

**Surry County Public Safety Tower
IFB # 2015-01 RLR**

For Surry County Broadband Network

PROJECT BACKGROUND

Surry County, Virginia has installed over 4 miles of fiber through the downtown Surry area connecting key businesses and the County's municipal facilities to a point of presence located in the Surry West Business Park. An additional component of the County's broadband investment is the construction of a 350 foot tower within the business park and connected to the fiber network. This tower will allow the County to relocate their public safety wireless communication systems from a lesser-height leased tower, reducing costs and increasing county-wide coverage utilizing greater height. A key component of the tower investment is to provide access to private broadband providers for the deployment of high speed Internet services to residents and businesses in Surry and perhaps neighboring counties.

This Invitation for Bid seeks a qualified company to provide tower and foundation engineering, tower and materials, equipment shelter, and erection services for a single tower. The site will require ancillary improvements including fencing, grounding systems and new electrical service.

MAJOR INSTALLATION COMPONENTS

- Design and install foundations for the tower
- Engineer, furnish and install guyed tower
- Furnish and install external site and tower grounding
- Install new power service
- Furnish and place an equipment shelter
- Furnish and install perimeter fencing
- Finish grade, gravel and landscaping

Bids are due on or before 4:00 pm on: 07/31/2015

To receive a full copy of the Bid Documents please contact Rhonda Russell at 757-294-5210. Copies may also be obtained from the Surry County web site : <http://surrycountyva.gov/page/current-bids-&-rfps/> or directly from the Office of the County Administrator at the address below.

:

Bid Responses shall be submitted to:

Mr. Tyron W. Franklin, Surry County Administrator
C/O Ms. Rhonda L. Russell, Director
Surry Co Planning & Community Development
P.O. Box 357
45 School Street
Surry, Virginia 23883



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INVITATION FOR BID

This IFB consists of this introduction and the following:

- Appendix 1 – General Terms and Conditions
- Appendix 2 – General Bid Submission Criteria
- Appendix 3 – Specifications and Scope of Work
- Appendix 4 – Tower Site Plan
- Appendix 5– Geotechnical Analysis and Report

Bid is Due on or Before: 07/31/2015

Clearly mark package as "Surry County Tower Bid IFB 2015-01 RLR"



Submit Bid Responses to:

Mr. Tyron W. Franklin, Surry County Administrator
C/O Ms. Rhonda L. Russell, Director
Surry Co Planning & Community Development
P.O. Box 357
45 School Street
Surry, Virginia 23883
757-294-5210

Bid Conditions:

1. The undersigned BIDDER proposes and agrees, if this Bid is accepted, to enter into an Agreement with Surry County in the form included in the Contract Documents to complete all Work specified or indicated in the Contract Documents for the Contract Price and within the Contract Time indicated in this Bid and in accordance with the Contract Documents.
2. BIDDER accepts all of the terms and conditions of the Instructions to Bidders. BIDDER will sign the Agreement and submit along with any other documents required by the Contract Documents within fifteen days after the date of OWNER’s Notice of Award.
3. In submitting this Bid, BIDDER represents, as more fully set forth in the Agreement, that:
 - a. BIDDER has examined copies of all the Contract Documents and of the appendices.
 - b. BIDDER has examined the site and the locality where the Work is to be performed, the legal requirements (federal, state and local laws, ordinances, rules and regulations), state license requirements and the conditions affecting cost, progress or performance of the Work and has make such independent investigations as BIDDER deems necessary;
 - c. This Bid is genuine and not made in the interest of or on behalf of any undisclosed person, firm or corporation and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; BIDDER has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; BIDDER has not solicited or induced any person, firm or a corporation to refrain from bidding; and BIDDER has not sought by collusion to obtain for himself any advantage over any other Bidder or over OWNER.
 - d. BIDDER will complete the Work for the Lump Sum Price of – (See Page 10). Optional items individually priced.
 - e. BIDDER agrees that the Work will be substantially complete within the following number of calendar days from award of contract – (See Page10).
4. The Contractor(s) shall maintain the following insurance coverages:

Worker’s Compensation	Statutory
Commercial General Liability	\$1,000,000 each occurrence-bodily injury and property damage \$2,000,000 general aggregate
Contractual Liability	\$1,000,000 each occurrence
Completed Operations And Products Liability	\$2,000,000 aggregate
Vehicle Liability	\$1,000,000 each accident-bodily injury and property damage



The Contractor(s) shall be responsible for all costs of insurance maintained pursuant to this Agreement. The Contractor(s) shall provide Surry County with a satisfactory Certificate of Liability Insurance (included with the bid submission) that shows the insurance coverage listed above is in effect.

The insurance required hereunder shall be primary, and any insurance or self-insurance maintained by Surry County shall be in excess of and shall not contribute with any insurance providers to the contractor under this Agreement. Any deductibles or self-insured retentions applicable to required coverage shall be paid by the contractor, and Surry County shall not be required to participate therewith. The contractor waives all rights of subrogation against Surry County that exist now or in the future relative to the insurance coverage provided under this Agreement.

The failure of the contractor to pay all insurance premiums when due and payable shall be grounds for the immediate termination of this Agreement by Surry County.

5. Communications concerning this Bid shall be addressed to:

Ms. Rhonda L. Russell
Director, Surry Co Planning & Community Development
P.O. Box 357
45 School Street
Surry, Virginia 23883
rlrussell@surrycountyva.gov

Questions and answers will be posted on the Surry County website,
<http://www.surrycountyva.gov/page/current-bids-&-rfps/>

6. ACCEPTANCE AND REJECTION: Surry County reserves the right to reject any or all bids, to accept bids in whole or in part (unless otherwise indicated by bidder), to waive any informalities in bids received, to accept bids on materials or equipment with variations from specifications where efficiency of operation will not be impaired, and to award bids to best serve the interest of Surry County.

7. BIDDING PROCEDURE:

- a. Submit the original and five (5) sets of the bid response sheet, references and product descriptions.
- b. Submit three (3) references and names of any subcontractors on the project.
- c. Please describe the product that is proposed and include any appropriate manufacturers information and descriptions.
- d. All bids submitted shall include a copy of the current state licenses held by the bidder required to perform the Work specified or indicated in the Contract Documents.
- e. All bids submitted shall have included in the price the cost of any business or professional licenses, and permits or fees required by the local, state or federal government.
- f. All bids must be signed in order to be considered. If the bidder is a firm or corporation, the bidder must show the title of the individual executing the bid.
- g. Bids must be sealed and labeled on the outside of an envelope or package to show the Bid Number **2015-01 RLR**.
- h. All forms, blanks and questions must be completed. Failure to do so may be cause for rejection of bid.
- i. Surry County will neither accept oral bids nor accept bids received by telephone, fax or e-mail. Unless otherwise specified, bidders are to use the Bid Response Form, attached.



- j. Bids received after the due date and time will be deemed unresponsive and returned to the bidder unopened.
 - k. In the event the Surry County offices are closed due to inclement weather and/or emergency situations at the time set aside for the advertised bid opening, the opening date will default to the next open business day at the same time and location.
 - l. No bid shall be altered or amended after the specified time for opening.
8. **Bid Bond:** A 5% bid bond is required. Each bid shall be accompanied by a bid bond with surety satisfactory to the Surry County attorney or a cashier's check or a certified check, made payable to Surry County. Personal and company checks are not acceptable as Bid Bonds. Bids received without a bid bond shall be rejected. The Bid Bond will be forfeited as liquidated damages if the successful bidder fails to provide a required Performance Bond or fails to honor their bid. Cashier's checks and certified checks submitted as Bid Bonds will be returned to unsuccessful bidders; surety bonds will be retained for the successful bidder. Surety bonds must be issued by a surety company authorized to do business in Virginia (see Appendix 1).
9. **BID ACCEPTANCE PERIOD:** Any bid in response to this solicitation shall be binding for sixty (60) days from the date of opening, unless extended by mutual consent of the parties.
10. **AWARD CRITERIA:** In order to be considered for an award of contract, a bid must comply with the specifications and the submission requirements of this Invitation to Bid. If an award is made pursuant to this Invitation to Bid, the award shall be made by Surry County to the lowest responsive and responsible bidder or bidders.
- a. The lowest responsive bidder(s) may be required to furnish a contractor qualifications statement, to include additional references, prior to any such award. Surry County may contact all references furnished by bidders. The right is further reserved by Surry County to contact references other than, and/or in addition to, those furnished by the bidder. If, in the sole opinion of the Surry County, a bidder is determined to be non-responsible as a result of any investigation conducted by or for the Surry County, award will not be made to that bidder.
 - b. Surry County reserves the right, at its option, to conduct on-site inspections of any bidder's facilities prior to award. The results of any such inspection will be considered by Surry County in determining bidder's capabilities of successfully administering the contract.
 - c. Results of product testing, if any, may be used by Surry County, among other factors, in determining bidder's ability to responsibly perform the service sought herein.

The successful bidder will receive a Purchase Order or Contract. In accordance with Virginia law, notice of award will be posted on the Surry County's website, <http://www.surrycountyva.gov/page/current-bids-&-rfps/> and at the Surry County offices at 45 School Street in Surry, Virginia. Requests for bid results must be made in writing and a self-addressed stamped envelope is required for mailing. Surry County reserves the right to reject any and all bids in whole or in part, to waive any informality, and to delete items prior to making an award. Bids making exceptions to terms and conditions included in this invitation may be considered, but preference may be given to those who do not make such exceptions.

11. Pre-bid meeting



If the bidder desires to visit the site prior to submitting a bid, the bidder shall request a site visit by July 17, 2015 by contacting Ms. Rhonda L. Russell of Surry County at rlrussell@surrycountyva.gov or 757-294-5210.

Bid Submission

This bid is submitted by:

Company Name

Address

City, State, Zip

FEIN

Name of Person Authorized to Sign

Title

Authorized Signature

Date

Bid Pricing

In Response to: Surry County IFB 2015-01 RLR Public Safety Wireless Tower

\$ _____
Lump Sum Price

Calendar Days Required _____

Bid Pricing for Optional Items:

Equipment Shelters:

Description/Model

Price

Description/Model

Price

Description/Model

Price

Additional Items for Consideration: (Attach Page)



APPENDIX 1: GENERAL TERMS AND CONDITIONS

The procurement documents, including this Appendix 1 "*General Terms and Conditions*," to this Invitation to Bid, and the response of the bidder (the "**Contractor**") will be incorporated into a resulting contract as fully and completely as if set forth in such contract in its entirety. The following are the general conditions that will apply to this procurement done by Virginia's Surry County Local Government Council (**Surry County**), by submission of a bid, all bidders agree to these terms and conditions.

1. General Provisions

Nothing in any resulting contract shall be construed as authority for either party to make commitments which will bind the other party beyond the scope of service contained herein. This contract is subject to appropriations by Surry County.

