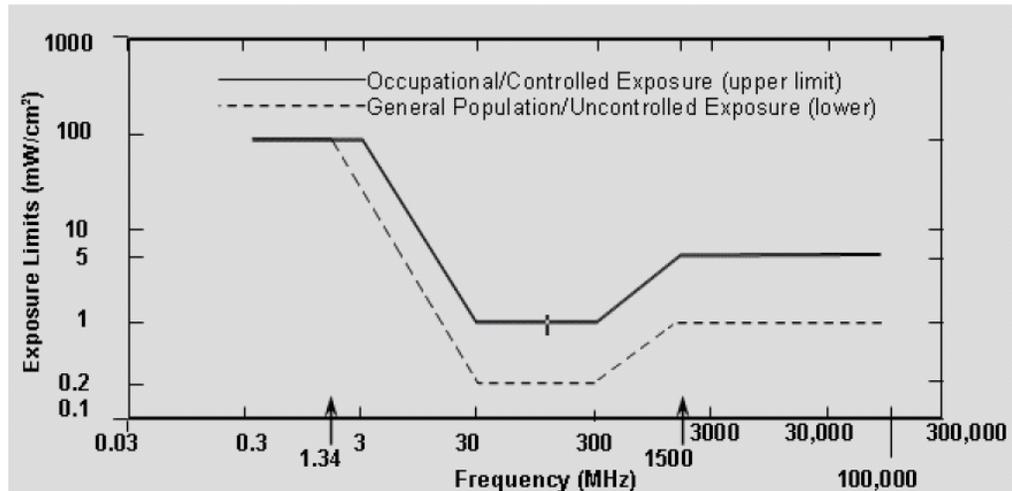


Figure 3



8 FCC Standard Certification

This report certifies that the site KENTUCKY DR – 4056 is in compliance with the FCC standard. The analysis and procedure used to provide the report is according to OET Bulletin 65 and other industry standards.

Prepared by:
Steven Fruit
RF Technician
Telnet Inc.

Date: 03/09/11

Reviewed by:
Boris Lublinsky
Project Manager, EMF Specialist
Telnet Inc.

Date: 03/09/11



9 Glossary of Terms

1. *Electromagnetic Field (energy density)* – the electromagnetic energy contained in an infinitesimal volume divided by that volume.
2. *Exposure* – Exposure occurs whenever and wherever a person is subjected to electric, magnetic or electromagnetic fields other than those originating from physiological processes in the body and other natural phenomena.
3. *General Population / Uncontrolled Exposure* – applies to human exposure to RF fields when the general public is exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public always fall under this category when exposure is not employment-related.
4. *Maximum Permissible Exposure (MPE)* – the rms and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed without harmful effect and with an acceptable safety factor.
5. *Occupational / Controlled Exposure* – applies to human exposure to RF fields when persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/controlled limits.
6. *Power Density (S)* – Power per unit area normal to the direction of propagation, usually expressed in units of watts per square meter (W/m^2) or, for convenience, units such as milliwatts per square centimeter (mW/cm^2) or microwatts per square centimeter ($\mu W/cm^2$).
7. *Ionization* – a process by which electrons are stripped from atoms and molecules. This process can produce molecular changes that can lead to damage in biological tissue, includes effect on DNA, the genetic material. This process requires interaction with high levels of electromagnetic energy.
8. *Non-Ionizing radiation* – a type of emission that is not great enough to cause ionization of atom and molecules. “RF and Microwave Emissions” are low-level energy which are not capable of ionization.



10 Appendix

Narda Safety Test Solutions
435 Moreland Road, Hauppauge, NY 11788
Phone: 631-231-1700 · Fax: 631-231-1711
E-mail: nardaeast@L-3com.com
www.nardamicrowave.com



Calibration Certificate

Narda Safety Test Solutions hereby certifies that the referenced equipment has been calibrated by qualified personnel to Narda's approved procedures. The calibration was carried out within a certified quality management system conforming to ISO 9001:2000.

The metrological confirmation system for test equipment complies with ISO 10012-1.

Object	Electric Field Probe EA5091
Part Number (P/N)	2402/07
Serial Number (S/N)	01006
Manufacturer	Narda Safety Test Solutions
Date of Calibration	Tue 07/Jul/2009 13:10:41
Results of Calibration	Test Results within Specification
Confirmation interval (recommended)	24 Months
Ambient Conditions	(23 +/-3)°C (40..60)% rel. humidity
Calibration Procedure	ATE Software 990199 Ver. 1.49
Probe Definition File Set	P/N 990199-04 Ver. 1.06
Results Filed Under	EA5091_01006_07Jul2009.txt

Hauppauge, NY

Calibrated by

Quality Assurance

This certificate may only be published in full, unless permission for the publication of an approved extract has been obtained in writing from the Director of Quality Assurance.

Certificate No. 01006_07Jul2009.txt

Date of issue: 07/Jul/2009

Page 1 of 6



Narda Safety Test Solutions GmbH
Sandwiesenstrasse 7 · D-72793 Pfullingen · Germany
Phone: +49-7121-9732-0 · Fax: +49-7121-9732-790



Calibration Certificate

Narda Safety Test Solutions GmbH hereby certifies that the referenced equipment has been calibrated by qualified personnel to Narda's approved procedures. The calibration was carried out within a certified quality management system conforming to DIN EN ISO 9001:2000.

The metrological confirmation system for test equipment complies with ISO 10012-1.

Object	Broadband Field Meter NBM-550
Part Number (P/N)	2401/01
Serial Number (S/N)	A-0125
Manufacturer	Narda Safety Test Solutions GmbH
Customer	
Date of Calibration	2009-07-02
Results of Calibration	Test results within specifications
Confirmation interval (recommended)	24 months
Ambient conditions	(23 ± 3)°C (20 ... 60) % rel. humidity
Calibration procedure	2401-8700-00A

Pfullingen, 2009-07-02


Person in charge
M. Budim


Head of Laboratory
N. Moll

This certificate may only be published in full, unless permission for the publication of an approved extract has been obtained in writing from the Managing Director.

MANAGEMENT
SYSTEM



Certified by DQS against
DIN EN ISO 9001:2000
(Reg.-No. 99379-QM)

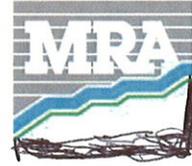
Certificate No. NBM-550-A-0125-090702-63

Date of issue: 2009-07-02

Page 1 of 3

MORRIS & RITCHIE ASSOCIATES, INC.

ENGINEERS, ARCHITECTS, PLANNERS, SURVEYORS,
AND LANDSCAPE ARCHITECTS



April 14, 2011

Mr. Timothy Smidt, P.E.
Telegent Engineering Inc.
1718 West Jarrettsville Road
Jarrettsville, Maryland 21084

Re: AT&T Mobility
Kentucky Drive (Site No. 2852)
1125 North Patrick Henry Drive
Arlington, Arlington County, Virginia 22205
MRA Project No. 16895.049
Structural Evaluation for AT&T LTE Installation – Revision 2

Dear Tim:

As requested, Morris & Ritchie Associates, Inc. (MRA) has completed our structural evaluation of the existing building at the above referenced site. The objective of MRA's evaluation was to determine if the existing building can structurally support the proposed AT&T LTE installation.

The structural evaluation has been based on information shown in recent photographs, as provided by Bechtel Communications, as-built drawings prepared by Mactec Engineering & Consulting, dated January 23, 2006, and as-built drawings prepared by Mactec Engineering & Consulting, dated August 21, 2006. A site visit was not performed by MRA. Bechtel Communications and TEI provided MRA the proposed equipment and layout.

The evaluation examines the impact on the existing structure of installing three (3) Kathrein 800 10764 panel antennas (55.2" x 11.8" x 6", 41 lbs). These antennas will be installed one (1) per sector in three (3) sectors to individual pipe mounts mounted behind the stealth enclosures, attached to the church steeple. In addition, three (3) Alcatel-Lucent 9442 AWS RRH units (12" x 9" x 25", 43 lbs), three (3) Alcatel-Lucent 9442 700MHz RRH units (10.8" x 12.2" x 21", 51 lbs), and three (3) Raycap DC2-48-60-0-9E Cable Distribution Boxes (10.3" x 10.3" x 6.2", 16 lbs) will be installed at the base of the steeple, secured to the steeple walls with a new unistrut frame assembly.

It is our understanding that the existing equipment cabinets in the steeple equipment room are to remain, except for one (1) RBS 2206 cabinet (500 lbs) and one (1) PD cabinet (500 lbs), which are being removed and replaced with one (1) ALU LTE 9412 cabinet (400 lbs), one (1) RXAIT cabinet (300 lbs), and (1) PD cabinet (800 lbs).

Based on the as-built drawings provided, the equipment room, at one time, supported one (1) UMTS cabinet (800 lbs), one (1) GSM cabinet (1,300 lbs), two (2) growth cabinets (800 lbs each), one (1) DC Power Bay (800 lbs), two (2) battery stacks (3,500 lbs each), and one (1) telco rack (250 lbs), for a total weight of approximately 11,750 lbs. We note that these equipment cabinet weights were not provided, but assumed based on our experience on similar projects. The proposed equipment configuration consists of one (1)

1220-C East Joppa Road, Suite 505, Towson, Maryland 21286 Tel: (410) 821-1690 Fax: (410) 821-1748

Abingdon, MD • Laurel, MD • Towson, MD • Georgetown, DE • Wilmington, DE • York, PA
(410) 515-9000 (410) 792-9792 (410) 821-1690 (302) 855- 5734 (302) 326-2600 (717) 751-6073

Visit us on the web at www.mragta.com

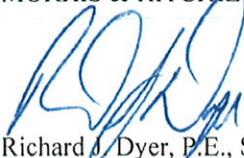
UMTS cabinet (800 lbs), two (2) GSM cabinets (1,300 lbs each), one (1) proposed ALU LTE 9412 cabinet (400 lbs), one (1) proposed RXAIT cabinet (300 lbs), one (1) proposed PD cabinet (800 lbs), two (2) battery stacks (3,500 lbs each), and one (1) telco rack (250 lbs), for a total proposed weight of approximately 12,150 lbs, approximately the same as the equipment that was previously supported by the equipment room.

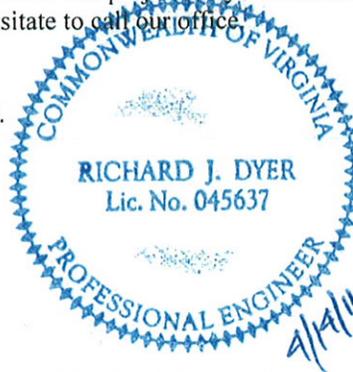
Although we have no documentation on the existing steeple, the reactions of the antennas, RRH's, and Cable Distribution Boxes into the masonry walls and concrete steeple structure are minimal compared to the total loads acting on the structure.

As a result of our evaluation, we find that the additional weight and wind load due to the proposed installation will have a minimal impact on the existing equipment room and building structure. The existing equipment room and building are adequate to resist the weight and wind load effects of the proposed AT&T LTE installation, as described herein. No structural problems are anticipated.

We appreciate the opportunity to be of service on this project. If you should have any questions or require any additional information, please do not hesitate to call our office.

Sincerely,
MORRIS & RITCHIE ASSOCIATES, INC.


Richard J. Dyer, P.E., S.E., S.E.C.B.
Senior Engineer



Electromagnetic Energy (“EME”) Measurement and Site Compliance Report



Prepared for



Site Information

US ID: 4064
Site Name: WALKER CHAPEL CHURCH
Address: 4102 NORTH GLEBE ROAD,
ARLINGTON VA, 22207.

Survey Date: July 20, 2010
Surveyed By: Javad Jarrahi
M-RFSC: Sean Miller

Report Date: March 1, 2011



AT&T

US ID: 4064 - Site Name: WALKER CHAPEL CHURCH
Electromagnetic Energy (“EME”)
Measurement and Site Compliance Report



4102 NORTH GLEBE ROAD, ARLINGTON VA, 22207.



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1 Summary

1.1 Introduction

AT&T has installed RF transmitting antennas at the following location (the “wireless telecommunications facility”):

Street Address: 4102 NORTH GLEBE ROAD, ARLINGTON VA, 22207.

US ID: 4064

Construction ID: 2856

Latitude / Longitude: 38.921684 / -77.128754

Telnet, Inc performed an RF emission survey of the RF environment surrounding the facilities installed by AT&T at this location. The facility is located on a stealth steeple.

AT&T is licensed by the Federal Communications Commission (“FCC”) to provide wireless communications services. As required by the FCC, wireless system operators perform an assessment of the potential human exposure to radio frequency emissions emanating from transmitting antennas at the site.

The physical survey verified antenna placement and technical specifications for accurate recommendations to determine compliance with FCC guidelines. Antenna specifications presented herein are based on direct evidence from an antenna or transmitter cabinet, information from the site manager or building manager, information from the licensees, educated estimates by the field technician or a combination of some or all of these sources.

1.2 Statement of Compliance

After evaluation of the total RF emission levels from all the operators and a thorough review of the site access procedures, signage and observable antenna locations, Telnet has determined that:

This site is compliant with FCC Policy.

AT&T contributes less than 5% of the maximum permissible exposure (MPE) based on theoretical modeling using the parameters supplied by the client.

The compliance determination is based on General Public MPE levels due to predicted and measured levels based on Spatial Averaging, RF signage placement, and the level of restricted access to the antennas at the site.



1.3 Safety Recommendations & Site Compliance Actions

This site is compliant with the FCC rules and regulations and no further steps are required at this time. Since AT&T contributes less than 5% of the MPE, should this site be non-compliant for any reason, all other operators who contribute greater than 5 % would all be liable to bring the site into compliance.

During the field visit, Telnet documented the presence and location of signs and barriers. Areas that require that action in order to meet AT&T corporate policy are listed below. No action means the location is compliant with the company policy.

Site Access Locations

No Action required

Alpha Sector Location

No Action required

Beta Sector Location

No Action required

Gamma Sector Location

No Action required

1.3.1 Lockout/Tagout Procedures for Antenna, Transmission Line and Power Amplifier Maintenance

Whenever anyone is working on an antenna, transmission line, high power amplifier (HPA), or multi-channel power amplifier (MCPA), the transmitter (power amplifier) MUST be turned off. This can be accomplished either locally by flipping a circuit breaker(s) or remotely by command from the NMC/NOC.

