

Historic Architectural Review Commission

Agenda Packet

January 26, 2010 – 3:00 p.m.

City Commission Chamber
Old City Hall, 510 Greene Street



Item 5.b.4.

CL4- Request for installation of exterior antenna at top of building- #1500 Reynolds Avenue- Verizon Wireless-(H10-01-15-40)- Installation of exterior antenna and internal transmit antenna.

CL4- Request for installation of exterior antenna at top of building - #1500
Reynolds Avenue- Verizon Wireless (H10-01-15-40)

Installation of exterior antenna and internal transmit antenna.

The proposed installation of an antenna for wireless communication will be at the top roof of the newest addition to Casa Marina Hotel. The proposed equipment is a donor antenna that will be mounted above roofline and behind an existing parapet wall. The antenna will be setback from the west elevation and will be 57 feet height from ground level. The antenna will be 18.5" wide and will not exceed in height the existing parapet wall.

Guidelines that should be reviewed for this application;

- Air conditioning units, antennas, trash facilities and satellite dishes (pages 42-43);
 - *Guideline 5*
Exterior air conditioning units, television dishes and antennas should be mounted out of sight of the public right of way and obscured behind landscaping or fencing whenever possible.

It is staff believes that the proposed donor antenna will not be seen from the right of way. The antenna will be mounted inside of the existing parapet wall and will not extend over it. The antenna will be located on the top of a + four story building; pedestrians will not see it.

The applicant included in the submittal an email from the Florida State Historic Preservation Office, Florida Division of Historical Resources, with their findings that there will be no visual or direct adverse effect on historic properties in the Area of Potential Effect.

Staff understands that this undertaking will have no adverse effect on the surrounding properties. The installation of the proposed antenna complies with the guidelines. Staff recommends to this Commission to **approve** the installation as proposed.

Application

12 January 2010

City of Key West, H.A.R.C.
604 Simonton Street, First Floor
Key West, Florida 33040
Attn. Ms. Enid Torregrosa,
Historic Preservation Planner

Submitted on behalf of:

Verizon Wireless
777 Yamato Road, 6th Floor
Boca Raton, FL 33431
Attn: Ms. Josephine Conde
Leasing and Contracts Administrator
(561) 995-5500

**RE: CERTIFICATE OF APPROPRIATENESS – CASA MARINA RESORT
1500 Reynolds Avenue, Key West, Florida 33040**

Dear Ms. Torregrosa,

EnviroDesign Associates, Inc. (EDA) presents the enclosed on behalf of Verizon Wireless for the Certificate of Appropriateness application at the Casa Marina Resort facility. The purpose of this package is to provide sufficient information to allow the City of Key West Architectural Review Committee to approve the Certificate of Appropriateness for the installation of a communications “donor” antenna on the rooftop of the southeast corner of the west wing, as approved by the State Historic Preservation Office (SHPO) on December 18, 2009.

The following is included as part of this application:

- Certificate of Appropriateness Application
- SHPO Letter
- Historic Properties Map
- Historic Properties Photos
- Donor Antenna Photo Depiction (Figure – 1)
- Donor Antenna Location Drawing (Figure – 2)
- Antenna Drawings

Should you have any questions please feel free to call or email.

Sincerely yours,
EnviroDesign Associates, Inc.

Scot Wehmeyer
Sr. Project Manager



**CITY OF KEY WEST
BUILDING DEPARTMENT
CERTIFICATE OF APPROPRIATENESS**

APPLICATION # _____

OWNER'S NAME: Cara Marina Owner LLC DATE:

OWNER'S ADDRESS: 811 Summole Street
Key West, FL 33040 PHONE #: 305-
296-3535

APPLICANT'S NAME: Verizon Wireless PHONE #: 561-
995-5671

APPLICANT'S ADDRESS: 777 Yamato Rd. Ste 600
Boca Raton, FL 33431

ADDRESS OF CONSTRUCTION: 1435 Simonton Street
Key West, FL 33040 # OF UNITS:

THERE WILL BE A FINAL INSPECTION REQUIRED UNDER THIS PERMIT

DETAILED DESCRIPTION OF WORK: Installation of exterior antenna
and internal transmit antennas

Chapter 837.06 F.S.-False Official Statements – Whoever knowingly makes a false statement in writing with the intent to mislead a public servant in the performance of his or her official duty shall be guilty of a misdemeanor of the second degree punishable as provided for in s. 775.082 or 775.083

This application for Certificate of Appropriateness must precede applications for building permits, right of way permits, variances, and development review approvals. Applications must meet or exceed the requirements outlined by the Secretary of the Interior's Standards for Rehabilitation and Key West's Historic Architectural Guidelines.

Once completed, the application shall be reviewed by staff for completeness and either approved or scheduled for presentation to the Historic Architectural Review Commission at the next available meeting. The applicant must be present at this meeting. The filing of this application does not ensure approval as submitted.

Applications that do not possess the required Submittals will be considered incomplete and will not be reviewed for approval.

Date: 11/23/09.

Applicant's Signature: [Signature]
(RAMESH TOOLSIE, Dir. Network Eng.)

Required Submittals

	TWO SETS OF SCALED DRAWINGS OF FLOOR PLAN, SITE PLAN AND EXTERIOR ELEVATIONS (for new buildings and additions)
	TREE REMOVAL PERMIT (if applicable)
	PHOTOGRAPHS OF EXISTING BUILDING (repairs, rehabs, or expansions)
	PHOTOGRAPHS OF ADJACENT BUILDINGS (new buildings and additions)
	ILLUSTRATIONS OF MANUFACTURED PRODUCTS TO BE USED SUCH AS SHUTTERS, DOORS, WINDOWS, PAINT COLOR CHIPS, AND AWNING FABRIC SAMPLES

Staff Use Only

Date: _____

Staff Approval: _____

Fee Due: \$ _____

HISTORIC ARCHITECTURAL REVIEW APPLICATION

HISTORIC ARCHITECTURAL REVIEW COMMISSION USE ONLY

Approved _____

Denied _____

Deferred _____

Reason for Deferral or Denial:

HARC Comments:

Limit of Work Approved, Conditions of Approval and/or Suggested
Changes:

Date: _____

Signature: _____

Historic Architectural
Review Commission

Scot Wehmeyer

From: Lucy D. Jones [ldjones@floridahistoryllc.com]
Sent: Thursday, November 19, 2009 3:16 PM
To: 'Scot Wehmeyer'
Subject: FW: Section 106 Notification of SHPO/THPO Concurrence- Email ID #32265

SHPO concurrence for Casa Marina Tower

From: towernotifyinfo@fcc.gov [mailto:towernotifyinfo@fcc.gov]
Sent: Thursday, November 19, 2009 3:00 PM
To: Lucy Jones
Subject: Section 106 Notification of SHPO/THPO Concurrence- Email ID #32265

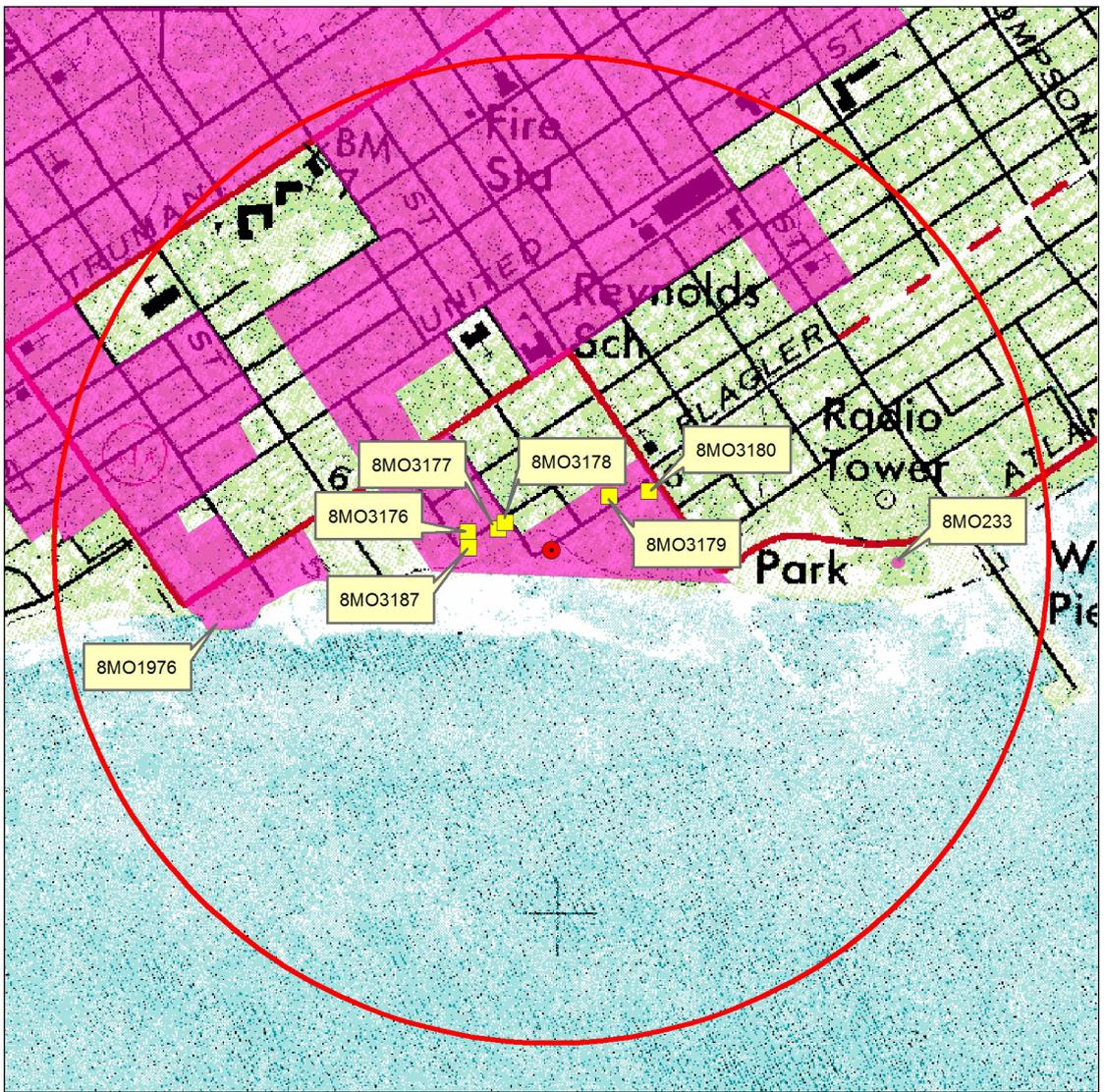
This is to notify you that the Lead SHPO/THPO has concurred with the following filing:

Date of Action: 11/19/2009
Direct Effect: No Effect on Historic Properties in APE
Visual Effect: No Adverse Effect on Historic Properties in APE
Comment Text: None

File Number: 0004032111
Purpose: Collocation Submission Packet
Notification Date: 7AM EST 11/16/2009
Applicant: Verizon Services Corporation d/b/a Verizon
Consultant: Florida History, LLC
Site Name: Casa Marina
Site Address: 1500 Reynolds Street
Site Coordinates: 24-32-50.6 N, 81-47-29.6 W
City: Key West
County: MONROE
State:FL
Lead SHPO/THPO: Florida Division of Historical Resources

NOTICE OF FRAUDULENT USE OF SYSTEM, ABUSE OF PASSWORD AND RELATED MISUSE

Use of the Section 106 system is intended to facilitate consultation under Section 106 of the National Historic Preservation Act and may contain information that is confidential, privileged or otherwise protected from disclosure under applicable laws. Any person having access to Section 106 information shall use it only for its intended purpose. Appropriate action will be taken with respect to any misuse of the system.



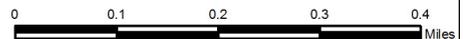
Legend:

-  Proposed Tower Location
-  1/2-mile APE
-  NRHP-listed Resource
-  Representative Buildings Protographed



Casa Marina

Monroe County, Florida
 Township 67 South, Range 25 East
 Base Map: Key West, Fla. 1971
 USGS 7.5' topographic quadrangle



Historic Property within Area of Potential Effect for Visual Effects

8MO1976 (Key West Historic District), consisting of 187 buildings, is partially located within the ½-mile APE for visual effects for the Casa Marina Tower. The Key West Historic District (8MO1976) was listed on the National Register of Historic Places in 1971, and meets the definition of historic property for antenna collocation projects.

The antennas are to be placed on the roof of the 5-story modern addition to the Casa Marina hotel (8MO3180), and will not be visible from the street or the ground. Given the proposed location, small size, and unobtrusive design of the antenna, there will be no effect on historic properties.

Six historic structures located within 500 ft. of the proposed antenna location and the Key West Historic District were photographed for this project.



8MO3176 (701 Waddell Street), facing north-northwest (10/15/09)



Viewshed from 8MO3176 (701 Waddell Street) back towards proposed antenna location, facing south-southeast (10/15/09)



8MO3177 (Cocoanut Beach Resort [1500 Alberta Ave]), facing west-southwest (10/15/09)



Viewshed from 8MO3177 (Cocoanut Beach Resort [1500 Alberta Ave]), back towards proposed antenna location, facing east-southeast (10/15/09)



8MO3178 (Cocoanut Beach Resort [1502 Alberta Ave]), facing west-southwest (10/15/09)



Viewshed from 8MO3178 (Coconut Beach Resort [1502 Alberta Ave]), back towards proposed antenna location, facing southeast (10/15/09)



8MO3179 (Marriott Human Resources Building [1500 Reynolds St]) facing north-northeast (10/15/09)



Viewshed from 8MO3179 (Marriott Human Resources Building [1500 Reynolds St]), back towards proposed antenna location, facing southwest (10/15/09)



8MO3180 (Casa Marina Hotel Building [1500 Reynolds St]) facing south-southwest (10/15/09)



Viewshed from 8MO3180 (Casa Marina Hotel Building [1500 Reynolds St]), back towards proposed antenna location, facing southwest (10/15/09)

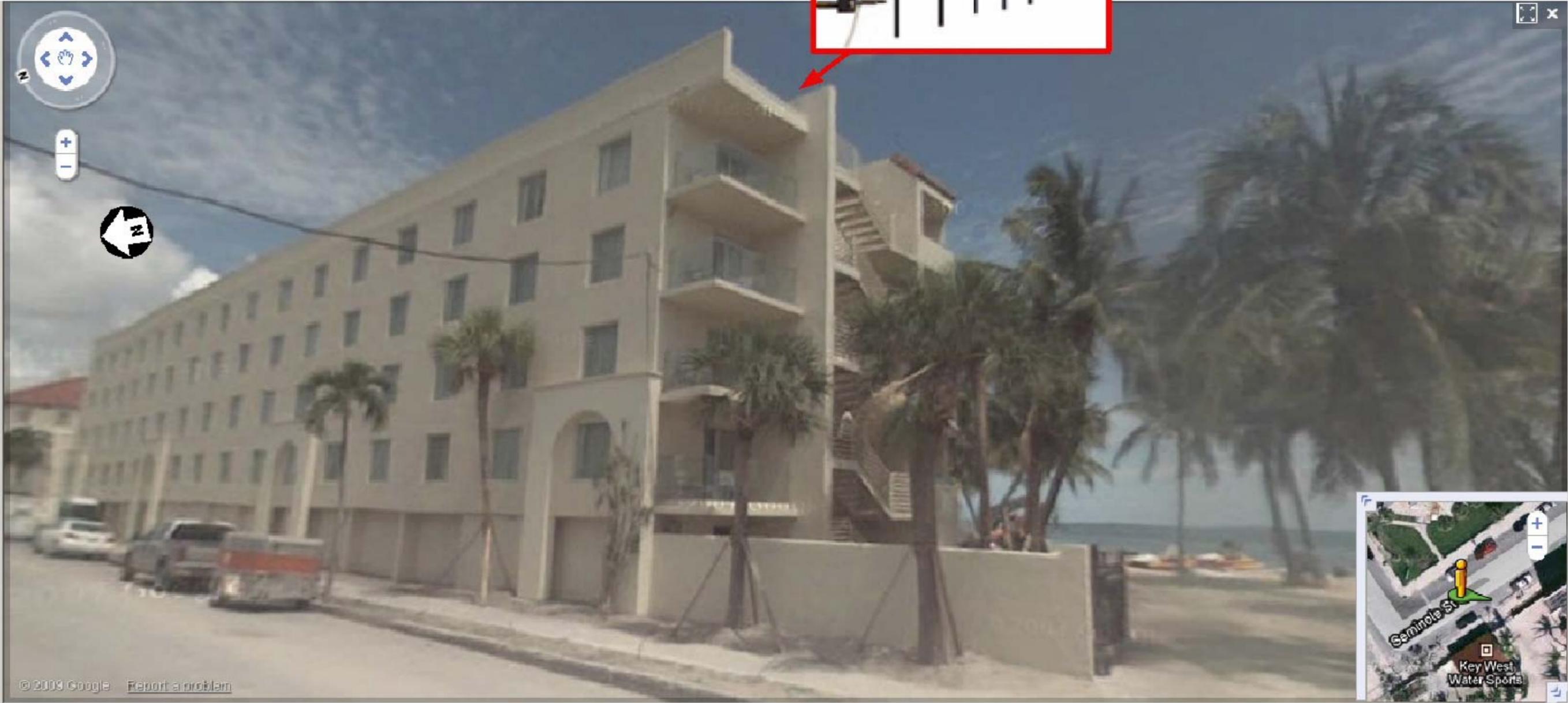
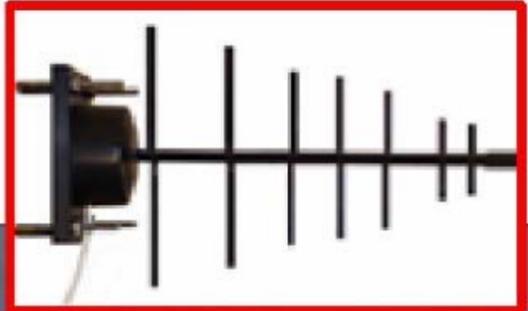


8MO3187 (Louis Backyard Building [700 Waddell Ave]) facing southeast (10/15/09)



Viewshed from 8MO3187 (Louis Backyard Building [700 Waddell Ave]), back towards proposed antenna location, facing south-southeast (10/15/09)

Antenna will be mounted above roof line and in by 3-8 ft. and away from view from the street at this or any other angle.



**PHOTO DEPICTION
Casa Marina
1500 Reynolds Street
Key West, FL 33040**

SCALE: NOT TO SCALE

298 Pineapple Grove Way,
Delray Beach, Florida
Phone (561) 274-6500
Fax (561) 274-8558

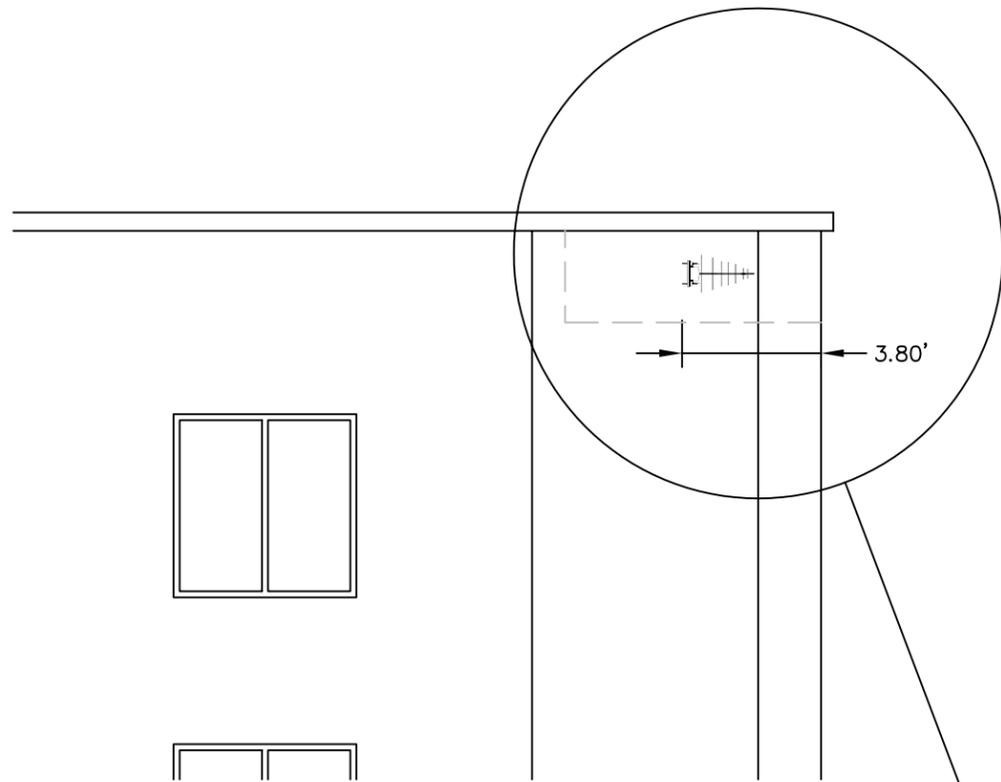


EnviroDesign
Associates Inc.
www.envdesign.com

Drawn By: SEW	January 2010 Project No.: casa marina	Figure No.: 1
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UNLESS SIGNED AND SEALED BY A REGISTERED PROFESSIONAL
ENGINEER REPRESENTING ENVIRODESIGN ASSOCIATES, INC.