2. Laws of the Commonwealth

- A.** Any purchase order or contract resulting from this solicitation shall be governed in all respects whether as to validity, construction, performance, or otherwise by the laws of the Commonwealth of Virginia. The Contractor providing goods or services to Surry County under this contract assures Surry County that it is:
1. Conforming to the provisions of the Civil Rights Act of 1964, as amended, the Virginia Fair Employment Contracting Act of 1975, as amended, and the Virginia Human Rights Act, as amended, where applicable;
 2. Not employing illegal alien workers or otherwise violating the provisions of the Immigration Reform and Control Act of 1986;
 3. Complying with federal, state and local laws and regulations applicable to the performance of the services procured; and
 4. Submitting the bid or proposal in full compliance with the Virginia Conflict of Interest Act.
- B.** In every contract of over \$10,000, the Contractor agrees during the performance of this contract that:
1. The Contractor **(1)** will not discriminate against any employee or applicant for employment because of race, religion, color, sex, disability, or national origin, except where religion, sex or national origin is a bona fide occupational qualification reasonably necessary to the normal operation of the Contractor, **(2)** will post in conspicuous places, available to employees and applicants for employment, notices setting forth the provisions of this nondiscrimination clause, and **(3)** will state that the Contractor is an equal opportunity employer in all solicitations or advertisements for employees placed by or on behalf of the Contractor under this contract. All notices, advertisements, and solicitations placed in accordance with federal law, rule or regulation shall be deemed sufficient for the purpose of meeting the requirements of this section;



2. The Contractor will include the provisions of the foregoing subparagraph 2.(B)(1) in every subcontract or purchase order under this Contract of over \$10,000, so that the provisions will be binding upon each subcontractor or vendor; and

C. In every contract of over \$10,000, the Contractor agrees during the performance of this contract that:

The Contractor shall **A)** provide a drug-free workplace for its employees; **B)** post in conspicuous places, available to employees and applicants for employment, a statement notifying employees that the unlawful manufacture, sale, distribution, dispensation, possession, or use of a controlled substance or marijuana is prohibited in its workplace and specify the actions which will be taken against any employee for a violation; **C)** state in all of its solicitations or advertisements for employees that it maintains a drug-free workplace; and **D)** include the provisions of this sub-paragraph in every subcontract or purchase order of over \$10,000, so that said provisions shall be binding upon each subcontractor or vendor.

For purposes of this sub-paragraph, "drug-free workplace" means a site for the performance of work done in connection with a specific contract awarded to a contractor in accordance with the provisions of the Virginia Public Procurement Act, the employees of whom are prohibited from engaging in the unlawful manufacture, sale, distribution, dispensation, possession or use of any controlled substance or marijuana during the performance of the contract.

D. In addition to the provisions contained in sub-paragraph C. pertaining to drug-free place, Contractor shall comply with the federal Drug Free Workplace Act.

E. Pursuant to Section 2.2-4343.1 of the Code of Virginia of 1950, in all invitations to bid, requests for proposals, contracts, and purchase orders, Surry County does not discriminate against faith-based organizations.

3. Certifications

The Contractor certifies that:

1. The bid or offer (1) is made without prior participation, understanding, agreement, or connection with any corporation, firm or person submitting a bid/offer for the same materials, supplies, equipment, or services with respect to the allocation of the business afforded by or resulting from the acceptance of the bid or proposal, (2) is in all respects fair and without collusion or fraud, and (3) is or is intended to be competitive and free from any collusion with any person, firm or corporation;

2. The Contractor has not offered or received any kickback from any other bidder or Contractor, supplier, manufacturer, or subcontractor in connection with the bid/offer on this solicitation. A kickback is defined as an inducement for the award of a contract, subcontracts or order, in the form of any payment, loan, subscription, advance, deposit of money, services or anything, present or



promised, unless consideration of substantially equal or greater value is exchanged. Further, no person shall demand or receive any payment, loan, subscription, advance, and deposit of money, services or anything of value in return for an agreement not to compete on a public contract;

3. The Contractor is not a party to nor has he participated in nor is obligated or otherwise bound by agreement, arrangement or other understanding with any person, firm or corporation relating to the exchange of information concerning bids, prices, terms or condition upon which the contract resulting from the acceptance of his bid proposal is to be performed;
4. The Contractor understands that collusive bidding is a violation of the Virginia Governmental Frauds Act and federal Law, and can result in fines, prison sentences, and civil damage awards and agrees to abide by all conditions of this bid; and
5. The Contractor or subcontractor has not and will not confer on any public employee having official responsibility for a procurement transaction any payment, loan, subscription, advance, deposit of money, services or anything of more than nominal value, present or promised, unless consideration of substantially equal or greater value is exchanged.

4. Warranties

Any goods or services furnished by the Contractor under the contract shall be covered by the most favorable warranties provided by the Contractor to any customer; the rights and remedies hereby provided are in addition to any and do not limit those otherwise available to Surry County. The Contractor agrees that if such warranties are in any respect breached, the Contractor will pay to Surry County the full contract price agreed to by Surry County to be paid for the supplies, materials, equipment or services furnished under the bid.

5. Modifications, Additions or Changes

Modifications, additions or changes to these terms and conditions may not be made except in writing and agreed to by Surry County; however, no fixed priced contract may be increased by more than twenty-five (25) percent of the amount of the contract or \$50,000 whichever is greater without the approval of Surry County. The amount of any contract may not be increased for any purpose without adequate consideration provided to Surry County.

6. Indemnification

The Contractor agrees to indemnify, defend and hold harmless Surry County and its officers, agents, and employees from any claims, damages and actions of any kind or nature, whether at law or in equity, arising from or caused by the use of any materials, goods, or equipment of any kind or nature furnished by the Contractor or any services of any kind or nature provided by the Contractor, provided that such liability is not attributable to the sole negligence on the part of Surry County or to failure of Surry County to use the materials, goods, or equipment in the manner outlined by the Contractor and descriptive literature or specifications submitted with the Contractor's bid.

7. Assignment



The contract may not be assigned, sublet, or transferred without the written consent of Surry County.

8. Default

In the case of default or breach by the Contractor or the failure of the Contractor to deliver the services in conformance with the specifications in the contract Surry County shall give written notice to the Contractor specifying the manner in which the contract has been breached. If Surry County gives such notice of breach and the Contractor has not corrected the breach within fifteen days of receipt of the written notice, Surry County shall have the right to immediately rescind, revoke or terminate the contract and in addition to any other remedies available at law to procure such services from other sources and hold the Contractor responsible for any and all excess cost occasioned thereby.

9. Audit

The Contractor hereby agrees to retain all books, records, and other documents relative to this contract for five years after final payment or after all other pending matters are closed, whichever is longer. Surry County and its authorized agents, state auditors, the grantor or provider of the funds to Surry County for the purpose of financing all or a portion of this project, the Comptroller of Virginia or of the United States, or any of their duly authorized representatives shall have access to any books, documents, papers and records of the Contractor which are directly pertinent to the specific contract for the purpose of making audits, examinations, excerpts or transcriptions.

10. Ownership of Documents

Any reports, studies, photographs, negatives, or other documents prepared by Contractor in the performance of its obligations under any resulting contract shall be remitted to Surry County by the Contractor upon completion, termination or cancellation of this Contract. Contractor shall not use, willingly allow or cause to have such materials used for any purpose other than performance of Contractor's obligations under this contract without the prior written consent of Surry County. Surry County shall own the intellectual property rights to all materials produced under this contract.

11. Required Bonds

A. Bid Bond

The Contractor shall furnish to Surry County a bid bond required under Section 2.2-4336 of the Code of Virginia in the amount of five percent (5%) of the bid.

B. Payment and Performance Bonds

In order to secure its performance of the Project, and pursuant to Section 2.2-4337 of the Code of Virginia, the Contractor shall cause to be furnished separate performance and payment bonds to Surry County in the amount of the Contract Price. The bonds shall be from the Contractor as obligor to Surry County as sole obligee, provided that the bonds clearly state that no default by the Contractor shall excuse the surety from any obligations the surety has to Surry County under the bonds. Those to be protected under the payment bond will be intended third-



party beneficiaries. The bonds shall be executed by a corporate surety or corporate sureties that are reasonably acceptable to Surry County, and duly authorized to do business in the Commonwealth. If a surety upon any bond furnished in connection herewith becomes insolvent, or otherwise not authorized to do business in the Commonwealth, then the Contractor shall promptly cause the replacement of the bond or cause equivalent security acceptable to Surry County to be furnished. The Contractor shall cooperate with Surry County in order to fulfill any reasonable requirements in connection with the financing for the Project with respect to the form of performance and payment bonds provided hereunder.

C. Other forms of security

In lieu of a bid, payment or performance bond, the Contractor may furnish a certified check or cash escrow in the face amount required for the respective bonds, subject to approval by Surry County.

12. Required Payment

Pursuant to Section 2.2-4354 of the Code, the Contractor covenants and agrees to:

- a. within seven days after receipt of any amounts paid to the Contractor under the Contract, (i) pay any subcontractor for its proportionate share of the total payment received from Surry County attributable to the work under the Contract performed by such subcontractor, or (ii) notify Surry County and the subcontractor, in writing, of its intention to withhold all or a part of the subcontractor's payment and the reason therefor;
- b. provide its federal employer identification number or social security number, as applicable, before any payment is made to the Contractor under the Contract; and
- c. pay interest at the legal rate or such other rate as may be agreed to in writing by the subcontractor and Contractor on all amounts owed by the Contractor that remain unpaid after seven days following receipt by the Contractor of payment from Surry County for work performed by the subcontractor under the Contract, except for amounts withheld pursuant to subparagraph a. above.
- d. include in its contracts with any and all subcontractors the requirements of a, b, and c. above.

13. Liability Coverage

In addition to that which may be expressly stated in the procurement announcement documents prepared by Surry County, the Contractor shall take out and maintain during the life of the Contract such bodily injury, liability and property damage liability insurance as shall protect it and Surry County from claims for damages for personal injury, including death, as well as from claims for property damage, which may



arise from its activities under this agreement. Such insurance must be issued by a company admitted within the Commonwealth of Virginia and with at least a Best's Key Rating of at least A:V1. The Contractor shall provide Surry County with a certificate of insurance showing such insurance to be in force and providing that the insurer shall give Surry County at least 30 days' notice prior to cancellation or other termination of such insurance.

14. No Waiver

Any failure of Surry County to demand rigid adherence to one or more of this Agreement's provisions in the contract, on one or more occasions, shall not be construed as a waiver nor deprive Surry County of the right to insist upon strict compliance with the terms of this Contract. Any waiver of a term of this Contract, in whole or in part, must be in writing and signed by the party granting the waiver to be effective.

15. Termination

Surry County may terminate the resulting contract for its convenience upon thirty (30) days written notice to the Contractor. The Contractor shall not be paid for any service rendered or expense incurred after receipt of such notice except such fees and expenses incurred prior to the effective date of termination that are necessary for curtailment of the Contractor's work under this contract.

16. Choice of Law

To ensure uniformity of the enforcement of this Contract, and irrespective of the fact that either of the parties now is, or may become, a resident of a different state, this Agreement shall be governed by and construed in accordance with the laws of the Commonwealth of Virginia, without regard to her principles of conflicts of law.

17. Forum Selection

The parties hereby submit to the personal jurisdiction and venue of any state or federal court located within the Commonwealth of Virginia for resolution of any and all claims, causes of action or disputes arising out of or related to this Contract and agree that service by registered mail to the addresses set forth in Paragraph 19 of this Appendix shall constitute sufficient service of process for any such action. The parties further agree that any claims, causes of action or disputes arising out of, relating to or concerning this Contract shall have jurisdiction and venue only in the Circuit Court of Surry County, Virginia, or in the U.S. District Court, Eastern District.

18. Severability

If any provision of this Contract is held to be illegal, invalid, or unenforceable, or is found to be against public policy for any reasons, such provision shall be fully severable and this Contract shall be construed and enforced as if such illegal, invalid, or unenforceable provision had never been part of this Contract, and the remaining provisions of this Contract shall remain in full force and effect and shall not be affected by the illegal, invalid, or unenforceable provision, or by its severance from this Contract.