The person initiating or requesting the transmitter shutdown is the ONLY person authorized to restore the transmitter to service. This person is responsible for making sure that ALL work has been completed, that ALL cables have been properly reconnected, and that EVERYONE is clear of the work area before the transmitter is reactivated. Generally, this person is considered to be the one actually performing the work. In the case of a contractor working at an active site, the FE/Technician may initiate the request on behalf of the contractor.



1.3.2 Lockout/Tagout Procedure, Local Shutdown

After securing permission to shut the transmitter down, the Field Engineer (FE)/Field Technician (FT) will turn off the circuit breaker and verify that the correct transmitter was deactivated. The FE/FT will then place a locking device(s) over the circuit breaker(s) to prevent accidental activation by an unauthorized person and place a TAG on, or in the immediate vicinity of, the circuit breaker(s). The tag should state "Do Not Operate." At the NMC/NOC the same note, including date and time and location, must be entered in the computer or a tag must be placed on the monitor frame in such a manner that the console operator will be made aware that the transmitter can not be activated without permission from the person who initiated the maintenance request.

The FE/FT will turn the key(s) over to the person performing the work. Upon completion of the work, this person performing the task will return the key(s). As a precautionary measure, prior to reactivating the transmitter, the FE/FT MUST verify, to the extent possible, that all connections have been made and that the work area is clear of personnel.

1.3.3 Lockout/Tagout Procedure, Remote Shutdown

After requesting the NMC/NOC to shut the transmitter down, the FE/FT will verify that the correct transmitter was deactivated. The FE/FT will then place a TAG on or in the immediate vicinity of transmitter. The tag should state "Do Not Operate." At the NMC/NOC the same note, including date/time, must be entered in the computer or a tag must be placed on the monitor frame in such a manner that the console operator will be made aware that the transmitter can not be activated unless the following conditions are met: 1) The tag has been removed by the person performing the work; and 2) Permission is provided by the person who initiated the maintenance request.

Upon completion of the work, the person performing the task will remove the tag and notify the FE/FT that the work is completed. As a precautionary measure, prior to requesting reactivation of the transmitter, the FE/FT MUST verify, to the extent possible, that all connections have been made and that the work area is clear of personnel.

Note: Even though normal procedures call for a remote shutdown, if it is possible to turn off the circuit breaker without causing a software reload or other similar problems the FE/FT should follow the local shut down procedure.



1.4 Site Measurements

The site survey crew has provided the sketch of the rooftop with a visual representation of the RF environment at the site and depict antenna locations and rooftop structures. Figure 3 depict the surveyed measurements in percentage of MPE limits for General Population standards. Percentages greater than 100% exceed the FCC MPE limits. Section 4.5 contains actual spatially averaged MPE measured at each reference point.

Additional Information in the Site Layout Diagram

The RF emissions diagram provides indications of RF Signage, barriers and locked doors.

RF Signage & Barrier Key					
RF Signage			Barriers		
Type	Existing Location	Recommended Location	Type	Existing Location	Recommended Location
Notice	NE	NR	Locked Door	LE	LR
Caution	CE	CR	Fencing	RE	RR
Warning	WE	WR	Rope Chain		
Information Sign 1	I1E	I1R	Paint Stripes		
Information Sign 2	I2E	I2R	Tape		
Information Sign 3	I3E	I3R			
Information Sign 4	I4E	I4R			

Table 1
RF Signage & Barrier Key

1.5 Roof Level Measurements

Figure 1 represents the actual readings at various points on the rooftop. These measurements depicts the energy levels that can be encountered by an individual at the site.

Maximum value for Occupational Standard based on Spatial Averaging: 2.10%

Maximum value for General Population Standard based on Spatial Averaging: 10.50%

Result Summary : AT&T is Compliant with FCC Policy based on General Public Maximum Permissible Exposure

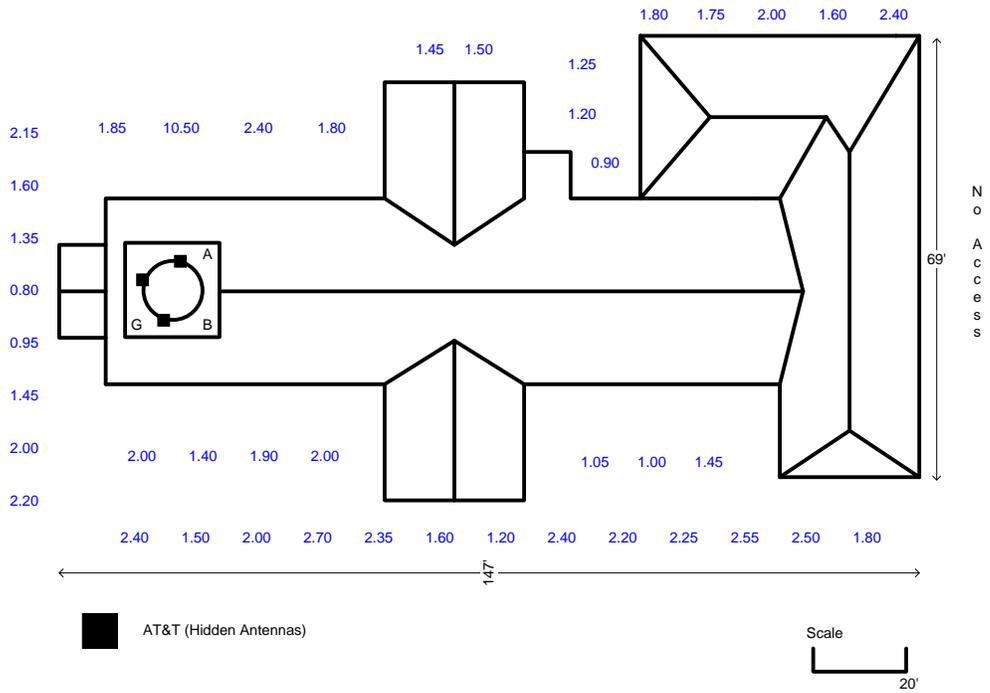


Figure 1
Numbers in Blue are the Percentage (%) of MPE Limits for General Population Standard



1.6 RF Modeling

The modeling calculations assume that the antennas are operating at 100% capacity; that all antenna channels are transmitting simultaneously and that the radio transmitters are operating at full power. Obstructions (trees, buildings etc) that would normally attenuate the signal are not taken into account. As a result, the predicted signal levels are more conservative (higher) than the actual signal levels will be from the measurement conclusions.

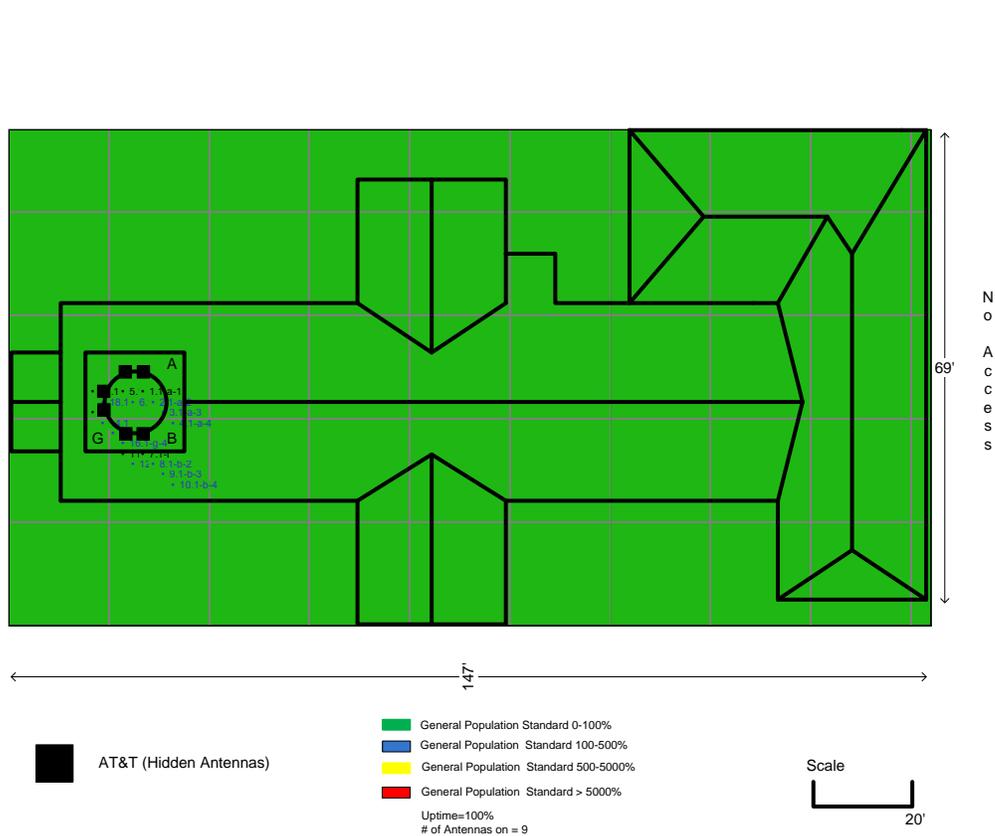


Figure 2
Percent of FCC General Population Exposure Limit, All carriers including proposed LTE

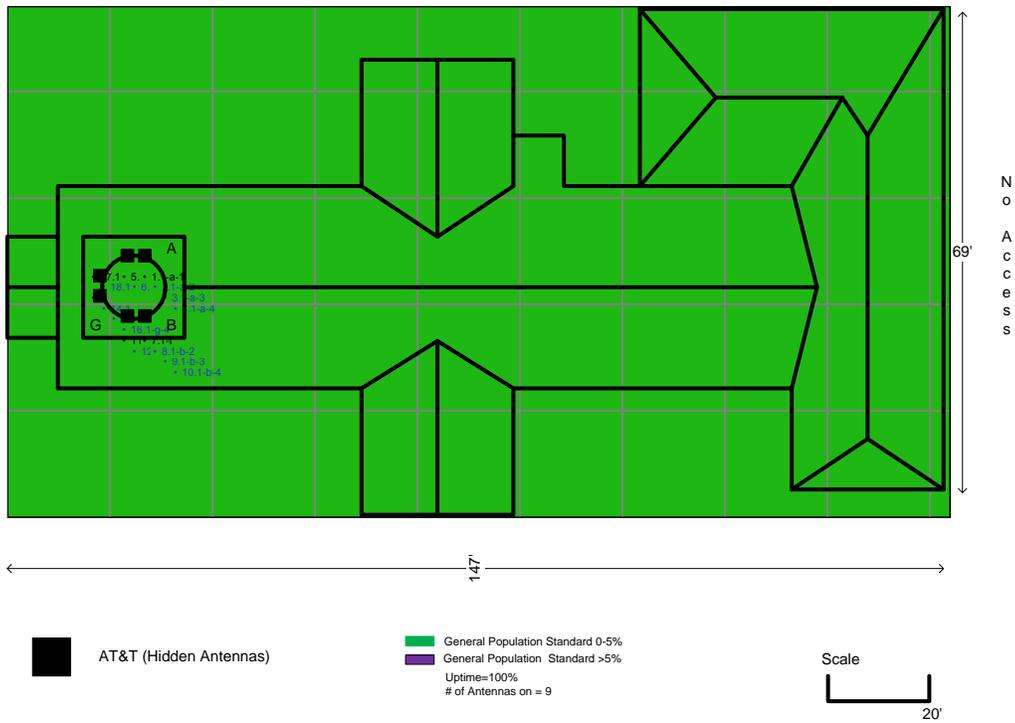


Figure 3
5% FCC Exposure Limit, AT&T



2 Site Configuration

A survey was performed on 07/20/2010 to determine the RF emission levels present at the site. Measurements were performed on the areas considered accessible to the occupational population. At this site, additional steps were taken to assess areas accessible to the general population. The results of the measurements were the combined energy levels of AT&T antennas. To measure the RF emissions within the vicinity, Telnet, inc, utilized NARDA E Field Probe Model EA5091, Frequency Range 300 KHz - 50 GHz with NARDA Electromagnetic Survey Meter Model NBM-550. Calibration was performed by Narda Safety Test Solutions on April 26, 2007 for a total interval of 24 month.

Relevant administrative and compliance-related information about the antenna site rooftop area is summarized in the table below :

Rooftop Access	
Access Method	No Access
Access to Keys	NA
Door Locked	NA
Collocation Status	Non-Collocated
Rooftop Area Classification	General Population
Weather Conditions	Sunny / Clear

2.1 Antenna Inventory

The Antenna Inventory shows all transmitting antennas on the site (see Table 1). This inventory was verified on site and was used by Telnet to perform software modeling of RF emissions . The inventory coincides with the site diagrams on this report, identifying each antennas location at the site.

For other carriers at the site, the use of “Generic” as an antenna model, or “ Unknown” for an operator means the information with regard to the carrier, their FCC license and / or antenna information was not available nor could it be secured while on site. Equipment, antenna models and nominal transmit power were used for modeling, based on past experience with radio service providers.



