



Jasper County, Missouri

*Jasper County Emergency Services
New Tower for 7/800 P25 Public
Safety Radio System*

RFP 2024-001



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1.0 Terms and Conditions

1.1 Purpose

This Request for Proposal (RFP) encompasses a turnkey project to provide Jasper County Emergency Services, Missouri (further known throughout this document as 'Customer') with a new tower to support the existing 700MHz radio network capable of meeting current and future communication needs, reliably and functionally.

1.2 Instructions

This RFP is a complete document and must be returned intact with the Vendor proposal provided in a point-by-point fashion. The RFP Authorization Form (See Attachments) must be completed. All responses and attachments should be placed into the Vendor proposal immediately behind the area in which the information was requested i.e., a point-by-point response.

If supplementary materials are inserted, each inserted page must be labeled in the bottom margin with the number of the RFP page behind which it is being placed. If more than one page is inserted behind a particular RFP page, then each must be labeled with the appropriate page number plus a letter designator, e.g. 121a, 121b, 121c, etc.

When submitting responses to RFPs, corporate entities are required to comply with Missouri State law regarding authorized signatures. A letter of proposal submittal is required. If an official with the proposing Vendor, other than the president executes the letter of transmittal such signature must be accompanied by a certificate or a copy of a resolution adopted by the corporation setting forth the authority of that individual to execute a contract.

The Vendor shall provide a point-by-point and narrative response that must be met as described below. The Vendors shall clearly delineate in its point-by-point response its position with respect to the stated requirement, meaning the statement of any of the following:

- Understood – meaning that the item has been read and its direction or meaning is understood;
- Comply – meaning that the item has been read and that the Vendor agrees and accepts the requirement(s) as stated;

- Comply with Clarification – meaning that the Vendor fully accepts the requirement and is in addition providing an explanation of how it intends to adhere to the requirement(s);
- Exception – meaning that the Vendor understands the Customer's item but cannot accept or undertake the Customer's requirement(s).

Proposal responses that take exception to a stated RFP requirement risk being graded down in the evaluation process. Vendors are encouraged to request clarification of RFP items that are unclear during the period provided within the Customer's open procurement cycle.

1.2.1 Proposal Timeline

<u>Release of Request for Proposal:</u>	Monday, Oct 15, 2024
<u>Mandatory Pre-Proposal Conference:</u>	Wed, Nov 6, 2024 at 01:00PM CST
<u>Vendor Site Visits (Day 1):</u> Immediately following pre-proposal conference.	Wed, Nov 6, 2024 at 02:00PM CST
<u>Deadline for Submission of Questions:</u>	Friday, Nov 15, 2024 at 03:00PM CST
<u>Answers Provided through Addendum No _____</u> Later Than:	Friday, Nov 22, 2024 at 03:00PM CST
<u>Proposal Due Date and Time</u>	Friday, Dec 13, 2024 at 03:00PM CST
<u>Vendor Oral Presentations</u>	TBD

1.2.2 Mandatory Pre-RFP Conference

This RFP constitutes the full scope of the information request. A mandatory RFP pre-proposal conference will be conducted after the release of this RFP. The time and place of the pre-proposal conference will be at 13870 Dispatch Ln Carthage, Missouri 64836 on Wed, Nov 6, 2024 at 01:00PM CST.

1.2.3 Mandatory Site Visits

Vendor site visits shall be made available immediately following the Mandatory Pre-Proposal Conference on Wed, Nov 6, 2024 at 02:00PM CST.

1.2.4 RFP Questions

If during the review or preparation of the RFP response a Vendor discovers any errors, omissions, or ambiguities, they should submit, in writing, their questions to Dean Hart. Written RFP questions can be directed via email to Dean Hart at dean.hart@tusaconsulting.com. Vendors shall submit all written questions on or before the designated deadline for submission of questions noted in the Proposal Deadline section.

All emails must use the following subject line:

JASCO 911, MO Site Addition RFP Question

1.2.5 Late RFP Response Submission

Any RFP Response submitted after the specified submission due date and time, will not be accepted and will be returned unopened to the submitting organization. All RFP responses will be held in confidence, to the extent permissible by Jasper County Emergency Services, Missouri law, as applicable.

1.2.6 RFP Response Submittal

The RFP Response shall be divided into two sections: 1) Technical and 2) Pricing. Two (2) copies each of the Technical Response and One (1) electronic searchable copy of the Technical Response AND Two (2) copies each of the Pricing Response and One (1) electronic searchable copy Pricing Response are to be submitted.

The Pricing Responses (including electronic copy) shall be separated from the Technical Response (including electronic copy) and independently sealed. **Do NOT put your price in the technical proposal or it will be disqualified.**

Each RFP Response shall be submitted in standard 8.5 x 11.5, three ring binders. The entire RFP Response package must be submitted in a sealed container addressed to: 13870 Dispatch Ln, Carthage, MO 64836 and identifying the title of the procurement. The time and date of the Proposal Opening must be plainly marked on the container as well as the Vendor's name, address and State Contractor's License Number.

Upon receipt of the proposals, Jasper County Emergency Services will announce all received vendor proposals to the customer.

1.2.6.1 Evaluation Specifics

Technical and Pricing Proposals shall be evaluated separately using a weighted point system whereby out of a maximum 100% Overall Project Score, 70% shall be allocated to Technical Proposal evaluation scores, and 30% being allocated to the Pricing Proposal.

Technical Proposals will first be evaluated for overall responsiveness and completeness to the RFP. Proposals that are determined responsive and complete will be evaluated by the Customer and Consultant.

Proposals will be graded in the following areas, listed in relative order of importance, with respect to the requirements as outlined in this RFP:

1. Performance (30%)
2. Vendor qualifications, references, history of product support, and
3. Equipment installation and implementation (25%)
4. Warranty (10%)
5. Organization, Scope, and Proposal Detail (10%)

The scored results of this Evaluation will be multiplied by 0.70, thereby yielding a weighted technical project-total score. The results of this portion of the Evaluation shall be submitted to Jasper County Emergency Services.

At the direction of Jasper County Emergency Services as to the suitability and acceptability of the Evaluation Results, the Consultant will next open and evaluate proposed costs for each responsive Technical Proposal.

The relative cost differences between responsive Cost Proposals shall be compared and evaluated. Each of the Pricing Proposals received from responsive Vendors shall have their individual cost evaluation raw scores multiplied by 0.30 and those portion results added together with the Technical Evaluation score, thus yielding an Overall Project Score for each Vendor's response.

That Vendor response receiving the highest Overall Project Score shall be recommended by the Consultant as being the most responsive, best proposal. In the case of a tied Overall Project Score, the Consultant shall recommend that Vendor response having the highest Technical Proposal evaluation score.

1.2.5.2 Total Costs

Jasper County Emergency Services reserves the right to evaluate the total project price based on initial cost and lifecycle analyses. Any deviations by Vendors from the pricing requirements herein shall be pre-approved by Jasper County Emergency Services in advance of submittal, or they will be construed as being non-conforming, and the submittal will not be given further consideration.

1.3 Definitions

Definitions as used herein:

- a) Vendor:**
Any organization, company, or supplier responding to this RFP
- b) Contractor:**
The Vendor to whom a Contract is awarded.
- c) Proposal, RFP Response, Submittal:**
Correspondence or material furnished by Responders in response to this specification.
- d) Jasper County Emergency Services, Owner**

Jasper County Emergency Services, Missouri

- e) Consultant
TUSA Consulting Services II, LLC.

- f) System
Contractor furnished tower, shelter, generator, and site civil work.

1.4 Vendor Standards and References

The Vendor must have, delivered and installed at least comparable towers, shelters, generators, and site civils, having comparable size, scope, and with similar terrain.

These four systems shall be described with enough information that Jasper County Emergency Services or its Consultant can reasonably determine their project equivalency.

RFP responses must include a detailed summary of similar work, as well as a current customer contact, including name, address, and phone number, title, department, and system responsibility.

The following standards shall apply, as a minimum, to all equipment, installation methods and materials:

- A. EIA/TIA-Electronic/Telecommunications Industry Association
- B. NEC - National Electric Code
- C. NEMA - National Electrical Manufacturer's Association
- D. IEEE - Institute of Electrical and Electronic Engineers, Inc.
- E. FCC - Federal Communications Commission
- F. FAA - Federal Aviation Administration
- G. NFPA - National Fire Protection Association
- H. Building Codes for Jasper County Emergency Services, Missouri
- I. OSHA - Occupational Safety and Health Administration
- J. (R56) Motorola Standards and Guidelines for Communications Sites or equivalent

1.5 Workmanship

All proposed workmanship supportive of the RFP must conform to normal and accepted standards for the telecommunications industry. All fixed site equipment, including , electrical wiring, towers, shelters, generators, and site civils, antennas, mounts, etc. are to be installed by or under the supervision of the Contractor.

The Contractor must completely remove and properly dispose of residue due to its work, return the site to a useable state and will be responsible for the cost of repairing all damage caused by the Contractor or its Sub-Contractors during network installation.

Jasper County Emergency Services and its Consultant reserves the right to halt any civils installation process due to poor workmanship, housekeeping, scheduling, work interruptions, etc.

Work halts that are the result of poor workmanship would not relieve the Contractor of their responsibility to conform to the installation time requirements as stated by Contract.

1.6 Materials

All equipment, except with the expressed written permission of Jasper County Emergency Services and its Consultant, must be new and unused, meet telecommunications industry standards, and, where applicable, be registered with and approved by the Federal Communications Commission.

Jasper County Emergency Services and its Consultant reserve the right to reject and require the return, at the Contractor's expense, of any defective components that fail to comply with this RFP.

Rejections of material for cause would not provide an extension of time to the Contractor in the performance of contracted requirements. Such rejections or returns will neither validate nor invalidate the remainder of any Contract.

1.7 Subcontractors

It is intended that a single Contractor have total turnkey responsibility for the subsequent Jasper County Emergency Services project so as to assure a fully compliant completion of the proposed work.

Therefore, any Vendor desiring to use Sub-Contractor(s) must include within their response a list and description of potential, qualified Sub-Contractor(s). Jasper County Emergency Services may require documentation and references to ensure the qualification of a proposed Sub-Contractor.

1.8 Premises Visits

Vendors, before submitting an RFP Response, are required to visit the existing Jasper County Emergency Services radio infrastructure site premises in order to gain familiarity with conditions which may affect the work or planned solution(s). See section 1.2.1 above for additional details.

Site Visits shall take place immediately following the Pre-Proposal Conference.

Vendors must indicate any special requirements, i.e., architectural, mechanical, electrical, civil or structural modifications, that their equipment may need at either Jasper County Emergency Services-owned or non-Jasper County Emergency Services-owned locations that are intended to be utilized.

Estimated costs for these special requirements shall be disclosed in the RFP Response. Failure to ask questions on special requirement or provide costs can result in a proposal being scored down.

1.9 Contact

All contact and inquiry concerning this RFP shall be directed to:

<u>Project Name:</u>	JASCO 911, MO Site Addition
<u>Customer Position</u>	911 Director
<u>City/County/State:</u>	Carthage, Missouri
<u>Customer Contact Name:</u>	Lisa Rataczak
<u>Street:</u>	13870 Dispatch Ln
<u>City/State/Zip Code:</u>	Carthage, Missouri, 64836
<u>Phone:</u>	(417)358-7000
<u>Email:</u>	lrataczak@jasco.gov

1.10 Notification

Vendors will be notified of Jasper County Emergency Services desire to enter into additional discussions as well as an oral presentation of proposed solutions, if determined necessary.

Jasper County Emergency Services ranking of proposals shall be published after a recommendation of the best and most advantageous proposal is presented to the Jasper County Emergency Services Board.

1.11 Installation

1.11.1 Project Time Frame for Completion

The Project's anticipated time frame for completion is no greater than eight (8) months from a formal Notice to Proceed. The Project will not be deemed completed until the fully-compliant proposed infrastructure has been installed; receipt of as-built documentation has occurred; and a Certificate of Substantial Completion has been issued by the Consultant for any remaining punch list items.

Standardized Vendor contracts will not be accepted unless suitably modified to comply with this RFP and subsequent RFP Addendums.

1.12 Training

The Vendor shall coordinate all training and, all sessions must be approved by Jasper County Emergency Services.

1.13 Manufacturer Support

1.13.1 Jasper County Emergency Services requires, at a minimum, a one-year comprehensive warranty on all infrastructure equipment required by this proposal.

1.14 Warranty of Network Performance

The Vendor acknowledges that it has carefully reviewed the functional requirements and warrants that the proposed tower, shelter, generator, and site civil work function according to equipment specifications, industry standards, and the minimum operative characteristics specified herein in this RFP.

1.15 Remedies

Remedies shall be part of any Contract awarded and negotiated with the Successful Vendor. The scope of these remedies will become part of a negotiated contract and shall minimally include a graduated set of monetary penalties for unexcused late or delayed performance by the Contractor. The project schedule's indicated completion date shall be the basis for assessment of completion remedies.

Remedies shall be applied as follows:

Unexcused project completion delays of between 1 day and 30 days beyond the Contract's indicated completion date shall be assessed a penalty of \$1,000 per day.

Unexcused completion delays that extend from Day 31 through Day 70 beyond the Contract's indicated completion date shall be assessed a penalty of \$1,500 per day.

Unexcused completion delays beyond 70 days shall be assessed a remedy of \$2,000 per day.

Any unexcused project completion delay that exceeds 180 days from the Contract's indicated completion date shall trigger an automatic default of the Contract. If the Contractor is unable to cure the reason for its completion failure within 45 additional days, the Contract will self-cancel and the Owner will initiate action against the Contractor's performance bond unless some acceptable accommodation is reached by the Contractor with the Owner. During the 45-day default period, remedies will be assessed at the rate of \$3,000 per day.

Remedies shall also apply to warranty repair service. The RFP and its subsequent contract with the Successful Vendor will include a mandatory warranty period where repair services performed in the field will be necessary. This RFP contains response time periods within which the Contractor is required to provide services and materials.

A failure to perform on the part of the Contractor to meet its contracted response time requirements shall result in a financial penalty of the scope and amount indicated by this RFP or as modified during contract negotiations.

1.16 Acceptance Testing Process

Acceptance testing procedures will be defined during Contract Negotiations. These procedures would essentially test and verify the performance of tower installation features.

The Acceptance Test shall minimally encompass:

- 1 An installed determination of compliance with Industry standards and published RFP requirements of the various equipment elements provided under the Contract;

- 2 Functionality of standby power systems;
- 3 Functionality and path reliability of microwave link segments and the overall network as a whole;
- 4 A successful confirmation by Motorola Solutions (the radio vendor) to coverage.
- 5 Completion of a mandatory 30-day reliability burn in absent of any major failures.

1.17 Right of Refusal

Jasper County Emergency Services reserves the right to reject any and all RFP Responses received. Acceptance of any Response will not place Jasper County Emergency Services under any obligation to purchase any equipment, system or services.

Jasper County Emergency Services reserves the right to reject any or all bids and to waive any or all irregularities, mistakes, omissions or informalities relative thereto.

The date and time for the submittals of questions and for the submittal of bids as set forth in this RFP shall be deemed mandatory. The failure to meet all submittal dates as set forth shall constitute a defect in the submission, which shall be grounds for rejection as non-responsive. The failure to meet any submittal dates shall not be considered a waivable irregularity, omission, or informality.

1.18 Bid, Performance, and Payment Bonds

A Performance Bond in the amount of one hundred percent (100%) of the Contract Price shall be provided by the Contractor in the event a contract is subsequently awarded through either a sole-source or competitive procurement process.

