



Contract Number: CTN-IT-CMS 140044-12
Effective Date: 7-4-14
Term Date: 7-4-15
Cost: _____
Revenue: ✓
Total: _____ NTE: _____
Action: _____
Renewal By: 5-1-15
Term: 7-4-15
Reviewed by: SR

BOARD OF SUPERVISORS AGENDA ITEM SUMMARY

Requested Board Meeting Date: March 3, 2015

ITEM SUMMARY, JUSTIFICATION &/or SPECIAL CONSIDERATIONS:

Amendment 12 of the Non-Exclusive Right-of-Way Use License between Pima County and Alltel Communications of the Southwest Limited Partnership, revises Exhibit C (modifications to Site B, Foothills Drive) and updates insurance requirements. There is no change in future revenue or basic terms of the contract.

CONTRACT NUMBER (If applicable): CTN-IT-CMS140044 (formerly #12-14-T-140044-0700)

STAFF RECOMMENDATION(S):

The Information Technology Department recommends that the Pima County Board of Supervisors adopt and the Chairman sign the Twelfth Amendment to License for Alltel Communications of the Southwest Limited Partnership dba Verizon Wireless.

CORPORATE HEADQUARTERS: Nevada

Page 1 of 2

To CoB: 2-18-15

Bos: 3-3-15

vend. 1
ver. 9
20 pgs (2)

Procure Dept 02/05/15 AM 10:05

CLERK OF BOARD USE ONLY: BOS MTG. _____

ITEM NO. _____

PIMA COUNTY COST: N/A and/or REVENUE TO PIMA COUNTY: \$ N/A

FUNDING SOURCE(S): N/A

(i.e. General Fund, State Grant Fund, Federal Fund, Stadium D. Fund, etc.)

Advertised Public Hearing:

		YES	X	NO
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Board of Supervisors District:

1	X	2		3		4		5		All	
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IMPACT:

IF APPROVED:

Alltel Communications of the Southwest Limited Partnership dba Verizon Wireless will modify/update their existing facility at 6411 N. Foothills Drive to enhance/improve telecommunication services to Pima County residents.

IF DENIED:

Alltel Communications of the Southwest Limited Partnership dba Verizon Wireless will not be allowed to modify/update their existing facility at 6411 N. Foothills Drive and telecommunication services will not be enhanced/improved for Pima County residents.

DEPARTMENT NAME: Information Technology

CONTACT PERSON: Julie K McWilliams TELEPHONE NO.: 724-8066

CONTRACT	
NO. <u>CTN-IT-CMS140044</u>	
AMENDMENT NO. <u>12</u>	
This number must appear on all invoices, correspondence and documents pertaining to this contract.	



PIMA COUNTY
TWELFTH AMENDMENT TO LICENSE

CONTRACT No. CTN- IT-CMS140044
(former contract #12-14-T-140044-0700)

THIS TWELFTH AMENDMENT TO LICENSE (the "Twelfth Amendment") is entered into by and between Pima County ("Licensor"), a political subdivision of the State of Arizona, and Alltel Communications Southwest Holdings, Inc., d/b/a Verizon Wireless ("Licensee"), a Delaware Corporation, and shall be effective upon endorsement by the Pima County Board of Supervisors.

RECITALS

Licensor and 360 Communications Company of Nevada, a Nevada limited partnership, entered into a Non-Exclusive Right-of-Way Use License (the "License") dated July 5, 2000, with an expiration date of July 4, 2005, and recorded on July 13, 2000, in Docket 11339, Page 59, in the office of the Pima County, Arizona, Recorder.

Alltel Communications of the Southwest Limited Partnership subsequently merged with 360 Communications Company of Nevada and assumed the rights and obligations under the License. The License has been amended on multiple occasions to upgrade Sites A-F (Exhibits B-G) and extend the License through July 4, 2015.

With this Twelfth Amendment to License, Licensor agrees to modifications to Site B (6411 N. Foothills Drive) as represented on Exhibit C-1. The annual fee and termination date remain unchanged.

AGREEMENT

WHEREFORE, the parties agree as follows:

1. The effective date of this Twelfth Amendment to License shall be upon endorsement by the Pima County Board of Supervisors.
2. The following is added to Section 3. Insurance:

"The Licensee's insurance shall be primary insurance and non-contributory with respect to all other available sources.

Any modification or variation from the insurance requirements in this Agreement shall be made by the contracting department in consultation with the Division of Risk Management. Such modification will not require a formal contract amendment, but may be made by administrative action, and without the consent of Licensee, upon notice by County. Licensee shall supply a certificate of insurance including the modification within ten (10) days from the date notice of the modification is received by Licensee. Such notice will be given pursuant to the terms of the Agreement; if the Agreement does not specify a notice procedure, County may give notice by Certified U.S. Mail, E-Mail or Facsimile; Certified Receipt, E-Mail Receipt Confirmation or Facsimile Confirmation shall constitute proof of receipt of notice. Failure by Licensee to supply a modified certificate of insurance as required by this paragraph shall constitute material breach by Licensee and grounds for immediate termination of the Agreement by County. Licensee further hereby consents to the addition of the modified insurance requirements to the Agreement."

3. The annual fee shall remain unchanged.
4. Exhibit C and Revised Exhibit C are replaced in their entirety with the attached Exhibit C-1 (Site B, 6411 North Foothills Drive).
5. All other provisions of the License, as previously amended, shall remain in effect and continue to be binding upon the parties.

(REMAINDER OF PAGE INTENTIONALLY LEFT BLANK)

IN WITNESS WHEREOF, the parties have affixed their signatures to this Twelfth Amendment to License on the dates written below.

PIMA COUNTY:

Chair, Board of Supervisors

Date

LICENSEE:

Alltel Communications Southwest
Holdings, Inc, d/b/a Verizon Wireless

By: _____

Name: Brian Mecum

Title: Area Vice President Network

Date: 1/26/15

ATTEST:

Clerk of the Board of Supervisors

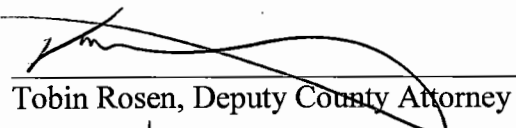
Date

APPROVED AS TO CONTENT:


Jesse Rodriguez, Chief Information Officer

2/4/15
Date

APPROVED AS TO FORM:


Tobin Rosen, Deputy County Attorney

11/19/14
Date

EXHIBIT C-1

SITE NAME: TUC_SUNRISE & CAMPBELL-SMR **6411 N. FOOTHILLS DRIVE** **TUCSON, ARIZONA, 85718**



SITE PHOTO

SHEET INDEX

- T-1 PROJECT INFORMATION AND DATA
- A-1 SITE PLAN
- A-2 ENLARGED SITE PLAN
- A-3 ANTENNA INFORMATION
- A-4 ELEVATIONS
- A-5 ELEVATIONS

CLIENT

VERIZON WIRELESS
 126 W. GEMINI DR.
 TEMPE, ARIZONA, 85283
 CONTACT: DAVID BUTTKER
 PHONE: (480) 777-4316

PROJECT DATA

LEASSEE: VERIZON WIRELESS
 126 W. GEMINI DR.
 TEMPE, ARIZONA, 85283
 ZONING: CM-1
 APN: N/A
 LEASE AREA: T.B.D.
 JURISDICTION: PIMA COUNTY
 BUILDING CODES: 2012 I.B.C.
 2011 N.E.C.
 2012 I.A.C.
 2012 I.F.C.

OWNER / LESSOR

PIMA COUNTY (P.O.W.)
 201 N. STONE AVE. 4th FLOOR
 TUCSON, ARIZONA, 85701
 CONTACT: T.B.D.
 PHONE: (520) 740-6410

TOWER OWNER

VERIZON WIRELESS
 126 W. GEMINI DR.
 TEMPE, ARIZONA, 85283
 CONTACT: DAVID BUTTKER
 PHONE: (480) 777-4316

SITE ACQUISITION

Pinnacle Consulting
 1426 AL MARSH STREET, #101
 GILBERT, ARIZONA, 85233
 CONTACT: LEANNE STOLTE
 PHONE: (480) 204-8618

ARCHITECT

YOUNG DESIGN CORP.
 10245 E. VIA LINDA, SUITE 211
 SCOTTSDALE, ARIZONA, 85258
 CONTACT: MATTHEW YOUNG
 PHONE: (480) 451-9609
 FAX: (480) 451-9608

STRUCTURAL CONSULTANT

TOWER ENGINEERING PROFESSIONALS
 3703 JUNCTION BLVD.
 RALEIGH, NC, 27603
 CONTACT: SEBASTIAN ANDRES
 PHONE: (919) 561-6351
 FAX: (919) 561-6350

PROJECT DESCRIPTION

THE PROJECT CONSISTS OF THE REMOVAL OF (8) EXISTING ANTENNAS TO BE REPLACED WITH (8) NEW LESSEE ANTENNAS AND ASSOCIATED EQUIPMENT FOR COMPANY'S WIRELESS TELECOMMUNICATIONS NETWORK AT THE EXISTING RAD CENTER. INSTALL (8) NEW TMA/DUPLEXERS, (2) PER SECTOR, MOUNTED BEHIND NEW ANTENNAS. (2) EXISTING 75' COAX TO BE RE-USED. FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.

