

COMMUNICATIONS SITE LEASE

between

CITY AND COUNTY OF SAN FRANCISCO,
as Landlord

and

GTE MOBILNET OF CALIFORNIA LIMITED PARTNERSHIP,
D/B/A/VERIZON WIRELESS,
as Tenant

For the lease of

a Site at Zuckerberg San Francisco General Hospital and Trauma Center
Building 25
1001 Potrero Avenue
San Francisco, California

October 6, 2017

TABLE OF CONTENTS

	<u>Page</u>
1. BASIC LEASE INFORMATION	1
2. CO-LOCATION OF TELECOMMUNICATIONS FACILITIES	4
2.1 Prohibition on Co-location Without Landlord's Consent	4
2.2 Required Co-location	4
3. PREMISES; AS IS LEASE	5
3.1 Lease Premises	5
3.2 As Is Lease	5
4. TERM	6
4.1 Term of Lease	6
4.2 Confirmation of Commencement Date and Expiration Date	6
5. RENT; ADDITIONAL CHARGES	6
5.1 Base Rent	6
5.2 Adjustments in Base Rent	7
5.3 Additional Charges	7
5.4 Late Charges	7
5.5 Default Interest	7
6. USE	8
6.1 Permitted Use	8
6.2 No Illegal Uses or Nuisances	8
7. INSTALLATION OF TENANT IMPROVEMENTS	8
7.1 Tenant Improvement Work	8
7.2 Local Hire Requirements	9
7.3 Air-conditioning and Fire Suppression	9
8. ALTERATIONS	9
8.1 Tenant's Alterations	9
8.2 Title to and Removal of Tenant's Equipment	10
8.3 Taxes on Tenant's Property	10
9. CITY'S ALTERATIONS OF THE BUILDING AND BUILDING SYSTEMS	10
10. REPAIRS AND MAINTENANCE	11
10.1 City's Repairs	11
10.2 Tenant's Repairs	11

11.	LIENS	11
12.	UTILITIES AND SERVICES	12
	12.1 Utilities and Services	12
	12.2 Mandatory or Voluntary Restrictions	12
	12.3 Floor Load.....	12
13.	COMPLIANCE WITH LAWS AND RISK MANAGEMENT REQUIREMENTS	13
	13.1 Compliance with Laws	13
	13.2 Licenses and Approvals	14
	13.3 Radiofrequency Radiation and Electromagnetic Fields.....	14
	13.4 Compliance with City's Risk Management Requirements	14
14.	SUBORDINATION.....	14
15.	DAMAGE OR DESTRUCTION.....	15
16.	EMINENT DOMAIN	15
	16.1 Eminent Domain	15
	16.2 Temporary Takings.....	16
17.	ASSIGNMENT AND SUBLETTING	16
18.	DEFAULT	16
	18.1 Events of Default	16
	18.2 Remedies.....	17
19.	TENANT'S INDEMNITY	18
20.	INSURANCE.....	18
	20.1 Tenant's Insurance.....	18
	20.2 Tenant's Property	19
	20.3 City's Self Insurance	19
	20.4 Waiver of Subrogation.....	19
21.	LIMITATION OF CITY'S LIABILITY.....	20
	21.1 Limitation on City's Liability.....	20
	21.2 Consequential Damages.....	20
	21.3 No Relocation Assistance	20
22.	ACCESS TO PREMISES	21
	22.1 Tenant's Access to the Premises	21
	22.2 City's Access to the Premises.....	21
	22.3 Emergency Access	22
	22.4 No Liability	22

22.5	No Abatement	22
22.6	Minimize Disruption	22
23.	ESTOPPEL CERTIFICATES	22
24.	RULES AND REGULATIONS	23
25.	SECURITY DEPOSIT.....	23
26.	SURRENDER OF PREMISES	23
27.	HAZARDOUS MATERIALS	24
27.1	Definitions.....	24
27.2	Hazardous Materials in Premises.....	24
27.3	Tenant's Environmental Indemnity	25
28.	SPECIAL PROVISIONS.....	25
28.1	Extension Options.....	25
28.2	Tenant's Right to Terminate.....	26
28.3	City's Right to Terminate Due to Finding by Board of Supervisors.....	26
28.4	City's Protection Against Interference	26
28.5	Tenant's Protection Against Interference	26
29.	GENERAL PROVISIONS	27
29.1	Notices	27
29.2	No Implied Waiver	27
29.3	Amendments	28
29.4	Authority	28
29.5	Interpretation of Lease	28
29.6	Successors and Assigns.....	28
29.7	Brokers.....	29
29.8	Severability	29
29.9	Governing Law	29
29.10	Entire Agreement.....	29
29.11	Attorneys' Fee	29
29.12	Holding Over	30
29.13	Time of Essence.....	30
29.14	Cumulative Remedies	30
29.15	Survival of Indemnities.....	30
29.16	Signs.....	30
29.17	Light and Air.....	30

29.18	Recording.....	31
29.19	Taxes, Assessments, Licenses, Permit Fees and Liens.....	31
29.20	Non-Liability of City Officials, Employees and Agents	31
29.21	Wages and Working Conditions.....	31
29.22	Non-Discrimination in City Contracts and Benefits Ordinance	32
29.23	Requiring Health Benefits for Covered Employees.....	33
29.24	MacBride Principles - Northern Ireland	34
29.25	Drug-Free Workplace	34
29.26	Tropical Hardwood and Virgin Redwood Ban	34
29.27	Pesticide Prohibition.....	34
29.28	Prohibition of Tobacco Sales and Advertising	35
29.29	Prohibition of Alcoholic Beverage Advertising	35
29.30	Preservative-Treated Wood Containing Arsenic	35
29.31	Conflicts of Interest.....	36
29.32	Notification of Limitations on Contributions	36
29.33	Sunshine Ordinance	36
29.34	Counterparts.....	36
29.35	Effective Date	36
29.36	Cooperative Drafting	37

LIST OF EXHIBITS

EXHIBIT A – Approved Tenant's Plans and Specifications

EXHIBIT B – Notice of Commencement Date

EXHIBIT C – Access for Telecommunications Equipment Installation and Maintenance

COMMUNICATIONS SITE LEASE

THIS COMMUNICATIONS SITE LEASE (this "Lease") dated for reference purposes only as of October 6, 2017, is made between the CITY AND COUNTY OF SAN FRANCISCO, a municipal corporation ("City" or "Landlord"), and GTE MOBILNET OF CALIFORNIA LIMITED PARTNERSHIP, a California limited partnership D/B/A/VERIZON WIRELESS ("Tenant").

City and Tenant hereby covenant and agree as follows:

1. BASIC LEASE INFORMATION

The following is a summary of basic lease information (the "Basic Lease Information"). Each item below shall be deemed to incorporate all of the terms set forth in this Lease pertaining to such item. In the event of any conflict between the information in this Section and any more specific provision of this Lease, the more specific provision shall control.

Lease Reference Date:	October 6, 2017
Landlord:	CITY AND COUNTY OF SAN FRANCISCO
Tenant:	GTE Mobilnet of California Limited Partnership D/B/A Verizon Wireless
Building (<u>Section 2.1</u>):	Zuckerberg San Francisco General Hospital and Trauma Center, Building 25, 1001 Potrero Avenue, San Francisco, California
Premises (<u>Section 2.1</u>):	The portions of the Building consisting of (1) approximately four (4) square feet of space in Building 25, MPOE BB1111, Room HB380; (2) one 19" rack space within MPOE – BB1111, Room 380; (3) associated fiber cables and connections, GPS pathway or access to existing or new roof penetration for coax cable access through conduit for the BPS antenna located on the roof of the Building from MPOE; and (4) the placement and use of wiring conduits, utility and fiber cabling, wires and conduits reasonably necessary to connect Tenant's equipment to City's DAS simplified equipment all shown and described with more specificity in Exhibit A attached thereto. In connection with the lease of the Premises and for the term of the Lease, Tenant shall have a nonexclusive license for the placement and use of wiring and conduit as shown on the Approved Plans (as defined below). The Building is under the jurisdiction of the City's Department of Public Health.

Term (Section 3.1): Estimated commencement date:
November 1, 2017

Expiration date:
October 31, 2022

Extension Options (Section 28.1): Two (2) options to extend, each for five (5) years

Base Rent (Section 4.1): Annual Base Rent: \$60,000.00
Monthly payments: \$5,000.00

So long as Tenant participates in the DAS, in consideration of Tenant's participation and providing in-building service to ZSFGH's staff, patients and visitors, and in consideration of the benefit of Tenant's Equipment for same, City shall defer Base Rent for the initial term of the Lease and any Extended Terms (as defined below).

Adjustment Dates (Section 4.2): Annually on the anniversary of the Commencement Date (as defined below), beginning on the first anniversary of the Commencement Date.

Use (Section 5.1): Tenant shall use the Premises for the sole purpose of participating in the Building's "Distributed Antenna System" (for in-building wireless radio telecommunications), which includes installing, maintaining, repairing and operating Tenant's equipment and a customized in-building radio telecommunications system comprised of one or more Base Station(s) or repeaters (as applicable and set forth in Exhibit A), and related transmission facilities and related equipment and cabling that will be installed, to enable enhanced radio frequency coverage from Tenant's "Network" at the Premises. Tenant shall not use the Premises for any other purposes without the written consent of Landlord.

Equipment (Exhibit A): The following equipment and improvements that Tenant has the right to install at the Building pursuant to this Lease, which installation shall be at Tenant's sole cost that equipment set forth in Exhibit A and the placement and use of wiring conduits, utility and fiber cabling, wires and conduits reasonably necessary to connect Tenant's equipment to City's DAS simplified equipment, and related power cable/supply and equipment (collectively, "Tenant's Equipment") as shown on Exhibit A attached hereto.

Utilities and Services (Section 10.1):

Utilities to be provided by City for a service charge of \$3,708 per annum, payable monthly in advance at \$309.00 subject to a three (3%) percent increase annually on the anniversary of each Adjustment Date. In consideration of the benefit of the service and equipment to City, Tenant is exempt from payment of utilities during the initial term of the Lease and any Extended Terms thereafter so long as Tenant participates in the DAS.

Security Deposit (Section 24.1):

\$5,000.00 (Already paid by Tenant under that certain Revocable Permit to Enter and Use Property dated May 12, 2016 between the Parties)

Notice Address of Landlord (Section 28.1):

Real Estate Division
City and County of San Francisco
25 Van Ness Avenue, Suite 400
San Francisco, CA 94102
Attn: John Updike
Director of Property
Re: **VERIZON, IDAS, ZSFGH**
Fax No.: (415) 552-9216

with a copy to:

Department of Public Health
101 Grove Street
San Francisco, CA 94102
Attn: Director of Public Health
Re: ZSFGH – 1001 Potrero Avenue
Building 25
Verizon, DAS

and to:

Office of the City Attorney
City and County of San Francisco
1390 Market Street, 5th Floor
San Francisco, CA 94102
Attn: Deputy City Attorney
Re: ZSFGH – DAS - Verizon
Fax No.: (415) 554-4755

Key Contact for Landlord:

Jim Applegarth
John.applegarth@sfdph.org

Telephone No.:

415.206.4906

Key Contact for Landlord:

Bill Kim
Bill.kim@sfdph.org

Telephone No.:

415.554.2633

Notice Address for Tenant

GTE Mobilnet of California Limited Partnership,
d/b/a/ Verizon Wireless

(Section 28.1):

180 Washington Valley Road
Bedminster, New Jersey 07921
Attn: Network Real Estate
(Re: Zuckerberg San Francisco General Hospital)

Key Contact for Tenant: Terry Vance
Telephone No.: (916)-205-1194
Alternate Contact for Tenant: Network Operations Center
Telephone No.: 1-800-264-6620

2. CO-LOCATION OF TELECOMMUNICATIONS FACILITIES

2.1 Prohibition on Co-location Without Landlord's Consent

Co-location of facilities is prohibited except with the express written approval of landlord. A "co-located telecommunication facility" means a telecommunication facility comprised of one or more antennas, dishes, or similar devices owned or used by more than one public or private entity that is not controlled by or under common control with Tenant. The term "control" in the foregoing sentence shall mean (a) as to a corporation, the ownership of stock having the right to exercise more than fifty percent (50%) of the total combined voting power of all classes of stock of the controlled corporation, issued and outstanding, and (b) as to partnerships and other forms of business associations, ownership of more than fifty percent (50%) of the beneficial interest and voting control of such association. Tenant shall use its best efforts to provide City with notice in advance of any such permitted Assignment and in any event shall provide City with written notice later than ten (10) days after the effective date of such permitted Assignment.

2.2 Required Co-location

Notwithstanding the foregoing, Tenant is on notice that Landlord may require Tenant to co-locate its facilities on the Premises with other facilities or providers or require Tenant to permit other facilities or providers to co-locate on Tenant's facilities.

Tenant shall cooperate and use commercially reasonable efforts to facilitate co-location of future telecommunications facilities upon the Premises; provided, however, that Tenant shall not be under any such obligation if a proposed co-location causes interference with Tenant's existing use of the Premises. If no such interference would occur upon installation of a co-locator's equipment as reasonably determined by Landlord, then the proposed co-locator in each instance shall, as a condition precedent to any proposed co-location: (i) execute and deliver a co-location agreement prepared in commercially reasonable form by the proposed co-locator; (ii) pay all costs arising from or related to the co-location, including but not limited to any and all costs incurred by Tenant to accommodate such co-location; and (iii) reimburse Tenant a commercially reasonable percentage of costs and expenses (including capital expenditures) incurred by Tenant in connection with the development, use, or occupancy of the premises prior to the co-location.

3. PREMISES; AS IS LEASE

3.1 Lease Premises

Subject to the terms, covenants and conditions set forth in this Lease, City leases to Tenant and Tenant leases from City those Premises specified in the Basic Lease Information and shown on the plans attached hereto as Exhibit A (the "Premises"). Tenant shall have access to the Premises and portions of the common areas of the Building as provided in Section 22.1 (Tenant's Access to Premises).

As used herein, "**Property**" means the Premises, Building and real property upon which the Building is located and all other improvements and appurtenances to such land. In connection with its use of the Premises and for the Term of this Lease, City grants Tenant a nonexclusive license for the placement and use of Tenant's utility and fiber cabling, wires, and conduits reasonably necessary to connect Tenant's Equipment (collectively, the "Tenant Cables") across the areas shown on the Approved Plans (as defined in Section 7.1 (Tenant Improvement Work)). Such license shall be irrevocable, but shall terminate upon any termination of this Lease. City, in its sole discretion and at its sole cost and expense, may relocate the license area upon one hundred eighty (180) days prior written notice to Tenant. Except as otherwise expressly permitted in this Lease, all Tenant Cables that connect Tenant's Equipment located in different sites within, and on top of, the Building shall pass through existing openings in the Building's walls, floors, or ceilings unless Tenant reasonably determines that such existing openings are not usable. In such event, Tenant shall obtain Landlord's prior written consent to make any new penetrations through the Building walls, floors, or ceilings and roofs for any Tenant Cables, which consent will not be unreasonably withheld, conditioned or delayed.

To request Landlord's consent to new penetrations, Tenant shall deliver such request to Landlord in writing, together with any information reasonably requested by Landlord to analyze whether such proposed penetrations would negatively impact the Building's safety or structural integrity (a "**Request Notice**"). Such Landlord-requested information may include an analysis of the impact of the proposed penetrations, prepared by a California-licensed structural engineer with reasonable experience in analyzing such issues. If the cost of making any such new penetrations is more than Five Thousand Dollars (\$5,000), Tenant shall pay Landlord the administrative fee described in Section 8.1, but in no event shall such fee exceed Five Thousand Dollars (\$5,000). If the cost of making any such new penetrations is Five Thousand Dollars (\$5,000) or less, at Landlord's election, Tenant shall pay Landlord a reasonable administrative review fee not to exceed Five Hundred Dollars (\$500) before Landlord is required to review such new penetration request. Such administrative review fee shall be based on Landlord's estimated costs in reviewing the proposed penetrations. Landlord shall notify Tenant in writing if Landlord will charge such an administrative review fee and the amount of such fee within thirty (30) days' of receiving Tenant's Request Notice. Tenant shall have the right to withdraw its Request Notice at any time; provided, however, that if Tenant withdraws such Request Notice after delivering the administrative review fee or a Section 8.1 administrative fee, Landlord shall have no obligation to reimburse such fee to Tenant.

3.2 As Is Lease

TENANT EXPRESSLY ACKNOWLEDGES AND AGREES THAT THE PREMISES ARE BEING LEASED AND ACCEPTED IN THEIR "AS IS, WITH ALL FAULTS" CONDITION, WITHOUT REPRESENTATION OR WARRANTY OF ANY KIND, AND SUBJECT TO ALL APPLICABLE LAWS, RULES AND ORDINANCES, INCLUDING, WITHOUT LIMITATION, ZONING ORDINANCES AND REGULATIONS GOVERNING THE USE, OCCUPANCY OR POSSESSION OF THE PREMISES OR LICENSED AREAS. TENANT REPRESENTS AND WARRANTS TO LANDLORD THAT TENANT HAS CONDUCTED A REASONABLY DILIGENT INVESTIGATION, EITHER

INDEPENDENTLY OR THROUGH AGENTS OF TENANT'S CHOOSING, OF THE CONDITION OF THE PREMISES AND OF THE SUITABILITY OF THE PREMISES FOR TENANT'S INTENDED USE, AND TENANT IS RELYING SOLELY ON ITS INDEPENDENT INVESTIGATION. TENANT FURTHER REPRESENTS AND WARRANTS THAT ITS INTENDED USE OF THE PREMISES IS THE USE DESCRIBED IN THE BASIC LEASE INFORMATION. TENANT AGREES THAT NEITHER CITY NOR ANY OF ITS AGENTS HAVE MADE, AND CITY DISCLAIMS, ANY REPRESENTATIONS OR WARRANTIES, EXPRESS OR IMPLIED, WITH RESPECT TO THE PHYSICAL, STRUCTURAL OR ENVIRONMENTAL CONDITION OF THE PREMISES OR THE PRESENT OR FUTURE SUITABILITY OF THE PREMISES OR LICENSED AREAS FOR THE CONDUCT OF TENANT'S BUSINESS, OR ANY OTHER MATTER WHATSOEVER RELATING TO THE PREMISES, INCLUDING, WITHOUT LIMITATION, ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. FOR PURPOSES OF CALIFORNIA CIVIL CODE SECTION 1938, TO THE EXTENT APPLICABLE TO THIS SPECIFIC LEASE AND PREMISES, THE BUILDING HAS NOT BEEN INSPECTED BY A CERTIFIED ACCESS SPECIALIST.

4. TERM

4.1 Term of Lease

The Premises are leased for a term (the "Term") of five (5) years, commencing and terminating as set forth below. The Term of this Lease shall end on the Expiration Date specified in the Basic Lease Information, or such earlier date on which this Lease terminates pursuant to the terms hereof. No delay in the commencement of this Lease beyond the Estimated Commencement Date specified in the Basic Lease Information shall serve to extend the Initial Term beyond the Expiration Date. Tenant shall have the right to extend the Term for two (2) Extended Terms as provided in Section 28.1 (Options to Extend Term). As used below, the "Term" shall include the initial term of five (5) years, and any of the Extended Terms if Tenant duly exercises its Extension Options with respect to such Extended Term(s) pursuant to this Lease.

4.2 Confirmation of Commencement Date and Expiration Date

The Term of this Lease shall commence on City's Board of Supervisors and Mayor's approval and execution by the parties, and the earlier to occur of (i) the first day of the first month following Tenant's notice to Landlord in writing that Tenant has obtained all permits and approvals necessary for Tenant to be legally entitled to install Tenant's Equipment as set forth in Exhibit A at the Premises, or (ii) the Estimated Commencement Date specified in the Basic Lease Information (the "Commencement Date"). The Term shall terminate on the Expiration Date unless earlier terminated pursuant to the terms hereof or extended as provided in Section 28.1. Promptly following the Commencement Date, if the Commencement Date occurs on a date other than the Estimated Commencement Date specified in the Basic Lease Information, Tenant shall deliver to City a notice in substantially the form attached hereto as Exhibit B identifying the Commencement Date determined in accordance with the provisions hereof, and City shall execute and return such notice to Tenant. However, the parties' failure to execute or deliver such notice shall not affect the commencement of the Term.

5. RENT; ADDITIONAL CHARGES

5.1 Base Rent

Beginning on the Commencement Date, Tenant shall pay to City during the Term the annual Base Rent specified in the Basic Lease Information as the same may be increased pursuant to Section 5.2 (Adjustments in Base Rent) (the "**Base Rent**"). The Base Rent shall be

payable in equal consecutive monthly payments on or before the first day of each month, in advance, by good check to the City and County of San Francisco at the address for the Director of Property specified in the Basic Lease Information, or such other place as City may designate in writing. Tenant shall pay the Base Rent without any prior demand and without any deduction or setoff. If the Commencement Date occurs on a day other than the first day of a calendar month, or the Expiration Date occurs on a day other than the last day of a calendar month, then the Base Rent for such fractional month shall be prorated based on a thirty (30)-day month.

In consideration of the benefit and public purpose of Tenant's Equipment and participation in the ZSFGH's DAS for City's use, including the doctors, staff, patients, and visitors at the Zuckerberg San Francisco General Hospital and Trauma Center, Tenant is exempt from payment of Base Rent until this Lease expires or is terminated, the Building is no longer used as the Zuckerberg San Francisco General Hospital and Trauma Center, and so long as Tenant participates in the ZSFGH's DAS and provides said services and benefit to City and department staff. If Tenant ceases to participate in the DAS but does not vacate the Premises, Tenant shall pay all Base Rent, utilities, and fees.

5.2 Adjustments in Base Rent

Subject to the exemption set forth in Section 5.1, on each date specified in the Basic Lease Information for the adjustment of Base Rent (an "**Adjustment Date**") during the Term, the Base Rent payable by Tenant under Section 5.1 (Base Rent) above shall be adjusted annually by three (3) percent.

5.3 Additional Charges

Subject to the exemption set forth in Section 5.1, Tenant shall promptly pay to City any and all charges, if any, required under any other provision of this Lease, as additional rent (herein called "**Additional Charges**"). Such Additional Charges shall be payable to City at the same place and in the same manner as the Base Rent is payable. City shall have the same remedies for a default in the payment of any Additional Charges as for a default in the payment of Base Rent. As used in this Lease, the term "Rent" shall include the Base Rent and any Additional Charges.

5.4 Late Charges

Subject to the exemption set forth in Section 5.1, if Tenant fails to pay any Rent within ten (10) days after delivery of notice that the same is due and payable, such unpaid amounts will be subject to a late payment charge equal to ONE HUNDRED AND FIFTY percent (150%) of the unpaid amounts in each instance. The late payment charge has been agreed upon by City and Tenant, after negotiation, as a reasonable estimate of the additional administrative costs and detriment that will be incurred by City as a result of any such failure by Tenant, the actual costs thereof being extremely difficult if not impossible to determine. The late payment charge constitutes liquidated damages to compensate City for its damages resulting from such failure to pay and shall be paid to City together with such unpaid amounts.

5.5 Default Interest

Subject to the exemption set forth in Section 5.1, any Rent, if not paid within ten (10) days following the due date, shall bear interest from the due date until paid at the rate of six percent (6%) per year or, if a higher rate is legally permissible, at the highest rate an individual is permitted to charge under law. However, interest shall not be payable on late charges incurred by Tenant nor on any amounts on which late charges are paid by Tenant to the extent this interest

would cause the total interest to be in excess of that which an individual is lawfully permitted to charge. Payment of interest and late charges shall not excuse or cure any default by Tenant.

6. USE

6.1 Permitted Use

Tenant shall use the Premises during the Term of this Lease solely for such uses as are specified in the Basic Lease Information and for no other use. Tenant shall not interfere with the use and operation of the Building as a hospital and trauma center, nor the ZSFGH Campus.

6.2 No Illegal Uses or Nuisances

Without limiting the foregoing, Tenant shall not use or occupy any of the Premises, or permit the use or occupancy thereof, in any unlawful manner or for any illegal purpose, or permit to be carried on any offensive, immoral, noisy, or hazardous use. Tenant shall take all commercially reasonable precautions to eliminate any nuisances or hazards in connection with its activities within the Premises. Tenant shall not advertise in any manner in areas outside the Premises or on or about the Building; provided, however that Tenant may place one identification plate on each piece of Tenant's Equipment, which plate shall be no larger than two (2) inches by two (2) inches and shall be reasonably approved in advance by City, in order to identify Tenant's Equipment as belonging to Tenant.

7. INSTALLATION OF TENANT IMPROVEMENTS

7.1 Tenant Improvement Work

Following the Commencement Date, Tenant shall commence to install Tenant's Equipment and other improvements on the Premises in accordance with the plans and specifications as set forth and depicted in Exhibit A, which have been approved by City (such work is called the "**Tenant Improvement Work**" or "**Tenant Improvements**" and such plans and specifications are called the "**Approved Plans**"). A copy of the Approved Plans is attached hereto as Exhibit A. The Approved Plans may be altered, subject to the prior written and reasonable approval of City, if required in order for Tenant to obtain any permits or approvals necessary for installation, or construction of any modifications, alterations, replacements or additions.

Tenant shall not alter, replace, modify, or add to any of Tenant's Equipment without City's prior written consent; provided, however, that Tenant may perform maintenance, repairs, like-for-like exchanges or similar replacements of Tenant's Equipment and may make modifications within the interior of any of Tenant's Equipment without prior approval of City so long as the like-for-like exchanges or similar replacements of Tenant's Equipment are substantially similar in size and weight to the previous Tenant Equipment, do not pose any greater danger to the Building than the Tenant's Equipment to be so exchanged or replaced, will comply with Section 12.3 (Floor Load), and Tenant obtains all regulatory approvals required for such exchanges, replacements, or modifications. If Tenant wishes to make any exchange or replacement of Tenant's Equipment within the Premises that requires City's prior written consent, City will not unreasonably withhold, condition or delay its approval; provided, however, subject to Section 5.1, that City shall have the right to condition its approval of such requested exchange or replacement on an increase in the Base Rent if such requested exchange or replacement results in Tenant realizing additional revenues or charging higher fees to its customers, unless such higher fees to its customers are solely used to pay for Tenant's additional cost in making such requested exchange or replacement. Tenant acknowledges that City shall have the sole discretion in deciding whether to approve to any proposed addition to the Tenant's

Equipment within the Premises or any proposed exchange or replacement of Tenant's Equipment that would result in any expansion of the Premises.

Tenant shall be responsible, at its cost, for performing the Tenant Improvement Work in accordance with the Approved Plans and otherwise in compliance with the standards contained in Section 8.1 (Tenant's Alterations). Tenant shall further be responsible, at its cost, for obtaining all permits and licenses required in connection with the Tenant Improvements and satisfy any conditions or mitigation measures approved in connection therewith. No Tenant Improvement Work shall commence until Tenant has first obtained all necessary permits and approvals for Tenant to be legally entitled to construct the Tenant Improvements.

7.2 Local Hire Requirements

Unless exempt, for any Tenant Improvement Work or Alteration (as set forth in Section 8) estimated to cost more than \$750,000, Tenant agrees to comply with the San Francisco Local Hiring Policy set forth in San Francisco Administrative Code Section 6.22(G) in the performance of the Tenant Improvement Work or Alteration. Prior to the commencement of such work, Tenant shall contact City's Office of Economic Workforce and Development ("OEWD") to discuss the local hiring requirements issued by OEWD under the San Francisco Local Hiring Policy that apply to the Tenant Improvement Work, or Alteration, if any. Tenant shall comply with all OEWD requirements issued with respect to the San Francisco Local Hiring Policy and applicable to the Tenant Improvement Work or Alteration.

7.3 Air-conditioning and Fire Suppression

Tenant shall have the right (but not the obligation) to install and maintain at its own cost and expense a self-contained air-conditioning system and fire protection system on the Premises, as shown on the Approved Plans or approved by the City. Installation of such systems shall be in compliance with Section 7.1 (Tenant Improvement Work) and Section 8.1 (Tenant's Alterations).

7.4 Electrical

Electrical load, equipment weight and rack units must be stated and submitted for the initial installation, and for any changes or modifications prior to any work. No modification to the busway or breakers is allowed. If Tenant requires power other than what is available, the Tenant shall re-design, construct and run conduit and wiring for a new circuit panel within the MPOE feeding to their Leased area at Tenant's sole cost. Load is limited to less than or equal to 100a for each busway. Tenant shall not make or permit any changed plans, designs and alterations except as set forth under Section 8 (Alterations).

8. ALTERATIONS

8.1 Tenant's Alterations

Tenant shall not make or permit any alterations to the Building or any of the heating, ventilating, air conditioning, plumbing, electrical, fire protection, life safety, security and other mechanical, electrical, and communications systems of the Building (collectively, "**Building Systems**"), or Premises except with City's prior written consent in each instance which may be withheld in City's sole discretion. All Alterations shall be done at Tenant's sole expense in accordance with plans and specifications approved by City, only by duly licensed and bonded contractors or mechanics, and subject to all other conditions which City may reasonably impose. If the cost of any Alterations to the Building (excluding any shown on the Approved Plans) is in excess of Five Thousand Dollars (\$5,000), then Tenant shall pay City an administrative fee equal to ten percent (10%) of the total "hard" costs of the work, not to exceed Five Thousand Dollars

(\$5,000). "Hard costs" shall include the cost of materials and installation, but shall exclude any costs associated with design, such as architectural fees.

8.2 Title to and Removal of Tenant's Equipment

Title to the Tenant Improvements, all permitted improvements or equipment installed at and affixed to the Premises by Tenant and all of Tenant's personal property (collectively, "Tenant's Property") shall remain the property of Tenant; provided, however, that any structural improvements to the Building made by Tenant shall become City's property and remain on the Premises. City hereby acknowledges that Tenant may grant to the vendor of the equipment to be installed at and affixed to the Premises a security interest in all equipment and fixtures owned by Tenant now or hereafter located at or on the Premises; provided no such security interest shall cover any portion of the Premises or the Building or City's property in, on or about the Building and further provided that any removal of such equipment or fixtures by the holder of any such security interest must be in compliance with the provisions of Section 26 (Surrender of Premises). Tenant may at any time, including any time it vacates the Premises (excluding the structural improvements referenced above), remove all of Tenant's Property from the Premises, subject to the provisions of Section 26 (Surrender of Premises). Notwithstanding anything to the contrary in this Lease, City can elect at any time prior to the Expiration Date or within thirty (30) days after termination of this Lease to require Tenant to remove on the Expiration Date or any earlier termination of this Lease in accordance with Section 26 (Surrender of Premises) at Tenant's sole expense, all or part of any structural improvements to the Premises or the common areas of the Building made by City or Tenant, which were made in order to provide sufficient support for Tenant's equipment, and any antenna or tower supports, foundations, or base plates.

8.3 Taxes on Tenant's Property

At least ten (10) days prior to delinquency, Tenant shall pay all taxes levied or assessed upon Tenant's Property, if any, and shall deliver satisfactory evidence of such payment to City promptly upon request.

9. CITY'S ALTERATIONS OF THE BUILDING AND BUILDING SYSTEMS

City reserves the right at any time to make alterations, additions, repairs, deletions or improvements to all or any part of the Building, the Building Systems or the common areas of the Building, for any purpose including compliance with mandatory or voluntary controls or guidelines, subject to the following terms and conditions. In performing any such work that would affect Tenant's normal use of Tenant's Equipment in the Premises, City shall, except in the event of an emergency or any unanticipated work required to protect the Building, the Building Systems, the Building common areas, or public health or safety, provide Tenant with at least forty-five (45) days' prior notice of such work and shall make reasonable efforts not to disrupt Tenant's normal use of Tenant's Equipment in the Premises in performing any such work. Subject to Section 5.1, the making of any such alterations, additions, repairs, deletions or improvements shall in no event entitle Tenant to any damages, relieve Tenant of the obligation to pay the full Base Rent and Additional Charges reserved hereunder or to perform each of its other covenants hereunder or constitute or be construed as a constructive or other eviction of Tenant, provided that Tenant can still operate the Premises as a Communications Site. During the period of any such alterations by City which materially impair Tenant's use of the Premises as a Communications Site, Tenant shall have the right at no additional charge to bring into the Building and operate a portable generator and mobile Communications Site and telescopic antennae or tower, in a mutually acceptable location and on the other terms and conditions provided with respect to such equipment in Section 15 (Damage and Destruction).

10. REPAIRS AND MAINTENANCE

10.1 City's Repairs

City shall be responsible for any maintenance of the Building, and City agrees **(i)** to correct any immediately life-threatening or hazardous condition that affects any portion of the Building necessary for Tenant's use of the Premises as a Communications Site, so long as such condition is not the result of damage or destruction discussed in Section 15 (Destruction), the acts, omissions or negligence of Tenant or its Agents (as defined below), such repair is not otherwise the responsibility of Tenant under Section 10.2 (Tenant's Repairs), and such condition is not disclosed to Tenant under any provision of this Lease or would not have otherwise been discovered by Tenant through a reasonably diligent inspection of the Premises prior to the reference date hereof, and **(ii)** to repair any condition caused by City or its tenants of the Building other than Tenant, which condition materially affects any portion of the Building necessary for Tenant's use of the Premises as a Communications Site and is not caused by damage or destruction discussed in Section 15 (Destruction). Upon becoming aware of any such condition, Tenant shall give the City written notice of the need for any repair for which the City is responsible under the preceding sentence; provided, however, that Tenant's agreement to provide written notice shall in no event be interpreted as an assumption of liability for such life-threatening or hazardous conditions unless Tenant would otherwise be responsible for such conditions hereunder. In the event that the costs of making the corrections or repairs described in Subsections (i) or (ii) above exceed Fifteen Thousand Dollars (\$15,000.00), City may elect to terminate this Lease within ninety (90) days of the condition requiring correction or repair in lieu of making such corrections or repairs, provided however, that Tenant may elect to pay the portion of such costs in excess of Fifteen Thousand Dollars (\$15,000.00) necessary in order to make such correction or repairs, in which case City will proceed with the correction or repair.