The Performance Bond shall be exercised by Jasper County Emergency Services for failure of the Contractor to perform according to the terms of the Contract, i.e., an uncured default condition that results in Contract Cancellation. The Performance Bond shall be in place prior to a notice to proceed.

A Payment Bond in the amount of one hundred percent (100%) of the Contract price would likewise be required. The Payment Bond must be from a surety company authorized to do business in the State of Missouri with a rating of A- or better in the most current edition of the A.M. Best Insurance Report.

The cost of these Performance and Payment Bonds shall be the responsibility of the Contractor.

1.19 Proposal Pricing Summary Sheets

Vendors shall provide detailed price breakdown submittals for infrastructure, network integration/project management, and installation/engineering services. It is not acceptable to lump category costs. Vendors must provide sufficient detail in their pricing proposals whereby it is possible to identify equipment types and services groupings. The format of the price submittal shall follow that as indicated by RFP Section 16 Pricing Considerations.

1.20 Corporate Resolution

RFP Responses must contain a Corporate Resolution or Power of Attorney authorizing and identifying agents to sign their Proposal or other documents as required by this RFP. This Corporate Resolution or Power of Attorney must be certified and notarized.

1.21 Non-Collusion Affidavit

Vendors must complete and submit the Non-Collusion Affidavit form. Attach an executed original in the Original-Marked proposal submittal and a copy of this executed form in all subsequent proposal copies, as required.

1.22 Brokerage Fee

The Contractor warrants that he has not employed any person to solicit or secure this Contract upon an agreement for a commission, percentage, brokerage, or contingent fee.

Breach of this warranty shall give Jasper County Emergency Services the right to terminate the Contract, or at the discretion of Jasper County Emergency Services to deduct from the Contract price or consideration, the amount of such commission, percentage, brokerage, or contingent fee.

This warranty shall not apply to commissions payable by contractors upon contracts or established commercial or selling agencies maintained by the Contractor for the purpose of securing business.

No elected official or employee of Jasper County Emergency Services shall be permitted to share any part of this Contract or any benefit that may arise wherefrom, and any contract made by Jasper County Emergency Services in which such individual(s) shall be personally interested shall be void, and no payments shall be made thereon by Jasper County Emergency Services or any officers thereof.

1.23 Conflict of Interest

In the interest of ensuring that efforts of the Contractor do not conflict with the interests of Jasper County Emergency Services, and in recognition of the Contractor's professional responsibility to Jasper County Emergency Services, the Contractor agrees to decline any offer of employment if its independent professional work on behalf of Jasper County Emergency Services is likely to be adversely affected by the acceptance of such employment. The initial determination of such a possibility rests with the Contractor. It is incumbent upon the Contractor to notify Jasper County Emergency Services and provide full disclosure of the possible effects of such employment on the Contractor's independent, professional work on behalf of Jasper County Emergency Services. Final decision on any disputed offers of other employment for the Contractor shall rest with Jasper County Emergency Services.

1.24 Contracts

This RFP and the Vendor's proposal will be an integral part of the Contract. Any and all statements made in the proposal will automatically become part of the final Contract for equipment and services.

Omission in the Vendor's proposal of any equipment, services, or provisions herein prescribed shall not be construed so as to relieve the Contractor of any responsibility or obligation necessary to the complete and satisfactory installation of any and all systems, equipment, and services specified. The price and any optional prices quoted must include all equipment, service, features, materials, labor, etc. necessary to make all the features, services, and equipment, which are included, fully functional. The Vendor agrees that the cost of additional equipment, materials, or labor necessary to meet these requirements, which was not otherwise calculated in the Vendor's proposal, shall be solely at the Contractor's expense.

If there are specific items that are purposefully excluded in the Vendor's indicated price, those must be defined by the Vendor's proposal. If, however, those Vendor-excluded items are what Jasper County Emergency Services and its Consultant consider to be normal and customary for a project of this type, any proposal excluding such items will be graded as not meeting minimum requirements for the appropriate RFP category(s) impacted by that exclusion.

Each Vendor proposal must be signed by a duly authorized officer who is empowered to contractually bind the Vendor.

Jasper County Emergency Services shall enter into contract negotiations with the apparent responsive and best Vendor. Should Jasper County Emergency Services be unable to negotiate a Contract with the apparent responsive and best Vendor, Jasper County Emergency Services may exercise the right to enter into Contract negotiations with the apparent responsive Vendor having the next-highest evaluation score.

1.25 Non-Appropriation of Funds

In the event no funds or insufficient funds are appropriated and budgeted by Jasper County Emergency Services or are otherwise unavailable for fulfilling the requirements of the Contract, the obligations of Jasper County Emergency Services shall terminate on the last day of the fiscal period for which appropriations are received without penalty or expense to Jasper County Emergency Services of any kind whatsoever. Jasper County Emergency Services will immediately notify the Contractor or its assignee of such occurrence. In the event of such termination, Jasper County Emergency Services agrees to peaceably surrender possession of the equipment to the Contractor or its assignee on the date of such termination.

The Contractor will be responsible for packing all equipment and any freight charges.

Jasper County Emergency Services will not cancel if any funds are appropriated to it, or by it, for the acquisition, retention or operation of the equipment or other equipment performing similar functions for the current fiscal period in which the termination occurs.

This shall include the next succeeding fiscal period thereafter and that it will not during the funding period give priority to other functionally similar equipment or services.

Contractor shall covenant and agree to indemnify and hold Jasper County Emergency Services harmless against any loss, damage liability, cost, penalty, or expense, including attorney's fees, which Jasper County Emergency Services does not otherwise agree to in the Contract and which is incurred or arises due to a failure of Jasper County Emergency Services to appropriate funds in the manner described herein for a continuation of the Contract or exercise of the option to purchase the equipment.

1.26 Purchase Payment Schedule

The following payment schedule shall apply:

- 10% at Contract execution.
- 15% Permits received for start of site work
- 20% Tower foundation and tower erection
- 20% Shelter foundation and shelter delivery
- 15% Tower, shelter, and site grounding
- 10% Site Civils
- 10% upon Final System Acceptance.

The Vendor agrees that all prices quoted in the RFP Response are valid for 18 months from the Contract execution date.

1.27 Contractor's Insurance

The Contractor shall be responsible for any and all loss of material connected with the construction due to unexplained disappearance, theft or misappropriation of any kind or nature. The foregoing provisions shall not operate to relieve the Contractor and any Subcontractors of responsibility for loss or damage to their own or rented property or property of their employees of whatever kind or nature, including but not limited to tools, equipment, forms, scaffolding and temporary structures including their contents.

Jasper County Emergency Services shall in no event be liable for any loss or damage to any of the aforementioned items or any other property of the Contractor and any Subcontractors, which is not included in the permanent construction.

The Contractor and any Subcontractors hereby waive any right of recovery they may have against Jasper County Emergency Services for damage or destruction of property of whatever kind or nature whether it is their own property or property of their employees.

The Contractor acknowledges the title and risk of loss for the new system shall transfer to Jasper County Emergency Services upon Final System Acceptance.

The Contractor shall procure and maintain for the duration of the Contract the following insurance policies as mandated by and with minimum limits set by Jasper County Emergency Services Procurement Policy with coverage for occurrences and claims that may arise from or in connection with the performance of the obligations hereunder by the Contractor, its agents, employees, representatives and subcontractors:

1. The contractor shall maintain in full force and effect throughout the contract term liability and property damage (casualty) policies. The policy of liability insurance shall cover all of the contractor's operations on the premises, including bodily injury and property damage; shall provide a per-occurrence limit of at least one million and aggregate of two million

The policy shall name Jasper County Emergency Services as an additional insured. The property damage policy shall cover the replacement value of the structures and equipment the contractor installs on site.

2. The contractor shall also maintain workers' compensation insurance as required by law, and employers' liability coverage of at least \$1,000,000. Jasper County Emergency Services will consider proposals offering reasonable exceptions to the requirements stated above. All policies shall be issued by an insurer of substantial size and financial stability.

The policies or certificates evidencing the coverage provided above shall be submitted at a Pre-Construction Conference prior to commencing any work or Jasper County Emergency Services issuance of a formal Notice to Proceed. Such policies or certificates shall provide that insurance will not be materially altered or cancelled without thirty (30) days prior written notice to Jasper County Emergency Services.

1.27.1 Other Provisions

The insurance policies required by the Contract shall contain, or be endorsed to contain, the following provisions:

1. Jasper County Emergency Services, its officers, agents, servants and employees, shall be added as, additional insured's, under the Comprehensive General Liability and Automobile Liability Coverages.

2. The Workers compensation insurance and Employer's liability coverages shall contain an express waiver of all rights of subrogation against Jasper County Emergency Services, its officers, agents, servants, and employees, for losses arising from work performed by the Contractor for Jasper County Emergency Services.

3. All insurance policies required by this Contract shall be endorsed to state that coverage shall not be suspended, voided, cancelled by either party

Coverage cannot be reduced or in limits except after thirty (30) days prior written notice by certified mail to Jasper County Emergency Services.

1.27.2 Acceptability of Insurers

All insurance required by this Section shall be placed with insurers that are authorized to do business in the State of Missouri and have a rating of no less than A- in the most current edition of the A.M. Best Insurance Report. Insurers shall have a minimum financial size category of V21 according to A.M. Best.

1.27.3 Certificates of Insurance

the Contractor shall furnish to ",Customer," Certificates of Insurance affecting coverage required by this Contract. The certificates are to be signed by a state licensed agent authorized by that insurer to bind coverage on its behalf and endorsements.

The certificates and endorsements must be received and approved by Jasper County Emergency Services prior to the Contract's effective date.

1.28 Affirmative Action / Equal Opportunity Employer

Jasper County Emergency Services is an affirmative action/equal opportunity employer that selects contractors without consideration of race, religion, color, ethnic background, sex, age, or handicap. Minority-owned business are encouraged to submit bids.

It is the policy of Jasper County Emergency Services to award public building contracts without regard to race, religion, color, creed, national origin, sex, age, or handicapping condition.

1.29 Indemnity

Indemnity terms shall be negotiated and mutually agreed with the apparent winning Vendor as part of final Contract negotiations.

1.29.1 Additional Required Forms

Vendors must fill out and return the following forms:

- A. Subcontractor's Disclosure Form
- B. Non-collusion Affidavit Form
- C. Contractor/Vendor Disclosure Form
- D. Proposal Authorization Form
- E. Israeli Statement
- F. Ethics Statement

1.29.2 Documents Required

- A. Proof of Payment Bond
- B. Proof of Performance Bond

2.0 Identified User Needs and Requirements

2.1 General

- 2.1.1** The intent of this RFP is to provide two tower sites which shall include a new tower, new equipment shelter, new generator, and additional site civils the Vendor’s proposed infrastructure.
- 2.1.2** The Vendor shall be responsible for conducting tower and foundation structural analysis for the proposed towers. Vendors are required to propose a comprehensive set of equipment and services that satisfy this RFP’s minimum requirements and are encouraged to describe specific areas within their proposal solutions that materially exceed these minimum objectives.
- 2.1.3** Section 6 Site Work Requirements, provides for specific workmanship standards for communications facilities that must be met by the Contractor in the course of constructing the system. This RFP provides a baseline of technical requirements coupled with functional objectives that must be considered by responding Vendors.
- 2.1.4** It shall be the responsibility of the Contractor to provide a turnkey proposal and to install Industry-accepted standard electrical grounding systems. All proposed grounding shall meet all requirements as specified in this RFP and Motorola 68P81089E50-C_Standards_and_Guidelines_for_Communication_Sites_R56.
- 2.1.5** The delivery and installation of: equipment shelters, security systems, standby and emergency power systems, towers, electrical grounding systems, cable attachment hardware, transmission line shields, tower-to-building cable tray hardware, and all necessary permitting is part of this project and must be furnished by the Vendor.
- 2.1.6** Scope of Work
- This scope of work calls for the provision of goods and services as necessary to develop, install a fully functional Telecommunications Tower System for Jasper County Emergency Services. The following primary components of the scope of work are:
- 2.1.6.1** Design and install one Telecommunication tower and corresponding compound around the tower.

2.1.6.2 Design and install one communication concrete building.

2.1.6.3 Design and provide electrical components for and within the sites.

2.1.6.4 Ensure one customer purchased LP Gas Generator for the site is coordinated with the preferred vendor and installed.

2.1.7 Responsibilities of Contractor

Contractor shall provide an on-site Project Manager for single point of contact with JASCO 911. The Project Manager's responsibilities shall include but not limited to:

2.1.7.1 Development of a complete construction schedule.

2.1.7.2 Delivery and storage of all materials.

2.1.7.3 On-site supervision of all work.

2.1.7.4 Weekly written status reports including progress and issues.

2.1.7.5 Keep and provide list of active and past sub-contractors.

2.1.7.6 Perform site inspections with the JASCO 911.

2.1.7.7 Provide detail site inspection sign-off sheets for completion of separate construction phases.

2.1.7.8 Monitor progress and take actions to ensure adherence to the bid specifications, schedule, and quality of work.

2.1.8 Summary of site work performed at sites:

2.1.8.1 Clearing, earthwork, excavating, backfilling, compacting and grading.

2.1.8.2 Construction access roads and drainage, including installation of stone base and surfacing and erosion control measures.

2.1.8.3 Installation of fencing and secured access gates.

- 2.1.8.4** Equipment Shelter foundations design and installation (The Shelter shall be constructed at a level that is no less than 6-inches above the 100-year flood plain.)
- 2.1.8.5** Manufacturing, delivery and setup of equipment shelters as specified, including sidewalks, grounding systems, and ancillary equipment.
- 2.1.8.6** Installation, delivery, startup, and testing of site generators with integral tank, including filling of the fuel tank.
- 2.1.8.7** Erection of a guyed tower, as specified, including tower design and construction, foundation design and construction, grounding, cable ladders, waveguide bridges, climbing ladders or step bolts with safety climbing devices, antenna and microwave mounts, and related equipment.
- 2.1.8.8** Work with JASCO 911 to coordinate installation of electrical service to the sites.
- 2.1.8.9** Obtain all permits and approvals required for site work.
- 2.1.8.10** Install any landscaping and/or trees that may be required at the sites.
- 2.1.8.11** Restore any disturbed areas around the sites to their original condition.

2.1.9 Work Description

The Contractor must answer all questions and request for specificity. All responses must reflect current capabilities. All specifications incorporating "will," "shall," "must," etc., are requirements. All specifications incorporating "may," "should," "desires," etc., are highly desirable features. In the case of a specific requirement not followed by a request for an explanation, Contractor must explicitly affirm that the proposed system or component meets that requirement. Simply taking exception to a requirement without providing an explanation, and where appropriate an alternative, may result in the rejection of proposal, Contractor shall provide a list of all exceptions taken to this RFP. Proposed alternative language, if appropriate, should be incorporated in the response to each requirement.

- 2.1.9.1** Tower Information - detailed included in Appendix A. Current Infrastructure. A new tower is required.

Reference sheets in Appendix A are provided for both sites, to demonstrated approximately location of each tower.

2.1.9.2 New Shelter Information (New Joplin) - detailed information in Section 3. Shelter Requirements. A new shelter is required for the New Joplin site.

Installation of Shelter and propane tank Information (New Joplin site) - detailed information in Section 3. Shelter Requirements and 4. LPG Generator.