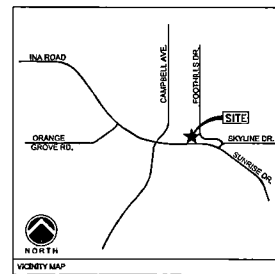
NOTE:
 ALL NEW EQUIPMENT INSTALLED ON TOWER SHALL BE PAINTED TO MATCH EXISTING ANTENNAS & POLE.

SITE COORDINATES

LATITUDE: 32° 18' 21.95" N
 LONGITUDE: 110° 55' 26.80" W
 GROUND ELEVATION: 2725.9' A.M.S.L.

SITE DIRECTIONS

TAKE I-10 EAST TOWARD TUCSON. TAKE THE I-10 R.D. EXIT & GO EAST ON I-10 ROAD, WHICH WILL BEAR SOUTH AND BECOME SKYLINE DRIVE. THEN WILL BECOME SKYLINE DRIVE. TURN LEFT IN NORTH DIRECTION. SKYLINE DRIVE & THEN IMMEDIATELY TURN LEFT ONTO FOOTHILLS DRIVE. SITE WILL BE A UTILITY POLE AND OUTDOOR CABINET VISIBLE STRAIGHT AHEAD



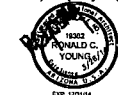
CLIENT



INTERNAL REVIEW	DATE
CONSTRUCTION SIGNATURE	
RF SIGNATURE	
FACILITIES SIGNATURE	
REAL ESTATE SIGNATURE	

PLANS PREPARED BY
YOUNG
design corp
 architecture / project management
 10245 E. Via Linda, Scottsdale, AZ 85258
 ph: 480 451 9609 fax: 480 451 9608
 e mail: corporate@ydcoffice.com

SCALE
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NO.	DATE	DESCRIPTION
1	03/26/14	FINAL ISSUE

ARCHITECTS JOB NO. YDC-5773

PROJECT INFORMATION

TUC_SUNRISE & CAMP

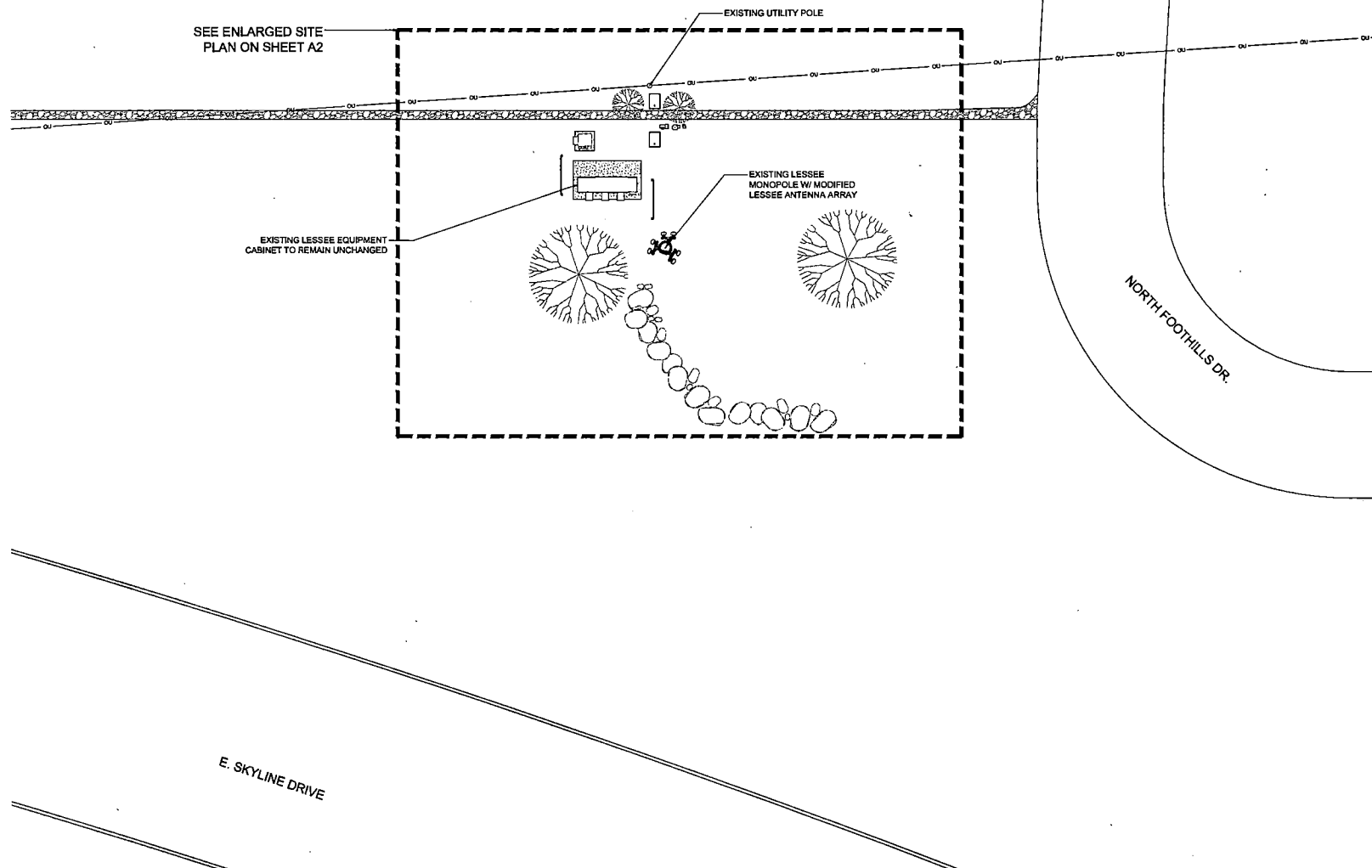
6411 N. FOOTHILLS DR
 TUCSON, ARIZONA, 85718

SHEET TITLE PROJECT INFORMATION AND DATA

JURISDICTION APPROVAL

SHEET NUMBER
T-1

EXHIBIT C-1



1
A-1

SITE PLAN

SCALE: 1" = 10'-0"

0 5' 10' 20'
SCALE: 1" = 10'-0"

CLIENT



verizon wireless
126 W. GEMINI DR.
TEMPE, AZ 85283

INTERNAL REVIEW DATE

CONSTRUCTION SIGNATURE

RF SIGNATURE

FACILITIES SIGNATURE

REAL ESTATE SIGNATURE

PLANS PREPARED BY
Young design corp

architecture / project management
10245 E. Via Linda, Scottsdale, AZ 85258
ph: 480 451 9609 fax: 480 451 9608
e mail: corporate@ydcoffice.com

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NO.	DATE	DESCRIPTION
1	03/26/14	FINAL ISSUE

