SCOPE OF WORK
ATTACHMENT B

Introduction/Background

An inspection at the Allied Industrial, Breezy Hill, Knight Road, and Town Creek tower sites, located at 456 Guy Payne Road, 4101 Forsyth Road, 4520 Knight Road, and 3177 Upper River Road, respectively, Macon, Georgia 31210, show multiple deficiencies for a proper public safety radio facility. The tower and antenna systems were built sometime prior to 2000.

Objectives

The objective of this project is to provide a turn-key solution for the tower upgrade and antenna systems:

- Upgrade the tower structures in accordance with Maintenance and Condition Assessment Reports from the inspections done by Tower Engineering Professionals (TEP)
- Install all antennas, lines and hardware as specified.
- Provide and install proper cable support.
- Provide and install antenna transmission line cable management system and cable entry ports (enlarge to accommodate all cabling plus spare ports.
- Provide and install building and tower grounding system.
- Install new LED tower light system.
- Remove old antenna system and hardware.

Terms and Definitions

- County - Macon-Bibb County, Georgia.
- Towers – 580ft, 150ft, 400ft, and 470ft. Communications Towers respectively in County.
- Project Manager - Respondent's representative responsible for coordination with County personnel and other contractors and individuals as may be required by the County for properly fulfilling the contractual obligations of the successful Respondent.
- Site Ready – tower upgrade and new antenna system installation, where applicable, is complete and prepared for cut-over.
- AI – Allied Industrial
- BH – Breezy Hill
- KR – Knight Road
- TC – Town Creek
- TEP – Tower Engineering Professionals (Engineers of Record)

Scope of Work (Allied Industrial and Town Creek)

- Supply and Install Grounding for Tower and Site Grounding System:
  - The site will be considered to include the tower, cable ice bridge, equipment shelter, exterior cable management, exterior cable entrance, interior cable entry/termination point and interior cable management at entry port (trapeze).
  - The grounding system will include a four foot (4') tower top lightning rod, the tower grounding (Earthing), the grounding of all antenna cables at the antenna elevations

(top), cables mid-tower, cable tower exit points (TGB, bottom), building cable entry location (EGB) and equipment room interior cable entry point (IGB). Each coax will have grounding kits every 75ft.
    - Interior Grounding:
        - Ground Bars: 4x30 Kit ground bars, insulators, connecting rods and exothermic welded #2 tinned solid copper to earth ring. Interior and exterior.
        - Trapeze to be three levels and solid copper with holes for bolting TVSS. Trapeze to be grounded as shown in the grounding specifications
    - Copper wire provided by Contractor.
    - Note: All grounding to meet or exceed Harris Site Grounding And Lightning Protection (T4618RevF) Specifications.
- Supply and Install Cable Ice Bridge and Cable Management System:
    - Cable ice bridge will be constructed of 18" wide galvanized steel Grip Span with cable supports placed near either end (approx 36") with stainless-steel snap-in cable hangers.
    - Vertical waveguide: 18" wide with snap-ins every 48" vertical and secured to tower diagonal members.
    - Supply and install all required cable entrance port boots for all openings with appropriately sized cable cushions.
    - Cable entry:
        - Coax Entry (exterior): (1) Microflect 12 (3x4), 4" Hole cable entry port sealed to building wall.
        - Coax Entry (interior): 2x8 pressure treated wood framed inside cinder block wall and dressed to match existing interior wall.
        - Coax to terminate 18" inside from the exterior port plate and TVSS to be bolted directly to trapeze.
    - Interior 18" cable ladder to meet new port complete with mounting hardware and grounding.
- Antenna Installation Matrix and Requirement:
    - All six-foot side arms, transmission lines, connectors, TVSS, jumpers, weatherproofing, hoisting grips and ground straps will be supplied and installed by the tower contractor. Antennae by others.
    - Provide antenna sweep testing on all antenna systems and components upon completion of installation using MBITR Antenna Systems Sweep Testing Standard (MBIT-17002 Rev 1.1) or newer. Sweep testing will consist of, but not limited to, the following:
        - Antenna Return Loss,
        - Transmission Return Loss,
        - Transmission DTF into a Load,
        - Transmission Return Loss into a Short,
        - Transmission DTF into a Short,
        - Antenna system Return Loss with surge protectors inline,
        - Supply test results in printed and electronic (PDF and Anritsu raw data file) format as part of the tower documentation submission upon project completion.
- Supply and install digital LED tower lighting system (Flash Technology, new tower lighting system to have daytime high intensity strobes, nighttime infrared and red flashing lighting), no monitoring services.
- Remove old antenna system and hardware (make and model of the existing antenna system is unknown, use the provided tower mapping to assist in identifying existing equipment,

antennae are to be stored inside the building compound located on site, the remaining components are to be disposed by the contractor).
- Remove and dispose old tower lighting system (existing tower lighting system is by Honeywell Flash Guard 2000/3000).