Antenna Number	Operator	Type	TX Freq (MHz)	ERP (Watts)	Gain (dBd)	Model	Azimuth (deg.)	Length (ft)	Horizontal Beamwidth (Deg.)	X	Y	Z
1-a-1	AT&T	Panel	850	430.6	13.85	742 265	30	6.5	65	14.0	23.0	85.0
1-a-2	AT&T	Panel	1900	765.8	16.05	742 265	30	6.5	65	14.0	23.0	85.0
1-a-3	AT&T	Panel	850	762.1	13.85	742 265	30	6.5	65	14.0	23.0	85.0
1-a-4	AT&T	Panel	1900	1355.3	16.05	742 265	30	6.5	65	14.0	23.0	85.0
1-a-5	AT&T	Panel	700	638.3	13.05	80010765-700	30	6.3	65	12.0	23.0	85.0
1-a-6	AT&T	Panel	2100	1230.3	15.9	80010765-AWS	30	6.3	65	12.0	23.0	85.0
1-b-1	AT&T	Panel	850	430.6	13.85	742 265	150	6.5	65	12.0	17.0	85.0
1-b-2	AT&T	Panel	1900	765.8	16.05	742 265	150	6.5	65	12.0	17.0	85.0
1-b-3	AT&T	Panel	850	762.1	13.85	742 265	150	6.5	65	12.0	17.0	85.0
1-b-4	AT&T	Panel	1900	1355.3	16.05	742 265	150	6.5	65	12.0	17.0	85.0
1-b-5	AT&T	Panel	700	638.3	13.05	80010765-700	150	6.3	65	14.0	17.0	85.0
1-b-6	AT&T	Panel	2100	1230.3	15.9	80010765-AWS	150	6.3	65	14.0	17.0	85.0
1-g-1	AT&T	Panel	850	430.6	13.85	742 265	270	6.5	65	9.0	23.0	85.0
1-g-2	AT&T	Panel	1900	765.8	16.05	742 265	270	6.5	65	9.0	23.0	85.0
1-g-3	AT&T	Panel	850	762.1	13.85	742 265	270	6.5	65	9.0	23.0	85.0
1-g-4	AT&T	Panel	1900	1355.3	16.05	742 265	270	6.5	65	9.0	23.0	85.0
1-g-5	AT&T	Panel	700	638.3	13.05	80010765-700	270	6.3	65	9.0	21.0	85.0
1-g-6	AT&T	Panel	2100	1230.3	15.9	80010765-AWS	270	6.3	65	9.0	21.0	85.0

Table 2
Antenna Inventory
RFDS Version: V2010_4.2

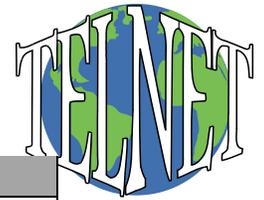


2.2 AT&T Site Specifications

AT&T will be operating in four different frequency bands – the 700 MHz, 850 MHz, 1900 MHz & 2100 MHz- and plans to use three different technologies called GSM, UMTS, LTE.

The table below summarizes the relevant technical data for the site

Wireless Provider	AT&T
Frequency	850 Mhz
Antenna Manufacture & Model	Kathrein – 742 265
Maximum Gain	16 dBi
RF Channels Per Sector (Max)	8 (GSM), 2 (UMTS)
Max. Trans Power / RF Channel	40 Watts
Antenna Centerline Postion Above Ground Level (A,B,G)	85', 85', 85'
Antenna Orientation	30, 150 , 270 Degrees
Wireless Provider	AT&T
Frequency	1900 Mhz
Antenna Manufacture & Model	Kathrein – 742 265
Maximum Gain	18.2 dBi
RF Channels Per Sector (Max)	8 (GSM), 2 (UMTS)
Max. Trans Power / RF Channel	40 Watts
Antenna Centerline Postion Above Ground Level (A,B,G)	85', 85', 85'
Antenna Orientation	30, 150 , 270 Degrees
Wireless Provider	AT&T
Frequency	700 Mhz
Antenna Manufacture & Model	Kathrein - 80010765
Maximum Gain	15.2 dBi
RF Channels Per Sector (Max)	1 (LTE)
Max. Trans Power / RF Channel	40 Watts
Antenna Centerline Postion Above Ground Level (A,B,G)	85', 85', 85'
Antenna Orientation	30, 150 , 270 Degrees



Wireless Provider	AT&T
Frequency	2100 Mhz
Antenna Manufacture & Model	Kathrein - 80010765
Maximum Gain	18.05 dBi
RF Channels Per Sector (Max)	1 (AWS)
Max. Trans Power / RF Channel	40 Watts
Antenna Centerline Postion Above Ground Level (A,B,G)	85', 85', 85'
Antenna Orientation	30, 150 , 270 Degrees

Table 3
Site Specifications

3 Photos of Rooftop and Antennas

3.1 AT&T Existing Sectors



AT&T Sector 1 (Hidden Antennas)



AT&T Sector 2 (Hidden Antennas)



AT&T Sector 3 (Hidden Antennas)



4 Modeling Summary and Assumptions

4.1.1 General Model Assumptions

In this report, it is assumed that all antennas are operating at full power at all times. Software modeling was performed for all transmitting antennas located on the site. Telnet, Inc has further assumed a 100% duty cycle and maximum radiated power.

The site has been modeled with these assumptions to show the maximum RF energy density. Telnet Inc believes this to be a worst case analysis, based on best available data.

If at any time power density measurements were to be made, Telnet Inc believes the real time measurements would indicate levels below those shown in this report. By modeling in this way, we have conservatively shown exclusion areas (areas not to be entered without a personal RF monitor, carriers reducing power or performing real time measurements to show real time exposure levels).

4.1.2 Use of Generic Antennas

For the purposes of this report, the use of 'Generic' as an antenna model, or 'Unknown' for a wireless carrier, means that the information about the carrier, their FCC license and/ or antenna information was not provided and could not be obtained while on site. In the event of unknown information, Telnet will use our industry specific knowledge of equipment, antenna models and transmit power to model the site. If more specific information can be obtained for the unknown measurement criteria, remodeling of the site is recommended. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.



4.1.3 Statistical Summary

Statistical Summary		
%MPE	SQ. FT	%SQ. FT.
	4416	100.00 % of total ROOF Area
0-100	4416	100.00 % of Selected Area
101 - 500	0	0.00 % of Selected Area
501 - 5000	0	0.00 % of Selected Area
> 5000	0	0.00 % of Selected Area
Roof Area 4416 sq. ft. Max %MPE 3.2 % Min %MPE 0.0 % Using Near/Far Spatial Avg Model With FCC 1997 Public Standard		

Table 4 Percent of FCC General Population Exposure Limit, All carriers

Statistical Summary		
%MPE	SQ. FT	%SQ. FT.
	4416	100.00 % of total ROOF Area
0-5	4416	100.00 % of Selected Area
6 - 500	0	0.00 % of Selected Area
501 - 5000	0	0.00 % of Selected Area
> 5000	0	0.00 % of Selected Area
Roof Area 4416 sq. ft. Max %MPE 3.2 % Min %MPE 0.0 % Using Near/Far Spatial Avg Model With FCC 1997 Public Standard		

Table 5 Percent of FCC General Population Exposure Limit, AT&T proposed



5 Survey Methodology

5.1 Sampling Description

The rooftop area of the site under evaluation was laid out in a grid of measurement points. Measurements were performed every 5-10' at various locations on the rooftop. The measurements were performed using industry-accepted techniques described in FCC Bulletin OET-65. At each measurement point identified where measurement was over 20%, a spatially averaged measurement is collected over the height of an average human body. The survey meter performs a time average measurement while the user slowly moves the probe over a distance range of 0 cm to 200 cm (about six feet) above the rooftop level. The results recorded at each measurement location include the average values over the spatial distance. The analysis included all emitters aggregated by carrier and height that were indicated to be present.

6 Analysis and Computation

Based on emission patterns of the antennas at this location most of the energy emitted is spread towards the horizon. This assumes the antennas have a zero downtilt. If a mechanical downtilt other than zero is applied to the antennas then the maximum energy emitted will need to be calculated using the information below.

The following formulas can be used for calculating the power density.

Power density is calculated by dividing the surface area of the sphere or the unit area normal to the direction of the propagation. This information is usually shown in units of microwatts per square centimeter (uW/cm²), milliwatt per square centimeters (mW/cm²), or watts per square meter (W/m²).

6.1 Analysis

$$S = \frac{(P \times KFact)}{(2\pi Rh)}$$

where :

S = power density (mW/cm²)

P = total power input to the antenna (mW)

K = antenna correction factor / numeric factor for antenna discrimination

R = straight line distance of the antenna from a 6 ft. human (cm)

h = distance between the roof level and the bottom of the antenna (cm) or the vertical distance from the tip of the antenna to the roof level where a 6 ft. human being is assumed standing directly from the antenna (also equal to R at 0)

MPE% = Calculated exposure level, as a percentage of the FCC MPE limit for continuous exposure of the general population



7 FCC Limits for MPE

The FCC guidelines for human exposure to RF electromagnetic fields were derived from the recommendations of two expert organizations, the National Council on Radiation Protection and Measurements (“NCRP”) and the Institute of Electrical and Electronics Engineers (“IEEE”). The exposure guidelines are based on thresholds for known adverse effects and they incorporate appropriate margin of safety. The federal health and safety agencies such as: the Environmental Protection Agency (“EPA”), the Food and Drug Administration (“FDA”), the National Institute on Occupational Safety and Health (“NIOSH”) and the Occupational Safety and Health Administration (“OSHA”) have also been actively involved in monitoring and investigating issues related to RF exposure.

The FCC’s MPE limits are based on exposure limits over a wide range of frequencies recommended by the NCRP and the exposure limits developed by the IEEE and adopted by the American National Standards Institute (“ANSI”) to replace the 1982 ANSI guidelines. The limits for localized absorption are based on the recommendations of both the ANSI/IEEE and the NCRP. The potential hazard associated with the RF electromagnetic fields is discussed in OET Bulletin No. 56 “Questions and Answers about the Biological Effects and Potential Hazards of RF Electromagnetic Fields”. This document can be obtained on the FCC website at <http://www.fcc.gov>.

Sections 7.1, 7.2 and 7.3 represent the FCC limits for both occupational and general population exposures to different radio frequencies:

7.1 (A) Limits for Occupational/Controlled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f ²)*	6
30-300	61.4	0.163	1.0	6
300-1500	--	--	f/300	6
1500-100,000	--	--	5	6



7.2 (B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Time E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f ²)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz

*Plane-wave equivalent power density

NOTE 1: **Occupational/controlled** limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

NOTE 2: **General population/uncontrolled** exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or can not exercise control over their exposure.

7.3 Controlled and Uncontrolled Exposure Limits

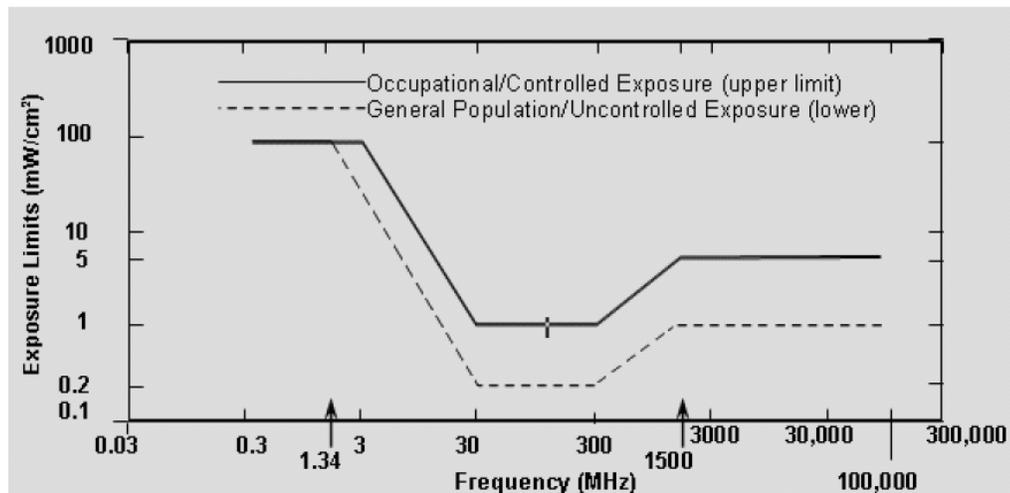


Figure 3



8 FCC Standard Certification

This report certifies that the site WALKER CHAPEL CHURCH – 4064 is in compliance with the FCC standard. The analysis and procedure used to provide the report is according to OET Bulletin 65 and other industry standards.

Prepared by:
Fady Rizk
RF Technician
Telnet Inc.

Date: 03/01/11

Reviewed by:
Boris Lublinsky
Project Manager, EMF Specialist
Telnet Inc.

Date: 03/01/11



9 Glossary of Terms

1. *Electromagnetic Field (energy density)* – the electromagnetic energy contained in an infinitesimal volume divided by that volume.
2. *Exposure* – Exposure occurs whenever and wherever a person is subjected to electric, magnetic or electromagnetic fields other than those originating from physiological processes in the body and other natural phenomena.
3. *General Population / Uncontrolled Exposure* – applies to human exposure to RF fields when the general public is exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public always fall under this category when exposure is not employment-related.
4. *Maximum Permissible Exposure (MPE)* – the rms and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed without harmful effect and with an acceptable safety factor.
5. *Occupational / Controlled Exposure* – applies to human exposure to RF fields when persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/controlled limits.
6. *Power Density (S)* – Power per unit area normal to the direction of propagation, usually expressed in units of watts per square meter (W/m^2) or, for convenience, units such as milliwatts per square centimeter (mW/cm^2) or microwatts per square centimeter ($\mu W/cm^2$).
7. *Ionization* – a process by which electrons are stripped from atoms and molecules. This process can produce molecular changes that can lead to damage in biological tissue, includes effect on DNA, the genetic material. This process requires interaction with high levels of electromagnetic energy.
8. *Non-Ionizing radiation* – a type of emission that is not great enough to cause ionization of atom and molecules. “RF and Microwave Emissions” are low-level energy which are not capable of ionization.



10 Appendix

Narda Safety Test Solutions
435 Moreland Road, Hauppauge, NY 11788
Phone: 631-231-1700 · Fax: 631-231-1711
E-mail: nardaeast@L-3com.com
www.nardamicrowave.com



Calibration Certificate

Narda Safety Test Solutions hereby certifies that the referenced equipment has been calibrated by qualified personnel to Narda's approved procedures. The calibration was carried out within a certified quality management system conforming to ISO 9001:2000.

The metrological confirmation system for test equipment complies with ISO 10012-1.

Object	Electric Field Probe EA5091
Part Number (P/N)	2402/07
Serial Number (S/N)	01006
Manufacturer	Narda Safety Test Solutions
Date of Calibration	Tue 07/Jul/2009 13:10:41
Results of Calibration	Test Results within Specification
Confirmation interval (recommended)	24 Months
Ambient Conditions	(23 +/-3)°C (40..60)% rel. humidity
Calibration Procedure	ATE Software 990199 Ver. 1.49
Probe Definition File Set	P/N 990199-04 Ver. 1.06
Results Filed Under	EA5091_01006_07Jul2009.txt

Hauppauge, NY

Calibrated by

Quality Assurance

This certificate may only be published in full, unless permission for the publication of an approved extract has been obtained in writing from the Director of Quality Assurance.