ARCHITECTS JOB NO.
YDC-5773

PROJECT INFORMATION

TUC_SUNRISE & CAMPBELL

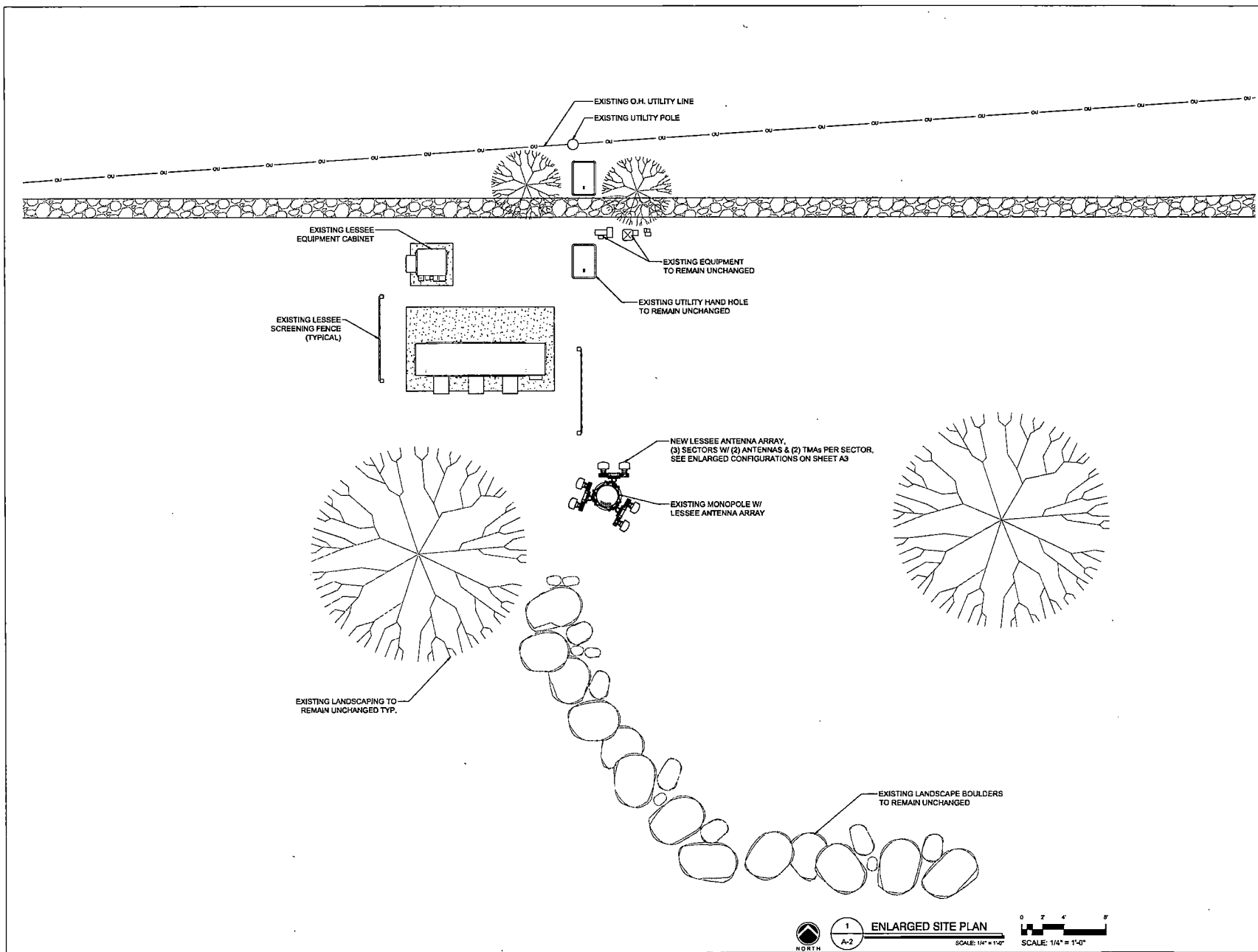
6411 N. FOOTHILLS DR
TUCSON, ARIZONA, 85718

SHEET TITLE

SITE PLAN

JURISDICTION APPROVAL

SHEET NUMBER
A-1



CLIENT

verizon wireless

126 W. GEMINI DR.
TEMPE, AZ 85283

INTERNAL REVIEW DATE

CONSTRUCTION SIGNATURE

RF SIGNATURE

FACILITIES SIGNATURE

REAL ESTATE SIGNATURE

PLANS PREPARED BY

YOUNG design corp

architecture / project management
10245 E. Via Linda, Scottsdale, AZ 85258
ph: 480 451 9609 fax: 480 451 9608
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102914 DONALD C. YOUNG ENGINEER - STATE OF ARIZONA

NO.	DATE	DESCRIPTION
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ARCHITECTS JOB NO. YDC-5773

PROJECT INFORMATION

TUC_SUNRISE & CAMPBELL

8411 N. FOOTHILLS DR
TUCSON, ARIZONA, 85718

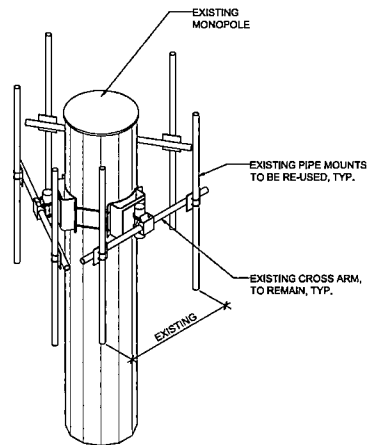
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ENLARGED SITE PLAN

JURISDICTION APPROVAL

SHEET NUMBER

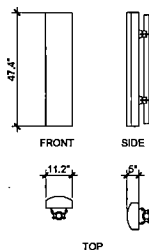
A-2



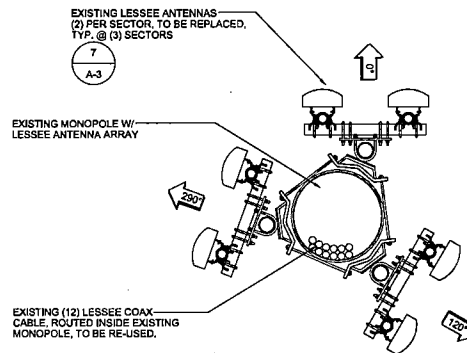
3 ANTENNA MOUNTING
SCALE: N.T.S.

COAXIAL CABLE TABLE					
SECTOR	AZIMUTH	CENTERLINE	QTY.	SIZE	TYPE
ALPHA	0°	33'-0"	4	7/8"	AVA5-50
BETA	120°	33'-0"	4	7/8"	AVA5-50
GAMMA	230°	33'-0"	4	7/8"	AVA5-50

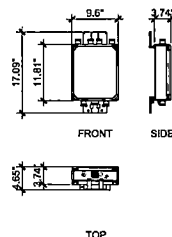
4 COAXIAL CABLE TABLE
SCALE: N.T.S.



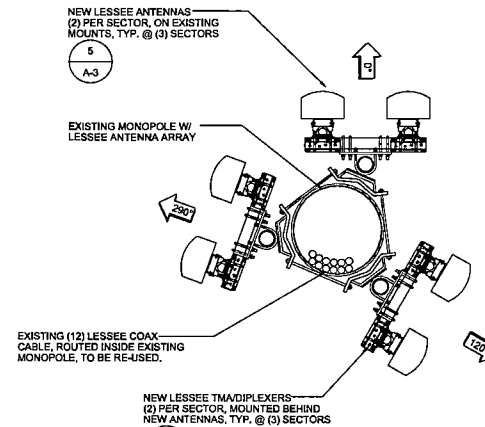
7 EXISTING ANTENNA(S)
TO BE REMOVED
SCALE: N.T.S.



2 EXISTING ANTENNA LAYOUT
SCALE: 1/2" = 1'-0"



6 NEW TMA/DIPLEXER
SCALE: N.T.S.



1 NEW ANTENNA LAYOUT
SCALE: 1/2" = 1'-0"

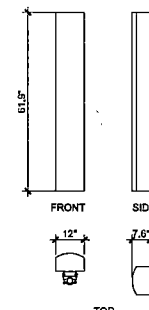
MECHANICAL DOWN TILT:
ALPHA SECTOR: ANTENNA 1: 0°, ANTENNA 2: 0°
BETA SECTOR: ANTENNA 1: 4°, ANTENNA 2: 4°
GAMMA SECTOR: ANTENNA 1: 5°, ANTENNA 2: 5°

IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO VERIFY DOWN TILT INFORMATION
DISPECTED HEREIN WITH RF DEPARTMENT PRIOR TO INSTALLING ANTENNAS.

NOTE:
ALL AZIMUTHS ARE SHOWN RELATIVE TO TRUE NORTH,
UNLESS NOTED OTHERWISE.