NOTES:
 ANTENNA WILL BE LOCATED
 ABOVE ROOFLINE AND 3.8
 FEET IN AND AWAY
 FROM VIEW.

ANTENNA WILL NOT BE VISIBLE
 FROM STREET AS POSITIONED.



LOCATION
 OF DONOR
 ANTENNA

ELEVATION 57'
 ABOVE GROUND LEVEL

SOUTHWEST END OF
 CASA MARINA RESORT
 (NEW ADDITION. CONSTRUCTED
 CIRCA 1986.)

SEMINOLE STREET

DONOR ANTENNA LOCATION
Casa Marina
1500 Reynolds Street
Key West, FL 33040



EnviroDesign
 Associates Inc.
 www.envirodesign.com

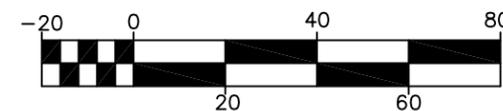
298 Pineapple Grove Way,
 Delray Beach, Florida
 Phone (561) 274-6500
 Fax (561) 274-8558

Drawn By:
 SEW

January 2010
 Project No.: casa marina

Figure No.:
2

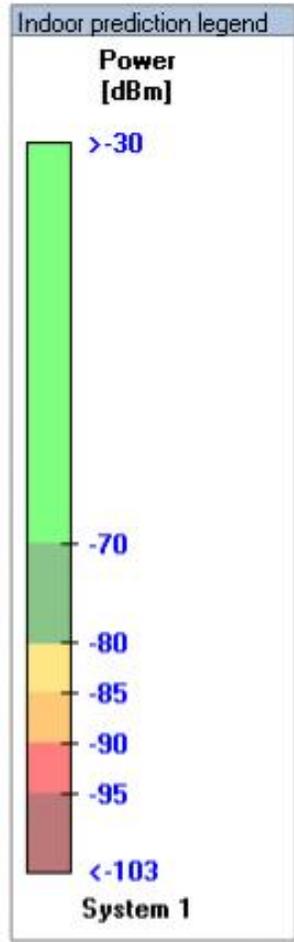
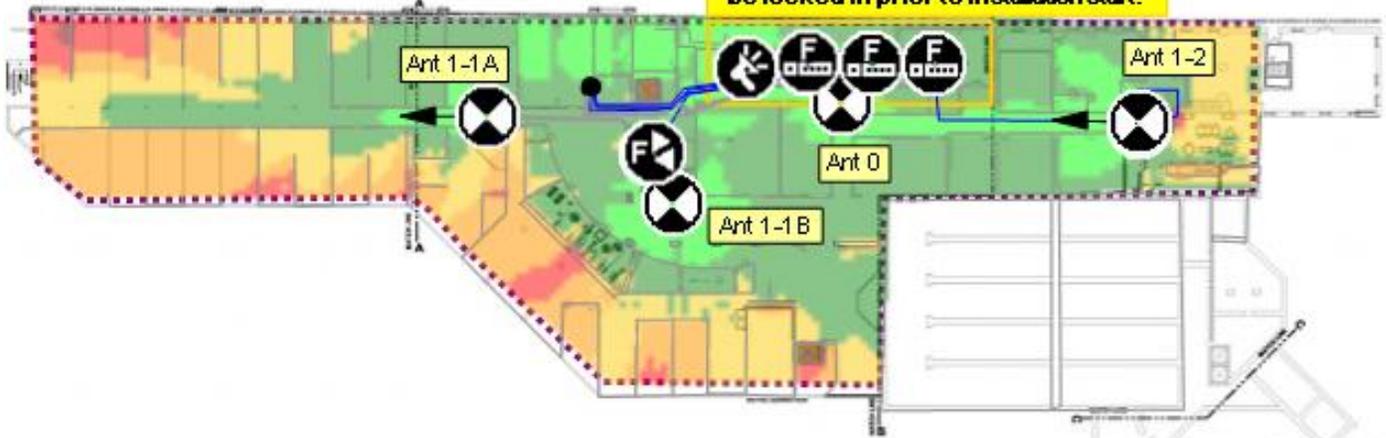
SCALE: 1" = 40'



O:\VERIZON\CASA MARINA\NEPA\CA\11X17.DWG

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Main Equipment Rack. This location will be locked in prior to installation start.



Pictograms legend

- Antenna
- Fiber BDA
- Fiber BDA Hub
- Repeater
- Splitter

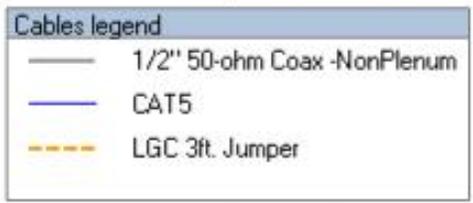
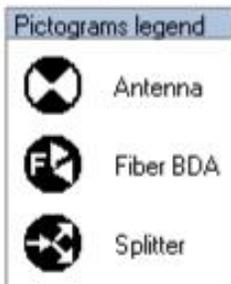
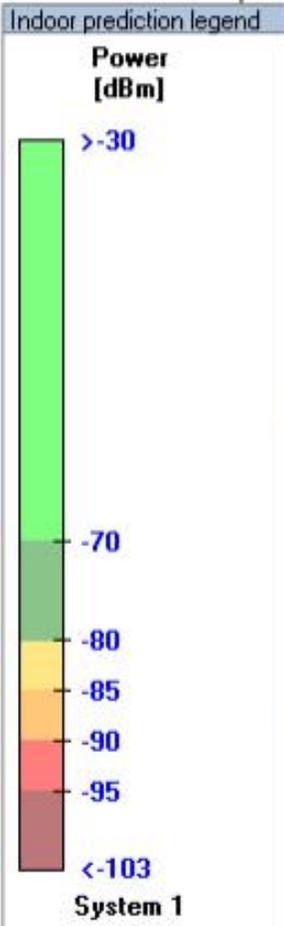
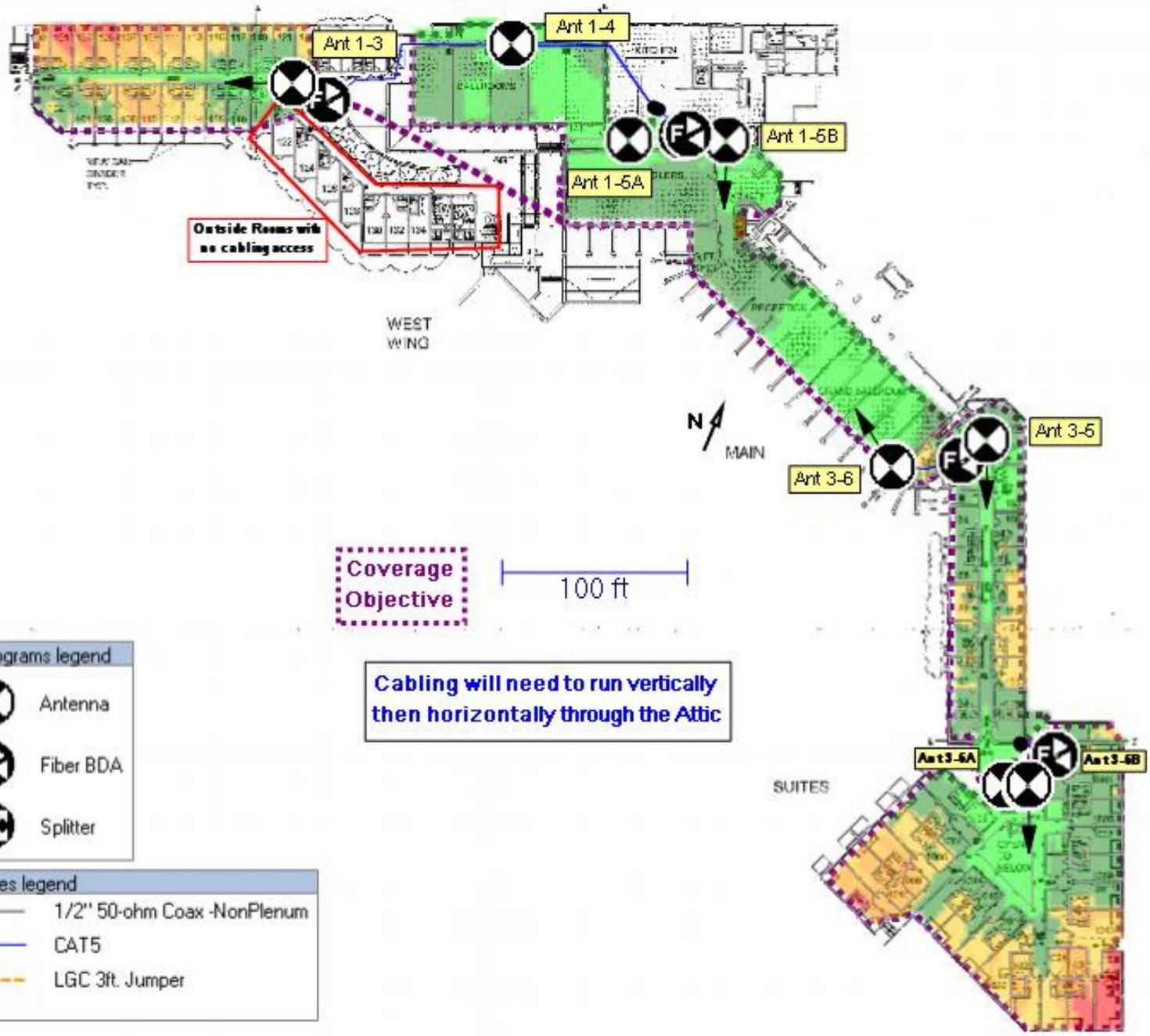
Cables legend

