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# REQUEST FOR PROPOSAL

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## **Rural Nebraska Healthcare Network**

**FCC Rural Health Care Pilot Program  
Administered under Universal Service Administrative Company guidelines**

**Requested by: The Rural Nebraska Healthcare Network**

**RNHN RFP 2009-00**

*Prepared by:*



Fiberutilities Group  
Armstrong Centre  
Suite 500  
222 Third Avenue, SE  
Cedar Rapids, IA 52401  
(319) 364-3200

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**OVERVIEW OF RFP PACKAGE**

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This RFP bidder package was designed to be as inclusive as possible, providing bidders sufficient information needed to submit a bid.

Included in this RFP are the following Sections and Attachments.

1. **Introduction and Background** provides information on two fiber networks: a Medical Network and a Commercial Network. The RFP also outlines FCC/USAC involvement, introduces the management company selected for network planning, operations and maintenance, and includes user and access point mapping.
2. **Contact Information** identifies contact individuals related to this RFP with phone, fax, and email information.
3. **Timing and Milestones Dates** outlines bid opening and closing dates as well as acceptable response formats.
4. **Question / Clarification Process** outlines Q & A procedures for maintaining a fair, open and transparent bidding process for all bidder RFP inquiries.
5. **Bid Submission Process** confirms the specific logistical requirements necessary to respond to this RFP.
6. **Bid Evaluation Process** outlines the criteria to be used in the selection of winning bids.
7. **RFP Bid Overview** outlines the various standards and specifications needed to respond to this RFP.
8. **Alternatives** discusses the ability to offer cost saving or efficiency alternatives in the bid response.
9. **Payment Process** outlines the sequential steps and associated bidder expectations regarding the timely processing of bidder invoicing / payment.
10. **Attachments** provide additional detail and specifications pertaining to the various sections of this RFP.

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## **1. INTRODUCTION AND BACKGROUND**

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The Rural Nebraska Healthcare Network (RNHN) is a not-for-profit corporation whose members are the nine not-for-profit and public hospitals in the Panhandle of Nebraska.<sup>1</sup> A board of directors, which is comprised of the Chief Executive Officer of each member hospital, governs the RNHN.

Since 1996, RNHN members have collaborated on projects in order to coordinate a unified healthcare response in the face of the geographic isolation of its patients. RNHN is an integrated healthcare system that serves nearly all patients in the Nebraska Panhandle.<sup>2</sup>

The purpose of this RFP is to design, construct, operate, and maintain a fiber optic network connecting each of RNHN's member hospitals with each other and with other health care facilities (Medical Network). The Medical Network will be funded, in part, by the Universal Service Administrative Company (USAC) under the Rural Healthcare Pilot Program (RHCPP) of the Federal Communications Commission (FCC).

RNHN anticipates that it will obtain additional funding by selling Indefeasible Rights of Use (IRU) for dark fiber in a *privately funded, 48 fiber network owned by RNHN* that is co-located with the Medical Network (Commercial Network).<sup>3</sup> The Commercial Network will be deployed at the same time the Medical Network is deployed, and construction shall be completed as a single project.

There are two components to this RFP. Bidders may respond to either or both components:

1. **Fiber Network Construction.** RNHN is issuing this RFP for the construction, rights-of-way, procurement and electronics required to light an approximately 800 mile green-field fiber network in the Nebraska Panhandle (see specific site and geography Attachment G1—Map). This network will consist of two physically separate fiber cables, simultaneously deployed along the same route (e.g., in a single trench for underground construction, on the same poles for aerial construction), the Medical Network and the Commercial Network.
  - a. The Medical Network is a 24-count fiber cable used exclusively for qualified medical users. It will be a lit network with active electronics.

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<sup>1</sup>The member hospitals are: Box Butte General Hospital, Alliance; Chadron Community Hospital, Chadron; Garden County Health Services, Oshkosh; Gordon Memorial Health Services, Gordon; Kimball Health Services, Kimball; Memorial Health Center, Sidney; Morrill County Community Hospital, Bridgeport; Perkins County Health Services, Grant; and Regional West Medical Center, Scottsbluff.