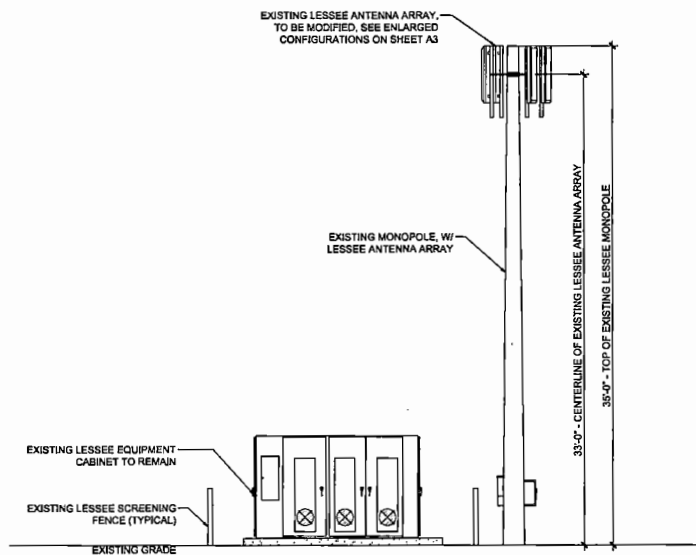
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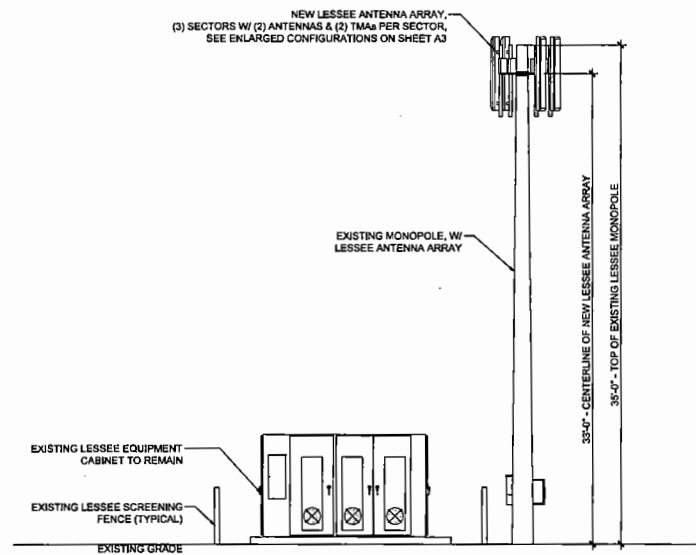
5 NEW ANTENNA
SCALE: N.T.S.

CLIENT	
verizon wireless	
126 W. GEMINI DR. TEMPE, AZ 85283	
INTERNAL REVIEW	DATE
CONSTRUCTION SIGNATURE	
RF SIGNATURE	
FACILITIES SIGNATURE	
REAL ESTATE SIGNATURE	
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Young design corp	
architecture / project management 10245 E. Via Linda, Scottsdale, AZ 85258 ph: 480 451 9609 fax: 480 451 9608 e mail: corporate@ydcoffice.com	
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2 EXISTING SOUTH ELEVATION

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



1 NEW SOUTH ELEVATION

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

CLIENT

verizon wireless

126 W. GEMINI DR.
TEMPE, AZ 85283

INTERNAL REVIEW DATE

CONSTRUCTION SIGNATURE

RF SIGNATURE

FACILITIES SIGNATURE

REAL ESTATE SIGNATURE

PLANS PREPARED BY

young design corp

architecture / project management
10245 E. Via Linda, Scottsdale, AZ 85258
ph: 480 451 9609 fax: 480 451 9608
e mail: corporate@ydcoffice.com

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NO.	DATE	DESCRIPTION
1	05/26/14	FINAL ISSUE

ARCHITECTS JOB NO.
YDC-5773

PROJECT INFORMATION

TUC_SUNRISE & CAMPBELL

6411 N. FOOTHILLS DR
TUCSON, ARIZONA, 85718

SHEET TITLE
ELEVATIONS

JURISDICTION APPROVAL

SHEET NUMBER
A-4

CLIENT

verizon wireless

126 W. GEMINI DR.
TEMPE, AZ 85283

INTERNAL REVIEW _____ DATE _____

CONSTRUCTION SIGNATURE _____

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10240 E. Via Linda, Scottsdale, AZ 85258
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NO.	DATE	DESCRIPTION
1	03/26/14	FINAL ISSUE

ARCHITECTS JOB NO.
YDC-5773

PROJECT INFORMATION

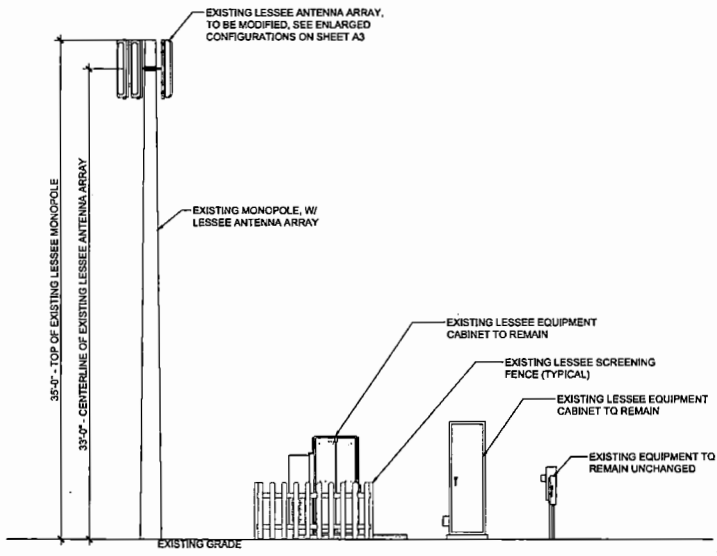
TUC, SUNRISE & CAMPBELL

6411 N. FOOTHILLS DR
TUCSON, ARIZONA, 85718

SHEET TITLE
ELEVATIONS

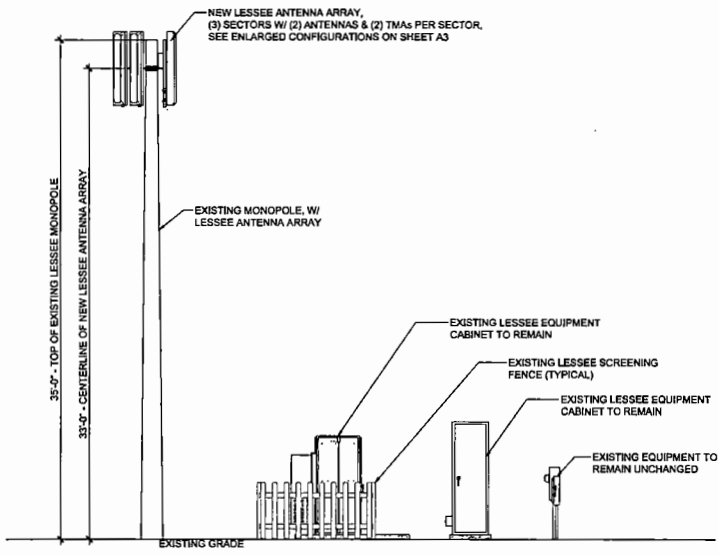
JURISDICTION APPROVAL

SHEET NUMBER
A-5



2 EXISTING EAST ELEVATION

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



1 NEW EAST ELEVATION

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

CLIENT

verizon wireless

126 W. GEMINI DR.
TEMPE, AZ 85283

INTERNAL REVIEW DATE

CONSTRUCTION SIGNATURE

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PLANS PREPARED BY

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NO.	DATE	DESCRIPTION
1	03/28/14	FINAL ISSUE

ARCHITECTS JOB NO.
YDC-5773

PROJECT INFORMATION

TUC_SUNRISE & CAMPBELL

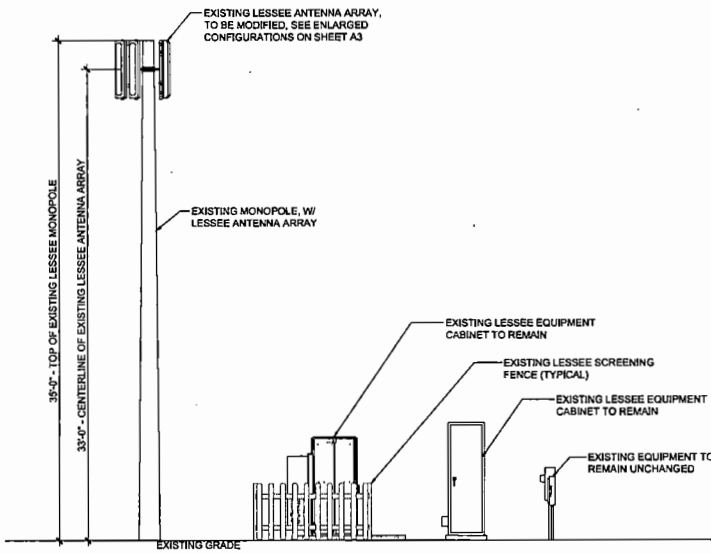
8411 N. FOOTHILLS DR
TUCSON, ARIZONA, 85718