19. Notices

All requests, notices and other communications required or permitted to be given under this Contract shall be in writing and delivery thereof shall be deemed to have been made when such notice shall have been either (a) duly mailed by first-class mail, postage prepaid, return receipt requested, or any comparable or superior postal or air courier service then in effect, or (b) transmitted by hand delivery, telegram, telex, telecopier or facsimile transmission, to the party entitled to receive the same at the address indicated below or at such other address as such party shall have specified by written notice to the other party.

Notices to Surry County shall be sent to:

Ms. Rhonda L. Russell
Director, Surry County Planning & Community Development
P.O. Box 357
45 School Street
Surry, Virginia 23883
rrussell@surrycountyva.gov

20. Contractual Claims Procedure

- A. Contractual claims or disputes, whether for money or other relief, except for claims or disputes exempted by law from the procedure set forth herein, shall be submitted in writing no later than sixty days after final payment; provided, however, that Contractor shall give Surry County written notice of its intention to file a claim or dispute within fifteen days after the occurrence upon which the claim or dispute shall be based. Any written notice of Contractor's intention to file such a claim or dispute need not detail the amount of the claim, but shall state the facts and/or issues relating to the claim in sufficient detail to identify the claim, together with its character and scope. Whether or not Contractor files such written notice, Contractor shall proceed with the work as directed. If Contractor fails to make its claim or dispute, or fails to give notice of its intention to do so as provided herein, then such claim or dispute shall be deemed forfeited.
- B. Surry County, upon receipt of a detailed claim, may at any time render its decision and shall render such decision within one hundred twenty days of final payment. Each such decision rendered shall be forwarded to the Contractor by written notice.
- C. If the Contractor disagrees with the decision of Surry County concerning any pending claim, the Contractor shall promptly notify Surry County by written notice that the Contractor is proceeding with the work under protest. Any claim not resolved, whether by failure of the Contractor to accept the decision of Surry County or under a written notice of Contractor's intention to file a claim or a detailed claim not acted upon by the governing body of Surry County, shall be specifically exempt by the Contractor from payment request, whether progress or



final. Pendency of claims shall not delay payment of amounts agreed due in the final payment.

- D. The decision on contractual claims by the governing body of Surry County shall be final and conclusive unless the Contractor appeals within six months of the date of the final decision on the claim by instituting legal action in the appropriate circuit court.

21. Retainage

Surry County will pay the Contractor 95% of the total amount due and the Owner shall retain 5 percent of the amount due until final completion and acceptance of all work covered by the contract.



APPENDIX 2: GENERAL BID SUBMISSION CRITERIA

The procurement documents, including this Appendix 2 "*Bid Submission Criteria*" to this Invitation to Bid, and the response of the bidder (the "**Contractor**") will be incorporated into a resulting contract as fully and completely as if set forth in such contract in its entirety. The following are provisions that will apply to this procurement done by Surry County, by submission of a bid, all bidders agree to these provisions.

1. A bidder may withdraw or cancel a bid at any time prior to the date set for opening. After such time, the bidder may not withdraw for a period of sixty calendar days. Any bidder may be required to clarify his bid or acknowledge by written confirmation that the minimum requirements of the bid are included in the bidder's bid.
2. Any invitation to bid, a request for proposal, any other solicitation or any and all bids or proposals may be canceled or rejected when it is determined that it is in the best interest of Surry County to do so. The reasons therefor shall be made a part of the contract file. Any bid which is incomplete, conditional, obscure, or which is not in conformance with the specifications may be rejected, or any such irregularities may be waived at the option of Surry County.
3. Except in the case of an emergency affecting the public health safety or welfare, no contract shall be awarded on the basis of cost plus a percentage of cost. This paragraph shall not apply to contracts of insurance. Public contracts may be awarded on any other basis.
4. With the following exceptions procurement documents are subject to the *Virginia Freedom of Information Act*:
 - A. Cost estimates relating to a proposed procurement transaction prepared by or for Surry County shall not be opened to public inspection.
 - B. Bid and proposal records shall be opened to public inspection only after award of the contract. Any bidder or bidder may be allowed to inspect the bid or proposal records prior to award unless Surry County decides not to accept any bids and to reopen the contract.
 - C. Trade secrets or proprietary information submitted to Surry County are not subject to disclosure if requested by the person submitting such information. Any such request must identify what is to be protected and state the reasons therefor.
5. Any bidder submitting a bid to Surry County subjects himself to the decision of the Surry County Administrator, or his designee, or the Surry County Board of Supervisors ("Board") as to the quality of what is offered, responsiveness of the bid, responsibility of the bidder, and the qualifications of any bidder. The County Administrator, or his designee, with the advice of the Board, in their sole discretion will evaluate bids and in



all cases the decision made shall be final. Every bidder submitting a bid agrees to abide by the decisions of such officials as a condition precedent to the submission of the bid.

6. Surry County does not accept the responsibility for maintaining a bid list and will not accept the responsibility for the failure of any competitor to receive a solicitation directly from Surry County.
7. Once requests for bid have been advertised, should a prospective bidder find any discrepancy in or omissions from the specifications, requests for proposal, or other contract documents, or should he be in doubt as to their meaning, he shall at once notify the specified contact person who will send written instructions to all bidders. Surry County will not be responsible for any oral instructions.
8. The provisions of Sections 2.2-4305, 2.2-4315, 2.2-4311, 2.2-4312, 2.2-4330, 2.2-4333 through 2.2-4338, 2.2-4340, 2.2-4341, 2.2-4363, and 2.2-4367 through 2.2-4377 of the Code of Virginia of 1950 are incorporated into these conditions by reference as fully as if set forth herein.
9. By submitting a bid, the bidder agrees and warrants that he has examined all the contract documents and, if appropriate, the subject of the contract and where the specifications require a given result to be produced, that the specifications are adequate and the required results can be produced under the specifications in the contract. Omissions from the specifications shall not relieve the Offeror from the responsibility of complying with the general terms of the contract as indicated by the specifications. Once the award has been made, failure to have read all the conditions, instructions and specifications of the contract will not be a cause to alter the original contract or bid or for the Offeror to request additional compensation.
10. The firm, corporate or individual name of the bidder must be signed in ink in the space provided for the signature on Page 5. In the case of a corporation the title of the officer signing must be stated and each officer must be thereunto duly authorized. In the case of a partnership, the signature of at least one of the partners must follow the firm name using the term "member of the firm."



APPENDIX 3: SPECIFICATIONS AND SCOPE OF WORK

New Tower Facilities

The Contractor shall provide a 350 foot guyed steel tower. The Contractor shall provide a structural load analysis for the proposed structure. The new tower shall be designed to fully support the proposed system design antenna load (RF and microwave) including all transmission cables, miscellaneous appurtenances, amplifiers, ice shields, lightning rod, mounts, etc. A structural load analysis is required to be compliant with TIA/EIA-222-G, The tower, along with the foundation, shall be designed as a structure Class III. The tower shall be designed to support exposure Category C, topographic category 1, ice thickness and wind speed in accordance to TIA/EIA-222-G in Surry County, factoring in as-built and future load considerations. The guy paths will be spaced radially at 120 degree intervals with one anchor ring.

Reference Standards

Unless otherwise modified herein, materials, design and construction procedures for the tower proposed by the Offeror shall be in accordance with the latest version of Electronic Industries Association (EIA) standard TIA/EIA-222-G, Federal Aviation Administration (FAA) Advisory Circular AC 70/7460-1 K Change 2 (or latest version), ACI/ASTM concrete standards and all applicable local codes. Grounding of the tower shall be in conformance with Motorola R56, 2005 edition.

Submittals - Documentation

The Contractor shall prepare and submit for approval, scale drawings of the tower depicting its overall height, the number and height of sections, the horizontal spread of each section, antenna loading at specified heights, and obstruction lighting details.

For the proposed tower, the Contractor shall submit for approval a profile view of the tower containing structural details and engineering notes as well as a comprehensive tower foundation design. Drawings shall be sealed by a registered professional engineer (structural) licensed in the Commonwealth of Virginia.

Tower Specifications

Height

The tower height is specified as 345' with an appurtenance not to exceed 5'. Therefore the total tower height will not exceed 350' above ground level (AGL).

- Latitude 37-07-45.31N NAD 83
- Longitude: 76-49-46.00W
- 116 feet site elevation
- 350 feet AGL
- 466 feet AMSL



For additional information, refer to the tower drawings contained within Appendix 4, Tower Site Plan.

Materials

All galvanized steel materials used in the construction of the tower shall be new, and shall conform to the provisions of TIA/EIA-222-G with respect to physical properties, manufacture, workmanship and factory finishes.

Loads and Stresses

The design of the tower shall take into account dead and live loads induced by the structure itself and all appurtenances, and all stress applied to the tower and its appurtenances by wind forces. The minimum safety factors listed by TIA/EIA-222-G shall apply under the most severe combination of dead load plus live loading. The proposed tower design shall factor in all applicable strength limit states and serviceability limit states as defined by the current version of TIA/EIA-222-G. The tower shall properly be categorized and reliability requirements determined appropriately per TIA/EIA-222-G for each structure incorporating the relevant environmental loads for Surry county such as wind, ice, seismic, and foundation loading.

Wind loading and wind gust load factors shall be calculated per TIA/EIA-222-G, with all appurtenances installed. The structures also shall be designed per TIA/EIA-222-G to withstand additional horizontal wind pressures and dead loading produced by the accumulation of radial ice. The tower shall be designed to meet twist, sway and displacement specifications for all loading conditions as recommended by TIA/EIA-222-G for the loading requirements shown in Table A below.



Loading Requirements

The baseline loading requirements are shown in Table A below.

Table A

Mount Ht (Ft, AGL)	Antenna	Antenna Model	Mount	Mount Model	Trans Line	Azimuth (degrees)	(I)mmEDIATE or (F)UTURE
345	VHF Omni Antenna - Rx	PD220-3BN	Standoff Bracket	WSS200	350' LDF5-50A 7/8" trans line	270°	I
328	700 MHz Orion Antenna - RX	I01-83B-10-X-03	Standoff Bracket	WSS300	340' LDF5-50A Antenna Line		I
325	700 MHz Head-End Amplifier (RFS)	18'x6'x6" 20 lbs			340' LDF54-50A Amplifier Monitor Cable		I
318	VHF Omni Antenna - TX	PD220-3BN	Standoff Bracket	WSS300	320' AVA7-50 Antenna Line	270°	I
318	700 Mhz Orion Antenna - TX	I01-83B-10-X-03	Standoff Bracket	WSS300			I
300	11GHz 3.5 ft Microwave Dish	Trango 11GHz Microwave system or equivalent			300 ft 24 ct fiber		F
250	4' Microwave Dish - Anticipate Future Attachment						F
215	AVIAT Network Antenna - TR IOW Main	PAD8-59	Antenna support & pipe		255' EW63 Transmission Line	148.42°	I
200	39.54000 Omni Antenna - SIRS	DB201	Standoff Bracket	WSS400	200' LDF4-50A SIRS Antenna Line	200°	I
185	4.9 Gig Dish - Orion to Disp Link	HDDA5W-29			185' 7929A Double Shielded Cat5	68°	I
185	4.9 Gig Transceiver	PTP200					I



Mount Ht (Ft., AGL)	Antenna	Antenna Model	Mount	Mount Model	Trans Line	Azimuth (degrees)	(I)mmEDIATE or (F)UTURE
185	AVIAT network antenna - DR to IOW Poothouse	PAD8-59	Antenna support & pipe		225' ew63 Transmission Line	148.42°	I
180	(3) 900 MHz panel antennas with radios	e.g. UBNT 120 degree sector antennas with RM900 radios			½ inch shield Ethernet cable		F
175	4.9 Gig Dish – Dominion Link	HDDAW5-29			175' 7929A Double Shielded Cat5	73°	I
145	AVIAT Network Microwave (TR) Main to Berkley	PAD6-59	Antenna support & Pipe		185' EW63 Transmission Line	35.39°	I
136	6 panel GSM/UMTS antennas with amplifiers and 6 LTE panel antennas with remote radio units	e.g. HBXX-6516DS-R2M, DBXNH-6565-R2M, TMA-ETW190VSI2UB			AVA5 (7/8" alum) plus 24 ct fiber		F
100	(3) 2.4 GHz antennas with radios	e.g. UBNT 120 degree sector antennas with RM2 GPS radios			½ inch shielded Ethernet cable		F
80	Same as 180 ft						F
50	Link Receive Antenna	SD222	Standoff Bracket	WSS300	50' LDF4-50A Link Receiver Antenna Line	275°	I
50	SIRS Link Antenna	Y4505	Standoff Bracket	WSS200	LDF4-50A trans line	68°	I



The Offeror shall provide pricing of the tower installation for Table A loading.