<sup>2</sup>The Panhandle covers 11 counties spread out over 14,000 square miles with an average population density of 6.5 people per square mile.

<sup>3</sup> IRU's do not convey legal title, only quiet enjoyment to use of fiber for a specific period of time. Consequently, RNHN will be the sole owner of, and hold legal title to, the Commercial Network.

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- b. The Commercial Network is a 48-count cable that will be used for a variety of commercial telecommunication and data purposes. It will be a dark network with no electronics.
  - c. **All responses must separately identify all incremental costs associated with the concurrent deployment and installation of the Commercial Network.**
  - d. The optical gear and associated electronics required to light the Medical Network must meet the standards and specifications contained within this RFP
2. **Leased Network Circuits.** The RNHN is also issuing this RFP for the leasing of certain capacity-based circuits capable of redundantly connecting the Medical Network to the Front Range Gigapop (FRGP) located in Denver, Colorado as further specified in Attachment LC-1. The lease will be a fifteen (15) year IRU capacity lease with the right to renew for five (5) years by RNHN.

RNHN project planning and project management will be controlled by Fiberutilities Group LLC, 222 3<sup>rd</sup> Avenue, SE, Cedar Rapids, Iowa 52401 [www.fiberutilities.com](http://www.fiberutilities.com). Fiberutilities currently manages over 8,000 route miles of fiber, including other medical networks and other RHCPP applicant networks.

The goal of the RNHN is to facilitate, through connectivity, improvements in patient care by making available both critical care and new health care applications to rural users. Specific uses include (but are not limited to):

- Intra- and inter-region secure medical records sharing
- Connectivity to other regional health care networks and national interoperability initiatives, such as the Department of Health and Human Services or the Center for Disease Control initiatives via Internet2 and/or National LambdaRail
- Enabling the deployment and use of various tele-health applications in a rural environment through large bandwidth connectivity

The primary purpose of this RFP is to clearly define the scope and requirements needed to create the Medical Network capable of delivering these benefits by soliciting bids from qualified bidders as specified in this RFP. The secondary purpose of this RFP is to clearly define the scope and requirements needed to create the Commercial Network and the leased network circuit(s) to Denver for the Medical Network.

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**2. CONTACT INFORMATION**

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All questions or requests for clarification related to the requirements specified in this RFP should be directed to:

Kent Van Metre  
**Rural Nebraska Healthcare Network** Contract Project Manager  
Fiberutilities Group LLC  
222 3<sup>rd</sup> Avenue SE  
Suite 500  
Cedar Rapids, Iowa, 52401  
Phone: 319- 364-3200  
Fax: 319-364-8100  
E mail: kvanmetre@fiberutilities.com

**USAC bidder information:**  
Phone: 1-800-229-5476  
Web address: [www.usac.org/rhc](http://www.usac.org/rhc)  
Access the "Vendors" tab or the "Contact" tab

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**3. TIMING AND MILESTONE DATES**

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All information and documents related to this RFP may be accessed at the <http://www.usac.org/rhc-pilot-program/> website under the "Search Posted Services" tab.

The bidding process will begin upon the posting of this RFP by USAC on the official USAC web site and will remain for a period of no fewer than 30 days and will fully comply with all USAC required bid posting requirements and timelines.

*Estimated* RFP Posting on USAC website ..... August 25 2009  
Bid Response Deadline ..... Posting Date +45 days  
Bid Award Announcements (approx) ..... Posting Date +90 days

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**4. QUESTION / CLARIFICATION PROCESS**

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RNHN is committed to a fair, open, and transparent bidding process and will hold two separate clarification conference calls related to the information presented in this RFP.

All questions or requests for clarification should be presented at these sessions which are open to all bidders bidding the project.

Calls will be held on the following dates at the following times:

The second Friday following the posting of the RFP on the USAC web site.

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The third Friday following the posting of the RFP on the USAC web site.

All calls will begin at 10:00 a.m. Central Time.

The Conference call bridge number for each call is: (641) 623-3733 Pass Code 78785

**Bidders seeking clarification have sole responsibility for attending these conference calls.**

A bidder email distribution list will be created for the purpose of distributing any information that cannot be verbalized on the conference calls.