SHEET TITLE
ELEVATIONS

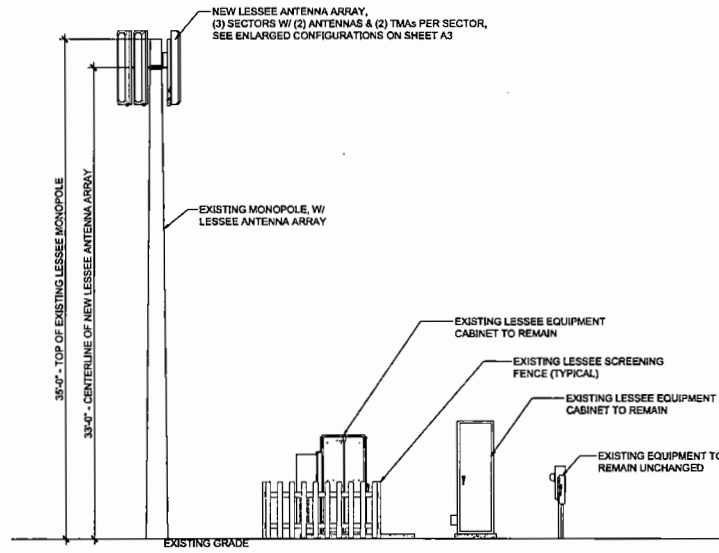
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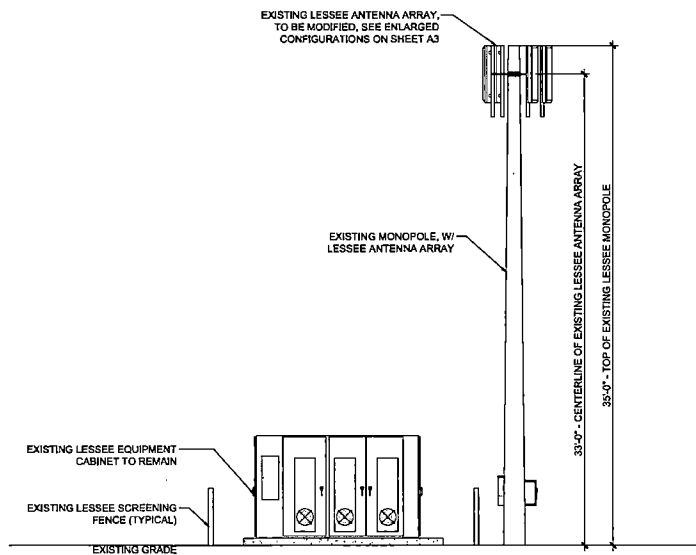
A-5



2 EXISTING EAST ELEVATION
SCALE: 1/4" = 1'-0"

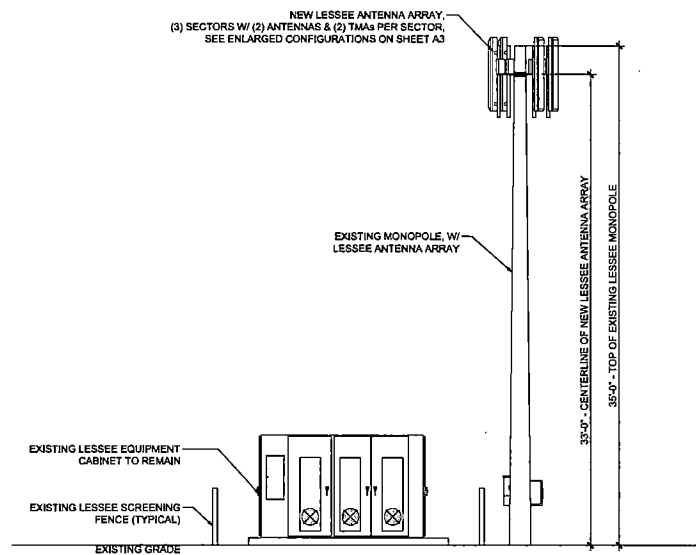


1 NEW EAST ELEVATION
SCALE: 1/4" = 1'-0"



2 EXISTING SOUTH ELEVATION
A-4

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



1 NEW SOUTH ELEVATION
A-4

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

CLIENT	
126 W. GEMINI DR. TEMPE, AZ 85283	
INTERNAL REVIEW	DATE
CONSTRUCTION SIGNATURE	
RF SIGNATURE	
FACILITIES SIGNATURE	
REAL ESTATE SIGNATURE	
PLANS PREPARED BY 	
architecture / project management 10245 E. Via Linda, Scottsdale, AZ 85258 ph: 480 451 9609 fax: 480 451 9608 e-mail: corporate@ydcoffice.com	
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PREPARED BY: YDC	
NO.	DATE DESCRIPTION
1	03/26/14 FINAL ISSUE
ARCHITECTS JOB NO. YDC-5773	
PROJECT INFORMATION TUC_SUNRISE & CAMPBELL 6411 N. FOOTHILLS DR TUCSON, ARIZONA, 85718	
SHEET TITLE ELEVATIONS	
JURISDICTION APPROVAL	
SHEET NUMBER A-4	

DPX-02x

Diplexer | 700 / AWS | Single and Dual Units | Outdoor

- Suitable for UMTS and LTE systems
- DC/AISG bypass with built-in lightning protection
- Suitable for BTS or antenna-end of the feeder
- Single or dual units available for indoor or outdoor use

Ordering Options

DPX-027	Single unit, no DC/AISG bypass, with single wall/pole mounting kit
DPX-021	Single unit, DC/AISG bypass COM to 1800/2100 only, with single wall/pole mounting kit
DPX-023	Single unit, DC/AISG bypass COM to 800/900 only, with single wall/pole mounting kit
DPX-025	Single unit, DC/AISG bypass COM to both ports, with single wall/pole mounting kit
DPX-028	Dual unit, no DC/AISG bypass with dual wall/pole mounting kit
DPX-022	Dual unit, DC/AISG bypass COM to 1800/2100 only, dual wall/pole mounting kit
DPX-024	Dual unit, DC/AISG bypass COM to 800/900 only, with dual wall/pole mounting kit
DPX-026	Dual unit, DC/AISG bypass COM to both ports, with dual wall/pole mounting kit

Electrical Specifications

700 MHz Channel

Pass-band	698-960 MHz
Insertion loss	0.2 dB max, 0.11 dB typical
Return loss all ports	20 dB min
Phase linearity variation	0.1° max over any 180 kHz within the pass-band
Group delay variation	0.1 ns max over any 180 kHz within the pass-band

AWS Channel

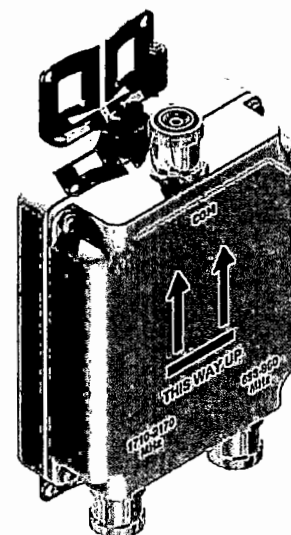
Pass-band	1710-2170 MHz
Insertion loss	0.2 dB max, 0.12 dB typical
Return loss all ports	20 dB min
Phase linearity variation	1° max over any 180 kHz
Group delay variation	0.1 ns max over any 180 kHz within the pass-band

General Characteristics

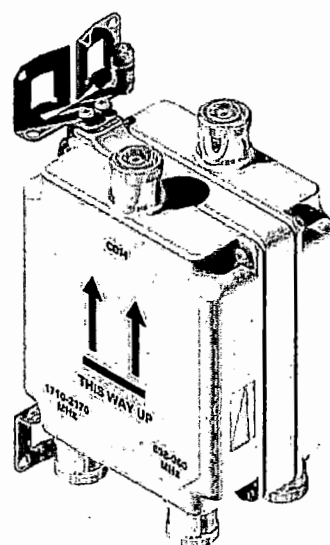
Maximum average input power	500 W
Maximum PEP input power	5000 W
Isolation 698-960 port to 1710-2170 port	50 dB min
Intermodulation	< -155 dBc all ports (2 x 43 dBm carriers)
DC/AISG paths	Factory configured, see Ordering Options listed above
DC current rating	2A continuous, 4A peak
Voltage drop through device	0.1V max at 2A

Environmental Characteristics

Operating temperature	-40° to +65° C / -40° to +149° F
Environmental sealing	IP67, ETSI EN 300 019 class 4.1
Lightning protection	5kA (8/20us) on all ports



DPX-02x Single Unit



DPX-02x Dual Unit

Quoted performance parameters are provided to offer typical or range values only and may vary as a result of normal manufacturing and operational conditions. Extreme operational conditions and/or stress on structural supports is beyond our control. Such conditions may result in damage to this product. Improvements to product may be made without notice.