- 1/2" 50-ohm Coax -NonPlenum
- 1/2" 50-ohm Coax -Plenum
- 4003-2-5
- CAT5
- LGC 3ft. Jumper
- RG-142 NM-NM-4'
- SM Fiber

Systems information legend

System 1: Verizon Wireless / 1xEV-DO
 1900 MHz - PCS Band / B Block / Nb. of channels: 11 / Nb. of sources: 1

	TITLE	Basement	DESIGNER	Jeff Burdenski
	COMPANY	Casa Marina Resort Key West	DATE	8/3/2009
		Verizon Wireless		



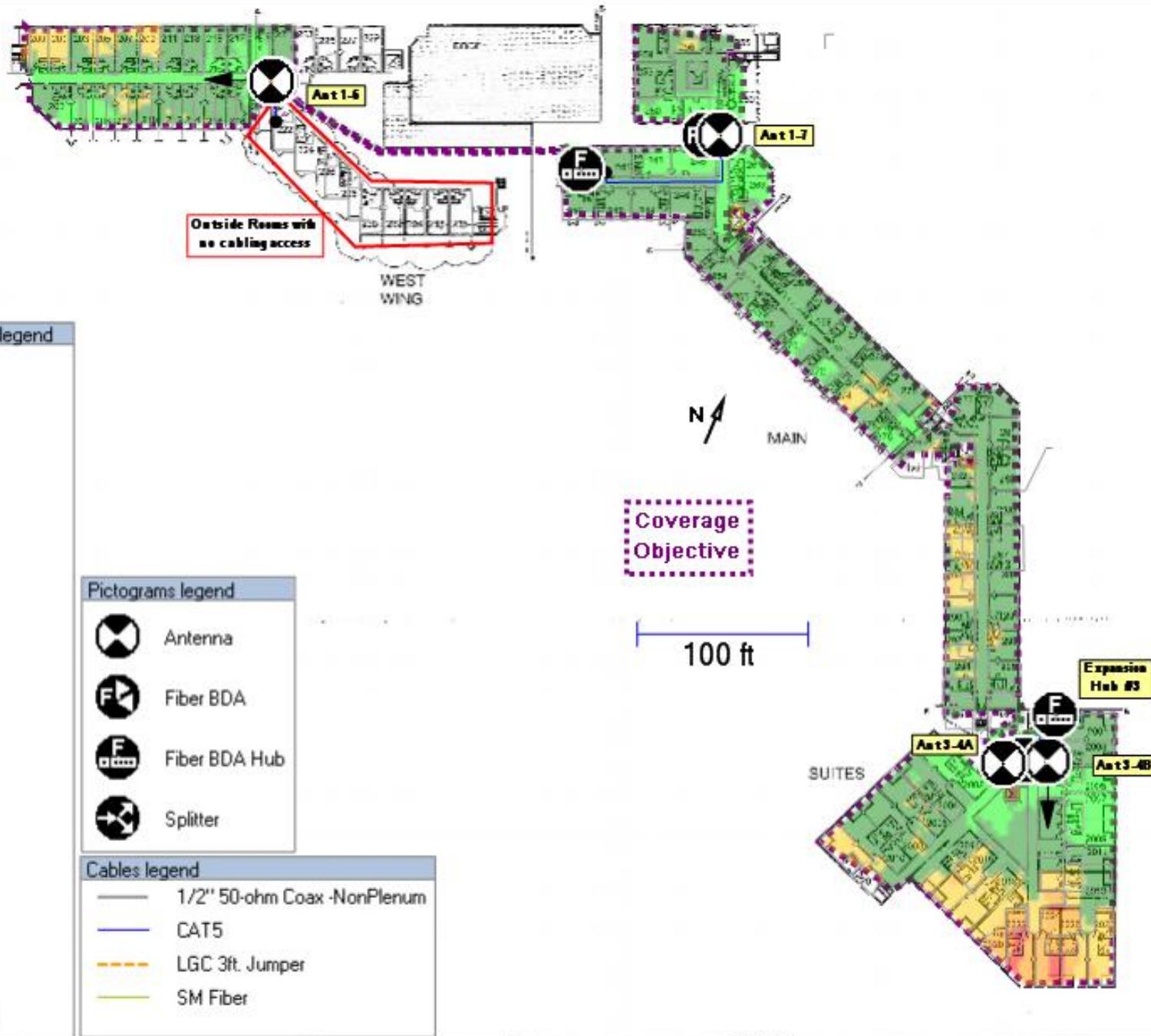
Coverage Objective

100 ft

Cabling will need to run vertically then horizontally through the Attic

1 AD.15 First Floor Plan
Scale: 1/8" = 1'-0"

	TITLE	1st Floor	DESIGNER	Jeff Burdinski
	COMPANY	Casa Marina Resort Key West	DATE	8/3/2009
		Verizon Wireless		



1 A0.27

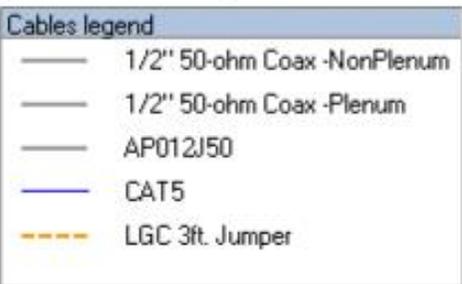
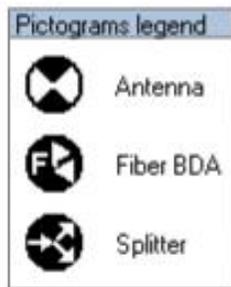
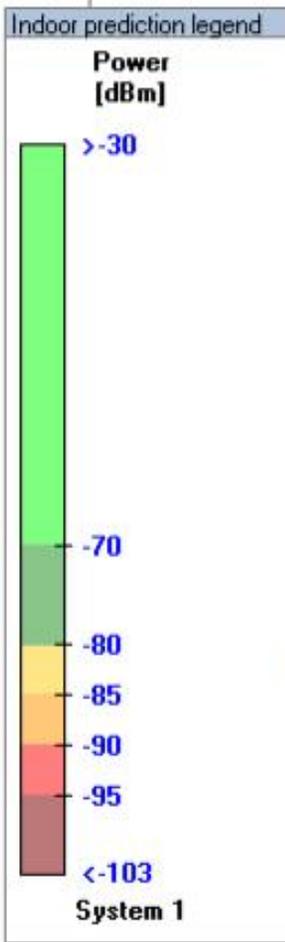
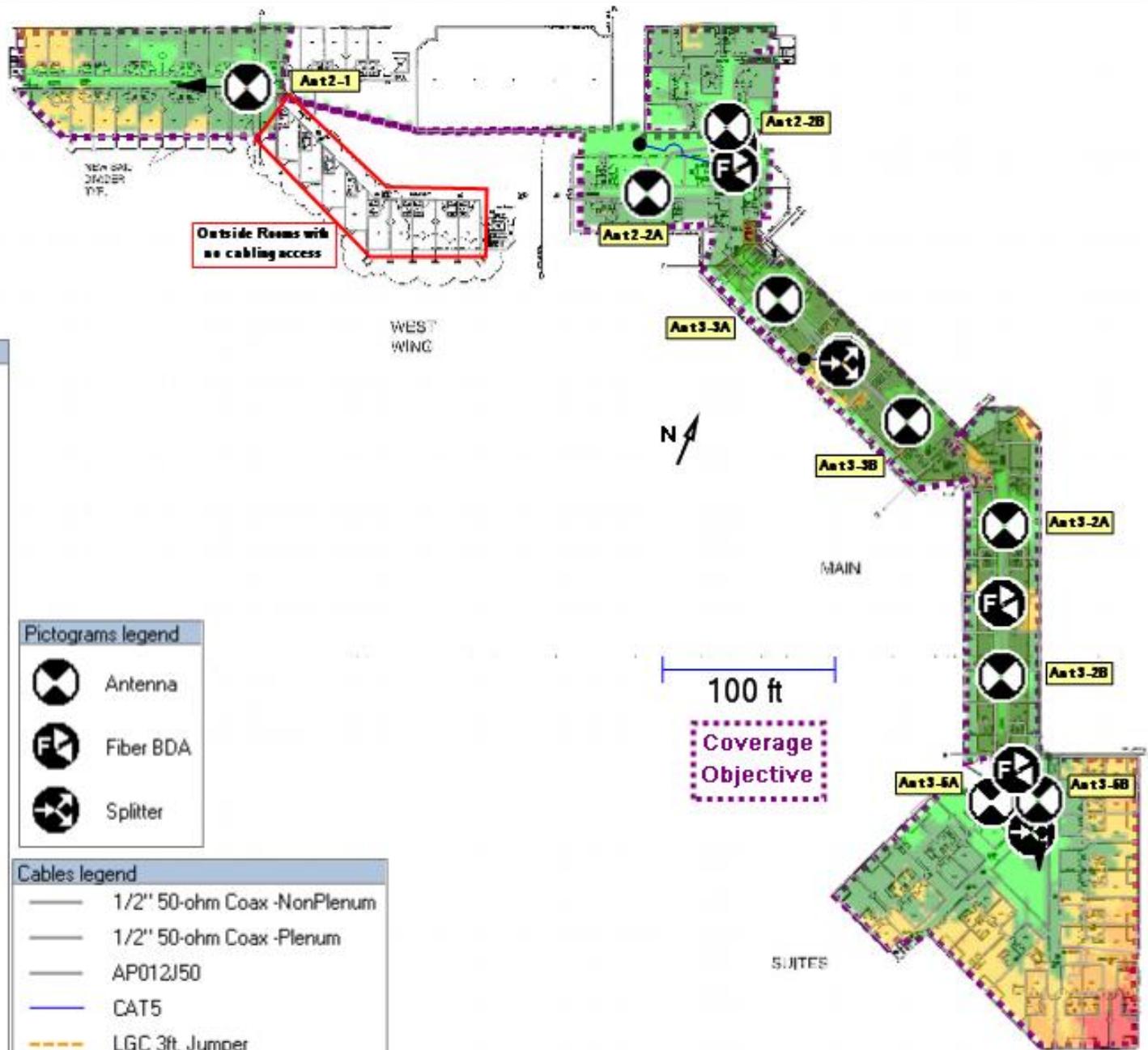
Second Floor Plan