Call notes or minutes will not be distributed.

Any bidder desiring to be included in this distribution list should send an email with contact information to: [kvanmetre@fiberutilities.com](mailto:kvanmetre@fiberutilities.com) with the words BIDDER EMAIL DISTRO in the subject line.

These group clarification conference calls and the bidder distribution list will be the sole mechanism used for distributing additional information related to this RFP.

## **5. BID SUBMISSION PROCESS**

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All bidders responding to this RFP must have a valid Service Provider Identification Number (SPIN) issued by USAC.

The bidder SPIN must be provided at the time of the RFP response or the bid may be disqualified.

Bidders must make certain that their SPIN includes the checked box qualifying them for participation in the RHCPP.

Any questions by bidders related to SPIN's or USAC's requirements should be directed to USAC by email ([RHCPILOT@usac.com](mailto:RHCPILOT@usac.com)) or by telephone (1-800-229-5476).

All RFP responses should contain complete contact information for the responding bidder (name, company, mailing address, phone number, fax number and email address).

All RFP responses should include background information on the bidders' company, including, at a minimum, a brief resume of financial, technical and managerial qualifications, areas of expertise, number of years in business, website URL if applicable, and any other information the bidder feels is important related to its ability to respond to this RFP.

All responses to this RFP must be submitted electronically in MS Word or PDF format by the due date and time and should be submitted to:

**[kvanmetre@fiberutilities.com](mailto:kvanmetre@fiberutilities.com)**

with **"RNHN RFP RESPONSE"** listed on the subject line of the e mail

**NOT LATER THAN 5:00 pm CT of the 45<sup>th</sup> day from USAC posting.**

***If the RFP response information fails to arrive within the specified timeline, the response may be disqualified from consideration for this RFP.***

## 6. BID EVALUATION PROCESS

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Bids not meeting the specifications as outlined in this RFP may be disqualified from consideration in this phase of the project.

Bids will be evaluated based on the following criteria:

- a) Overall initial project cost.
- b) Guaranteed network completion timelines (defined as fully ready to serve including testing and acceptance) for key portions of the networks, including completion of the entire networks.
- c) Quality/ clarity/compliance of RFP response, favorable overall terms and conditions, and favorable service level agreements.
- d) Ability to procure full and complete rights-of-way agreements for the networks.
- e) Qualifications of bidder and bidder experience with past projects consistent with the size and scope outlined in this RFP.
- f) Ability to understand and communicate an understanding of the project, including the deployment aspects of two physically separate cables.
- g) Bid award preference for the leased circuit portion of this RFP will be given to bidders that provide the best connectivity solution, best price-per-megabit bid, and are capable of connecting the Medical Network and the FRGP location as specified in the RFP.

Lowest price considerations, while important and weighted appropriately, will not be the sole determinant in a successful bid award.

RNHN reserves the right to contact a bidder after submission of bid proposals for the purpose of clarifying a bid proposal to ensure mutual understanding. This contact may include written questions, interviews, site visits, and a review of past performance. This information may be used to evaluate the bidder's proposal. However, the information received from the bidder shall not be considered in the evaluation of a bidder's proposal if the information materially alters the content of the bid proposal.

RNHN reserves the right to waive deficiencies in a bid proposal. The decision as to whether a deficiency will be waived or will require the rejection of a bid proposal will be at the sole discretion of RNHN. This reserved right does not diminish RNHN's right to reject a bid proposal if bidder fails to comply or respond to any part of this RFP.

Upon award of a contract, the bidder will provide certification per USAC requirements and will assist RNHN in the preparation of the Network Cost Worksheet (NCW). These are required for the Funding Commitment Letter (FCL) to be issued by USAC.

The successful bidder must, within sixty days, enter into a contract with RNHN to implement the service contemplated by this RFP. Failure of a successful bidder to agree to the terms of a contract within such sixty day period may be grounds for RNHN to award the project to another bidder. All contracts are contingent upon final USAC approval and funding.