10.2 Tenant's Repairs

Tenant shall maintain all parts of its Premises at its sole expense, including without limitation, the floors, electrical wiring, fixtures and equipment, in good repair and working order and in a clean, safe and sanitary condition. Tenant shall make all repairs and replacements: **(a)** at Tenant's expense and at such time and, when required hereunder, in such manner as reasonably approved by City, **(b)** by duly licensed and bonded contractors or mechanics, **(c)** in a manner and using equipment and materials which will not interfere with or impair City's operations, use or occupation of the Building or the Building Systems, and **(d)** in accordance with any Building Rules and Regulations (as defined in Section 24.1 (Rules and Regulations)) and all applicable Laws (as defined in Section 13.1 (Compliance with Laws)).

11. LIENS

Tenant shall keep the Premises and the Building free from any liens arising out of any work performed, material furnished or obligations incurred by or for Tenant. In the event Tenant shall not, within one hundred twenty (120) days following the imposition of any such lien, cause the lien to be released of record by payment or posting of a proper bond, City shall have in addition to all other remedies provided herein and by law or equity the right, but not the obligation, to cause the same to be released by such means as it shall deem proper, including, but not limited to, payment of the claim giving rise to such lien. All such sums paid by City and all expenses incurred by it in connection therewith (including, without limitation, reasonable attorneys' fees) shall be payable to City by Tenant within ninety (90) days after receipt of notice. City shall have the right at all times to post and keep posted on the Premises any notices permitted or required by law or that City shall deem proper for the protection of City, the Premises, and the Building, from mechanics' and material supplier's liens. Tenant shall give to City at least fifteen (15) days' prior written notice of commencement of any repair or construction on the Premises except for minor and routine repair and maintenance for which

Tenant is responsible hereunder. Tenant shall not create, permit or suffer any other encumbrances affecting any portion of the Premises or the Building except as expressly permitted under this Lease or without first obtaining the written consent of City, which City may give or withhold in its sole discretion.

12. UTILITIES AND SERVICES

12.1 Utilities and Services

City shall furnish, at its cost, any and all utilities or services necessary or appropriate for Tenant's use and enjoyment of the Premises for a service charge of Three Thousand Seven Hundred and Eight Dollars (\$3,708.00) per annum, payable monthly in advance at Three Hundred and Nine Dollars (\$309.00) subject to a three (3%) percent increase annually on the anniversary date of each Adjustment Date. Should any governmental entity promulgate or revise any statute, ordinance or building, fire or other code or impose mandatory or voluntary controls or guidelines on City or the Building or any part thereof, relating to the use or conservation of energy or electricity, or in the event City is required or elects to make alterations to any part of the Building in order to comply with such mandatory or voluntary controls or guidelines, Tenant shall be responsible for the difference in the utility or service charge, if any, due to any such alterations. Tenant shall not: **(a)** connect or use any electrical equipment that exceeds the capacity of the Building electrical system; or **(b)** connect any apparatus, machine or device through electrical outlets except in the manner for which such outlets are designed, except for such modifications as may be shown on the Approved Plans and for any other such modifications at Tenant's sole cost as are reasonably approved in writing in advance by City.

In consideration of the benefit and public purpose of Tenant's Equipment and participation in the ZSFGH's DAS for City's use, including the doctors, staff, patients, and visitors at the Zuckerberg San Francisco General Hospital and Trauma Center, Tenant is exempt from payment of Base Rent including utilities and services until this Lease expires or is terminated, the Building is no longer used as the Zuckerberg San Francisco General Hospital and Trauma Center, and so long as Tenant participates in the ZSFGH's DAS and provides said services and benefit to City and department staff. If Tenant ceases to participate in the DAS but does not vacate the Premises, Tenant shall pay all Base Rent, utilities, and fees.

12.2 Mandatory or Voluntary Restrictions

Subject to the exemption set forth in Section 12.1, in the event City provides any utilities for a service charge pursuant to Section 12.1 (Utilities and Services), and any governmental entity promulgates or revises any statute, ordinance or building, fire or other code or imposes mandatory or voluntary controls or guidelines on City or the Building or any part thereof, relating to the use or conservation of energy or electricity, or in the event City is required or elects to make alterations to any part of the Building in order to comply with such mandatory or voluntary controls or guidelines, such compliance and the making of such alterations shall in no event entitle Tenant to any damages, relieve Tenant of the obligation to pay the full Base Rent and Additional Charges reserved hereunder or to perform each of its other covenants hereunder or constitute or be construed as a constructive or other eviction of Tenant, provided that Tenant can still operate the Premises as a Communications Site.

12.3 Floor Load

Without the prior written consent of City, which City may give or refuse in City's sole discretion, Tenant shall not place or install in the Premises any machine, equipment, structure or other improvement the weight of which shall exceed the normal loadbearing capacity of the floors or roof of the Building, except as may be shown in the Approved Plans. If City consents to the placement or installation of any such machine or equipment in the Premises, Tenant at its

sole expense shall reinforce the floor or roof of the Premises in the area of such placement or installation, pursuant to plans and specifications reasonably approved by City and otherwise in compliance with Section 8.1 (Tenant's Alterations), to the extent necessary to assure that no damage to the Premises or the Building or weakening of any structural supports will be occasioned thereby.

13. COMPLIANCE WITH LAWS AND RISK MANAGEMENT REQUIREMENTS

13.1 Compliance with Laws

Tenant, at Tenant's expense, shall promptly maintain the Premises, any Tenant Improvements and Tenant's Alterations and any other improvements and equipment permitted hereunder, and Tenant's use and operations thereon, in strict compliance with all present and future laws, orders and regulations of federal, state, county and municipal authorities (collectively, "Laws") relating to the Premises or the use or occupancy thereof, whether foreseen or unforeseen, ordinary as well as extraordinary. Such Laws shall include, without limitation, all Laws relating to health and safety and disabled accessibility including, without limitation, the Americans with Disabilities Act, 42 U.S.C. Section 12101 et seq. (insofar as such Act relates to Tenant's unique use) and Title 24 of the California Code of Regulations, all present and future Environmental Laws (as defined in Section 27.1 (Definitions)), and all present and future life safety, fire sprinkler, seismic retrofit and other building code requirements. Any work or installations made or performed by or on behalf of Tenant or any person or entity claiming through or under Tenant pursuant to the provisions of this Section shall be made in conformity with and subject to the provisions of Section 10.2 (Tenant's Repairs). In making any application to City's Planning Department for the Communications Site, Tenant agrees to act as both "Applicant" and "Project Sponsor." A copy of all conditional use permits authorizing use of the Premises shall be copied to the Director of Property and the Department of Public Health prior to any work.

The parties acknowledge and agree that Tenant's obligation to comply with all Laws as provided herein is a material part of the bargained-for consideration under this Lease. Tenant's obligation under this Section shall include, without limitation, the responsibility of Tenant to make substantial or structural repairs and alterations to the Premises (including any of the Tenant Improvements or any of Tenant's Alterations), regardless of, among other factors, the length of the then remaining Term hereof, the relative benefit of the repairs to Tenant or City, the degree to which the curative action may interfere with Tenant's use or enjoyment of the Premises, the likelihood that the parties contemplated the particular Law involved, and whether the Law involved is related to Tenant's particular use of the Premises. No occurrence or situation arising during the Term, nor any present or future Law, whether foreseen or unforeseen, and however extraordinary, shall relieve Tenant from its obligations hereunder, or shall give Tenant any right to terminate this Lease in whole or in part or to otherwise seek redress against City. Except as expressly provided herein, Tenant waives any rights now or hereafter conferred upon it by any existing or future Law to terminate this Lease, , or to compel City to make any repairs to comply with any such Laws, on account of any such occurrence or situation.

Tenant understands and agrees that City is entering into this Lease in its capacity as a property owner with a proprietary interest in the Premises and not as a regulatory agency with police powers. Nothing in this Lease shall limit in any way Tenant's obligation to obtain any required regulatory approvals from City departments, boards or commissions having jurisdiction over the Premises. By entering into this Lease, City is in no way modifying or limiting Tenant's obligation to cause the Premises to be used and occupied in accordance with all Laws as provided above.

13.2 Licenses and Approvals

Tenant represents and warrants that it has acquired all licenses, permits, and other approvals required under all federal, state, and local laws for the operation of Tenant's Equipment on the Premises. Tenant shall maintain all such licenses, permits or other approvals throughout the Term of this Lease.

13.3 Radiofrequency Radiation and Electromagnetic Fields

Without limiting Section 13.1 above, Tenant shall comply with all present and future laws, orders and regulations of federal, state, county and municipal authorities relating to allowable presence of or human exposure to Radiofrequency Radiation ("RFs") or Electromagnetic Fields ("EMFs") on or off the Premises, including without limitation, all applicable standards adopted by the Federal Communications Commission ("FCC"), whether such RF or EMF presence or exposure results from Tenant's equipment alone or from the cumulative effect of Tenant's equipment added to all other sources in the Building. City shall not agree to allow any third party entering into an occupancy or use agreement after the Commencement Date to cause an increase in RF or EMF levels in the Building such that the cumulative levels exceed applicable standards adopted by the FCC. The parties agree that RFs and EMFs are exclusively regulated at the federal level as of the Commencement Date or as may change pursuant to FCC standards and regulations. If the cumulative effect of City's use of the Building taken together with Tenant's use hereunder and other tenant(s) whose use predated the Commencement Date exceeds such standards, Tenant shall have the right to terminate this Lease without penalty upon ninety (90) days' prior written notice to City. Without limiting the provisions of Tenant's indemnity contained in Section 18 (Indemnity), Tenant, on behalf of itself and its successors and assigns, shall indemnify the "Indemnified Parties," and each of them, from and against all "Claims" incurred in connection with or arising in whole or in part from the presence of or exposure to RFs or EMFs resulting from Tenant's use of the Premises.

13.4 Compliance with City's Risk Management Requirements

Tenant shall not do anything, or permit anything to be done, in or about the Premises which would create any unusual fire risk, and shall take commercially reasonable steps to protect City from any potential premises liability by reason of any business operation being conducted by Tenant in the Premises. Tenant, at Tenant's expense, shall comply with all reasonable rules, orders, regulations or requirements of City's Risk Manager.

14. SUBORDINATION

This Lease shall be subordinate to any reciprocal easement agreements, ground leases or underlying leases and the lien of any mortgage or deed of trust (collectively, "Encumbrance"), which may now exist or hereafter be executed affecting any of the Building, the real property upon which the Building is located or City's interest therein and all renewals, extensions, modifications, and replacements of such Encumbrance, provided that the City shall obtain a non-disturbance and attornment agreement for Tenant's benefit in the form reasonably satisfactory to Tenant from the holder of any such Encumbrance, and that the holder of such Encumbrance does not disturb Tenant's use and possession of the Premises and recognizes Tenant's rights under this Lease. Notwithstanding the foregoing, City shall have the right to subordinate any such Encumbrances to this Lease. If any superior ground lease or underlying lease terminates for any reason or any mortgage or deed of trust is foreclosed or a conveyance in lieu of foreclosure is made for any reason, Tenant shall attorn to the successor-in-interest to City, at the option of such successor-in-interest, provided that so long as Tenant is not in default hereunder, such successor-in-interest shall recognize this Lease and shall not disturb Tenant in its possession of the Premises for any reason other than one that would entitle City to terminate this Lease or otherwise dispossess Tenant of the Premises in accordance with the terms hereof. No

further instrument shall be required to make the provisions hereof operative except that City shall give Tenant written notice of such subordination. Tenant agrees, however, to execute and deliver, upon demand by City and in the form requested by City, any additional documents evidencing the priority or subordination of this Lease provided such documents contain a non-disturbance and recognition agreement executed by the holder of such Encumbrance.

15. DAMAGE OR DESTRUCTION

The parties recognize that the Premises are a small portion of a building used as, among other things, a hospital and trauma center. In the event of damage to the Premises or the Building by any cause other than City's gross negligence or willful misconduct, City shall have no obligation to rebuild or repair. If City, in City's sole and absolute discretion, determines to repair or rebuild, City shall give Tenant written notice of its determination and its good faith estimate of the amount of time to repair or rebuild, within thirty (30) days of the date of such damage or destruction.

During the period of any repair or rebuilding provided for hereunder, Tenant shall have the right, at its sole expense, to bring onto the Building in a location mutually acceptable to Tenant and City and to operate a portable generator and mobile Communications Site and telescopic antennae or tower in order to provide for continuous service to Tenant's customers during such period. Neither the placement nor use of such generator or equipment shall interfere with City's operations or business in the Building or, if City has elected to repair or rebuild the Premises or the Building as provided above, with such repair or reconstruction.

The parties hereto understand and agree that the provisions of this Section are intended to govern fully the rights and obligations of the parties in the event of damage or destruction, and Tenant and City each hereby waives and releases the provisions of Section 1932, subdivision 2, and Section 1933, subdivision 4, of the Civil Code of California (When hirer may terminate the hiring) or under any similar law, statute or ordinance now or hereafter in effect.

16. EMINENT DOMAIN

16.1 Eminent Domain

If all or any part of the Premises shall be taken as a result of the exercise of the power of eminent domain or any transfer in lieu thereof, this Lease shall terminate as to the part so taken as of the date of taking. In the case of a partial taking, Tenant shall have the right to terminate this Lease as to the balance of the Premises by written notice to City within thirty (30) days after such date; provided, however, that a condition to the exercise by Tenant of such right to terminate shall be that the portion of the Premises taken shall be of such extent and nature as to materially impair Tenant's use of the balance of the Premises as a Communications Site. In the event of a partial taking of the Premises which does not result in a termination of this Lease, the Base Rent and Additional Charges thereafter to be paid shall be equitably reduced.

If any material part of the Building shall be taken as a result of the exercise of the power of eminent domain or any transfer in lieu thereof, City shall have the right to terminate this Lease by written notice to Tenant within thirty (30) days of the date of the taking.

In the event of any taking, City shall be entitled to any award which may be paid or made in connection therewith. Tenant shall have no claim against City for the value of any unexpired term of this Lease or otherwise except that Tenant may claim any portion of the award that is specifically allocable to Tenant's relocation expenses or the interruption of or damage to Tenant's business or loss or damage to Tenant's Property.

The parties understand and agree that the foregoing provisions of this Section are intended to govern fully the rights and obligations of the parties in the event of a taking. Tenant and City each hereby waives and releases any right to terminate this Lease in whole or in part under Sections 1265.120 and 1265.130 of the California Code of Civil Procedure (partial termination of lease and Court order terminating lease, respectively) or under any similar law, statute or ordinance now or hereafter in effect.

16.2 Temporary Takings

Notwithstanding the foregoing, if a taking occurs with respect to all or any portion of the Premises for less than ninety (90) days, this Lease shall remain unaffected thereby, and Tenant shall continue to perform all of the terms, conditions and covenants of this Lease, except that Tenant shall be entitled to an abatement in Base Rent, if any is paid, to the extent that its use of the Premises as a Communications Site is materially impaired. In the event of any such temporary taking, City shall be entitled to receive the balance of any award.

17. ASSIGNMENT AND SUBLETTING

17.1 Restriction on Assignment and Subletting

This Lease is personal to Tenant. Tenant shall not directly or indirectly (including, without limitation, by merger, acquisition, or other transfer of any controlling interest in Tenant), voluntarily or by operation of law, sell, assign, encumber, pledge or otherwise transfer any part of its interest in or rights with respect to the Premises or its leasehold estate hereunder, or permit any portion of the Premises to be occupied by anyone other than itself (collectively, "Assignment"), or sublet any portion of the Premises ("Sublease") without City's prior written consent, subject to the exception for certain permitted transfers as provided in Section 17.2 (Permitted Assignment).

17.2 Permitted Assignment

City agrees that Tenant shall be permitted to enter into an Assignment of this Lease without City's prior consent but with notice to City as provided below, to any entity which (i) directly or indirectly controls, is controlled by or is under the common control with, Tenant or any entity which acquires all or substantially all of Tenant's assets in the market defined by the Federal Communications Commission in which the Building is located by reason of a merger, acquisition or other business reorganization, (ii) will use the Premises in the same manner as Tenant under this Lease, and (iii) holds or will hold (after such proposed assignment) all applicable licenses, permits, and other approvals necessary to lawfully operate a Communications Site on the Premises. As used above, the term "control" shall mean **(a)** as to a corporation, the ownership of stock having the right to exercise more than fifty percent (50%) of the total combined voting power of all classes of stock of the controlled corporation, issued and outstanding, and **(b)** as to partnerships and other forms of business associations, ownership of more than fifty percent (50%) of the beneficial interest and voting control of such partnership or association. Tenant shall provide City with notice in advance of any such permitted Assignment so long as such prior notice does not violate any applicable Laws or valid confidentiality agreements, and in any such event, Tenant shall provide City with written notice no later than ten (10) business days after the effective date of such permitted Assignment.

18. DEFAULT

18.1 Events of Default

Any of the following shall constitute an event of default by Tenant hereunder:

(a) subject to Section 5.1, any failure to pay any Base Rent or Additional Charges as and when due, provided Tenant shall have a period of ten (10) days from the date of written notice from City within which to cure any default in the payment of Rent; provided, however, that City shall not be required to provide such notice regarding Tenant's failure to make such payments when due more than twice during any calendar year, and any such failure by Tenant after Tenant has received two such notices in any calendar year from City shall constitute a default by Tenant hereunder without any requirement on the part of City to give Tenant notice of such failure except for a three (3)-day notice to pay or quit as required by law;

(b) any failure to perform or comply with any other covenant, condition or representation made under this Lease, provided Tenant shall have a period of thirty (30) days from the date of written notice from City within which to cure such default under this Lease, or, if such default is not capable of cure within such thirty (30)-day period, Tenant shall have a reasonable period to complete such cure if Tenant promptly undertakes action to cure such default within such thirty (30)-day period and thereafter diligently prosecutes the same to completion and Tenant uses its best efforts to complete such cure within sixty (60) days after written notice of default from City;

(c) any vacation or abandonment of the Premises for more than fourteen (14) consecutive days such that the Premises are no longer being used for the purposes set forth in Section 5.1; City acknowledges that the Premises are to be used as an unoccupied transmission facility and, accordingly, lack of on-site personnel shall not, in and of itself, be deemed to indicate vacation or abandonment; and

(d) the appointment of a receiver due to Tenant's insolvency to take possession of all or substantially all of the assets of Tenant, or an assignment by Tenant for the benefit of creditors, or any action taken or suffered by Tenant under any insolvency, bankruptcy, reorganization, moratorium or other debtor relief act or statute, whether now existing or hereafter amended or enacted, if any such receiver, assignment or action is not released, discharged, dismissed or vacated within sixty (60) days.

18.2 Remedies

Upon the occurrence of an event of default by Tenant which is not cured by Tenant within the applicable grace period, if any, specified in Section 18.1 (Events of Default), City shall have the following rights and remedies in addition to all other rights and remedies available to City at law or in equity:

(a) the rights and remedies provided by California Civil Code Section 1951.2 (damages on termination for breach), including, but not limited to, the right to terminate Tenant's right to possession of the Premises and to recover the worth at the time of award of the amount by which the unpaid Base Rent and Additional Charges, if any, for the balance of the Term after the time of award exceeds the amount of rental loss for the same period that Tenant proves could be reasonably avoided, as computed pursuant to subsection (b) of such Section 1951.2.

(b) the rights and remedies provided by California Civil Code Section 1951.4 (continuation of lease after breach and abandonment), which allows City to continue this Lease in effect and to enforce all of its rights and remedies under this Lease, including the right to recover rent as it becomes due, for so long as City does not terminate Tenant's right to possession. Acts of maintenance or preservation, efforts to relet the Premises or the appointment of a receiver upon City's initiative to protect its interest under this Lease shall not constitute a termination of Tenant's right to possession. If City exercises its right under California Civil Code Section 1951.4, City may from time to time sublet the Premises or any part thereof for such term or terms (which may extend beyond the Term) and at such rent and upon such other terms as City in its sole discretion may deem advisable, with the right to make alterations and repairs to

the Premises. Upon each such subletting, Tenant shall be immediately liable for payment to City of, in addition to Base Rent and Additional Charges due hereunder, the cost of such subletting and such alterations and repairs incurred by City and the amount, if any, by which the Base Rent and Additional Charges owing hereunder for the period of such subletting (to the extent such period does not exceed the Term) exceeds the amount to be paid as Base Rent and Additional Charges for the Premises for such period pursuant to such subletting. No action taken by City pursuant to this Subsection shall be deemed a waiver of any default by Tenant and, notwithstanding any such subletting without termination, City may at any time thereafter elect to terminate this Lease for such previous default.

(c) the right to have a receiver appointed for Tenant upon application by City to take possession of the Premises and to apply any rental collected from the Premises and to exercise all other rights and remedies granted to City pursuant to this Lease.

19. TENANT'S INDEMNITY

Tenant, on behalf of itself and its successors and assigns, shall indemnify, defend and hold harmless ("**Indemnify**") City, its Agents and Invitees (as defined below), and their respective heirs, legal representatives, successors and assigns (individually and collectively, the "**Indemnified Parties**"), and each of them, from and against any and all liabilities, losses, costs, claims, judgments, settlements, damages, liens, fines, penalties and expenses, including, without limitation, direct and vicarious liability of every kind (collectively, "**Claims**"), incurred in connection with or arising in whole or in part from: (a) injury to or death of a person, including, without limitation, employees of Tenant, or loss of or damage to property, occurring on or about the Premises or License Areas or arising in connection with the use of the Premises or License Areas under this Lease; (b) any default by Tenant in the observation or performance of any of the terms, covenants or conditions of this Lease to be observed or performed on Tenant's part; (c) the use or occupancy or manner of use or occupancy of the Premises by Tenant, its Agents or Invitees or any person or entity claiming through or under any of them; (d) the condition of the Premises or any occurrence on the Premises from any cause attributable to the events described in clauses (a), (b) or (c) of this Section; or (e) any acts, omissions or negligence of Tenant, its Agents or Invitees, in, on or about the Premises or the Building; all regardless of the negligence of, and regardless of whether liability without fault is imposed or sought to be imposed on, the Indemnified Parties, except to the extent that such Indemnity is void or otherwise unenforceable under applicable law in effect on or validly retroactive to the date of this Lease and further except to the extent such Claim is caused by the willful misconduct or active negligence of the Indemnified Parties. The foregoing Indemnity shall include, without limitation, reasonable fees of attorneys, consultants and experts and related costs and City's costs of investigating any Claim. Tenant specifically acknowledges and agrees that it has an immediate and independent obligation to defend City and the other Indemnified Parties from any claim which actually or potentially falls within this indemnity provision even if such allegation is or may be groundless, fraudulent or false, which obligation arises at the time such claim is tendered to Tenant by City and continues at all times thereafter. Tenant's obligations under this Section shall survive the termination of the Lease.

20. INSURANCE

20.1 Tenant's Insurance

(a) Tenant shall procure and keep in effect at all times during the Term, at Tenant's cost, insurance in the following amounts and coverages:

(i) Commercial General Liability Insurance with limits of Two Million Dollars (\$2,000,000) each occurrence combined single limit for bodily injury and property damage, and Four Million Dollars (\$4,000,000) general aggregate, including

Contractual Liability, Personal and Advertising Injury, Independent Contractors, Explosion, Collapse and Underground (XCU), Products Liability and Completed Operations.

(ii) Worker's Compensation Insurance in compliance with the state of operation and with Employer's Liability with limits of One Million Dollars (\$1,000,000) each accident/disease/policy limit.

(iii) Commercial Automobile Liability Insurance in the amount of One Million Dollars (\$1,000,000) each occurrence combined single limit for bodily injury and property damage, covering owned and non-owned and hired vehicles, as applicable.

(b) The Commercial General Liability and Commercial Automobile Liability Insurance policies shall:

(i) Include as additional insured as their interest may appear under this Lease the City and County of San Francisco, its officers, and employees.

(ii) That such policies are primary insurance to any other insurance available to the City and County of San Francisco, with respect to any claims arising out of this Lease, and that insurance applies separately to each insured against whom claim is made or suit is brought. Such policies shall also provide for severability of interests and that an act or omission of one of the named insureds which would void or otherwise reduce coverage shall not reduce or void the coverage as to any insured, and shall afford coverage for all claims based on acts, omissions, injury or damage which occurred or arose (or the onset of which occurred or arose) out of the equipment and service provided under this Lease.

(c) Upon the commencement date of this Lease, Tenant shall deliver to City certificates of insurance and blanket additional insured endorsements from insurers in a form reasonably satisfactory to City, evidencing the coverages required hereunder.

(d) Tenant's compliance with the provisions of this Section shall in no way relieve or decrease Tenant's liability under Section 19 (Indemnity), or any other provision of this Lease.

(e) Notwithstanding anything to the contrary in this Lease, City may elect, in City's sole and absolute discretion, to terminate this Lease if Tenant allows any required insurance coverage to lapse by: (1) providing Tenant written notice of such lapse; and (2) immediately providing written notice of termination if Tenant fails to reinstate the lapsed coverage within three (3) days of City's notice of such default.

20.2 Tenant's Property

Tenant shall be responsible, at its expense, for separately insuring Tenant's Property.

20.3 City's Self Insurance

Tenant acknowledges that City self-insures against casualty, property damage and public liability risks. City agrees to maintain an adequate program of self-insurance for public liability risks during the Term and shall not be required to carry any third party insurance with respect to the Building, the Premises or otherwise.

20.4 Waiver of Subrogation

Notwithstanding anything to the contrary contained herein, City and Tenant each hereby waives any right of recovery against the other party for any loss or damage sustained by such other party with respect to the Building or the Premises or any portion thereof or the contents of

the same or any operation therein, whether or not such loss is caused by the fault or negligence of such other party, to the extent such loss or damage is (i) covered by third party insurance such Waiving Party is required to carry under this Lease or (ii) is actually covered by any other third party insurance then carried by the Waiving Party. Each Waiving Party agrees to cause its third party insurers to issue appropriate waiver of subrogation rights endorsements to all policies relating to the Building or the Premises; provided, the failure to obtain any such endorsement shall not affect the above waiver.

21. LIMITATION OF CITY'S LIABILITY

21.1 Limitation on City's Liability

City shall not be responsible for or liable to Tenant, and Tenant hereby waives all Claims against City and its Agents and releases City and its Agents from, all Claims for any injury, loss or damage to any person or property in or about the Premises or any License Area created under this Lease by or from any cause whatsoever (other than to the extent caused by the active negligence or willful misconduct of City and its Agents), including, without limitation, acts or omissions of persons occupying adjoining premises or any part of the Building adjacent to or connected with the Premises; theft; burst, stopped or leaking water, gas, sewer or steam pipes; or gas, fire, oil or electricity in, on or about the Premises or the Building.

21.2 Consequential Damages

Tenant expressly acknowledges and agrees that the Rent payable hereunder does not take into account any potential liability of City for any consequential or incidental damages including, but not limited to, lost profits arising from the disruption to Tenant Improvements. City would not be willing to enter into this Lease in the absence of a complete waiver of liability, to the fullest extent permitted by Law, for consequential or incidental damages due to the acts or omissions of City or its Agents, and Tenant expressly assumes the risk with respect thereto. Accordingly, without limiting any indemnification obligations of Tenant or other waivers contained in this Lease and as a material part of the consideration for this Lease, Tenant fully releases, waives and discharges forever any and all claims, demands, rights, and causes of action against City for consequential and incidental damages (including without limitation, lost profits) arising out of this Lease, including, without limitation, any interference with uses conducted by Tenant pursuant to this Lease, regardless of the cause, and whether or not due to the active or passive negligence or willful misconduct of City or its Agents, and covenants not to sue for such damages City, its departments, commissions, officers, directors and employees, and all persons acting by, through or under each of them.

21.3 No Relocation Assistance

This Lease creates no right in Tenant to receive any relocation assistance or payment for any reason under the Relocation Assistance Act (California Government Code Section 7260 et seq.), the Uniform Relocation Assistance Act (42 U.S.C. Section 4602 et seq.) as such acts may be amended or revised or under any existing or future law upon any termination of tenancy except as provided in Section 15 (Eminent Domain) hereof.

Tenant fully waives, releases and relinquishes forever any and all claims, demands, rights and causes of action that it may have against the city under any existing or future laws, for any compensation from City not otherwise provided for herein, upon any termination of tenancy hereunder.

In connection with the releases under Sections 21.1 (Limitation on City's Liability), 21.2 (Consequential Damages), and 21.3 (No Relocation Assistance), Tenant acknowledges that it is familiar with Section 1542 of the California Civil Code, which reads:

A GENERAL RELEASE DOES NOT EXTEND TO CLAIMS WHICH THE CREDITOR DOES NOT KNOW OR SUSPECT TO EXIST IN HIS OR HER FAVOR AT THE TIME OF EXECUTING THE RELEASE, WHICH IF KNOWN BY HIM OR HER MUST HAVE MATERIALLY AFFECTED HIS OR HER SETTLEMENT WITH THE DEBTOR.

Tenant acknowledges that the releases contained herein includes all known and unknown, disclosed and undisclosed, anticipated and unanticipated claims. Tenant realizes and acknowledges that it has agreed upon this Lease in light of this realization and, being fully aware of this situation, it nevertheless intends to waive the benefit of Civil Code Section 1542, or any statute or other similar law now or later in effect. The releases contained herein shall survive any termination of this Lease.

22. ACCESS TO PREMISES

22.1 Tenant's Access to the Premises

City hereby grants to Tenant during the Term of this Lease and for the limited purposes and subject to the terms and conditions set forth below, a nonexclusive license in and over the following common areas of the Building to the Premises: areas providing physical access by personnel and equipment including ramps, loading docks, walkways, staircases, and ladders; and the transmitter room on and in which Tenant's Equipment is installed as shown on Exhibit A. Use of such areas shall be subject to City's rights under Section 9 (City's Alterations of Building and Building Systems). The license granted to Tenant hereunder is for the sole purpose of constructing, maintaining, restoring, replacing and operating Tenant's Equipment located within the Premises or the common areas of the Building, including any necessary electrical and telephone conduits, in accordance with the use permitted under this Lease.

Such rights shall include the right of ingress and egress through the Building during non-business hours for access to or from the Premises or Tenant's Equipment, provided that Tenant shall provide City with at least forty-eight (48) hours prior written notice of any requested access, shall only access the Premises or any Tenant Cables elsewhere in the Building while accompanied by a designated City representative and shall comply with all reasonable requirements of such designated person with respect to Tenant's requested access. In the event of an emergency, Tenant shall have the right to enter the Premises (or the Building with respect to accessing any Tenant Cables), and if a designated City representative is not available to accompany Tenant at such time and following such access, Tenant promptly notifies the Key Contact for Landlord designated in Section 1 above, provided it makes good faith efforts if possible to notify City, or City's designated person, in advance of such entry.

22.2 City's Access to the Premises

City and its designated Agents shall have the right to enter the Premises at all times with reasonable notice (except in the event of an emergency) for any of the following purposes:

- (a) To determine whether the Premises are in good condition and to inspect the Premises;
- (b) To determine whether Tenant is in compliance with its obligations hereunder and to cure or attempt to cure any default in accordance with the provisions of Section 18.2 (Remedies) hereof;
- (c) To serve, post or keep posted any notices required or allowed under any provisions of this Lease or required under any applicable law;

(d) To do any maintenance or repairs to the Premises that City has the right or the obligation, if any, to perform hereunder.

(e) However, City shall not be allowed to access or handle Tenant's Equipment in any way except as set forth in Section 22.3.

22.3 Emergency Access

In the event of any emergency that could result in imminent danger of bodily harm or damage to property, as determined by City, City may, at its sole option and without notice (provided that City shall make reasonable efforts to provide Tenant with notice when feasible in light of the exigent circumstances) enter the Premises and alter or remove Tenant's Property on or about the Premises only to the extent required to mitigate such emergency. City shall have the right to use any and all means City considers appropriate to gain access to any portion of the Premises in an emergency. In such case, City shall not be responsible for any damage or injury to any such property, nor for the replacement of any such property and any such emergency entry shall not be deemed to be a forcible or unlawful entry onto or a detainer of, the Premises, or any eviction, actual or constructive, of Tenant from the Premises or any portion thereof.

22.4 No Liability

City shall not be liable in any manner, and Tenant hereby waives any claims, for any inconvenience, disturbance, loss of business, nuisance or other damage arising out of City's entry onto the Premises, except damage resulting from the negligence or willful misconduct of City or its Agents and not contributed to by the acts, omissions or negligence of Tenant, its Agents or Invitees.

22.5 No Abatement

Subject to the exemption set forth in Section 5.1, Tenant shall not be entitled to any abatement in Rent if City exercises any rights reserved in this Section 22.

22.6 Minimize Disruption

City shall use its reasonable good faith efforts to conduct any activities on the Premises allowed under this Section 22 in a manner that, to the extent practicable, will minimize any disruption to Tenant's use hereunder.

23. ESTOPPEL CERTIFICATES

Tenant, at any time and from time to time within fifteen (15) business days after receipt of written notice from City, shall execute, acknowledge and deliver to City or to any party designated by City, a certificate of Tenant stating: (a) that Tenant has accepted the Premises, (b) the Commencement Date and Expiration Date of this Lease, (c) that this Lease is unmodified and in full force and effect (or, if there have been modifications, that the Lease is in full force and effect as modified and stating the modifications), (d) whether or not there are then existing any defenses against the enforcement of any of the obligations of Tenant under this Lease (and if so, specifying the same), (e) whether or not there are then existing obligations of City under this Lease (and if so specifying the same), (f) the dates, if any, to which the Base Rent and Additional Charges have been paid, and (g) any other information relating to delivery, acceptance and condition of the Premises, and the condition of Tenant's Equipment that may be reasonably required by any such persons.