2.1.9.3 Generator Information - The site will have a new generator provided and installed per Section 4. LPG Generator.

2.1.9.4 Site Civil Information - detailed information in Section 6. Site Work Requirements. Site Civil work will be required at the site.

2.1.9.5 Electrical and Grounding Information - detailed information in Sections 3-7. Electrical and ground will be required at the site.

2.1.9.6 Site compounds will be approximately 100'x100' to allow space for Customer shelter and generator and future tenants as allowed by JASCO 911.

2.1.9.7 The site will require a road for access. Vendors will provide this access road as part of this RFP.

3.0 General Equipment and Shelter Requirements

3.1 New Shelter Design Considerations

Equipment shelters shall be of a concrete floor, bullet-resistant, prefabricated concrete aggregate type designed to house radio communications, the standby power generator/transfer switch, and sensitive electronic equipment:

3.1.1 The exterior wall measurements shall be no less than 10ft high, 10ft wide and 12ft long. Interior dimensions shall include nominal wall, roof and floor dimensions, to be determined by Contractor.

3.1.2 Equipment shelters must provide an interior climate suitable for the operation of sensitive electronic equipment, that is, it must be dust proof, watertight and airtight.

3.1.3 The shelter shall NOT include a separate power generator equipment area. The generator shall be located outside the shelter.

3.1.4 {Intentionally Removed}

3.1.5 The equipment shelter shall be supported by a reinforced concrete pad with attachment devices appropriate for securing the building assembly to survive straightline type force (no less than 150-mph) winds.

3.1.6 Any sites located within a FEMA 100-Year Floodplain shall require elevation due to the increased flood risk. These equipment shelters shall be elevated upon approved concrete piers or galvanized steel framework.

3.1.6.1 The finished length of piers/framework shall extend, minimally, four feet above ground level but otherwise in accordance with FEMA's 100-Year floodplain elevation height plus an 24-inch contingency margin.

3.1.7 Any metal components, attachment hardware, cross-braces and lifting eyes shall be hot-dip galvanized metal after fabrication.

3.2 New Shelter Configuration Details

- 3.2.1** The exterior wall finish shall be exposed aggregate concrete. Seeding of aggregate for an exposed aggregate finish is not acceptable. Exterior walls must be bullet resistant as defined below.
- 3.2.2** The roof shall be a flat, tapered type having a minimum slope of 1/2" per foot from the roof centerline.
 - 3.2.2.1** The roof shall be designed to support a minimum of 100-lbs/sq. ft. distributed load.
- 3.2.3** All exterior wall, floor and roof joints shall be sealed using a compressible, resilient sealant. There shall be no exposed roof-to-wall or wall-to-floor joints.
- 3.2.4** Cement used in concrete shelters shall be standard Portland cement conforming to the requirements of the "Standard Specification of Portland Cement", ASTM Designation C150. Concrete aggregate shall conform to the requirements of the "Specifications for Concrete Aggregates" ASTM C33 and "Specifications for lightweight aggregates for structural concrete" ASTM C330.
- 3.2.5** Exterior concrete surfaces shall be sealed with a minimum of two coats of THOROGLAZE® H Concrete Sealer or equivalent.
- 3.2.6** The shelter's interior floor shall be covered with 1/8" x 12" x 12" industrial weight solid vinyl floor tile. Floor color shall be light beige.
 - 3.2.6.1** The subfloor shall be designed to support a minimum of 200 lbs. / sq. ft. distributed floor load, while on foundation, or as needed to support proposed equipment. Consideration should be given to the area(s) for the proposed 48VDC battery plant weight load.
- 3.2.7** Walls shall have a minimum thermal insulation factor of R11.
- 3.2.8** The shelter's roof shall have a minimum thermal insulation factor of R19.
- 3.2.9** Interior wall surfaces shall be faced with white vinyl/coated wood paneling.
 - 3.2.9.1** The interior ceiling surface shall be white, vinyl coated plywood. Seams in the plywood shall be trimmed with batten strips painted to match the ceiling.

3.2.10 Building openings for the door, air-conditioners, transmission line entrance and other entries shall be framed and sealed in such a manner that moisture cannot penetrate the insulation within the walls or the interior walls of the structure.

3.2.11 Each door measuring 36"W x 84"H x 3" made of thick insulated bullet-resistant steel, and equipped with a three-point latch, shall be provided. All door hardware shall be stainless steel and incorporate three external hinges having non-removable hinge pins. Door shall open outward to maximize internal building utilization.

3.2.11.1 The term 'bullet-resistant' is defined, for this RFP, as unable to be penetrated by a .30-06 or .308 commercial cartridge firing a lead tipped, 160-grain projectile, at not more than 2600 fps muzzle velocity. The projectile will be test-fired at a range of 100 yards. The structure/material must not be completely penetrated at that distance.

3.2.12 Fiberglass exterior awnings shall be provided to protect the door entrance(s) and air-conditioner units.

3.2.13 All hardware used on the exterior surfaces of this shelter shall be either hot-dipped galvanized or stainless steel. Wafer, MDF (Medium-Density Fiberboard), or particleboard wood products are not an acceptable construction material for this project.

3.2.14 Contractor shall provide detailed fabrication drawings for the concrete foundation (or steel frameworks), designed to adequately support the proposed building structures and wind loads.

3.2.14.1 Additionally, the building frame shall be mechanically bonded to the concrete/steel foundation. Strapping and anchor materials shall be hot-dipped galvanized protected.

3.2.14.2 Building, and foundation detail drawings and related calculations must be reviewed, approved and stamped by a State of Missouri-licensed Professional Engineer (P.E.)

3.3 New Shelter Electrical Requirements

3.3.1 Each shelter shall be equipped with overhead cable trays located above all

3.3.1.1 Auxiliary cable trays shall be provided to support transmission lines and telecommunications cables, as necessary.

- 3.3.1.2** All cable tray joints shall be electrically bonded using No. 6 AWG copper wire jumpers with approved compression fittings.
 - 3.3.2** Individual, properly grounded with home run grounds, 120VAC, 20A electrical circuits shall be provided to each of the equipment racks/cabinets.
 - 3.3.3** Each shall be terminated as two twist lock type outlets mounted on the cable tray directly above the center of each planned equipment rack. One of the outlets will be provided with generator power and the other with UPS supplied power, clearly identified by the power source.
 - 3.3.4** Individual, properly grounded with home run grounds, 240VAC, 30A electrical circuits shall be provided for the UPS unit.
 - 3.3.5** Sufficient flexible conduit shall be provided above the rack to permit interconnection to chargers located at the bottom of the rack.
 - 3.3.6** DC wiring for the radio network's battery plant and interconnection to the various equipment groupings shall be furnished and installed, as required.
 - 3.3.7** DC wiring for the radio network's battery plant and interconnection to the various equipment groupings shall be furnished and installed, as required.
 - 3.3.8** Install eight (8), properly grounded with home run grounds, quad 120VAC convenience outlets, two each on the two longest walls and one each on each of the remaining walls.
 - 3.3.9** {Intentionally Removed}
 - 3.3.10** The Contractor shall furnish and install one circuit breaker panel board. Panel board shall be sized for all the indicated branch circuits, equipment loads plus a fifty percent growth factor.
- 3.4 UPS Requirements**
- 3.4.1** No UPS shall be included in this bid.
- 3.4 Electrical/Transient Grounding System**
- 3.4.1** The Contractor shall furnish and install an interior and buried exterior electrical grounding system and power surge protection for each location, as follows:

- 3.4.1.1** A single #2AWG copper conductor ground halo shall be installed on all four interior walls, spaced approximately six inches below ceiling level. The halo shall include a twelve-inch gap/break at the furthest point from the single-point ground attachment, which shall coincide with the RF transmission line entrance.
- 3.4.1.2** Ground halo shall be mounted on six-inch standoffs, located on twelve-inch centers. It shall be affixed to the transmission line ground entry-port buss bar.
- 3.4.1.3** This ground entry-port buss bar must be equipped with an Alarm, connected to the network's alarming system, to indicate ground failure, tamper, or theft.
- 3.4.1.4** All equipment cabinets, racks, transmission line entrance and cable trays shall be individually bonded to the halo using #6AWG copper conductors with approved compression fittings.
- 3.4.1.5** Interior halo shall be bonded to an exterior, buried ground network using low impedance copper conductors.
- 3.4.1.6** Electrical transient protectors shall utilize MOV and avalanche clamp devices such as the Transector Systems Model 1101-808 series or equivalent. This device shall be installed on the commercial power feed as well as the standby generator feed to the power transfer switch.
- 3.4.1.7** A single, stranded #00AWG copper exterior ground system shall be installed about the building and tower perimeter, located below the frost line, as identified locally, and exothermically bonded to the building frame, interior halo, transmission line ladder, generator system, ice shields, and radio tower legs. All site grounding practices and methods shall meet a recognized telecommunications standard such as IEEE, Motorola R56 or the current revision of Harris AE/LZT 123 46181/1.

3.5 Shelter Lighting Requirements

- 3.5.1** Install 4-foot, 2-bulb, 80-watt LED FCC Type accepted light fixtures as necessary to provide effective illumination for each equipment rack.

- 3.5.2** Install emergency exit and interior lighting as required by fire code.
- 3.5.3** Exterior lights above the door(s) and area lights on each of the exterior shelter corners shall be controlled by, at a maximum, two light switches located just inside the main door opening on the side away from the hinges at shoulder height.
- 3.5.4** No LED lights are permitted on exterior walls without prior approval by the Customer.

3.6 HVAC Requirements

- 3.6.1** The Contractor shall furnish and install a dual, wall-mounted heating and air-conditioning system appropriately sized for each shelter/equipment heat load.
- 3.6.2** Each HVAC unit shall incorporate circuitry to ensure that both compressors do not attempt to restart at the same time.
- 3.6.3** HVAC configuration must include timer circuits to rotate use of the air conditioner units on a weekly basis.
- 3.6.4** The HVAC configuration shall include appropriate sensors to cause both air conditioners to run simultaneously as needed to more rapidly reduce the internal temperature to a safe operating level.
- 3.6.5** Equipment shall be furnished with compressor anti-cycle circuitry to prevent short-cycle starts against high compressor head pressure.
- 3.6.6** Equipment shall be furnished with a compressor hot gas bypass (or its equivalent) to minimize electrical power surges because of compressor cycling.
- 3.6.7** Design of HVAC system shall take into consideration the following environmental conditions:
 - 3.6.7.1** Desired Interior Temperature: 70 degrees F
 - 3.6.7.2** Maximum Outdoor Temperature: 115 degrees F
 - 3.6.7.3** Minimum Outdoor Temperature: 0 degrees F
 - 3.6.7.4** Transmitter Power Dissipation: 8,000 watts
1165 BTU/Hr

3.6.7.5	Other Equipment	1000 watts 850 BTU/Hr
3.6.7.6	Battery Charger/Inverter:	2,000 watts 1025 BTU/Hr
3.6.7.7	Lighting:	750 watts (Intermittent)

3.7 Shelter Alarm Systems

- 3.7.1** The Contractor shall furnish and install an over/under temperature sensor, continuously adjustable over the range of 32°F to 120°F, having independent Form-C output contacts suitable for high/ low temperature alarm activation.
- 3.7.2** The Contractor shall furnish and install a door entry alarm sensor, magnetic type, having a Form-C contact closure output.
- 3.7.3** The Contractor shall furnish and install single-loop smoke/ fire alarm system.
- 3.7.4** Smoke/fire alarm sensors shall be mounted above battery charger equipment, in the generator room, and in vicinity of AC power distribution panel board.
 - 3.7.4.1** Smoke/fire alarm panel shall have visual indicators depicting individual alarm sensor status.
 - 3.7.4.2** Smoke/fire alarm panel shall operate from both 120VAC and 12VDC battery power sources.
 - 3.7.4.3** The Jasper County Emergency Services Fire Marshal will inspect the proposed fire alarm system.

3.8 Existing Shelter Requirements

No Existing Shelter is included.

- 3.8.1** {Section not used}
 - 3.8.1.1** {Section not used}

3.8.1.2 {Section not used}

3.8.1.3 {Section not used}

3.8.1.4 {Section not used}

3.8.1.5 {Section not used}

3.9 Site Electrical Requirements

The vendor will design and install an H-frame style configuration in the compound of the site, that will provide a minimum of five (5) meters with the capabilities of four (4) future renters that may be colocated on the new tower.

The H-frame will be grounded to the site ground ring configuration.

The vendor will be responsible to coordinate the electrical connection from the H-frame to the electric utility provider for the site. It is estimated the electric pole for each site may be up to 200' from the H-frame and should be taken into consideration for this project.

4.0 LPG Generator Equipment Requirements

- 4.1** A standby power generator system shall be furnished by the Vendor for each infrastructure site.

For its proposed infrastructure sites, the Vendor shall include:

- 4.1.1** The necessary labor and materials, as required, to furnish and install LPG fuel tanks, automatic transfer switches, manual-operated auxiliary generator connector facilities, alarm functionality and electrical wiring services to provide fully operational standby power systems.
- 4.1.2** A generator housed outside the provided equipment shelter, in accordance with the manufacturer's specifications for shock and vibration mounting, ventilation, fuel supply and electrical connections.
- 4.1.3** The radiator air inlet shall incorporate a baffle to protect the radiator core from exterior wind-blown debris damage.
- 4.1.4** It shall be the responsibility of the Vendor to provide, install and test a complete and operable standby power generator with automatic transfer switch.
- 4.1.5** Equipment shall be new, factory tested at 0.8 or better power factor for 3-hours and shall be installed within the required equipment shelters, in accordance with local area building, fire, and electrical codes.
- 4.1.6** The following documentation shall be supplied by the Contractor for the generator set and transfer switch supplied:
 - 4.1.6.1** Specification and data sheets for the exact type and model generator and transfer switch supplied pursuant to this procurement, including all options and accessories included.
 - 4.1.6.2** Manufacturer's certification of prototype testing.
 - 4.1.6.3** Manufacturer's warranty documents.
 - 4.1.6.4** Shop drawings showing plan and elevation views of the equipment.

- 4.1.6.5** Interconnection wiring diagrams showing all external connections required; with field wiring terminals marked in a consistent point-to-point manner.
- 4.1.6.6** Manufacturer's installation instructions.
- 4.1.6.7** Operator's and maintenance manuals that outline routine maintenance and troubleshooting procedures.
- 4.1.6.8** Transfer switch manual and wiring diagram.
- 4.1.7** Start-Up Service shall be included with the following requirements:
 - 4.1.7.1** A factory authorized service representative shall provide initial start-up service and shall conduct on site acceptance testing.
 - 4.1.7.2** The representative must remain until site acceptance is completed, as witnessed by the Customer.
 - 4.1.7.3** Load test records for the installed generator system shall be furnished to The Customer.
- 4.1.8** The following type of engine configuration will be used:
 - 4.1.8.1** The generator package shall include an LPG configured engine coupled with low reactance, brushless 120/240vac single-phase, 60Hz generator.
 - 4.1.8.2** The generator package shall be equipped with:
 - 4.1.8.2.1** A temperature compensated automatic voltage regulator;
 - 4.1.8.2.2** Under/over-speed protection function;
 - 4.1.8.2.3** A control panel;
 - 4.1.8.2.4** Engine block heater;
 - 4.1.8.2.5** High ambient-temperature cooling system.
 - 4.1.9.1** Output power rating of the generator shall be sized for the full calculated load of the affiliated site, inclusive of a 50% excess load factor.