Appurtenances

The proposed self-supporting tower shall be designed to support all required immediate and future appurtenances. Appurtenances include, but are not limited to, the following: antennas, antenna mounts, antenna platforms, microwave antennas and radomes, lighting, transmission line, transmission line hangers, waveguide support ladder, climbing ladder and safety cable kit with harness, lightning rods, conduit, waveguide bridge, lighting control, amplifiers, and ice shields. The tower shall be equipped with an integrated lightning rod.

Antenna and Transmission Line Support

The tower shall be designed to support the antennas and transmission lines shown in Table A above. A copper grounding buss bar shall be affixed to the base of the tower to facilitate future grounding of transmission line assemblies. A 24-inch wide waveguide transmission line cable ladder pre-drilled, for universal snap-in hanger kits shall be installed along each face of the tower and each ladder assembly shall extend the entire height of the tower (as feasible). The cable ladder shall be of galvanized steel construction, and shall have mounting hardware of stainless steel or galvanized steel construction.

Lighting and Controls

The FAA has issued a Determination that the structure is to be marked/lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, a med-dual system – Chapters 4, 8(M-Dual), & 12.

Activation of the required lighting system shall be via a redundant light-sensitive, photoelectric type switch and controller which will activate the lights at dusk (or other cloud-darkened condition) and switch to medium intensity flashing white lights at sunrise. The controller shall automatically switch from red lights at sunrise to strobe lights, and back to red lights when the sky darkens.

Wiring for the tower lighting shall be enclosed in rigid galvanized steel conduit, which shall be vented sufficiently to eliminate condensation buildup. Wiring and conduit shall be provided and installed in conformance with the tower manufacturer's specifications and in accordance with local electrical codes. Tower lighting control and electrical cabling shall be affixed with hanger kits to the tower waveguide ladder in the same manner as transmission line.

The tower lighting control system shall be equipped to provide Form-"C" dry contact closure alarm indications of bulb failure for strobes, marker side lights, and power failure which shall be connected to the Surry County Emergency Communications network. The



tower lighting control system shall provide fiber connectivity for remote diagnostics of the tower lighting system. All tower lighting control equipment shall be wall-mounted and installed inside of the pre-fabricated shelter in a manner so as not to obstruct any of the useable racking footprints. The Contractor shall properly ground all tower lighting control boxes and equipment to the facility single point grounding system. All tower lighting control equipment shall be backed up by the emergency generator power system.

Transmission Line Bridge

Tower installation shall include a self-supporting transmission line bridge from the base of the tower to the shelter cable entry ports to support and protect future transmission lines. The length of the bridge shall be such that it fully supports and protects cables from the tower to the equipment shelter, but is not in physical contact with the tower. The bridge and trapeze should be adequately sized to handle the number of transmission lines specified under heading Tower Loadings on pages 26 and 27 with room for additional cables for future expansion.

Bridge shall be equipped with the following features:

- I. Trapeze supports that will accept either snap-in hangers or cushioned hangers to properly attach the transmission lines at intervals recommended by the manufacturer.
- II. X-brace or other stabilizer supports at each end.
- III. Galvanized or other approved corrosion resistant construction

Supports shall be attached to concrete using anchor bolts or by other appropriate means. Concrete supports shall reach to below the frost line to a minimum depth of 40 inches or as recommended by the bridge manufacturer, whichever is deeper.

Each support column shall be bonded to the ground ring using #2 AWG bare, tinned, solid copper wires exothermically welded to the column and to the ground ring.

If pipe columns are used as column structural members, they shall be capped with galvanized steel threaded pipe caps of the proper diameter for the columns furnished.

Climbing Ladder

The tower provided shall be equipped with an OSHA-approved climbing ladder with safety climbing cable with belt that extends the entire length of the tower (as feasible).

Grounding & Testing

Grounding system to be installed and tested in accordance with Motorola R56-2005, with the test probe located at least 5 times the compound diagonal measurement (250 feet for 30x40 foot compound) or more if possible.

Fence shall be bonded to the building external ground ring. Contractor shall include with engineering documentation where connections are made and what materials (conductor size and specifics) are used.



An acceptance test is required to be coordinated with Surry County and performed by the Successful Vendor to test all grounding systems installed at the site in accordance with Motorola R-56, 2005 Edition.

Ground tests shall be conducted in the presence of a County representative, and results shall be recorded on a form provided by the Successful Vendor and approved by the County manager. These completed forms shall be included as a part of the installation and acceptance test documentation.

The resistance to ground of the tower and shelter ground system shall be shown to measure 5 ohms or less. Supplemental electrodes or chemical grounds shall be provided and installed if necessary to achieve this objective.

Equipment Shelter

Contractor shall procure, deliver and install an equipment shelter as part of the tower installation and compound construction activities. Contractor to provide quotes and specifications for three (3) shelter options of not less than 12 ft x 16 ft. Specifications shall include basic requirements for HVAC and 200-400 amp service and master ground bar. Two entrances are desired for future separation between County and potential 3rd party tower tenants. Shelter to be installed on concrete pad. Conduit entryway to extend from inside shelter to 2 feet (2') outside shelter to an in-ground vault to be placed by others. Additional equipment and generator facilities are not included in this bid and will be supplied by the County following turnover of the tower and compound installation.

SCOPE OF WORK

Contractor Responsibility

The Contractor shall be responsible for: designing and installing suitable tower foundations; designing, manufacturing, shipping, and erecting the tower, shipping and installation of an equipment shelter, installing and testing lighting control system, for providing all project management, construction management, testing, and installation services necessary for tower erection, compound fencing, and for site restoration/cleanup. The Contractor shall be responsible for ensuring that the tower meets or exceeds all design criteria, labor services, guarantees and installation requirements contained in these specifications, or in national or industry standards to which this specification refers.

Tower Construction

Soil Analysis



The geotechnical analysis has been completed and the report is contained in Appendix 5.

Foundation Design

The proposal price for the foundation design will be based on the geotechnical report contained in Appendix 5 and the tower loading requirements in Table A.

The Contractor shall meet or exceed the requirements outlined in the latest editions of ACI301 and ACI318 as it pertains to workmanship and materials. Concrete test cylinders shall be properly cast with copies of all test reports being provided to the Surry County manager for review and analysis. The Contractor maintains complete construction management and engineering responsibility for ensuring that the foundation and tower design(s) have been met and is in compliance with geotechnical reports during the tower foundation and erection process. All field certification and reports shall be provided to Surry County as performed. The Contractor shall deliver three reports: tower design (sealed), foundation design (sealed) and concrete test reports. These reports shall be delivered in hardcopy and softcopy format.

Site Plan

A site plan has been prepared and is contained in Appendix 4. The conditional use permit has been approved and can be provided upon request. Preliminary grading of the site and construction entrance has been completed. The Contractor shall install the tower in conformance with the approved site plan.

Power

The Contractor shall be responsible for providing and installing a utility riser frame and power meter board within the fenced compound. The power meter board shall be equipped with two electric meter bases having individual main disconnect switches. The riser frame shall be supported by galvanized metal support pipes capped at their top (or by other approved method). The pipes shall be embedded in concrete to a depth of at least three feet below grade. Pipes shall be equipped with galvanized uni-strut or equivalent mounts supporting channel cross members on which the meter base and disconnect switches will be installed. The support pipes shall be bonded to the site grounds via exothermic welded #2 AWG solid bare tinned copper wire.

The Contractor shall install conduit from the meters to the service panels in the electronic equipment shelter, including trenching, backfill, and grounding. Surry County will arrange for commercial power installation to the meter base at a future date.

Temporary power may be required for the obstruction lighting on the tower during construction. The Contractor is responsible for arranging and installing this temporary power. Temporary obstruction lights shall be installed while the tower is being erected.



Lightning Protection

The tower shall include one approved air terminal and one down conductor sized in accordance with NPFA 780 utilizing class II materials. The down conductor shall be connected to the Tower Ground ring using methods approved in R56. Approval includes up to 5 foot lightning rod.

Marking/Lighting

The tower marking/lighting shall be in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, paint/red lights - Chapters 3 (Marked), 4, 5 (Red), &12.

If the tower is to be painted, the paint shall be applied at the factory with touch up painting to be completed at the site. Touch-up galvanizing, if needed, shall be done in dry weather. Galvanizing shall not be applied over wet surfaces.

Shelter Placement

Contractor shall procure, deliver and install an equipment shelter selected by the County as specified in the final contract documents. Shelter shall be placed on concrete pad and included in the grounding of the tower and compound. Contractor shall install electric service and grounding of the shelter to the tower compound. Contractor shall install conduit inside the shelter extending two feet (2') outside the shelter.

Site Restoration

The Contractor shall clean-up the work site(s) on a daily basis removing all rubbish and construction debris, resulting from its work at the sites. The Contractor shall supply a dumpster or similar trash storage/removal device where a substantial amount of construction debris is generated. Upon completion of all work, the entire job site areas and access roads shall be left clean and free of trash, debris, mud, dirt, dust, scrap materials and excess materials.

Upon completion of foundation and other subsurface site preparation work (grounding and underground utilities), remove any remaining vegetation, grade as necessary and compact the compound in accordance with site plans, or as necessary to ensure drainage, removing any surface imperfections greater than 1" from the fill area. Remove any surface debris or rocks that might damage filter cloth underlayment. Spray entire prepared surface area with pre-emergent weed killer.

Filter Cloth

Furnish, deliver, and install a weed suppressing nonwoven spun bonded polypropylene filter cloth to cover the area to at least one foot beyond the area to be fenced, installed in



accordance with the manufacturer's instructions ensuring at least 6" of cloth overlap at seams.

Gravel

Furnish, deliver, and spread on to the entire compound area a quantity of #57 stone sufficient to ensure a coverage depth of at least 4 inches in all areas of the compound, including a one foot barrier outside of fenced area. Distribute the stone evenly, rake finish, and spray down with water. Add stone as necessary to ensure that filter cloth is fully covered.

Fencing

The successful responder shall provide chain link fencing in accordance with the following minimum requirements.

The compound fence shall be dimensioned 30 x 40 feet and shall have one swing gate.