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Bidders are required to maintain transaction documentation and records in compliance with FCC rules and USAC document retention requirements, but in any event for a minimum period of five (5) years.

**This is a Request for Proposal. It is not an offer. Submission of a response is an offer and does not constitute acceptance by RNHN. RNHN reserves the right to not award a bid for all or any portion of the RFP.**

Should no bids be deemed acceptable, RNHN reserves the right to re-bid specific items or the entire project.

All bid response information is considered confidential. RFP responses will not be shared with other bidders.

All bids submitted will receive a closure response via mail consisting of either a) the awarding of the bid to enter into a contract or b) a non-award notification letter. Closure responses will be sent to the contact name and address indicated on the bid. Bidders should anticipate a minimum of three weeks to complete the analysis of bids and provide the appropriate bidder response.

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**7. RFP BID OVERVIEW**

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- I. Purpose & Project Scope / RFP Overview
- II. Bid Response Sections
  - a. Outside Plant Connectivity
    - i. Outside Plant Fiber Optic Cable and Regeneration Facility Installation and Construction Bid
    - ii. Optical Connectivity - Equipment & Installation Bid
  - b. Leased Circuit Connectivity
- III. Outside Plant Bid Design Overview
  - a. Required Regeneration Facility Location Site
  - b. Cable Connectivity Design
  - c. Diverse Routing Design for Each Cable
  - d. Hospital, Clinic and Spur-Clinic Site Locations
  - e. Optical Span Reserve Requirements
- IV. Optical Design Overview
- V. Bid Response Separate Cost Categories
  - a. Medical Network (24 Count Cable) Costs
  - b. Commercial Network (48 Count Cable) Incremental Costs
  - c. Third Cost Category– Single 72 Count Cable Option
  - d. Summary of Costs to Include in All Bids Options
  - e. Optical/Electronics Bid
- VI. Bid Design & Construction Specification Documents
  - a. RUS Underground Construction Specifications
  - b. RUS Aerial Construction Specifications
  - c. Site Construction Specifications
  - d. Specifications for Fiber Optic Splicing and Testing
  - e. Network Electronic Specifications and Network Electronic Diagrams
  - f. Documentation
  - g. Bidder Performance Bond Requirements
- VII. Logical Map Overview

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- VIII. Required Outside Plant Bid Response Format
  - a. Medical Network (24-Count) Fiber Optic Cable Installation Overview
  - b. Commercial Network Incremental Bid(48-Count) Fiber Optic Cable Overview
  - c. Alternate Cabling / Single 72 Count Cable Costing Analysis
  - d. Optical Equipment Bid Requirements Overview
  
- IX. Leased Circuits Bid Response Format
  - a. FRGP interconnection
  - b. Bandwidth Requirements
  - c. Availability Requirements
  - d. Performance Requirements
  - e. Maintenance Requirements
  - f. Testing & Acceptance
  - g. 15 Year Lit Capacity IRU

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**I. Purpose & Project Scope / RFP Overview**

The Medical Network is designed to provide the Hospital locations with a initial 2 Gigabit backbone capacity with 1 Gigabit access, and Clinic locations having a 1 Gigabit backbone and 1 Gigabit access. This is provided via an Ethernet circuit utilizing a 24 count primary fiber optic cable connection between 9 rural western Nebraska hospitals and 29 clinics with fiber connectivity and optronics. The Commercial Network is designed as a 48 count fiber along significant portions of the Medical Network route. The Medical Network will be connected via dual leased circuits to the Front Range Gigapop (FRGP) facility in Denver, Colorado.

All costs and expenses, for the preparation of a bid will be solely the responsibility of the bidder. Only the winning bid for both networks will be awarded a contract. It is the sole discretion of RNHN to award any or all bids with no financial or legal obligation to non winning bidders and a financial or legal obligation to winning bidders only upon funding by USAC under the RHCPP. The RNHN project will only be completed in its entirety. Partial segment bids or bids for specific portions of the networks will not be awarded. Bidders seeking to respond with partial solutions are encouraged to partner with other potential bidders to provide an entire solution. Such collaborative responses should be clearly indicated as such.