Scale: 1/8" = 1'-0"



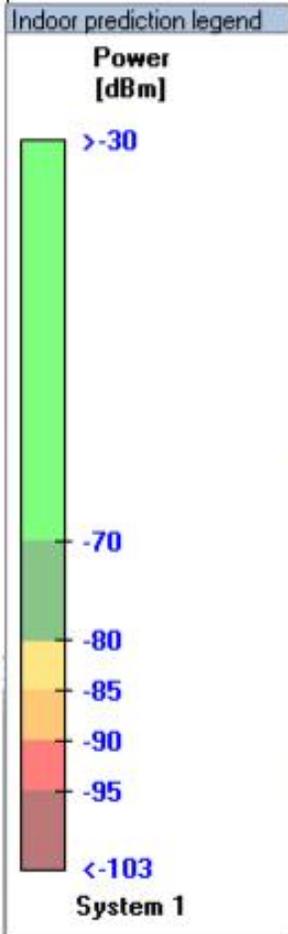
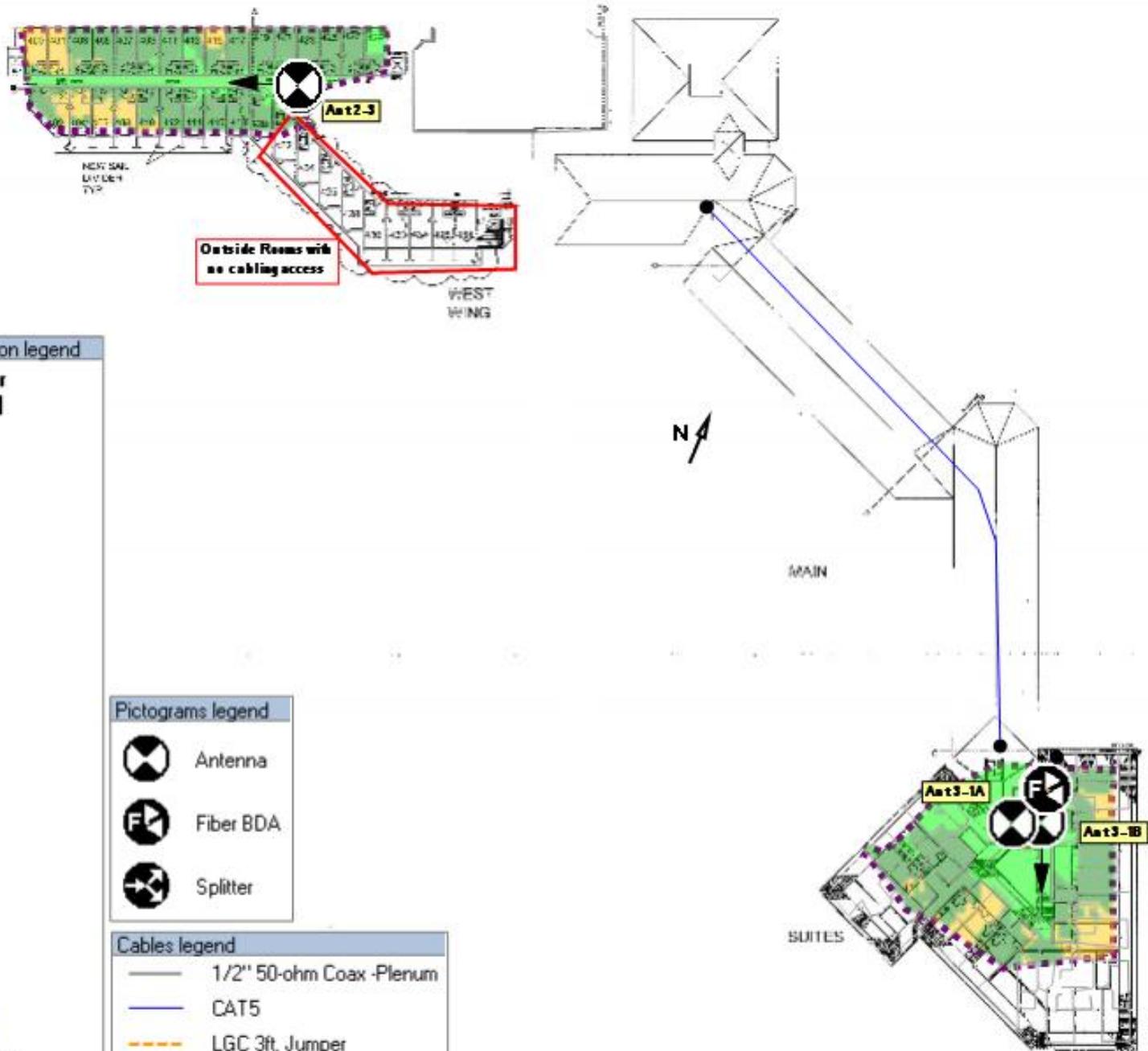
TITLE 2nd Floor
 Casa Marina Resort Key West
COMPANY Verizon Wireless

DESIGNER Jeff Burdinski
DATE 8/3/2009



1 A0.37 **Third Floor Plan**
Scale: 1/32" = 1'-0"

	TITLE	3rd Floor	DESIGNER	Jeff Burdinski
		Casa Marina Resort Key West	DATE	8/3/2009
	COMPANY	Verizon Wireless		

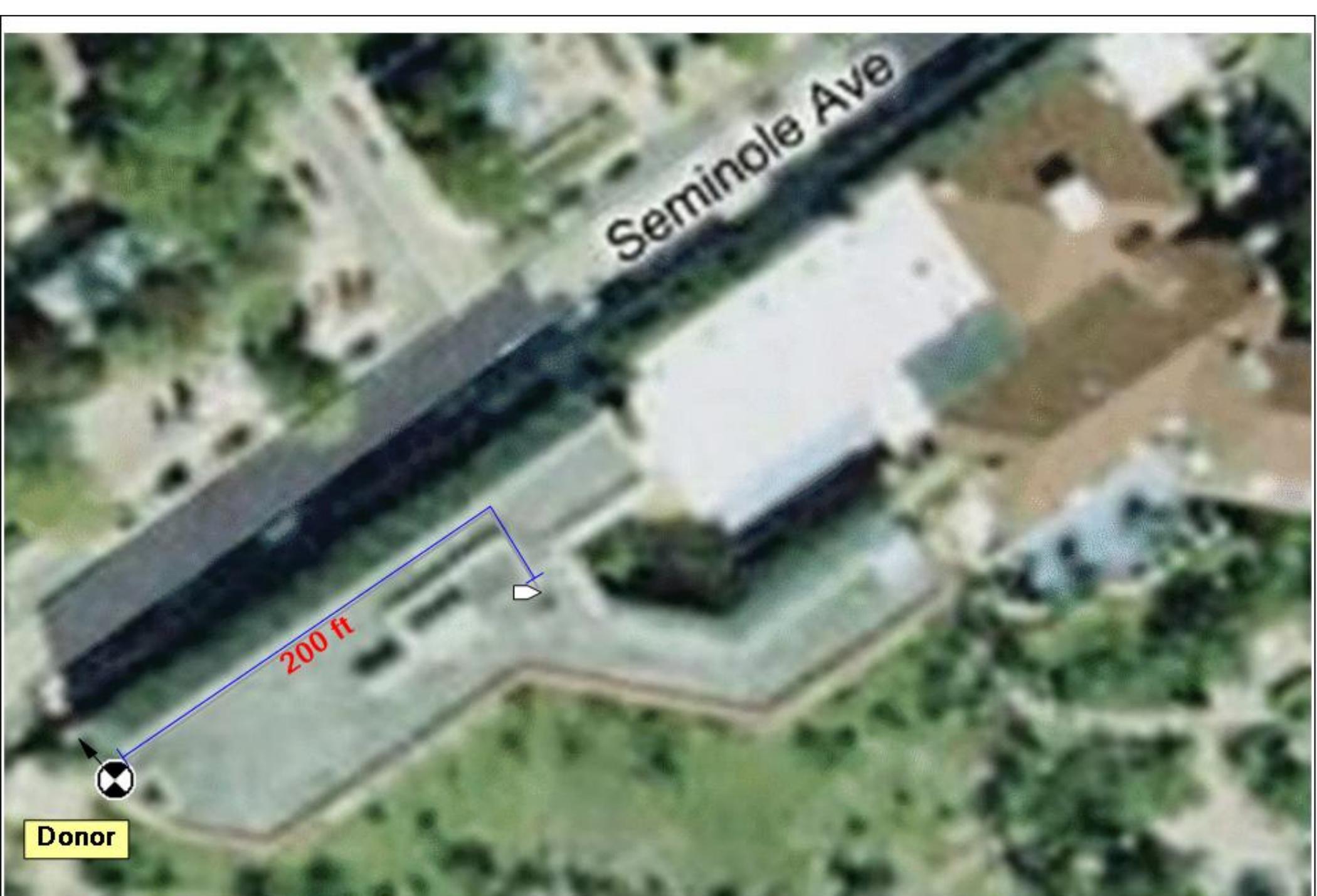


- Pictograms legend**
- Antenna
 - Fiber BDA
 - Splitter

- Cables legend**
- 1/2" 50-ohm Coax -Plenum
 - CAT5
 - LGC 3ft. Jumper

1 A0.44 **Fourth Floor Plan**
 Scale: 1/8" = 1'-0"

	TITLE	4th Floor	DESIGNER	Jeff Burdenski
	Casa Marina Resort Key West		DATE	8/3/2009
	COMPANY	Verizon Wireless		