- 4.1.9.2** In no instance shall the proposed generator be configured for less than 25KW output.
- 4.1.9.3** The generator shall also be capable of continuous 24-hour operation, full single-phase output at 1.0 pf.
- 4.1.9.4** The following specifications shall also apply:
 - 4.1.9.4.1** Voltage Regulation: Maintained with +/- 2% of rated voltage for constant load between no load and full load.
 - 4.1.9.4.2** Frequency Regulation: Maintained within 0.5% from steady state no load to steady state rated load.
 - 4.1.9.4.3** Single-Step Load Pickup: 100% of rated output power, less applicable derating factors, with the engine generator at operating temperature.
- 4.1.10** The generator shall have the following Set Controls:
 - 4.1.10.1** The generator shall be a remote-start type compatible with the automatic transfer switch to be supplied pursuant to this procurement.
 - 4.1.10.2** Manual starting and stopping shall be provided from the control panel.
 - 4.1.10.3** Cranking control: Shall provide a minimum of three cranking cycles of at least 15-seconds before lockout and activation of an over-crank alarm condition.
 - 4.1.10.4** The generator shall automatically shut down and lock out upon:
 - 4.1.10.4.1** Failure to start (over-crank)
 - 4.1.10.4.2** Over speed
 - 4.1.10.4.3** Low lubricating oil pressure
 - 4.1.10.4.4** High engine temperature
 - 4.1.10.4.5** Low Coolant level
 - 4.1.10.4.6** Other factors that may be harmful to the generator

- 4.1.11** Alarm contacts shall be provided to allow transmission of fault alarms for any of the above conditions, plus low oil pressure pre-warning, high coolant temperature pre-warning, low coolant temperature, low fuel and an alarm indication when the generator set is running.
 - 4.1.11.1** These alarm contacts shall be wired into, and shall be reported by, the radio network alarm system.
- 4.1.12** Meters shall be provided and located both at the generator and within the equipment shelter, to indicate output voltage, output current, running time, and frequency/RPM.
- 4.1.13** An AC rheostat (or electronic equivalent) shall be supplied for fine tuning of the generator's output voltage.
- 4.1.14** These devices shall be mounted either on the transfer switch door or a separate, remote panel.
- 4.1.15** The generator must have the capability to communicate to a central control software terminal, via the IP network, to allow for remote start and other diagnostic capabilities.
- 4.1.16** The LPG-Generator shall have the following Fuel Supply requirements:
 - 4.1.16.1** The Contractor shall supply a new, corrosion-proof, 1,000-gallon LPG storage tank to be installed on a concrete or elevated steel foundation, as dependent upon site flood plain conditions.
 - 4.1.16.2** The fuel tank shall have a shield installed above to prevent debris from the nearby tower puncturing or damaging the tank shell.
 - 4.1.16.3** The tank shall be refilled after the conclusion of radio network acceptance tests.
 - 4.1.16.4** Fuel lines shall be buried below the frost line, as determined by the location. At any point at which the fuel line exits above grade, the line shall be insulated to reduce condensation at the regulator.
 - 4.1.16.5** A low fuel level alarm shall be provided.
 - 4.1.16.6** All fuel supply lines will be sized accordingly for the generator running at full load.

- 4.1.16.7** All necessary regulators, drip pots, piping, meters, or other supplies needed for installation that meets local fire and building codes shall be furnished and installed.
- 4.1.16.8** Contractor shall supply a full fuel tank at time of System Acceptance.
- 4.1.16.9** Generator shall be capable of being connected to a natural gas line with constant supply of natural gas rather than the supplied tank with the option to switch to the LPG tank if the natural gas supply is interrupted.
- 4.1.17** A residential-grade exhaust silencer shall be installed on the generator.
- 4.1.18** Battery and Charger specifications are as follows:
 - 4.1.18.1** A lead acid starting battery, rated for the engine type to be supplied, shall be furnished and installed with the generator package.
 - 4.1.18.2** This battery shall be float charged by a 10-ampere, voltage-regulated charger which is powered by a protected 120VAC source.
 - 4.1.18.3** Float, taper and equalize charge settings shall be provided.
 - 4.1.18.4** Battery charger shall be physically located within the generator transfer switch enclosure.
 - 4.1.18.5** Battery and charger must be able to operate in, as low as, 0 degrees F.
 - 4.1.18.6** Form-C charging system alarm contacts shall be provided and connected to the network's alarm system to report loss of AC power, low battery voltage and excessively high battery charging current.
- 4.1.19** The following Cooling System components are required:
 - 4.1.19.1** A radiator-cooled engine is required.
 - 4.1.19.2** The radiator shall be filled with a water/coolant mixture in accordance with the engine manufacturer's recommendations.

4.1.19.3 A thermostatically-controlled water jacket coolant heater shall be provided and installed in accordance with the manufacturer's recommendations.

4.1.20 The Generator Base shall have the following characteristics:

4.1.20.1 The generator set shall be mounted on a heavy-duty steel base which is anchored to a Contractor-furnished building foundation.

4.1.20.2 The base shall maintain alignment between generator set components and shall include vibration isolators.

4.2 The Generator Transfer Switch

4.2.1 An automatic transfer switch which provides switching of the equipment shelter electrical load between commercial power and generator power shall be supplied and installed for each Vendor proposed standby generator.

4.2.1.1 Each transfer switch shall be completely factory assembled and shall contain electronic controls designed for surge voltage isolation, with voltage sensors on all phases of both input power sources.

4.2.1.2 Permanently attached manual handles shall also be installed on the transfer switch.

4.2.1.3 The switch shall provide positive mechanical and electrical interlocking, and mechanically-held contacts.

4.2.1.4 Quick-make and quick-break contact mechanisms shall be provided for manual transfer under load.

4.2.1.5 Each transfer switch shall be installed in a key locking, UL listed, NEMA rack to be mounted on a wall within the radio equipment shelter.

4.2.1.6 The switch shall be fully wired and integrated with the engine generator set in accordance with local electrical and fire codes.

- 4.2.1.7** A manually-operated transfer switch, as well as appropriate power connectorization, shall be provided to allow the interconnection of an auxiliary, trailered generator set should the permanently-located generator fail in operation, utilizing an Appleton plug or equivalent.

- 4.2.1.8** All transfer switches and accessories shall be U.L. listed and labeled, tested per U.L. Standard 1008 and CSA Approved.

- 4.2.1.9** Transfer switches shall be double-throw electrically and mechanically interlocked and mechanically-held in both positions.

- 4.2.1.10** Main switch contacts shall be high-pressure silver alloy.

- 4.2.1.11** Contact assemblies shall have arc chutes for positive arc extinguishment. Arc chutes shall have insulating covers to prevent inter phase flashover.

- 4.2.1.12** Form-C contacts shall be provided in each main switch position for alarm reporting purposes.

- 4.2.1.13** These contacts shall be connected to the network's alarm system for reporting transfer status.

- 4.2.1.14** Each transfer switch shall be continuously rated for operation in ambient temperature ranges of -40 to +50 degrees Celsius.

- 4.2.1.15** Transfer switches shall be rated, minimally, to carry the generator's full rated output, inclusive of the 50% added capacity over calculated equipment loading.

- 4.2.1.16** The Line-In, Generator-In and Load side terminations for the automatic transfer switch shall be protected from lightning transients using a combination of Metal Oxide Varistor (MOV) and avalanche Zener diode technologies.

- 4.2.1.17** All alarm and instrumentation wiring from the generator, that enters the equipment shelter, must likewise include appropriate lightning surge protection in the form of solid-state, fast-acting voltage clamp devices whose clamping voltage is closely matched to normal individual-alarm signal amplitudes.

- 4.2.1.18** Transfer switch control shall be solid state and designed for a high level of immunity to power line surges and transients.
- 4.2.1.19** The device shall be tested in accordance with IEEE Standard 587-1980 (or latest revision).
- 4.2.1.20** Controls shall have optically isolated logic inputs, and isolation transformers for AC inputs.
- 4.2.1.21** Relays shall be installed on all outputs.
- 4.2.1.22** Solid state under voltage sensors shall simultaneously monitor all phases of the standby power source and the commercial power source.
- 4.2.1.23** Pick up and drop out voltage settings shall be adjustable.
- 4.2.1.24** Voltage sensors shall allow for adjustment to sense partial loss of voltage on any phase.
- 4.2.1.25** Controls shall be provided with solid state over voltage sensors, adjustable from 100-130% of nominal input voltage to monitor the source.
- 4.2.1.26** An adjustable time delay shall be provided.
- 4.2.1.27** Automatic controls shall signal the engine generator to start upon signal from normal source sensors.
- 4.2.1.28** A time delay start, variable from 0 to 5 seconds, shall be provided to avoid nuisance startups.
- 4.2.1.29** Battery voltage starting contacts shall be gold, dry type contacts which have been factory wired to a field wiring terminal block.
- 4.2.1.30** The switch shall transfer when the emergency source reaches the set point voltage and frequency.
- 4.2.1.31** A time delay shall be provided for transfer that shall be continuously variable from 0 to 120 seconds.
- 4.2.1.32** The switch shall retransfer the load to commercial power after a delay.

- 4.2.1.33** This time delay shall be variable (adjustable) from 0 to 30 minutes to avoid short engine run times.
- 4.2.1.34** The retransfer time delay shall be immediately bypassed if the emergency generator fails.
- 4.2.1.35** A control shall automatically signal the engine generator to stop after a time delay, which shall be adjustable from 0 to 10 minutes, the time starting upon return to commercial power.
- 4.2.1.36** Power for transfer operation shall be from the source to which the load is being transferred.
- 4.2.1.37** Diagnostic indicators shall be provided to allow the last successful step in the sequence of control functions to be pinpointed.
- 4.2.1.38** The present status of the control functions shall also be indicated.
- 4.2.1.39** These functions, at a minimum, shall include:
 - 4.2.1.39.1** Source 1 OK
 - 4.2.1.39.2** Start generator set
 - 4.2.1.39.3** Source 2 OK
 - 4.2.1.39.4** Transfer timing
 - 4.2.1.39.5** Transfer complete
 - 4.2.1.39.6** Retransfer timing
 - 4.2.1.39.7** Retransfer complete
 - 4.2.1.39.8** Timing for stop
- 4.2.2** A key-operated Front Panel selector switch shall be provided which will provide the following functions:
 - 4.2.2.1** Test to simulate commercial power loss to allow testing of the generator set with or without transfer of the load.

- 4.2.2.2** Normal - leaves the transfer switch in its normal operating position.

- 4.2.2.3** Retransfer a momentary position which will provide an override of the retransfer time delay and cause immediate return to the commercial power source (if available).

- 4.2.3** An Exerciser Clock setting shall be included which allows setting the day, time and duration of a generator set exercise/test period. Tests under load or with no load shall be selectable.

5.0 Tower Requirements

All vendors shall comply with the Customer tower ordinances and local codes in addition to the requirements listed in this RFP.

5.1 Basic Design

- 5.1.1 The basic standard for the design of newly required steel antenna towers, wave guide bridges and supporting structures, shall be ANSI/TIA-222-H.
- 5.1.2 Towers shall be triangular shaped, solid-rod structure having an overall height to be determined by the Vendor, based on the requirements of area coverage and availability of unobstructed microwave paths for site connectivity. Limits of available space in certain areas may dictate the use of self-supported towers.
- 5.1.3 Each tower shall be designed for a minimum sustained 150-mph wind speed with the full complement of necessary antennas and required lights and other Federally-required equipment.
- 5.1.4 Antenna loads are provided in Appendix A - New Site for reference for current and future loading requirements.
- 5.1.5 All fabricated tower assemblies and parts shall be hot-dipped galvanized after fabrication per ASTM Standard A123. Hardware shall be galvanized per ASTM Standard A153 and B695. Other types of zinc coating or plating are not acceptable.
- 5.1.6 Towers shall be supplied with a full-length transmission line ladder(s) designed to accept transmission lines needed for the proposed design plus a growth factor as determined in Appendix A.
- 5.1.7 Towers shall be equipped with an outside climbing ladder/cable type safety devices and LED lighted in accordance with FAA and current OSHA regulation 29 CFR 1910.27.
 - 5.1.7.1 This device shall not interfere with the ease of climbing from one rung of the ladder to the next.
 - 5.1.7.2 There must be at least two sources of climbing safety belts compatible with the safety climb anti-fall system, as supplied with the tower.

- 5.1.8** Tower lighting shall conform to FAA Advisory Circular AC 70/7460-1M, or current revision, Obstruction Marking and Lighting. VHF, UHF and 800 MHz radio equipment may be operational/co-located at the various radio sites. Therefore, it is imperative that only shielded, RFI-conditioned lighting devices be provided.
- 5.1.9** The Vendor shall provide detailed tower lighting equipment specification literature in its response sufficient in scope where The Customer can determine the suitability of the proposed lighting system with respect to planned or anticipated radio operations.
- 5.1.10** The Contractor shall install tower lighting controls in a temporary fixture adjacent to the tower, operated by a photo control, and provide a Form-C contact wired into the alarm panel. (Note: This controller device is to be relocated within the site equipment shelter once fully constructed. Please allow sufficient lighting control cable slack to allow for re-installation inside the equipment shelter.
- 5.1.11** {Section not used}
- 5.1.12** A site's Electrical Grounding System shall be furnished and installed by the Contractor in accordance with the following minimum practices:

 - 5.1.12.1** Install a ground ring around the base of the tower, consisting of 10'x 5/8" ground rods driven to a depth necessary to meet the required resistance measurement of the specifications, adjacent to the foundation of the tower at each leg.
 - 5.1.12.2** Ground rods shall be interconnected by a minimum #00AWG stranded copper wire, which is to be exothermically welded to the top of each ground rod.
 - 5.1.12.3** Copper wire and ground rods shall be installed in a trench below the local frost line.
 - 5.1.12.4** Maximum spacing between rods shall not exceed twice the length of the ground rod.
 - 5.1.12.5** Each tower leg shall be bonded to the ground ring using #00 AWG stranded tinned copper cable, which has been exothermically welded to a flat, 4-inch square solid steel tab located near the base of each tower leg.
 - 5.1.12.6** Each cable lead will run to the closest ground rod through an insulated sleeve to minimize wire damage.

- 5.1.12.7** The upper end of the sleeve should be sealed with a non-shrinking compound such as RTV to prevent water from collecting within the sleeve.
- 5.1.12.8** The Contractor shall avoid making any acute bends as the ground wire transitions from the foundation.
- 5.1.12.9** Bends should be a minimum of 9-inches in radius.
- 5.1.12.10** To complete the exothermic welding process, attachment area on the tower tab shall be cleaned and coated with a cold galvanizing compound.
- 5.1.12.12** The ground bar must be tamper and theft resistant. The wire lead must be sleeved so that it is protected from physical damage.
- 5.1.12.13** Like above, the upper end of the sleeve shall be sealed with a non-shrinking compound like RTV to prevent water from entering and collecting within the sleeve.
- 5.1.12.14** This ground wire lead shall be installed at the time the tower ground ring is installed.
- 5.1.12.15** The ground rod/ring system shall extend around the perimeter of the equipment shelter, transmission line copper entrance port into the shelter and to the perimeter fence.
- 5.1.12.16** Ground system ring around the tower base shall be located a minimum of 36 inches away from the tower foundation.
- 5.1.12.17** The tower ground system ring shall be connected to the equipment shelter ground ring in at least two places, on the closest corners of the shelter ring.
- 5.1.12.18** The Contractor shall electrically bond all transmission line outer shields to the structure at the top of the tower immediately below the antenna and at the line midpoint if the tower's height is over 200-feet.
- 5.1.12.19** Likewise, bond all transmission line shields near the bottom segment of the tower, approximately one-foot above the bend made to enter the waveguide-bridge and again at the shelter's antenna entry port/panel.