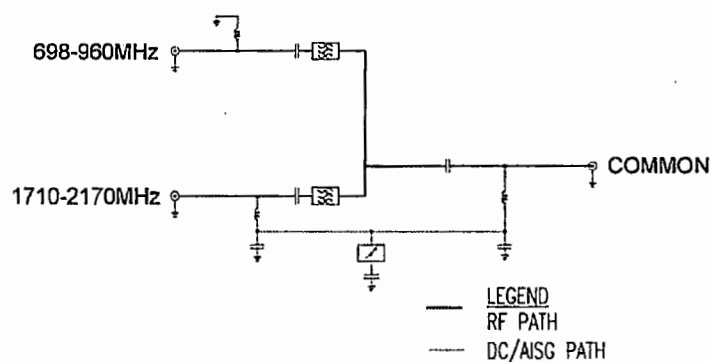
DPX-02x

Diplexer | 700 / AWS | Single and Dual Units | Outdoor

Mechanical Characteristics

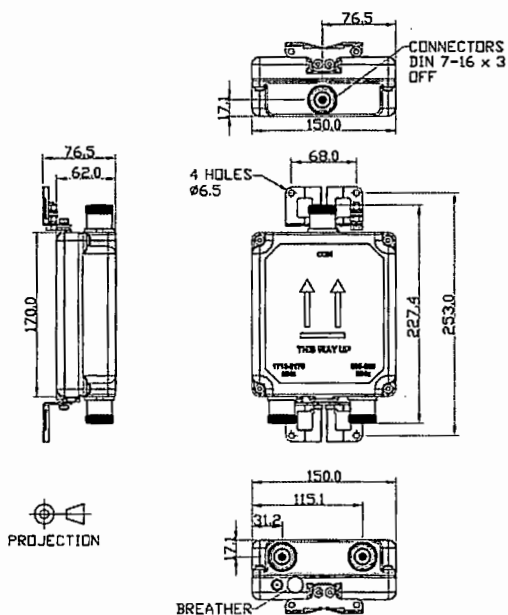
Dimensions of Single Unit - height x width x depth	170 x 150 x 62 mm / 6.7 x 5.9 x 2.4 in (excludes mounting kits and connectors)
Dimensions of Dual Unit - height x width x depth	170 x 150 x 97.5 mm / 6.7 x 5.9 x 3.8 in (excludes mounting kits and connectors)
Finish	Painted, light grey (RAL7035)
Weight	3 kg / 6.6 lbs
Connectors	3 / 7-16 DIN / Female / Long-neck
Mounting	Wall or pole mount
RoHS Compliance	Yes

Electrical Block Diagram

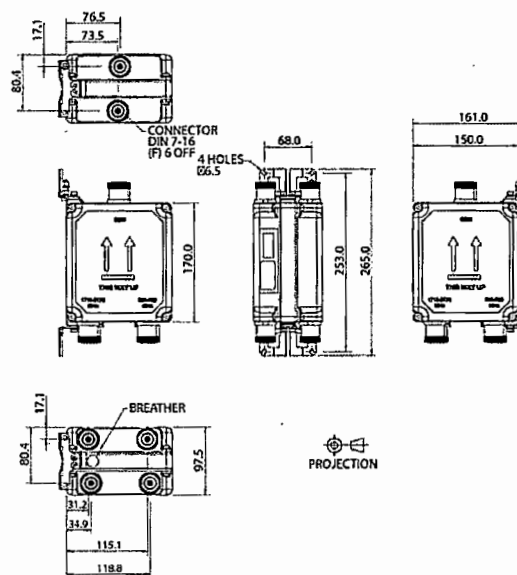


Mechanical Diagram

DPX-02x Single Unit



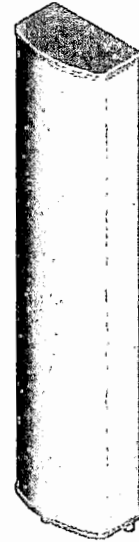
DPX-02x Dual Unit



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HTXCW631518x000

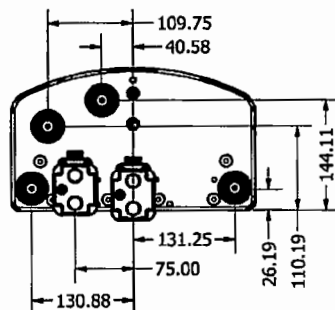
XX-Pol | Dual Band VET Panel | 65° / 63° | 14.9 / 17.5 dBi



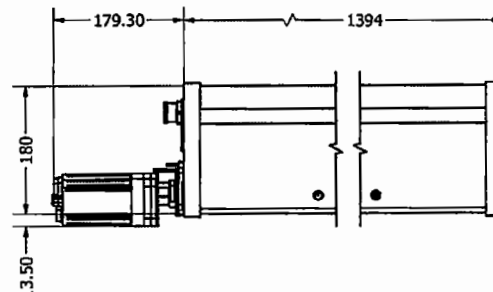
Ordering Options					
When ordering...	Replace "x" with "M" for Manual Electrical Tilt or "R" for Remote Electrical Tilt				
Manual Electrical Tilt	HTXCW631518M000				
Remote Electrical Tilt AISG v1.1	HTXCW631518R000				
Remote Electrical Tilt AISG v2.0 / 3GPP	HTXCW631518R000G				
Remote Electrical Tilt Ericsson Proprietary	HTXCW631518R000E				
Electrical Characteristics	696-960 MHz		1710-2170 MHz		
Frequency bands	696-806	806-960	1710-1880	1850-1990	1920-2170
Polarization	±45°		±45°		
Horizontal beamwidth	70°	65°	65°	63°	61°
Vertical beamwidth	17°	15°	8°	7°	6°
Gain	14.4 dBi	14.9 dBi	16.5 dBi	17.0 dBi	17.5 dBi
Electrical downtilt	2-10°		2-10°		
Impedance	50Ω				
VSWR	≤1.5:1		≤1.5:1		
Upper sidelobe suppression (0°)	> 16 dB		> 16 dB		
Front-to-back ratio (+/-30°)	> 30 dB		> 30 dB		
Isolation between ports	< -25 dB				
IM3 (2x20W carrier)	< -153 dBc				
Input power	500 W		250 W		
Lightning protection	Direct Ground				
Connector(s)	4 Ports / EDIN / Female / Bottom				
Mechanical Characteristics					
Dimensions HTXCW631518M000 (LxWxH)	1394 x 304 x 180 mm			54.9 x 12.0 x 7.1 in	
Dimensions HTXCW631518R000 (LxWxH)	1573 x 304 x 194 mm			61.9 x 12.0 x 7.6 in	
Weight without mounting brackets	13.5 kg			29.8 lbs	
Survival wind speed	> 200 km/hr			> 125 mph	
Wind loads (160 km/hr or 100 mph)	Front: 519 N; Side: 307 N			Front: 117; Side: 69 lbf	
Remote Electrical Downtilt Control					
Remote Electrical Tilt (RET) Control	The remote control of the electrical tilt is managed by an external unit.				
RET Module Part Number (two per antenna)	RETU-EB01 for AISG v1.1 protocol (two units included with HTXCW631518R000) RETU-EG01 for AISG v2.0 / 3GPP protocol (two units included with HTXCW631518R000G) RETU-EE01 for Ericsson Proprietary protocol (two units included with HTXCW631518R000E)				
Mounting Options		Part Number	Fits Pipe Diameter		Weight
2-Point Mounting Bracket Kit		MKS04P01	40-115 mm (2.0-4.5 in)		2.9 kg (6.4 lbs)
2-Point Mounting & Downtilt Bracket Kit		MKS04T03	40-115 mm (2.0-4.5 in)		4.1 kg (9.0 lbs)