Donor

200 ft

Seminole Ave

	TITLE	Roof-Donor Antenna	DESIGNER	
		Casa Marina Resort Key West		Jeff Burdenski
	COMPANY	Verizon Wireless	DATE	
				8/3/2009



LGC WIRELESS
EXPANDING THE REACH OF WIRELESS

- Over 5000 LGC distributed antenna systems deployed in more than 30 countries.
- Delivers superior in-building wireless voice and data coverage in the largest venues
- High composite power and RF performance delivers industry-leading wireless coverage and capacity with a minimal amount of equipment
- Compatible with all major access protocols used worldwide including GPRS, EDGE, CDMA2000, and WCDMA
- Software-selectable hub frequency, system gain, and antenna output power
- Requires no electrical power at the remote antennas
- Uses standard fiber and Cat-5E/6 ScTP for flexible, non-disruptive installation
- Intelligent, software-controlled operations, alarming, administration, and maintenance capabilities support both onsite and remote configuration and monitoring
- FCC, UL, and CE Mark approved

2540 Junction Ave. • San Jose, CA95134
Ph: (408) 952-2400 • Fax (408) 952-2410

www.lgcwireless.com

InterReach™ unison



PCS

As its name suggests, InterReach Unison operates as a seamless extension of the public wireless network infrastructure, expanding the reach of wireless communications by delivering crystal-clear signals and ample capacity throughout any public or private facility.

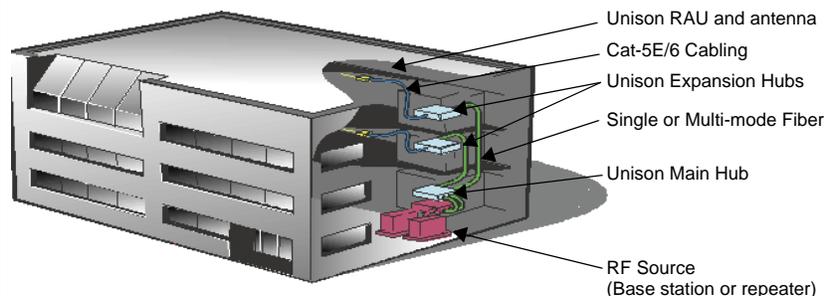
This solution provides a revolutionary degree of flexibility, power and intelligence that accommodates unique requirements elegantly; adapts to changing needs easily; and keeps system life-cycle costs low. Simply stated, InterReach Unison is the only intelligent software-based wireless networking system to meet today's demand and provide the power and flexibility to adapt to

tomorrow.

InterReach Unison was created specifically to address the needs of larger installations and dense, high-traffic environments, such as convention centers, sporting venues and airports. InterReach Unison has a modular architecture and uses industry-standard, lightweight cables.

Together, these unique features combine to provide wireless operators and building owners with power and intelligence in a single, versatile solution

No dropped calls. No static. No dead zones. Just clear signals when and where you want them.



Operating Frequencies

PCS spectrum in the United States		
Bands	Downlink (MHz)	Uplink (MHz)
A	1930–1945	1850–1865
D	1945–1950	1865–1870
B	1950–1965	1870–1885
E	1965–1970	1885–1890
F	1970–1975	1890–1895
C	1975–1990	1895–1910

Operating Frequencies

Bands	InterReach Unison Band	Downlink RF Passband (MHz)	Uplink RF Passband (MHz)
A B D	PCS6	1930–1965	1850–1885
B D E F	PCS7	1945–1975	1865–1895
C E F	PCS8	1965–1990	1885–1910
A4/A5/D/B/E	PCS9	1935–1970	1655–1890
A5/D/B/E/F	PCS10	1940–1975	1860–1895
D/B/E/F/C2	PCS11	1945–1982.5	1865–1902.5
B4/B5/E/F/C	PCS12	1955–1990	1875–1910

PCS Specifications

Parameter	Single-Mode Fiber: 2 km		Multi-Mode Fiber: 1 km	
	Downlink	Uplink	Downlink	Uplink
Average gain with 75 m Cat-5 at 25°C (77°F) (dB) ^a	15	15	15	15
Ripple with 75 m Cat-5 (dB)	2.5	3	2.5	3
Output IP3 (dBm)	38		36.5	
Input IP3 (dBm)		-12		-14
Output 1 dB Compression Point (dBm)	26		26	
Noise Figure 1 MH-1 EH-8 RAUs (dB)		16		16
Noise Figure 1 MH-4 EHs-32 RAUs (dB)		22		22

a. The system gain is adjustable in 1 dB steps from 0 to 15 dB, and the gain of each RAU can be attenuated 10 dB in one step.

Output Power at RAU

No. of Carriers	Power per Carrier (dBm)				maximum composite downlink
	TDMA	GSM	Edge	CDMA	
1	23.0	26.0	23.0	16.0	
2	18.0	20.0	17.5	13.0	
3	15.0	16.5	14.0	11.0	
4	13.0	14.0	12.0	10.0	
5	11.5	12.0	10.5	9.0	
6	10.5	11.0	9.5	8.0	
7	9.5	10.0	9.0	7.5	
8	8.5	9.0	8.0	7.0	
9	8.0	8.5	7.5		
10	7.5	8.0	7.0		
11	7.0	7.5	6.5		
12	6.5	7.0	6.0		
13	6.5	6.5	6.0		
14	6.0	6.5	5.5		
15	5.5	6.0	5.0		
16	5.5	5.5	5.0		
20	4.5	4.5	4.0		
30	2.5	3.0	2.0		

These PPC numbers assume 2 km of SMF or 1 km of MMF.

Note: Operation at or above the output power levels may prevent Unison from meeting RF performance specifications or FCC Part 15 and EN55022 emissions requirements. Please see the Unison Installation, Operation, and Reference manual for system design information.

Flexible Output Levels

The system gain can be adjusted from 0 to 15 dB in 1 dB increments. In addition, the output of any individual Remote Access Unit (RAU) can be adjusted by 10 dB to provide controlled coverage in specific building areas.

Cabling Specifications

Parameter	Specifications
Optical Fiber	These specifications assume that the fiber optic cable, single-mode or multi-mode, is Corning with SC/APC connectors.
Optical Power Budget	Uplink and Downlink Maximum: 3 dB optical Optical power budget between Main Hub and Expansion Hub Optical loss = Σ (fiber loss + connector losses + splice losses + patch cord losses)
Cat-5E/6	The specifications in this document assume that the Cat-5E/6 screened twisted pair (ScTP) cable is Belden 1624P DataTwist® Five, Belden 1533P, CommScope 5ES4, or equivalent.
Cat-5E/6 Lengths	Minimum: 10 meters (33 ft) Maximum: 100 meters (328 ft) Maximum with Cat-5 Extender: 170 meters (558 ft)

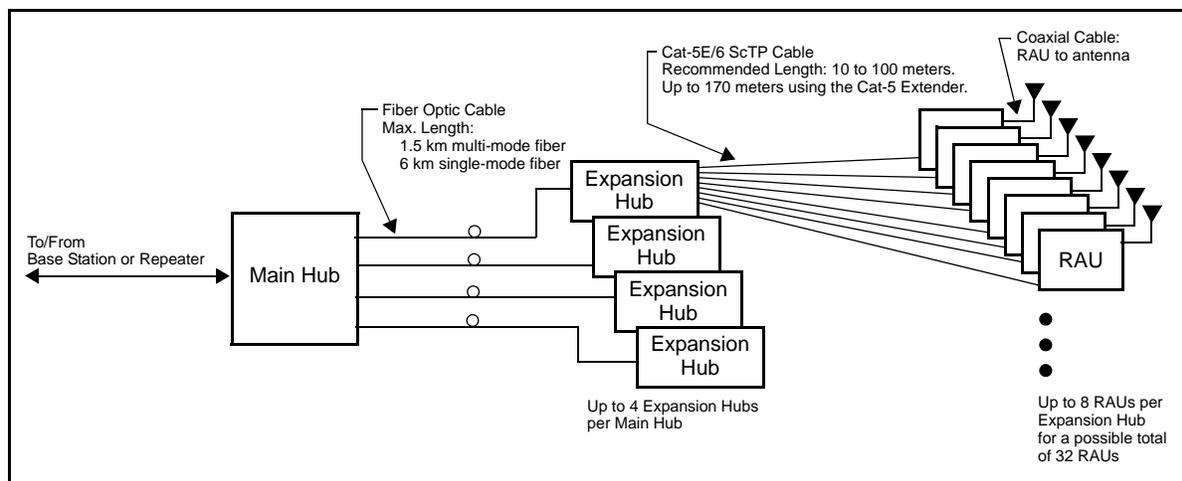
Alarming

InterReach Unison monitors over 170 parameters within the system. Three levels of alarms are available:

- LEDs: Each unit has LEDs to indicate a fault in the unit or a unit that is connected to it. For example, if an RAU has a fault its LED will light red, the fault information is sent to the Expansion Hub which also displays a red LED at the RAU's port connector.
- Contact Alarms: Connect the Main Hub to a base station or external monitoring equipment. Expansion Hubs support 3 contact alarms and can support UPS monitoring.
- Status, Warning, and Fault messages are displayed on a PC/laptop that is running LGC Wireless AdminManager or OpsConsole software tools.

System Architecture

The minimum configuration of a single Unison system is one Main Hub, one Expansion Hub, and one RAU (1-1-1). The maximum configuration of a single system is one Main Hub, four Expansion Hubs, and 32 RAUs (1-4-32). Multiple systems may be deployed to cover larger areas or campus applications.