- 5.1.12.20** Use only transmission line grounding kits approved by the manufacturer for use on the type and diameter of transmission lines provided. All installed grounding kits shall be weather sealed.
- 5.1.12.21** Fencing shall be grounded to the ground ring via #2 AWG solid copper wires, bonded via exothermic welding at each fence post.
- 5.1.12.22** Exothermic welds shall be cleaned and protected with a minimum two coats of cold galvanize material. Gates shall utilize braided, flexible straps.
- 5.1.12.23** The shelter's interior halo ground and transmission line copper inside entrance port (buss bar) shall exothermically bond to the outdoor ground.
- 5.1.12.24** A ground test well shall be provided at a minimum of two locations along the ground loop.
- 5.1.12.25** One test well shall be located adjacent to the tower and the other at the far side of the equipment shelter loop.
- 5.1.12.26** Each test well shall consist of a minimum 6-inch diameter PVC material that extends down to the depth of two feet and shall allow the attachment of a test wire to measure ground resistance.
- 5.1.12.27** A screw on or drop on cover that is easily removable to allow testing
- 5.1.12.28** Grounding system resistance shall be measured to be 3-ohms or less between any point on the ground system and earth ground.
- 5.1.12.29** Measurement shall be done with a 4-point ground resistance tester

5.2 Guy Wires

- 5.2.1** Galvanized guy strand shall conform to the minimum requirements of ASTM Standard A475 Extra High Strength (EHS) or equivalent recognized standard.

- 5.2.2** Preformed guy grips and dead-ends shall be designed specifically for the length, size and type of cable being used. This shall include the size, number, and lay of the wires and electrochemical compatibility of the material.
- 5.2.3** An adequate bend radius shall be provided, as per the manufacturer's recommendations, at the inside of cable attachments consisting of a thimble.
- 5.2.4** Shackles used to connect guy assemblies shall be forged from AISI grade 1035 or 1045 steel or equivalent and suitably heat-treated (quenched and tempered, normalized or annealed).
- 5.2.5** Turnbuckle devices shall be installed at the anchor end of the guy assembly for adjusting the guy tension. In initial installations, the minimum take-up adjustment available after the structure is plumb and the guy tensions are set shall be 6 inches for guys with normal diameter of 0.5-inches and 10-inches for guys with normal diameter greater than 0.5 inches.
- 5.2.6** All guy wires shall be bonded to ground rods using, minimally, a #2AWG solid, tinned copper wire. Bonding shall include use of guy wire grounding clamps that are tin-plated bronze (or similar type material) to prevent electrolysis. Grounding attachment clamps shall be installed above the guy wire turnbuckle.
- 5.2.7** Guy wire anchor plates are to be grounded using, minimally, a #2AWG solid, tinned copper wire that is exothermically welded to the anchor plate. Welds shall be cleaned and treated with cold galvanized coatings to prevent rusting.
- 5.2.8** All guy wires shall include ice clips ahead of the preforms. Turnbuckle safety cables must use a "Figure 8" configuration.
- 5.2.9** All guy wire anchor locations will be fenced per fencing requirements in this RFP.

5.3 Required Tower Submittals

- 5.3.1** The Contractor shall furnish wind-load stress, geotechnical reports and foundation calculations used in the design of the proposed tower structure. Existing towers shall be evaluated for structural, electrical grounding and foundation stability, inclusive of identification/resolution of corrosion within tubular members and the suitability to support additional antenna loads as necessary to accommodate the newly added Contractor-furnished equipment.

- 5.3.2** The Contractor shall furnish documentation approved by a registered professional engineer, licensed in the State of Missouri certifying that the proposed new tower(s) and foundation(s), as well as required modifications to be made to existing towers, meet the requirements of EIA/TIA-222-H.
- 5.3.3** Prior to initial design review, Contractor shall perform soil pH value testing at all proposed new tower sites.
- 5.3.4** The Contractor shall furnish written certification that all installed tower components on both new and existing towers have been properly constructed and hot-dipped galvanized.
- 5.3.5** The Vendor shall furnish documentation as to any special condition or restriction applied to the use of materials, products or equipment contained in their response.
- 5.3.6** Contractor shall provide to The Customer, a minimum of two sets of completed “as-builts” on each tower and shelter installed or modified in this project. In the case of new structures, this shall include engineering and design documentation from the tower and shelter manufacturer.
- 5.3.7** Installed structural members or welded structural assemblies, except for standard hardware, shall have a part number. The part numbers shall correspond with the Contractor’s assembly drawings. Part numbers are to be permanently attached (stamped, welded lettering, and/or stamped on a plate that is welded to the member, etc.) to the member before all protective coatings are applied. Attached/affixed part numbers shall have a minimum character height of 0.50 inches.
- 5.3.8** The Contractor shall provide a detailed report of electrical ground resistance measurements of the completed, as-installed, electrical grounding system, on a per-site basis with field drawings to indicate the measurement at a specific location.

6.0 Site Work Requirements

6.1 Site Preparation and Sub-grading

6.1.1 General

Site clearing, site grubbing, initial earthwork, rough grading, and final grading as needed for installation of towers and equipment shelters is the Contractor's responsibility. The following describes a set of minimum requirements for the execution and completion of site-related construction activities.

6.1.2 Dewatering of the Site

- 6.1.2.1 Control grading around excavations to prevent surface water from flowing into excavation areas.
- 6.1.2.2 Drain or pump as required, thereby maintaining all excavations, trenches, and pier holes free of water from any source and discharge to approved drains or channels. Commence dewatering action when water first appears and continue until work is complete to the extent that no damage will result from hydrostatic pressure, flotation, or other causes.
- 6.1.2.3 Use pumps of adequate capacity to ensure rapid drainage of area, and construct and use drainage channels and sub-drains with sumps, as required.
- 6.1.2.4 Remove unsuitable excessively wet sub-grade materials and replace with approved backfill material.

6.1.3 Soil Compaction

- 6.1.3.1 Compact sub-grades, fills, embankments and backfills using spreading equipment, tamping rollers, rubber-tired rollers, vibratory compactors, or power tampers, as required to obtain reasonable uniformity. Nuclear soil testing results are required to be provided in a report to the Consultant.
- 6.1.3.2 Perform within moisture content range as specified to obtain required results with equipment used.

6.1.3.3 Achieve minimum densities specified as references to:

6.1.3.3(a) Cohesive soils - 95 percent maximum density at optimum moisture, AASHTO T99.

6.1.3.3(b) Cohesionless Soils – 70 percent of maximum relative density.

- ASTM, STP 479 Bunnister method.
- USBR - E12 relative density.
- Relative density, ASTM D2049

6.2 Drilled Pier Foundations

6.2.1 General

Extent of Work: Perform all drilling and excavation and supply all labor and materials to construct drilled pier foundations, as necessary.

6.2.2 Performance

6.2.2.1 Quality Assurance will be met with a field inspection of The Customer's quality control designee.

6.2.2.1(a) The Customer's Project Representative will be designated to be responsible for field inspection of the drilled pier foundations. The representative will transmit, in writing, to the consultant and contractor any materials or methods observed that do not conform to this specification and, if required, will not be considered for payment. The Customer's Project Representative must inspect each drilled pier.

Specific responsibilities of The Customer's Project Representative will be:

- Observe drilling excavation of drilled pier foundations. Ensure the placement of anti-caving physical barriers or the use of special drilling mud to prevent excessive cavitation.
- Inspect bearing elevation of drilled piers.
- Observe placement of concrete and rebar within the drilled pier foundation to match design specification. Ensure that no excessive earth contamination occurs. Contamination of poured concrete is sufficient to cancel the pour and request engineering inspection.
- The Customer's representative shall photograph or film all foundation excavation and pouring activities Contractor's Qualifications.

6.2.2.1(b) The Contractor's qualifications must be minimum of two-year's experience in drilled pier construction, including experience with similar subsurface material, water conditions, shaft sizes, and special techniques as required.

6.2.2.2 Drilled Pier Details

6.2.2.2(a) Drilled pier shaft dimensions and top elevations shall be in accordance with foundation design calculations and drawings.

6.2.2.2(b) The drilled pier shaft bearing, or bottom elevation shall be at the elevation indicated, unless it is determined by The Customer that the bearing elevation should be adjusted.

6.2.2.2(c) The excavate pier shaft shall be drilled to required dimensions and elevations as indicated. Sidewall stability will be maintained during drilling and extend excavation to suitable material.

6.2.2.2(d) Inspection of each pier will be by The Customer's Project Representative and Contractor to determine suitability of supporting material for drilled piers.

- 6.2.2.2(e)** Remove from bottom of drilled piers, loose material or free water in quantities sufficient to cause settlement or affect concrete strength as determined by The Customer.
- 6.2.2.2(f)** Install temporary casing, where required, to prevent caving of drilled pier sides or excessive seepage.
- 6.2.2.2(g)** Dewater all drilled pier excavations prior to cleaning, inspection, and placing concrete.
- 6.2.2.2(h)** Each drilled pier must be inspected and approved by The Customer's Project Representative before any concrete may be placed.
- 6.2.2.2(i)** Dispose of any excavated material at locations approved for that purpose.

6.2.2.3 Reinforcing Steel

- 6.2.2.3(a)** Place reinforcement for drilled piers in accordance with foundation design documents.
- 6.2.2.3(b)** Place bars as shown on foundation drawings with concrete cover of not less than 3-inches where exposed to soil.
- 6.2.2.3(c)** A reinforcing cage shall be designed as a structural element and braced to retain its configuration throughout the placing of concrete and the extraction of the casing (if used) from the shaft.
- 6.2.2.3(d)** Dewater drilled piers and maintain the excavation free of water prior to placing concrete.
- 6.2.2.3(e)** Place concrete immediately after final inspection.
- 6.2.2.3(f)** Place concrete immediately after completion of excavation and after The Customer's Project Representative has completed his inspection. Do not leave uncased excavations open overnight.
- 6.2.2.3(g)** Free fall concrete (not over 6 feet) may be used provided it is directed through a hopper, or equivalent; such that fall is vertical down center of shaft without hitting sides. Vibrate concrete only after casing, if used, has been pulled.

- 6.2.2.3(h)** Place concrete in pier in one continuous pour operation from bottom to top.
- 6.2.2.3(i)** The Customer's Project Representative will provide inspection during the removal of casing and placing of concrete. Withdraw casing, if used, only as shaft is filled with concrete. Always maintain an adequate head of concrete to balance outside soil and water pressure above the bottom of the casing during withdrawal. Specific procedures that the Contractor will follow to accomplish this objective shall be submitted for approval.
- 6.2.2.3(j)** Where the casing is removed, provide specifically designed concrete with a minimum slump of 5-inches and with a retarder to prevent arching of concrete (during casing pulling) or setting concrete until after casing is pulled. Check concrete level prior to, during, and after pulling casing. Pull casing before slump decreases below 5-inches as determined by testing.
- 6.2.2.3(k)** During casing extraction, upward movement of the reinforcing steel shall not be permitted. Downward movement should not exceed 2-inches per shaft length.
- 6.2.2.3(l)** Remove all water and concrete contaminated with soil, or water before resuming concrete placement.
- 6.2.2.3(m)** Center reinforcing cages in the drilled pier excavation and suspend them in an approved manner prior to placement of concrete to the cutoff elevation.
- 6.2.2.3(n)** Leave forms on pier for a period of three days.
- 6.2.2.3(o)** Set anchor bolts to the manufacturer's required tolerances, using substantial templates or other approved method.

6.3 Concrete, Forms and Reinforcement

6.3.1 General

This RFP includes concrete, forms, and steel reinforcement. This includes drilled pier foundations with square caps for steel structures, concrete pads for transformers and breakers, equipment shelter and tower foundations, and cable trenches.

6.3.2 Quality Assurance and Applicable Standards

6.3.2.1 American Concrete Institute (ACI)

6.3.2.1(a) ACI 304 - Recommend Practice for Measuring, Mixing, and Placing Concrete.

6.3.2.1(b) ACI 305 - Committee Report on Hot-Weather Concreting.

6.3.2.1(c) ACI 306 - Committee Report on Cold-Weather Concreting.

6.3.2.1(d) ACI 315 - Manual of Standard Practice for Detailing Reinforced Concrete Structures.

6.3.2.1(e) ACI 318 - Building Code Requirements for Reinforced Concrete.

6.3.2.2 American National Standards Institute (ANSI)

6.3.2.2(a) B 1 8.2.1 - Square and Hex Bolts and Screws, Including Askew Head Bolts, Hex Screws, and Lag Screws.

6.3.2.2(b) B 1 8.2.2 - Square and Hex nuts.

6.3.2.3 American Society for Testing and Materials (ASTM)

6.3.2.3(a) A36 - Structural Steel.

6.3.2.3(b) A82 - Cold-Drawn Wire.

6.3.2.3(c) AI 85 - Welded Steel Wire Fabric for Concrete Reinforcement.

6.3.2.3(d) A307 - Low-Carbon Steel Externally and Internally Threaded Standard Fasteners.

- 6.3.2.3(e)** A615 - Deformed Billet Steel Bars for Concrete Reinforcement.
- 6.3.2.3(f)** C31 - Making and Curing Concrete Compression and Flexure Test Specimens in the Field.
- 6.3.2.3(g)** C33 - Concrete Aggregates.
- 6.3.2.3(h)** C39 - Compressive Strength of Cylindrical Concrete Specimens.
- 6.3.2.3(i)** C94 - Ready-Mixed Concrete.
- 6.3.2.3(j)** C 143 - Slump of Portland Cement Concrete.
- 6.3.2.3(k)** C 150 - Portland Cement.
- 6.3.2.3(l)** C309 - Liquid Membrane-Forming Compounds for Curing Concrete.

6.3.2.4 Midwest Concrete Industry Board (MCIB)

6.3.3 Equipment and Materials

6.3.3.1 Concrete Materials

- 6.3.3.1(a)** Cement must conform to ASTM C 150. Portland cement Type 1.
- 6.3.3.1(b)** Water shall be clean and free from injurious amounts of oil, acids, alkaline, or other deleterious substances. Any potable drinking water will be acceptable.
- 6.3.3.1(c)** Fine Aggregates such as Clean natural sand. Manufactured sand may be used upon written approval of The Customer's designee. They shall Conform to ASTM C33.
- 6.3.3.1(d)** Coarse aggregates such as Clean crushed stone or processed gravel, not containing organic materials shall conform to ASTM C33.
- 6.3.3.1(e)** 4-6 percent air shall be used in all concrete.

6.3.3.1(f) Water reducing admixture shall conform to ASTM C494, Type A.

6.3.3.2 Concrete Mix

6.3.3.2(a) Ready-mixed Concrete shall meet requirements of ASTM C94, and of materials and proportions specified.

6.3.3.2(b) Ready-mixed concrete plant shall be subject to approval of The Customer's Project Representative.

6.3.3.3 Form materials

6.3.3.3(a) Exterior grade plywood minimum 5/8 inch thick.

6.3.3.3(b) Approved wood fiberboard.

6.3.3.3(c) Dressed lumber, free of loose knots.

6.3.3.3(d) Form ties shall be approved break-back type.

6.3.3.4 Steel Reinforcement

6.3.3.4(a) Reinforcement bars shall conform to ASTM A615, Grade 60 for all bars No. 4 or larger.

6.3.3.4(b) Tie and-all No.3 bars shall conform to ASTM A615, Grade 40.