Scope of Work (Knight Road)

- Replace the existing antennae (6) with new antennae (6).

Scope of Work (All tower sites)

- Tower upgrades in accordance with Maintenance and Condition Assessment Report for each site as listed by TEP.

General

- Respondent will assume all risk and liability for any damages that may occur to surrounding structures during the relocation, demolition and removal process.
  - Respondent shall have liability coverage naming Macon-Bibb County certificate holder.
  - Force Majeure, without limitation:
    - Acts of nature;
    - Acts or failure to act on the part of any governmental authority other than the City or Contractor, including, but not limited to, enactment of laws, rules, regulations, codes or ordinances subsequent to the date of this Agreement.
- The Respondent is responsible for being familiar with all conditions, instructions, and documents governing this project and bid. Failure to make such investigation and preparations shall not excuse the Contractor from performance of the duties and obligations imposed under the terms of this contract.
- Tower structural analysis is available for review.
- There are no known drawings for the existing site.
- The Macon-Bibb County Engineering Department (780 3rd Street, Macon, Georgia 31201) may have drawings showing the easements to the site from the road.
- Contractor is responsible for the security, cleanliness and upkeep of the tower site always until accepted by MBITR.
- Liquidated damages shall be imposed for exceeding the date of completion.

Specification

- If a crane is used, Respondent shall be responsible for, but not limited to the following:
  - Proper crane sizing;
  - All permits;
  - Ingress and egress of the crane to the site;
  - Public safety (securing the operating area around the tower).

- List of Attachments
  - Antenna Installation Schedule.
  - Antenna Sweep Specifications.
  - Harris Grounding Specifications.
  - TEP Maintenance and Condition Assessment Reports
  - Antenna Data Sheets.
- Contractor's tower workers must possess a valid Comtrain or equivalent Basic Tower Safety and Rescue training certification. Contractor must provide proof of such training certification with the proposal.
- Antenna system sweep testing is required as part of this project. Contractor must provide with the proposal proof of employee training or certification in the use of the sweep testing equipment to be used for this project (nearly all analyzer manufacturers have training certifications available for their products, Anritsu being one of the largest, a .pdf copy showing the name of the operator and the certifying company will suffice).
- All work performed by the awarded contractor or its sub-contractors must comply with the then current Harris Site Grounding And Lightning Protection (T4618RevF) and MBITR Antenna Systems Sweep Testing Standard (MBIT-17002 Rev 1.1) specifications. Work provided under this proposal will be subject to an T4618RevF inspection by the County's radio service provider and/or Harris directly and the awarded contractor will be required to correct any deficiencies at no additional cost to MBC.
- Any alternate items or proposals shall be noted as exceptions to the RFQ requirements with a complete explanation as to the nature of the alternate proposal.

Antenna Installation Schedule:

Antenna ID	Height	Ant Loc	Color Code	Freq MHz	Make	Cable Make/Size	Top Connector	Bottom Connector	Jumper Size/Length	Jumper Connectors
Alpha Tx	400 (AI) 457 (TC)	1A	RN	806-869	Provided by others	RFS LCF158-50 1 5/8"	DIN Female	DIN Female	RFS LCF12-50 6'	DIN Male-DIN Male
Beta Tx	400 (AI) 457 (TC)	1B	BN	806-869	Provided by others	RFS LCF158-50 1 5/8"	DIN Female	DIN Female	RFS LCF12-50 6'	DIN Male-DIN Male
Gamma Tx	400 (AI) 457 (TC)	1G	GN	806-869	Provided by others	RFS LCF158-50 1 5/8"	DIN Female	DIN Female	RFS LCF12-50 6'	DIN Male-DIN Male
Alpha Rx	420 (AI) 437 (TC)	2A	RR	806-869	Provided by others	RFS LCF78-50 7/8"	DIN Female	DIN Female	RFS LCF12-50 6'	DIN Male-DIN Male
Alpha TTA	420 (AI) 437 (TC)	2A	RW	806-869	Provided by MBC	RFS LCF12-50 1/2"	N Male	N Female	-	-
Beta Rx	420 (AI) 437 (TC)	2B	BR	806-869	Provided by others	RFS LCF78-50 7/8"	DIN Female	DIN Female	RFS LCF12-50 6'	DIN Male-DIN Male
Beta TTA	420 (AI) 437 (TC)	2B	BW	806-869	Provided by MBC	RFS LCF12-50 1/2"	N Male	N Female	-	-
Gamma Rx	420 (AI) 437 (TC)	2G	GR	806-869	Provided by others	RFS LCF78-50 7/8"	DIN Female	DIN Female	RFS LCF12-50 6'	DIN Male-DIN Male
Gamma TTA	420 (AI) 437 (TC)	2G	GW	806-869	Provided by MBC	RFS LCF12-50 1/2"	N Male	N Female	-	-
Tenant	402	3A	TBD	TBD	TBD	RFS LCF114-50 1 1/4"	DIN Female	DIN Female	RFS LCF12-50 6'	TBD
GPS 1A	40	9A	YR	1575	TBD	RFS LCF12-50 1/2"	N Male	N Female	-	-