HTXCW631518R000

Bottom View/Dimensions



Side View/Dimensions



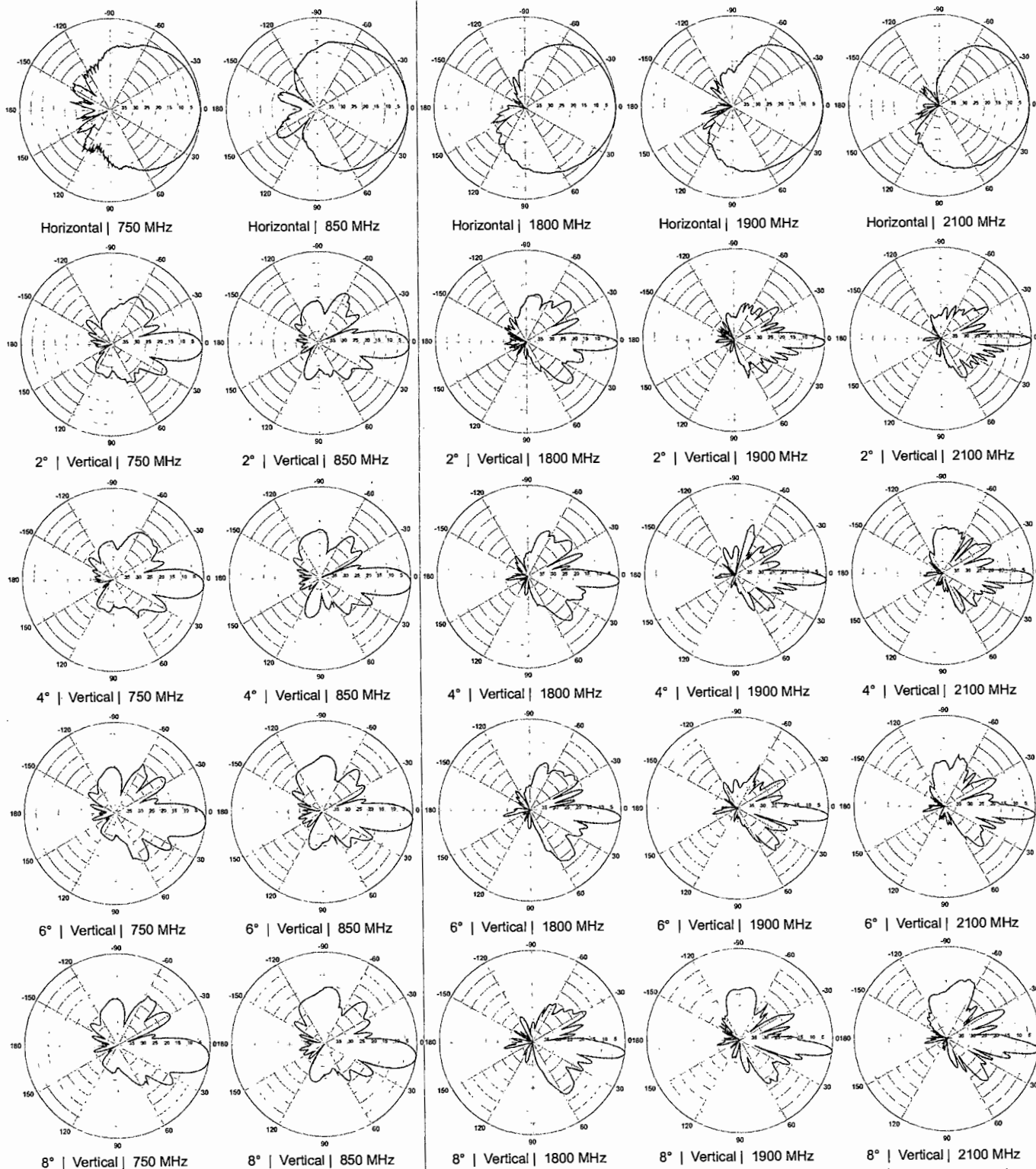
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HTXCW631518x000

XX-Pol | Dual Band VET Panel | 65° / 63° | 14.9 / 17.5 dBi

696-960 MHz

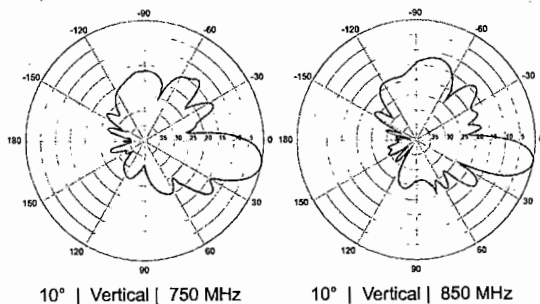
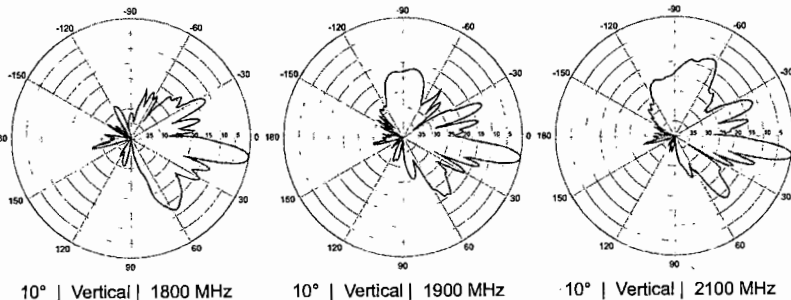
1710-2170 MHz



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HTXCW631518x000

XX-Pol | Dual Band VET Panel | 65° / 63° | 14.9 / 17.5 dBi

696-960 MHz**1710-2170 MHz**

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TTA-TWG020H, TTA-TWG021H

Dual Band AWS and 1900 Twin TMA with Optional Low Band Bypass, AISG 2.0

Designed to be deployed in co-located AWS, 1900 and low band 698-960 MHz systems with wideband antennas. Provides internal duplexing in all three bands with gain in the high bands.

- Improved base station sensitivity through gain in the AWS and 1900 uplink bands
- Internal duplexing of 698-960 MHz signals to be passed to additional ANT ports
- Excellent noise figure performance
- AISG 2.0 compatible, hardware & software configuration using AISG "personality" upload
- Internal duplexing of AWS and 1900 MHz bands
- Optional DC/AISG bypass onto ANT low band main



Ordering Options

TTA-TWG020H	AWS/1900MHz dual band twin TMA, 60MHz BW, with low band bypass, AISG 2.0, configured with generic personality
TTA-TWG021H	AWS/1900MHz dual band twin TMA, 60MHz BW, with low band bypass, AISG 2.0, DC/AISG bypass onto ANT low band Main

RF Characteristics

Downlink 1900 (RX) Path

Pass-band	1930-1990 MHz
Insertion loss	0.5 dB typical
Return loss, all ports	18 dB min
Maximum input power	160 W (average) / 2kW (PEP)
Intermodulation at antenna port	< -153 dBc (3rd order) in RX band with 2x20W carriers

Uplink 1900 (TX) Path

Pass-band	1850-1910 MHz
Gain	12 dB nominal
Gain variation over frequency, temperature	±1 dB maximum
Return loss	18 dB minimum operating, 12 dB in bypass
Noise Figure	1.4 dB typical
Bypass loss	2.5 dB typical
Output IP3	+28 dBm typical
Maximum input power with no damage	+12 dBm

Downlink AWS (RX) Path

Pass-band	2110-2170 MHz
Insertion loss	0.4 dB typical
Return loss	18 dB minimum
Maximum input power	160 W (average) / 2kW (PEP)
Intermodulation at antenna port	< -163 dBc max, (7th order) in RX band with 2x20W carriers

Uplink AWS (TX) Path

Pass-band	1710-1770 MHz
Gain	12 dB nominal
Gain variation over frequency, temperature	±1 dB maximum
Return loss	18 dB minimum operating, 12 dB in bypass
Noise figure	1.3 dB typical
Bypass loss	2.5 dB typical
Output IP3	+28 dBm typical
Maximum input power with no damage	+12 dBm