Certificate No. 01006_07Jul2009.txt

Date of issue: 07/Jul/2009

Page 1 of 6



Narda Safety Test Solutions GmbH
Sandwiesenstrasse 7 · D-72793 Pfullingen · Germany
Phone: +49-7121-9732-0 · Fax: +49-7121-9732-790



Calibration Certificate

Narda Safety Test Solutions GmbH hereby certifies that the referenced equipment has been calibrated by qualified personnel to Narda's approved procedures. The calibration was carried out within a certified quality management system conforming to DIN EN ISO 9001:2000.

The metrological confirmation system for test equipment complies with ISO 10012-1.

Object	Broadband Field Meter NBM-550
Part Number (P/N)	2401/01
Serial Number (S/N)	A-0125
Manufacturer	Narda Safety Test Solutions GmbH
Customer	
Date of Calibration	2009-07-02
Results of Calibration	Test results within specifications
Confirmation interval (recommended)	24 months
Ambient conditions	(23 ± 3)°C (20 ... 60) % rel. humidity
Calibration procedure	2401-8700-00A

Pfullingen, 2009-07-02


Person in charge
M. Budim


Head of Laboratory
N. Moll

This certificate may only be published in full, unless permission for the publication of an approved extract has been obtained in writing from the Managing Director.

MANAGEMENT
SYSTEM



Certified by DQS against
DIN EN ISO 9001:2000
(Reg.-No. 99379-QM)

Certificate No. NBM-550-A-0125-090702-63

Date of issue: 2009-07-02

Page 1 of 3



Calculation Cover Sheet

Project: AT&T Turfing		Job No.: 25471		Calc. No.: 25471-430-A3C-EF-00054		Sheet: 1	
Subject: Walker Chapel Church				Discipline: Civil/Structural			
Calculation Status Designation		<input type="checkbox"/> Preliminary		<input checked="" type="checkbox"/> Confirmed		<input type="checkbox"/> Superseded	
						<input type="checkbox"/> Voided	
Computer Program/Type		SCP		Program No.		Version/Release No.	
		<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No		Mathcad		14.0.0.163	

Note:

Use of these calculations by persons without access to pertinent factors upon which these calculations are based, and without proper regard for their purpose, could lead to erroneous conclusions. Should it become necessary to use these calculations for work in the future, it is recommended that the calculations be reviewed with authorized Bechtel personnel to ensure that the purposes, assumptions, judgements and limitations are thoroughly understood. In addition, these calculations may contain confidential information proprietary to Bechtel Corporation that is not to be used, disclosed, or reproduced in any format by any non-Bechtel party without Bechtel's prior written permission. Notwithstanding the above, AT&T has the right to use the information contained in this document pursuant to the Contract between Bechtel Corporation and AT&T.

Structure: PASS
Foundation: N/A

Joseph
Hudock

Digitally signed by Joseph Hudock
DN: cn=Joseph Hudock, c=US,
o=Bechtel Communications,
email=jhudock@bechtel.com
Date: 2010.10.07 08:02:40 -0400



Bechtel Corporation
5295 Westview Drive
Frederick, MD 21703

*Total No. of Sheets do not include Attachments, See Table of Contents for a complete list

No.	Reason for Revision	Total No. of Sheets	Last Sheet No.	By	Checked	Approved/ Accepted	Date
0	Issued For Use	5*	5	RK	GM	GM	10/6/10

Record of Revisions

Bechtel Confidential



Project: AT&T Turfing
 Originator: Robert Kain

Calculation Sheet

Subject: Walker Chapel Church
 Date: October 4, 2010
 Checker: George Murray

Job Number: 25471
 Calc. No.: 430-A3C-EF-00054
 Sheet No.: 2 Sheet Rev.: 000

TABLE OF CONTENTS

1.0 Purpose	3
2.0 Design Basis	3
3.0 Criteria	3
4.0 Assumptions	3
5.0 References	4
6.0 Calculations	4
7.0 Conclusion	5

ATTACHMENTS

A. RFDS LTE V02.1 dated 4/26/2010 Redline	9 sheets
B. Feed Package SOW Excerpts	3 sheets
C. Kathrein Cut Sheets for 840-10525 antenna	2 sheets

Bechtel Confidential



Project: AT&T Turfing
 Originator: Robert Kain

Calculation Sheet

Subject: Walker Chapel Church
 Date: October 4, 2010
 Checker: George Murray

Job Number: 25471
 Calc. No.: 430-A3C-EF-00054
 Sheet No.: 3 Sheet Rev.: 000

1.0 Purpose

The purpose of this calculation is to verify the structural capability of new mounts and the equipment room at the Walker Chapel Church site at 4102 N. Old Glebe Road in Arlington, Virginia to support a new Kathrein Antenna 840-10525, the accompanying RRH units and a new lineage Power plant.

2.0 Design Basis

The design wind speed is based on IBC 2006 (90 mph-3 sec gust, Exposure C).

3.0 Criteria

1. TIA-222-F Standard - Structural Standard for Antenna Supporting Structures and Antennas
2. IBC 2006
3. Cingular Washington/Baltimore Design Standards, Cingular Wireless Network Operations, 7150 Standard Drive, Parkway Center, Hanover, Maryland 21076, June 3, 2005

4.0 Assumptions

1. It is assumed that the original design, material production and classification, fabrication and erection of the structure was performed in accordance with accepted industry design standards and methods.
2. It is assumed that the existing structure and its attachments have been properly maintained in accordance with the referenced standards and/or the manufacturer's requirements and are in good condition with no structural defects and with no deterioration to its members.
3. It is assumed that the manufactured structural and nonstructural elements and attachments are load-rated, designed and fabricated in accordance with accepted industry standards for design, materials and workmanship.
4. It is assumed that member or section shapes, sizes, and materials are accurate as provided in the referenced documents.
5. All equipment, antennas, mounts, coax and wave guides are assumed to have been properly installed and supported as per the manufacturer's requirements.
6. All welds and connections are assumed to develop at least the member capacity, unless determined otherwise.
7. All prior structural modifications, if any, are assumed to have been properly installed and to be fully effective.
8. It is assumed that the antenna supporting structure has been designed properly by a registered professional engineer for the loads which are acting on the structure prior to the proposed modifications herein.

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Project: AT&T Turfing
Originator: Robert Kain

Calculation Sheet

Subject: Walker Chapel Church
Date: October 4, 2010
Checker: George Murray

Job Number: 25471
Calc. No.: 430-A3C-EF-00054
Sheet No.: 4 Sheet Rev.: 000

5.0 References

1. IBC 2006
2. ASCE 7-05 Minimum Design Loads for Buildings and Other Structures
3. Cingular Washington/Baltimore Design Standards, Cingular Wireless Network Operations, 7150 Standard Drive, Parkway Center, Hanover, Maryland 21076, June 3, 2005
4. Bechtel Calculation 24782-432-A3C-EF-00529 Rev. 0
5. Bechtel Calculation 24782-432-A3C-EF-00356 Rev. 0.

6.0 Calculations

Antennas

AT&T proposes adding 3 new panel antennas (Kathrein Model 840-10525) and a 2 1/2" conduit along with 6 RRH units in the existing site at Walker Chapel Church. The existing antennas will be changed to 840-10525 as well. There are current 4 mounting pipes at 90° intervals behind 4 RF transparent louvers. Each sector will have 2 antennas stacked on a single pipe. The fourth pipe will hold the TMAs for the 3 sectors. The RRHs will be inside and wall mounted about 10 ft below the antennas to the existing CMU walls

The proposed installation will result in an insignificant load increase to that currently on the steeple.

Equipment Room

Batteries := 4000·lb	Ref. 4 Sht. 5	RXAIT := 800·lb	
T _{rack} := 250·lb	Ref. 4 Sht. 5	Nokia := 1422·lb	
BTS := 741·lb	Ref. 4 Sht. 5	Power _{plant} := 800·lb	Ref. 5 Sht. 4
UMTS := 826·lb	Ref. 4 Sht. 5	LTE _{rack} := 200·lb	

$$\text{Proposed}_{\text{Loading}} := 2 \cdot \text{Batteries} + T_{\text{rack}} + 2 \cdot \text{RXAIT} + \text{UMTS} + \text{Nokia} + \text{LTE}_{\text{rack}} + \text{Power}_{\text{plant}}$$

$$\text{Proposed}_{\text{Loading}} = 13098 \cdot \text{lb}$$

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Project: AT&T Turfing
 Originator: Robert Kain

Calculation Sheet

Subject: Walker Chapel Church
 Date: October 4, 2010
 Checker: George Murray

Job Number: 25471
 Calc. No.: 430-A3C-EF-00054
 Sheet No.: 5 Sheet Rev.: 000

$$Flr_{Load} := \frac{\text{Proposed}_{\text{Loading}}}{15.5 \cdot \text{ft} \cdot 8 \cdot \text{ft}}$$

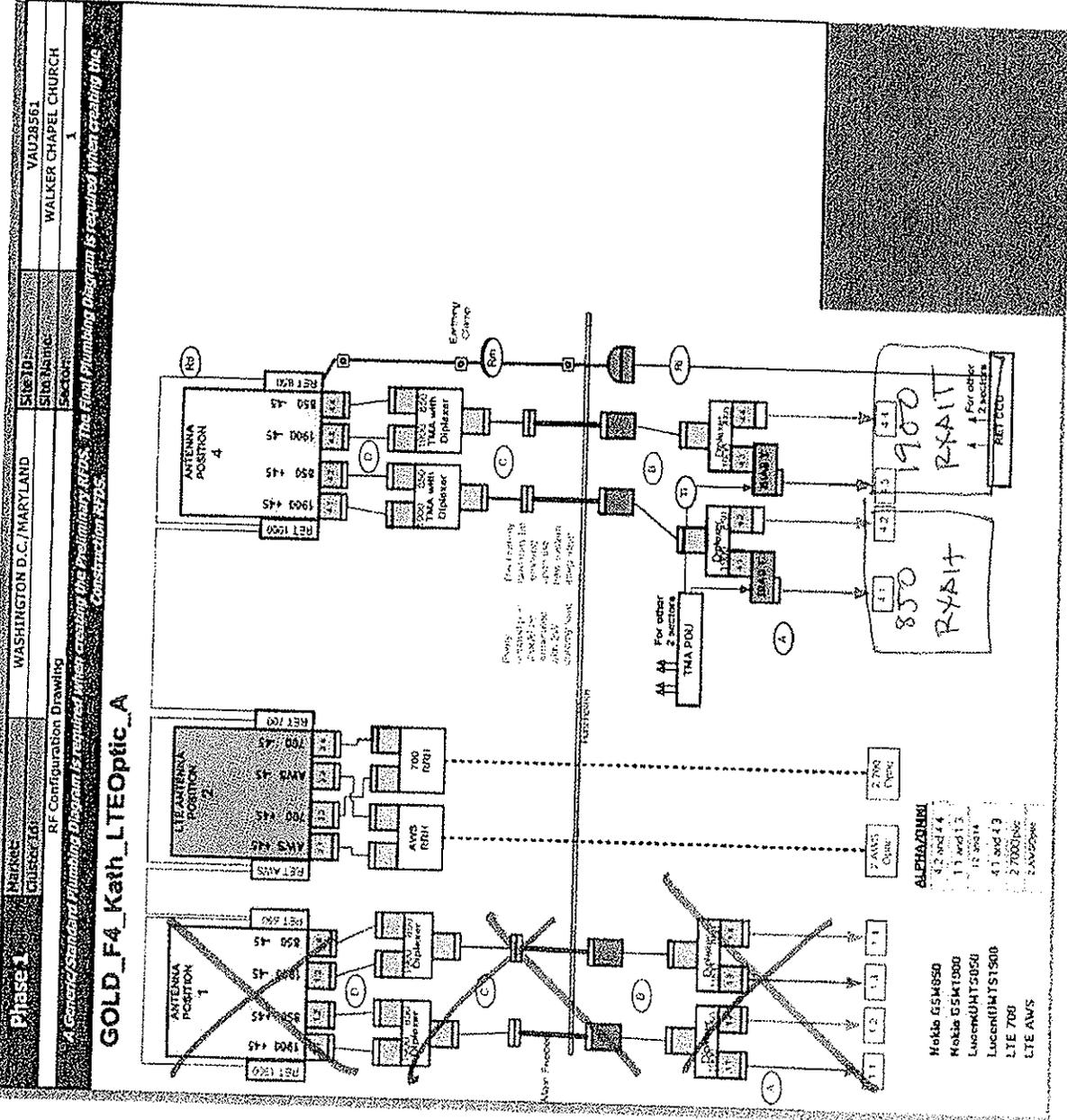
$$Flr_{Load} = 105.63 \frac{\text{lb}}{\text{ft}^2}$$

The floor strip being loaded by the new power plant and new LTE equipment frame is supporting less load than the end strip which is carrying 2 batteries. Therefore, the new power plant and new LTE equipment frame's increase in loading to the equipment room floor is O.K. by comparison.

7.0 Conclusion

The antenna support pipes are O.K. as designed. The existing CMU walls can withstand the additional loads applied by the RRHs and the DC2 boxes. The existing equipment room is O.K. by comparison with existing loads..