Each guy anchor shall be fenced and shall have one pedestrian gate. Fencing to be placed at a distance of 15 feet (15') from anchor. Fence dimensions to be adjusted to maintain one foot (1') of clearance below the lowest guy. Contractor to specify final dimensions.

Fence General Specifications: Fence shall be 8'-0" high chain link fence, with three strands of barbed wire at top for a total height of 9'-0", consisting of 2" mesh, 9 gauge chain link fabric, 2-1/2" outside diameter (o.d.) line posts spaced a maximum of 10'-0" on center (o.c.), with 1-5/8" o.d. top rail. Chain link fabric shall be secured to line posts, top rail and bottom tension wire using 9 gauge tie wire attached at a maximum of 12" o.c. Top Selvage shall be knuckled, bottom selvage twisted.

Corner and end posts (at gates) shall be 4" o.d complete with 1-5/8" o.d. brace rail, 3/8" truss assembly using 12 gauge tension bands secured at a maximum of 12" o.c.

The fence fabric finished grade shall be leveled so that there is no gap between the fence fabric and grade. A 1" gap shall be provided between the base of the gate frame and finished grade

Fence Materials should meet as a minimum the requirements of:

For Chain link fabric, ASTM A392 (Class 2), Specification for Zinc-Coated Steel Chain-Link Fencing

For Rigid Components: Post, brace rail and top rail shall comply with ASTM F1043, Specification for Strength and Protective Coatings of Metal Industrial Chain Link Fence Framework

For Barbed wire: ASTM A121 (zinc coated Type Z Class 3), Specification for Metallic-Coated Carbon Steel Barbed Wire

For Barbed wire arms: ASTM F626, Specification for Fence Fittings, Type I-three strand 45 degree arm.

For Fittings, ties, nuts, bolts: ASTM F626, Specification for Fence Fittings.



For Bottom tension wire: ASTM A824 (Type II Zinc-Coated Class 5), Specification for Metallic-Coated Steel Marcellled Tension Wire for Use with Chain Link.

Gate General Specifications:

Swing gate shall be double opening, 7'-0" by 8'-0" high plus three strands of barbed wire on top (1'). Pedestrian gate shall be single opening, 4'-5' wide (contractor to specify) plus three strands of barbed wire on top (1'). Gate frame shall be fabricated from 2" o.d., welded joints at all corners. Chain link fabric shall be installed to match the fence system. Gates shall be provided with a positive type latching device that will accommodate a padlock. Solutions accommodating multiple padlocks are encouraged.

Gate Material Specifications:

- For Chain link fabric: ASTM A392, Specification for Zinc-Coated Steel Chain-Link Fence Fabric
- For Swing gates: ASTM F900, Specification for Industrial and Commercial Swing Gates.
- Gateposts size, o.d., shall comply with ASTM F1043 Group IC, Specification for Strength and Protective Coatings of Metal Industrial Chain Link Fence Framework.
- Gateposts shall comply with ASTM F1043, Specification for Strength and Protective Coatings of Metal Industrial Chain Link Fence Framework.
- For Welded joints: ASTM Practice A780, Standard Practice for Repair of Damaged and Uncoated Areas of Hot Dip Galvanized Coatings.

Concrete Installation: Line posts shall be set plumb in concrete footings set a minimum depth of 39" and a minimum diameter of 10"; Gate and Corner posts shall be set a minimum depth of 42" with a minimum diameter of 16". Top of all post footings shall be at grade level, with a minimum 0.5" crown to shed water. Posts shall be installed at intervals not exceeding 10 feet o.c.

Concrete Specifications:

For Concrete Footings: ASTM 567 Standard Practice for Installation of Chain Link Fence. Concrete footings shall have a 28-day compressive strength of 2,500 psi.

Signage

Safety warning signs shall be furnished and installed on the compound fence. Signage shall consist of aluminum signs:

- Surry County
- For site access or leasing information call Surry County 757-294-5210
- Electromagnetic energy signs – Richard Tell Associates or equivalent – Tessco Part Number 43875 – one for the site
- RF Caution sign – on entrance gate to compound, Richard Tell Associates or equivalent, Tessco Part Number 428025



- Aluminum no trespassing sign, 18”X24” worded “No Trespassing – Violators Will be Prosecuted”, one per side of compound on fence (total 3)
- Anti-climb warning sign – Rohn-Radian ACWS, Tescos Part Number 56536, or equivalent, at 5 feet above ground level

Site Closeout Inspection

The Contractor shall participate in a site closeout inspection with one or more representatives of Surry County and other interested parties. The Contractor shall provide Surry County with an as-built certification from a Registered Virginia Professional Engineer that the tower conforms to TIA/EIA-222G for the wind load of Surry County, VA.

Written Construction Schedule and Plan

The Contractor shall provide a written construction schedule and plan which describes in detail each major task and operation. The plan shall describe the sequence and proposed method of accomplishing each task.

Laydown areas for this project shall be the Contractor’s responsibility. Coordination and scheduling of construction activities with the owner is a salient feature of this contract.

Contract Modification Procedures

No amount, in part or in whole, of a change order shall be included in a requisition for payment by the Contractor until the change order has been executed and copies of the change order have been distributed to the Owner and Contractor.



APPENDIX 4: SITE PLAN

Pink lines indicate footprint of guy wires and required cleared distance of 20 feet in width for guy path. Length of each guy wire from tower to anchor is 245 feet.

Yellow triangle represents tower base within the fenced compound, located at approximately
 $76^{\circ}52'3.235''W$ $37^{\circ}7'23.543''N$

Anchor Location
 $76^{\circ}52'5.724''W$ $37^{\circ}7'24.913''N$

Anchor Location
 $76^{\circ}52'3.537''W$ $37^{\circ}7'21.056''N$

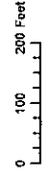
Anchor Location
 $76^{\circ}52'0.637''W$ $37^{\circ}7'24.674''N$



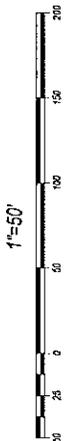
Proposed Location 2
Surry County Parcel 40-1

Surry County Board of Supervisors
 Final Approved Location

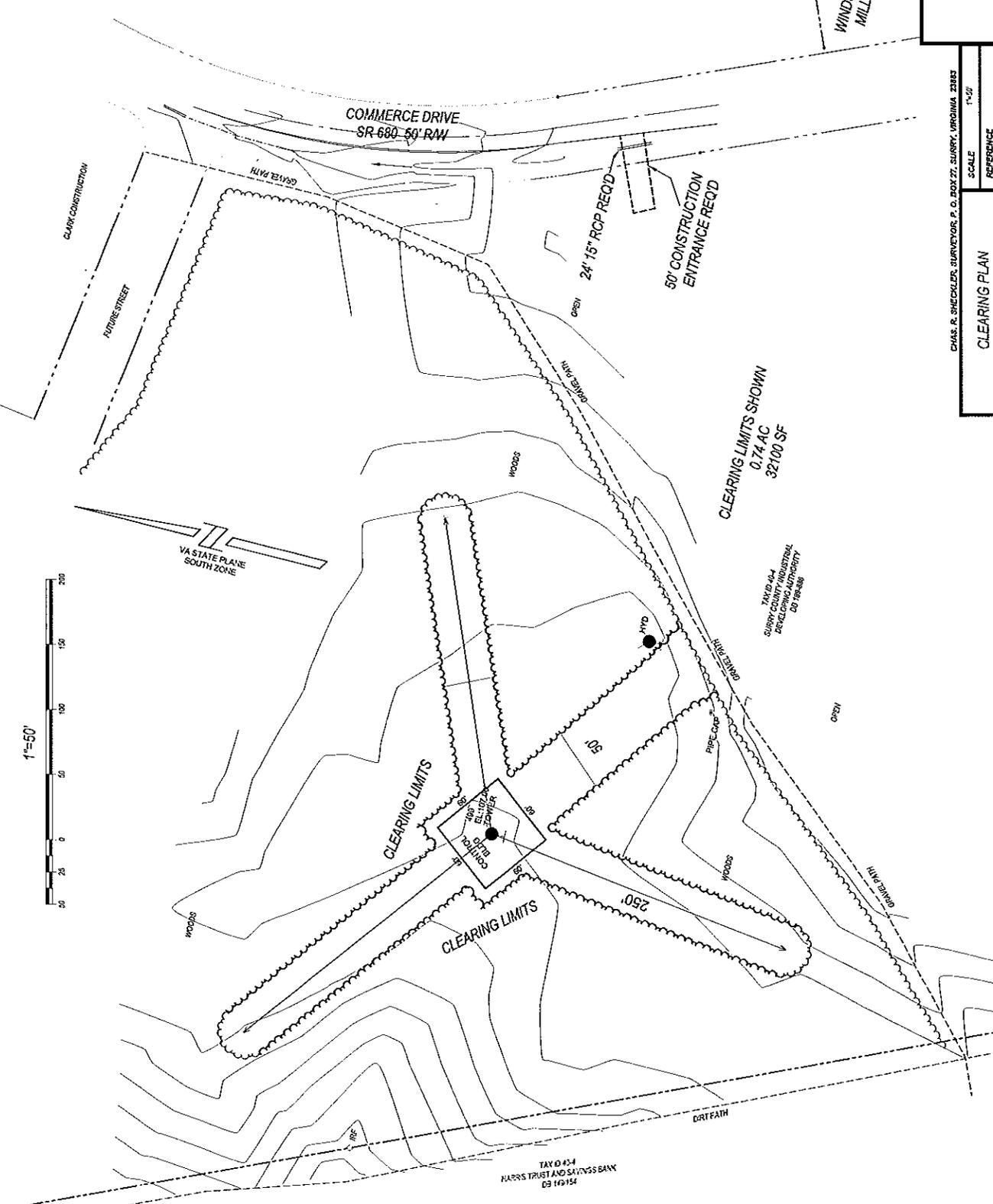
1:2400 Scale



Icon Engineering, Inc.
 10 Hickory Springs, Ind Dr
 Canton, Georgia 30115
 770-592-8797



VA STATE PLANE SOUTH ZONE



CHAS. R. SHECKLER, SURVEYOR, P. O. BOX 27, SURRY, VIRGINIA 23883

SCALE	1"=50'
REFERENCE	
DATE	DECEMBER 18, 2014
JO	242CLOPLAN

CLEARING PLAN
TOWER SITE
SURRY INDUSTRIAL PARK

COSMAN DISTRICT, SURRY COUNTY, VIRGINIA

CLEARING LIMITS SHOWN
 0.74 AC
 32100 SF

TAX ID #04
 SURRY COUNTY INDUSTRIAL
 DEVELOPMENT AUTHORITY
 D0 116286

TAX ID #434
 HARRIS TRUST AND SAVINGS BANK
 D3 116154

WINDSOR
 MILLS



APPENDIX 5: GEOTECHNICAL ANALYSIS AND REPORT

Date: April 13, 2015

Rhonda Russell
Surry County
45 School Street
Surry, Virginia 23883
Office: (757) 294-5271



Tower Engineering Professionals, Inc.
326 Tryon Road
Raleigh, NC 27603
(919) 661-6351
Geotech@tepgroup.net

Subject: Subsurface Exploration Report

Surry County Designation: Site Name: Commerce Drive Tower Site

Engineering Firm Designation: TEP Project Number: 60489.31129

Site Data: Commerce Drive, Dendron, VA 23839 (Surry County)
Latitude N37° 7' 23.543", Longitude W76° 52' 3.235"
Proposed Guyed Tower

Dear Ms. Russell,

Tower Engineering Professionals, Inc. (TEP) is pleased to submit this "Subsurface Exploration Report" to evaluate subsurface conditions in the tower area as they pertain to providing support for the tower foundation.