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TTA-TWG020H, TTA-TWG021H

Dual Band AWS and 1900 Twin TMA with Optional Low Band Bypass, AISG 2.0

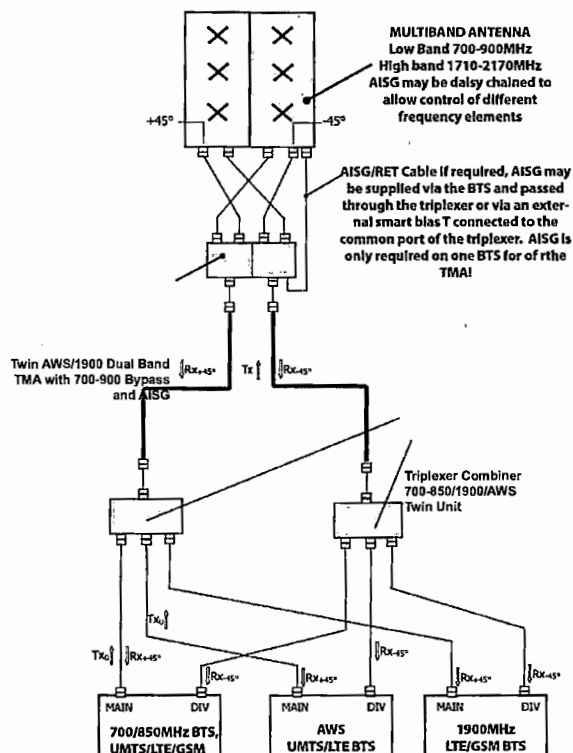
RF Characteristics	
Low Band Bypass Path	
Pass-band	698-960 MHz
Insertion loss	0.2 dB typical
Return loss	18 dB minimum
Maximum input power	120 W (average) / 2kW (PEP)
Intermodulation at antenna port	-153 dBc, (3rd order) with 2x20W carriers
General Characteristics	
Impedance	50 Ohms
Current Alarm Mode (Default Mode Selected on the Absence of AISG Packets)	
Current window alarm mode (CWA) is the default TMA operating mode and can be configured to specific customer requirements. The generic personality is configured so that both channels are independently powered and monitored via the respective BTS port. The BTS port sinks additional current to indicate an alarm state in its uplink path. Normal operating and alarm current values are configured independently and can be altered via a field-loadable personality file.	
DC supply voltage	7.5 to 30 V DC, case is DC ground
Supply current, normal operation (TTA-TWG020H)	150 ± 15 mA per port
Supply current, alarm mode (TTA-TWG020H)	200 ± 20 mA per port for (programmable)
DC supply current, alarm mode programmable range	150-250 mA, programmable with 100mA normal operating current
AISG Mode of Operation (Auto Selected on Valid AISG 2.0 Frames)	
AISG signals can be applied to either BTS1 or BTS2 port. The TMA unit switches to AISG mode when valid frames are detected on one of the BTS ports. Both LNAs take DC power from the port with AISG frames or, if DC is present on both ports, both channels supply equal power to the TMA.	
DC supply voltage	+7.5V to +30V DC
AISG version	2.0
Supply current, AISG mode	265 mA at 7.5V, 75 mA at 30V typical
AISG connector, current rating	IEC60130-9, 8-pin female, < 4A peak, 2A continuous, pin 6
Field firmware, upgradable	Yes
Environmental Characteristics	
Operating temperature range	-40°C to +65°C / -40°F to +149°F
Ingress protection	IP67
Lightning protection RF port	±5kA max (8/20us)
Lightning protection AISG port	±2kA max (8/20us) IEC61312-1
MTBF	> 1,000,000 hours
Compliance	EMC: EN301 489, ETSI EN 300 019 class 4.1, RoHS
Mechanical Characteristics	
Dimensions	See Mechanical Diagram (following page)
Weight	10.5 kg / 23.1 lbs
Connectors	6 x 7/16, EDIN Female, 1 x AISG Female
Finish	Painted, light grey (RAL7035)
Mounting & Installation	Pole / wall bracket supplied with two metal clamps for 45-178 mm (1.8-7.0 in) diameter poles.

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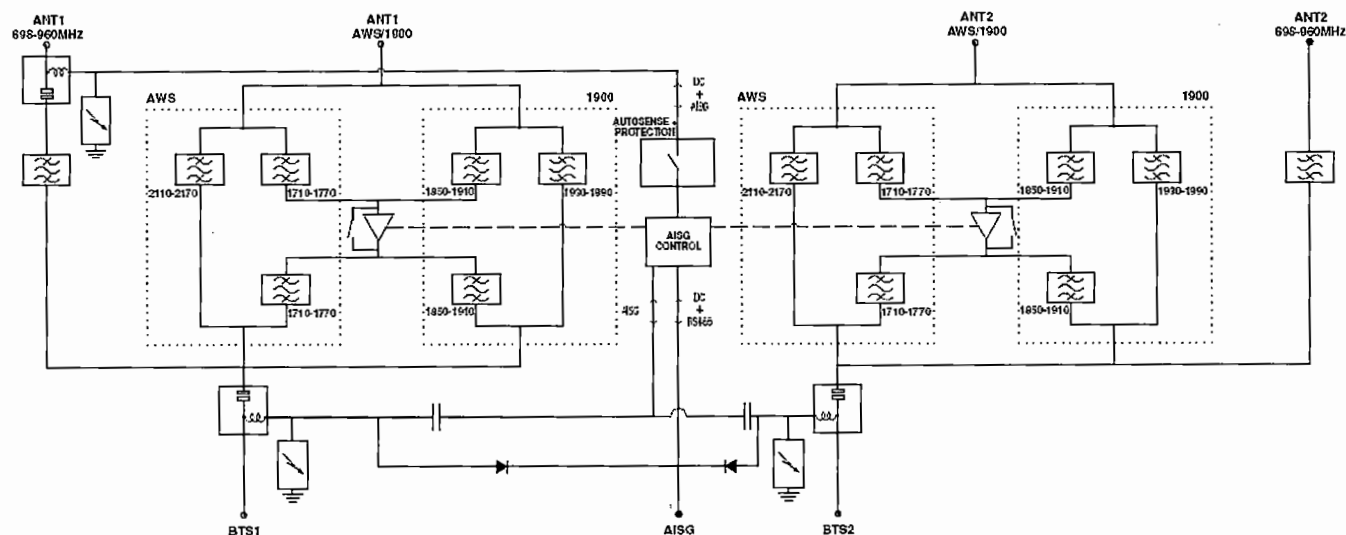
TTA-TWG020H, TTA-TWG021H

Dual Band AWS and 1900 Twin TMA with Optional Low Band Bypass, AISG 2.0

System Block Diagram



Electrical Block Diagram (TTA-TWG021H)

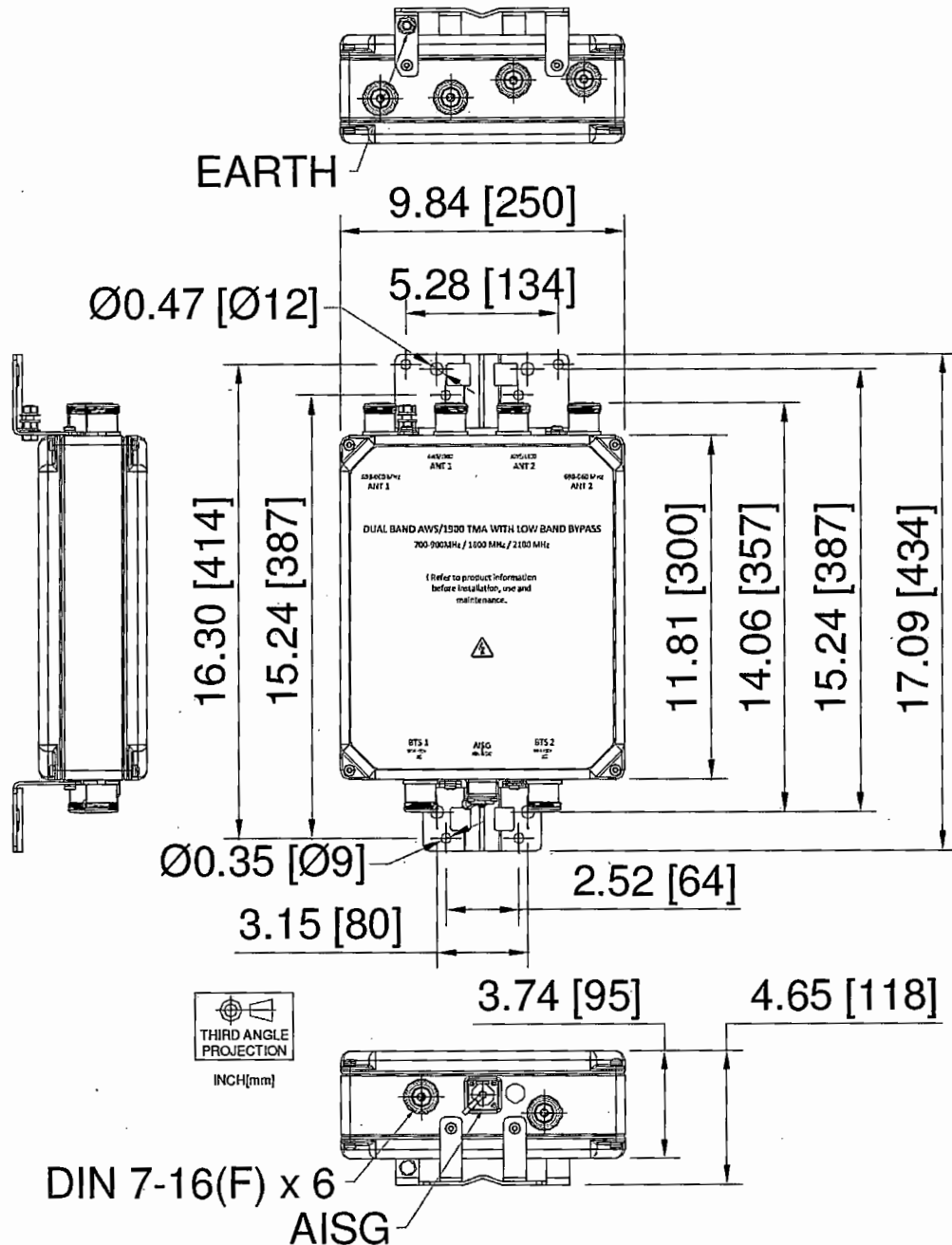


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Dual Band AWS and 1900 Twin TMA with Optional Low Band Bypass, AISG 2.0

Mechanical Block Diagram



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