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CALC NO. 25471-430-A3C-EF-00054
 ATTACHMENT B REV. 6
 SHEET 1 OF 3



LTE - EXPANSION



Site Name: Walker Chapel Church

Const. ID:

SOW - Items

Construction

- WALKER CHAPEL
 STEEPLE, TI, SWAP UMTS / GSM ANTENNA FOR NEW 2' MODEL, NEED 2' MODEL ANTENNA, NEW DUAL VOLTAGE POWER PLANT
 7/28/2010: RFDS V2.1 7/20 -- RRH'S ATOP
 EXISTING AZIMUTH - 30-150-270 PER FEED LTE AZ - 355-120-240 NEED TO REDLINE TO MATCH EXISTING AZIMUTH
- Description of Service
- 1 REPLACE EXISTING 265 ANTENNAS WITH NEW 2' ANTENNA FOR GSM / UMTS (3 TOTAL)
 - 2 INSTALL (1) NEW KATHREIN LTE ANTENNA IN STEEPLE (3 TOTAL)
 - 3 DECOM EXISTING 5M RET CABLE BETWEEN EACH ANTENNA PER SECTOR (3 TOTAL)
 - 4 INSTALL (1) NEW 5M RET CABLE BETWEEN NEW LTE ANTENNA TO (E) ANTENNA (6 TOTAL)
 - 5 INSTALL (1) NEW 1M RET CABLE ON LTE ANTENNA BETWEEN MOTORS (3 TOTAL)
 - 6 REPLACE (1) (E) GROUND BAR WITH (N) AT SECTOR MOUNT (3 TOTAL)
 - 7 PREP 3 NEW UNISTRUT FRAMES INSIDE STEEPLE FOR RRH'S
 - 8 PREP FOR RRH'S ON NEW FRAMES (IE GROUNDS)
 - 9 HANG (6) RRH'S ON NEW FRAMES
 - 10 INSTALL (12) JUMPERS TOPSIDE FOR LTE
 - 11 INSTALL (12) DC LOADS ON END OF JUMPERS
 - 12 INSTALL (1) NEW RAYCAP DOME SURGE PROTECTION
 - 13 INSTALL (1) 12 PAIR FIBER (75LF) FROM TI TO DOME
 - 14 INSTALL (2) 3 PAIR DC CABLE (75LF) TI TO DOME
 - 15 INSTALL (6) FIBER JUMPERS FROM DOME TO RRH (197LF)
 - 16 INSTALL (6) DC CIRCUITS FROM DOME TO RRH (197LF)
 - 17 DECOM EXISTING ERICSSON POWER PLANT
 - 18 DECOM (2) EXTERNAL BREAKER PANELS
 - 19 INSTALL (1) NEW DUAL VOLTAGE LINEAGE POWER PLANT
 - 20 COMPLETE (1) GSM DC PREP
 - 21 COMPLETE (1) UMTS DC PREP
 - 22 INSTALL (1) NEW FRAME FOR LTE GEAR
 - 23 INSTALL (1) NEW RAYCAP DC6 UNIT IN LTE FRAME
 - 24 INSTALL (6) NEW 10A BREAKERS FOR SECTORS / RRHS
 - 25 INSTALL (1) NEW FIBER TRAY IN LTE BAY
 - 26 INSTALL (1) 66 BLOCK ON ALARM BACKBOARD FOR LTE
 - 27 INSTALL (2) 10A BREAKERS FOR BBU'S WITH DC DROPS
 - 28 INSTALL (1) GPS ANTENNA MOUNT NEXT TO (E) GPS ANTENNA
 - 29 INSTALL (100LF) OF 1/2" COAX FOR NEW GPS
 - 30 INSTALL ALL GROUNDS AS REQUIRED FOR NEW EQUIPMENT
 - 31 SET ANTENNA DOWNTILTS FOR UMTS / GSM / LTE PER RFDS
 - 32 INSTALL WEATHERPROOFING AS REQUIRED
 - 33 COMPLETE PSAP CALL TESTING
- . MT-
 1) siad install and provisioning
 2) installation of (2) fiber jumpers 10 meters

Project Controls

 BECHTEL

 AT&T

DATE _____

DATE _____



LTE - EXPANSION



Antenna/Tower Sketch: Sketch the tower (or antenna array if on sled or building) including all antennas and heights of antenna and/or platforms and antenna mounts. Include height of tower and/or building. Include all coax runs and indicate if shared with other vendors. Sketch arrays when taking distance photo. SHOW DIMENSIONS ON ALL CABLE RUNS, ICE BRIDGE OR TRAY, BUILDING AND WATER TANK.

Site Name: Walker Chapel Church

Const. ID:

tower height - 125 ft

RAD center - 95 ft

Beta

Alpha

Gamma

Note manufacturer and diameter for boots and hatchplate.

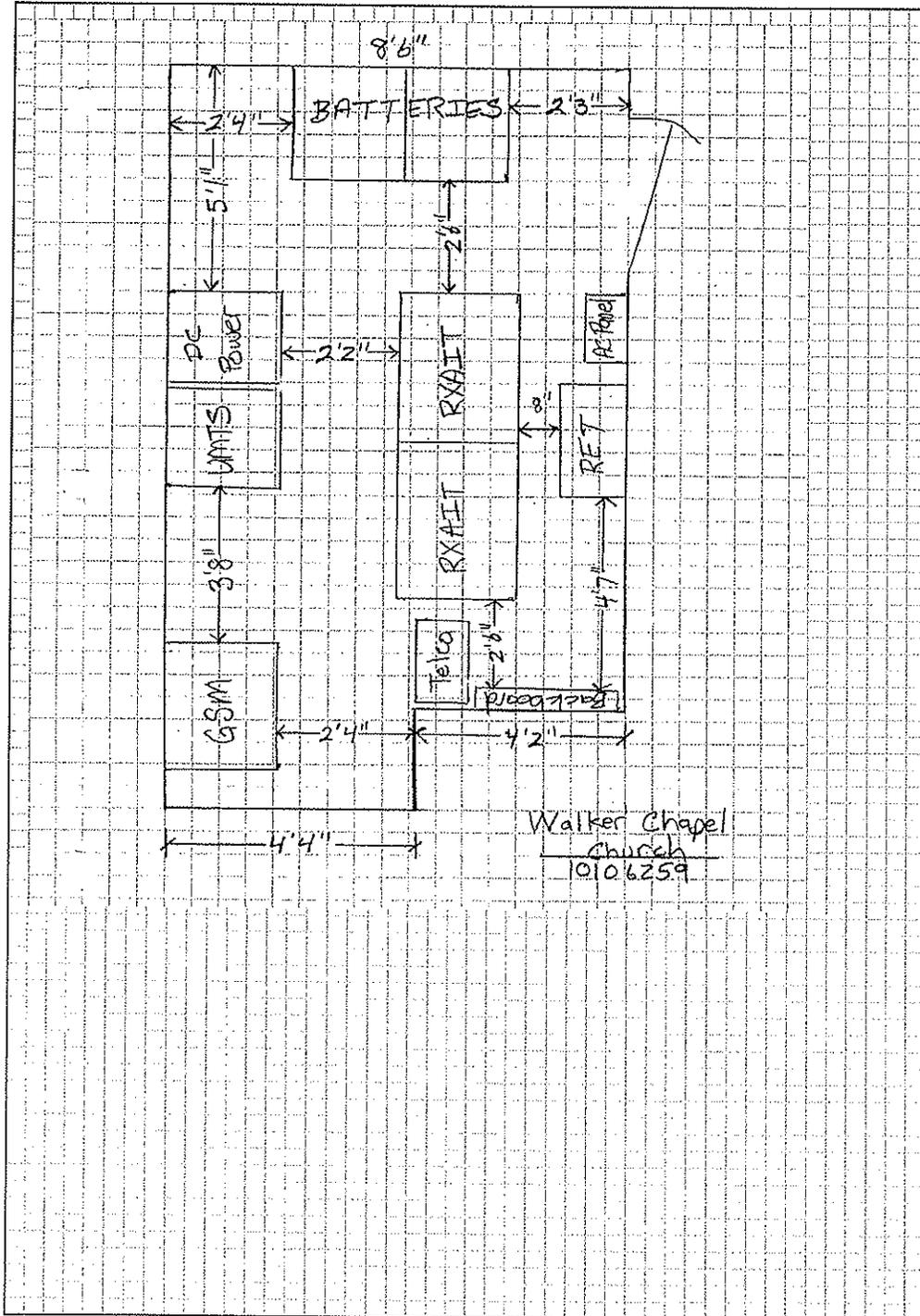


LTE - EXPANSION



Shelter OR Pad Sketch: Sketch the shelter including all equipment with overall dimensions. Show all Cingular equipment and include all wiring runs (elec. transport and coax). SHOW ALL DIMENSIONS INCLUDING CABLE RUNS

Site Name: Walker Chapel Church
Const. ID:





Preliminary

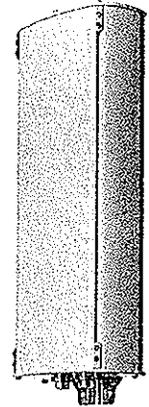
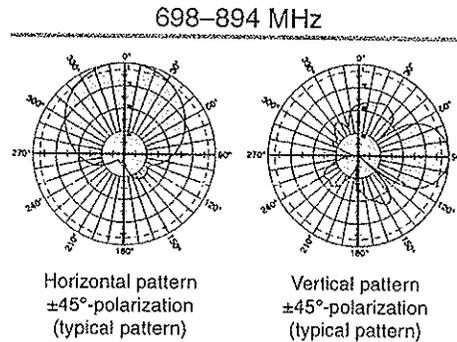
840 10525

65° Dualband Directional Antenna

Kathrein's dual band antennas are ready for 3G applications, covering all existing wireless bands as well as all spectrum under consideration for future systems, LTE, PCS and 3G/UMTS. These cross-polarized antennas offer diversity operation in the same space as a conventional 700 MHz antenna, and are mountable on our compact sector brackets

- Wide band operation.
- Exceptional intermodulation characteristics.
- Various gain, beamwidth and downtilt ranges.
- High strength pultruded fiberglass radome.

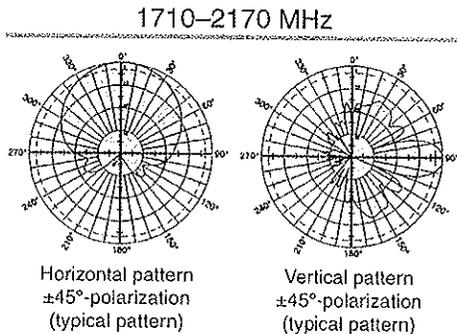
CALC NO. 25471-430-A3C-EF-00054
 ATTACHMENT 6 REV. 0
 SHEET 1 OF 2



General specifications:

Frequency range	698-894 MHz 1710-2170 MHz
Impedance	50 ohms
VSWR	<1.5:1
Intermodulation (2x20w)	IM3: <-150 dBc
Polarization	+45° and -45°
Connector	4 x 7-16 DIN female
Isolation intrasystem	>30 dB
Weight	15.9 lb (7.2 kg)
Dimensions	22.8 x 10.3 x 5.5 inches (579 x 262 x 139 mm)
Wind load Front/Side/Rear	at 93 mph (150kph) 23 lbf / 18 lbf / 41 lbf (100 N) / (80 N) / (180 N)
Wind survival rating*	120 mph (200 kph)
Shipping dimensions	29 x 11.9 x 7.6 inches (736 x 302 x 192 mm)
Shipping weight	19.2 lb (8.7 kg)
Mounting	Fixed and tilt mount options are available for 2 to 4.6 inch (50 to 115 mm) OD masts.

See reverse for order information.



Specifications:	698-806 MHz	824-894 MHz	1710-1755 MHz	1850-1990 MHz	2110-2170 MHz
Gain*	10.5 dBi	11 dBi	12.5 dBi	13.3 dBi	13.6 dBi
Front-to-back ratio	>25 dB (co-polar)	>25 dB (co-polar)	>27 dB (co-polar)	>27 dB (co-polar)	>27 dB (co-polar)
Maximum input power	250 watts (at 50°C)	250 watts (at 50°C)	200 watts (at 50°C)	200 watts (at 50°C)	200 watts (at 50°C)
+45° and -45° polarization horizontal beamwidth	72° (half-power)	66° (half-power)	64° (half-power)	64° (half-power)	60° (half-power)
+45° and -45° polarization vertical beamwidth	37° (half-power)	34° (half-power)	19° (half-power)	18.5° (half-power)	18° (half-power)
Cross polar ratio					
Main direction	0°	0°	25 dB (typical)	25 dB (typical)	25 dB (typical)
Sector	±60°	>10 dB	>8 dB	>8 dB	>8 dB
Integrated combiner	*The insertion loss is included in the given antenna gain values				



11241-FRO

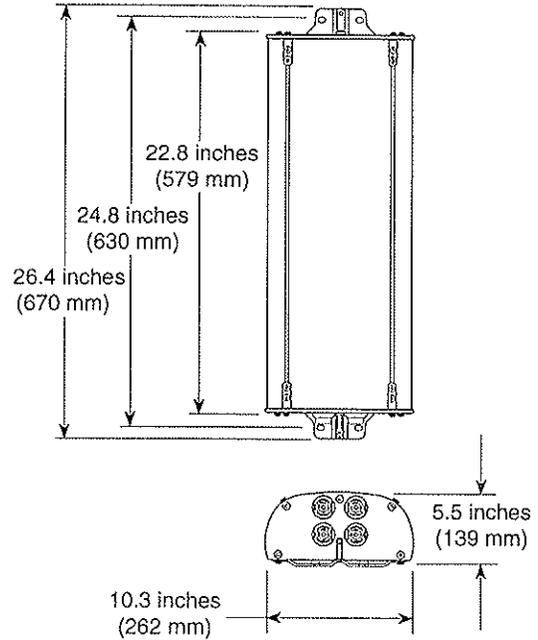
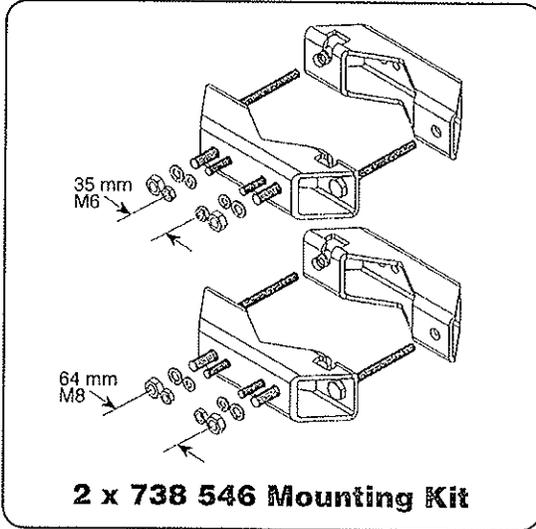
* Mechanical design is based on environmental conditions as stipulated in EIA-222-F (June 1996) and/or ETS 300 019-1-4 which include the static mechanical load imposed on an antenna by wind at maximum velocity. See the Engineering Section of the catalog for further details.



Preliminary

840 10525

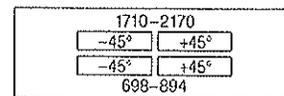
65° Dualband Directional Antenna



Profile PA2

Mounting Options:

Model	Description
2 x 738 546	Mounting Kit for 2 to 4.6 inch (50 to 115 mm) OD mast.
850 10013	Tilt Kit for use with the 2 x 738 546 mounting kit 0-34 degrees downtilt angle.