**II. Bid Response Sections**

Bid award preference will be given to bidders that respond to both the Medical and Commercial Networks based on cost, timeliness of completion, quality/clarity/compliance, ability to procure favorable rights-of-way, bidder qualifications/experience, and the ability to understand and to communicate an understanding of the project. Similarly, bid award preference for the leased circuit portion of this RFP will be given to bidders that provide the best connectivity solution, best price-per-megabit bid, and are capable of connecting the Medical Network and the FRGP location as specified in the RFP.

This RFP will have the following two separate bids:

**A. Outside Plant Connectivity**

**i. Fiber Optic Cable and Regeneration Facility Installation and Construction Bid**

The projected route distance for the entire network project is expected to be approximately 800 miles of fiber optic cable.

Bidders must include within their bids as a separate line item the incremental cost of installation of the 48 count Commercial Network along the designated portions of the Medical Network route. Bidders must also provide the per foot construction costs for various construction types (trenching, plowing, boring, aerial, splicing, conduit, etc.) in the event additional sites may be added prior to completion of the installation. Only one regeneration facility site location has been specified. All other regeneration facilities will be determined

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by the bidder to meet the optical span requirements of the equipment solution they include in their bid.

Each bid must include all costs of the project and should include, but is not limited to, the following: all costs for site selection, installation, materials, facility design land acquisition, permitting, setting, engineering, electrical, and the splicing and termination of all fibers in a bidder provided fiber termination panel located inside the specified regeneration facility and any required medical facility.

Each bid must also include all one-time and any recurring right-of-way costs for 20 years, including pole rental, easements, city franchise, building access, and any other associated costs.

**ii. Optical Connectivity - Equipment & Installation Bid**

This section of the bid must provide an initial 2 Gigabit Ethernet connection with growth capacity to 5 Gigabits within the entire Medical Network. This section of the bid is for the optical equipment required to light the 24-count Medical Network only. The second 48-count cable is for the Commercial Network which is dark fiber and will not have optical equipment as a part of a bid.

**B. Leased Circuit Connectivity**

This section of the bid must provide leased circuit connectivity options from logical places along the Medical Network (as outlined in Section IX) to the FRGP facility in Denver, Colorado. The bid must include connectivity alternatives at the 45 Mbps, 150 Mbps, 600Mbps and 1 GIG capacity levels.

**III. OUTSIDE PLANT BID DESIGN OVERVIEW**

**A. Required Regeneration Facility Location**

Section VII contains a logical map of the optical ring configuration requirements and the required regeneration facility placement. All regeneration facility locations required to support the Medical Network design and site location selection, with the exception of the one listed below, will be determined by the bidder. Only the location below requires a regeneration site to be located specifically at:

**Ogallala three way fiber optic cable intersection** – preference is within 1500 feet of 2601 N Spruce St. Ogallala, NE. Minor deviations may be allowed with written approval from RNHN.

**B. Cable Connectivity Design**

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Fiber optic connectivity is required between all medical facilities listed in Section III(D). These medical facilities have been designated as "Hospital Sites" (9), "Clinic Sites"(25) and "Spur-Clinic Sites"(4). The nine Hospital Site locations must be built in a ringed configuration, connected with diverse and separate cable routes that will form the backbone of the network. Clinic Sites and Spur Clinic Sites may be connected to the Medical Network backbone ring via a single fiber cable or entrance (a single lateral) to the nearest Hospital Site location. In addition, Clinic Sites must be capable of optically transmitting and receiving to the closest Hospital Site or regeneration facility on both the east and west paths.

**C. Diverse Routing Design for Each Cable**

Both the Medical Network and the Commercial Network shall have diverse routing to the Hospital and Regeneration Site facilities. The Commercial Network cable will NOT enter the Hospital Sites, Clinic Sites or Spur Clinic Sites listed in Section III(D). The Commercial Network will be routed between the hand holes that are required to be placed outside of each Hospital and Clinic site location with 50 feet of slack coil. (See Attachment OSP-1, Site Construction Specifications, Figure 3.2 for reference.)

The Commercial Network shall NOT be installed along the routes required to reach the Spur Clinic Sites.