This report has been prepared in accordance with generally accepted geotechnical engineering practice for specific application to this project. The conclusions in this report are based on the applicable standards of TEP's practice in this geographic area at the time this report was prepared. No other warranty, express or implied, is made.

TEP assumes the current ground surface elevation; tower location and subsequent centerlines provided are correct and are consistent with the elevation and centerlines to be used for construction of the structure. Should the ground surface elevation be altered and/or the tower location be moved or shifted TEP should be contacted to determine if additional borings are necessary.

The analyses and recommendations submitted herein are based, in part, upon the data obtained from the subsurface exploration. The soil conditions may vary from what is represented in the boring logs. While some transitions may be gradual, subsurface conditions in other areas may be quite different. Should actual site conditions vary from those presented in this report, TEP should be provided the opportunity to amend its recommendations as necessary.

We at Tower Engineering Professionals, Inc. appreciate the opportunity of providing our continuing professional services to you and Surry County. If you have any questions or need further assistance on this or any other projects please give us a call.

Report Prepared/Reviewed by: Stephen W. Nickerson, P.E. / John D. Longest, P.E.

Respectfully submitted by:

John D. Longest, P.E.



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1) PROJECT DESCRIPTION

Based on the preliminary drawings, it is understood a guy wire anchored communications tower will be constructed at the referenced site. The guy paths will be spaced radially at 120 degree intervals with one anchor ring. The tower structure loads will be provided by the manufacturer.

2) SITE EXPLORATION

The field exploration included the performance of four soil test borings (B-1, B-2, B-3 and B-4) to the planned depth of 60 feet (bgs) adjacent to the tower mast centerline and 20 feet (bgs) adjacent to each of the proposed guy anchors. The borings were performed by a track mounted drill rig using mud rotary drilling techniques to advance the holes. Split-spoon samples and Standard Penetration Resistance Values (N-values) were obtained in accordance with ASTM D 1586 at a frequency of four samples in the top 10 feet and two samples every 10 feet thereafter.

The Split-spoon samples were transported to the TEP laboratory where they were classified by a Geotechnical Engineer in general accordance with the Unified Soil Classification System (USCS), using visual-manual identification procedures (ASTM D 2488).

A Boring Location Plan showing the approximate boring locations, Boring Logs presenting the subsurface information obtained and a brief guide to interpreting the boring logs are included in the Appendix.

3) SITE CONDITIONS

The site is located off of Commerce Drive in Dendron, Surry County, Virginia. The proposed tower and compound are to be located in woodlands. The ground topography is relatively level.

4) SUBSURFACE CONDITIONS

The following description of subsurface conditions is brief and general. For more detailed information, the individual Boring Logs contained in Appendix B - Boring Logs may be consulted.

4.1) Soil

The USCS classification of the materials encountered in the borings include SM, CL, SC, CH and ML. The Standard Penetration Resistance ("N" Values) recorded in the materials ranged from 2 to 26 blows per foot of penetration.

4.2) Rock

Rock was not encountered in the borings. Refusal of drilling advancement was not encountered in the borings.

4.3) Subsurface Water

Subsurface water was encountered at a depth of 7 to 14 feet (bgs) in the borings at the time of drilling. It should be noted the subsurface water level will fluctuate during the year, due to seasonal variations and construction activity in the area.

4.4) Frost

The TIA frost depth for Surry County Virginia is 20 inches.



5) TOWER FOUNDATION DESIGN

Based on the boring data, it is the opinion of TEP that a pier extending to a spread footing or a single drilled shaft can be used to support the tower mast. The guy anchors can utilize buried concrete blocks or drilled shafts. The following presents TEP's conclusions and recommendations regarding the foundation types.

5.1) Tower Mast Foundations

The tower mast foundation should bear a minimum of 20 inches below the ground surface to penetrate the frost depth. Based on preliminary site information the site is located on relatively level ground. It is recommended that foundation designs account for site grades being raised with excavation spoils or that foundation drawings specify minimum embedment depths based on existing site elevations and factor in ground slopes. The values are based on the current ground surface elevation.

Table 1A –Tower Mast Shallow Foundation Analysis Parameters – Boring B-1

Depth		Soil	Static Bearing ^{1,3} (psf)	Cohesion ² (psf)	Friction Angle ² (degrees)	Effective Unit Weight (pcf)	Friction Factor
Top	Bottom						
0	3.5	SM	1700	-	31	104	0.38
3.5	6	CL	2575	3425	-	115	0.30
6	8.5	CL	2375	3000	-	115	0.30
8.5	13.5	SM	2000	-	35	111	0.43

Notes:

- 1) The bearing values provided are net allowable with a minimum factor of safety of 2 with anticipated settlement less than 1 inch. Bearing may be increased by 1/3 for transient loading (e.g. wind or earthquake loading)
- 2) These values should be considered ultimate soil parameters
- 3) The soil values are based on a maximum foundation size of 15 foot squared. If the foundation design size exceeds this dimension TEP should be contacted to re-evaluate soil parameters based on the actual foundation size

The following values may be used for design of the tower mast drilled shaft foundation. TEP recommends the side frictional and lateral resistance values developed in the top section of the caisson for a depth equal to the half the diameter of the caisson or the frost depth, whichever is greater, be neglected in the calculations. The values are based on the current ground surface elevation.

Table 1B – Tower Mast Drilled Shaft Foundation Analysis Parameters – Boring B-1

Depth		Soil	Static Bearing ¹ (psf)	Side Frictional Resistance ² (psf)	Cohesion ³ (psf)	Friction Angle ³ (degrees)	Effective Unit Weight (pcf)
Top	Bottom						
0	3.5	SM	1500	20	-	31	104
3.5	6	CL	9725	640	3425	-	115
6	8.5	CL	8650	560	3000	-	115
8.5	13.5	SM	5775	220	-	35	111
13.5	18.5	ML	3850	600	3225	-	53
18.5	23.5	ML	2575	400	2150	-	52
23.5	28.5	SM	1725	390	-	35	50
28.5	33.5	SW-SM	1150	410	-	33	49
33.5	38.5	ML	775	180	500	-	42
38.5	43.5	ML	525	110	300	-	41
43.5	48.5	ML	350	60	175	-	40
48.5	53.5	ML	1700	250	825	-	44
53.5	58.5	ML	1375	230	675	-	43
58.5	60	SM	13150	620	-	33	50

Notes:

- 1) The bearing values provided are net allowable with a minimum factor of safety of 2. Bearing may be increased by 1/3 for transient loading (e.g. wind or earthquake loading). If the bearing depth of the foundation is less than 5 diameters below the ground surface the bearing values listed in Table 1A – Shallow Foundation Analysis Parameters should be utilized
- 2) The side frictional resistance values provided are allowable with a minimum factor of safety of 2. Side frictional resistance values may be increased by 1/3 for transient loading (e.g. wind or earthquake loading)
- 3) These values should be considered ultimate soil parameters

5.2) Guy Anchor Foundations

The following values may be used for design of guy anchor drilled shafts and/or shallow deadmen anchors. The values are based on the current ground surface elevation.

Shallow Foundation Guy Anchor Design:

The guy anchor uplift loads can be resisted by the weight of the concrete plus the weight of the soil directly above the anchor block and the friction force acting along the sides of the anchor block. The anchor blocks should be buried a minimum of 3 feet. Each of the anchor blocks can be assumed to resist the lateral forces by passive pressures developed from the following tables. The side frictional resistance values provided are assuming concrete cast against undisturbed soils, any variations from this should be presented to TEP so values may be amended.

Drilled Shaft Foundation Guy Anchor Design:

The guy anchor uplift loads can be resisted by the weight of the concrete and the friction force acting along the sides of the caisson. TEP recommends the side frictional and lateral resistance values developed in the top section of the caisson for a depth equal to the half the diameter of the caisson or the frost depth, whichever is greater, be neglected in the calculations.

Table 2A – Southwest Guy Anchor Foundation Analysis Parameters – Boring B-2³

Depth		Soil	Side Frictional Resistance ¹ (psf)	Cohesion ² (psf)	Friction Angle ² (degrees)	Effective Unit Weight (pcf)	Friction Factor
Top	Bottom						
0	3.5	SM	20	-	30	103	0.36
3.5	6	CL	600	3200	-	116	0.30
6	8	SC	160	-	40	115	0.50
8	8.5	SC	180	-	39	53	0.49
8.5	13.5	CH	600	3200	-	54	0.30
13.5	18.5	SM	240	-	35	49	0.43
18.5	23.5	SM	230	-	30	42	0.36
23.5	28.5	SM	330	-	36	50	0.45
28.5	33.5	SW-SM	340	-	33	49	0.40
33.5	38.5	ML	200	550	-	42	0.30
38.5	43.5	ML	120	325	-	41	0.30
43.5	48.5	ML	60	175	-	40	0.30
48.5	53.5	ML	260	875	-	44	0.30
53.5	58.5	ML	240	725	-	43	0.30
58.5	60	SM	550	-	33	50	0.40

Table 2B – East Guy Anchor Drilled Shaft Foundation Analysis Parameters – Boring B-3³

Depth		Soil	Side Frictional Resistance ¹ (psf)	Cohesion ² (psf)	Friction Angle ² (degrees)	Effective Unit Weight (pcf)	Friction Factor
Top	Bottom						
0	3.5	ML	250	775	-	105	0.30
3.5	6	ML	600	3250	-	115	0.30
6	8.5	CL	570	3050	-	115	0.30
8.5	9	SC	190	-	37	115	0.46
9	13.5	SC	220	-	38	53	0.47
13.5	18.5	SM	270	-	38	52	0.47
18.5	23.5	SM	330	-	38	52	0.47
23.5	28.5	SM	340	-	35	50	0.43
28.5	33.5	SW-SM	360	-	33	49	0.40
33.5	38.5	ML	200	550	-	42	0.30
38.5	43.5	ML	120	325	-	41	0.30
43.5	48.5	ML	60	175	-	40	0.30
48.5	53.5	ML	260	850	-	44	0.30
53.5	58.5	ML	230	700	-	43	0.30
58.5	60	SM	570	-	33	50	0.40

Table 2C – Northwest Guy Anchor Drilled Shaft Foundation Analysis Parameters – Boring B-4³

Depth		Soil	Side Frictional Resistance ¹ (psf)	Cohesion ² (psf)	Friction Angle ² (degrees)	Effective Unit Weight (pcf)	Friction Factor
Top	Bottom						
0	3.5	SM	20	-	31	104	0.38
3.5	6	CL	640	3425	-	116	0.30
6	7	CL	640	3425	-	115	0.30
7	8.5	CL	640	3425	-	53	0.30
8.5	13.5	CL	840	4500	-	54	0.30
13.5	18.5	CL	520	2775	-	54	0.30
18.5	23.5	SM	250	-	33	46	0.40
23.5	28.5	SM	330	-	36	50	0.45
28.5	33.5	SW-SM	340	-	33	49	0.40
33.5	38.5	ML	200	550	-	42	0.30
38.5	43.5	ML	120	325	-	41	0.30
43.5	48.5	ML	60	175	-	40	0.30
48.5	53.5	ML	260	875	-	44	0.30
53.5	58.5	ML	240	725	-	43	0.30
58.5	60	SM	550	-	33	50	0.40

Notes:

- 1) The side frictional resistance values provided are allowable with a minimum factor of safety of 2. Side frictional resistance values may be increased by 1/3 for transient loading (e.g. wind or earthquake loading)
- 2) These values should be considered ultimate soil parameters
- 3) Due to the close proximity of the borings, the soil layers from 20 to 60 feet (bgs) for borings B-2 thru B-4 are assumed similar to the soils encountered from 20 to 60 feet (bgs) in boring B-1 and are being utilized for analysis.