Order Information:

Model	Description
840 10525	Antenna with 7-16 DIN connectors

All specifications are subject to change without notice. The latest specifications are available at www.kathrein-scala.com.

Kathrein Inc., Scala Division Post Office Box 4580 Medford, OR 97501 (USA) Phone: (541) 779-6500 Fax: (541) 779-3991
 Email: communications@kathrein.com Internet: www.kathrein-scala.com



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ACTING DIRECTOR

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#1 COURTHOUSE PLAZA, SUITE 701
2100 CLARENDON BOULEVARD
ARLINGTON, VIRGINIA 22201
(703) 358-3760



HOUSING AND NEIGHBORHOOD DIVISION
JOAN L. LINDERMAN
DIVISION CHIEF

July 22, 1996

Jonathan P. Pak, Agent
for AT&T Wireless Services
c/o Hazel & Thomas, P.C.
3110 Fairview Park Drive
Falls Church, VA 22042

RE: Certificate of Appropriateness
Walker Chapel Historic District
4102 North Glebe Road
Z-2133-78-HD\RPC: 03066001

Gentlemen:

At its meeting of July 17, 1996, the Historical Affairs and Landmark Review Board (HALRB) approved a Certificate of Appropriateness to install 4 black louvers and 4 white fleur-de-lis crosses in fiberglass at the above referenced property.

The enclosed yellow placard must be displayed and the approved drawings must be available at the construction site. Please be advised that County staff will conduct periodic inspections of your project to ensure compliance with the approved CoA. The County inspectors cannot permit changes in the field or the construction of any items not shown on the approved drawings and plans. The CoA will expire one year from the date of issuance.

If you need assistance or have any questions, please call the Historic Preservation Office at (703) 358-3760.

Sincerely,

William Dale Waters
Historic Preservation Coordinator

c: S. Ingraham, Zoning Office
R. Reis, Inspection Services
J. Bernal, Code Enforcement
Walker Chapel United Methodist Church

ARLINGTON COUNTY, VIRGINIA

Department of Community Planning,
Housing and Development
Community Improvement Division

CERTIFICATE OF APPROPRIATENESS

CoA # 96-30

Date July 22, 1996

This CoA issued by the Historical Affairs and Landmark Review Board
pursuant to Section 31A of the Arlington County Zoning Ordinance

Historic District WALKER CHAPEL

Address 4102 NORTH GLEBE ROAD
ARLINGTON, VA 22207

Owner WALKER CHAPEL UNITED METHODIST Church

Remarks Installation of 4 black louvers and
4 White Fleur de Lis Crosses in fiberglass.



HALRB APPROVED - COA Issued on 7/22/96
Field changes to exterior components of
approved plans are not permitted. For
information, call (703) 358-3769

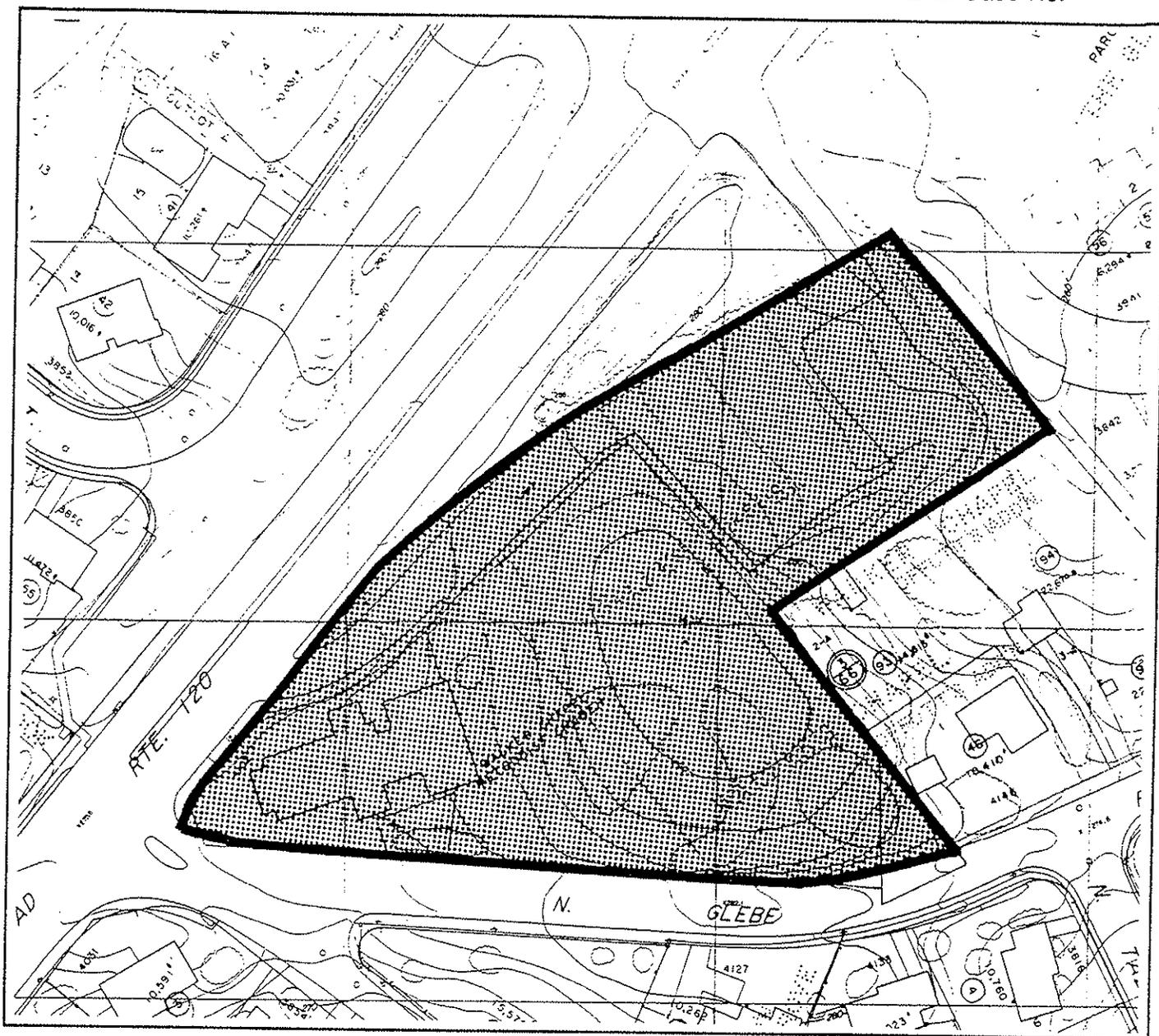
HALRB APPROVED

THIS CARD MUST BE DISPLAYED ON OUTSIDE OF BUILDING OR PREMISES
WHERE PLAINLY VISIBLE FROM THE STREET UNTIL COMPLETION OF WORK

Historical Affairs and Landmark Review Board

Arlington County, Virginia

HALRB Case No. 96-30



A request by Hazel and Thomas, P.C., agent for AT&T Wireless Services, for a Certificate of Appropriateness (COA) to install louvered panels in the steeple of the chapel located at 4102 North Old Glebe Road, which is known as the Walker Chapel Historic District.



**HISTORICAL AFFAIRS AND LANDMARK REVIEW BOARD
ARLINGTON COUNTY, VIRGINIA**

**STAFF REPORT
HALRB CASE NO. 96-30
WALKER CHAPEL HISTORIC DISTRICT
June 17, 1996**

I. Request

A request by Hazel and Thomas, P.C., agent for AT&T Wireless Services, for a Certificate of Appropriateness (COA) to install replacement louvered panels in the steeple of the chapel located at 4102 North Old Glebe Road, which is known as the Walker Chapel Historic District.

II. History and Background

The Walker Chapel Historic District was officially designated a historic district by the Arlington County Board on October 3, 1978 (Ordinance No. HD-108-78-1).

To date, HALRB Case No. 96-30 is the fifth request for a COA at this location.

III. Historic District Significance

The Walker Chapel and Cemetery Grounds Historic District is historically significant because its congregation is the third oldest in Arlington County and for its association with the Walker Family, who donated the land for the building of the original church. The brothers, Robert and James Walker, gave the land and contributed to the building efforts. The original building was dismantled in 1930.

IV. Description of Proposed Activities

HALRB Case No. 96-30 is a request to install louvered panels in the steeple of the chapel. The louvers will have an almost identical appearance to the originals and are being requested to facilitate the installation of wireless antennas within the steeple. The louvers will be constructed to replicate the appearance and size of the original and will be black in color.

Attached for the Review Board's information is the Design Review Committee's (DRC) report for the request. The DRC recommends approval for the request pending the submission of additional specifications information and a sample of the louver material. With the information being provided, the

CoA would be found to be appropriate for the structure and in compliance with requirements of the County's Historic Preservation Ordinance.

V. Staff Recommendation

Staff concurs with the DRC recommendations and recommends approval of the applicant's request for new louvers in the steeple of the chapel for antenna use.

I:\hand_hp\hpcases\1996\hairbc96.30

HALRB/Design Review Committee Report Meeting Date: 7/3/96

For DRC: Michael McHugh, Gray Gillem, Rebecca Hubbard,
Amy Silverman and David Ricks

For Arlington County: Dale Waters and Joan White

Case # 96-30

Agenda Item # 1

Applicant: Walker Chapel

For Applicant:

(See attached application for applicant, address, name of property and property description, drawings, photographs and proposed scope of work.)

Design Recommendations:

1. Applicant to submit photographs showing details of existing louvers.
2. Applicant will also provide sample.
- 3.
- 4.
- 5.
- 6.
- 7.

Findings (not applicable in case of preliminary review):

Recommended Action by full HALRB:

- Approve CoA
- Approve CoA pending recommended revisions and/or additional information
- No recommendation - full Board decision
- Defer ruling on CoA (explanation):
- Deny CoA (explanation):

ARLINGTON COUNTY, VIRGINIA
HISTORICAL AFFAIRS AND LANDMARK REVIEW BOARD
APPLICATION FOR CERTIFICATE OF APPROPRIATENESS

RECEIVED JUN 19 1996

DATE 6-19-96 2-2133.78 -HD RPC# 03066001

DESIGNATED PROPERTY:

Name Walker Chapel

Address 4102 N. Old Glebe Road, Arlington, Virginia

OWNER:

Name Walker Chapel United Methodist Church

Address 4102 N. Old Glebe Road, Arlington, Virginia

Phone (Home) _____ (Work) 703.538.5200

PERSON FILING APPLICATION, IF OTHER THAN OWNER:

Name Hazel & Thomas, P.C. - Jonathan P. Rak, agent for AT&T Wireless Services

Address 3110 Fariview Park Drive, Falls Church, Virginia 22042

Phone (Home) _____ (Work) 703.641.4200

Relationship to Applicant Agent for Applicant, AT&T Wireless Services (please see attached authorization)

PURPOSE OF APPLICATION:

Alteration Addition _____ Demolition _____ New Construction _____ Relocation _____

Will an application related to this property go before the Board of Zoning Appeals, Planning Commission, or County Board? If so, please specify No.

Does the proposed work require a building permit? Yes.

Is any demolition anticipated? Replacement of Louvers only.

BRIEF PROPERTY DESCRIPTION: (Bldg. type, age and condition, original and proposed use; previous CoAs?)

The subject building is a church built in 1960. Applicant, AT&T Wireless Services proposes to replace the louvers in the steeple of the church with 3 antennas which will be almost identical in appearance to the existing louvers.

DESCRIPTION OF PROPOSED WORK:

AT&T Wireless Services proposes to install 3 panel antennas in the steeple of the Walker Chapel. The antennas will replace 3 of the louvers in the steeple at 3 different facings. The antennas will be constructed and installed in such a manner as to be nearly identical in appearance to the existing louvers.

Estimated Start and Finish Dates of Work: September 15 to December 1, 1996.

PROJECT ARCHITECT/ENGINEERS/CONTRACTORS:

Project Architect - HDR

For further information, call the Historic Preservation Coordinator at (703) 358-3760.
Please forward the Application to:

Historical Affairs and Landmark Review Board
2100 Clarendon Boulevard
Suite 701
Arlington, Virginia 22201

LETTER OF TRANSMITTAL

Historical Affairs and Landmark Review Board
2100 Clarendon Boulevard
Suite 701
Arlington, Virginia 22201

RECEIVED JUN 19 1996

Dear Review Board Members:

Enclosed is an Application for a Certificate of Appropriateness and the following attachments:

Drawings (10 copies each) - Indicate scale on each drawing.

Site Plan n/a
Elevation 1/16" = 1'
Section 1/8" = 1'
Detail 1/8" = 1'

Photographs (10 copies each) - Please indicate number of photographs.

Color 1 Black/White _____

Material Samples/Manufacturer's Catalog Cuts - Please describe all material exhibits.

(1) Manufacturer's Catalog Cut which illustrates antenna
type.

I understand that these materials will be placed in the file for information about my property following the public hearing.

Janneth P. Pelt
(Signed)

Date 6/17/96

If further information is needed, please call the Historic Preservation Coordinator at (703) 358-3760.

PHOTOS
ARLINGTON, VA - WALKER CHAPEL (SITE # W254.1)

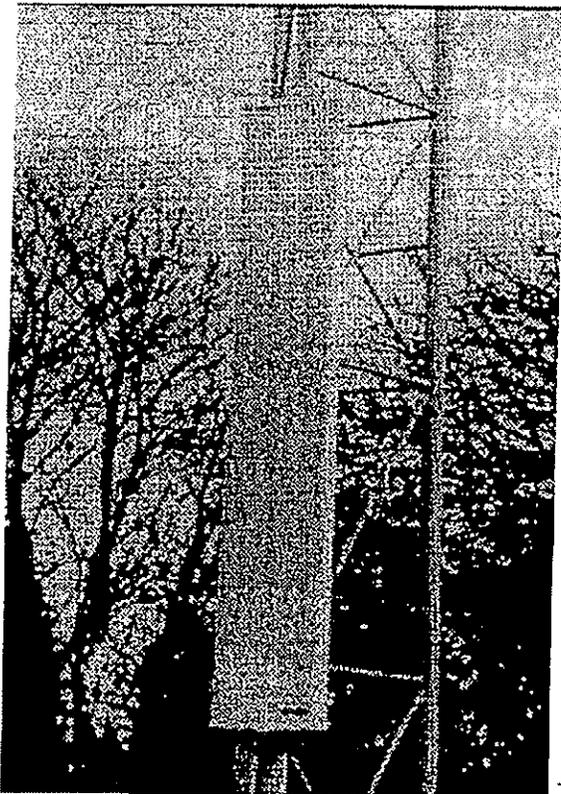


LOOKING SOUTHWEST AT SITE

X-CELL

Dual Polarized Flat Panel
PCS Sector Antenna
PCS D 085-17-*

COMSAT RSI's Dual Polarized Antenna is manufactured using one piece printed circuit construction which insures unsurpassed reliability, beam shaping and intermodulation performance.