24. RULES AND REGULATIONS

Tenant shall faithfully comply with any and all reasonable rules, regulations and instructions, written or oral which may be established or modified during the Term by City with respect to use of any part of the Building, including those set forth on Exhibit C ("Access for Telecommunications Equipment Installation and Maintenance").

25. SECURITY DEPOSIT

If not already paid, upon execution of this Lease, Tenant shall deposit with City the sum specified as the security deposit in the Basic Lease Information (the "**Security Deposit**"), in cash, to secure Tenant's faithful performance of all terms, covenants and conditions of this Lease.

Subject to the exemption set forth in Section 5.1, Tenant agrees that City may (but shall not be required to) apply the Security Deposit in whole or in part to remedy any damage to the Premises caused by Tenant, its Agents or Invitees, or any failure of Tenant to perform any other terms, covenants or conditions contained herein (including, but not limited to, the payment of Rent or other sum due hereunder either before or after a default), without waiving any of City's other rights and remedies hereunder or at law or in equity and without any obligation. Tenant waives the provisions of Section 1950.7 of the California Civil Code or any similar law, statute or ordinance now or hereafter in effect and agrees that Landlord may retain any portion of Security Deposit reasonably necessary to compensate Landlord for any other foreseeable or unforeseeable loss or damage caused by the acts or omissions of Tenant, its Agents or Invitees. Without limiting the foregoing, Tenant understands and agrees that Landlord may apply some or all of the Security Deposit to the payment of future Rent following a Tenant default.

Should City use any portion of the Security Deposit to cure any default by Tenant hereunder, Tenant shall replenish the Security Deposit to the original amount within thirty (30) days following receipt of written notice. If the Base Rent is increased pursuant to any of the provisions of this Lease, Tenant shall increase the amount of the Security Deposit accordingly. City's obligations with respect to the Security Deposit are solely that of debtor and not trustee. City shall not be required to keep the Security Deposit separate from its general funds, and Tenant shall not be entitled to interest on the Security Deposit. The amount of the Security Deposit shall in no way limit the liabilities of Tenant under any provision of this Lease.

26. SURRENDER OF PREMISES

Upon the Expiration Date or other termination of this Lease, Tenant shall peaceably quit and surrender to City the Premises in good order and condition, normal wear and tear excepted, free of debris and hazards, after having made the last necessary repair required by Tenant under this Section (and damage caused by casualty or condemnation excepted). The Premises shall be surrendered free and clear of all liens and encumbrances other than presently existing liens and encumbrances and any other encumbrances created by City. Tenant shall, before the Expiration Date or other termination of this Lease, remove all of Tenant's Property as provided in Section 8.2 (Title to and Removal of Tenant Improvements), and repair any damage resulting from the removal; provided, however, that City shall have the right to require Tenant to leave all or a portion of the Tenant Cables in place if City notifies Tenant of its exercise of such right in writing prior to the Expiration Date or other termination of this Lease. Tenant's removal and repair work pursuant to this Section shall be performed (a) at Tenant's expense and at such time and, when required hereunder, in such manner as reasonably approved by City, (b) by duly licensed and bonded contractors or mechanics, (c) in a manner and using equipment and materials which will not interfere with or impair City's operations, use or occupation of the Building or the Building Systems, and (d) in accordance with any Building Rules and Regulations and all applicable Laws.

Tenant's obligations under this Section shall survive the Expiration Date or other termination of this Lease. Any items of Tenant's Property which shall remain in the Premises after the Expiration Date of this Lease may, at the option of City, be deemed abandoned and in such case may be disposed of by City in accordance with Civil Code Section 1980 et seq. or any other manner allowed by law.

Concurrently with the surrender of the Premises as provided above, Tenant agrees, if requested by City, to execute, acknowledge and deliver to City a quitclaim deed to the Premises and any other instrument reasonably requested by City to evidence or otherwise effect the termination of Tenant's leasehold estate hereunder and to effect such transfer or vesting of title to the Tenant Improvements or other improvements or equipment which are to remain part of the Premises as provided herein.

27. HAZARDOUS MATERIALS

27.1 Definitions

As used herein, the following terms shall have the meanings set forth below:

(a) "Environmental Laws" shall mean any federal, state, local or administrative law, rule, regulation, order or requirement relating to industrial hygiene, environmental conditions or Hazardous Materials, whether now in effect or hereafter adopted.

(b) "Hazardous Material" shall mean any material that, because of its quantity, concentration or physical or chemical characteristics, is at any time now or hereafter deemed by any federal, state or local governmental authority to pose a present or potential hazard to human health, welfare or safety or to the environment. Hazardous Material includes, without limitation, any material or substance defined as a "hazardous substance," or "pollutant" or "contaminant" pursuant to the Comprehensive Environmental Response, Compensation and Liability Act of 1980 ("CERCLA", also commonly known as the "Superfund" law), as amended, (42 U.S.C. Section 9601 et seq.) or pursuant to Section 25316 of the California Health & Safety Code; any "hazardous waste" listed pursuant to Section 25140 of the California Health & Safety Code; and petroleum, including crude oil or any fraction thereof, natural gas or natural gas liquids.

(c) "Investigate and Remediate" shall mean the undertaking of any activities to determine the nature and extent of Hazardous Material that may be located in, on, under or about the Property or that has been, is being or threatens to be Released into the environment, and to clean up, remove, contain, treat, stabilize, monitor or otherwise control such Hazardous Material.

(d) "Release" when used with respect to Hazardous Material shall include any actual or imminent spilling, leaking, pumping, pouring, emitting, emptying, discharging, injecting, escaping, leaching, dumping, or disposing into or inside the Building, or in, on, under or about the Property or the environment.

27.2 Hazardous Materials in Premises

Tenant covenants and agrees that neither Tenant nor any of its Agents or Invitees acting on Tenant's behalf shall cause or permit any Hazardous Material to be brought upon, kept, used, stored, generated, disposed of or Released in, on or about the Premises or any other part of the Property, or transported to or from the Property in violation of Environmental Laws, except that Tenant may use small quantities of Hazardous Materials, including backup batteries, if any, as needed for backup power, routine cleaning and maintenance of Tenant's Equipment which are customarily used for backup power, routine cleaning and maintenance of such equipment and so long as all such materials are handled and used in compliance with Environmental Laws. Tenant

shall immediately notify Landlord if and when Tenant learns or has reason to believe there has been any Release of Hazardous Material on or about the Premises or the Property.

27.3 Tenant's Environmental Indemnity

If Tenant breaches any of its obligations contained in this Section, or if any act, omission or negligence of Tenant or any of its Agents or Invitees acting on Tenant's behalf results in any contamination of the Premises or any other part of the Property or in a Release of Hazardous Material from, on, about, in, or beneath any part of the Premises or the Property or the violation of any Environmental Law, then in any such event Tenant, on behalf of itself and its successors and assigns, shall Indemnify City, its Agents and Invitees, and their respective successors and assigns, and each of them, from and against any and all Claims (including, without limitation, damages for decrease in value of the Premises or the Property, the loss or restriction of the use of rentable or usable space or of any amenity of the Premises or the Property and sums paid in settlement of claims, attorneys' fees, consultants' fees and experts' fees) arising during or after the Term of this Lease relating to such Release or violation of Environmental Laws; provided, however, Tenant shall not be liable for any Claims to the extent such Release was caused by the active negligence or willful misconduct of City or its Agents. The foregoing Indemnity includes, without limitation, costs incurred in connection with any activities required to Investigate and Remediate any Hazardous Material brought onto the Premises or the Property by Tenant or any of its Agents or Invitees acting on Tenant's behalf and to restore the Property to its condition prior to Tenant's introduction of such Hazardous Material or the correction of any violation of Environmental Laws. Tenant specifically acknowledges and agrees that it has an immediate and independent obligation to defend City and the other Indemnified Parties from any claim which actually or potentially falls within this indemnity provision even if such allegation is or may be groundless, fraudulent or false, which obligation arises at the time such claim is tendered to Tenant by City and continues at all times thereafter. Without limiting the foregoing, if Tenant or any of its Agents or Invitees acting on Tenant's behalf cause the Release of any Hazardous Material on, about, in, or beneath the Premises or Property, then in any such event Tenant shall, immediately, at no expense to City, take any and all necessary actions to return the Premises or the Property, as applicable, to the condition existing prior to the Release of any such Hazardous Materials on the Property or otherwise abate the Release in accordance with all Environmental Laws, except to the extent such Release was caused by the active negligence of City or its Agents. Tenant shall afford City a full opportunity to participate in any discussions with governmental regulatory agencies regarding any settlement agreement, cleanup or abatement agreement, consent decree, or other compromise or proceeding involving Hazardous Material.

28. SPECIAL PROVISIONS

28.1 Extension Options

(a) Options to Extend Term

Subject to City's rights under Sections 28.3 (City's Right to Terminate) and 28.4 (City's Protection Against Interference), City grants to Tenant two (2) options to extend the Term of this Lease (the "**Extension Options**"), each for an additional five (5) years (the "**Extended Terms**"). This Lease shall automatically be extended for such two (2) Extended Terms unless Tenant terminates the Lease at the end of the then current term by giving City written notice of the intent to terminate at least six (6) months prior to the end of the then current term. Any such notice by Tenant shall be irrevocable by Tenant except as provided in Section 28.1(b) (Base Rent and Other Terms). If any material event of default by Tenant is outstanding hereunder either on the date which is ninety (90) days prior to the expiration of the immediately prior term or at any time prior to the first day of the Extended Term (or if any event has occurred which with the giving of notice or the passage of time or both would constitute a material event of default and such event has not been cured prior to the earlier of expiration of any applicable cure period under this

Lease or the expiration of the immediately prior term), then City may elect by notice to Tenant to reject the automatic exercise of the Extension Option, whereupon the Extension Option (and any subsequent Extension Option) shall be null and void.

(b) Base Rent and Other Terms

If Tenant elects to exercise any of the Extension Options, then the lease for the Extended Term(s) shall cover the entire Premises and shall be upon all of the terms, covenants and conditions of this Lease, and subject to the exemption set forth in Section 5.1, Base Rent hereunder shall be determined as follows and adjusted in accordance with Section 5.2 (Adjustments in Base Rent). At the commencement of the Extended Term, the Base Rent shall be adjusted to the greater of: (1) the then City's minimum monthly base rent for similar personal communication sites, including equipment and antennas, atop and within City owned assets, or (2) Base Rent prior to the start of any Option Year Term after adjusting for annual Base Rent escalations. Subject to the exemption set forth in in Section 5.1 hereunder, beginning in the first year of any Option Year, Base Rent is subject to the annual escalation of 3% and shall continue each year of the Extended Term.

28.2 Tenant's Right to Terminate

In the event Tenant loses its permits necessary to operate the Communications Site due to reasons other than its failure to comply with the conditions of the permit and in spite of reasonable efforts by Tenant to maintain its permits, Tenant may terminate this Lease with ninety (90) days' prior written notice to City. The parties do not intend that Tenant's foregoing right to terminate be used to relocate to a better site or to reduce the total number of communication sites operated by Tenant and/or any of its affiliates for the Building or the area served by the Communications Sites at the Premises, if any. Notwithstanding anything to the contrary contained herein, Tenant shall have the right to terminate this Lease at any time without cause, provided that twelve (12) months' prior written notice is given to the City.

28.3 City's Right to Terminate Due to Finding by Board of Supervisors

City shall have the right to terminate this Lease without penalty upon ninety (90) days' written notice to Tenant if, after notice and public hearing and a reasonable time (not to exceed sixty (60) days) for Tenant to effect a remedy, the San Francisco Board of Supervisors determines that Tenant's continued use of the Premises will adversely affect public health and safety.

28.4 City's Protection Against Interference

So long as Tenant is not in default hereunder, after the Commencement Date City shall not grant a lease for the Building if such use would materially adversely interfere with Tenant's normal operation of the Communications Site. Any such future lease of the Building to a third party that permits the installation of communication equipment shall be conditioned upon such tenant not causing measurable interference which materially impairs Tenant's ability to utilize the Premises for its intended purpose.

28.5 Tenant's Protection Against Interference

Tenant will not permit its equipment or use of the Premises as a Communications Site to cause interference with or impairment of City's 911 Public Communications Safety System or Citywide 800 MHz Radio System or other communication or computer equipment used by City or any of its Agents or tenants on the Property. Tenant will not use the Premises or Tenant's

Equipment located on the Premises in any way which interferes with any existing use of the Building prior to this Lease, or any future use of the Building by City or its successors except as specifically set forth in Section 28.4 (City's Protection Against Interference) (including, without limitation, City's use of the Building as a hospital and trauma center with related radio, telephone and other communications transmission and reception). In the event Tenant's equipment causes such interference, and after City has notified Tenant of such interference in writing **and by calling Tenant's Network Operations Center at 1-800-264-6620**, Tenant will take all commercially reasonable steps necessary to correct and eliminate the interference, including but not limited to, powering down such equipment and later powering up such equipment for intermittent testing. In the event any such interference does not cease within five (5) business days after Tenant's receipt of written **and telephonic** notice as set forth herein, such interference shall be deemed a material breach of this Lease by Tenant, which shall, upon notice from City, be responsible for terminating such interference. The parties acknowledge that such continuing interference beyond the foregoing five (5) business day period may cause irreparable injury and, therefore, City shall have the right to bring action to enjoin such interference or to terminate this Lease immediately upon notice, at City's election. If any change in the nature of City's use of the Building during the Term results in measurable interference which materially impairs Tenant's normal operation of its equipment located on the Premises and, as a result of such interference, it is necessary to alter the Tenant Improvements or Tenant's other equipment located on the Premises, Tenant shall notify City of such interference, which notice shall include a detailed description of the necessary Alterations and a cost estimate therefor. After giving City notice, Tenant may, at its election, either **(i)** make the Alterations described in such notice, in compliance with Section 8.1 (Tenant's Alterations) of this Lease, or **(ii)** terminate this Lease upon thirty (30) days' prior written notice to City. If Tenant elects to make such Alterations, Tenant shall offset the actual, documented cost incurred by Tenant to complete such Alterations against Base Rent as it comes due, up to a maximum amount equal to the lesser of **(a)** the cost estimate contained in Tenant's notice to City described above or **(b)** Ten Thousand Dollars (\$10,000.00).

29. GENERAL PROVISIONS

29.1 Notices

Any notice given under this Lease shall be effective only if in writing and given by delivering the notice in person, by sending it first class mail or certified mail with a return receipt requested or overnight mail, return receipt requested, with postage prepaid, to: **(a)** Tenant at Tenant's address set forth in the Basic Lease Information, or at any place where Tenant or any agent, officer or employee of Tenant may be personally served if sent subsequent to Tenant's vacating, deserting, abandoning or surrendering the Premises; or **(b)** Landlord at City's address set forth in the Basic Lease Information; or **(c)** to such other address as either City or Tenant may designate as its new address for such purpose by notice given to the other in accordance with the provisions of this Section. All notices hereunder shall be deemed to have been given or received two (2) days after the date when it shall have been mailed if sent by first class, certified or overnight mail, or upon the date personal delivery is made. Neither party may give official or binding notice by facsimile.

29.2 No Implied Waiver

No failure by either party to insist upon the strict performance of any obligation of the other under this Lease or to exercise any right, power or remedy arising out of a breach thereof, irrespective of the length of time for which such failure continues, shall constitute a waiver of such breach. No acceptance by any Agent of City of full or partial Base Rent or Additional Charges during the continuance of any such breach, and no acceptance of the keys to or possession of the Premises prior to the expiration of the Term by any Agent of City, shall constitute a waiver of such breach or of City's right to demand strict compliance with such term,

covenant or condition or operate as a surrender of this Lease. No express written waiver by either party of any default or the performance of any provision hereof shall affect any other default or performance, or cover any other period of time, other than the default, performance or period of time specified in such express waiver. One or more written waivers of a default or the performance of any provision hereof by either party shall not be deemed to be a waiver of a subsequent default or performance. The consent of City given in any instance under the terms of this Lease shall not relieve Tenant of any obligation to secure the consent of City in any other or future instance under the terms of this Lease.

29.3 Amendments

This Lease nor any of its term or provisions may be changed, waived, discharged or terminated orally, and no breach thereof shall be waived, altered or modified, except by a written instrument signed by both parties hereto.

29.4 Authority

If Tenant signs as a corporation or a partnership, each of the persons executing this Lease on behalf of Tenant does hereby covenant and warrant that Tenant is a duly authorized and existing entity, that Tenant is qualified to do business in California, that Tenant has full right and authority to enter into this Lease, and that each and all of the persons signing on behalf of Tenant are authorized to do so. Upon City's request, Tenant shall provide City with evidence reasonably satisfactory to City confirming the foregoing covenants and warranties.

29.5 Interpretation of Lease

The words "City" or "Landlord" and "Tenant" as used herein shall include the plural as well as the singular. If there is more than one Tenant, the obligations and liabilities under this Lease imposed on Tenant shall be joint and several. As used herein, the term "Agents" when used with respect to either party shall include the agents, employees, officers, contractors, subcontractors and representatives of such party, and the term "Invitees" when used with respect to either party shall include the clients, customers, invitees, guests, licensees, assignees or subtenants of such party. The captions preceding the articles and sections of this Lease and in the table of contents have been inserted for convenience of reference and such captions in no way define or limit the scope or intent of any provision of this Lease. This Lease has been negotiated at arm's length and between persons sophisticated and knowledgeable in the matters dealt with herein. Provisions in this Lease relating to number of days shall be calendar days, unless otherwise specified, provided that if the last day of any period to give notice, reply to a notice or to undertake any other action occurs on a Saturday, Sunday or a bank or City holiday, then the last day for undertaking the action or giving or replying to the notice shall be the next succeeding business day. All approvals, consents or other determinations permitted or required by City hereunder shall be made by or through City's Director of Property or his or her designee unless otherwise provided in this Lease, by City's Charter or City Ordinance.

29.6 Successors and Assigns

The terms, covenants and conditions contained in this Lease shall bind and inure to the benefit of City and Tenant and, except as otherwise provided herein, their personal representatives and successors; provided, however, that upon the sale, assignment or transfer by City named herein (or by any subsequent landlord) of its interest in the Building as owner or lessee, including any transfer by operation of law, City (or any subsequent landlord) shall be relieved from all subsequent obligations and liabilities arising under this Lease subsequent to such sale, assignment or transfer.

29.7 Brokers

Neither party has had any contact or dealings regarding the leasing of the Premises, or any communication in connection therewith, through any licensed real estate broker or other person who could claim a right to a commission or finder's fee in connection with the lease contemplated herein except as identified in the Basic Lease Information, whose commission, if any is due, shall be paid pursuant to a separate written agreement between such broker and the party through which such broker contracted. In the event that any broker or finder perfects a claim for a commission or finder's fee based upon any such contact, dealings or communication, the party through whom the broker or finder makes his claim shall be responsible for such commission or fee and shall indemnify and hold harmless the other party from all claims, costs, and expenses (including, without limitation, reasonable attorneys' fees and disbursements) incurred by the indemnified party in defending against the same. The provisions of this Section shall survive any termination of this Lease.

29.8 Severability

If any provision of this Lease or the application thereof to any person, entity or circumstance shall be invalid or unenforceable, the remainder of this Lease, or the application of such provision to persons, entities or circumstances other than those as to which it is invalid or unenforceable, shall not be affected thereby, and to each provision of this Lease shall be valid and be enforced to the full extent permitted by law, except to the extent that enforcement of this Lease without the invalidated provision would be unreasonable or inequitable under all the circumstances or would frustrate a fundamental purpose of this Lease.

29.9 Governing Law

This Lease shall be construed and enforced in accordance with the laws of the State of California and City's Charter.

29.10 Entire Agreement

This instrument, including the exhibits hereto, which are made a part of this Lease, contains the entire agreement between the parties and all prior written or oral negotiations, understandings and agreements are merged herein. The parties further intend that this Lease shall constitute the complete and exclusive statement of its terms and that no extrinsic evidence whatsoever (including prior drafts hereof and changes therefrom) may be introduced in any judicial, administrative or other legal proceeding involving this Lease. Tenant hereby acknowledges that neither City nor City's Agents have made any representations or warranties with respect to the Premises, the Building or this Lease except as expressly set forth herein, and no rights, easements or licenses are or shall be acquired by Tenant by implication or otherwise unless expressly set forth herein.

29.11 Attorneys' Fee

In the event that either City or Tenant fails to perform any of its obligations under this Lease or in the event a dispute arises concerning the meaning or interpretation of any provision of this Lease, the defaulting party or the non-prevailing party in such dispute, as the case may be, shall pay the prevailing party reasonable attorneys' and experts' fees and costs, and all court costs and other costs of action incurred by the prevailing party in connection with the prosecution or defense of such action and enforcing or establishing its rights hereunder (whether or not such action is prosecuted to a judgment). For purposes of this Lease, reasonable attorneys' fees of the City's Office of the City Attorney shall be based on the fees regularly charged by private attorneys with the equivalent number of years of experience in the subject matter area of the law for which the City Attorney's services were rendered who practice in the City of San Francisco

in law firms with approximately the same number of attorneys as employed by the Office of the City Attorney. The term "attorneys' fees" shall also include, without limitation, all such fees incurred with respect to appeals, mediations, arbitrations, and bankruptcy proceedings, and whether or not any action is brought with respect to the matter for which such fees were incurred. The term "costs" shall mean the costs and expenses of counsel to the parties, which may include printing, duplicating and other expenses, air freight charges, hiring of experts, and fees billed for law clerks, paralegals, and others not admitted to the bar but performing services under the supervision of an attorney.

29.12 Holding Over

Subject to the exemption set forth in Section 5.1, any holding over after the expiration of the Term with the express consent of City shall be construed to automatically extend the Term of this Lease for a period of one (1) year at a Base Rent equal to one hundred fifty percent (150%) of the latest Base Rent payable by Tenant hereunder prior to such expiration, and shall otherwise be on the terms and conditions herein specified so far as applicable (except for those pertaining to the Term and any Extension Options). Any holding over without City's consent shall constitute a default by Tenant and entitle City to exercise any or all of its remedies as provided herein, notwithstanding that City may elect to accept one or more payments of Base Rent and Additional Charges from Tenant.

29.13 Time of Essence

Time is of the essence with respect to all provisions of this Lease in which a definite time for performance is specified.

29.14 Cumulative Remedies

All rights and remedies of either party hereto set forth in this Lease shall be cumulative, except as may otherwise be provided herein.

29.15 Survival of Indemnities

Termination of this Lease shall not affect the right of either party to enforce any and all indemnities and representations and warranties given or made to the other party under this Lease, nor shall it affect any provision of this Lease that expressly states it shall survive termination hereof.

29.16 Signs

Tenant agrees that it will not erect or maintain, or permit to be erected or maintained, any signs, notices or graphics upon or about the Premises which are visible in or from public corridors or other portions of any common areas of the Building or from the exterior of the Premises, without obtaining the prior written consent and approval of City, which City may withhold or grant in its sole discretion.

29.17 Light and Air

Tenant covenants and agrees that no diminution of light, air or view by any structure that may hereafter be erected (whether or not by City) shall entitle Tenant to any reduction of the Base Rent or Additional Charges under this Lease, result in any liability of City to Tenant, or in any other way affect this Lease or Tenant's obligations hereunder, except as described in Section 28.4 (City's Protection Against Interference).

29.18 Recording

Tenant agrees that it shall not record this Lease nor any memorandum or short form hereof in the Official Records of the City and County of San Francisco.

29.19 Taxes, Assessments, Licenses, Permit Fees and Liens

(a) Tenant recognizes and understands that this Lease may create a possessory interest subject to property taxation and that Tenant may be subject to the payment of property taxes levied on such interest. Tenant further recognizes and understands that any sublease or assignment permitted under this Lease and any exercise of any option to renew or extend this Lease may constitute a change in ownership for purposes of property taxation and therefore may result in a revaluation of any possessory interest created hereunder.

(b) Tenant agrees to pay taxes of any kind, including possessory interest taxes, that may be lawfully assessed on the leasehold interest hereby created and to pay all other taxes, excises, licenses, permit charges and assessments based on Tenant's usage of the Premises that may be imposed upon Tenant by law, all of which shall be paid when the same become due and payable and before delinquency. Tenant agrees not to allow or suffer a lien for any such taxes to be imposed upon the Premises or upon any equipment or property located thereon without promptly discharging the same, provided that Tenant, if so desiring, may have reasonable opportunity to contest the validity of the same.

(c) San Francisco Administrative Code Sections 23.6-1 and 23.6-2 require that the City and County of San Francisco report certain information relating to this Lease, and any renewals thereof, to the County Assessor within sixty (60) days after any such transaction; and that Tenant report certain information relating to any assignment of or sublease under this lease to the County Assessor within sixty (60) days after such assignment or sublease transaction. Tenant agrees to provide such information as may be requested by the City to enable the City to comply with this requirement.

29.20 Non-Liability of City Officials, Employees and Agents

No elective or appointive board, commission, member, officer, employee or agent of City shall be personally liable to Tenant, its successors and assigns, in the event of any default or breach by City or for any amount which may become due to Tenant, its successors and assigns, or for any obligation of City under this Lease.

29.21 Wages and Working Conditions

Tenant agrees that any person performing labor for Tenant on any public work at the Premises, which includes the Tenant Improvements, Alterations, demolition, installation, maintenance and repair work to the extent such activities are paid for in whole or part out of public funds, shall be paid not less than the highest prevailing rate of wages consistent with the requirements of Section 6.22(E) of the San Francisco Administrative Code, and shall be subject to the same hours and working conditions, and shall receive the same benefits as in each case are provided for similar work performed in San Francisco County. The terms "public work" and "paid for in whole or part out of public funds" as used in this Section are defined in California Labor Code Section 1720 et seq., as amended. Tenant shall include in any contract for such labor a requirement that all persons performing labor under such contract shall be paid not less than the highest prevailing rate of wages for the labor so performed. Tenant shall require any contractor to provide, and shall deliver to City upon request, certified payroll reports with respect to all persons performing such labor at the Premises.

29.22 Non-Discrimination in City Contracts and Benefits Ordinance

(a) Covenant Not to Discriminate

In the performance of this Lease, Tenant agrees not to discriminate against any employee of, any City employee working with Tenant, or applicant for employment with Tenant, or against any person seeking accommodations, advantages, facilities, privileges, services, or membership in all business, social, or other establishments or organizations, on the basis of the fact or perception of a person's race, color, creed, religion, national origin, ancestry, age, height, weight, sex, sexual orientation, gender identity, domestic partner status, marital status, disability or Acquired Immune Deficiency Syndrome or HIV status (AIDS/HIV status), or association with members of such protected classes, or in retaliation for opposition to discrimination against such classes.

Tenant further acknowledges that the Americans with Disabilities Act requires that programs, services and other activities provided by a public entity to the public, whether directly or through a contractor, must be accessible to the disabled public. Subject to Section 11.1 (Compliance with Laws) hereof, Tenant acknowledges its obligation to comply with such Act and any other federal, state or local disability rights legislation. Tenant warrants that it will fulfill that obligation. Tenant also warrants that it will not discriminate against disabled persons in the provision of services, benefits or activities.

(b) Subcontracts

Tenant shall include in all subcontracts relating to the Premises a non-discrimination clause applicable to such subcontractor in substantially the form of Subsection (a) above. In addition, Tenant shall incorporate by reference in all subcontracts the provisions of Sections 12B.2(a), 12B.2(c)-(k), and 12C.3 of the San Francisco Administrative Code and shall require all subcontractors to comply with such provisions. Tenant's failure to comply with the obligations in this Subsection shall constitute a material breach of this Lease.

(c) Non-Discrimination in Benefits

Tenant does not as of the date of this Lease and will not during the term of this Lease, in any of its operations in San Francisco, on real property owned by City, or where the work is being performed for the City or elsewhere within the United States, discriminate in the provision of bereavement leave, family medical leave, health benefits, membership or membership discounts, moving expenses, pension and retirement benefits or travel benefits, as well as any benefits other than the benefits specified above, between employees with domestic partners and employees with spouses, and/or between the domestic partners and spouses of such employees, where the domestic partnership has been registered with a governmental entity pursuant to state or local law authorizing such registration, subject to the conditions set forth in Section 12B.2(b) of the San Francisco Administrative Code.

(d) HRC Form

As a condition to this Lease, Tenant shall execute the "Chapter 12B Declaration: Nondiscrimination in Contracts and Benefits" form (Form HRC-12B-101) with supporting documentation and secure the approval of the form by the San Francisco Human Rights Commission. Tenant hereby represents that prior to execution of this Lease, **(i)** Tenant executed and submitted to the HRC Form HRC-12B-101 with supporting documentation, and **(ii)** the HRC approved such form.

(e) Incorporation of Administrative Code Provisions by Reference

The provisions of Chapters 12B and 12C of the San Francisco Administrative Code relating to non-discrimination by parties contracting for the lease of City property are incorporated in this Section by reference and made a part of this Lease as though fully set forth herein. Tenant shall comply fully with and be bound by all of the provisions that apply to this Lease under such Chapters of the Administrative Code, including but not limited to the remedies provided in such Chapters. Without limiting the foregoing, Tenant understands that pursuant to Section 12B.2(h) of the San Francisco Administrative Code, a penalty of Fifty Dollars (\$50) for each person for each calendar day during which such person was discriminated against in violation of the provisions of this Lease may be assessed against Tenant and/or deducted from any payments due Tenant.

29.23 Requiring Health Benefits for Covered Employees

Unless exempt, Tenant agrees to comply fully with and be bound by all of the provisions of the Health Care Accountability Ordinance (HCAO), as set forth in San Francisco Administrative Code Chapter 12Q, including the remedies provided, and implementing regulations, as the same may be amended from time to time. The provisions of Chapter 12Q are incorporated herein by reference and made a part of this Lease as though fully set forth. The text of the HCAO is available on the web at <http://www.sfgov.org/olse/hcao>. Capitalized terms used in this Section and not defined in this Lease shall have the meanings assigned to such terms in Chapter 12Q.

(a) For each Covered Employee, Tenant shall provide the appropriate health benefit set forth in Section 12Q.3 of the HCAO. If Tenant chooses to offer the health plan option, such health plan shall meet the minimum standards set forth by the San Francisco Health Commission.

(b) Notwithstanding the above, if the Tenant is a small business as defined in Section 12Q.3(d) of the HCAO, it shall have no obligation to comply with Subsection (a) above.

(c) Tenant's failure to comply with the HCAO shall constitute a material breach of this Lease. City shall notify Tenant if such a breach has occurred. If, within thirty (30) days after receiving City's written notice of a breach of this Lease for violating the HCAO, Tenant fails to cure such breach or, if such breach cannot reasonably be cured within such period of thirty (30) days, Tenant fails to commence efforts to cure within such period, or thereafter fails diligently to pursue such cure to completion, City shall have the right to pursue the remedies set forth in Section 12Q.5(f)(1-5). Each of these remedies shall be exercisable individually or in combination with any other rights or remedies available to City.

(d) Any Subcontract entered into by Tenant shall require the Subcontractor to comply with the requirements of the HCAO and shall contain contractual obligations substantially the same as those set forth in this Section. Tenant shall notify City's Purchasing Department when it enters into such a Subcontract and shall certify to the Purchasing Department that it has notified the Subcontractor of the obligations under the HCAO and has imposed the requirements of the HCAO on Subcontractor through the Subcontract. Each Tenant shall be responsible for its Subcontractors' compliance with this Chapter. If a Subcontractor fails to comply, the City may pursue the remedies set forth in this Section against Tenant based on the Subcontractor's failure to comply, provided that City has first provided Tenant with notice and an opportunity to obtain a cure of the violation.

(e) Tenant shall not discharge, reduce in compensation, or otherwise discriminate against any employee for notifying City with regard to Tenant's compliance or anticipated compliance with the requirements of the HCAO, for opposing any practice proscribed by the

HCAO, for participating in proceedings related to the HCAO, or for seeking to assert or enforce any rights under the HCAO by any lawful means.

(f) Tenant represents and warrants that it is not an entity that was set up, or is being used, for the purpose of evading the intent of the HCAO.

(g) Tenant shall keep itself informed of the current requirements of the HCAO.

(h) Tenant shall provide reports to the City in accordance with any reporting standards promulgated by the City under the HCAO, including reports on Subcontractors and Subtenants, as applicable.

(i) Tenant shall provide City with access to records pertaining to compliance with HCAO after receiving a written request from City to do so and being provided at least five (5) business days to respond.

(j) City may conduct random audits of Tenant to ascertain its compliance with HCAO. Tenant agrees to cooperate with City when it conducts such audits.

(k) If Tenant is exempt from the HCAO when this Lease is executed because its amount is less than Twenty-Five Thousand Dollars (\$25,000), but Tenant later enters into an agreement or agreements that cause Tenant's aggregate amount of all agreements with City to reach Seventy-Five Thousand Dollars (\$75,000), all the agreements shall be thereafter subject to the HCAO. This obligation arises on the effective date of the agreement that causes the cumulative amount of agreements between Tenant and the Contracting Department to be equal to or greater than Seventy-Five Thousand Dollars (\$75,000) in the fiscal year.

29.24 MacBride Principles - Northern Ireland

The provisions of San Francisco Administrative Code §12F are incorporated herein by this reference and made part of this Agreement. By signing this Agreement, Contractor confirms that Contractor has read and understood that the City urges companies doing business in Northern Ireland to resolve employment inequities and to abide by the MacBride Principles, and urges San Francisco companies to do business with corporations that abide by the MacBride Principles.

29.25 Drug-Free Workplace

Tenant acknowledges that pursuant to the Federal Drug-Free Workplace Act of 1989, the unlawful manufacture, distribution, possession or use of a controlled substance is prohibited on City premises. Tenant agrees that any violation of this prohibition by Tenant, its employees, agents or assigns shall be deemed a material breach of this Lease.