6.3.3.4(c) Welded wire fabric shall conform to ASTM A185, using bright basic wire conforming to ASTM A82. Wire gauge No. 11 or smaller shall be galvanized.

6.3.3.5 Anchor Bolts

6.3.3.5(a) All anchor bolts required for complete installation shall be provided.

6.3.3.5(b) Anchor bolts and accessories shall conform to ASTM A307 using A36 steel.

6.3.3.5(c) Use hexagonal bolts and nuts conforming to ANSI B 1 8.2.1 and B 1 8.2.2.

6.3.3.5(d) All exposed area of anchor bolts and nuts, plus a minimum of three inches of embedded area, shall be hot-dipped galvanized.

6.3.3.5(e) Install as indicated on foundation drawings.

6.3.4 Performance

6.3.4.1 Field Testing

Field testing of concrete and making of the concrete test cylinders will be performed by an independent testing laboratory approved by the Customer's Permit Department.

6.3.4.2 Laboratory Testing

6.3.4.2(a) Laboratory for testing shall be selected and paid by the Contractor.

6.3.4.2(b) Laboratory will furnish cylinder molds with cap seals or adequate means of identification.

6.3.4.2(c) Cylinders shall be tested conforming to ASTM C39. Average strength of two test cylinders (at 28 days) shall be used as result of the test. Break one test cylinder after 7-days curing, one after 14-days, and two after 28-days.

6.3.4.2(d) Results shall be provided to the Project Representative in a formal report. A copy shall be provided to the Consultant and Contractor.

6.3.4.3 Low Strength Concrete

Low strength is defined as concrete whose 7-day and 14-day test (average of 2 cylinders) is less than 70% and 85%, respectively, of the specified minimum 28-day compressive strength.

6.3.4.3(a) Concrete shall remain accessible with no other work performed that relates to or depends upon the questionable concrete until a formal decision as to the disposition of the concrete is given by the Customer's Project Representative.

6.3.4.3(b) Low strength concrete shall be removed and replaced if requested by the Customer's designee.

6.3.4.4 Preparation and Placing of Concrete

- 6.3.4.4(a)** Clean bonding surfaces free from laitance and foreign materials.
- 6.3.4.4(b)** Place concrete on property prepared and unfrozen sub grade and only in dewatered excavations.
- 6.3.4.4(c)** Do not deposit partially hardened concrete or concrete contaminated by foreign materials.
- 6.3.4.4(d)** Placing the concrete shall Conform to ACI 304.
- 6.3.4.4(e)** Place concrete within 60 minutes after mixing, except The Customer's designee may extend the period to 90 minutes (maximum) dependent upon weather conditions.
- 6.3.4.4(f)** Place in horizontal layers not exceeding 18-inches.
- 6.3.4.4(g)** Vibrate concrete to produce solid mass without honeycomb or surface air bubbles.

6.3.4.5 Curing of Concrete

- 6.3.4.5(a)** Cure with liquid membrane-forming compound conforming to ASTM C309, Type I. Apply per manufacturer's recommendations.
- 6.3.4.5(b)** Apply curing compound to all exposed surfaces immediately after removing form or after finishing concrete.
- 6.3.4.5(c)** Keep formwork wet until stripped.

6.3.4.6 Placing Concrete in Cold Weather

- 6.3.4.6(a)** Conform to the practice recommended in ACI 306 when the temperature is below 40-degrees F or is likely to fall below 40-degrees F during a twenty-four-hour period after placing.
- 6.3.4.6(b)** Protect pier caps and other concrete from freezing using insulating blankets.

6.3.4.7

Placing Concrete in Hot Weather

6.3.4.7(a) Conform to practices recommended in ACI 305 when temperature is 90-degrees Fahrenheit or above or is likely to rise above 90-degrees Fahrenheit within a twenty-four-hour period after placing.

6.3.4.8

Concrete Construction Joints

6.3.4.8(a) Locate where indicated. Conform to AC 318.

6.3.4.8(b) Clean and break laitance or other foreign material from bonding surface. Bed with 1-inch of grout for bonding in horizontal joints.

6.3.4.9

Concrete Surface Float Finish

6.3.4.9(a) Compact, accurately screed, and wood float all slabs to a true uniform surface.

6.3.4.9(b) Test surface with straightedge and eliminate high and low spots of more than 1/8-inch in 10 feet.

6.3.4.9(c) Use this finish in addition to the finishes specified below for all surfaces as indicated.

6.3.4.9(d) Use a final finish for footing slabs not exposed.

6.3.4.10

Concrete Hand-troweled Finish

6.3.4.10(a) Finish surface as in Float Finish and in addition, trowel and steel trowel to obtain a smooth dense finish after concrete has hardened to ring under the trowel.

6.3.4.10(b) Use this finish on all floors, slabs, and equipment bases not specifically designated for a different finish.

6.3.4.11

Concrete Broom Finish

6.3.4.11(a) Finish surface as in Float Finish and, in addition, draw a stiff bristled broom across the previously floated surface.

6.3.4.11(b) Corrugations shall be uniform in appearance, not more than 1/16-inch in depth and shall be perpendicular to direction of traffic.

6.3.4.11(c) Use this finish on all outdoor slabs subject to vehicular or pedestrian traffic and areas to receive grout.

6.3.4.12 Concrete Burlap Finish

6.3.4.12(a) Apply burlap surface treatment to exposed edges of slabs, curbs and foundations.

6.3.4.12(b) Wet and fill all voids using mortar with the same sand-cement ratio as original concrete. Use approximately 20 percent white cement to match concrete color.

6.3.4.12(c) Strike off all excess mortar flush with the surface using a burlap or canvas cloth with a circular motion.

6.3.4.12(d) Remove all rough spots and rub with cloth to leave a surface of uniform texture and appearance.

6.3.4.12(e) Finish shall result in a coating of mortar that will fill all small voids and air holes leaving a smooth surface.

6.3.4.12(f) Cure as specified under Curing Concrete.

6.3.4.13 Defective Concrete Surface Treatment

6.3.4.13(a) After removal of forms, remove all fins, projections and form ties.

6.3.4.13(b) Grout and cure all voids, damaged areas, and tie holes.

6.3.4.14 Concrete Forms

6.3.4.14(a) Treat forms with an approved oil or lacquer prior to placing reinforcement.

6.3.4.14(b) Wet forms with clean, clear water prior to placing concrete.

6.3.4.14(c) Adequately brace and stiffen forms to prevent deflection and settlement.

6.3.4.15 Steel Reinforcement

6.3.4.15(a) Place accurately, tie at intersection, and support on chairs. Conform to ACI 318.

6.3.4.15(b) Tie securely with 16 gauge or larger annealed iron wire.

6.3.4.15(c) Splice steel not less than 30 bar-diameters for A615, Grade 40, and 42 bar-diameters for A615, Grade 60, unless otherwise indicated.

6.3.4.15(d) Splice plain bars not less than twice that for deformed bars.

6.3.4.15(e) Lap welded wire fabric not less than the length of one mesh.

6.3.4.15(f) No.3 bars to be Grade 40, with all others to be Grade 60.

6.3.4.15(g) Provide ¼-inch chamfer for all exposed edges of concrete, vertical and horizontal.

6.4 Fences and Gates (Chain-Link Security Type)

6.4.1 General

6.4.1.1 Quality Insurance and Applicable Standards

6.4.1.1(a) Federal specification RR-F-191 - Fencing, wire and post, metal and gates, chain-link fence fabric, chain-link and accessories.

6.4.1.1(b) RR-F-191 - Fencing, wire and post, metal and gates, chain-link fence fabric, chain-link and accessories.

6.4.1.1(c) RR-F-221 - Fencing, wire, barbed wire, woven-wire and netting, fence post and accessories.

6.4.2 Requirements

- 6.4.2.1** Manufacturer’s standard materials where such materials conform to these specifications or have been approved by The Customer.
- 6.4.2.2** Conform to FS RR-F-191 except as indicated or specified otherwise.
- 6.4.2.3** Fence height – 8 feet high galvanized chain link with 3-strand barbed wire at top (9½ feet overall height).
- 6.4.2.4** Gate widths as indicated on layout drawings.
- 6.4.2.5** Finish for fence framework and appurtenances (excluding fabric) – Galvanized with minimum weight for zinc per square foot as follows:
 - 6.4.2.5(a)** Pipe – 1.8 ounces.
 - 6.4.2.5(b)** Hardware and accessories – conform to FS RR-F-191.
 - 6.4.2.5(c)** Barbed wire – 0.80 ounce.
- 6.4.2.6** Finish for Fence Fabric
 - 6.4.2.6(a)** Galvanized per ASTM A392, Class-2 with 1.8-ounce, minimum weight, for zinc per square foot or, aluminum coated per ASTM A491, Class-2 with 0.40- ounce, minimum weight, for aluminum per square foot.
- 6.4.2.7** All fence and gates to have 3-strand barbed wire at top.
- 6.4.2.8** All materials furnished shall comply with the above requirements.
- 6.4.3** Fence Fabric
 - 6.4.3.1** No.9 gauge, 2-inch diamond mesh chain-link fabric.
 - 6.4.3.2** Top and bottom selvage twisted and barbed.
 - 6.4.3.3** Fabric fastenings of 9-gauge galvanized wire ties.
- 6.4.4** Post, Top Rail, and Braces

- 6.4.4.1** Post
 - 6.4.4.1(a)** End, angle, corner or pull posts – 3-inches O.D. at 5.79 pounds per foot.
 - 6.4.4.1(b)** Line posts – 2.5-inches O.D. at 3.65 pounds per foot.

- 6.4.4.2** Top Rail
 - 6.4.4.2(a)** 1.625-inch O.D. standard weight steel pipe.
 - 6.4.4.2(b)** 18-foot minimum length of each section.

- 6.4.4.3** Expansion Type Coupling for Each Joint.
 - 6.4.4.3(a)** Diagonal truss rods 3/8 inch in diameter equipped with truss tightened.
 - 6.4.4.3(b)** Horizontal braces – 1.660-inch O.D. at 2.27 pounds per foot.

- 6.4.4.4** Post tops shall be designed as a weather tight closure cap for tubular post.

- 6.4.4.5** Top Rail Expansion Type Coupling for Each Joint.

- 6.4.4.6** Malleable Iron or Pressed Steel Barbed Wire Supporting Arms
 - 6.4.4.6(a)** Single arm at 45-degrees with vertical, sloping to outside of fence.
 - 6.4.4.6(b)** Constructed for attaching three rows of barbed wire to each arm and designed as a weather tight closure cap for tubular posts.
 - 6.4.4.6(c)** Designed for 200-pound minimum pull-down load.
 - 6.4.4.6(d)** Attached to steel posts or integral with post top.
 - 6.4.4.6(e)** Provided with openings to receive top rail.

- 6.4.4.7** Malleable Iron or Pressed Steel Stretcher Bars
 - 6.4.4.7(a)** One-piece, full height of fabric.

6.4.4.7(b) 3/6-inch x 3/4-inch, galvanized.

6.4.4.7(c) Bands of galvanized steel or malleable iron.

6.4.4.8 Malleable Iron or Pressed Steel Bolts

6.4.4.8(a) Zinc coated.

6.4.4.8(b) Conform to FS FF-B-575.

6.4.5 Barbed Wire

6.4.5.1 Two-strand, 12½ gauge wire with 4-point barbs 5 inches O.C.

6.4.5.2 Conform to FS RR-F-221, Type 1, Style 2.

6.4.5.3 Three rows required on all fence and gates.

6.4.6 Gates

6.4.6.1 Framing

6.4.6.1(a) Frames of tubular members, 2-inch O.D. at 2.72 pounds per foot.

6.4.6.1(b) Intermediate horizontal and vertical members for proper gate operation and for attachment of fabric, hardware and accessories.

6.4.6.1(c) Frames assembled by welding or watertight galvanized steel rigid fittings.

6.4.6.1(d) Diagonal cross bracing of 3/8 inch diameter adjustable truss rods to provide frame rigidity.

6.4.6.1(e) Diagonal cross bracing of 3/8 inch diameter adjustable truss rods to provide frame rigidity.

6.4.6.2 Gate hardware hinges shall be of pressed or forged steel, or malleable iron, non-lift-off type, 1 to 1.2 pair per leaf.

6.4.6.3 Latches and Gate stops – Double Leaf.

6.4.6.3(a) Plunger-bar type latch, full gate height, designed to engage gate stop of flush-plate type with anchors.

6.4.6.3(b) Locking device and padlock eyes an integral part of latch.

6.4.6.3(c) Keeper to automatically engage gate leaf and secure free end of gate in full 90-degrees open position.

6.4.6.4 Latches – Single Leaf

6.4.6.4(a) Forked type to permit operation from either side of gate.

6.4.6.4(b) Padlock eye as integral part of latch.

6.4.7 Performance and Fence Installation

6.4.7.1 Follow general contour of ground and properly aligned.

6.4.7.2 Fence Post

6.4.7.2(a) Set in concrete retaining wall. Trowel finish tops of footings and dome to direct water away from posts.

6.4.7.2(b) Install plumb and in straight alignment.

6.4.7.2(c) Temporarily brace until concrete in bases has set.

6.4.7.2(d) Spaced 10 feet center-to-center, maximum.

6.4.7.3 Post Bracing

6.4.7.3(a) Installed at each end, at the gatepost, and on each side of corner posts.

6.4.7.3(b) Install after the concrete in post base has set.

6.4.7.3(c) Install so posts are plumb when diagonal rod is under tension.

6.4.7.4 Top Rails

6.4.7.4(a) Run continuously through post caps or barbed wire supporting arms.

6.4.7.4(b) Install expansion coupling at each joint.

- 6.4.7.5** Tension wire shall be weaved through the fabric and tie to each post with minimum 6-gauge galvanized wire.

- 6.4.7.6** Fabric
 - 6.4.7.6(a)** Stretch taut with equal tension on each side of line posts.

 - 6.4.7.6(b)** Fasten to top rail and steel posts with wire ties.

 - 6.4.7.6(c)** Space wire ties at 12-inches O.C. maximum on posts and at 24-inches O.C. maximum on top rail.

- 6.4.7.7** Stretcher Bars
 - 6.4.7.7(a)** Thread through or clamp to fabric 4-inches on center.

 - 6.4.7.7(b)** Secure to posts with metal bands spaced 15-inches on center maximum.

 - 6.4.7.7(c)** Install at each gate, pull and end post, and each side of corner post.

- 6.4.7.8** Barbed Wire
 - 6.4.7.8(a)** Attach three rows to each barbed wire supporting arm. Pull wire taut and fasten securely to each arm.

 - 6.4.7.8(b)** Install three rows above fabric and on extended gate end members of gates.

- 6.4.7.9** Gates
 - 6.4.7.9(a)** Install plumb, level, and free swinging through full opening without interference.

 - 6.4.7.9(b)** Install all hardware, including keepers, ground set items and flush plate in concrete to engage gate stop.

 - 6.4.7.9(c)** Furnish and install gate alarms.

- 6.4.7.10** Repairing Damaged Coatings

6.4.7.10(a) Repair any damaged coating in the shop or field by recoating with compatible and similar coating.

6.4.7.10(b) Apply per manufacturer’s recommendations.

6.4.7.11 Furnish and install Danger signs as approved by the Customer’s designee.

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6.5 Crushed Rock Surface

This section includes crushed rock surface and method of depositing for the placement of permanent crushed rock surfacing in equipment shelter areas.