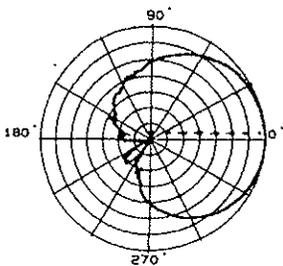


SPECIFICATIONS

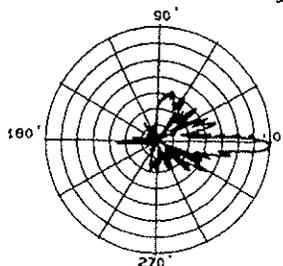
Frequency:	1850-1965 MHz
Polarization:	Dual Linear, Vertical and Horizontal
Gain:	14.5 dBd +/- 1.0 dB
Vertical Beamwidth:	6.0 +/- 0.5 degrees
Horizontal Beamwidth(V-Pol):	85 +/- 5 degrees
V to H Azimuth Tracking: (Over 120 degree sector/receive band):	<2.0 dB
Vertical to Horizontal Isolation (Receive Band)	>30 dB typical, >25 dB maximum
Null Fill (1st null below horizon):	-18 dB minimum
Upper Side Lobe Suppression(0-20deg):	>18 dB typical, >16 dB min.
Electrical Downtilt:	2.0 +/- 0.5 degrees
Front to Back Ratio:	>25 dB
VSWR:	1.3:1 typical, 1.5:1 max.
Maximum Input Power:	250 watts CW
Intermodulation Products:	<-153 dBc 2x20 watt carriers
Connectors:	7/16 DIN Female
Dimensions:	67"Hx8"Wx2"D
Weight:	15.87 lbs.

Windload at 100 MPH front 127 lbf

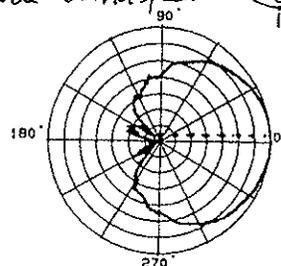
*Survival windspeed side 11 lbf
125 MPH*



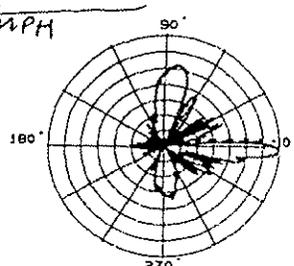
Horizontal Port
Horizontal Pattern



Horizontal Port
Vertical Pattern



Vertical Port
Horizontal Pattern



Vertical Port
Vertical Pattern

PCS POLARIZATION DIVERSITY SPECIFICATIONS

Electrical:

Slant (+45°/-45) Polarization

Model	X-S-68-6-X-X	X-S-68-10-X-X	X-S-85-6-X-X	X-S-85-10-X-X
Termination	7/16 DIN			
Impedance	50 ohm			
Frequency Range	1850 - 1990 MHz			
Gain dBi	17.5	16.4	16.6	15.5
VSWR	<1.3:1			
Beamwidth (3dB from maximum-each array)	68° Horizontal 6° Vertical	68° Horizontal 10° Vertical	85° Horizontal 6° Vertical	85° Horizontal 10° Vertical
Polarization	+/-45° Slant	+/-45° Slant	+/-45° Slant	+/-45° Slant
Max. Input Power	200 Watts per Channel			
Downtilt	Available 0°, 2°, 4°, 6°			

Mechanical:

Weight (lbs.)	8.8	4.4	8.8	4.4
Length	66"	41"	66"	41"
Width	6.3"	6.3"	5.0"	5.0"
Depth	2.9"	2.9"	2.9"	2.9"
Opt. Downtilt Bracket	Adjustable 0° - 10°			

Product	Freq	Horiz °	Vert °	Downtilt	Feed Loc
X = XPD	S=PCS	68°	6°	0°	B=Bottom
	N=PCN	85°	10°	2°	M=Middle
	M=GSM			4°	T=Top
				6°	



July 3, 1996

Design Review Committee
Historical Affairs and Landmark Review Board
2100 Courthouse Plaza, Suite 701
Arlington, Virginia

RE: Walker Chapel Historic District

Dear Review Committee and Review Board:

Applicant, AT&T Wireless Services, proposes to replace the above referenced Chapel's steeple louvers with replica louvers. The existing louvers which are located in the steeple of Walker Chapel (built in 1960) are made of metal, which is problematic to Applicant's proposed use. AT&T wishes to place three "cross polarization" antennas inside the subject steeple as part of its new nationwide wireless communications network known as PCS (personal communications services). The proposed antennas would be placed behind the louvers and would not be visible from the exterior of the Chapel. Unfortunately, these antennas cannot operate behind a metal facing. Applicant wishes to replicate and replace the existing metal louvers with fiberglass louvers in order to allow the antennas to operate.

Applicant intends to employ a company with extensive expertise to reconstruct the louvers so that the change will be unnoticeable.

Attached are a few pages from the company's brochure which illustrates some of its prior work. We hope you will agree that their reproductions are extremely impressive.

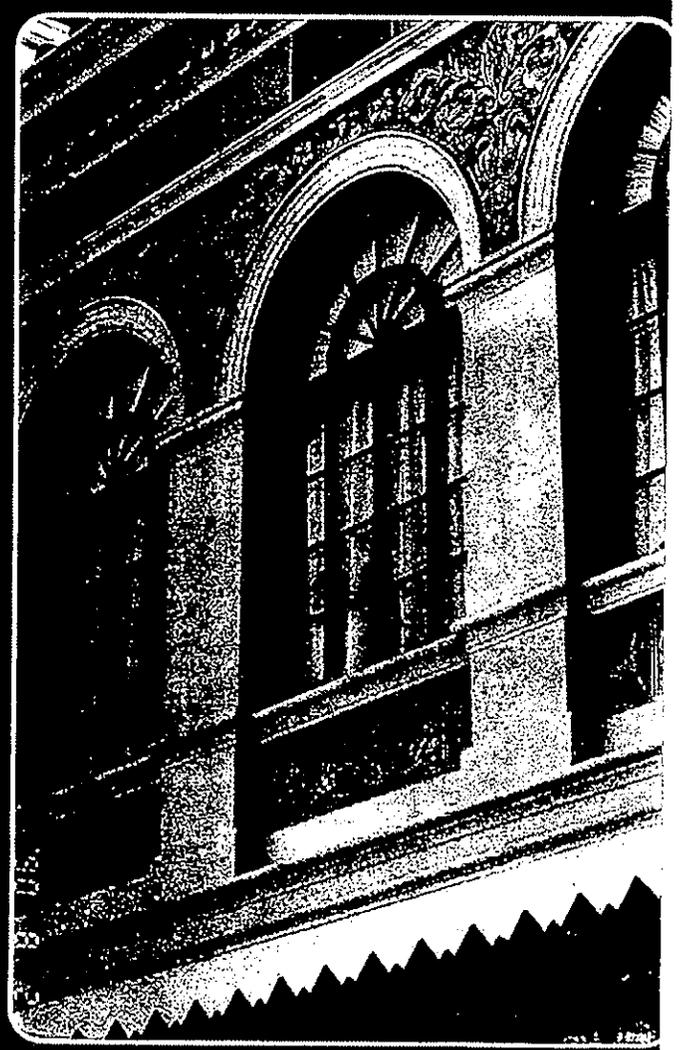
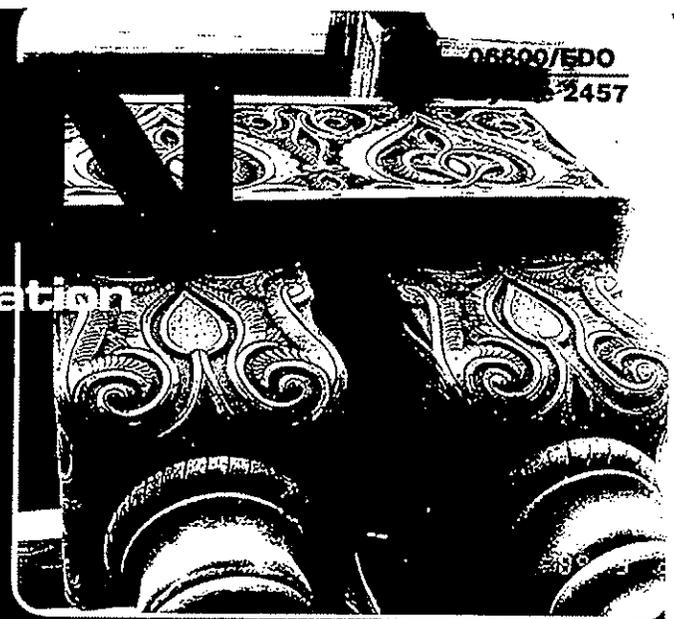
Sincerely yours,

D. Garvey Corporation, Project Managers

Jeffrey A. Schonberger

08800/EDO
2457

architectural ornamentation



fiberglass

EDON has created exterior FRP dormers, window frames, moldings, cornices and brackets in contemporary finishes for the building industry.



Manna Bay/Ouincy, MA

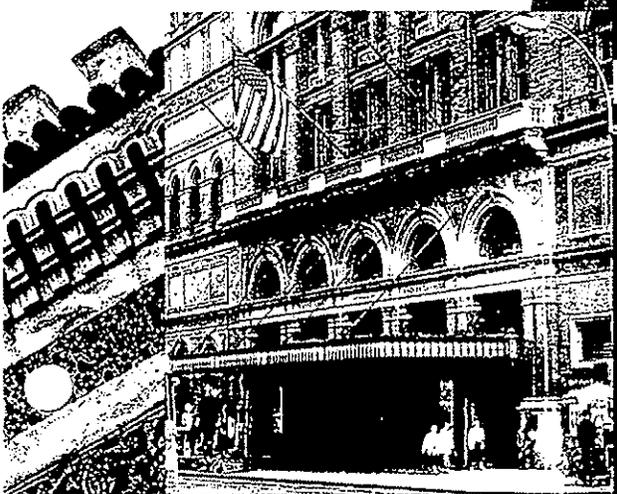
EDON'S ability to reproduce the shapes and sizes of complex configurations allows the architect the freedom to re-create historical shapes and finishes, without sacrificing the authentic look. EDON lightweight Fiberglass

eliminates extra structural requirements.



Column Capitals

EDON'S completely integrated in-house capability permits quality fine-tuning, cost effectiveness and on-time delivery.



Carnegie Hall/NYC, NY

**Art-Deco Ornamentation
Universal Studios, FL**

EDON sculptured and produced the fiberglass Art Deco spandrels, moldings and trim for this reproduction of the 1940s building.



EDON Fiberglass Shapes & Finishes Architectural Column Covers



Faux Marble Facade—
Universal Studios, FL

From classical to contemporary, from unadorned to ornate, EDON is a unique source of Architectural Shapes and Finishes. Unique, because the concepts presented here only begin to express the full range of EDON designer/architect engineered components.

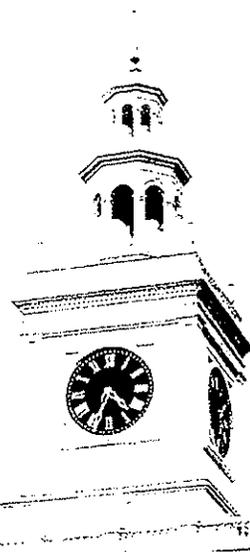
Fiberglass Reinforced Polyester (FRP) is the material of choice in outdoor or high traffic settings. EDON FRP column covers and architectural components are not effected by weather and will not corrode, crack or rot. EDON FRP architectural components offer very real cost savings, and can be manufactured in a wide variety of shapes and finishes.

Fiberglass Reinforced Gypsum (FRG) architectural components by EDON offer an even greater cost savings. Used extensively in interior applications, FRG architectural components possess a zero flame spread, zero smoke-contribution and zero toxicity performance.

EDON FRG column covers and architectural shapes allow a low budget to be maintained without compromising quality.