**D. Hospital, Clinic and Spur-Clinic Site Locations**

Sites below are listed as either "Hospital", "Clinic" or "Spur Clinic" sites. Spur Clinic Sites may be connected to the Medical Network backbone at any logical or most cost efficient splice point.

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<b>Rural Nebraska Healthcare Network Member Hospitals and Affiliated Clinics, FCC Rural Health Care Pilot Program</b>	<b>Designation</b>
<b>Box Butte General Hospital,</b> 2101 Box Butte Ave, Alliance, NE 69301	<b>HOSPITAL</b>
Hemingford Clinic, 812 Laramie Ave., Hemingford, NE, 69348	CLINIC SITE
<b>Cow Country Health Clinic, 111 Main St, Hyannis, NE 69350</b>	<b>SPUR CLINIC SITE</b>
Sandhills Family Center, 2107 Box Butte Ave., Alliance, NE 69301	CLINIC SITE
<b>Chadron Community Hospital,</b> 821 Morehead Street, Chadron, NE 69337	<b>HOSPITAL</b>
Legend Buttes Health Services, 11 Paddock Street, Crawford, NE 69339	CLINIC SITE
Hay Springs Medical Clinic, 232 N Main St Hay Springs, NE 69347	CLINIC SITE
Western Community Health Resources, 739 Morehead Street, Chadron, NE 69337	CLINIC SITE
Western Community Health Resources, 619 Box Butte Ave. Alliance, NE 69301	CLINIC SITE
Western Community Health Resources, 11 Paddock Street, Crawford, NE 69339	CLINIC SITE
Western Community Health Resources, 207 Main Street, Rushville, NE 69360	CLINIC SITE
Western Community Health Resources, 106 North Main, Gordon, NE 69343	CLINIC SITE
Western Community Health Resources, Native American Ctr. 502 W. 2nd, Chadron, NE 69337	CLINIC SITE
WCHR Family Planning Clinic, 848 Morehead Street, Chadron, NE 69337	CLINIC SITE
<b>Garden County Hospital,</b> 1100 West 2nd, Oshkosh NE 69154	<b>HOSPITAL</b>
Garden County Rural Health Clinic, 1100 West 2nd, Oshkosh, NE 69154	CLINIC SITE
<b>Gordon Memorial Hospital,</b> 300 E 8th Street, Gordon, NE 69343	<b>HOSPITAL</b>
Gordon Clinic, 807 North Ash St., Gordon, NE 69343	CLINIC SITE
Rushville Clinic, 308 West 3rd St., Rushville, NE 69360	CLINIC SITE
<b>Kimball Health Services,</b> 505 S. Burg St., Kimball, NE 69154	<b>HOSPITAL</b>
Kimball Health Services Clinic, 505 S. Burg St., Kimball, NE 69154	CLINIC SITE
<b>Memorial Health Center,</b> 645 Osage St., Sidney, NE 69162	<b>HOSPITAL</b>
Sidney Medical Associates, 1625 Dorwart Dr., Sidney, NE, 69162	CLINIC SITE
Memorial Health Center Surgical Care and Outpatient Clinic, 645 Osage St., Sidney, NE 69162	CLINIC SITE
<b>Chappell Medical Clinic, 562 Vincent Ave., Chappell, NE 69129</b>	<b>SPUR CLINIC SITE</b>
<b>Morrill County Community Hospital,</b> 1313 S Street, Bridgeport, NE 69336	<b>HOSPITAL</b>
Morrill County Hospital Clinic, 1320 S St., Bridgeport, NE 69336	CLINIC SITE
Chimney Rock Medical Center, 320 Main St., Bayard, NE 69334	CLINIC SITE
Morrill County Family Resource Center, 1309 R St., Bridgeport, NE 69336	CLINIC SITE
<b>Perkins County Health Services,</b> PO Box 26 Grant, NE 69140	<b>HOSPITAL</b>
Grant Medical Clinic, 912 Central Avenue, Grant, NE 69140	CLINIC SITE
<b>Regional West Medical Center,</b> 4021 Ave B, Scottsbluff, NE 69361	<b>HOSPITAL</b>
<b>Regional West Medical Center,</b> 3700 Ave D, Scottsbluff, NE 69361	<b>HOSPITAL</b>
Regional West Physicians Clinic, 2 West 42nd Street, Scottsbluff, NE 69361	CLINIC SITE
<b>Regional West Physicians Clinic, 1456 Center Ave., Mitchell, NE 69357</b>	<b>SPUR CLINIC SITE</b>
<b>Regional West Physicians Clinic, 302 Center Ave., Morrill, NE, 69358</b>	<b>SPUR CLINIC SITE</b>
Regional West Physicians Clinic 1275 Sage Street, Gering, NE, 69341	CLINIC SITE
Regional West Physicians Clinic, 3911 Ave B, Scottsbluff, NE 69361	CLINIC SITE
Regional West Physicians Clinic, 3011 Ave B, Scottsbluff, NE 69361	CLINIC SITE