29.26 Tropical Hardwood and Virgin Redwood Ban

The City and County of San Francisco urges companies not to import, purchase, obtain or use for any purpose, any tropical hardwood or tropical hardwood wood product, virgin redwood or virgin redwood wood product except as expressly provided by the application of Sections 802(b) and 803(b) of the San Francisco Environment Code.

29.27 Pesticide Prohibition

Tenant shall comply with the provisions of Section 308 of Chapter 3 of the San Francisco Environment Code (the "Pesticide Ordinance") which (i) prohibit the use of certain pesticides on City property, (ii) require the posting of certain notices and the maintenance of certain records

regarding pesticide usage and **(iii)** require Tenant to submit to Department of Public Health, ZSFGH, an integrated pest management ("IPM") plan that **(a)** lists, to the extent reasonably possible, the types and estimated quantities of pesticides that Tenant may need to apply to the Premises during the terms of this Lease, **(b)** describes the steps Tenant will take to meet the City's IPM Policy described in Section 300 of the Pesticide Ordinance and **(c)** identifies, by name, title, address and telephone number, an individual to act as the Tenant's primary IPM contact person with the City. In addition, Tenant shall comply with the requirements of Sections 303(a) and 303(b) of the Pesticide Ordinance.

Nothing herein shall prevent Tenant, through City's Department of Public Health, from seeking a determination from the Commission on the Environment that it is exempt from complying with certain portions of the Pesticide Ordinance as provided in Section 307 thereof. City shall reasonably cooperate with Tenant, at Tenant's sole cost and expense, if Tenant seeks in good faith an exemption under the Pesticide Ordinance.

29.28 Prohibition of Tobacco Sales and Advertising

Tenant acknowledges and agrees that no advertising of cigarettes or tobacco products is allowed on the Premises. This advertising prohibition includes the placement of the name of a company producing, selling or distributing cigarettes or tobacco products or the name of any cigarette or tobacco product in any promotion of any event or product. This advertising prohibition does not apply to any advertisement sponsored by a state, local, nonprofit or other entity designed to (i) communicate the health hazards of cigarettes and tobacco products, or (ii) encourage people not to smoke or to stop smoking.

29.29 Prohibition of Alcoholic Beverage Advertising

Tenant acknowledges and agrees that no advertising of alcoholic beverages is allowed on the Premises. For purposes of this section, "alcoholic beverage" shall be defined as set forth in California Business and Professions Code Section 23004, and shall not include cleaning solutions, medical supplies and other products and substances not intended for drinking. This advertising prohibition includes the placement of the name of a company producing, selling or distributing alcoholic beverages or the name of any alcoholic beverage in any promotion of any event or product. This advertising prohibition does not apply to any advertisement sponsored by a state, local, nonprofit or other entity designed to (i) communicate the health hazards of alcoholic beverages, (ii) encourage people not to drink alcohol or to stop drinking alcohol, or (iii) provide or publicize drug or alcohol treatment or rehabilitation services.

29.30 Preservative-Treated Wood Containing Arsenic

Tenant may not purchase preservative-treated wood products containing arsenic in the performance of this Lease unless an exemption from the requirements of Environment Code Chapter 13 is obtained from the Department of Environment under Section 1304 of the Environment Code. The term "preservative-treated wood containing arsenic" shall mean wood treated with a preservative that contains arsenic, elemental arsenic, or an arsenic copper combination, including, but not limited to, chromated copper arsenate preservative, ammoniac copper zinc arsenate preservative, or ammoniacal copper arsenate preservative. Tenant may purchase preservative-treated wood products on the list of environmentally preferable alternatives prepared and adopted by the Department of Environment. This provision does not preclude Tenant from purchasing preservative-treated wood containing arsenic for saltwater immersion. The term "saltwater immersion" shall mean a pressure-treated wood that is used for construction purposes or facilities that are partially or totally immersed in saltwater.

29.31 Conflicts of Interest

Through its execution of this Lease, Tenant acknowledges that it is familiar with the provisions of Section 15.103 of the San Francisco Charter, Article III, Chapter 2 of City's Campaign and Governmental Conduct Code, and Section 87100 et seq. and Section 1090 et seq. of the Government Code of the State of California, and certifies that it does not know of any facts which would constitute a violation of said provisions, and agrees that if Tenant becomes aware of any such fact during the term of this Lease, Tenant shall immediately notify the City.

29.32 Notification of Limitations on Contributions

Through its execution of this Lease, Tenant acknowledges that it is familiar with Section 1.126 of the San Francisco Campaign and Governmental Conduct Code, which prohibits any person who contracts with the City for the selling or leasing of any land or building to or from the City whenever such transaction would require approval by a City elective officer or the board on which that City elective officer serves, from making any campaign contribution to (1) an individual holding a City elective office if the contract must be approved by the individual, a board on which that individual serves, or a board on which an appointee of that individual serves, (2) a candidate for the office held by such individual, or (3) a committee controlled by such individual, at any time from the commencement of negotiations for the contract until the later of either the termination of negotiations for such contract or six months after the date the contract is approved. Tenant acknowledges that the foregoing restriction applies only if the contract or a combination or series of contracts approved by the same individual or board in a fiscal year have a total anticipated or actual value of \$50,000 or more. Tenant further acknowledges that the prohibition on contributions applies to each prospective party to the contract; each member of Tenant's board of directors, chairperson, chief executive officer, chief financial officer and chief operating officer; any person with an ownership interest of more than 20 percent in Tenant; any subcontractor listed in the contract; and any committee that is sponsored or controlled by Tenant. Additionally, Tenant acknowledges that Tenant must inform each of the persons described in the preceding sentence of the prohibitions contained in Section 1.126. Tenant further agrees to provide to City the names of each person, entity or committee described above.

29.33 Sunshine Ordinance

In accordance with Section 67.24(e) of the San Francisco Administrative Code, contracts, of communications between City and persons or firms seeking contracts will be open to inspection immediately after a contract has been awarded. Nothing in this provision requires the disclosure of a private person's or organization's net worth or other proprietary financial data submitted for qualification for a contract, lease, agreement or other benefit until and unless that person or organization is awarded the contract, lease, agreement or benefit. Information provided which is covered by this Section will be made available to the public upon request.

29.34 Counterparts

This Lease may be executed in two or more counterparts, each of which shall be deemed an original, but all of which taken together shall constitute one and the same instrument.

29.35 Effective Date

This Lease shall become effective on the date upon which the Board of Supervisors and the Mayor have adopted a resolution approving this Lease and the parties hereto have duly executed this Lease.

29.36 Cooperative Drafting

This Lease has been drafted through a cooperative effort of both parties, and both parties have had an opportunity to have the Lease reviewed and revised by legal counsel. No party shall be considered the drafter of this Lease, and no presumption or rule that an ambiguity shall be construed against the party drafting the clause shall apply to the interpretation or enforcement of this Lease.

NOTWITHSTANDING ANYTHING TO THE CONTRARY CONTAINED IN THIS LEASE, THE PARTIES ACKNOWLEDGE THAT NO OFFICER OR EMPLOYEE OF CITY HAS AUTHORITY TO COMMIT CITY TO THIS LEASE UNLESS AND UNTIL A RESOLUTION OF CITY SHALL HAVE BEEN DULY ADOPTED APPROVING THIS LEASE, AND AUTHORIZING APPROPRIATE CITY OFFICERS TO CARRY OUT THE TRANSACTIONS CONTEMPLATED HEREBY. THEREFORE, ANY OBLIGATIONS OR LIABILITIES OF CITY HEREUNDER ARE CONTINGENT UPON, AND SUBJECT TO, DUE ADOPTION OF SUCH A RESOLUTION, AND THIS LEASE SHALL BE NULL AND VOID IF SUCH RESOLUTION IS NOT ADOPTED BY THE BOARD OF SUPERVISORS AND APPROVED BY THE MAYOR, IN THEIR RESPECTIVE SOLE AND ABSOLUTE DISCRETION, AND IN ACCORDANCE WITH CITY'S CHARTER AND ALL OTHER APPLICABLE LAWS. APPROVAL OF THE TRANSACTIONS CONTEMPLATED BY THIS LEASE BY ANY DEPARTMENT, COMMISSION OR AGENCY OF CITY SHALL NOT BE DEEMED TO IMPLY THAT SUCH RESOLUTION WILL BE ADOPTED NOR WILL ANY SUCH APPROVAL CREATE ANY BINDING OBLIGATIONS ON CITY.

City and Tenant have executed this Lease as of the date first written above.

TENANT:

GTE Mobilnet of California Limited Partnership, a
California limited partnership d/b/a/ Verizon
Wireless

By: Cellco Partnership
Its: General Partner

By:

CITY:

CITY AND COUNTY OF SAN FRANCISCO,
a municipal corporation

By: _____
JOHN UPDIKE
Director of Property

APPROVED AS TO FORM:

DENNIS J. HERRERA
City Attorney

By: _____
VIRGINIA DARIO ELIZONDO
Deputy City Attorney

City and Tenant have executed this Lease as of the date first written above.

TENANT:

GTE Mobilnet of California Limited Partnership, a
California limited partnership d/b/a/ Verizon
Wireless

By: Cellco Partnership
Its: General Partner

By: 

Phillip French Executive Director

CITY:

CITY AND COUNTY OF SAN FRANCISCO,
a municipal corporation

By: _____
JOHN UPDIKE
Director of Property

APPROVED AS TO FORM:

DENNIS J. HERRERA
City Attorney

By: 
VIRGINIA DARIO ELIZONDO
Deputy City Attorney

EXHIBIT A
PLANS AND EQUIPMENT



SF GENERAL HOSPITAL iDAS

PS NO. 291710 / PSP NO. 2014099812
995 POTRERO AVE
SAN FRANCISCO, CA 94110

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH WITH CURRENT EDITIONS OF THE CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUCTED TO PERMIT WORK NOT CONFORMING TO THE LOCAL CODES.

- 2013 CALIFORNIA BUILDING CODE (*13 CBC)
- 2013 CALIFORNIA FIRE CODE (*13 CFC)
- 2013 CALIFORNIA ELECTRIC CODE (*13 CEC)
- 2013 CALIFORNIA MECHANICAL CODE (*13 CMC)
- 2013 SAN FRANCISCO FIRE CODE (2013 SFFC)
- 2013 NEPA 13 AUTOMATIC SPRINKLER SYSTEMS
- 2013 NFPA 72 NATIONAL FIRE ALARM CODE

PROJECT TEAM

CIVIL ENGINEER:

INFINIGY ENGINEERING
25455 RANCHO PARKWAY SOUTH,
LAKE FOREST, CA 92530
CONTACT: DAN CONNELL
(949) 753-8887
connell@infinigy.com

SITE ACQUISITION:

MODUS, INC.
145 WINDHAM STREET, 3RD FLOOR
SAN FRANCISCO, CA 94105
LEASING & ZONING CONTACT: SAMANTHA HUANG
PHONE: (415) 640-7602
E-MAIL: shuang@modus-corp.com

PROJECT DESCRIPTION

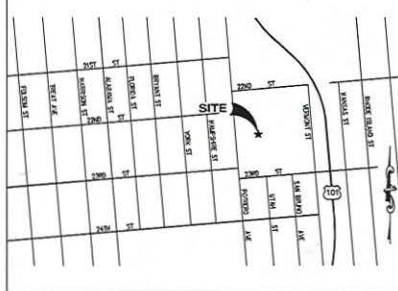
THIS PROJECT CONSISTS OF A MODIFICATIONS TO AN EXISTING VERIZON WIRELESS ANTENNA FACILITY. MODIFICATIONS INCLUDE:

- ADD iDAS BACK MOUNTED EQUIPMENT IN AN EXISTING 19" RACK IN THE HEAD END EQUIPMENT ROOM
- ADD (3) MIRRORS IN THE HEAD END EQUIPMENT ROOM
- THE NEW iDAS EQUIPMENT INTO THE EXISTING ELECTRICAL BREAKER BOXES
- SUPPLY TELLER TO THE iDAS EQUIPMENT RACK.

DRIVING DIRECTIONS

START OUT GOING SOUTHWEST ON MITCHELL DR. TOWARD N WIGET LN. TURN LEFT ONTO N WIGETA LN. TAKE THE 2ND RIGHT ONTO YONACIO VALLEY RD. YONACIO VALLEY RD BECOMES HILLSIDE AVE. MERGE ONTO CA-24 W TOWARD DAKELAND. TAKE EXIT 208 TOWARD I-580/SAN FRANCISCO/HAYWARD. MERGE ONTO I-580 W. MERGE ONTO I-80 W VIA EXIT 19A ON THE LEFT (PORTIONS TOLL). MERGE ONTO US-101 S/JAMES LICK Fwy S VIA EXIT 1A ON THE LEFT TOWARD SAN JOSE. TAKE THE C CHAVEZ ST EXIT. EXIT 432. KEEP RIGHT TO TAKE THE POTRERO AVE/C CHAVEZ ST W RAMP. MERGE ONTO POTRERO AVE. THE SITE IS ON THE RIGHT

VICINITY MAP (NOT TO SCALE)



GENERAL CONTRACTOR NOTES

DO NOT SCALE DRAWINGS

CONTRACTOR SHALL VERIFY ALL PLANS WITH EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE. SHALL IMMEDIATELY NOTIFY THE ARCHITECT IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

SHEET INDEX

SHEET	DESCRIPTION
T-1	TITLE SHEET, SITE INFORMATION AND VICINITY MAP
T-2	GENERAL CONSTRUCTION NOTES, GENERAL NOTES, ABBREVIATIONS & LEGEND
C-1	OVERALL SURVEY
C-2	ENLARGED ROOFTOP SURVEY
A-1	OVERALL SITE PLAN
A-2	EQUIPMENT / HEAD END ROOM - MPOE ROOM HB380
A-3	EQUIPMENT ELEVATIONS - HEAD END ROOM - MPOE ROOM HB380
A-4	EQUIPMENT RACK DETAILS
D-1	DETAILS, BILL OF MATERIALS, & SPEC SHEETS
D-2	SPEC SHEETS
E-1	ELECTRICAL ROUTING / HEAD END ROOM - MPOE ROOM HB380
E-2	SINGLE LINE DIAGRAM



PROJECT INFORMATION:
**SF GENERAL HOSPITAL
iDAS**
PS NO.291710 / PSP NO.2014099812
995 POTRERO AVE,
SAN FRANCISCO, CA 94110

Modus, Inc.

145 WINDHAM STREET, 3RD FLOOR
SAN FRANCISCO, CA 94105

CURRENT ISSUE DATE:
05/17/16

ISSUED FOR:
100% CD

REV.-DATE-DESCRIPTION-BY-

REV.	DATE	DESCRIPTION	BY
4	05/17/16	100% CD	JR
3	05/06/16	100% CD	JR
2	03/30/16	100% CD	JR
1	03/09/16	100% CD	JR
0	02/15/16	90% CD	HL

CIVIL ENGINEER:
INFINIGY Design, Build, Deliver.
25455 RANCHO PARKWAY, SOUTH
LAKE FOREST, CA 92530
OFFICE # (949) 753-8887
FAX # (949) 753-8833

DRAWN BY: _____ CHK.: _____ APV.: _____
HL JR

LICENSER:

SHEET TITLE:
**TITLE SHEET, SITE INFORMATION
AND VICINITY MAP**

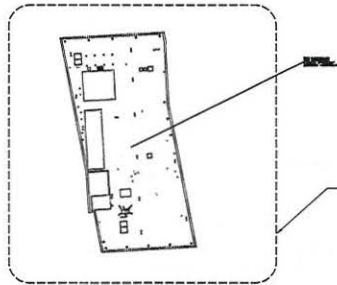
SHEET NUMBER:
T-1

22ND STREET

POTRERO AVE

VERMONT STREET

23RD STREET



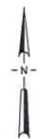
(1) HOSPITAL BUILDING - LOCATION OF
 (2) VERIZON EQUIPMENT AREA LOCATED
 IN THE JUDGE ROOM HISSIO - LOCATION
 OF HOSPITAL NEUTRAL HOST DAS

1
A-2

APN: 4154-001
 OWNER(S): CITY OF SAN FRANCISCO
 APN: 4154-001

OVERALL SITE PLAN

SCALE: 1"=50'-0"
 0 25' 50'



verizonwireless
 VERIZON WIRELESS
 2785 MITCHELL DRIVE
 WALNUT CREEK, CA 94598

PROJECT INFORMATION:
**SF GENERAL HOSPITAL
 IDAS**
 PS NO.291710 / PSP NO.20140999812
 905 POTRERO AVE.
 SAN FRANCISCO, CA 94110

Modus, Inc.
 Site Acquisition / Planning / Construction Management / Site Restoration
 145 WASHINGTON STREET, 20th FLOOR
 SAN FRANCISCO, CA 94103

CURRENT ISSUE DATE:
05/17/16

ISSUED FOR:
100% CD

REV.	DATE	DESCRIPTION	BY
4	05/17/16	100% CD	JR
3	05/06/16	100% CD	JR
2	03/30/16	100% CD	JR
1	03/09/16	100% CD	JR
0	02/15/16	90% CD	HL

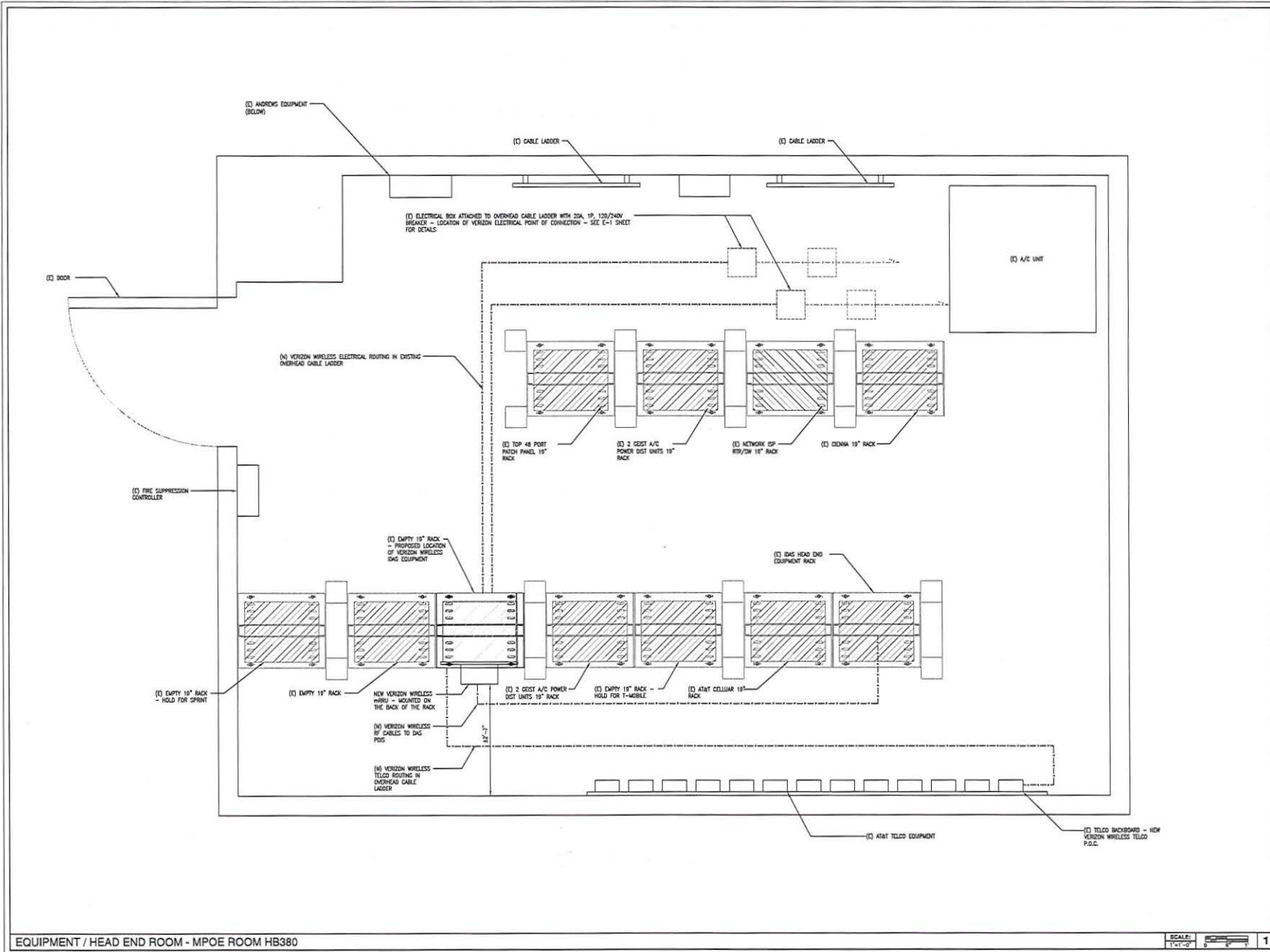
CIVIL ENGINEER:
INFINIGY8 Design, Build, Deliver.
 26455 RANCHO PKWY, SOUTH
 LAKE FOREST, CA 92033
 OFFICE # (949) 753-0077
 FAX # (949) 753-0033

DRAWN BY: HL CHK.: JR APV.: JR

LICENSER:

SHEET TITLE:
OVERALL SITE PLAN

SHEET NUMBER:
A-1



EQUIPMENT / HEAD END ROOM - MPOE ROOM HB380

SCALE: 1"=1'-0" 1



PROJECT INFORMATION:
SF GENERAL HOSPITAL IDAS
 PS NO.291710 / PSP NO.2014099812
 955 POTRERO AVE.
 SAN FRANCISCO, CA 94110

Modus, Inc.
 149 NATOMA STREET, 3RD FLOOR
 SAN FRANCISCO, CA 94103

CURRENT ISSUE DATE:
05/17/16

ISSUED FOR:
100% CD

REV.	DATE	DESCRIPTION	BY
4	05/17/16	100% CD	JR
3	05/06/16	100% CD	JR
2	03/30/16	100% CD	JR
1	03/09/16	100% CD	JR
0	02/15/16	90% CD	HL

CIVIL ENGINEER:
INFINIGY8 Design, Build, Deliver.
 26455 RANCHO PKWY, SOUTH
 LAKE FOREST, CA 92530
 OFFICE # (949) 753-8857
 FAX # (949) 753-8833

DRAWN BY: _____ CHK. _____ APV. _____
 HL JR

LICENSER:

SHEET TITLE:
EQUIPMENT LAYOUT

SHEET NUMBER:
A-2



PROJECT INFORMATION:
SF GENERAL HOSPITAL IDAS
 PS NO.291710 / PSP NO.20140998912
 955 POTRERO AVE.
 SAN FRANCISCO, CA 94110

Modus, Inc.
 145 WALTON STREET, 2ND FLOOR
 SAN FRANCISCO, CA 94102

CURRENT ISSUE DATE:
05/17/16

ISSUED FOR:
100% CD

REV.	DATE	DESCRIPTION	BY
4	05/17/16	100% CD	JR
3	05/06/16	100% CD	JR
2	03/30/16	100% CD	JR
1	03/09/16	100% CD	JR
0	02/15/16	90% CD	HL

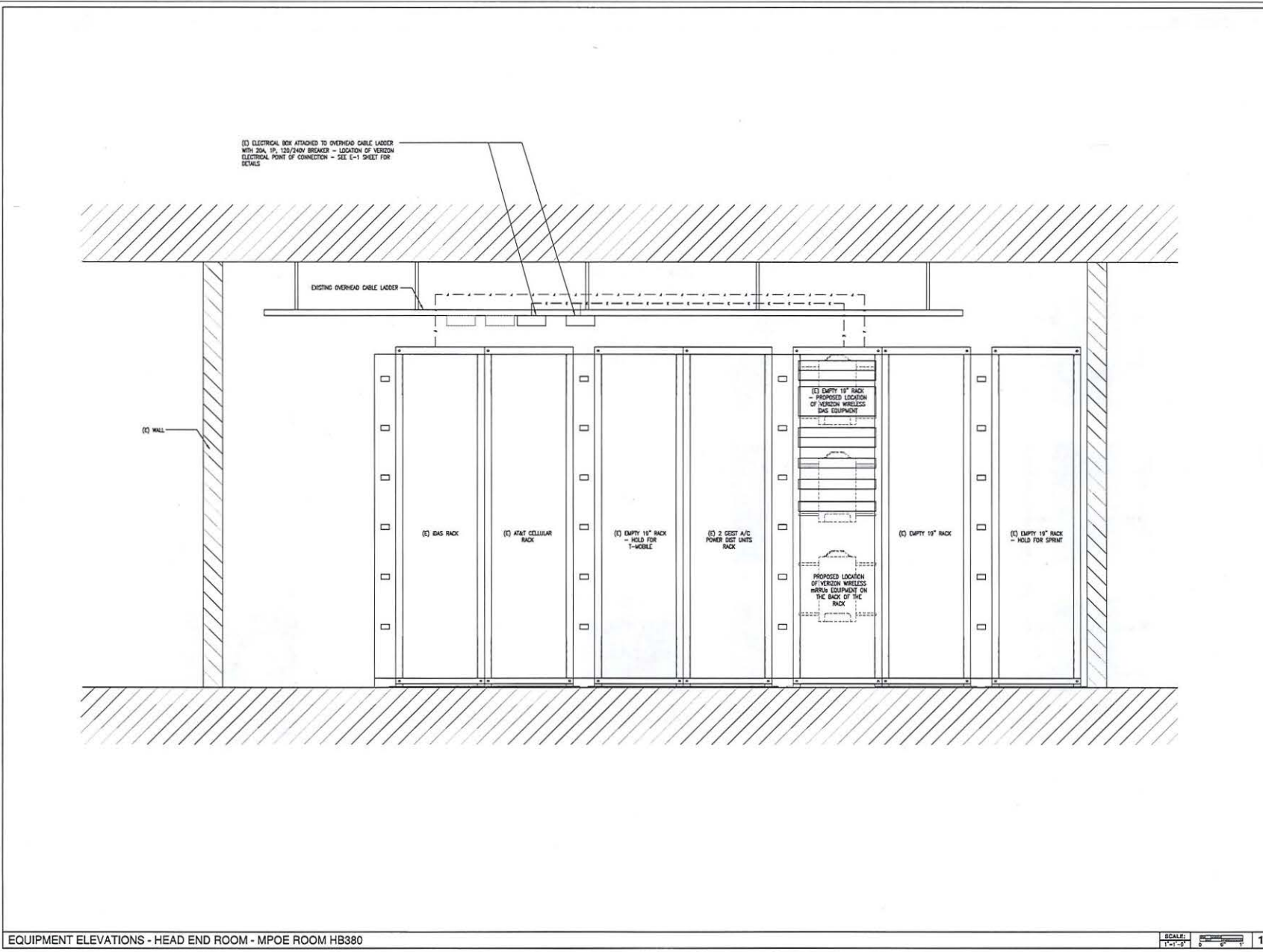
CIVIL ENGINEER:
INFINIGY8 Design, Build, Deliver.
 26455 RANCHO PKWY. SOUTH
 LAKE FOREST, CA 92530
 OFFICE # (949) 753-8897
 FAX # (949) 753-8833

DRAWN BY: HL CHK.: JR APV.: JR

LICENSER:

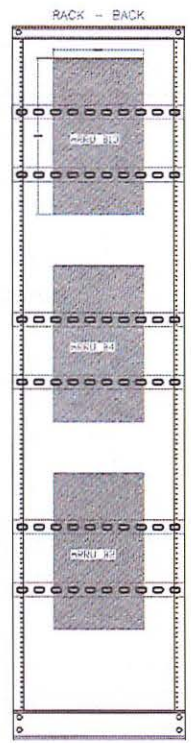
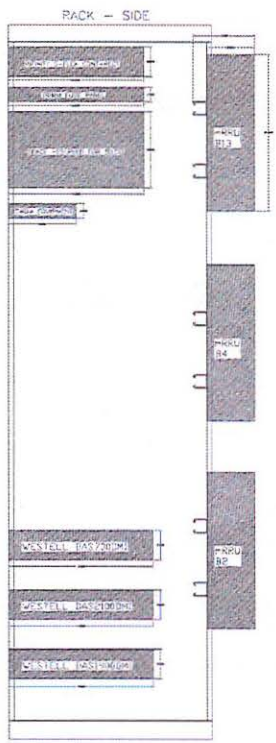
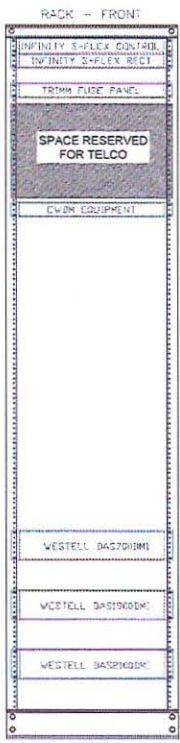
SHEET TITLE:
EQUIPMENT ELEVATIONS

SHEET NUMBER:
A-3



EQUIPMENT ELEVATIONS - HEAD END ROOM - MPOE ROOM HB380

SCALE: 1"=1'-0" 1



PROJECT INFORMATION:
SF GENERAL HOSPITAL IDAS
 PS NO.291710 / PSP NO.20140899812
 595 POTRERO AVE.
 SAN FRANCISCO, CA 94110



CURRENT ISSUE DATE:
 05/17/16

ISSUED FOR:
 100% CD

REV.	DATE	DESCRIPTION	BY
4	05/17/16	100% CD	JR
3	05/06/16	100% CD	JR
2	03/30/16	100% CD	JR
1	03/09/16	100% CD	JR
0	02/15/16	90% CD	HL

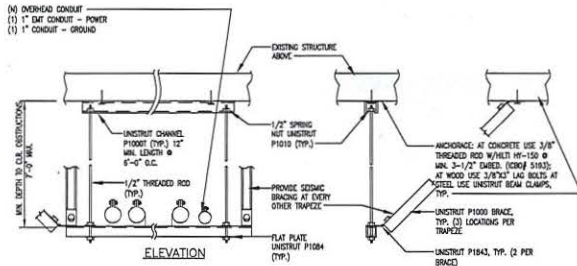
CIVIL ENGINEER:
INFINIGY8 Design, Build, Deliver.
 28455 RANCHO PINOY, SOUTH LAKE FOREST, CA 92630
 OFFICE # (949) 758-8887
 FAX # (949) 758-8833

DRAWN BY: _____ CHK.: _____ APV.: _____
 HL JR

LICENSER: _____

SHEET TITLE:
 EQUIPMENT RACK DETAILS

SHEET NUMBER:
 A-4

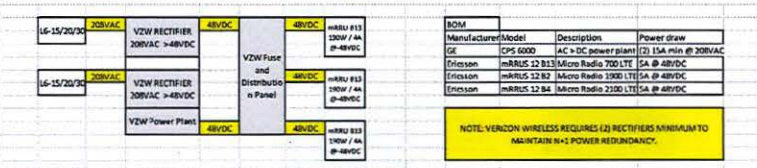


OVERHEAD CONDUIT DETAIL

SCALE: N.T.S. 7

Manufacturer	Model Number	Rack Units Required	BTU/hr
Ericsson	mRRUS 12 B13	11U (Rack 9)	500
Ericsson	mRRUS 12 B2	11U (Rack 9)	500
Ericsson	mRRUS 12 B4	11U (Rack 9)	500
Ericsson	6601 Shelf	3U (Rack 9)	1040
GE	Infinity-S	4U (Rack 9)	1100
Westell	A90-DAS700DM-S	2U (Rack 9)	N/A
Westell	A90-DAS1900D-S	2U (Rack 9)	N/A
Westell	A90-DAS2100DM-S	2U (Rack 9)	N/A
Alcatel Lucent	7705 SAR-8	2U (Rack 9)	650
Total BTU/hr (MAX)			4290

Rack 9
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34
35
36
37
38
39
40
41
42
43
44
45
46
47



NOTE: VERIZON WIRELESS REQUIRES (2) RECTIFIERS MINIMUM TO MAINTAIN N+2 POWER REDUNDANCY.

BILL OF MATERIALS

SCALE: N.T.S. 9

mRRUS

Technical Data

This section describes the physical characteristics, environmental data, and power supply of the mRRUS.

Dimensions

This section provides technical data and dimensions for the mRRUS. Table 1 and Table 2 list technical data and Figure 2 shows the dimensions for the mRRUS.

Table 1 mRRUS Technical Data

Description	Value
Maximum minimal output power	256 W
Number of carriers	WCDMA and LTE: One to four carriers (subject to license handling)

Description	Value
Frequency ⁽¹⁾	1,620 to 1,860 MHz uplink 2,110 to 2,170 MHz downlink B1 for LTE and WCDMA 1,860 to 1,920 MHz uplink 1,920 to 1,980 MHz downlink B2 for LTE and WCDMA 1,710 to 1,785 MHz uplink 1,825 to 1,885 MHz downlink B3 for LTE and WCDMA 1,710 to 1,755 MHz uplink 2,110 to 2,165 MHz downlink B4 for LTE and WCDMA 2,560 to 2,570 MHz uplink 2,020 to 2,090 MHz downlink B7 for LTE 698 to 715 MHz uplink 728 to 745 MHz downlink B12 for LTE ⁽²⁾ 777 to 787 MHz uplink 746 to 756 MHz downlink B13 for LTE ⁽²⁾

Description	Value
CPRI line rate	Up to 5 Gbits
Dimensions with Solar Shield, Handle, and Feet	
Height	400 mm
Width	285 mm
Depth	140 mm
Dimensions without Solar Shield, Handle, or Feet	
Height	380 mm
Width	240 mm
Depth	121 mm

Description	Value
Weight	
mRRUS	10 kg
Color	
White	

(1) Information about Interference Rejection (IR) can be found in the document IRIS Configurations.
 (2) B12 supports up to 16 MHz LTE, 1.4 carriers. In single carrier operation with E-UTRA, 1.4 MHz or 1.8 MHz carriers is not used. 1.4 MHz and 1.8 MHz is only used in multicarrier operation together with a wider carrier (UTRA or E-UTRA). For E-UTRA, 1.4 MHz and 1.8 MHz, the requirements on output power occupancy and sensitivity must not be fulfilled at band edge. These are to be fulfilled in any multicarrier configurations with 1.4 MHz or 1.8 MHz carrier center frequency not at 32.5 MHz offset from band edge.
 (3) B12 only supports 8 and 10 MHz LTE. Not in use on two carriers.