6.5.1 Applicable Standards

6.5.1.1 American Society for Testing and Materials

6.5.1.1(a) C117– Test for Materials Finer than No. 200 Sieve in Mineral Aggregate by Washing.

6.5.1.1(b) C131– Test for Abrasion of Coarse Aggregates by Use of Los Angeles Machine.

6.5.1.1(c) C136 – Test for Sieve or Screen Analysis of Fine and Coarse Aggregates.

6.5.1.1(d) D423 – Test for Liquid Limit of Soils.

6.5.1.1(e) D75 – Sampling Stone, Slag, Gravel, Sand and Stone Block for Use as Highway Materials.

6.5.1.2 American Association of State Highway and Transportation Officials (AASHTO)

6.5.1.2(a) T99–Test for the Moisture Density Relations of Soils Using a 5.5-Pound Rammer and a 12-Inch Drop.

6.5.1.3 Sample and Testing

6.5.1.3(a) Test to determine conformance with all requirements for material quality and properties specified herein will be performed by an independent laboratory approved by the Customer and compensated by the Contractor.

6.5.1.3(b) Obtain representative samples of material in accordance with ASTM D75 for testing. Furnish the Customer's designee sufficient materials for testing from each sample at the time obtained.

6.5.1.3(c) Furnish specific schedule for sampling to provide the Customer's designee the opportunity to observe sampling.

6.5.1.4 Submittals. Includes, but not limited to, the following:

6.5.1.4(a) Test result reports from testing laboratory indicating conformance with the specifications.

6.5.1.4(b) Certification of conformance with the specifications.

6.5.2 Materials

6.12.1.1 Crushed rock surface shall consist of ¾-inch aggregate placed on top of a 6-mil polyvinyl barrier.

6.12.1.2 Aggregate shall consist of Crushed limestone or crushed natural gravel, free from lumps or balls of clay or other objectionable matter, and reasonably free from thin and elongated pieces of dirt. Aggregates shall consist of angular fragments, durable and sound, and shall be reasonably uniform in density and quality.

6.5.3 Performance and General Requirements

6.5.3.1 Stockpiles

6.5.3.1(a) Only with approval of the Customer's designee in specified locations.

6.5.3.1(b) Clear and level storage sites prior to stockpiling.

6.5.3.1(c) Place in a manner and at locations designated by the Customer, providing separate stockpiles for materials from separate sources.

6.5.3.2 Preparation of Sub-Grade

6.5.3.2(a) Clean off all foreign substances.

6.5.3.2(b) Correct any ruts, depressions, or soft yielding spots and areas with inadequate compaction.

6.5.3.2(c) Treat all sub-grade areas with soil sterilant.

6.5.3.2(d) The Customer’s Project Representative will inspect, prior to placing crushed rock surface, for adequate compaction and surface tolerances.

6.5.3.3 Grade Control

6.5.3.3(a) Establish and maintain by means of grade stakes, properly spaced so string lines may be stretched between stakes.

6.5.3.4 Placing of Materials

6.5.3.4(a) Supply and install after the herbicide treatment, a

6.5.3.4(b) Deposit and spread material in a uniform lift/layer and compact to the thickness indicated and as specified. Spread material uniformly on the prepared sub-grade from moving vehicles or spreader boxes.

6.5.3.4(c) Level material to the required contour and grades.

6.5.3.4(d) Remove those portions of the layer, which became segregated or mixed with sub-grade material in spreading and replace with new material as required by the Customer’s designee.

6.5.3.4(e) Remove and repair sub-grade areas damaged during application of the crushed rock surface.

6.5.3.5 Shaping and Compacting Materials

- 6.5.3.5(a)** Compact layers no less than 3-inches or more than 6-inches thick.
- 6.5.3.5(b)** Roll to specified compaction requirements throughout full depth of layer with power rollers, rubber-tired rollers or combination.
- 6.5.3.5(c)** Shape and smooth by blading and rolling with power roller, rubber-tired roller, or both.
- 6.5.3.5(d)** Hand tamp in places not accessible to rolling equipment.
- 6.5.3.5(e)** Base compaction on weight per cubic foot of material passing $\frac{3}{4}$ -inch sieve and compact to at least 100 percent of maximum density at optimum moisture.
- 6.5.3.5(f)** Determine and control compaction in accordance with AASHTO T99.
- 6.5.3.5(g)** Surface shall show no deviation in excess of $\frac{3}{8}$ -inch in any 10 feet when tested with a 10-foot straightened applied parallel with and at right angles to the center lines of the paved area.
- 6.5.3.5(h)** Correct any deviation specified in excess of this amount by loosening, adding or removing material, reshaping, watering, and compacting as requested by the Customer's designee.

6.6 Herbicide Applications

6.6.1 Equipment and Materials

- 6.6.1.1** Sprayers and applicators shall be suitable for intended use.
- 6.6.1.2** Mix herbicide per manufacturer's recommendations.
- 6.6.1.3** Herbicide shall be Krover (1) as manufactured by DuPont, Inc., or approved equal.
- 6.6.1.4** Do not apply herbicide if it is too windy or where other adverse weather conditions exist.

6.6.1.5 Apply at a rate of 10 pounds of product per acre, or in accordance with manufacturer's recommendations.

6.6.2 Performance

6.6.2.1 Apply only after final sub-grade has been established.

6.6.2.2 Apply before installation of vegetation barrier cloth and placement of crushed rock.

6.6.2.3 Follow manufacturer's recommendations on timing of application with respect to weather and barrier/crushed rock placement.

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7.0 Installation Guidelines

7.1 Contractor Project Management

- 7.1.1** Contractor will assign a Project Manager as a single point of contact between the Customer and the Contractor for the full duration of the project.
- 7.1.2** The Contractor's PM shall conduct an initial Design Review Meeting whereby the project's order of task progression, site/facility layout details, tower engineering studies, coverage design and related items will be presented to The Customer for review, comment and approval for the Contractor to proceed with production tasks.
- 7.1.3** At a minimum the Contractor will initiate monthly progress meeting with the Customer whose purpose is to update on progress made.
- 7.1.4** The Contractor's PM at a minimum is responsible for developing and maintaining an updated Project Time Line.
- 7.1.4.1** Project Time Line updates/revisions, commencing with the Customer's official Notice to Proceed to the Contractor, shall be submitted by the PM on the last day of each project-month for review and approval by the Customer.
- 7.1.4.2** The monthly Project Time Line submittal at a minimum shall depict:
- Progress made per task in the preceding 30-day period;
 - Work/tasks to be accomplished in the next 30-day period;
 - Identification of critical path items and;
 - Work/tasks to be undertaken by the Customer (if any).

- 7.1.4.3** Coincident with the production of the updated Project TimeLine, the Contractor's PM shall identify any known or anticipated issues that will cause a delay to the project's implementation schedule that are not within the Contractor's control. Failure by the Contractor's PM to identify such issues in advance will negate any opportunity for schedule relief to the Contract's specified Project Completion Date.

- 7.1.5** Failure by the Contractor to produce a monthly updated Project Time Line within the period specified herein will result in an automatic 7-day reduction of the Contract's specified Project Completion Date (or that Project Completion Date as previously modified by The Customer's executed Change Order if any.

- 7.1.6** Any change in PM, anytime during the full duration of the project, must be approved by the Customer and the new PM shall be selected by the Customer via an interview process.

- 7.1.7** The Contractor's Key Personnel shall be approved by the Customer prior to assignment. The Customer reserves the right to require replacement of the Contractor's Key Personnel at any time during the project.

7.2 Engineering Drawings

- 7.2.1** Drawings shall, as a minimum, illustrate:

 - 7.2.1.1** Relative rack/rack locations
 - 7.2.1.2** Equipment power wiring (primary and emergency)
 - 7.2.1.3** Equipment interconnection wiring (signal and control)

- 7.2.2** Civil drawings showing location details of equipment to be placed in existing or new facilities shall be provided by Contractor.

- 7.2.8** Contractor shall supply true copies of Final Project Record Documents, including the Engineering Drawings, software releases, and alignment details listed above, but amended to show equipment "as-built" at the time of acceptance by the Customer.

- 7.2.9** The total number of documentation sets to be provided shall include one site-specific set for each infrastructure site and three comprehensive System documentation sets for the Customer's use.

7.2.10 Final Project Record Documents must be submitted to the Customer within thirty days after system acceptance testing has been successfully concluded.

7.2.11 Submissions shall also include electronic versions of all documents submitted.

7.2.13 Final payment for Contracted services shall not be released by the Customer until this documentation submittal has been successfully completed by the Contractor and reviewed and approved by the Customer.

7.3 Workmanship

7.3.1 All workmanship shall be in accordance with Industry-accepted best practices and the National Electric Code.

7.3.2 Work areas shall be maintained in a neat, orderly fashion.

7.3.3 Work sites shall incorporate Contractor-provided trash containers and residue of the work shall be discarded as the work is underway.

7.3.4 All sites will be cleaned up at the end of each work day, swept clean, tools picked-up, and walkways free of obstacles and obstructions.

7.3.5 The installation of audio, signal, data and control cables within equipment racks, enclosures, racks and cable trays must be properly routed such that wires/cables do not cross over each within cable bundles.

7.3.6 Cables must be properly labeled, routed and secured.

7.3.7 To the maximum extent possible, cables carrying AC power, low-level audio, RF and digital signals must be grouped separately.

7.3.8 All DC wiring, particularly those areas where battery terminals and power distribution buss bars are located, must incorporate insulation barriers to prevent the accidental short-circuiting of otherwise exposed conductors.

7.3.9 The Customer shall have the ability to temporarily stop work progress by the Contractor if workmanship falls below acceptable levels and shall have the authority to require the Contractor to remove and/or correct all observed instances of poor wiring practice, inappropriate use of installation materials and other obvious installation defects because of apparent poor workmanship.

7.3.10 The Customer shall provide the Contractor with approval to resume installation work activities once an agreement is reached to resolve observed workmanship defects.

7.3.11 The determination of Contractor workmanship acceptability, as well as the suitability of any proposed rework plans offered by the Contractor, shall remain with the Customer.

7.4 Equipment Storage

7.4.1 The Contractor shall provide the necessary storage space and skilled labor needed to receive, inventory and maintain supplies and consumables throughout the term of the contract. Customer reserves the right to inspect and inventory equipment at any time.

8.0 Warranty and Maintenance Guidelines

8.1 Warranty

The following conditions shall apply for equipment Warranty:

- 8.1.1.1** The Vendor will provide post-warranty maintenance and services comparable to the same services proposed for the warranty period.
 - 8.1.1.1(a)** All warranty and post-warranty services will be clearly identified and provided in a matrix.
 - 8.1.1.1(b)** All warranty and post-warranty services will cover the entire system, including Vendor provided OEM and third-party equipment. These services will be priced individually for customer information.
 - 8.1.1.1(c)** The Customer can optionally remove any post-warranty services as determined by The Customer's need to provide in-house or subcontract any of these respective services.
- 8.1.1.2** The System Warranty period will commence at the time of Final System Acceptance and the Contractor shall provide all labor and parts for maintenance and repair, including preventative maintenance, of all system equipment provided in the proposed network.
- 8.1.1.3** All cost for the one-year warranty services will be absorbed by the Contractor.
- 8.1.1.4** Replacement parts must be of new or current manufacture and meet or exceed the specifications of the original supplied equipment (OEM).
- 8.1.1.5** Post-warranty replacement parts service for emergency infrastructure equipment repair, not available locally, shall be shipped out on the first available flight. Any parts required for non-emergency repair that are not available locally should be shipped out for next day delivery.

8.1.1.6 (Unused)

8.1.1.7 (Unused)

8.1.1.8 (Unused)

8.1.1.9 (Unused)

8.1.1.10 (Unused)

8.1.1.11 Original Equipment Manufacturers (OEM) shall have a fully qualified, staffed, and equipped service facility positioned and capable of meeting this RFP's response time criteria during the warranty and maintenance agreement periods. Any subcontractors used during the warranty and post-warranty maintenance period must be pre-approved by The Customer.

8.1.2 The Vendor will supply as part of the technical response, a list of services and preventative maintenance to be provided during the warranty period as well as a schedule at which these services will occur.

8.1.4 (Unused)

8.1.5 (Unused)

8.1.6 (Unused)

8.1.7 Common parts for warranty repairs will be identified and provided.

8.2 Remedies

In the event of default on the response time to reported service outages, the Vendor agrees to pay The Customer the following penalties for response remedies:

- 8.1.1** Contractor shall pay \$250 for each occasion that it fails to meet the response time obligation for a reported infrastructure service outage.
- 8.1.2** Contractor shall pay \$500 per twenty-four-hour period in which a failed infrastructure site is not restored to operational status.
- 8.1.3** Should any specific equipment item (such as a repeater station, station circuit board, power amplifier, etc.) be submitted for repair three times during the warranty or post-warranty term, Contractor will replace that equipment item with a new item at no cost to the Customer and warranty the replacement for one additional year from the time of replacement.

8.3 Maintenance

- 8.3.1** During the initial warranty period, the Contractor shall be responsible for:
 - 8.3.1.1** Annual Preventative maintenance of tower
- 8.3.2** Contractor-provided maintenance during the warranty period will be monitored by the Customer.
- 8.3.3** The Contractor must supply monthly service logs listing the site(s) where service is performed, the equipment involved and service details.
- 8.3.4** Failure of individual units, subassemblies and/or components must be reported in writing to The Customer. This report must, as a minimum, include unit identification (description and serial number), explanation and cause of failure, and corrective action taken.
- 8.3.5** Contractor is responsible for all actions of its employees or subcontractors. Any equipment failure(s) caused by any act or omission of Contractor's employee or subcontractor shall be the responsibility of the Contractor.



- 8.3.6** The Contractor shall submit a maintenance work plan that identifies the tasks required, a listing of Contractor supplied personnel, and identification of a 24x7x365 Single Point of Contact (SPOC) responsible for Contractor maintenance issues.

- 8.3.7** All required service logs and repair reports must be submitted to the Customer in electronic format.

9.0 Infrastructure Pricing Considerations

9.1 General Pricing Information

Vendors shall provide a per-site granular price detail of proposed equipment, towers, generators, site civil engineering, program management, system engineering, installation services, and maintenance services. As this is a turnkey project, any pricing omission of a scope typically considered part of a P25 simulcast trunked radio system of this type will be provided for by the Contractor at no additional cost to the Customer.

9.2 Site Modification Costs

9.2.1 For equipment to be installed at the Customer-owned sites which have requirements for site preparatory work involving architectural, mechanical, electrical, civil or structural construction modifications, a description and cost of the modifications required must be provided by the Vendor for each individually named site.

9.2.2 For newly-added sites, the price provided by the Vendor shall include services typical and customary for the development and commissioning of a new system site, exclusive of access roadway development. The Customer will provide site access roadways if the property is the Customer-owned.

9.3 Lifecycle Costs

9.3.1 (Unused)

9.4 Warranty and Post-Warranty Maintenance Costs

9.4.1 Costs for the initial warranty and extended post-warranty maintenance service, inclusive of infrastructure software updates, hardware updates required to support newer software, defective/failed parts replacements, and spare parts, shall be included as part of the Vendor's cost proposal. Multi-year pricing shall be detailed by calendar year or the Customer fiscal year.

9.4.2 The Vendor shall provide detailed pricing for all system support services proposed under the post- warranty maintenance timeframe.

9.4.3 Post-warranty maintenance services will replicate all services available during the warranty year period, to include all third party equipment proposed.

9.4.4 The Vendor will provide post-warranty system services as an extended warranty service from the start of post warranty to 15-years.