6) SEISMIC

The Site Class per Section 1613.3.2, of the 2010 International Building Code (2010 IBC) and Chapter 20 of ASCE 7 (2010) based on the site soil conditions is Site Class E.

7) SOIL RESISTIVITY

Soil resistivity was performed at the TEP laboratory in accordance with ASTM G187-05 (Standard Test Method for Measurement of Soil Resistivity Using the Two Electrode Soil Box Method). Test results indicated a result of 110,000 ohms/cm.



8) CONSTRUCTION CONSIDERATIONS - SHALLOW FOUNDATIONS

8.1) Excavation

The boring data indicates excavation to the expected subgrade level for the tower mast & guy anchors will extend through sand and clay. A large tracked excavator should be able to remove the materials with minimal difficulty.

Excavations should be sloped or shored in accordance with local, state and federal regulations, including OSHA (29 CFR Part 1926) excavation trench safety standards. It is the responsibility of the contractor for site safety. This information is provided as a service and under no circumstance should TEP be assumed responsible for construction site safety.

8.2) Dewatering/Foundation Evaluation/Subgrade Preparation

As previously discussed, subsurface water was encountered in the borings at a depth of 7 to 14 feet (bgs). Therefore, dewatering (using pumped sumps or well points) will be required for construction purposes at this site. The subsurface water level should be kept below the bottom level of any excavation.

After dewatering and excavation to the design elevation for the footing, the materials should be evaluated by a Geotechnical Engineer or a representative of the Geotechnical Engineer prior to reinforcement and concrete placement. This evaluation should include probing, shallow hand auger borings and dynamic cone penetrometer testing (ASTM STP-399) to help verify that suitable residual material lies directly under the foundation and to determine the need for any undercut and replacement of unsuitable materials. Loose surficial material should be compacted in the excavation prior to reinforcement and concrete placement to stabilize surface soil that may have become loose during the excavation process. TEP recommends a 6-inch layer of compacted crushed stone be placed just after excavation to aid in surface stability.

8.3) Fill Placement and Compaction

Backfill materials placed above the tower mast and guy anchor foundations to the design subgrade elevation should not contain more than 5 percent by weight of organic matter, waste, debris or any otherwise deleterious materials. To be considered for use, backfill materials should have a maximum dry density of at least 100 pounds per cubic foot as determined by standard Proctor (ASTM D 698), a Liquid Limit no greater than 40, a Plasticity Index no greater than 20, a maximum particle size of 4 inches, and 20 percent or less of the material having a particle size between 2 and 4 inches. Because small handheld or walk-behind compaction equipment will most likely be used, backfill should be placed in thin horizontal lifts not exceeding 6 inches (loose).

Fill placement should be monitored by a qualified Materials Technician working under the direction of a Geotechnical Engineer. In addition to the visual evaluation, a sufficient amount of in-place field density tests should be conducted to confirm the required compaction is being attained.

8.4) Reuse of Excavated Soil

The sand and lean clay that meets the above referenced criteria can be utilized as backfill based on dry soil and site conditions at the time of construction.



9) CONSTRUCTION CONSIDERATIONS - DRILLED SHAFTS

Based on TEP's experience a conventional drilled shaft rig (Hughes Tool LDH or equivalent) can be used to excavate to the termination depth of TEP's borings. An earth auger can typically penetrate the materials encountered to the termination depth of the borings with minimal difficulty. Special excavation equipment may be necessary for a shaft greater than 60-inches in diameter.

Due to the subsurface water and the sandy soil, the contractor should utilize the "slurry" method for shaft construction. The following are general procedure recommendations in drilled shaft construction using the "slurry" method:

- 1) Slurry drilled shafts are constructed by conventional caisson drill rigs excavating beneath a drilling mud slurry. Typically, the slurry is introduced into the excavation after the groundwater table has been penetrated and/or the soils on the sides of the excavation are observed to be caving-in. When the design shaft depth is reached, fluid concrete is placed through a tremie pipe at the bottom of the excavation.
- 2) The slurry level should be maintained at a minimum of 5 feet or one shaft diameter, whichever is greater, above the subsurface water level.
- 3) Inspection during excavation should include verification of plumbness, maintenance of sufficient slurry head, monitoring the specific gravity, pH and sand content of the drilling slurry, and monitoring any changes in the depth of the excavation between initial approval and prior to concreting. In this area it is common to encounter thin layers of organic materials and/or shell deposits. These layers may rapidly alter the pH of the slurry mixture thus affecting the performance of the slurry. It is emphasized that pH levels of the slurry should be closely monitored at this site.
- 4) A removable steel casing should be installed in the shaft for the entire depth to prevent caving of the excavation sides due to soil relaxation. Loose soils in the bottom of the shaft should be removed.
- 5) The specific gravity or relative density of the drilling mud slurry should be monitored from the initial mixing to the completion of the excavation. An increase in the specific gravity or density of the drilling slurry by as much as 10 percent is indicative of soil particles settling out of the slurry onto the bottom of the excavation. This settling will result in a reduction of the allowable bearing capacity of the bottom of the drilled shaft.
- 6) After approval, the drilled shaft should be concreted as soon as practical using a tremie pipe.
- 7) For slurry drilled shafts, the concrete should have a 6 to 8 inch slump prior to discharge into the tremie. The bottom of the tremie should be set at about one tremie pipe diameter above the excavation. A closure flap at the bottom of the tremie should be used, or a sliding plug introduced into the tremie before the concrete, to reduce the potential for the concrete being contaminated by the slurry. The bottom of the tremie must be maintained in concrete during placement, which should be continuous.
- 8) The protective steel casing should be extracted as concrete is placed. A head of concrete should be maintained above the bottom of the casing to prevent soil and water intrusion into the concrete below the casing.

If variability in the subsurface materials is encountered, a representative of the Geotechnical Engineer should verify that the design parameters are valid during construction. Modification to the design values presented above may be required in the field.

APPENDIX A

BORING LAYOUT

Performed By: Tower Engineering Professionals, Inc.
326 Tryon Road, Raleigh, NC 27603 O) 919.661.6351 F) 919.661.6350
website: <http://www.tepgroup.net>

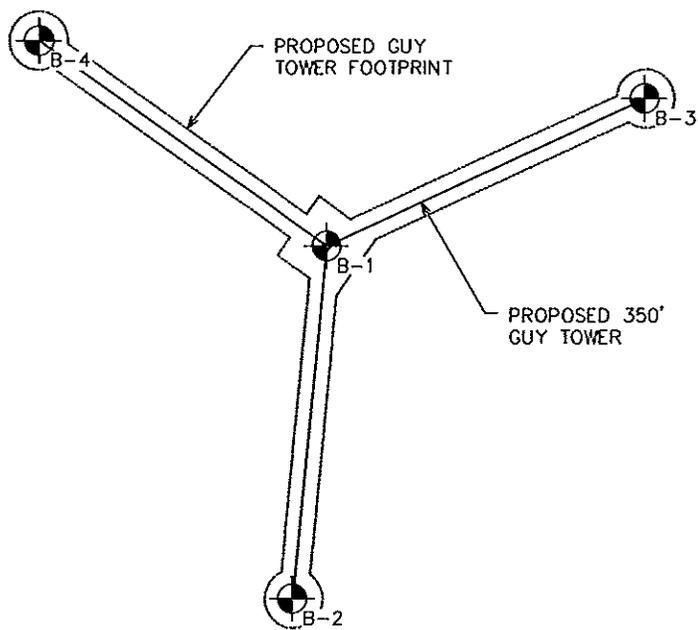




EXISTING BUILDING

WOODED AREA

COMMERCE DRIVE



BORING LAYOUT

SCALE: N.T.S.

PREPARED BY:

TOWER ENGINEERING PROFESSIONALS
326 TRYON ROAD
RALEIGH, NC 27603
(919) 661-6351
www.tepgroup.net

PREPARED FOR:

SURRY COUNTY
PLANNING AND COMMUNITY DEVELOPMENT
45 SCHOOL STREET
SURRY, VA 23883
OFFICE: (757) 294-5271

PROJECT INFORMATION:

**COMMERCE DRIVE
TOWER SITE**
COMMERCE DRIVE
DENDRON, VA 23839
(SURRY COUNTY)

REVISION:	0
TEP JOB #:	G0489.31129
SHEET NUMBER:	C-1

APPENDIX B
BORING LOGS

Performed By: Tower Engineering Professionals, Inc.
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 3703 Junction Boulevard
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LOG OF BORING B-1

1 of 1

DATE STARTED 4/8/2015	DRILLING METHOD Mud Rotary	HOLE SIZE 2 1/4in	CITY, STATE Dendron, Virginia
DATE COMPLETE 4/8/2015	HAMMER WEIGHT/FALL 140lbs / 30in	HAMMER TYPE Auto Hammer	TOTAL DEPTH 60.0 FT
GROUND EL.	LOGGED BY MJN	CHECKED BY TAD	DEPTH/EL. GROUNDWATER ▽ 14.0/ AD
BORING LOCATION Adjacent to centerline of proposed tower mast			

SAMPLE NUMBER	SAMPLE LENGTH (INCHES)	BLOW COUNTS (N) REC% / RQD%	ELEVATION (FEET)	DEPTH (FEET)	SAMPLE GRAPHIC	USCS GRAPHIC	DESCRIPTION AND CLASSIFICATION	REMARKS	POCKET PEN TSF	UNCONFINED STRENGTH, PSF	UNIT WEIGHT PCF
S1	18	1-2-3 (5)					0.0-3.5: Loose, light brown, fine silty SAND (SM), with clay, trace roots, moist				
S2	18	3-8-11 (19)		5			3.5-6.0: Very stiff, light brown and light gray, lean CLAY (CL), trace fine sand, moist		4		
S3	18	7-7-11 (18)					6.0-8.5: little silt, little fine sand		3		
S4	18	3-5-8 (13)		10			8.5-13.5: Medium dense, light gray and pale red, fine silty SAND (SM), with clay, moist				
S5	18	10-10-16 (26)		15			13.5-18.5: Very stiff, light brown, clayey SILT (ML), little fine sand, moist				
S6	18	5-6-11 (17)		20			18.5-23.5: light brown and light gray, with fine sand				
S7	18	2-6-9 (15)		25			23.5-28.5: Medium dense, light brown, fine to medium silty SAND (SM), wet				
S8	18	4-4-7 (11)		30			28.5-33.5: Medium dense, light brown, fine to coarse well-graded SAND (SW-SM), with silt, with fine gravel, moist				
S9	18	5-3-2 (5)		35			33.5-38.5: Medium stiff, light brown, clayey SILT (ML), trace fine sand, wet				
S10	18	0-1-2 (3)		40			38.5-48.5: to soft, gray, little fine sand	WOH / 6 Inches			
S11	18	0-1-1 (2)		45				WOH / 6 Inches			
S12	18	3-4-4 (8)		50			48.5-53.5: to medium stiff, little fine to coarse sand, with shell fragments, moist				
S13	18	6-4-3 (7)		55			53.5-58.5: with fine to coarse sand, mostly shell fragments, wet				
S14	18	4-6-8 (14)		60			58.5-60.0: Medium dense, light gray, fine to coarse silty SAND (SM), mostly shells, wet				
				60.0			60.0: Boring Terminated				

* Where elevations have not been provided in site documents, they have been estimated from available on file sources.