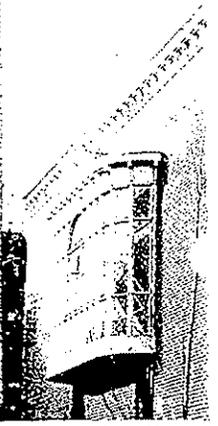
Universal Studios, FL



Poly-Prep School, NY



Church Dome/NJ

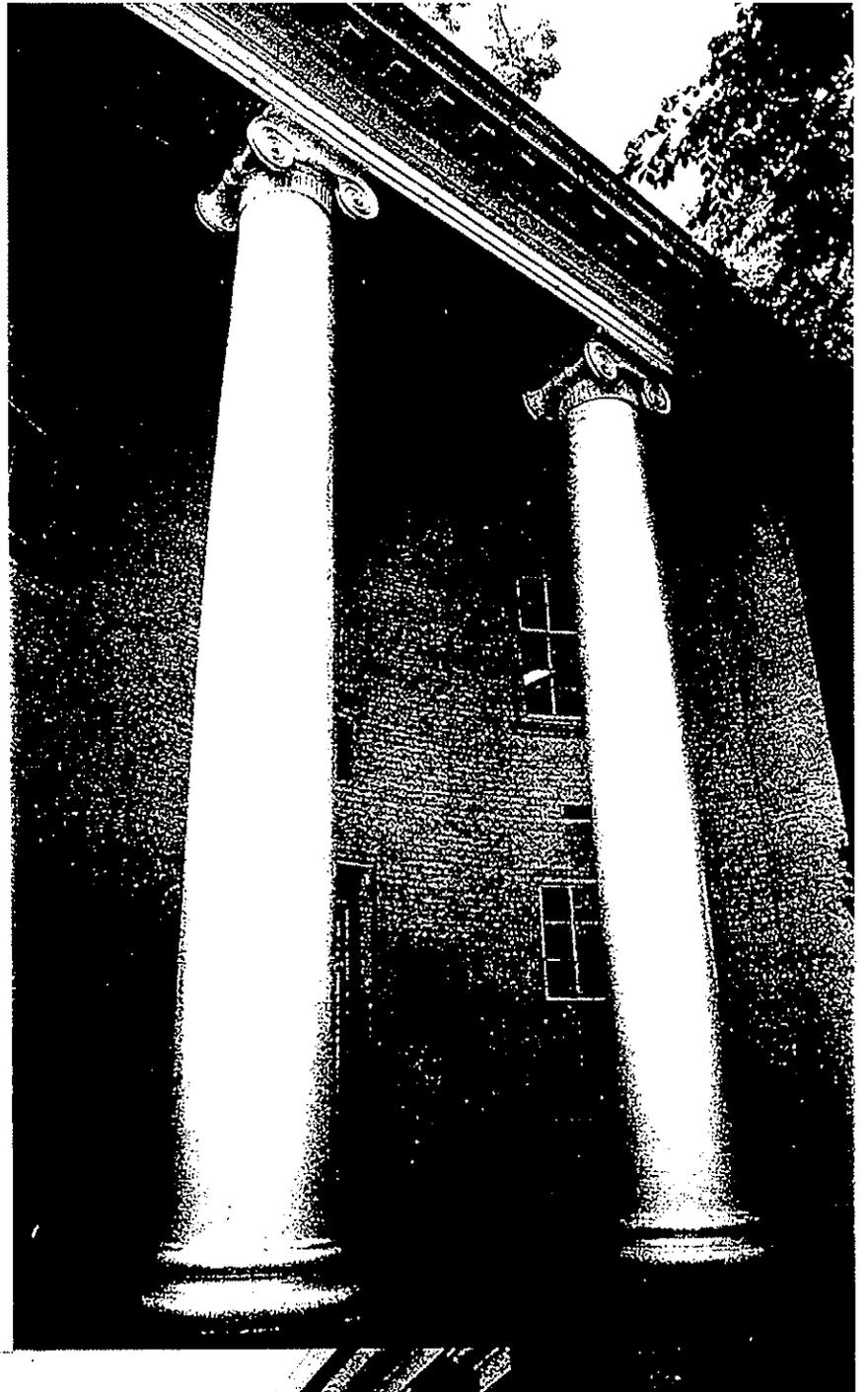


Georgetown University/Washingt

EDON Fiberglass Cornices, Moldings & Domes

EDON produces FIBERGLASS Cornices, Moldings, Church Domes, Architectural Domes, Historic configurations of all types, sizes and shapes. These architectural ornamentation products enhance many of the important buildings in America.

EDON blends the decorative with the practical in a wide range of sizes and styles in fiberglass. EDON stock Cornices and Moldings can solve cost problems. An economical answer to difficult design criteria. EDON can produce custom sizes, shapes and textures on your requirements. Integral color or applied finishes are available.



Columns Capitals
University of Delaware



American Adventure Building/Epcot, FL



Cornice Restoration
Plymouth, PA

STATEMENT REGARDING THE AT&T CELLULAR COMMUNICATIONS ANTENNAS AT WALKER CHAPEL

17 May 2011

The congregation of Walker Chapel United Methodist Church takes the concerns of its immediate community very seriously. For 140 years Walker Chapel has been the primary institution within the Old Glebe Road neighborhood, and many of our current members, worship service attendees and preschool users are residents within the boundaries of the modern day Old Glebe Civic Association.

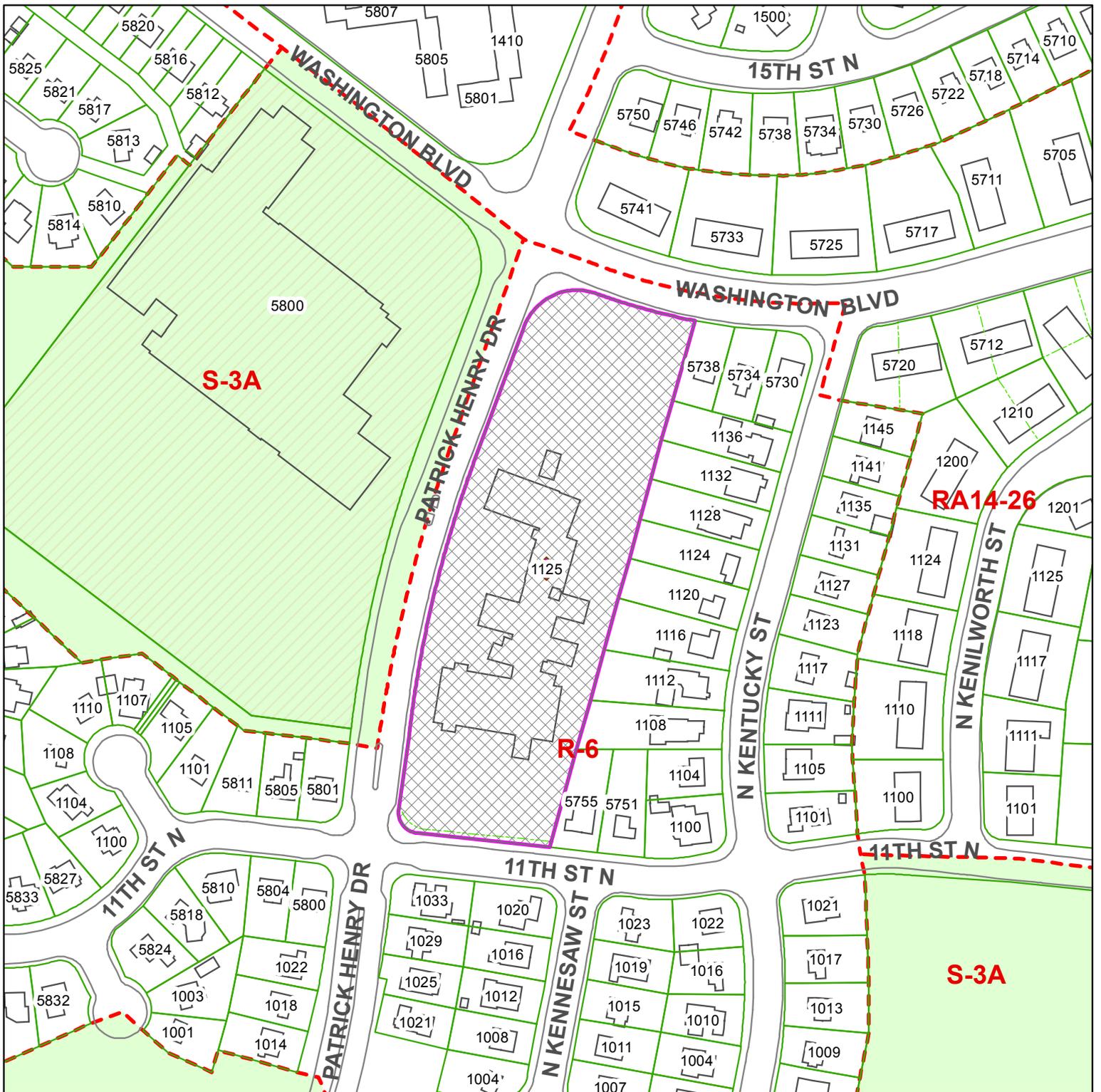
Recently, AT&T submitted a proposal to Arlington County to upgrade its cellular communications equipment and expand the number of antennas, as permitted by its lease with our church. Within 36 hours of my receipt of a weekend e-mail message from a concerned neighborhood resident, the Chair of our Board of Trustees, our Lay Leader and I met with him and his neighbor. We explained that in 1996, following a public hearing process, Walker Chapel entered into a legal agreement with AT&T to lease interior space in our church balcony and steeple for the installation of radio antennas and related equipment. This lease agreement permitted AT&T to install up to fourteen antenna devices and to update its equipment as it deemed necessary so long as the equipment and its operations were in full compliance with all prevailing federal governmental ordinances. AT&T has continuously operated cellular communications equipment in our steeple since lease inception; by exercising its available lease options, AT&T can operate its equipment until 2016. AT&T does not require Walker Chapel's permission to upgrade and expand its equipment up to the fourteen antenna limit, and AT&T is not obligated to increase its monthly lease payments when such events occur. Walker Chapel does not have the ability to terminate the lease for convenience.

Radio communication antennas and related equipment have for many years been placed in interior spaces in urban and suburban church steeples and other institutional structures such as school buildings, providing the necessary height to facilitate the needs of the cellular communications tenant. The radio equipment is usually hidden from public view, as this is more aesthetically acceptable in residential environments than are freestanding "mono poles" such as is situated in our community near the intersection of Old Glebe and Military Road.

With respect to radio frequency emissions (RFE), the Federal Communications Commission has established maximum permissible human exposure guidelines. All communications carriers are required to adhere to these guidelines. While we are not authorities in radio communications technology, we have confidence in the federal agencies regulating this aspect of communications commerce—and from a variety of reliable sources we understand that the RFE measured at the base of radio antenna installations is significantly less, often tens of thousands of times, than federally mandated maximum allowable readings. Finally, I know that there is a plethora of sources regarding RFE, including some of questionable veracity. Three readily accessible information sources that may be of specific interest are the Federal Communications Website; the "RF Emission Survey of FCPS Facilities" page of the Office of Safety and Security, Fairfax County Public Schools Website; and the Cellular Phone Towers page of the American Cancer Society Website.

Walker Chapel has been, is now, and will continue to be good, responsible stewards of all life in its community—the children, our close-by neighbors, our congregants, and even those who sit closest to the steeple—in the church balcony. We have not, and will not, knowingly put anyone at risk. Along with many other church congregations and public school boards, we believe that all due care has been exercised by recognized, national health and technical experts in matters relating to cellular communications installations. This is a pledge of our good faith.

Rev. James N. Earley, II, DMin.
Pastor
Walker Chapel United Methodist Church



U-3283-11-1

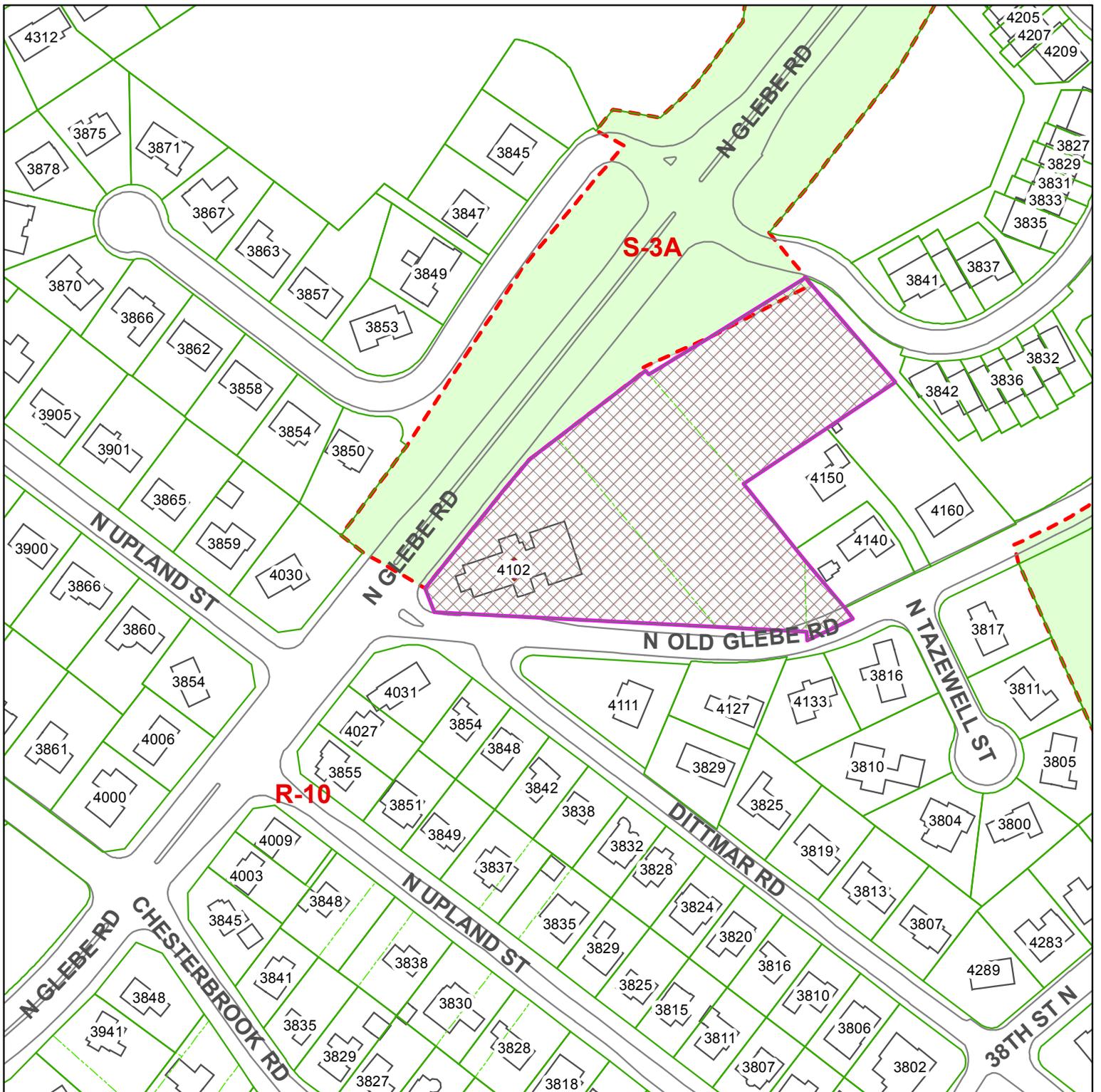
1125 Patrick Henry Drive

RPC: 09-067-001



 Case
 Location(s)
 Scale: 1:2,000

Note: These maps are for property location assistance only. They may not represent the latest survey and other information.



U-3286-11-1

4102 Old Glebe Road

RPC: 03-066-001



 Case
 Location(s)
 Scale: 1:2,000

Note: These maps are for property location assistance only.
 They may not represent the latest survey and other information.