Table 2 mRRUS Output Power

Standard	Maximum Number of Carriers per Branch	Configurable Output Power per Branch	Minimum Configurable Carrier Output Power
WCDMA single PIAT mode	4	125 mW to 5 W	125 mW4 (15 dBm) ⁽¹⁾
LTE single standard mode	4	For 1 carrier: 125 mW to 5 W For 2 carriers: 1 W to 5 W	125 mW4 (15 dBm) 1 W4 = 250 mW (24 dBm) ⁽¹⁾
Mixed mode	4	1 W to 5 W	1 W4 = 250 mW (24 dBm) ⁽¹⁾

(1) depending on the line carrier class. Note that the mRRUS dynamic range is diminished for one carrier out of four activated.

6601 SHELF

Technical Data

This section describes the physical characteristics, environmental data, and power solution of the main unit.

Dimensions

Table 1 lists the dimensions, weight, and color of the main unit.

Table 1 Dimensions, Weight, and Color

Dimensions	Value
Height	40 mm (1.5 in.)
Width	480 mm (18.9 in.)
Depth	350 mm
For more information about dimensions, refer to Figure 3.	

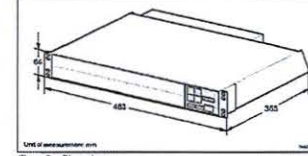


Figure 3 Dimensions

Space Requirements

This section describes the space requirements for installing the main unit in a 19-inch rack.

REV.	DATE	DESCRIPTION	BY
4	05/17/16	100% CD	JR
3	05/06/16	100% CD	JR
2	03/30/16	100% CD	JR
1	03/09/16	100% CD	JR
0	02/15/16	90% CD	HL

Table 2 mRRUS Dimensions with Solar Shield

Description	Value
Weight	
mRRUS	10 kg
Color	
White	

(1) Information about Interference Rejection (IR) can be found in the document IRIS Configurations.
 (2) B12 supports up to 16 MHz LTE, 1.4 carriers. In single carrier operation with E-UTRA, 1.4 MHz or 1.8 MHz carriers is not used. 1.4 MHz and 1.8 MHz is only used in multicarrier operation together with a wider carrier (UTRA or E-UTRA). For E-UTRA, 1.4 MHz and 1.8 MHz, the requirements on output power occupancy and sensitivity must not be fulfilled at band edge. These are to be fulfilled in any multicarrier configurations with 1.4 MHz or 1.8 MHz carrier center frequency not at 32.5 MHz offset from band edge.
 (3) B12 only supports 8 and 10 MHz LTE. Not in use on two carriers.

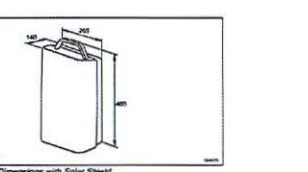
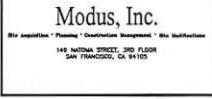


Figure 2 mRRUS Dimensions with Solar Shield



PROJECT INFORMATION:
SF GENERAL HOSPITAL IDAS
 PS NO.291710 / PSP NO.20140999812
 985 POTrero AVE
 SAN FRANCISCO, CA 94110



CURRENT ISSUE DATE:
05/17/16

ISSUED FOR:
100% CD

REV.	DATE	DESCRIPTION	BY
4	05/17/16	100% CD	JR
3	05/06/16	100% CD	JR
2	03/30/16	100% CD	JR
1	03/09/16	100% CD	JR
0	02/15/16	90% CD	HL

CIVIL ENGINEER:
INFINIGY8 Design, Build, Deliver.
 26455 RANCHO PKWY, SOUTH LAKE FOREST, CA 92680
 OFFICE # (949) 733-8807
 FAX # (949) 733-8833

DRAWN BY: _____ CHK.: _____ APV.: _____
 HL JR

LICENSER:

SHEET TITLE:

DETAILS, SPEC SHEETS, & BILL OF MATERIALS

SHEET NUMBER:

D-1

SPEC SHEETS

SCALE: N.T.S. 3

Infinity S-Flex System

Infinity S-Flex may be configured as a 48V-voltage power system. Infinity S-Flex is compatible from 25DA with a single tier for shelf and single distribution or Current Breaker Load (CBL) 2000T frame with 2-bay (shelving) up to 25DA with two-tier (shelving) and any combination of distributions. The system includes optional low-voltage battery disconnect.



Applications

- Wireless Telecom Networks
- Core/EAN
- Small Cell
- Indoor/Outdoor VRS sites
- Remote Radio Heads
- DAS
- Network
- Enterprise Applications

Key Features

- Redundant for faulting
- Front panel LED indicators
- 3U height, 9U power capacity
- 27 A 0.250 V AC input
- Digital fault clearing
- Non-pluggable
- ROPS-A compliant

Specifications

Model	25DA	50DA	75DA
Weight Range	137 lbs	225 lbs	307 lbs
Unit W x H	13 1/4" x 22 1/2"	13 1/4" x 22 1/2"	13 1/4" x 22 1/2"
Capacity	250A	500A	750A
Power Factor	0.95	0.95	0.95
Input Voltage	AC	AC	AC
Number of Outputs	4800	4800	4800
Output Current	250A / 250V	500A / 250V	750A / 250V
Output Voltage	0-28V DC	0-28V DC	0-28V DC
Max Power	4000W	10000W	15000W
Efficiency	85%	85%	85%
Operating Temperature	15°C to 60°C	15°C to 60°C	15°C to 60°C
Humidity	5% to 95%	5% to 95%	5% to 95%
Altitude	0 to 10000 ft	0 to 10000 ft	0 to 10000 ft
IP Rating	IP40	IP40	IP40
RoHS Compliant	Yes	Yes	Yes
Lead-Free	Yes	Yes	Yes
RECYCLED CONTENT	15% (Minimum)	15% (Minimum)	15% (Minimum)
RoHS Compliant	Yes	Yes	Yes
Lead-Free	Yes	Yes	Yes
RECYCLED CONTENT	15% (Minimum)	15% (Minimum)	15% (Minimum)
RoHS Compliant	Yes	Yes	Yes
Lead-Free	Yes	Yes	Yes
RECYCLED CONTENT	15% (Minimum)	15% (Minimum)	15% (Minimum)
RoHS Compliant	Yes	Yes	Yes
Lead-Free	Yes	Yes	Yes
RECYCLED CONTENT	15% (Minimum)	15% (Minimum)	15% (Minimum)
RoHS Compliant	Yes	Yes	Yes
Lead-Free	Yes	Yes	Yes
RECYCLED CONTENT	15% (Minimum)	15% (Minimum)	15% (Minimum)
RoHS Compliant	Yes	Yes	Yes
Lead-Free	Yes	Yes	Yes
RECYCLED CONTENT	15% (Minimum)	15% (Minimum)	15% (Minimum)
RoHS Compliant	Yes	Yes	Yes
Lead-Free	Yes	Yes	Yes

©2013 Westell Power Cabling | June 2013 | www.westell.com

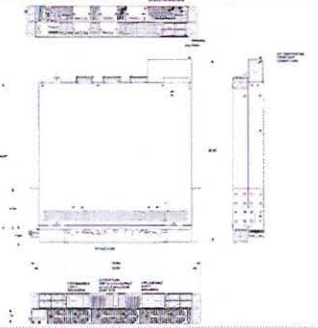
WIRELESS COMMUNICATIONS COMPONENTS

Name	Description
WCS-2000-000000000000	Wireless Core Switch (WCS) - 2000A Capacity
WCS-1000-000000000000	Wireless Core Switch (WCS) - 1000A Capacity
WCS-500-000000000000	Wireless Core Switch (WCS) - 500A Capacity

WIRELESS COMMUNICATIONS COMPONENTS

Name	Description
WCS-2000-000000000000	Wireless Core Switch (WCS) - 2000A Capacity
WCS-1000-000000000000	Wireless Core Switch (WCS) - 1000A Capacity
WCS-500-000000000000	Wireless Core Switch (WCS) - 500A Capacity

©2013 Westell Power Cabling | June 2013 | www.westell.com



©2013 Westell Power Cabling | June 2013 | www.westell.com

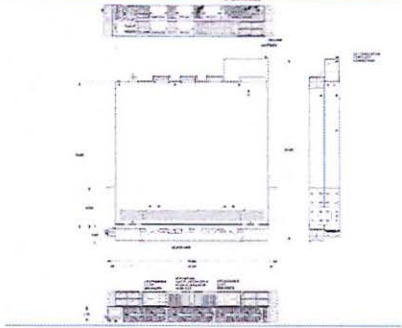
WIRELESS COMMUNICATIONS COMPONENTS

Name	Description
WCS-2000-000000000000	Wireless Core Switch (WCS) - 2000A Capacity
WCS-1000-000000000000	Wireless Core Switch (WCS) - 1000A Capacity
WCS-500-000000000000	Wireless Core Switch (WCS) - 500A Capacity

WIRELESS COMMUNICATIONS COMPONENTS

Name	Description
WCS-2000-000000000000	Wireless Core Switch (WCS) - 2000A Capacity
WCS-1000-000000000000	Wireless Core Switch (WCS) - 1000A Capacity
WCS-500-000000000000	Wireless Core Switch (WCS) - 500A Capacity

©2013 Westell Power Cabling | June 2013 | www.westell.com



©2013 Westell Power Cabling | June 2013 | www.westell.com

DAS Interface Panels

Product Specifications

Feature	Order Number 48V-023000-01	Order Number 48V-023000-02	Order Number 48V-023000-03	Order Number 48V-023000-04	Order Number 48V-023000-05
Top	3600mm (145.67 in)	3600mm (145.67 in)	3600mm (145.67 in)	3600mm (145.67 in)	3600mm (145.67 in)
Standard Interface Panel	1000mm (39.37 in)	1000mm (39.37 in)	1000mm (39.37 in)	1000mm (39.37 in)	1000mm (39.37 in)
Depth	100mm (3.94 in)	100mm (3.94 in)	100mm (3.94 in)	100mm (3.94 in)	100mm (3.94 in)
Weight	10kg (22.05 lb)	10kg (22.05 lb)	10kg (22.05 lb)	10kg (22.05 lb)	10kg (22.05 lb)
Material	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum
Color	Black	Black	Black	Black	Black
Finish	Matte	Matte	Matte	Matte	Matte
Dimensions	1000 x 1000 x 100 mm	1000 x 1000 x 100 mm	1000 x 1000 x 100 mm	1000 x 1000 x 100 mm	1000 x 1000 x 100 mm
Weight	10kg (22.05 lb)	10kg (22.05 lb)	10kg (22.05 lb)	10kg (22.05 lb)	10kg (22.05 lb)

Feature Highlights

- 10U 2-bay unit (10U) height
- Universal mounting brackets are included to enable mounting in 19" and 23" racks
- Temperature derated for outdoor applications
- Stand-off aluminum construction with powder-coated anodized front base plate
- Flush mount or 0.75 protrusion
- Other models available, contact Westell for details

 www.westell.com 800.377.8700	Westell, Inc. 750 N. Commerce Drive Aurora, IL 60504	 The DAS Group 3100 S. River Street Chicago, IL 60607	 RLM, Inc. 1000 W. Lake Street Chicago, IL 60606
-------------------------------------	--	--	---

VERIZON WIRELESS
2785 MITCHELL DRIVE
WALNUT CREEK, CA 94598

PROJECT INFORMATION:
**SF GENERAL HOSPITAL
 iDAS**
 PS NO.291710 / PSP NO.20140999812
 995 POTRERO AVE.
 SAN FRANCISCO, CA 94110

Modus, Inc.

149 NATOMA STREET, 3RD FLOOR
 SAN FRANCISCO, CA 94103

CURRENT ISSUE DATE:
05/17/16

ISSUED FOR:
100% CD

REV.	DATE	DESCRIPTION	BY
4	05/17/16	100% CD	JR
3	05/06/16	100% CD	JR
2	03/30/16	100% CD	JR
1	03/09/16	100% CD	JR
0	02/15/16	90% CD	HL

CIVIL ENGINEER:
INFINIGY8 Design
 Build.
 Deliver.
 28455 RANCHO PIKYWAY, SOUTH
 LAKE FOREST, CA 92530
 OFFICE # (949) 753-0807
 FAX # (949) 753-6833

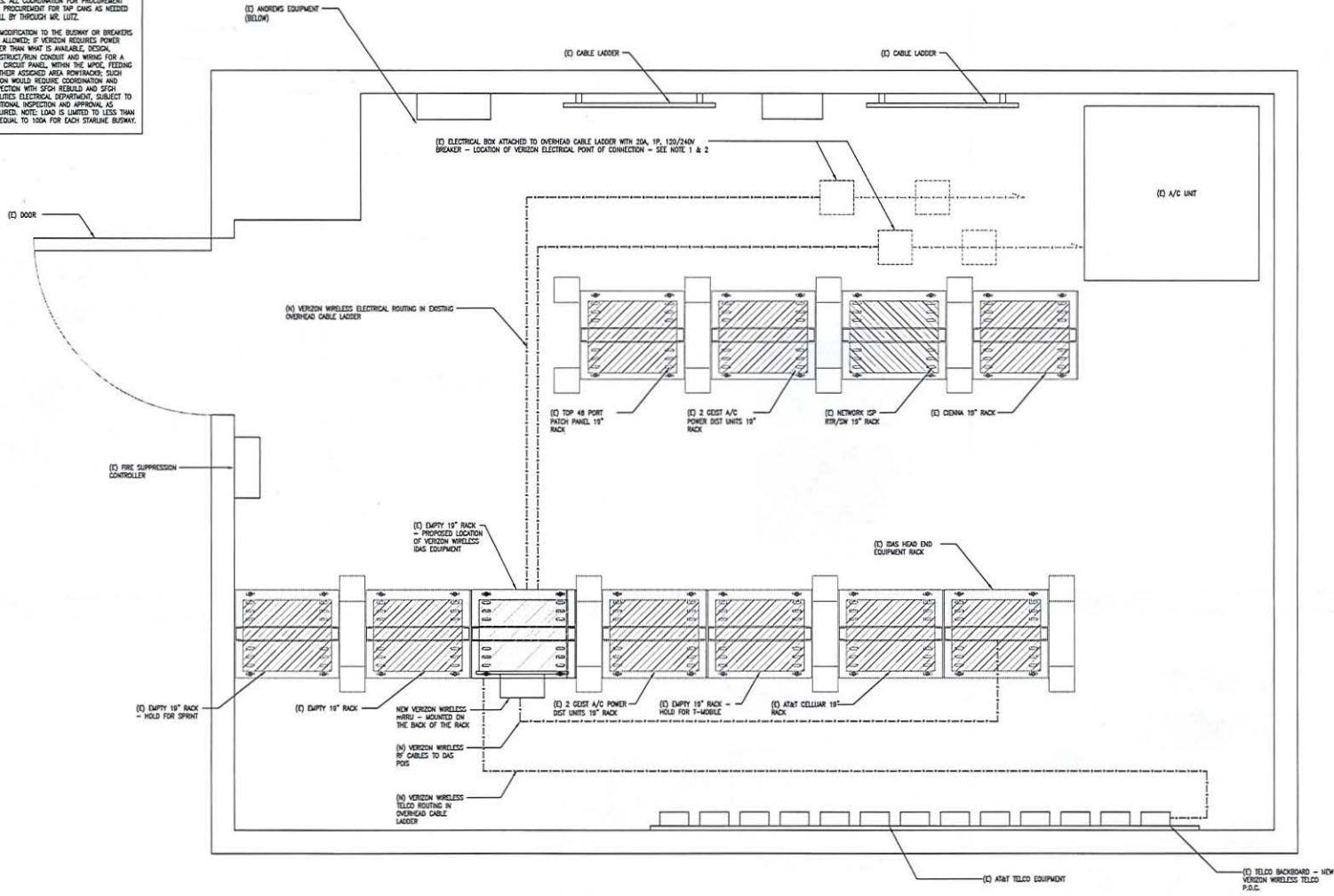
DRAWN BY: _____ CHK.: _____ APV.: _____
HL JR


LICENSER:

SHEET TITLE:
SPEC SHEETS

SHEET NUMBER:
D-2

- NOTE:
1. VERIZON/ VERIZON VENDORS SHALL FURNISH AND PROVIDE AT THEIR COST TO SFGH (DUCKENBERG SAN FRANCISCO GENERAL), THE SPECIFIC TAPING FROM STAIRWELL THAT'S IS REQUIRED FOR THEIR APPLICATION (ELECTRICAL REQUIREMENTS) BOTH FOR 20AMP AND 208 20AMP AND HANGABLE VENDOR IS TO WORK WITH MR. LUTZ, WALTER/ANALYST, AN ELECTRICAL STAIRWELL TAPING REPRESENTATIVE TO PROVIDE AND DELIVER FOR INSTALLATION THE REQUIRED UNITS. ALL COORDINATION FOR PROCUREMENT AND PROCEDURES FOR 10' CANS AS NOTED SHALL BY THROUGH MR. LUTZ.
 2. NO MODIFICATION TO THE BUDGET OR BREAKERS ARE ALLOWED, IF VERIZON REQUIRED POWER OTHER THAN WHAT IS AVAILABLE, DESIGN, CONDUIT/PAN CONDUIT AND WIRING FOR A NEW CIRCUIT PANEL, WITHIN THE MPOE, FEEDING TO THEIR ASSOCIATED AREA ROWTRACKS; SUCH ACTION WOULD REQUIRE COORDINATION AND INSPECTION WITH SFGH RESULT AND SFGH FACILITIES ELECTRICAL DEPARTMENT, SUBJECT TO ADDITIONAL INSPECTION AND APPROVAL, AS REQUIRED. NOTE LOAD IS LIMITED TO LESS THAN OR EQUAL TO 150A FOR EACH STAIRWELL BUDGET.





VERIZON WIRELESS
2785 MITCHELL DRIVE
WALNUT CREEK, CA 94598

PROJECT INFORMATION:
SF GENERAL HOSPITAL IDAS
PS NO.291710 / PSP NO.20140998812
985 POTRERO AVE.
SAN FRANCISCO, CA 94110

Modus, Inc.
Modus Inc. is a subsidiary of "PacifiCorp" (a subsidiary of "PacifiCorp") and is located at:
145 NATURAL STREET, 3RD FLOOR
SAN FRANCISCO, CA 94109

CURRENT ISSUE DATE:
05/17/16

ISSUED FOR:
100% CD

REV.	DATE	DESCRIPTION	BY
4	05/17/16	100% CD	JR
3	05/06/16	100% CD	JR
2	03/30/16	100% CD	JR
1	03/09/16	100% CD	JR
0	02/15/16	90% CD	HL

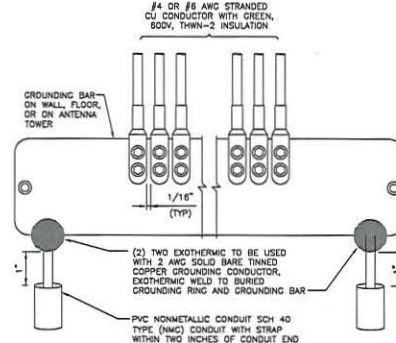
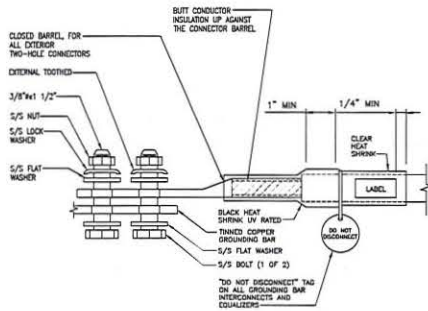
CIVIL ENGINEER:
INFINIGY8 Design, Subg., Deliver.
28455 RANDOLPH PKWY., SOUTH
LAKE FOREST, CA 92550
OFFICE # (949) 753-8877
FAX # (949) 753-8533

DRAWN BY: _____ CHK.: _____ APV.: _____
HL JR

LICENSER: _____

SHEET TITLE:
ELECTRICAL ROUTING

SHEET NUMBER:
E-1



NOTUSED

SCALE: 4

EXTERIOR TWO HOLE LUG

SCALE: 3

GROUNDING BUSS BAR

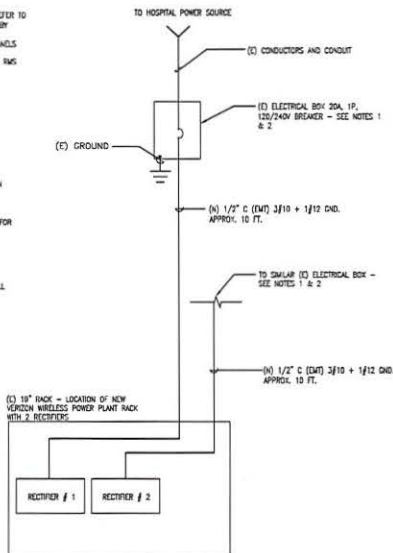
SCALE: 2

SINGLE LINE DIAGRAM NOTES:

- FOR COMPLETE INTERNAL WIRING AND ARRANGEMENTS, REFER TO NOTES (SEE MATERIALS LIST), PROVIDED AND INSTALLED BY CHELTER MANUFACTURER.
- PROVIDE A MIN. 3" WORK CLEARANCE IN FRONT OF PANELS AND SERVICE EQUIPMENT.
- ALL BREAKERS IN THE PANEL ARE TO BE RATED 40,000 RMS SYMMETRICAL, 100% 240V MAX, 75° C.
- ALL WIRING SHALL BE RATED FOR 75° C.
- CONDUIT REQUIREMENTS (TYP. UNLESS):
 - UNDERGROUND: PVC (SCH. 40 OR SCH. 80).
 - INDOOR: EMT (RIGID IN TRAFFIC AREAS).
 - OUTDOOR (AERIAL SPACES): RIG.

GENERAL UTILITY NOTES:

- UTILITY POINTS OF SERVICE AND WORK/MATERIALS SHOWN ARE BASED UPON INFORMATION PROVIDED BY THE UTILITY COMPANIES AND ARE FOR BID PURPOSES ONLY.
- CONTRACTOR SHALL COORDINATE WITH UTILITY COMPANY FOR FINAL AND EXACT WORK/MATERIALS REQUIREMENTS AND CONSTRUCT TO UTILITY COMPANY ENGINEERING PLANS AND SPECIFICATIONS ONLY. CONTRACTOR SHALL FURNISH AND INSTALL ALL CONDUIT, PULL ROPES, CABLES, PULL BOXES, CONDUITE ENCLOSURE OF CONDUIT IF REQUIRED). TRANSFORMER TAP, BARRIERS, POLE SETS, TRENCHING, SHOULD PAY ALL UTILITY COMPANY FEES, AND INCLUDE ALL REQUIREMENTS IN SCOPE OF WORK.



SINGLE LINE DIAGRAM

SCALE: 5

NOT USED

SCALE: 1

NOTE:
 1. VERIZON/ VERIZON VENDORS SHALL FURNISH AND PROVIDE AT THEIR COST TO 25FC (DUCKPOND SAN FRANCISCO GENERAL); THE SPECIFIC TAGS FROM STARLINE THAT'S IS REQUIRED FOR THEIR APPLICATION (ELECTRICAL REQUIREMENTS) BOTH 200 20AMP AND 200 50AMP ARE AVAILABLE. VENDOR IS TO WORK WITH MIKE LUTZ WALTER@MPLS2.ELECTRICAL CONSULTING TO OBTAIN AN ELECTRICAL TAGS FROM REPRESENTATIVE TO PROVIDE AND DELIVER FOR INSTALLATION THE REQUIRED UNITS. ALL COORDINATION FOR PROSECUTANT AND PROCUREMENT FOR TAG CANS AS NEEDED SHALL BE THROUGH MI. LUTZ.

2. NO MODIFICATION TO THE BUDGET OR BREAKERS ARE ALLOWED. IF VERIZON REQUIRES POWER OTHER THAN WHAT IS AVAILABLE. DESIGN, CONSTRUCTION CONDUIT AND WIRING FOR A NEW CIRCUIT PANEL WITH THE MPO, FEEDING TO THEIR ASSIGNED AREA REPRESENTATIVE. SUCH ACTION WOULD REQUIRE COORDINATION AND INSPECTION WITH SIGN REGULARS AND SPEC FACILITIES ELECTRICAL DEPARTMENT. SUBJECT TO ADDITIONAL INSPECTION AND APPROVAL AS REQUIRED. NOTE: LOAD IS LIMITED TO LESS THAN OR EQUAL TO 100A FOR EACH STARLINE BUSBAR.

Verizonwireless
 VERIZON WIRELESS
 2785 MITCHELL DRIVE
 WALNUT CREEK, CA 94598

PROJECT INFORMATION:
SF GENERAL HOSPITAL IDAS
 PS NO.291710 / PSP NO.20140988912
 995 POTRERO AVE.
 SAN FRANCISCO, CA 94110

Modus, Inc.
 148 NATOMA STREET, 3RD FLOOR
 SAN FRANCISCO, CA 94103

CURRENT ISSUE DATE:
05/17/16

ISSUED FOR:
100% CD

REV.	DATE	DESCRIPTION	BY
4	05/17/16	100% CD	JR
3	05/06/16	100% CD	JR
2	03/30/16	100% CD	JR
1	03/09/16	100% CD	JR
0	02/15/16	90% CD	HL

CIVIL ENGINEER:
INFINIGY8 Design, Build, Deliver.
 26455 RANCHO PINNY, SOUTH LAKE FOREST, CA 92630
 OFFICE # (949) 724-8807
 FAX # (949) 724-8833

DRAWN BY: _____ CHK.: _____ APV.: _____
 HL JR

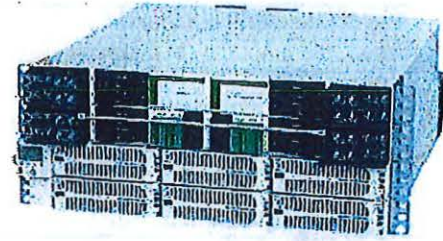
LICENSER:

SHEET TITLE:
 SINGLE LINE DIAGRAM

SHEET NUMBER:
E-2

Infinity S-Flex System

Infinity S-Flex may be configured as a -48V voltage power system. Infinity S-Flex is configurable from 150A with a single rectifier shelf and single distribution (4 Circuit Breaker Load & 12GMT Fuses with 2 Bulk Battery inputs) up to 250A with two rectifier shelves and any combination of distributions. The system includes optional low voltage battery disconnect.



Applications

- Wireless Telecom Networks
- C-RAN
- Small Cell
- Indoor/Outdoor Wireless
- Remote Radio Sites
- DAS
- Backhaul
- Enterprise Applications

Key Features

- Redundant fan cooling
- Front panel LED indicators
- 1U height, hi power density
- 277/220/110 V AC input
- Digital load sharing
- Hot pluggable
- RoHS 6 compliant

Specifications

INPUT	MIN	TYP	MAX
Voltage Range			
- High-Line	175Vac	220Vac	305Vac
- Low-Line	85Vac	110Vac	140Vac
Frequency	45Hz	60Hz	66Hz
Power Factor	98%	99.5%	
Total Harmonic Distortion	5%		

PRIMARY OUTPUT

Nominal Voltage	-48Vdc
Output (Power / Current)	250A / 13.5kW
V _o Setpoint (factory)	-54.5Vdc±1%
V _o Range	-42Vdc to -58Vdc
Regulation	±0.5%

MECHANICAL

Height (in. /mm)	3.5 / 89 (Base System with 1 power shelf)
Width (in. /mm)	19 / 484 (System Only) 23 / 584 (Mounted in Frame)
Depth (in. /mm)	16.75 / 425 (No AC Cover) 18.75 / 476 (With AC Cover)
Weight (lb / Kg)	18 / 8.2 (Base System with 1 power shelves)

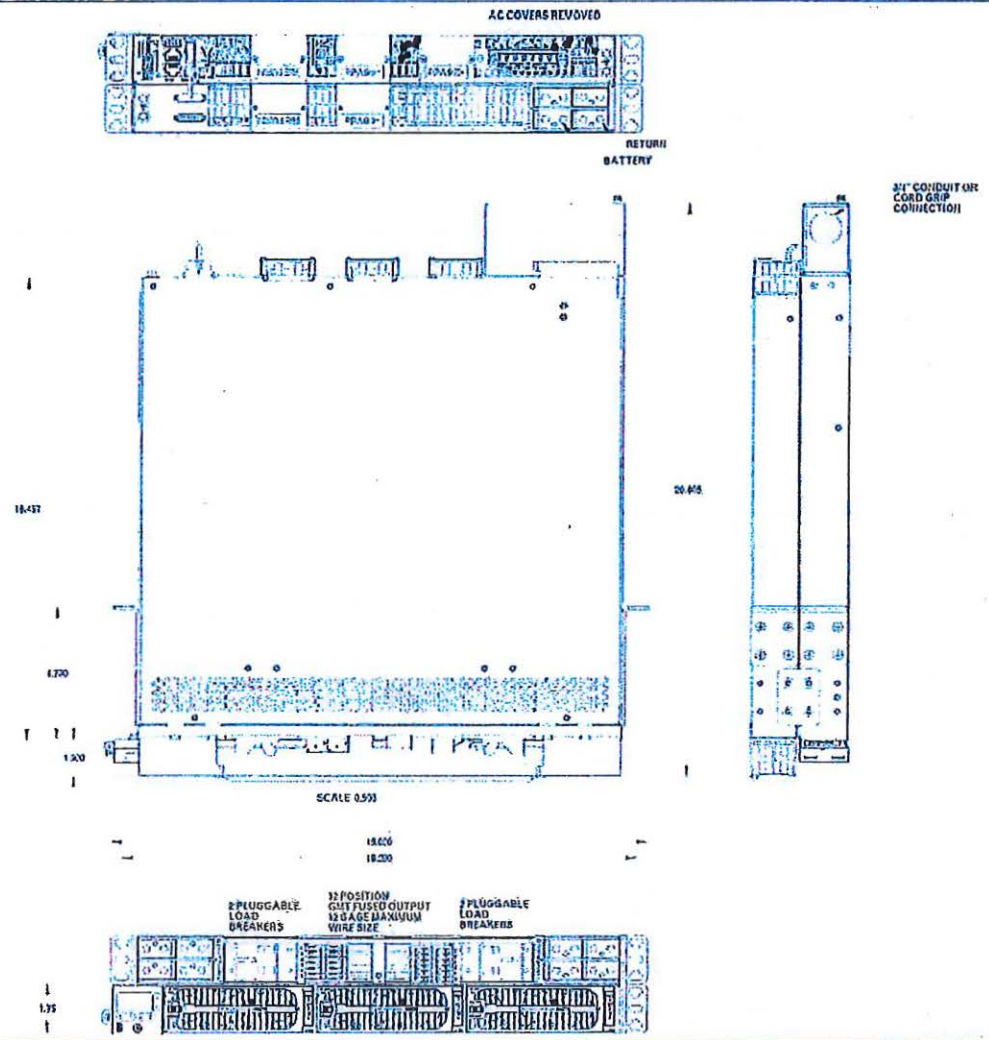
ENVIRONMENTAL

Operating Temperature	-40°C to +75°C (-40°F to 167°F)
Storage Temperature	-40°C to +85°C (-40°F to 185°F)
Relative Humidity	95% max, non-condensing
Altitude	4000M (for altitudes above 2000M, peak operating temperature de-rates 0.656° C /100M; 4000M peak temperature rating is 62° C)

SAFETY AND STANDARDS COMPLIANCE	
NEBs	Evaluated by independent NRTL test lab to Telcordia GR63-CORE and GR1089-CORE [Level 3]
Safety	CSA C22.2 No. 60950-1-07, 2nd Ed. + A1:2001 (MOD) Certified for Canada and U.S.; UL60950-1 2nd Ed.
RoHS	Compliant to RoHS EU Directive 2002/95/EC RoHS 5/6
EMC	European Directive 2004/108/EC; EN55022, Class A; EN55024; FCC, Class A; GR1089-CORE

AGENCY CERTIFICATIONS	
CSA	CSA C22.2 No 60950-1-07, 2nd Ed. + A1:2001 (MOD) and UL 60950-1 2nd Ed
EM/EMC	European Directive 2004/108/EC; EN55022 (CISPR22) Class A; EN55024 (CISPR24)
NEBS LEVEL 3	GR1089-CORE Special equipment room cooling may be needed - heat dissipation exceeds values of GR-63 Table 4-5

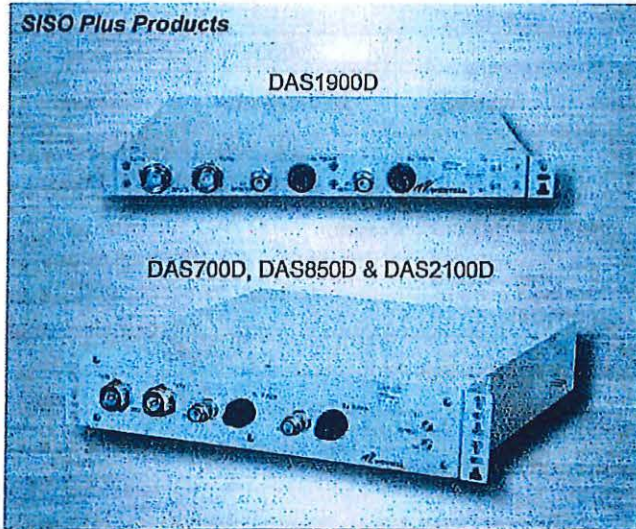
OUTLINE DRAWING (FOR VISUAL REFERENCE ONLY)



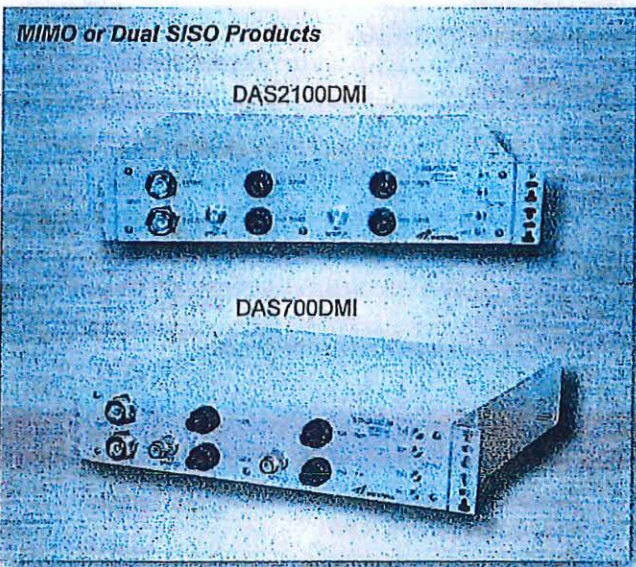


DAS Interface Panels

DAS850/1900/700/2100 MHz



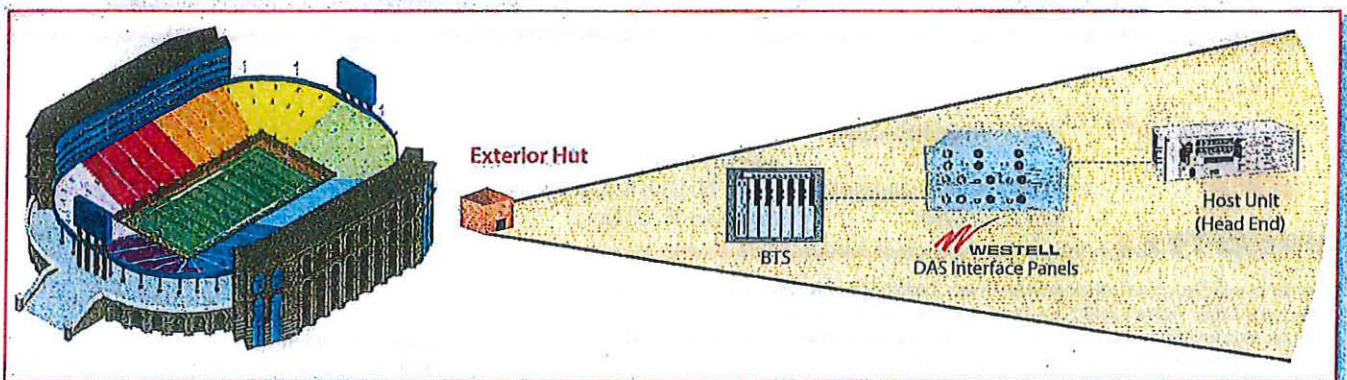
Many smartphone users in a concentrated area can quickly cripple the network's data throughput. Examples of this can be experienced at venues such as stadiums, convention centers, hospitals and college campuses. Service providers are increasingly implementing a distributed antenna system (DAS) to create a small cell infrastructure that will relieve the burden on the macro network. A critical component in a fiber-fed DAS is the head end where RF signals are converted to optical signals. Carriers must ensure the RF power levels are appropriately adjusted for the DAS head end equipment. Westell, a trusted partner to service providers for more than 30 years, has developed a DAS interface panel that will ensure RF power is safely delivered throughout the system.