Physical Specifications

Parameter	Main Hub	Expansion Hub	Remote Access Unit
RF Connectors	2 N-type, female	8 shielded RJ-45, female (Cat-5/6)	1 shielded RJ-45, female (Cat-5/6) 1 SMA, female (coaxial)
External Alarm Connector (contact closure)	1 9-pin D-sub, female	19-pin, D-sub, female	—
Administrative Serial Interface Connector	1 RS-232 9-pin D-sub, male	—	—
Fiber Connectors ^a	4 Pair, SC/APC	1 Pair, SC/APC	—
Power	Rating: 100–240V AC, 0.5A, 50–60 Hz Operating Range: 85–250V AC, 2.4–0.8A, 47–63 Hz	Rating: 115/230V AC, 5/2.5A, 50–60 Hz Operating Range: 90–132V AC/170–250V AC auto-ranging, 2.2–1.5A/1.2–0.8A, 47–63 Hz	36V DC (from the Expansion Hub)
Power Consumption (W)	30	4 RAUs: 120 typ/148 max 4 RAUs & 4 Extenders: 137 typ/172 max 8 RAUs: 170 typ/212 max 8 RAUs & 8 Extenders: 204 typ/260 max	
Enclosure Dimensions ^b (height × width × depth)	44.5 mm × 438 mm × 305 mm (1.75 in. × 17.25 in. × 12 in.) 1U	89 mm × 438 mm × 305 mm (3.5 in. × 17.25 in. × 12 in.) 2U	44 mm × 305 mm × 158 mm (1.7 in. × 12 in. × 6.2 in.)
Weight	< 3 kg (< 6.5 lb)	< 5 kg (< 11 lb)	< 1 kg (< 2 lb)

a. It is critical to system performance that only SC/APC fiber connectors are used throughout the fiber network, including fiber distribution panels.

b. Excluding angle-brackets for 19" rack mounting of hubs.

Note: Expansion Hub typical power consumption assumes that the Cat-5/6 cable length is no more than 100 meters without a Cat-5 Extender and no more than 170 meters with a Cat-5 Extender.

Environmental Specifications

Parameter	Main Hub and Expansion Hub	RAU
Operating Temperature	0° to +45°C (+32° to +113°F)	–25° to +45°C (–13° to +113°F)
Non-operating Temperature	–20° to +85°C (–4° to +185°F)	–25° to +85°C (–13° to +185°F)
Operating Humidity; non-condensing	5% to 95%	5% to 95%

Compliance

- Safety: UL 60950 3rd Edition
- EMC: FCC part 15 class A
- Radio: FCC part 22, part 24

Product Codes

InterReach Unison Main Hub: UNS-1-MH-2

InterReach Unison Expansion Hub: UNS-EH-2

InterReach Unison PCS Remote Access Unit: UNS-PCS-2

AdminManager Software: SW-ADM-V

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LGC Wireless Inc.
REGISTERED TO
ISO 9001/14001
R11678/A19671



Cat-5 Extender

lgcwireless.com

Contents

- Cat-5/5E/6 Cable Length Requirements
- Change in Unison Specifications
- Physical Specifications
- Environmental Specifications
- Alarms and Performance Monitoring
- Compliance
- Product Code



The Cat-5 Extender is used to increase the length of the Cat-5/5E/6 cable run between the Unison system and Remote Access Unit (RAU).* The Extender amplifies in the downlink, uplink, and clock signal paths to make up for the cable loss. The DC power for the RAU and the communication signals from the RAU are passed through the Extender. The Extender is plenum-rated.

Cat-5/5E/6 Cable Length Requirements

Unison system gain remains at 0 to 15 dB in 1 dB increments when conforming to the cable lengths shown below.

Minimum Cat-5/5E/6 Cable Length from Unison System to Extender	Minimum Cat-5/5E/6 Cable Length from Extender to RAU	Maximum Combined Cat-5/5E/6 Cable Length from Unison System to RAU
90 meters	20 meters	110 to 170 meters
295 feet	65 feet	360 to 557 feet

Change in Unison Specifications

The following table shows the change to system specifications that are stated in the InterReach Unison data sheets when using a Cat-5 Extender between the Unison system and RAU.

Specification	Change
Gain Variation (dB)	increase 0.5
Uplink Noise Figure (dB)	increase 0.5
Output IP3 (dBm)	no change
Output 1 dB Compression Point (dBm)	no change

Physical Specifications

Parameter	Values
Dimensions (height x width x depth)	36 mm x 110 mm x 140 mm 1.4 in x 4.3 in x 5.5 in

Environmental Specifications

Parameter	Rating
Operating Temperature	-25° to +45°C (-13° to +113°F)
Non-operating Temperature	-25° to +85°C (-13° to +185°F)
Operating Humidity; non-condensing	5% to 95%

Alarms and Performance Monitoring

The Cat-5 Extender has no alarms or performance monitoring capabilities. It does, however, pass alarms generated in the RAU through to the Unison system. A fault in the Cat-5 Extender will generate a fault which appears to originate in the connected RAU or Unison system port.

Compliance

- Safety: UL 60950 3rd Edition, UL 2043 (plenum-rated)
- Radio: FCC part 22, 24, and 90
- Europe: CE mark

Product Code

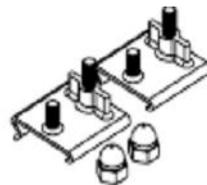
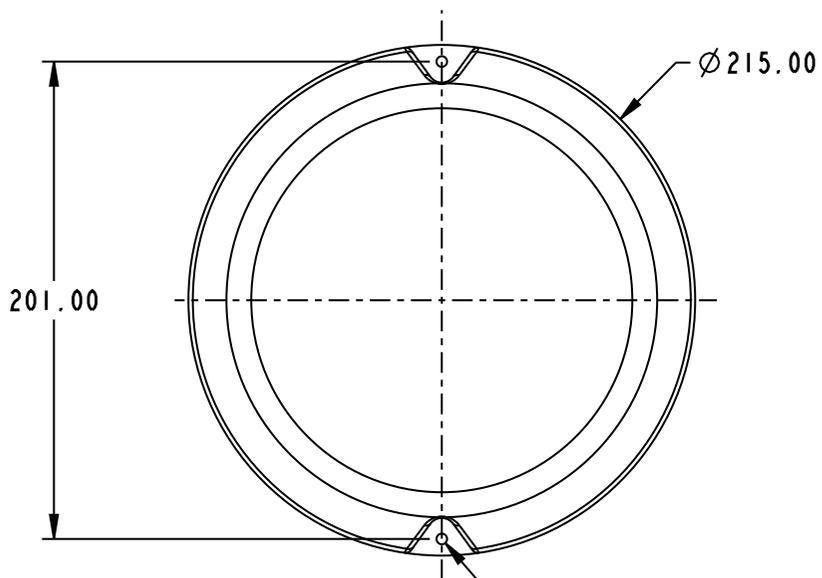
- InterReach Unison Cat-5 Extender: UNS-EX170-1

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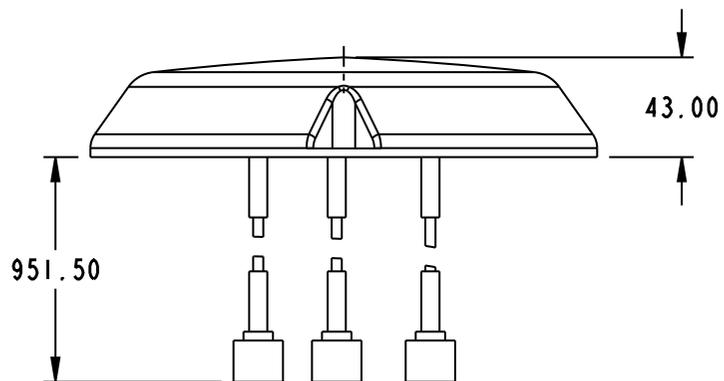
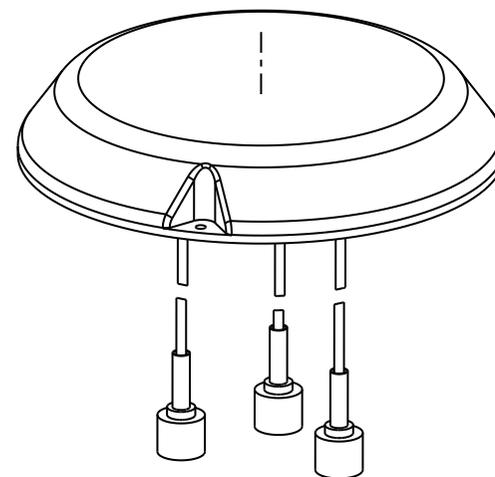
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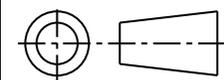


EACH UNIT TO INCLUDE 2 ACORN NUTS AND 2 ADAPTOR CLIPS TO MOUNT WITH STANDARD OR RECESSED TILES



Parameter	Performance		
	Port 1	Port 2	Port 3
Frequency Range	698-806MHz, 1710-2170MHz	824-894MHz, 1850-1990MHz	2500-2700MHz
Gain	3.0 dBi	2.0 dBi	0 dBi
Nominal Impedance	50Ohm		
Polarization	Vertical		
VSWR	<2:1		
Horizontal 3dB Beamwidth	Omni		
Front to Back ratio	8dB		
RF Connector	N Male		
Cable Length	3 feet		
Power	5 Watt		
Weight	Approximate 1.15lb		
ROHs	Compliant		