GPS 1B	40	9B	YB	1575	TBD	RFS LCF12-50 1/2"	N Male	N Female	-	-
GPS 2A	IB	10A	YYR	1575	TBD	RFS LCF12-50 1/2"	N Male	N Female	-	-
GPS 2B	IB	10B	YYB	1575	TBD	RFS LCF12-50 1/2"	N Male	N Female	-	-
GPS 3A	SH	11A	YYY R	1575	TBD	RFS LCF12-50 1/2"	N Male	N Female	-	-
GPS 3B	SH	11B	YYY B	1575	TBD	RFS LCF12-50 1/2"	N Male	N Female	-	-
Color Code: Black (K), Blue (B), Brown (N), Green(G), Orange(O), Red (R), Slate (S), Violet (V), White (W), Yellow (Y)										

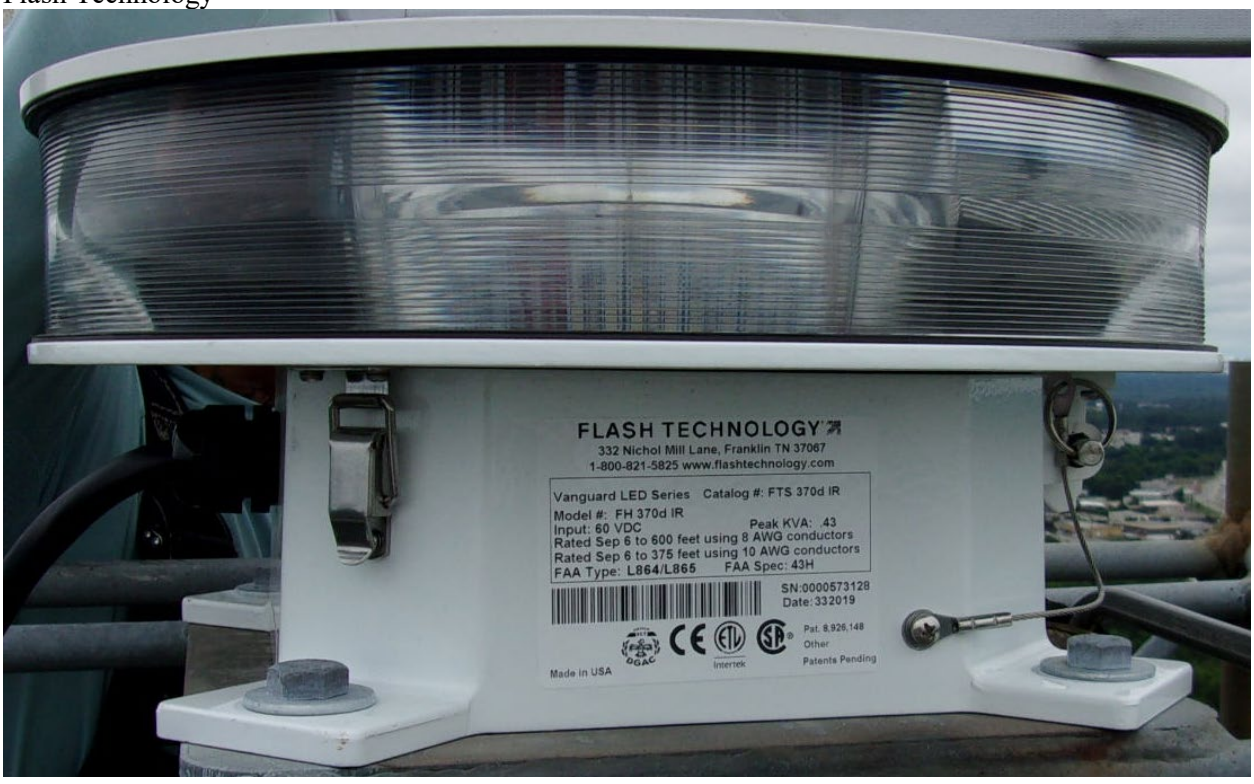
Antenna Sweep Specifications

MBITR-17002
Sweep Specification

L3Harris Grounding Specifications

Harris Site
Grounding And Ligh

Flash Technology



Maintenance and Condition Assessment Reports

Allied
Industrial_SOW_Ma

Breezy
Hill_SOW_Maintena

Knight
Road_SOW_Mainter

Town
Creek_SOW_Mainte