Westell's DAS interface panels reduce installation time, require minimal rack space, are convection cooled, require no AC or DC power and provide RF power adjustments without interrupting service.

The DAS interface trays are located between the base transceiver station (BTS) and the head end of the DAS. The DAS850/1900/700/2100 provides the proper power levels for the downstream DAS equipment and can be connected to two BTSs simultaneously. Both transmit and receive power levels can be monitored and adjusted without disconnecting from the BTS or the DAS head end.

The 1900 is a 1RU model, while the 850, 700 and 2100 are 2RU models. The 850 covers the cellular band, the 1900 is for the PCS band, the 700 is for the upper/lower 700 MHz band, and the 2100 covers the AWS band.



DAS Interface Panels

Product Specifications¹

Feature	Order Number ² A90-DAS850D-D ³ A90-DAS850D-S	Order Number ² A90-DAS700D-D ³ A90-DAS700D-S	Order Number ² B90-DAS1900D-D ³ A90-DAS1900D-S	Order Number ² A90-DAS2100D-D ³ A90-DAS2100D-S	Order Number ² A90-DAS700DMI-D ³ A90-DAS700DMI-S	Order Number ² A90-DAS2100DMI-D ³ A90-DAS2100DMI-S
Electrical						
Type	SISO Plus Products				MIMO or Dual SISO Products	
Operating Frequency Range	Cellular Band	700 MHz Bands	PCS Band	AWS Band	700 MHz Bands	AWS Band
Power Handling (7/16" DIN)	60 watts/port at 55°C (131°F) 40 watts/port at 65°C (149°F)				65 watts/port at 55°C (131°F) 60 watts/port at 65°C (149°F)	
IMD at TX/RX port in RX Band (typical)	-118dBm or -161dBc (two +43dBm input signals)					
Peak Power	1 KW					
MIn Isolation	70 dB					
TX Insertion Loss (typ.)	20 dB				15 dB	
RX Insertion Loss (typ.)	5.5 dB				2 dB	
Adjustable Tx Power	Attenuates from 0-50 dB (1 dB increments)					
Adjustable Rx Power	Attenuates from 0-50 dB (1 dB increments)					
Mechanical						
BTS Inputs	7/16" DIN (Female)					
DAS or Head End Connections	Female: QMA or SMA (specified by ordering #)					
Tx & Rx Monitoring Ports	N-type (Female)					
Dimensions (depth includes front panel knobs)	2RU H x 17" W x 19.91" D (Depth excluding front knobs 18.43")	2RU H x 17" W x 18.14" D (Depth excluding front knobs 16.65")	1RU H x 17" W x 23.92" D (Depth excluding front knobs 22.46")	2RU H x 17" W x 18.14" D (Depth excluding front panel knobs 16.65")		
Weight	25 lbs				30 lbs	
Environmental						
Operating Temp. Range	-40° C to +65° C					

1) Specifications subject to change. 2) Provided with QMA connectors for DAS head end connections. 3) Provided with SMA connectors for DAS head end connections.

Feature Highlights

- 1 or 2 rack unit (RU) height
- Universal mounting brackets are included to enable mounting in 19" and 23" racks
- Temperature hardened for outdoor applications
- Sturdy aluminum construction with powder-coated enamel painted face plate
- Flush mount or 5" projection
- Other models available; contact Westell for details



www.westell.com

Inside Sales / Support:
800.377.8766

Westell, Inc.
750 N. Commons Drive
Aurora, IL, 60504



Westell is a registered trademark of Westell, Inc. Availability of features and specifications subject to change without notice. This document is the property of Westell, Inc. and its contents are proprietary and may neither be copied, reproduced nor its contents disclosed to others without prior written agreement from Westell.

Copyright 2013 Westell, Inc.
All rights reserved.

1302IARIJ

DRAFT



7705 Chassis-Environmental-Power Specifications



Kamlesh Patel (VZW CT)

March 26, 2009

(Based on R2.0 Installation Guide)

7705 Chassis Specifications

Parameter	Description
Dimensions (without mounting brackets)	(3.5 x 17.5 x 9.8 in.) (H x W x D) (8.9 x 44.4 x 25 cm)
Chassis weight (unpopulated)	8.4 lbs (3.8 kg)
Chassis weight (FAM, 2 x CSM, 2 x Ethernet cards, 4 x ASAP cards)	16 lbs (7.3 kg)
Adapter card slots	6
Fan module slots	1
CSM slots	2
Mounting	Mount in a recommended 19-inch equipment rack Rack-mount brackets are factory-installed for 19-inch NEBS mounting

7705 Environmental Specs

Parameter	Description
Normal operating temperature	41 to 113°F (5 to 45°C) or -40° to 149°F (-40° to 65°C – extended temperature range)
Short-term operating temperature (1)	23 to 131°F (-5 to 55°C) or -40° to 149°F
Cold-start temperature	-4°F (-20°C)
Relative humidity	5 to 85% (non-condensing)
Short-term relative humidity (1)	5 to 95%, not to exceed 0.024 lb of water per 1.0 lb of air (35 g of water per 1.0 cubic meter of air)

7705 Environmental Specifications (continued)

Parameter	Description
Altitude range	Between 197 ft. (60 m) below sea level and 5906 ft (1800 m) above sea level (70kPa to 106kPa) (4000 meters is supported up to 42°C)
Shock and vibration	Very low levels for continuous duration disturbance (similar to modern office building, for example) Shock: 3 g half sine 11 ms Vibration: 0.1 g from 5 to 100 Hz
Earthquake	Suitable for high risk areas (Zone 4/California, for short duration disturbance)
Pollution degree ⁽²⁾	2
Rated voltage (DC)	-48/-60 VDC (-60 VDC is for various European countries) or +24 VDC
Operating voltage range (DC)	-40 to -75 VDC or +20.0 to +28.3 VDC
Heat dissipation (worst case configuration)	190 W
Acoustic noise level	73.5 dBA

Notes:

1. Short-term is a period of less than 96 consecutive hours and a total of no more than 15 days per year. This is equivalent to 360 hours per year, with short-term periods occurring no more than 15 times per year.
2. Pollution degree is as defined in IEC 60950.

Card Specifications

Adapter Card Specifications (T1 card and Ethernet Card)

Parameter	Description
Dimensions (H x W x D)	(6.7 x 0.9 x 8.7 in.) (17.0 x 2.24 x 22.0 cm)
Weight	0.84 lbs (0.38 kg) (16-port T1/E1 ASAP card) 0.77 lbs (0.35 kg) (8-port Ethernet card)

CSM Card Specifications

Parameter	Description
Dimensions (H x W x D)	(6.7 x 0.9 x 8.7 in.) (17.0 x 2.24 x 22.0 cm)
Weight	0.88 lbs (0.4 kg)

Fan Module Card Specifications

Parameter	Description
Dimensions (H x W x D)	(6.7 x 0.9 x 8.7 in.) (8.43 x 2.24 x 22.0 cm)
Weight	0.81 lbs (0.37 kg)

Component Power Consumption

Component	Power (Watts) (conservative estimate)
Chassis ⁽¹⁾ (no fans, no cards)	0 W
Fan module	28 W
CSM	17 W
Adapter cards	
16-port T1/E1 ASAP Adapter card (a16-chds1)	17 W
8-port Ethernet Adapter card (a8-eth)	20 W
8-port Ethernet Adapter card, version 2 (a8-ethv2)	20 W
4-port OC3/STM1 Clear Channel Adapter card	21 W

Note:

1. The chassis itself consumes no power because it has no power dissipating components once the fans and cards are removed.

SAR-8 Power Consumption

SAR-8

- ▣ Rated voltage (DC): -48 or +24 VDC
- ▣ Operating voltage range (DC): Specified on slide 4
- ▣ Circuit breaker or fuse with the following recommended rating must be provided:
 - for -48v systems: 5A (min) and 10A (max)
 - for +24v systems: 10A (min) and 20 A (max)
- ▣ Worst Case configuration power consumption: 182W (with available cards today)

7705 Config #4: Power Consumption

7705 Component	Watts	Qty	Power Usage
CSM	17	2	34
Fan Module	28	1	28
Ethernet Card	20	2	40
Total power consumption			102
Amps needed at -48v			3
Amps needed at -40v			3
Amps needed at +24v			5

7705 Config #1: Power Consumption

7705 Component	Watts	Qty	Power Usage
CSM	17	1	17
Fan Module	28	1	28
T1 Card	17	1	17
Ethernet Card	20	1	20
Total power consumption			82
Amps needed at -48v			2
Amps needed at -40v			3
Amps needed at +24v			4

7705 Config #2: Power Consumption

7705 Component	Watts	Qty	Power Usage
CSM	17	1	17
Fan Module	28	1	28
Ethernet Card	20	2	40
Total power consumption			85
Amps needed at -48v			2
Amps needed at -40v			3
Amps needed at +24v			4

7705 Config #3: Power Consumption

7705 Component	Watts	Qty	Power Usage
CSM	17	2	34
Fan Module	28	1	28
T1 Card	17	1	17
Ethernet Card	20	1	20
Total power consumption			99
Amps needed at -48v			3
Amps needed at -40v			3
Amps needed at +24v			5

Power Recommendation

- ❑ -48v power feeds, 7705 draws 3.8 amps for a fully loaded chassis. After factoring in 125% safety factor, VZW would need 7.5 Amps breakers/fuses (next available breaker/fuse size).
- ❑ +24v power feeds, 7705 draws 7.58 amps for a fully loaded chassis. After factoring in 125% safety factor, VZW would need 10 Amps breakers/fuses.
- ❑ VZW may implement 10 amps breakers/fuses for any cell site (-48v or +24v) for consistency and breaker/fuses availability reasons.

Monitoring Temperature

The operation of the fans in the version 2 fan modules (introduced in Release 2.0) are controlled by software and hardware based on the following temperature monitoring.

- The air temperature inside the 7705 SAR-8 is continually monitored by a hardware-controlled temperature switch on the fan module. Fans turn ON when the temperature at the switch exceeds 107°F (42°C) and OFF when the temperature drops below 89°F (32°C). This temperature monitoring is present even in the absence of the CSMs.
- During normal operation, the CSMs and adapter card temperatures are monitored by temperature sensors on each card. Fans are forced ON if any of the sensors exceeds 131°F (55°C). Fans will remain forced on (regardless of what the hardware-controlled temperature switch on the fan module indicates) until all the card temperatures reach or drop below 50°F (10°C).

An overheat alarm is raised if any card sensor temperature reaches or exceeds 167°F (75°C).

Card Temperatures

Each CSM and adapter card has temperature sensors to continuously monitor its own temperature and report the temperature to the CSM. The CSM continuously monitors the temperature reported from any card that is in the system abnormal temperature state.

- If the temperature of any adapter card exceeds 185°F (85°C), the card is rebooted by software. When the card comes up, it will display as being in the failed state, with the reason “Card has overheated”. Once the temperature drops to 158°F (70°C) or below, the card will go into the “booting” state and complete its reboot cycle.
- If the temperature of any card exceeds 243°F (117°C), the card is shut down until the temperature drops to an operationally safe temperature. At that point, the card will automatically reboot and be brought back into service.

Remote Radio Unit Description

mRRUS 12

DESCRIPTION

Copyright

© Ericsson AB 2014. All rights reserved. No part of this document may be reproduced in any form without the written permission of the copyright owner.

Disclaimer

The contents of this document are subject to revision without notice due to continued progress in methodology, design and manufacturing. Ericsson shall have no liability for any error or damage of any kind resulting from the use of this document.

Trademark List

All trademarks mentioned herein are the property of their respective owners. These are shown in the document Trademark Information.



Contents

1	Introduction	1
1.1	Warranty Seal	1
2	Product Overview	2
2.1	Main Features	3
2.2	Optional Equipment	3
3	Technical Data	4
3.1	Dimensions	4
3.2	Installation Recommendations	7
3.3	Space Requirements	9
3.4	Radio Frequency Electromagnetic Exposure	15
3.5	Acoustic Noise	15
3.6	Environmental Characteristics	15
3.7	Mains Supply Characteristics	17
3.8	System Characteristics	19
4	Hardware Architecture	20
4.1	Solar Shield	21
4.2	Heatsink	21
4.3	Installation Hatch	21
4.4	Integrated Antenna	21
5	Connection Interfaces	22
5.1	Position A, Optical Indicators	24
5.2	Position B, Maintenance Button	25
5.3	Position C and D, Interface for Optical Cable to Main Unit	25
5.4	Position E, External Alarm Interface	26
5.5	Position F, Power Supply Interface	26
5.6	Position G, Grounding Interface	27
5.7	Position H and I, Antenna Connection Interfaces	28
5.8	Supported Cable Dimensions	29
5.9	Optional Equipment Interfaces	29
6	Standards, Regulations, and Dependability	34



Remote Radio Unit Description

6.1	Regulatory Approval	34
6.2	Other Standards and Regulations	37



1 Introduction

This document describes the micro Remote Radio Unit multi-Standard (mRRUS) 12, which is a small Remote Radio Units (RRU) with an integrated Power Supply Unit (PSU) and optionally an integrated antenna.

Note: RRU is often used as a generic expression for a remotely installed Radio Unit (RU). It is also the name of models prior to the RRUS versions described in this document, for example Remote Radio Unit Wideband (RRUW).

1.1 Warranty Seal

The unit is equipped with a warranty seal sticker.

Note: Seals implemented by Ericsson must not be broken or removed, as it otherwise voids warranty.



2 Product Overview

The mRRUS expands coverage and performance in denser urban areas, where the use of small handheld devices demand high capacity on the operators networks. The mRRUS is designed to be located below roof level in cities and in demanding radio environments. Requirements include Power Line Disturbance (PLD) and blocking and receiver sensitivity.

The mRRUS is adapted for mobile broadband in Heterogeneous Network configurations in urban environments, characteristic that is not presently available with the conventional RRUS. The mRRUS can be connected in a star or cascade configuration using optical cable links.

A fiber optic cable connects the mRRUS to the main unit, as shown in Figure 1, or to an expanded macro RBS.

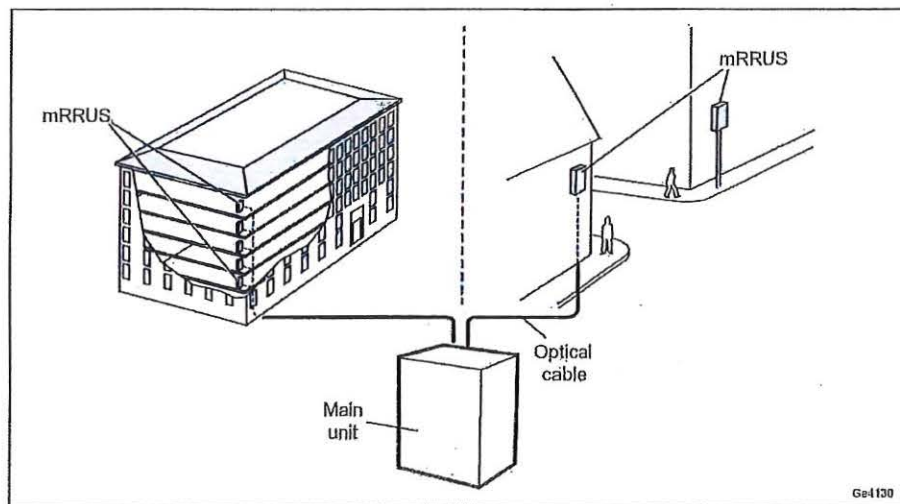


Figure 1 mRRUSs Connected to a Main Unit

The mRRUS is available in the following four variants:

- Integrated AC-PSU and integrated antenna
- Integrated DC-PSU and integrated antenna
- Integrated AC-PSU and external antenna ports
- Integrated DC-PSU and external antenna ports



2.1 Main Features

The mRRUS supports Wideband Code Division Multiple Access (WCDMA) and Long Term Evolution (LTE); detailed information about each band can be found in Section 3.1 on page 4.

The mRRUS has duplex transmitter/receiver (2TX/2RX) branches.

The mRRUS supports up to 5 Gbit/s CPRI (optical).

The mRRUS complies with 3GPP base station classes Medium Range (MR) and Local Area (LA); relevant standards are listed in Section 6.1.4 on page 36.

For LTE and WCDMA configurations with dual TX RRUSs, redundancy can be achieved by cross-connecting the antenna feeders between the mRRUS and the antenna. For more information, refer to *Cross-Sector Antenna Sharing Redundancy and Antenna System Equipment*.

2.2 Optional Equipment

The optional equipment for the mRRUS is the following:

- Wall or pole installation equipment
- TX-monitor equipment
- Semi-integrated omni antenna equipment

For information on how to install the wall or pole installation equipment, see *Installing mUnit Base Mount*, *Installing mUnit Small Clamps*, and *Installing mUnit Hose Plate*.

For information on how to install the TX-monitor equipment, see *Quick Guide (TX Monitor Package, mRRUS 12)*.

For information on how to install the semi-integrated omni antenna equipment, see *Installing mUnit Omni Support*.



3 Technical Data

This section describes the physical characteristics, environmental data, and power supply of the mRRUS.

3.1 Dimensions

This section provides technical data and dimensions for the mRRUS.

Table 1 and Table 2 list technical data and Figure 2 shows the dimensions for the mRRUS.

Table 1 mRRUS Technical Data

Description	Value
Maximum nominal output power	2x5 W
Number of carriers	WCDMA and LTE: One to four carriers (subject to license handling)



Description	Value
Frequency ⁽¹⁾	1,920 to 1,980 MHz uplink 2,110 to 2,170 MHz downlink B1 for LTE and WCDMA 1,850 to 1,910 MHz uplink 1,930 to 1,990 MHz downlink B2 for LTE and WCDMA 1,710 to 1,785 MHz uplink 1,805 to 1,880 MHz downlink B3 for LTE and WCDMA 1,710 to 1,755 MHz uplink 2,110 to 2,155 MHz downlink B4 for LTE and WCDMA 2,500 to 2,570 MHz uplink 2,620 to 2,690 MHz downlink B7 for LTE 699 to 715 MHz uplink 729 to 745 MHz downlink B12 for LTE ⁽²⁾ 777 to 787 MHz uplink 746 to 756 MHz downlink B13 for LTE ⁽³⁾
CPRI line rate	Up to 5 Gbit/s
Dimensions with Solar Shield, Handle, and Feet	
Height	460 mm
Width	265 mm
Depth	140 mm
Dimensions without Solar Shield, Handle, or Feet	
Height	380 mm
Width	240 mm
Depth	121 mm



Description	Value
Weight	
mRRUS	10 kg
Color	
White	

(1) Information about Instantaneous Bandwidth (IBW) can be found in the document RBS Configurations.

(2) B12 supports up to 15 MHz LTE, 1-4 carriers. In single carrier operation with E-UTRA, 1.4 MHz or 3 MHz carriers is not used. 1.4 MHz and 3 MHz is only used in multicarrier operation together with a wider carrier (UTRA or E-UTRA). For E-UTRA 1.4 MHz and 3 MHz, the requirements on output power accuracy and sensitivity must not be fulfilled at band edge. They are to be fulfilled in any multicarrier configuration with 1.4 MHz or 3 MHz carrier center frequency set at ≥ 2.5 MHz offset from band edge.

(3) B13 only supports 5 and 10 MHz LTE, that is one or two carriers.

Table 2 mRRUS Output Power

Standard	Maximum Number of Carriers per Branch	Configurable Output Power per Branch	Minimum Configurable Carrier Output Power
WCDMA single RAT mode	4	125 mW to 5 W	125 mW/4 (15 dBm) ⁽¹⁾
LTE single standard mode	4	For 1 carrier: 125 mW to 5 W	125 mW/4 (15 dBm)
		For >1 carrier: 1 W to 5 W	1 W/4 = 250 mW (24 dBm) ⁽¹⁾
Mixed mode	4	1 W to 5 W	1 W/4 = 250 mW (24 dBm) ⁽¹⁾

(1) According to the four carrier case. Note that the mRRUS dynamic range is dimensioned for one carrier out of four activated.

Figure 2 shows the mRRUS dimensions with solar shield.

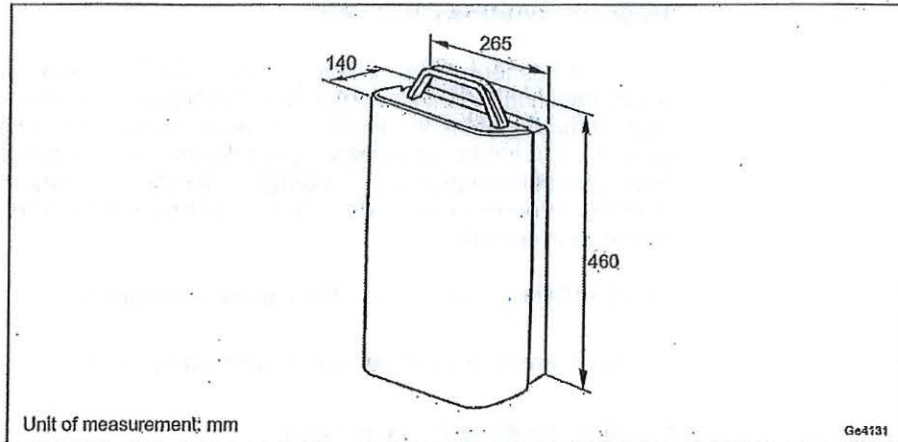


Figure 2 mRRUS Dimensions with Solar Shield

3.2 Installation Recommendations

To ensure reliable operation and maximum performance, an appropriate installation location must be chosen.

3.2.1 Indoor Locations to Avoid

Although the unit is designed for outdoor use, it can be used indoors. For indoor locations Ericsson recommends to operate according to ETSI 300 019-1-3 class 3.1 and 3.3. This does not cover installation with heat traps or installation in lofts, where air ventilation does not exist. To ensure smooth performance, avoid installing the unit in a potential microclimate location, for example, places with unventilated lofts, with heat traps, or where the product is exposed to direct sunlight through windows. Avoid installing the equipment under glass covers or skylight windows without proper ventilation.



3.2.2 Outdoor Locations to Avoid

Although Ericsson declares this product suitable for outdoor environments, avoid installing the unit in a potential microclimate location. Typical examples of microclimate locations are sites where the product is not only exposed to the actual surrounding temperature, but additional temperature as heat coming from dark colored planes, for example, reflections from the floor or walls. The additional temperature can generate heat traps with temperatures up to 10°C higher than expected.

Avoid installing equipment in the following locations:

- Near the exhaust of building ventilation systems
- Near the exhaust of chimneys
- Opposite large surfaces made of glass or new concrete

If the unit is to be installed outdoors but not under a roof, avoid installing the unit belly down when using the integrated antenna.

If the unit is to be placed in an environment subjected to lightning strike, an external Surge Protection Device (SPD) is needed.

3.2.3 Horizontal Installation under a Roof

Under exceptional conditions, the mRRUS can be installed horizontally beneath a roof with the side facing a wall.

In this type of installation, the unit should be mounted at least 10 cm from the roof with the rear solar shield removed, otherwise the unit backs off and shuts off before achieving the temperatures of 45°C and 55°C, respectively. Also ensure that the space between the side of the unit and the wall is not less than 0.2 m.

3.2.4 Other Considerations

Installing the mRRUS close to other electronic equipment can cause interferences.

3.2.5 Painting Limitations

Ericsson does not recommend painting the RRU as it may affect radio performance of the unit.

Ericsson will apply limitations to the warranty and service contract if the RRU is painted.



3.2.5.1 Technical Limitations

If the RRU is painted, be aware of the technical limitations below:

- Sunlight on dark paint may increase the temperature of the RRU causing it to shut down.
- The plastic surfaces and the plastic covers are suited for painting with normal commercially available one or two component paints.
- Never use metallic paint or paint containing metallic particles.
- Ensure that ventilation and drainage holes are free from paint.
- Ensure proper adhesion of the paint.

3.2.5.2 Commercial Limitations

If the RRU is painted, the commercial limitations below apply:

- Failure modes directly related to overheating due to painting are not valid for repair within the scope of the warranty or standard service contract.
- Product failures related to paint contamination of components of the unit are not valid for repair within the scope of warranty or standard service contract.
- When a painted unit is repaired, it will be restored to the standard color before being returned to the market. It is not possible to guarantee the same unit being sent back to the same place. This is also valid for units repaired under a service contract.
- For repairs within the warranty period or a standard service contract, the customer will be charged the additional costs for replacing all painted parts of the unit or the complete unit.

3.3 Space Requirements

This section describes the space requirements for installing the mRRUS.

The mRRUS can be installed in any of the following main installation alternatives:

- On a wall
- Under a roof
- On a pole or mast

All the installation alternatives can be used indoors or outdoors.

Figure 3 shows the main installation alternatives.

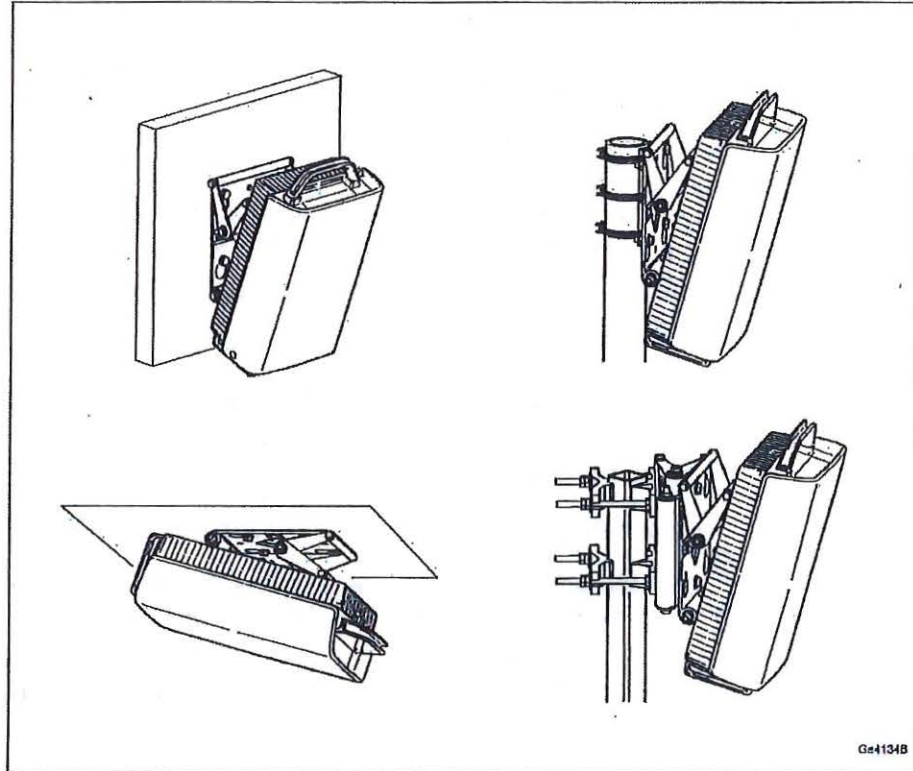


Figure 3 Main Installation Alternatives

For more information on installation alternatives, see *Installing mUnit Base Mount*, *Installing mUnit Small Clamps*, and *Installing mUnit Hose Plate*.

For installation requirements to comply with limitations on Radio Frequency (RF) Electromagnetic Fields (EMF) exposure, see Section 3.4 on page 14.

3.3.1 Generic Requirements

To ensure sufficient working space, allow a minimum of 1 m free space in front of the mRRUS.

3.3.2 Wall or Roof Installation

The wall or roof must be even within 5 mm/m. The installation requirements are shown in Figure 4.

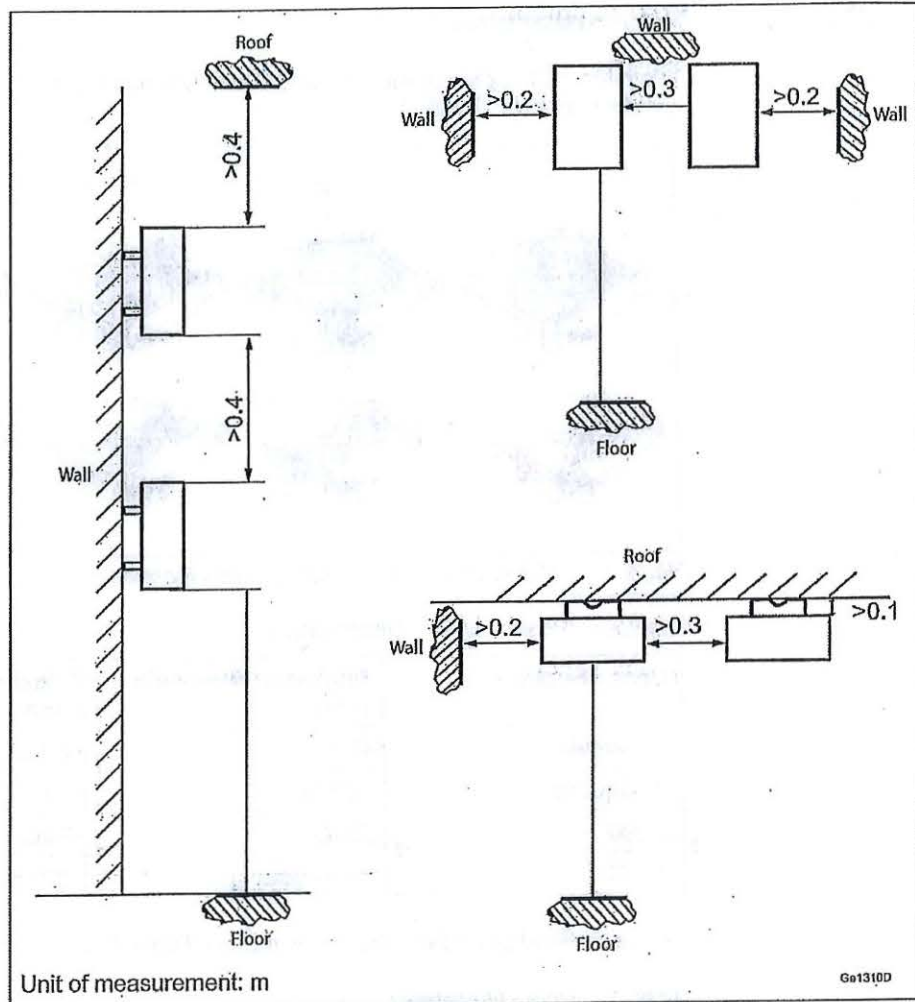


Figure 4 Wall or Roof Installation

3.3.2.1

Site Layout

To ensure adequate airflow between the units, allow a minimum of 0.4 m free space between the mRRUS and the roof, and between mRRUSs installed on a wall, on top of one another.