APPROVED

TOLERANCE (UNLESS STATED)	X = ±0.3 XX = ±0.13 ANGULAR = ± 30'	SYM	ECO/DESCRIPTION	DATE	CK	APP	 ANTENNA SUB PENANG, MALAYSIA	DRAWN BY: YT			
		I	INITIAL RELEASE	29/06/09	YT	CH FONG				CHECKED BY: CH FONG	
<ul style="list-style-type: none"> PRODUCT & PROCESS MUST COMPLY TO LT-GES MISSING INFORMATION REFER TO 3D DATA DIMENSIONS ARE IN MILLIMETERS UNLESS STATED OTHERWISE THIS DRAWING WAS GENERATED VIA PRO/ENGINEER PRINT NOT TO SCALE 							<small>CONFIDENTIAL</small> <small>THE INFORMATION CONTAINED IN THIS DOCUMENT IS OF PROPRIETARY NATURE. IT MAY NOT BE REPRODUCED OR USED WITHOUT EXPRESS WRITTEN PERMISSION OF LAIRD TECHNOLOGIES, ANTENNA SUB</small>		DWG. NO. : N/A	PG. 1/1	REV 1
							DESCRIPTION: LGC AGC MOUNTING & OUTLINE		MATERIAL: N/A		
							© 2009 LAIRD TECHNOLOGIES	PROJECT NO. LTIW 018	DATE: 30/6/09	SCALE: 0.300	UNITS: MM

Product Specifications



CELLMAX-D-CPUS-O

Cell-Max™ Directional Outdoor Antenna, 824–960 MHz and 1710–2500 MHz



CHARACTERISTICS

Dimensions

Height	203.00 mm 7.99 in
Length	46.00 mm 1.81 in
Net Weight	0.50 kg 1.10 lb
Width	156.00 mm 6.14 in

Electrical Specifications

Beamwidth, Horizontal	85° nominal
Beamwidth, Vertical	75° nominal
Gain at Frequency Band	7.0 dBi @ 824–960 MHz
Impedance	50 ohm
Input Power, maximum	50 W
Operating Frequency Band	824 – 960 MHz
Polarization	Vertical
Return Loss	11.0 dB
VSWR	1.7:1

Electrical Specifications (Band 2)

Beamwidth, Horizontal	85° nominal
Beamwidth, Vertical	75° nominal
Gain at Frequency Band	7.0 dBi @ 1710–2500 MHz
Operating Frequency Band	1710 – 2500 MHz
Return Loss at Frequency Band	11.0 dB @ 1710–2500 MHz

Product Specifications

CELLMAX-D-CPUS-O



VSWR 1.7:1

Environmental Specifications

Application	Outdoor
Operating Temperature	-30 °C to +70 °C (-22 °F to +158 °F)
Relative Humidity	Up to 100%

General Specifications

Antenna Type	Directional
Operating Frequency Band	1710 – 2500 MHz 824 – 960 MHz
Brand	Cell-Max™
Color	White
Interface	N Female
Package Quantity	1
Pigtail Cable	RG58, plenum rated
Radome Color	White
Radome Material Description	ABS, UV resistant

Mechanical Specifications

Mounting	4-hole wall mounting plate and hardware included
Pigtail Length	285.0 mm 11.2 in

Packed Dimensions

Height	110.0 mm 4.3 in
Length	270.0 mm 10.6 in
Shipping Weight	0.74 kg 1.63 lb
Volume	0.0037 m ³
Width	205.0 mm 8.1 in



PRODUCT DATA SHEET

1.7 - 5.7 GHz

CONTEMPORARY PATCH

- Indoor / outdoor
- Attractive styling
- Articulating
- Wall mountable

All antennas in the series may be wall or mast mounted and all are available with a variety of flush and articulating mounts. Flush mounts allow the antenna to hug the wall for minimal visual impact. There are two available articulating mounts that allow the pattern to be directed while still maintaining minimal visual impact.

Standard antennas come with either TNC, SMA or N female connectors and an integrated coaxial pigtail. Other connector and pigtail combinations are available upon request.



DirectLink™ Series Antennas Campus & In-Building directional antennas

DirectLink is a series of wall and mast mount directional antennas that has been designed to meet the most demanding needs of the contemporary wireless environment. DirectLink's attractive, UV resistant housings and mounts allow the antennas to be mounted anywhere in the campus or in-building environment. The antennas offer very precise and controllable pattern characteristics in frequencies starting with the 1710 MHz DCS band and continuing through the 5.725 GHz ISM band. All popular contemporary wireless system applications are covered with gain characteristics varying with frequency.

DIRECTLINK™ SPECIFICATION CHART

MODEL	FREQUENCY MHz	GAIN dBi	3dB Bmwidth, deg.		VSWR	F/B dB	Connector (female)	Articulating Version
			E-Plane	H-Plane				
S57212AMP10TNF	5725-5825	12	27	58	1.5:1	20	TNC	Yes
S57212MP10TNF	5725-5825	12	27	58	1.5:1	20	TNC	No
S57212AMP10SMF	5725-5825	12	27	58	1.5:1	20	SMA	Yes
S57212MP10SMF	5725-5825	12	27	58	1.5:1	20	SMA	No
S51512AMP10TNF	5150-5350	12	30	58	1.5:1	20	TNC	Yes
S51512MP10TNF	5150-5350	12	30	58	1.5:1	20	TNC	No
S51512AMP10SMF	5150-5350	12	30	58	1.5:1	20	SMA	Yes
S51512MP10SMF	5150-5350	12	30	58	1.5:1	20	SMA	No
S3407AMP10SMF	3400-3600	7.5	50	70	1.5:1	15	SMA	Yes
S3407MP10SMF	3400-3600	7.5	50	70	1.5:1	15	SMA	No
S2406MPC10NF*	2400-2500	6.5 dBic	65	65	1.5:1	20	N	Yes
S2307AMP10TNF	2300-2500	7.5	60	65	1.5:1	12	TNC	Yes
S2307MP10TNF	2300-2500	7.5	60	65	1.5:1	12	TNC	No
S2307AMP10SMF	2300-2500	7.5	60	65	1.5:1	12	SMA	Yes
S2307MP10SMF	2300-2500	7.5	60	65	1.5:1	12	SMA	No
S2307AMP10NF	2300-2500	7.5	60	65	1.5:1	12	N	Yes
S2307MP10NF	2300-2500	7.5	60	65	1.5:1	12	N	No
S1857AMP10SMF	1850-1990	7.5	50	80	1.5:1	12	SMA	Yes
S1857MP10SMF	1850-1990	7.5	50	80	1.5:1	12	SMA	No
S1857AMP10TNF	1850-1990	7.5	50	80	1.5:1	12	TNC	Yes
S1857MP10TNF	1850-1990	7.5	50	80	1.5:1	12	TNC	No
S1856MPC10NF*	1850-1990	6 dBic	70	70	1.5:1	20	N	Yes
S1718AMP10TNF	1710-1880	7.5	60	85	1.5:1	12	TNC	Yes
S1718MP10TNF	1710-1880	7.5	60	85	1.5:1	12	TNC	No
S1718AMP10SMF	1710-1880	7.5	60	85	1.5:1	12	SMA	Yes
S1718MP10SMF	1710-1880	7.5	60	85	1.5:1	12	SMA	No

COMMON SPECIFICATIONS

Power: 75 Watts (25 Watts at 5 GHz)

Polarization: Linear

Dimensions & Weight:

Standard wall mount -
5.70 x 3.81 x 1.50 in.
(14.48 x 9.68 x 3.80 cm),
5 oz (.14 kg)

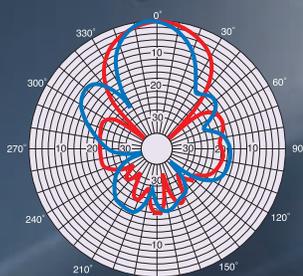
Articulating wall mt -
5.80 x 3.81 x 2.26 in.
(14.73 x 9.68 x 5.74 cm),
8 oz (.23 kg)

Connectors:
SMA, TNC. Other connector types available on special request.

Mounting:
Standard units for wall mounting. Mast mount bracket kits available. Custom mount configurations for volume users.

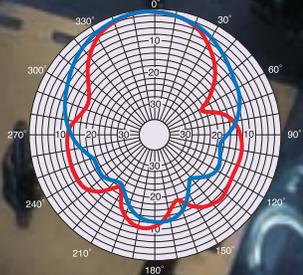
Cable: Low loss pigtail provided

S57212AMP



Red line: H-Plane
Blue line: E-Plane

S2307AMP



* Right Hand Circular Polarization

COMTELCO

Technical Specification

Y42818A

806-940 / 1710-2100 MHz 8dBd / 10dBi

MULTIBAND YAGI ANTENNA

High Performance: This 14 element yagi antenna provides 10dBi / 8dBd gain with excellent wide band performance.

Rugged and weatherproof: Our hybrid radome construction provides excellent weather protection for our driven element. The radome is constructed of UV inhibited ABS. The heavy duty mounting plate is extruded aluminum. Stainless steel V bolts are provided for long term reliability and resistance to corrosion.

Lightweight and Durable: This yagi antenna is easily installed by one person, yet is designed to withstand 125 MPH winds.

Termination Options:

Type A: 12" Teflon pigtail with N connector.



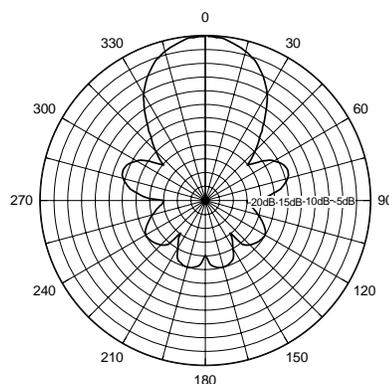
ELECTRICAL SPECIFICATIONS

GAIN:	10dBi / 8dBd
FREQUENCY@	
VSWR 2.0:1	806-940MHz / 1730-2100MHz
VSWR 2.5:1	745-970MHz / 1710-2500MHz
F to B RATIO:	20dB
VERT BEAMWIDTH:	40°
HORIZ BEAMWIDTH:	40°
POWER RATING:	150 watts
IMPEDANCE:	50 ohms

MECHANICAL SPECIFICATIONS

MATERIAL:	Aluminum & Brass booms 3/16" solid elements
RADOME:	3" UV inhibited ABS
LENGTH:	18.5"
WEIGHT:	2 lb.
MOUNTING:	2 1/2" mast maximum
FLAT PLATE AREA:	.12 ft ²
WIND RATING:	125 MPH
WIND LOAD:	8.1 lbs.

Horizontal Pattern



Vertical Pattern