9.5 Pricing Summaries

9.5.1 Pricing Summaries for Infrastructure equipment shall be provided as part of the response. All summary information will be supported by detailed cost information as detailed further in this Section. Pricing Summaries include;

9.5.1.1 Infrastructure Equipment

9.5.1.2 Project Management, Engineering, & Installation Services

9.5.1.3 Turnkey Discount

9.5.1.4 Optional Requests

9.6 Infrastructure Pricing Analysis Worksheets

9.6.1 The following pricing worksheets are to be used as an example to develop the Infrastructure Price Submittal. These worksheets are indicative of the detail required and may be amended or expanded by the Vendor as necessary. Any omission or error in developing the pricing proposal, shall be the sole responsibility of the Contractor.

Site (individual submittals required)

Cost Description	Number Req'd	List Unit Cost	Extended Cost	Maintenance Cost
Tower	_____	\$ _____	\$ _____	\$ _____
Tower Installation	_____	\$ _____	\$ _____	\$ _____
Equipment Shelter	_____	\$ _____	\$ _____	\$ _____
Standby Generator System	_____	\$ _____	\$ _____	\$ _____
Shelter Pad Installation	_____	\$ _____	\$ _____	\$ _____
Shelter, Tower, & Site Grounding	_____	\$ _____	\$ _____	\$ _____
Project Management	_____	\$ _____	\$ _____	\$ _____
Engineering	_____	\$ _____	\$ _____	\$ _____
NEPA/SHPO	_____	\$ _____	\$ _____	\$ _____
Permitting	_____	\$ _____	\$ _____	\$ _____
Access Road	_____	\$ _____	\$ _____	\$ _____



Fencing
 Herbicide and Rocking
 Documentation
 Other
 Other

_____	\$	_____	\$	_____	\$	_____
_____	\$	_____	\$	_____	\$	_____
_____	\$	_____	\$	_____	\$	_____
_____	\$	_____	\$	_____	\$	_____
_____	\$	_____	\$	_____	\$	_____
_____	\$	_____	\$	_____	\$	_____
_____	\$	_____	\$	_____	\$	_____
_____	\$	_____	\$	_____	\$	_____
_____	\$	_____	\$	_____	\$	_____
=====		=====		=====		=====

Subtotal Equipment
 Subtotal Labor
 Total Equipment/Labor

\$ _____
 \$ _____
 \$ _____

Appendix A: Site Location

Tower: Site #1 New Joplin Tower 400 ft Guyed Tower

Location: 37°06'13.9"N 94°33'50.2"W

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas or Type of Mount	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Notes
400.0		Large Omni Antenna				7/8	TX
400.0		Large Omni Antenna				7/8	RX 1
400.0		Large Omni Antenna				7/8	RX 2
400.0		TTA				7/8	
290.0		Ice Shield					
285.0		6ft Dish				EW63	Microwave to Dispatch
145.0		Ice Shield					
140.0		6ft Dish				EW63	Microwave to Hwy 43

Appendix B: RFP Definition of Terms

Additional Services	Service or deliverable within the scope of the Contract, but not specifically provided under any
AC 70/7460-1M	This Federal Aviation Administration (FAA) Advisory Circular (AC) describes the Federal Aviation Administration’s standards for marking and lighting structures to promote aviation safety.
AES	Advance Encryption Standard.
Agency	User operable on The Customer's radio communications
AMBE	Advanced Multiband Excitation, P25 digital voice-coder.
ANSI/TIA-222-H	American National Standards Institute / Telecommunications Industry Association: “Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Structures”
APCO	Association of Public Safety Communications Officials.
ATP	Acceptance Test Plan.
BER	Bit Error Rate.
Computer Aided Dispatch (CAD)	A computer-based system, which aids PSAP Telecommunicators by automating selected dispatching and record keeping activities.
CATP	Coverage Acceptance Test Plan.
Confidential Information	All tangible and intangible

information and materials, including all Personally Identifiable Information, being disclosed in connection with this Contract, in any form or medium (and without regard to whether the information is owned by The Customer or by a third party), that satisfy at least one of the following criteria: (i) Personally Identifiable Information; (ii) Proprietary Information; (iii) non-public information related to The Customer's employees, The Customers, technology (including databases, data processing and communications networking systems) schematics, specifications

Contract	The final version of any contractually binding agreement between The Customer and the Contractor relating to the subject matter of this RFP; references to the Contract include all exhibits, attachments, and other documents attached thereto or incorporated therein by reference.
Contract Term	The initial term of the Contract and any renewals and/or extensions.
Contracted Personnel	Contractor's employees or other personnel (including officers, agents, and Subcontractors) provided by the Contractor to perform work related to the
Contractor	A Vendor awarded a Contract.
CSSI	Radio Console Subsystem Interface.
The Customer Premises Equipment (CPE)	Communications or terminal equipment located in The Customer's

	facilities – terminal equipment at a
DAQ	Delivered Audio Quality.
dB	Decibel, a unit of power.
DC	Direct Current.
Deliverable	All project materials, including goods, software licenses, data, and documentation created during the performance or provision of Services hereunder or identified as a Deliverable in an applicable Statement of Work of other contract
Department	A public safety subdivision utilizing The Customer radio network/system.
DHS	United States Department of Homeland Security.
Dispatch Console	A specialized computer with a software application through which calls are made to and received from radio users and radio dispatch
Division	A sub-unit of a County agency.
DVB	A state-certified Disabled Veteran-Owned Business.
Dynamic Dual Mode	A feature of a P25 land mobile radio system whereby call requests are assigned to P25 Phase 1 or Phase 2 channels based upon the capability of the radio users participating in the
Effective Date	The date the contract has been fully executed by the Contractor and The Customer.

Emergency Services Internet Protocol Network (ESInet A managed Internet protocol network

that is used for emergency services and can be shared by all public safety answering points. It provides the IP transport infrastructure upon which independent application platforms and core functional processes can be deployed, including, but not restricted to, those necessary for providing NG9-1-1 services. ESNets may be contracted from a mix of dedicated and shared facilities. ESNets may be interconnected at local, regional, state, federal, national, and international levels to form an IP based inter-network

ERP	Effective Radiated Power.
FCC	Federal Communications Commission.
FDMA	Frequency Division Multiple Access.
FEMA	Federal Emergency Management Agency.
FirstNet	The independent authority within the National Telecommunications & Information Administration (NTIA) created by the Middle-Class Tax Relief and Job Creation Act of 2012 to provide emergency responders with the first nationwide, high-speed, broadband network dedicated to
Form-C	Normally-open/normally closed relay contact arrangement.
Geographic Information System (GIS)	A computer software system that enables one to visualize geographic aspects of a body of data. It contains the ability to translate implicit geographic data (such as a street address) into an explicit map location. It can query and analyze data to

	receive the results in the form of a map. It also can be used to graphically display coordinates on a map such as Latitude/Longitude from a wireless 9-
GHz	1-billion cycles per second, Giga-Hertz (or microwave)
GPS	Global Positioning System.
Home Run Grounds	A dedicated and continuous electrical ground wire connection (green insulated) between an electrical device and the electrical circuit breaker panel. This connection is used for personnel safety as per the
HVAC	Heating, Ventilation and Air Conditioning.
Hz	1 cycle per second, Hertz.
ID	Radio Unit Identifier.
IMBE	Improved Multiband Excited, P25 digital voice-coder.
IEEE	Institute of Electrical and Electronic Engineers.
Inter RF Sub- System Interface (ISSI)	An electronic gateway device used to link disparate P25 radio networks, thereby allowing radio user roaming across radio networks.
Interoperability	The ability of public safety responders to share information via voice and data communications systems on demand, in real time, when needed, and as authorized.
Key Personnel	Contracted personnel who play leading and critical roles in provided Services during the contract term.

KHz	1,000 cycles per second, Kilo-Hertz.
KMF	Key Management Facility.
kVA	Kilovolt-Ampere.
LCD	Liquid Crystal Display.
LMR	Land Mobile Radio.
LTE	Long Term Evolution.
MABAS	Mutual Aid Box Alarm System.
Mandatory	A requirement labeled as such must be present in the proposed solution, exactly as stated, or the solution will not be considered by The Customer.
MBE	A state-certified Minority Business Enterprise.
MHz	1,000,000 cycles per second, Mega-Hertz.
Municipality	Any county, city, village, town, school district, board of school directors, sewer district, drainage district, vocational, technical and adult education district, or any other public body having the authority to award
NCC	Network Control Center.
Next Generation 9-1-1	An enhanced 9-1-1 system that incorporates the handling of all 9-1-1 calls and messages, including those using IP-enabled services or other advanced communications technologies in the infrastructure of
NMS	Network Management System.

NOC	Network Operations Center.
NPSTC	National Public Safety Telecommunications Council.
OSHA	Occupational Safety and Health Administration.
OTAP	Over the Air Programming.
OTAR	Over the Air Rekeying.
OTEK	Over the Ethernet Keying.
P25	Project 25.
P25 Phase 1	Project 25 radio system using FDMA and the IMBE voice-coder.
P25 Phase 2	Project 25 radio system using TDMA and the AMBE voice-coder.
Parties	The County and the Contractor, collectively.
Party	Either the County or the Contractor, individually.
Personally Identifiable Information	An individual's last name and the individual's first name or first initial, in combination with and linked to any of the following elements, if the element is not publicly available information and is not encrypted, redacted, or altered in any manner that renders the element unreadable: (a) the individual's Social Security number; (b) the individual's driver's license number or state identification number; (c) the individual's date of birth; (d) the number of the individual's financial account, including a credit or debit card account number or any security

account number, or any security code, access code, or password that would permit access to the individual's financial account; (e) the individual's DNA profile; or (f) the individual's unique biometric data, including fingerprint, voice print, retina or iris image, or any other

Proposal

The complete response to this RFP submitted on the approved forms, in the required manner and setting forth the Vendor's prices for providing the products and services described in the RFP.

PTT

Push-to-Talk.

Public Information

Information that (i) is collected, assembled or maintained under a law or ordinance or in connection with the transaction of official business by a governmental body or for a governmental body; and (ii) the governmental body owns or to which it has a right of access.

Public Safety Answering Point (PSAP)

A facility to which a call on a basic or sophisticated system is initially routed for response, and on which a public agency directly dispatches the appropriate emergency service provider, relays a message to the appropriate emergency service provider or transfers the call to the appropriate emergency services

Response

A Vender's response to this RFP, also referred to as a Proposal.

RF

Radio Frequency.

RFP	This Request for Proposal.
SATP	Service Acceptance Test Plan.
Secondary PSAP	A PSAP equipped with automatic number identification and automatic location identification displays. It receives 9-1-1 calls only when they are transferred from the primary PSAP or on an alternative routing basis when calls cannot be completed
Services	All actions, recommendations, plans, research, customizations, modifications, documentation, maintenance, and support provided by the Contractor necessary to fulfill that which the Contractor is obligated to accomplish under the Contract.
SOW	Statement of Work.
State	The Customer's State identified in this RFP.
Subscriber Unit (SU)	Portable or Mobile Unit
Subcontract	Any contract, express or implied, between the Contractor and another party or between a Subcontractor and another party delegating or assigning, in whole or in part, the making or furnishing of any material or service requested for the performance of the Contract.
Subcontractor	A party to a Contractor, as included in the RFP Responder's Proposal.
System	The new radio communications network to be proposed by Vendors and installed by the Contractor.

TDMA	Time Division Multiple Access.
TIA	Telecommunications Industry Association
TIA-102	Telecommunications Industry Association, P-25 Standards.
TIA-603E	Telecommunications Industry Association, Land Mobile FM and PM Communications Equipment Measurement and Performance Standards.
TIA TSB-88	Telecommunications Industry Association, Technical Service Bulletin-88, Wireless Communications Systems Performance in Noise and Interference-Limited Situations.
TTA	Tower Top Amplifier
UHF	Ultra-High Frequency (i.e., 450-512MHz)
UPS	Uninterruptible Power Supply.
User	An entity or person that operates land mobile radio equipment.
User-Selectable	A radio feature that can be enabled/disabled by radio-equipped field personnel.
uV	micro volt. One-millionth of a Volt.
VAC	Volts Alternating Current.
Vendor	The entity that is responding to this RFP Specification.
VHF	Very-High Frequency (i.e., 136-174MHz)
VPN	Virtual Private Network.

NONCOLLUSION AFFIDAVIT

PROPOSAL INVALID IF THIS AFFIDAVIT IS NOT SIGNED AND NOTARIZED AND SUBMITTED WITH THE PROPOSAL

State of _____

This Request for Proposal (RFP) encompasses a turnkey project to provide Jasper County,

County of _____

I _____ of lawful age, being first duly sworn, on oath says that:

- 1 (S)he is the duly authorized agent of the vendor and/or contractor submitting the competitive proposal and/or procuring the contract which is attached to this statement, for the purpose of certifying the facts pertaining to the existence of collusion among proposers and between proposers and county/city officials or employees, as well as, facts pertaining to the giving or offering of things of value to government personnel in return for special consideration in the letting of any contract pursuant to the request for proposals to which this statement is attached;

- 2 (S)he is fully aware of the facts and circumstances surrounding the making of the proposal and/or the procurement of the contract to which this statement is attached and has been personally and directly involved in the proceedings leading to the submission of such proposals;

- 3 Neither the vendor/contractor nor anyone subject to the vendor/contractor's direction or control has been a party;
 - a to any collusion among proposers in restraint of freedom of competition by agreement to propose at a fixed rate or to refrain from submitting;

 - b to any collusion with any county/city official or employee as to quantity, quality or price in the prospective contract, or as to any other terms of such prospective contract, nor

 - c in any discussions between proposers and any county/city official concerning exchange of money or other thing of value for special consideration in the letting of a contract;

 - d to paying, giving, donating or agreeing to pay, give or donate to any officer or employee of the city of Bentonville, any money or other thing of value, either directly or indirectly, in procuring the contract to which his/her statement is attached.

Signature: _____ Title: _____

Subscribed and sworn before me this: _____ day of _____, 20_____

Notary Public: _____ My commission expires: _____

Contractor/Vendor Disclosure

THIS DOCUMENT MUST BE COMPLETED AND INCLUDED IN ANY SUBMISSION

Company Name: _____

Identify each employee of The Customer or the incorporated cities within The Customer to whom you, any of your employees owning more than 5% interest in your Company, or are a Director/Executive/Decision Maker of your Company are immediately related.

Immediate Relation includes:

- Spouse/Domestic Partner
- Parents-Natural or Legal/Step/In Laws
- Children/Step, Siblings-Whole/Half/Step/ In Laws
- Grandchildren/Step, Great Grandchildren.

OR

Check this box if you there are no applicable relationships to disclose.

Failure to disclose shall be considered a material breach and grounds for immediate termination of this contract. **Note: Any change in circumstances resulting in a conflict or appearance of a conflict shall be reported within 30 days of change of circumstance.**

Name: _____

Signature: _____ **Title:** _____

Proposal Authorization Form

To be submitted with each Price Proposal

I (or we) do hereby declare that I (or we) have carefully examined this RFP Specification and any addenda, and I (or we) have a clear understanding of said Specifications, and shall provide the required communications equipment and the necessary tools, machinery, apparatus, and other means of construction/installation, and to furnish all labor, materials, and services specified in the Contract or called for in the said Specifications (including all taxes/fees) necessary for the completion of the work described herein.

Respectfully submitted,
By:

Authorized Signature Title

Business Name Business Address

Telephone Number Date