Allow a minimum of 0.3 m free space between mRRUSs installed side by side on a wall, as well as between mRRUSs installed on a roof, and a minimum of 0.1 m between the roof and the mRRUS.

The minimum distance between the mRRUS and a wall must be 0.2 m.



3.3.3 Pole Installation

The alternative pole or mast variants are shown in Figure 5 and their dimensions are described in Table 3.

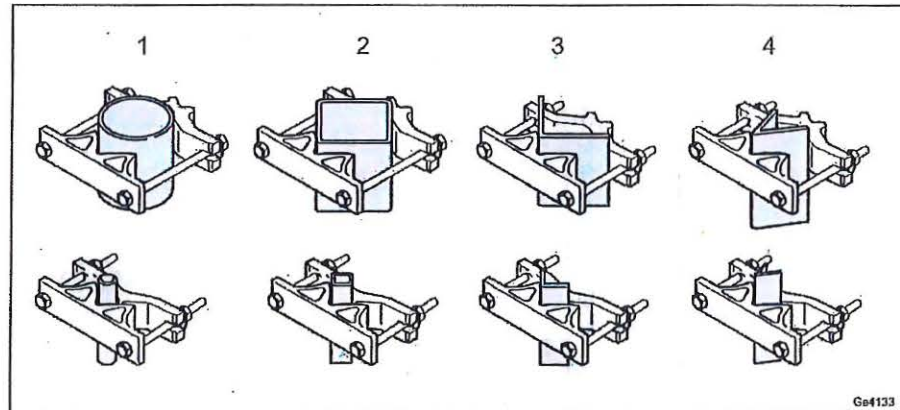


Figure 5 Alternative Pole or Mast Cross Sections

Table 3 Pole or Mast Dimensions

Cross Section	Minimum Dimension (mm)	Maximum Dimension (mm)
1. Circular	Ø25	Ø120
2. Square	35x35	90x90
3. 90°	35x35	90x90
4. 60°	40 in opening	100 in opening

The supported pole diameters are listed in Table 4.

Table 4 Pole Diameters

Mounting Equipment	Pole Diameter
Single fixture	60–120 mm
Mounting bracket	35–155 mm

3.3.3.1 Site Layout

To ensure adequate airflow between the units, allow a minimum of 0.4 m free space above and below each mRRUS. Allow a minimum of 0.3 m free space between mRRUSs installed side by side.



3.3.4

Wall or Pole Installation with a Semi-Integrated Omni Antenna

The wall must be even within 5 mm/m. The installation requirements are shown in Figure 6.

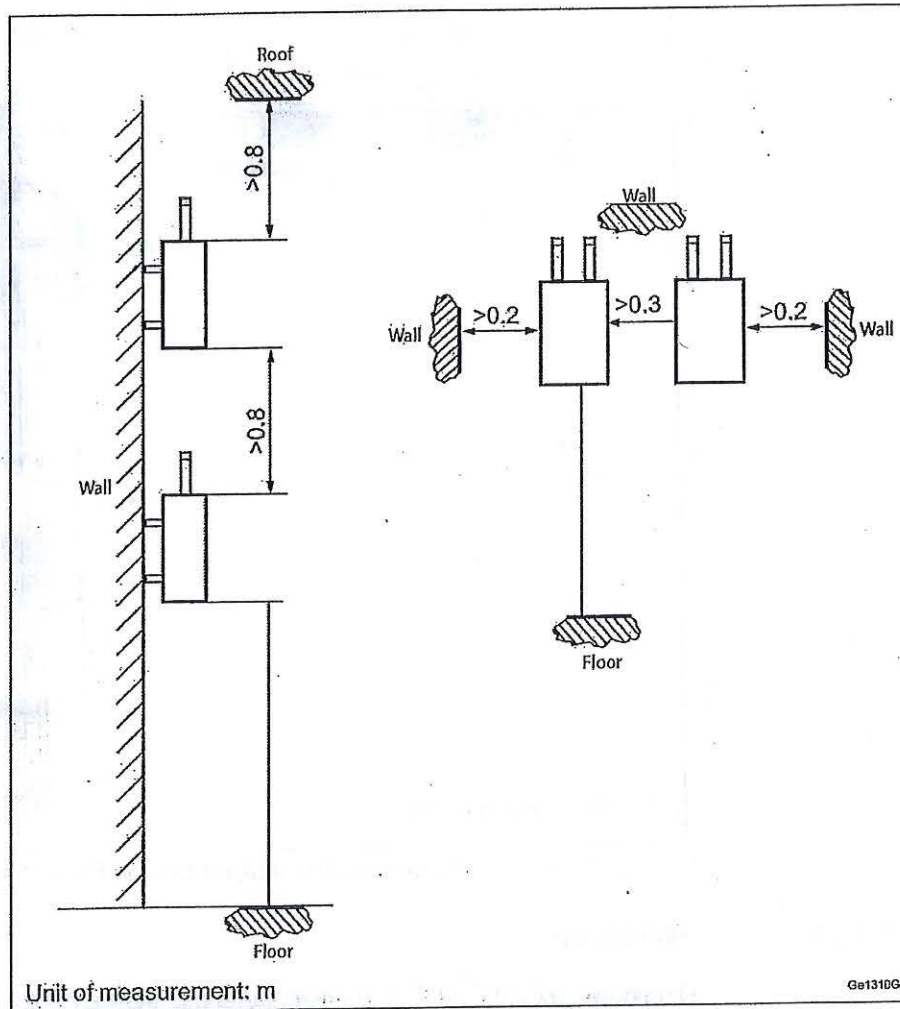


Figure 6 Wall or Pole Installation with a Semi-Integrated Omni Antenna

3.3.4.1

Site Layout

To ensure adequate space between the units and the semi-integrated omni antennas, allow a minimum of 0.8 m free space between the mRRUS and the roof, and between mRRUSs installed on a wall, on top of one another.

Allow a minimum of 0.3 m free space between mRRUSs installed side by side.



3.3.5 Wall, Roof, or Pole Installations with an External Antenna

Install the mRRUS below the external antenna. The installation requirements are shown in Figure 7.

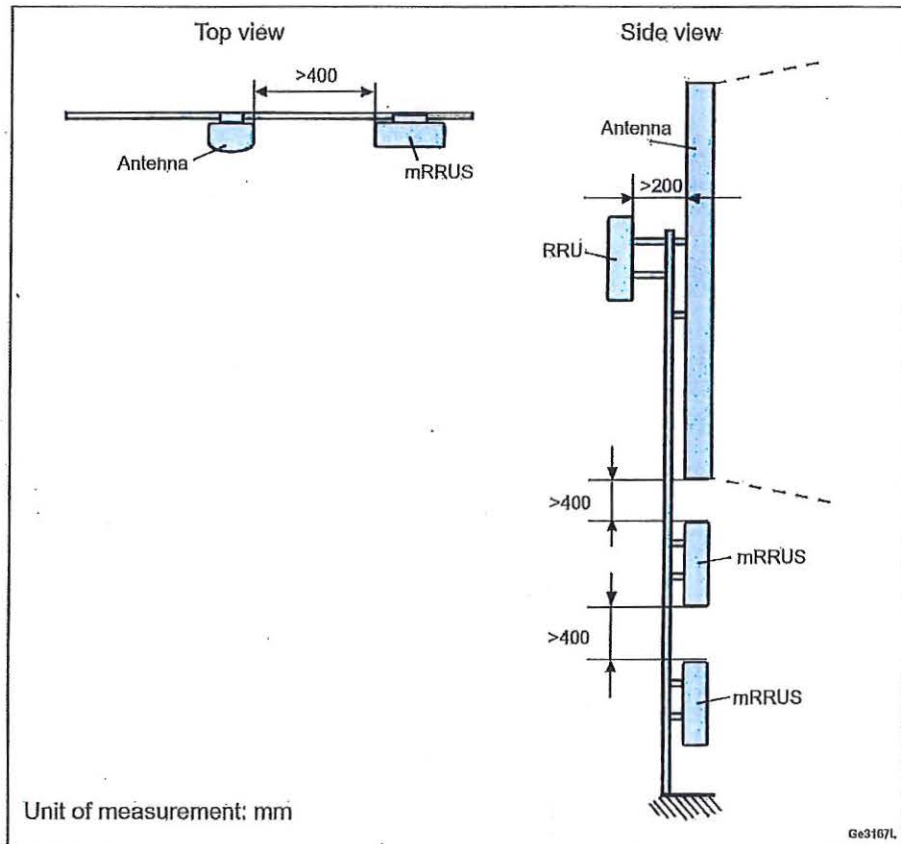


Figure 7 Wall, Roof, or Pole Installations with an External Antenna

3.3.5.1 Site Layout

To ensure adequate airflow between the units, allow a minimum of 400 mm free space between mRRUSs installed vertically on a pole. Allow a minimum vertical distance of 400 mm between mRRUS and antenna, if installed above or below an antenna. Allow a minimum of 200 mm free space between mRRUSs installed side by side. The minimum distance from the bottom of the mRRUS to the floor is 300 mm.

Note: An mRRUS can not be installed in the uppermost top position of a pole or mast.

If the antenna azimuth is in the direction of the mRRUS, the distance between the antenna and the mRRUS needs to be increased.



3.4 Radio Frequency Electromagnetic Exposure

This product contains a low-power radio transmitter which emits RF EMF during operation. Limits on exposure to RF EMF are specified in international safety guidelines which are developed by organizations such as ICNIRP (International Commission on Non-Ionizing Radiation Protection) and IEEE (The Institute of Electrical and Electronics Engineers). These limits have been adopted in standards and regulations applicable to radio communication products.

There are installation requirements that need to be followed for this product to comply with the limitations on RF EMF exposure to the general public that are applicable within the European Union (EU Recommendation 1999/519/EC), the United States (FCC CFR title 47, part 1.1310) and other markets. The product has been tested in accordance with the relevant technical standards and procedures specified by CENELEC, IEEE, ITU and the FCC to determine RF EMF limit compliance distances and boundaries. A compliance boundary is the volume around the product (or antenna connected to the product) outside of which the exposure is below the applicable limits. The compliance boundary is described as a cylinder or a box.

This product shall be installed so that the general public does not have access to the volume specified by the compliance boundary. Information about compliance boundaries for this product, including different radio access and antenna configurations, is provided in *Radio Frequency Electromagnetic Exposure*.

General information on RF EMF exposure from the RBS 6000 family of products can be found in *Radio Frequency Electromagnetic Fields*.

3.5 Acoustic Noise

The mRRUS does not generate acoustic noise.

3.6 Environmental Characteristics

This section contains mRRUS operating environment data.

3.6.1 Operating Environment

The following is a list of values for the mRRUS normal operating environment:

Temperature	-40 to +55°C
Solar radiation	≤ 1,120 W/m ²
Relative humidity	5 to 100%
Absolute humidity	0.26 to 40 g/m ³



Maximum temperature change	1.0°C/min
Maximum wind load at 50 m/s (pole installed single case)	430 N (front)

3.6.2 Heat Dissipation

The mRRUS is convection cooled. Table 5 shows the heat dissipation values when the unit is installed alone or around other mRRUSs. The values represent the maximum power heat dissipation of an mRRUS, taking into account optional equipment and future expansions.

Table 5 mRRUS Heat Dissipation

Unit	Output Power	Maximum Heat Dissipation
mRRUS	2x5 W	140 W

For information on power consumption, see *Power Consumption Guideline for RBS 6000*.

3.6.3 Vibration

This section describes the mRRUS tolerance to vibrations. The mRRUS operates reliably during seismic activity as specified by test method IEC 60 068-2-57 Ff.

Maximum level of Required Response Spectrum (RRS)	50 m/s ² within 2-5 Hz for DR=2%
Frequency range	1–35 Hz
Time history signal	Verteq II

The mRRUS operates reliably during random vibration as specified by test method IEC 60 068-2-64 Fh method 1

Random vibration, normal operation	0.5 m ² /s ³
------------------------------------	------------------------------------

The mRRUS operates reliably during shock as specified by test method IEC 60 068-2-27 Ea

Peak acceleration	40 m/s ²
Duration	22 ms



3.6.4 Materials

All Ericsson products fulfill the legal and market requirements regarding:

- Material declaration
- Fire resistance of material (components, wires, and cables)
- Recycling
- Restricted and banned material use

3.7 Mains Supply Characteristics

This section describes the power supply requirements, power consumption, and fuse and circuit breaker recommendations for the mRRUS.

The power for the mRRUSs can be provided from an AC or a DC power supply.

3.7.1 AC Power Supply Characteristics

The power supply voltage range for the mRRUS is 85 to 275 V AC. The power supply requirements are listed in Section 6.1.2 on page 34.

Table 6 mRRUS AC Power Supply Requirements

Normal Voltage Range	Tolerance Range
100 to 250 V	85 to 275 V AC
Connection	Phase-neutral, phase-phase
Frequency range	50 to 60 Hz
Voltage harmonics	< 10% at full load ⁽¹⁾
Shut-off allowance	At undervoltage or overvoltage
Inrush current peak	< 8 A
Inrush current duration	< 100 ms

(1) Must comply with IEC 61000-3-2

Fuse and Circuit Breaker Recommendations

Table 7 shows external fuse and circuit breaker capabilities for the mRRUS.

The recommendations given in this section are based on peak power consumption and do not provide information on power consumption during normal operation.

The recommended melting fuse type is gG-gL-gD in accordance with IEC 60 269-1. Circuit breakers must comply with at least Curve 3 tripping characteristics, in accordance with IEC 60 934.

*Table 7 mRRUS Fuse or Circuit Breaker Recommendations*

Unit (AC powered)	Output Power	Minimum Fuse Rating	Maximum Allowed Fuse Rating ⁽¹⁾
mRRUS	2x5 W	<ul style="list-style-type: none"> • 4 A (100 to 127 V AC) • 4 A (200 to 250 V AC) 	32 A

(1) The absolute maximum fuse class in accordance with mRRUS design restrictions.

3.7.2 DC Power Supply Characteristics

The power supply voltage for the mRRUS is -48 V DC. The power supply requirements are listed in Table 8.

Table 8 mRRUS DC Power Supply Requirements

Conditions	Values and Ranges
Nominal voltage	-48 V DC
Normal voltage range at mRRUS input connector	-58.5 to -38.0 V DC
Non-destructive range	0 to -60 V DC

Fuse and Circuit Breaker Recommendations

Table 9 shows the external fuse and circuit breaker capabilities for the mRRUS.

The recommendations given in this section are based on peak power consumption and do not provide information on power consumption during normal operation.

The recommended melting fuse type is gG-gL-gD in accordance with IEC 60 269-1. Circuit breakers must comply with at least Curve 3 tripping characteristics, in accordance with IEC 60 934.

Table 9 mRRUS Fuse or Circuit Breaker Recommendations

Unit (DC powered)	Output Power	Minimum Fuse Rating	Maximum Allowed Fuse Rating ⁽¹⁾
mRRUS	2x5 W	6 A	32 A

(1) The absolute maximum fuse class in accordance with mRRUS design restrictions.

3.7.3 Power Consumption

For information on power consumption, see *Power Consumption Guideline for RBS 6000*.



3.8 System Characteristics

This section describes the system characteristics of the unit.

3.8.1 Software

Information on software dependencies can be found in *Compatibilities for Hardware and Software*.

3.8.2 Radio Configurations

Information about available radio configurations can be found in *RBS Configurations*.



4 Hardware Architecture

This section describes the mRRUS hardware structure regardless of configuration or frequency. The mRRUS components are shown in Figure 8 and described in Table 10.

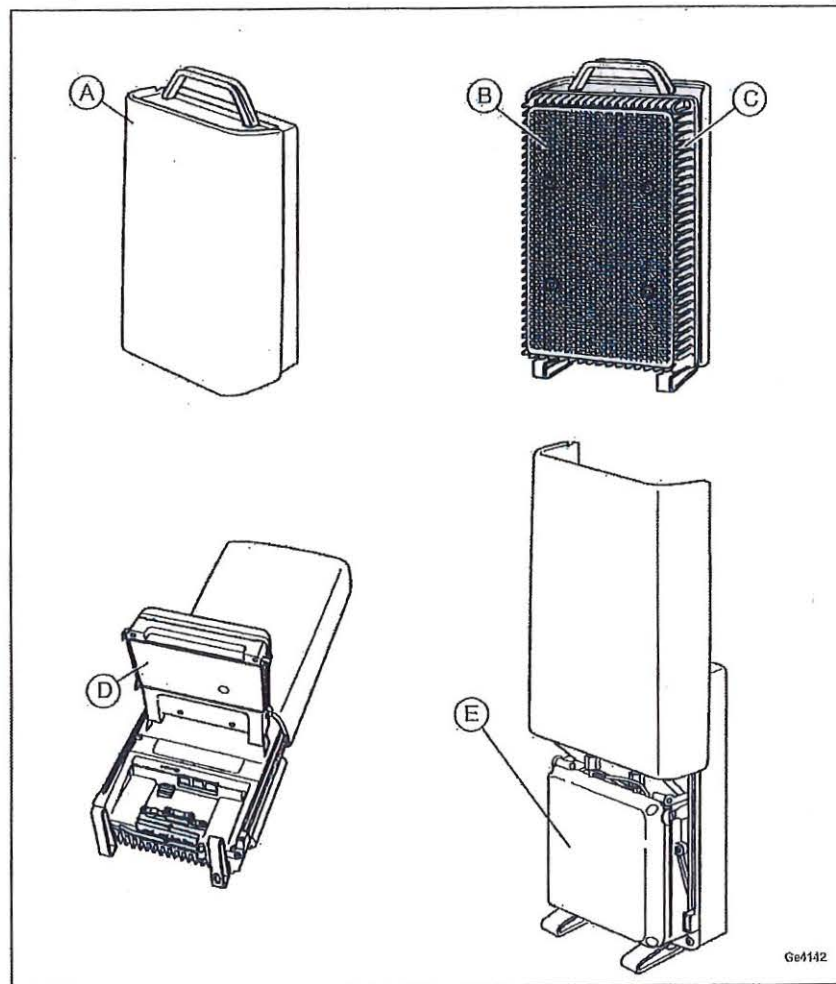


Figure 8 mRRUS Components

Table 10 Key to mRRUS Components

Position	Component
A	Front solar shield
B	Rear solar shield



Position	Component
C	Heatsink
D	Installation hatch
E	Integrated antenna

The mRRUS contains most of the radio processing hardware. The following sections describe the component units of the mRRUS.

4.1 Solar Shield

The mRRUS has two types of solar shield: a front solar shield, and a rear solar shield; as shown in Figure 8 and Table 10.

The solar shield protects the mRRUS from solar radiation and is part of the cooling design.

Note: To prevent the rear solar shield to block convection cooling airflows, the rear solar shield should be disassembled when the mRRUS is installed in confined spaces without ambient airflow (under rooftops, outdoor boxes, or similar locations).

4.2 Heatsink

The heatsink is a cast of aluminium for cooling the unit.

4.3 Installation Hatch

The installation hatch hides the optical indicators, the maintenance button, and the connectors.

For more information about optical indicators, maintenance button, and connectors; see Section 5 on page 22.

4.4 Integrated Antenna

The integrated antenna is located on the lower half of the mRRUS seen in a vertical position, as shown in Figure 8.



5 Connection Interfaces

This section contains information about the mRRUS interfaces shown in Figure 9, Figure 10, and listed in Table 11.

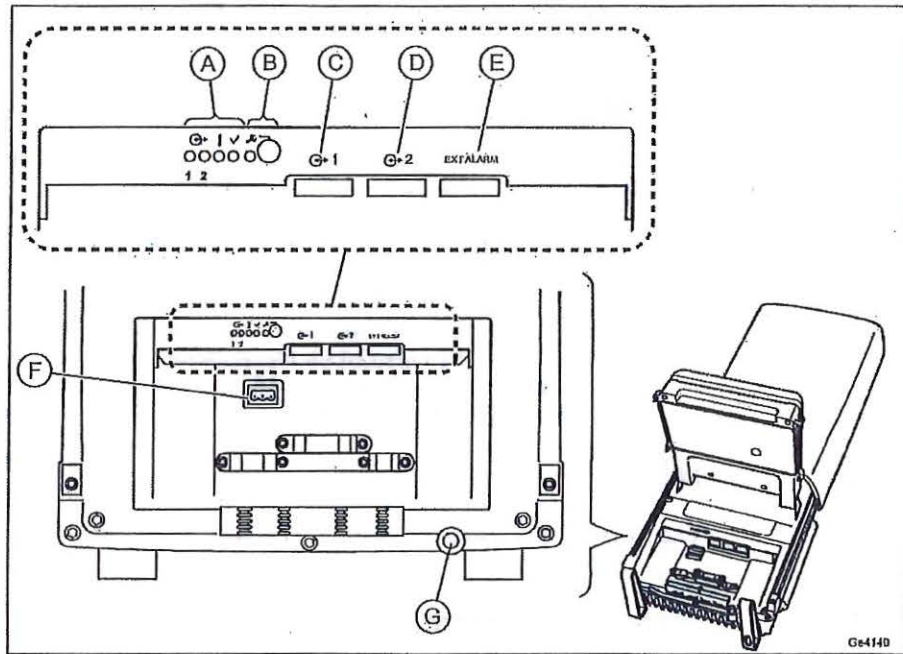


Figure 9 mRRUS Connection Interfaces

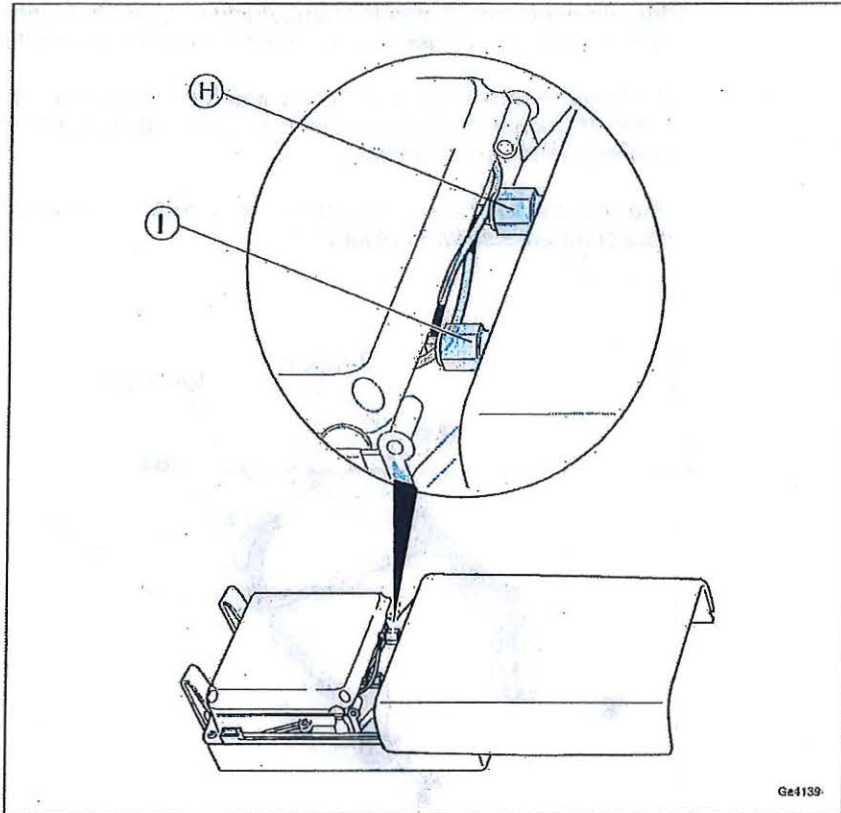


Figure 10 mRRUS Antenna Connection Interfaces

Table 11 mRRUS Connection Interfaces

Position	Description	Marking
A	Optical indicators	⊕1, ⊕2 !, ✓, ⚠
B	Maintenance button	⚠
C	Optical cable 1	⊕1
D	Optical cable 2	⊕2
E	External alarm	EXT ALARM
F	AC power supply interface	L, L/N, ⊕
	DC power supply interface	-48, RTN, ⊕
G	Grounding	⚡
H	Antenna A	A ⚡ interface
I	Antenna B	B ⚡ interface



When an integrated antenna is not included, antenna jumper cables with N-connectors can be used to connect the unit to an external antenna.

If it is necessary to open the hatch without disconnecting the antenna jumper cables, 1/4" angled connectors are required, otherwise 1/2" with straight connectors are recommended.

The antenna interfaces connected to antenna jumper cables with 1/4" angled connectors are shown in Figure 11.

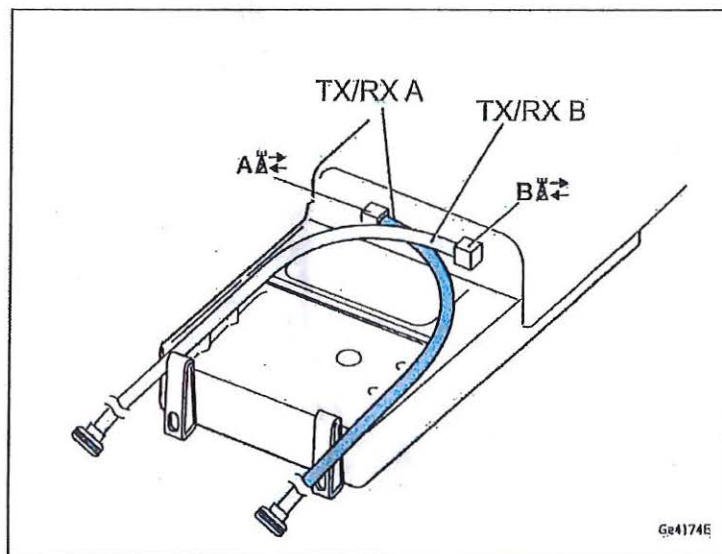


Figure 11 Antenna Jumper Cables with 1/4" Angled Connectors

5.1 Position A, Optical Indicators

The mRRUS is equipped with optical indicators that show system status. The optical indicators are located under the installation hatch. Table 12 describes how to interpret the optical indicators for mRRUS when WCDMA and LTE controlled.

Table 12 mRRUS Optical Indicators WCDMA or LTE Controlled

Marking	Indicator	Color	Mode	Indicates
!	Fault	Red	Off	No fault detected in mRRUS
			On	Fault detected in mRRUS



Marking	Indicator	Color	Mode	Indicates
✓	Operational	Green	Off	mRRUS not operational
			On	Power present
			Blink (2 Hz)	Load or testing in progress
			Blink (0.5 Hz)	Dependent resource missing
🔧	Maintenance	Blue ⁽¹⁾	Off	mRRUS not in maintenance mode
			On	mRRUS in maintenance mode
			Blink (0.5 Hz)	Shutdown in progress
⊕1, ⊕2	Interface	Green	Off	Disconnected
			On	Connected
Button:				
🔧	Maintenance	-	-	Switch mRRUS mode between Remote and Maintenance

(1) The color can also be yellow. The yellow optical indicator can blink busy.

More information about optical indicators can be found in *Indicators, Buttons, and Switches*.

5.2 Position B, Maintenance Button

The maintenance button is located on the right of the 🔧 symbol.

Note: Use a pointed object, for instance a screwdriver or a pencil tip, to press the maintenance button.

For more information about the maintenance button, see *Indicators, Buttons, and Switches*.

5.3 Position C and D, Interface for Optical Cable to Main Unit

The interfaces ⊕ 1 and ⊕ 2 provide connections to optical cables for traffic and timing signals between the mRRUS and the main unit. A Small Form-Factor Pluggable (SFP) is used to connect the optical cable to the mRRUS.



Note: The mRRUS uses SFP modules for optical transmission and optical radio interfaces on Data 1 (optical cable 1 in) and Data 2 (optical cable 2 out).

Only use SFP modules approved and supplied by Ericsson. These modules fulfill the following:

- Compliance with Class 1 laser product safety requirements defined in standard IEC 60 825-1
- Certification according to general safety requirements defined in standard IEC 60 950-1
- Functional and performance verified to comply with RBS specifications

5.4 Position E, External Alarm Interface

Two external alarms can be connected to the mRRUS external alarm port.

5.5 Position F, Power Supply Interface

Depending on the version of the product, the power supply for the mRRUS can be AC or DC.

5.5.1 AC Power Supply Interface

The AC power connection is made through a connector. The connector accepts cables with the limiting values listed in Table 13.

Table 13 AC Power Supply Cable Diameter Tolerances

Cable Length	Recommended Cross-Sectional Area of Each Conductor	Outer Diameter over Sheath
0 to 100 m	2.5 mm ²	9±1 mm

The power cable has a wire for Line (L), a wire for Line/Neutral (L/N), and a wire for Protective Earth (PE) conductors. The wire color code for wires is market dependent.

All cables must be shielded. The shielding must be properly connected both to the power connector and to the grounding interface in the power supply equipment, otherwise the mRRUS overvoltage does not function properly.



5.5.2 DC Power Supply Interface

The -48 V DC power connection is made through a connector. The connector accepts cables with the limiting values listed in Table 14.

Table 14 -48 V DC Power Supply Cable Diameter Tolerances

Cable Length	Recommended Cross-Sectional Area of Each Conductor	Outer Diameter over Sheath
0 to 60 m	2.5 mm ²	9±1 mm

The power cable conductor has a wire for 0 V, a wire for -48 V conductors. The wire color code is market dependent.

All cables must be shielded. The shielding must be properly connected both to the power connector and to the grounding interface in the power supply equipment, otherwise the mRRUS overvoltage does not function properly.

5.6 Position G, Grounding Interface

To protect the mRRUS from overvoltage and lightning strikes, it must be grounded. The grounding interface shown in Figure 12 accepts a small cable lug on a short, coated cable.

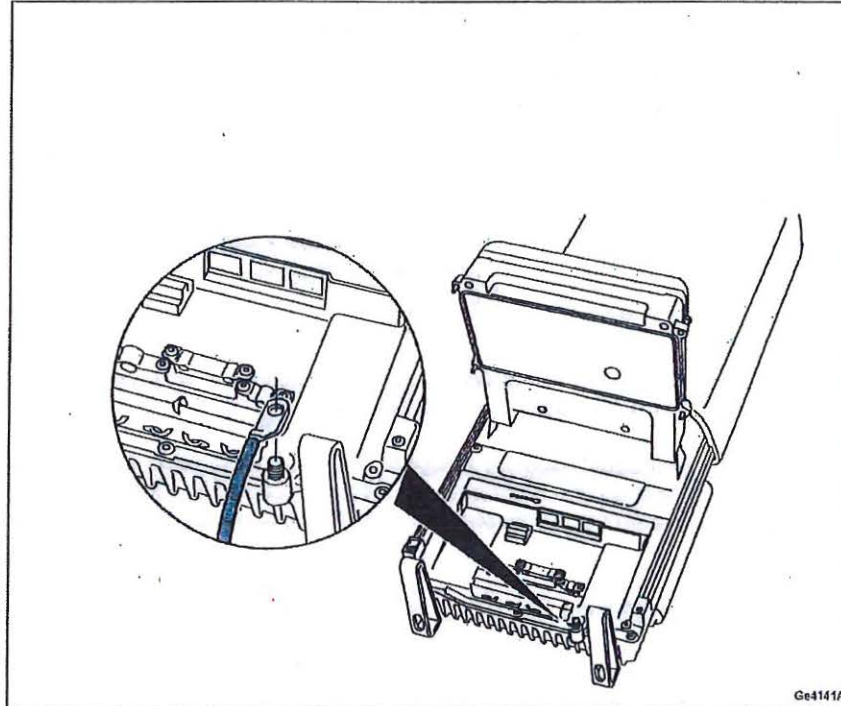


Figure 12 mRRUS Grounding Interface

5.7 Position H and I, Antenna Connection Interfaces

The antenna interfaces provide mRRUS connections to antennas. Antenna cables connect the mRRUS to the antennas.

The characteristics of the antenna connection interfaces and cable types are described in Table 15.

Table 15 mRRUS Antenna Connection Interfaces Characteristics

Connector Type	RF Cable Type	Cable Connector Type
N-type insert-receiver	50 Ω coaxial	N-type insert-type on both ends

Table 16 shows how to connect the antenna cables.

Table 16 mRRUS Antenna Cable Connectors

mRRUS Connectors	Antenna Connectors
A $\overleftrightarrow{\Delta}$ (Antenna A)	TX/RX
B $\overleftrightarrow{\Delta}$ (Antenna B)	TX/RX



5.8 Supported Cable Dimensions

The cable dimensions supported by the mRRUS are described in Table 17.

Note: To ensure the performance in outdoor locations, the cables must be concentric and the power and alarm cables must be shielded. The shield must be properly connected to the grounding interface for the overvoltage to function properly.

Table 17 Supported Cable Dimensions

Cable Type	Maximum Cable Length (m)	Recommended Cross-sectional Area of Each Conductor (mm ²)	Outer Diameter over Jacket (mm)
AC cable	100	2.5	8–9
DC cable	60	2.5	8–9
Optical cables (2 SFP)	500	—	4.4–6.0
External alarm cable	—	0.14–0.25	4.4–6.0

5.9 Optional Equipment Interfaces

The following equipment is optional and can be ordered separately.

5.9.1 TX-Monitor (Optional)

The TX-monitor facilitates to monitor output power from the mRRUS at any time during the operation, and without interrupting service. The monitoring interface is situated in the optional monitoring port. The TX-monitor components are shown in Figure 13 and listed in Table 18.