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LOG OF BORING B-2

1 of 1

PROJECT: **Commerce Drive Tower Site** SITE ID: _____ TEP NO.: **60489.31129**

DATE STARTED 4/8/2015	DRILLING METHOD Mud Rotary	HOLE SIZE 2 1/4in	CITY, STATE Dendron, Virginia
DATE COMPLETE 4/8/2015	HAMMER WEIGHT/FALL 140lbs / 30in	HAMMER TYPE Auto Hammer	TOTAL DEPTH 20.0 FT
GROUND EL.	LOGGED BY MJN	CHECKED BY TAD	DEPTH/EL. GROUNDWATER ∇ 8.0/ AD
BORING LOCATION Adjacent to centerline of proposed southwest guy anchor			

SAMPLE NUMBER	SAMPLE LENGTH (INCHES)	BLOW COUNTS (N) REC% / RQD%	ELEVATION (FEET)	DEPTH (FEET)	SAMPLE GRAPHIC	USCS GRAPHIC	DESCRIPTION AND CLASSIFICATION	REMARKS	POCKET PEN TSF	UNCONFINED STRENGTH, PSF	UNIT WEIGHT PCF
S1	18	1-2-2 (4)					0.0-3.5: Loose, light brown, fine to medium silty SAND (SM), with clay, moist				
S2	18	6-9-12 (21)		5			3.5-6.0: Very stiff, light gray and light brown, silty lean CLAY (CL), trace sand, moist		3.5		
S3	18	6-8-11 (19)					6.0-8.5: Medium dense, light brown and light gray, fine to medium clayey SAND (SC), with silt, moist				
S4	18	5-8-12 (20)		10			8.5-13.5: Very stiff, light brown and light gray, fat CLAY (CH), little silt, trace sand, moist		3.5		
S5	18	4-6-7 (13)		15			13.5-18.5: Medium dense, light brown, fine to medium silty SAND (SM), little clay, wet				
S6	18	2-2-3 (5)		20			18.5-20.0: to loose				
				20.0			20.0: Boring Terminated				

* Where elevations have not been provided in site documents, they have been estimated from available online sources.



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LOG OF BORING B-3

1 OF 1

PROJECT: **Commerce Drive Tower Site** SITE ID: TEP NO.: **60489.31129**

DATE STARTED 4/8/2015	DRILLING METHOD Mud Rotary	HOLE SIZE 2 1/4in	CITY, STATE Dendron, Virginia	
DATE COMPLETE 4/8/2015	HAMMER WEIGHT/FALL 140lbs / 30in	HAMMER TYPE Auto Hammer	TOTAL DEPTH 20.0 FT	DRILL RIG TYPE 300X
GROUND EL.	LOGGED BY MJN	CHECKED BY TAD	BACKFILL Cuttings	DEPTH/VEL. GROUNDWATER ∇ 9.0/ AD
BORING LOCATION Adjacent to centerline of proposed east guy anchor				

SAMPLE NUMBER	SAMPLE LENGTH (INCHES)	BLOW COUNTS (N) REC% / RQD%	ELEVATION (FEET)	DEPTH (FEET)	SAMPLE GRAPHIC	USCS GRAPHIC	DESCRIPTION AND CLASSIFICATION	REMARKS	POCKET PEN TSF	UNCONFINED STRENGTH, PSF	UNIT WEIGHT PCF
S1	18	1-2-3 (5)					0.0-3.5: Medium stiff, light brown, clayey SILT (ML), little sand, trace particulate organics, wet				
S2	18	5-11-11 (22)		5			3.5-6.0: to very stiff, moist				
S3	18	3-7-10 (17)					6.0-8.5: Very stiff, light brown and light gray, silty lean CLAY (CL), moist		3.25		
S4	18	5-7-10 (17)		10			8.5-13.5: Medium dense, light brown and light gray, fine clayey SAND (SC), with silt, moist				
S5	18	5-8-11 (19)		15			13.5-18.5: Medium dense, light brown, fine silty SAND (SM), with clay, wet				
S6	18	7-8-11 (19)		20			18.5-20.0: light brown and light gray, moist				
							20.0: Boring Terminated				

* Where elevations have not been provided in site documents, they have been estimated from available online sources.



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LOG OF BORING B-4

1 of 1

PROJECT: Commerce Drive Tower Site
 SITE ID:
 TEP NO.: 60489.31129

DATE STARTED 4/8/2015	DRILLING METHOD Mud Rotary	HOLE SIZE 2 1/4in	CITY, STATE Dendron, Virginia
DATE COMPLETE 4/8/2015	HAMMER WEIGHT/FALL 140lbs / 30in	HAMMER TYPE Auto Hammer	TOTAL DEPTH 20.0 FT
GROUND EL.	LOGGED BY MJN	CHECKED BY TAD	DEPTH/EL. GROUNDWATER ∇ 7.0/ AD
BORING LOCATION Adjacent to centerline of proposed northwest guy anchor			

* Where elevations have not been provided in site documents, they have been estimated from available online sources.

SAMPLE NUMBER	SAMPLE LENGTH (INCHES)	BLOW COUNTS (N) REC% / RQD%	ELEVATION (FEET)	DEPTH (FEET)	SAMPLE GRAPHIC	USCS GRAPHIC	DESCRIPTION AND CLASSIFICATION	REMARKS	POCKET PEN TSF	UNCONFINED STRENGTH, PSF	UNIT WEIGHT PCF
S1	18	2-2-3 (5)					0.0-3.5: Loose, light brown, fine silty SAND (SM), little clay, trace roots, moist				
S2	18	9-11-14 (25)		5			3.5-13.5: Very stiff, light brown and pale red, silty lean CLAY (CL), moist		4		
S3	18	5-7-11 (18)		7					4		
S4	18	6-8-13 (21)		10					4.5		
S5	18	6-7-14 (21)		15			13.5-18.5: light brown and light gray, trace sand		2.5		
S6	18	3-5-5 (10)		20			18.5-20.0: Loose, light brown, fine to medium silty SAND (SM), little clay, wet				
				20			20.0: Boring Terminated				



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Key to Soil Symbols and Terms

TERMS DESCRIBING CONSISTENCY OR CONDITION

COARSE-GRAINED SOILS (major portions retained on No. 200 sieve): includes (1) clean gravel and sands and (2) silty or clayey gravels and sands. Condition is rated according to relative density as determined by laboratory tests or standard penetration resistance tests.

Descriptive Terms	SPT Blow Count
Very Loose	< 4
Loose	4 to 10
Medium Dense	11 to 30
Dense	31 to 50
Very Dense	> 50

FINE-GRAINED SOILS (major portions passing on No. 200 sieve): includes (1) inorganic and organic silts and clays (2) gravelly, sandy, or silty clays, and (3) clayey silts. Consistency is rated according to shearing strength, as indicated by penetrometer readings, SPT blow count, or unconfined compression tests.

Descriptive Terms	SPT Blow Count
Very Soft	< 2
Soft	2 to 4
Medium Stiff	5 to 8
Stiff	9 to 15
Very Stiff	16 to 30
Hard	> 30

GENERAL NOTES

1. Classifications are based on the Unified Soil Classification System and include consistency, moisture, and color. Field descriptions have been modified to reflect results of laboratory tests where deemed appropriate.

2. Surface elevations are based on topographic maps and estimated locations and should be considered approximate.

3. Descriptions on these boring logs apply only at the specific boring locations and at the time the borings were made. They are not guaranteed to be representative of subsurface condition at other locations or times.

Group Symbols	Typical Names	Sampler Symbols
	GW Well-graded gravels, gravel-sand mixtures, little or no fines	Split Spoon
	GP Poorly-graded gravels, little or no fines/sands	Standard Penetration Test (SPT)
	GM Silty gravels, gravel-sand-silt mixtures	Pushed Shelby Tube
	GC Clayey gravels, gravel-sand-silt mixtures	Auger Cuttings
	SW Well-graded sands, gravelly sands, little or no fines	Grab Sample
	SP Poorly-graded sands, little or no fines/sands/gravels	Dynamic Cone Penetrometer
	SM Silty sands, sand-silt mixtures	Hand Auger
	SC Clayey sands, sand-clay mixtures	Rock Core
	ML Inorganic silts and very fine sands, rock floor, silty or clayey fine sands or clayey silts with slight plasticity	Log Abbreviations ATD - At Time of Drilling AD - After Drilling EOD - End of Drilling RMR - Rock Mass Rating WOH - Weight of Hammer WOR - Weight of Rod REC - Rock Core Recovery RQD - Rock Quality Designation
	CL Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays	
	OL Organic silts and organic silty clays of low plasticity	
	MH Inorganic silts, micaceous or distomaceous fine sandy or silty soils, elastic silts	
	CH Inorganic clays of high plasticity, fat clays	
	OH Organic clays of medium to high plasticity, organic silts	
	PT Peat and other highly organic soils	

Information Regarding This Subsurface Exploration Report

The information contained in this report has been specifically tailored to the needs of the client at the time the report was provided, for the specific purpose of the project named in this report. The attached report may not address the needs of contractors, civil engineers, or structural engineers. Anyone other than the named client should consult with the geotechnical engineer prior to utilizing the information contained in the report.

It is always recommended that the full report be read. While certain aspects of the report may seem unnecessary or irrelevant; just as each project and site are unique, so are the subsurface investigation reports and the information contained in them. Several factors can influence the contents of these reports, and the geotechnical engineer has taken into consideration the specific project, the project location, the client's objectives, potential future improvements, etc. If there is any question about whether the attached report pertains to your specific project or if you would like to verify that certain factors were considered in the preparation of this report, it is recommended that you contact the geotechnical engineer.

Geotechnical subsurface investigations often are prepared during the preliminary stages of a project and aspects of the project may change later on. Some changes may require a report revision or additional exploration. Some changes that often need to be brought to the attention of the geotechnical engineer include changes in location, size and/or type of structure, modifications to existing structures, grading around the project site, etc. Some naturally occurring changes can also develop that impact the information contained in this geotechnical report such as earthquakes, landslides, floods, subsurface water levels changing, etc. It is always recommended that the geotechnical be informed of known changes at the project site.

Subsurface exploration reports are generated based on the analysis and professional opinions of a geotechnical engineer based on the results of field and laboratory data. Often subsurface conditions can vary – sometimes significantly – across a site and over short distances. It often is helpful to retain the geotechnical engineer's services during the construction process. Otherwise, the geotechnical cannot assume responsibility or liability for report recommendations which may have needed to change based on changing site conditions or misinterpretation of recommendations.

Geotechnical engineers assemble testing and/or boring logs based on their interpretation of field and laboratory data. Testing and/or boring logs should always be coupled with the subsurface exploration report. The geotechnical engineer and Tower Engineering Professionals cannot be held reliable for interpretations, analyses, or recommendations based solely on the testing and/or boring log if it is independent of the prepared report.

The scope of the subsurface exploration report does not include an assessment or analysis of environmental conditions, determination of the presence or absence of wetlands or hazardous or toxic materials on or below the ground surface. Any notes regarding odors, fill, debris, or anything of that nature are offered as general information for the client, often to help identify or delineate natural soil boundaries.

For additional information, please contact the geotechnical engineer named in the attached report.