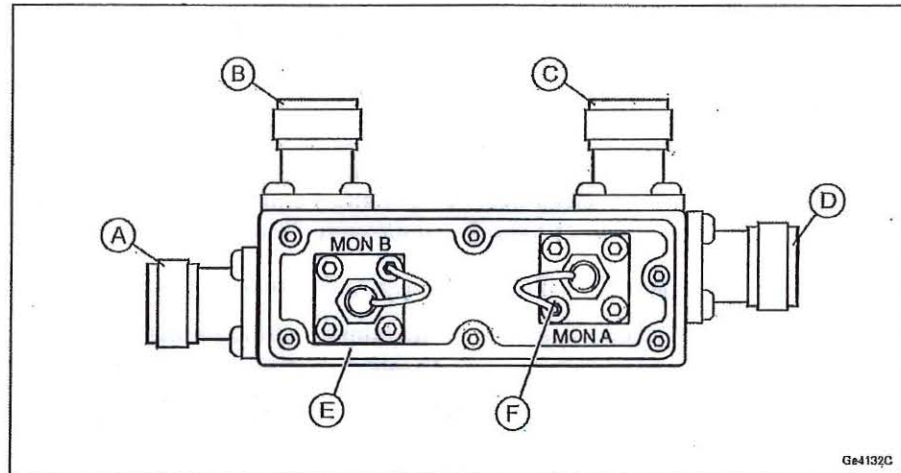


Figure 13 TX-Monitor Components

Table 18 TX-Monitor Overview

Position	Interface
A	RBS 2 N-type connector used for connecting to A $\overleftrightarrow{\Delta}$ or B $\overleftrightarrow{\Delta}$ interface
B	ANT A N-type connector for connecting the antenna cable
C	ANT B N-type connector for connecting the antenna cable
D	RBS 1 N-type connector used for connecting to A $\overleftrightarrow{\Delta}$ or B $\overleftrightarrow{\Delta}$ interface
E	MON B N-type or SMA connector for TX-port
F	MON A N-type or SMA connector for TX-port

Before connecting, the TX-monitor needs to be mounted on a bracket specially designed to hold it.

For information on how to install the TX-monitor, see *Quick Guide (TX Monitor Package, mRRUS 12)*.



5.9.1.1 TX-Monitor (Optional) and Integrated Antenna (Optional)

To install the TX-monitor to an integrated antenna, the integrated antenna must be rotated 180° from its original position, as shown in Figure 14.

Note: To protect the TX-monitor from getting in contact with the ground if the unit is in the vertical position, spacers must be installed above the support feet.

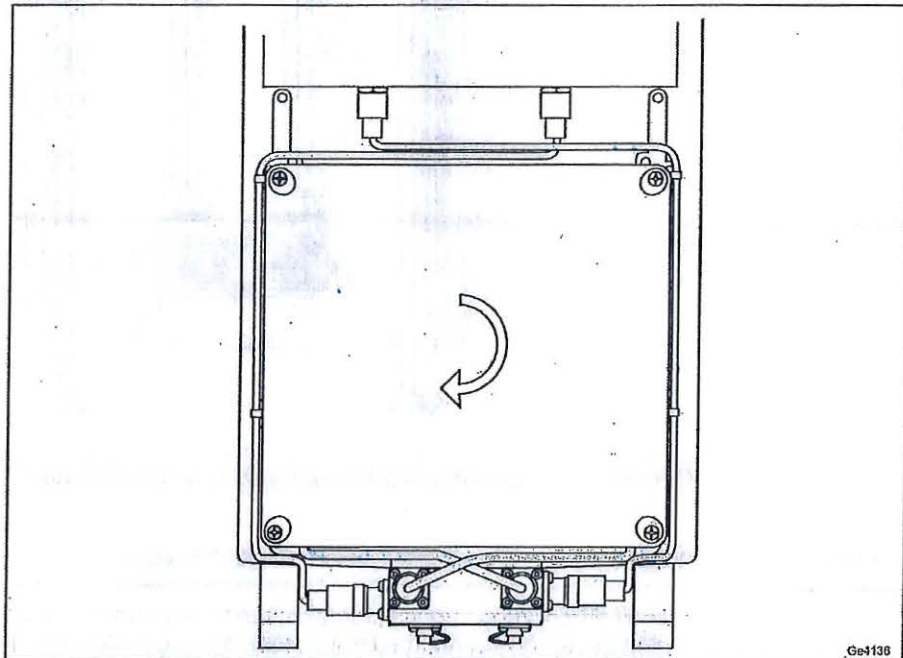


Figure 14 TX-Monitor (Optional) and Integrated Antenna (Optional)

5.9.1.2 TX-Monitor (Optional) and External Antenna

The TX-monitor can be placed on the antenna interface that is a transmitter port, which means **A** and **B** for mRRUS. The monitoring ports of the TX-monitor must be connected to the external antenna using antenna jumper cables, as shown in Figure 15.

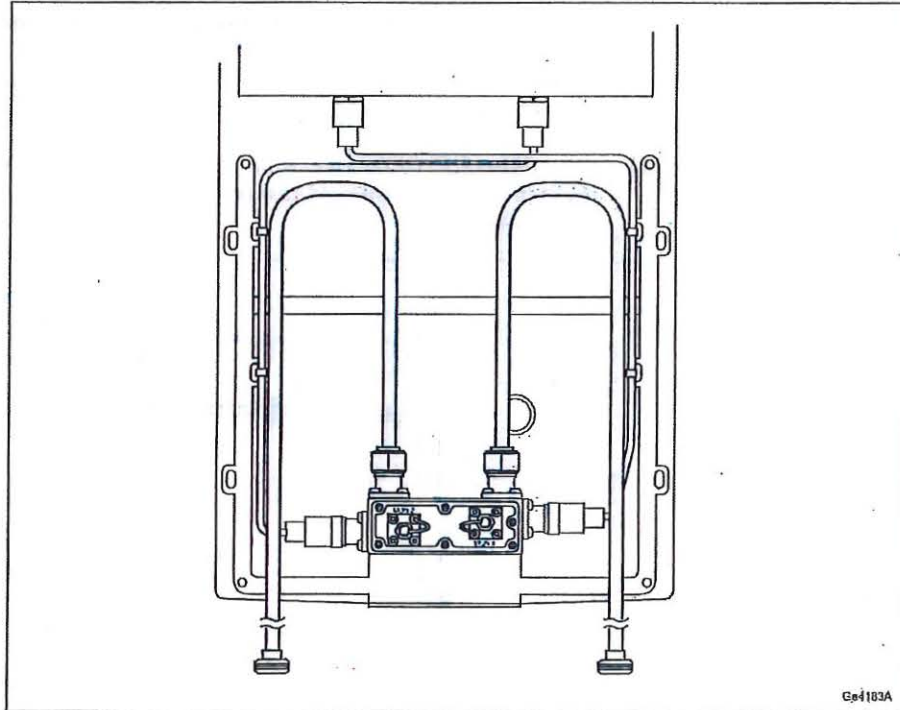


Figure 15 TX-Monitor (Optional) and External Antenna

5.9.2 Semi-Integrated Omni Antenna (Optional)

If the mRRUS does not include an integrated antenna, a semi-integrated omni antenna can be connected to the external antenna ports. The semi-integrated omni antenna is mounted on a bracket specially designed to be attached to the mRRUS.

For information on how to install the antenna on the bracket, see *Installing mUnit Omni Support*.

Semi-integrated omni antennas are available in the following two variants:

- Semi-integrated omni antenna for high bands
- Semi-integrated omni antenna for low bands

For information on installation alternatives, and how to install a semi-integrated omni antenna, see *Installing Remote Radio Units*.

5.9.2.1 Semi-Integrated Omni Antenna for High Bands

A semi-integrated omni antenna for high bands, mounted on top of an mRRUS that stands in vertical position, is shown in Figure 16.

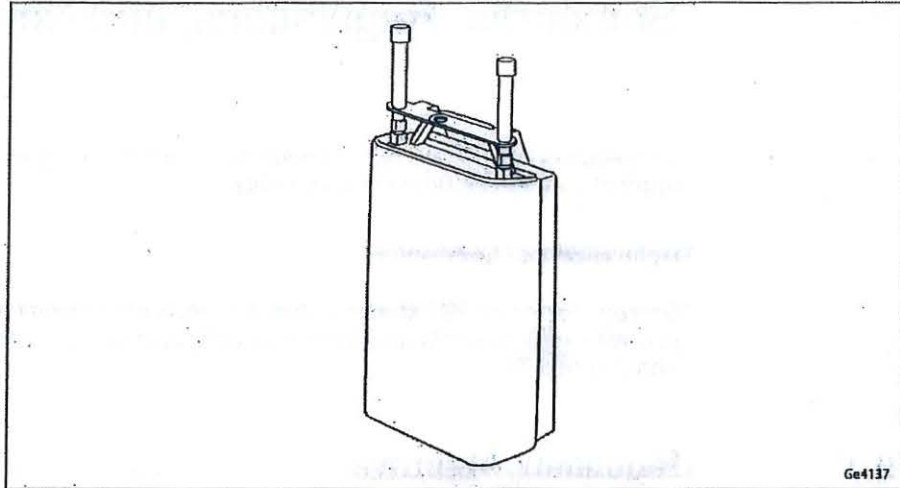


Figure 16 *Semi-Integrated Omni Antenna for High Bands*

Note: A semi-integrated omni antenna for high bands can be also mounted on top of an mRRUS that stands in horizontal position.

5.9.2.2

Semi-Integrated Omni Antenna for Low Bands

A semi-integrated omni antenna for low bands, mounted on top of an mRRUS that stands in horizontal position, is shown in Figure 17.

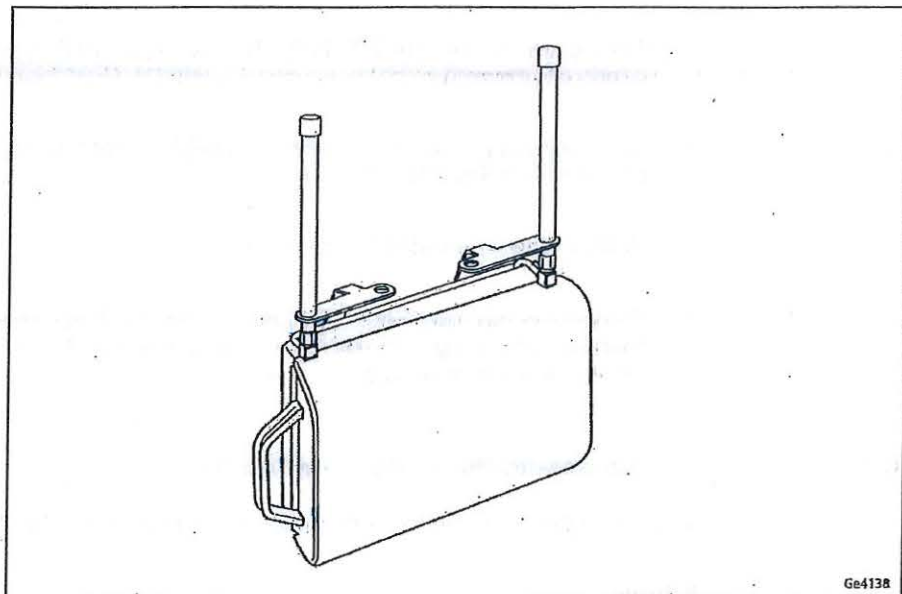


Figure 17 *Semi-Integrated Omni Antenna for Low Bands*



6 Standards, Regulations, and Dependability

This section presents a brief overview of standards, regulatory product approval, and declaration of conformity.

Declaration of Conformity

"Hereby, Ericsson AB, declares that this RBS is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC and 2011/65/EU."

6.1 Regulatory Approval

The RBS complies with the following market requirement:

- EC (European Community) market requirements, R&TTE Directive 1999/5/EC

CE 0168 Alert Mark (Class 2 equipment). Restrictions to use the apparatus may apply in some countries or geographic areas. Individual license to use the specific radio equipment may be required.

The apparatus may include Radio Transceivers with support for frequency bands not allowed or not harmonized within the European Community (EC).

- Restriction of Hazardous Substances in Electrical and Electronic Equipment (RoHS) Directive (2011/65/EU).
- North American market requirements.
- Products containing Radio Equipment outside North America and in countries not recognizing the CE-mark may be labeled according to national requirements or standards.

6.1.1 Environmental Standards Compliance

The RBS complies with the following environmental standard:

Europe

- EN 50 581 (RoHS)



6.1.2 Safety Standards Compliance

In accordance with market requirements, the RBS complies with the following product safety standards and directives:

International

- IEC 60 215
- IEC 60 950-1 Ed2 with amendment A1

Europe

- EN 50 385
- EN 60 215
- EN 60 950-1 Ed2 with amendment A1

North America

- FCC CFR 47 Part 1.1310
- FCC CFR 47 Part 2.1091
- Health Canada Safety Code 6
- IC RSS-102
- UL 60 950-1
- CSA-C22.2 No. 60 950-1-07 with amendment A1

6.1.2.1 Outdoor Specific Requirements

The RBS complies with the following outdoor specific requirements:

International

- IEC 60 529 (IP55)
- IEC 60 950-22

Europe

- EN 60 529 (IP55)
- EN 60 950-22



North America

- CSA-C22.2 No. 60950-22-07
- UL 50E
- UL 60950-22

6.1.3 EMC Standards Compliance

The RBS complies with the following Electromagnetic Compatibility (EMC) standards:

International

- 3GPP TS25.113
- 3GPP TS36.113
- 3GPP TS37.113

Europe

- ETSI EN 301 489-1
- ETSI EN 301 489-8
- ETSI EN 301 489-23
- ETSI EN 301 489-50

North America

- FCC CFR 47 Part 15 B
- IC ICES-003 B

6.1.4 Radio Standards Compliance

The RBS complies with the following radio standards:

International

- 3GPP TS25.141
- 3GPP TS36.141
- 3GPP TS37.141
- 3GPP TS51.021



Europe

- ETSI EN 301 502
- ETSI EN 301 908-1
- ETSI EN 301 908-3
- ETSI EN 301 908-14
- ETSI EN 301 908-18

North America

- FCC CFR 47 Part 22, 24, and 27 (USA frequency dependent)
- FCC CFR 47 Part 2 (USA)
- IC RSS-130, 132, 133, 139, and 199 (Canada frequency dependent)
- IC RSS-Gen (Canada)

6.1.5

Marking

To show compliance with legal requirements the product is marked with the following labels:

Europe

- CE mark

North America

- usETL/cETL
- FCC CFR 47 Part 15 Statement
- IC ICES-003 Statement
- FCC ID (located on mRRUS)
- IC ID (located on mRRUS)

6.2

Other Standards and Regulations

The standards and regulations in this section are not regulatory approved.



6.2.1 Dependability

The RRUS is designed for a MTBF of 50 years at 20°C (24-hour operation).

6.2.2 Spare Parts

This RRUS complies with the Ericsson Serviceability and Spare Parts Strategy.

6.2.3 Surface Quality

The surface quality of the RRUS is in accordance with Ericsson standard class A3.

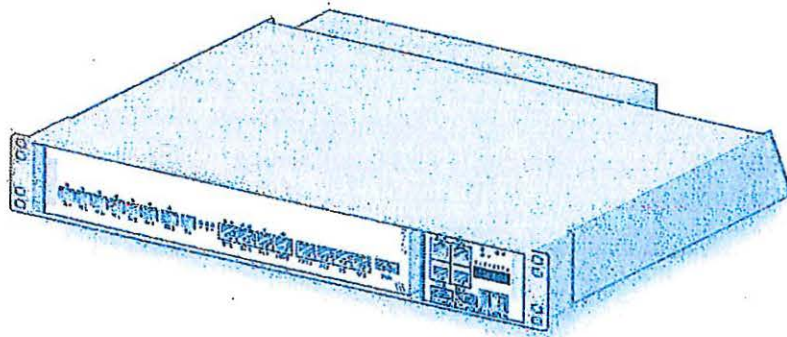
6.2.4 Vandal Resistance

Unauthorized access is not possible without damaging the unit.

Main Unit Description

RBS 6601

DESCRIPTION



Copyright

© Ericsson AB 2014. All rights reserved. No part of this document may be reproduced in any form without the written permission of the copyright owner.

Disclaimer

The contents of this document are subject to revision without notice due to continued progress in methodology, design and manufacturing. Ericsson shall have no liability for any error or damage of any kind resulting from the use of this document.

Trademark List

All trademarks mentioned herein are the property of their respective owners. These are shown in the document Trademark Information.



Contents

1	Introduction	1
2	Product Overview	1
2.1	Main Features	3
3	Technical Data	3
3.1	Dimensions	3
3.2	Space Requirements	4
3.3	Environmental Characteristics	5
3.4	Power Supply Characteristics	8
4	Hardware Architecture	11
4.1	Main Unit Overview	11
4.2	Support System	12
4.3	Fan Module	15
4.4	Movable Brackets	15
4.5	DU, TCU, or XMU 02	15
4.6	Front Cover (Optional)	17
4.7	Front Cover Brackets and Railings	17
4.8	DU to Support System Compatibility	18
5	Connection Interfaces	24
5.1	Earthing Interface	25
5.2	Built-in External Alarm Interface	26
5.3	SAU Interface (Optional)	27
5.4	Power Connection Interface	28
5.5	LMT Interface (Optional)	29
5.6	Synchronization Interface (Optional)	30
5.7	Radio Interface	31
5.8	Optical Interface to CDMA DBA Unit	33
5.9	Transmission Interface	34



Main Unit Description



1 Introduction

This document is a description of the RBS 6601 main unit.

2 Product Overview

The RBS 6601 main unit consists of a support system installed with either of the following:

- One or two Digital Units (DUs) for GSM, WCDMA or LTE, or
- One DU and one Transport Connectivity Unit (TCU), or
- One DU and one Auxiliary Multiplexing Unit (XMU).

The support system for the main unit is available in the following variants:

- Variant 1
- Variant 2

Figure 1 shows support systems, variant 1 and variant 2.

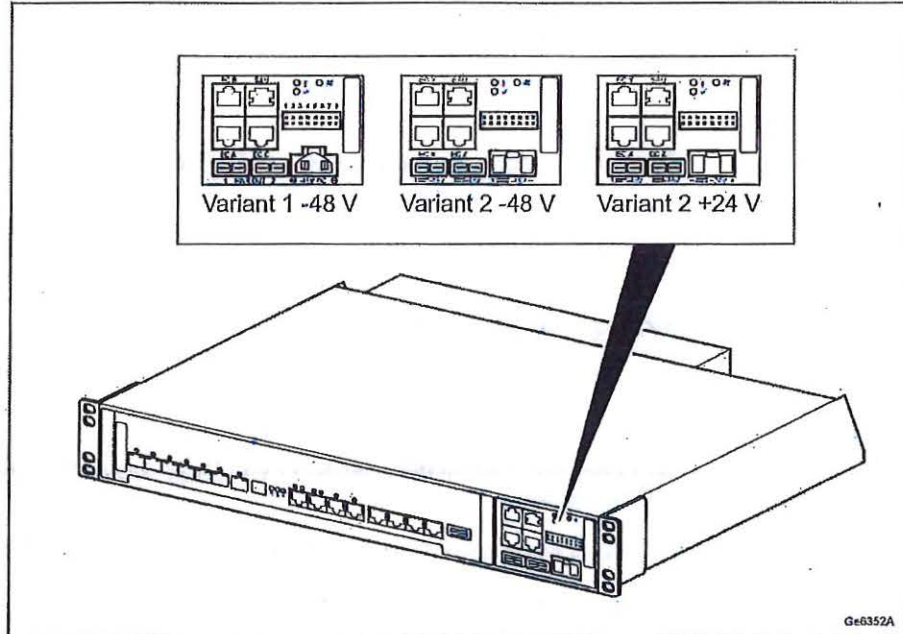


Figure 1 Support Systems, Variant 1 and Variant 2

The main unit facilitates a scalable, modular RBS with one or several indoor main units and a number of Remote Radio Units (RRUs) or Antenna Integrated Radio (AIR) units. Figure 2 shows the main unit installed in an RBS and connected to external radios.

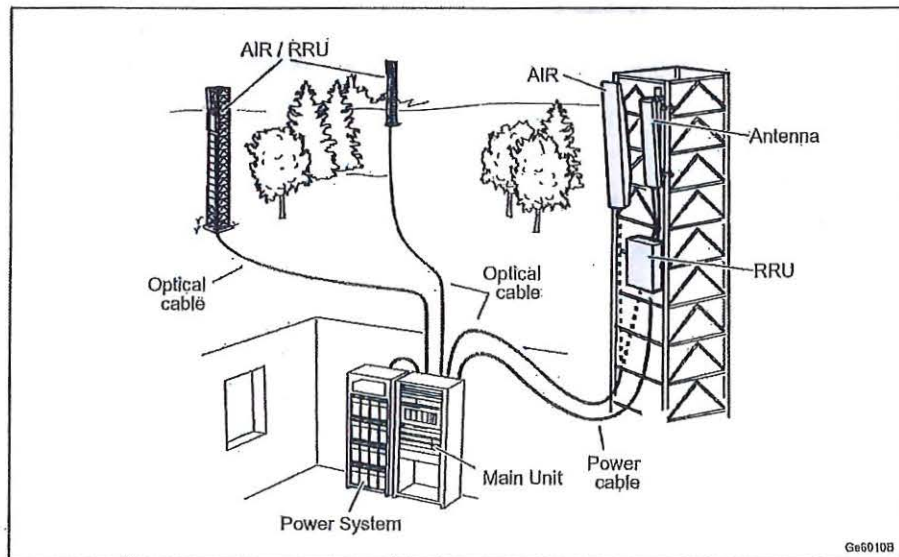


Figure 2 RBS Connected to External Radios



An overview of RBS 6601 can be found in *RBS Description*.

2.1 Main Features

This section describes the main features of the main unit.

Note: Not all features are supported by all configurations. Current radio configurations can be found in *RBS Configurations*.

The following are the main features of the main unit:

- Facilitates a modular, scalable system, with one or several main units and external radios, that can be configured to meet the current demand.
- Can be installed in a 19-inch rack or cabinet.
- Supports RRUs installed near the antennas, to decrease cable signal loss.
- -48 V DC or +24 V DC power supplies.
- Supports synchronization from Global Navigation Satellite System (GNSS) or over the transport network.
- Supports integrated external alarms.

3 Technical Data

This section describes the physical characteristics, environmental data, and power solution of the main unit.

3.1 Dimensions

Table 1 lists the dimensions, weight, and color of the main unit.

Table 1 Dimensions, Weight, and Color

Dimensions	
Height	66 mm (1.5 U)
Width	483 mm (19-inch)
Depth	355 mm
For more information about dimensions, refer to Figure 3.	



Weight	
Fully equipped main unit	< 10 kg
Color	
White	

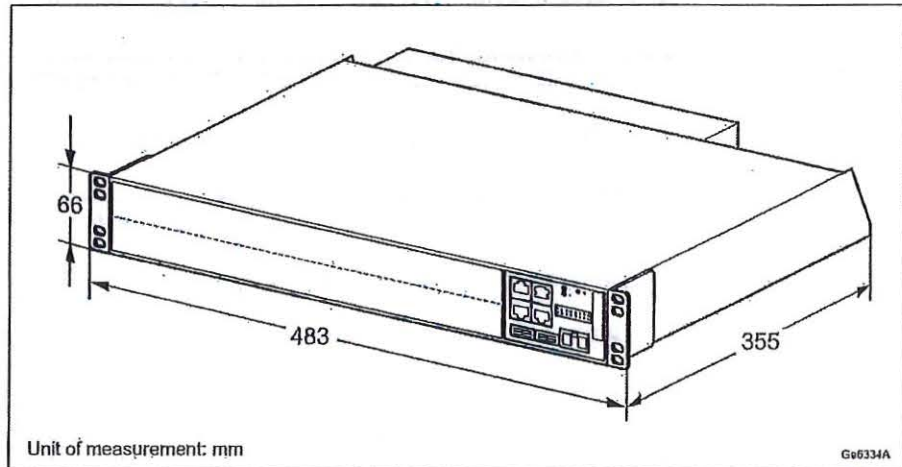


Figure 3 Dimensions

3.2 Space Requirements

This section describes the space requirements for installing the main unit in a 19-inch rack.

3.2.1 Installation Requirements

The main unit is 1.5 U high and can be installed in a 19-inch rack that complies with IEC 60297. It can also be installed in a cabinet. The rack or cabinet can be free-standing, without contact with other racks or cabinets, against a wall, back-to-back, or side-by-side with other racks or cabinets. Two or more main units can be installed in the same rack, and must be installed directly on top of each other, without space in between to maintain sufficient airflow.

The minimum distance between the rear of the main unit and the rear rack wall is 50 mm, to make room for the exhaust air. If the rack is equipped with a door, the minimum distance between the front of the main unit and the door is 50 mm, to provide space for cables and air intake. The movable brackets of the main unit can be adjusted up to 80 mm horizontally to place the main unit in the best position in the rack.

The main unit is intended for installation in a restricted access area. Access is gained through the use of a tool or lock and key, or other means of security, and is controlled by the authority responsible for the location.



3.3 Environmental Characteristics

This section describes the environmental characteristics of the main unit.

For more information about environmental characteristics, refer to *Environment Requirements*.

To achieve reliable operation and maximum performance; and to minimize the risk of unit malfunction, an appropriate installation location must be chosen. The main unit is an indoor unit which implies that the environmental characteristics are similar to that of inside an outdoor RBS. The main unit operating environment must be a temperature-controlled enclosed location suitable for sensitive data and telecommunication equipment, with very low levels of airborne particles.

The operating environment must comply with the following standards:

- IEC 60721-3-3 classes 3K3/3Z2/3Z4/3B1/3C2(3C1)/3S2/3M2, and
- ETSI EN 300 019-1-3 Class 3.1, except for the main unit operation temperature.

An appropriate installation location must have an adequate air conditioning system that provides the installation locations with the following:

- Controlled level of particles in the air, according to Table 2.
- Controlled air temperature, according to Table 3 in Section 3.3.1 on page 6.
- Controlled air humidity; according to Table 3 in Section 3.3.1 on page 6.

Table 2 Air Particle Limitations

Particles	Maximum Value	Unit
Salt Mist	0	cm ³ /m ³
Sand	30	mg/m ³
Dust (Suspension)	0.5	mg/m ³
Dust (Sedimentation)	1.5	mg/m ² h

Note: The main unit can be equipped with the optional front cover with filter to increase protection against particles.

The main unit cannot be installed in locations that do not meet the environmental criteria in this document. The following are examples of such unsuitable locations:

- Do not install the main unit where adequate air conditioning systems do not exist.
- Do not install the main unit where it is exposed to unfiltered outdoor air.



- Do not install the main unit where it is exposed to salt mist, sand, dust, or other particles.

3.3.1 Operating Environment

This section describes operating environment parameters for main unit operation.

There are three operating environments for the main unit: normal, exceptional, and non-destructive.

- Normal: Under normal conditions, all units function as specified.
- Exceptional: Under an exceptional environmental stress outside of normal operating limits, all units continue to function but with reduced performance or capacity. When conditions return to normal, the systems resume "Normal operation" status.
- Non-destructive: Under a non-destructive environmental stress beyond exceptional limits, no equipment function is guaranteed, and performance may degrade in an unspecified manner. However, the equipment still fulfills legal requirements and does not become hazardous to people. When conditions return to normal, no on-site intervention is needed to restore full RBS performance.

Table 3 gives the values for the main unit operating environment.

Table 3 Operating Environments

Operating Environment	Temperature (°C)	Relative Humidity (%)	Absolute Humidity (g/m ³)	Change of Temperature (°C/min)
Normal	+5 to +50	5-85	1-25	0.5
Exceptional	0 to +50	5-90	1-25	0.5
Non-Destructive	-10 to +55	5-90	1-25	0.5

3.3.2 Heat Dissipation

Check the operating temperature 12 hours after power up to take the heat dissipation of the units into account.

Any increase in temperature because of heat dissipation must be added to changes in temperature throughout the year. In areas where the temperature during the warm time of year is significantly higher than the rest of the year, the accumulated temperature can exceed the maximum allowed operating temperature. The operating environment must have sufficient air-conditioning.



For information on heat dissipation for different DUs, refer to Section 4.8 on page 18 .

3.3.3 Acoustic Noise Summary

Table 4 shows the sound pressure level corresponding to a free-standing (not built in) main unit according to EN ISO 11205, calculated according to EN ISO 11203.

Table 4 Maximum Sound Power Level

Temperature (°C)	Sound Power Level (dBA)
+20	58
+25	58
+30	58
+45	60

3.3.4 Vibration

This section describes the tolerance to vibrations.

The main unit operates reliably during seismic activity as specified by test method IEC 60 068-2-57 Ff.

Maximum level of Required Response Spectrum (RRS)	50 m/s ² within 2–5 Hz for DR=2%
Frequency range	1–35 Hz
Time history signal	VERTEQ II

The main unit operates reliably during random vibration as specified by test method IEC 60 068-2-64 Fh method 1.

Random vibration, normal operation	0.04 m ² /s ³
Random vibration, safe operation	0.15 m ² /s ³
Random vibration, non-destructive operation	0.2 m ² /s ³

The main unit operates reliably during shock as specified by test method IEC 60 068-2-27 Ea.

Peak acceleration	50 m/s ²
Duration	11 ms



3.3.5 Earthquake Requirements

To fulfill earthquake requirements, follow the instructions in the manual for the rack.

3.3.6 Materials

The materials in the main unit are managed through the Ericsson lists of banned and restricted substances based on legal and market requirements.

3.4 Power Supply Characteristics

This section describes the power supply, power consumption, and fuse and circuit breaker recommendations.

3.4.1 DC Power Supply Characteristics

The main unit, depending on the support system variant used, is available with a -48 V DC or $+24$ V DC power interface.

Power characteristics for -48 V DC power are listed in Table 5.

Table 5 -48 V DC Power Characteristics

Condition	Value
Nominal voltage	-48 V DC
Operating voltage range	-40.0 to -58.5 V DC
Non-destructive voltage range	0 to -60 V DC

Power characteristics for $+24$ V DC power are listed in Table 6.

Table 6 $+24$ V DC Power Characteristics

Condition	Value
Nominal voltage	$+24$ V DC
Operating voltage range	$+20.5$ V to $+29.0$ V DC
Non-destructive voltage range	0 V to $+32$ V DC

3.4.2 Power Consumption

The following factors affect the power consumption:

- Main unit configuration, both HW and SW
- Operating conditions, traffic-related and environment-related

EXHIBIT B

[Date]

Mr. John Updike
Director of Property
Real Estate Division
City and County of San Francisco
25 Van Ness Avenue, Suite 400
San Francisco, CA 94102

RE: Acknowledgment of Commencement Date and Expiration Date, Lease Between GTE MOBILNET OF CALIFORNIA LIMITED PARTNERSHIP, D/B/A VERIZON WIRELESS (Tenant), and the CITY AND COUNTY OF SAN FRANCISCO (Landlord), for Communications Site premises located at 1001 Potrero Avenue, Building 25, Zuckerberg San Francisco General Hospital

Dear Ms. Brown:

This letter will confirm that for all purposes of the Lease, the Commencement Date (as defined in Section 3.2 of the Lease) is _____, 2017.

Please acknowledge your acceptance of this letter by signing and returning a copy of this letter.

Very truly yours,

By: _____

Title: _____

Accepted and Agreed:

By: _____
JOHN UPDIKE
Director of Property

Dated: _____

EXHIBIT C

Access for Telecommunications Equipment Installation and Maintenance

Zuckerberg San Francisco General Hospital and Trauma Center

Access for Telecommunications Equipment Installation and Maintenance

1. Telecommunication company staff (Vendor) access to ZSFG buildings requires check in at the power plant located off of 22nd St., east of Potrero Ave.
2. No equipment can be added without prior approval from both ZSFG IT and Facilities departments.
3. Vendors must notify Chief Engineer of any known safety concerns prior to obtaining approval of equipment (i.e., transmitting signal hazards).
4. Notice: 48 hour minimum notice to ZSFG Facilities Department is required prior to vendor/consultant/subcontractor access to any ZSFG campus building.
5. ZSFG reserves the right to secure power to any equipment if deemed necessary.
6. Vendors must carry an official company ID to identify themselves and wear a ZSFG Facilities ID badge to gain access to the building.
7. Vendors will be required to sign a ZSFG campus orientation sheet which informs them of safety protocols.
8. No free parking is provided.

EXHIBIT B

[Date]

Mr. John Updike
Director of Property
Real Estate Division
City and County of San Francisco
25 Van Ness Avenue, Suite 400
San Francisco, CA 94102

RE:Acknowledgment of Commencement Date and Expiration Date, Lease Between
GTE MOBILNET OF CALIFORNIA LIMITED PARTNERSHIP, D/B/A VERIZON
WIRELESS (Tenant), and the CITY AND COUNTY OF SAN FRANCISCO (Landlord), for
Communications Site premises located at 1001 Potrero Avenue, Building 25, Zuckerberg San
Francisco General Hospital

Dear Ms. Brown:

This letter will confirm that for all purposes of the Lease, the Commencement Date (as
defined in Section 3.2 of the Lease) is _____, 2017.

Please acknowledge your acceptance of this letter by signing and returning a copy of this
letter.

Very truly yours,

By: _____

Title: _____

Accepted and Agreed:

By: _____
JOHN UPDIKE
Director of Property

Dated: _____

EXHIBIT C

Access for Telecommunications Equipment Installation and Maintenance

Zuckerberg San Francisco General Hospital and Trauma Center

Access for Telecommunications Equipment Installation and Maintenance

1. Telecommunication company staff (Vendor) access to ZSFG buildings requires check in at the power plant located off of 22nd St., east of Potrero Ave.
2. No equipment can be added without prior approval from both ZSFG IT and Facilities departments.
3. Vendors must notify Chief Engineer of any known safety concerns prior to obtaining approval of equipment (i.e., transmitting signal hazards).
4. Notice: 48 hour minimum notice to ZSFG Facilities Department is required prior to vendor/consultant/subcontractor access to any ZSFG campus building.
5. ZSFG reserves the right to secure power to any equipment if deemed necessary.
6. Vendors must carry an official company ID to identify themselves and wear a ZSFG Facilities ID badge to gain access to the building.
7. Vendors will be required to sign a ZSFG campus orientation sheet which informs them of safety protocols.
8. No free parking is provided.