In addition to the locations above, both the Medical Network and the Commercial Network must physically connect to:

- The required regeneration facility identified in Section III(A).
- To a specific location of the bidders choosing, but within 1,500 feet of the Great Plains Regional Medical Facility located at 601 W Leota St, North Platte, NE. Both the cables in the Commercial and Medical Network will

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have a 75 foot tail in a standard hand hole properly marked with signage, locate puck and wire.

The costs required to reach the Spur Clinic Sites may add disproportionately to the overall cost of the project. As such, Bidders should break out the costs of reaching each of the Spur Clinic Sites separately. Based on the costs associated with building to these locations, the RNHN may choose not to award the construction of these segments.

**E. Optical Span Reserve Requirements**

Specifications for distance between either regeneration facilities or medical sites shall maintain a optical loss budget reserve of at least 15% of the bidders optical equipment bid component specifications, to support future splices or fiber cuts (This is will be calculated by OTDR distance, not route sheath mileage.) Example, if optical span limitation is 100 kilometers the optical path distance may not exceed 85 kilometers.

**IV. OPTICAL DESIGN OVERVIEW**

The optical design requires redundant equipment in the event of failure for the Hospital Sites. The design requires an optical ring with equipment facing each direction on a segment. The equipment will be installed at each required hospital site and regeneration facility. It will provide diverse redundant connectivity in two separation directions, unless otherwise specified. The bid requires all jumpers and mounting accessories required to connect from the terminated fiber distribution panel to the optical equipment. Each medical and regeneration facility site where equipment is installed must have sufficient power and battery backup as specified in the site construction specifications. (See Attachment OSP-1.)

1. Specifications for the electronic and optical requirements can be found in Attachment EO-1.
2. Associated network electronic diagrams and illustrations can be found in Attachment EO-2.

**V. BID RESPONSE: SEPARATE COST CATEGORIES**

**A. Medical Network (24 Count Cable) Costs**

All design, materials, construction, installation, testing and documentation will be included in the 24 count Medical Network cable costs.

**B. Commercial Network (48 Count Cable) Incremental Costs**

The second bid response is for only the incremental cost of installing the additional 48 count cable for the Commercial Network in the same trench, conduit or aerial over-lashing. All hand holes along the route will be shared between both cables with all the costs included in the Medical Network bid unless a separate hand hole is required for the Commercial Network. Each cable will have its own separate splice

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cases but may be placed in the same hand hole. The Commercial Network bid will include only the incremental material (example: splice case) and installation labor (examples: incremental cost to place in same physical route and incremental splicing cost.)

The Commercial 48 count cable will have a 100' foot slack coil placed every 5,280 feet along the entire route. All buried slack coils will be buried a minimum of 48 inches below the surface with a locate puck, wire and signage.

In all cities where the fiber route passes through the city, the 48 count commercial cable will have one 100 foot slack coil placed in two separate locations along the path, within the city, a minimum of 500 feet apart at locations chosen by the bidder.

**C. Single 72 Count Cable Option**

The third bid cost response is for the installation at all of the same locations listed above but only with one 72-count fiber optic cable instead of two separate cables (24 and 48 count cables). All fibers would be terminated in fiber distribution panels with SC connectors in each regeneration facility. At the nine required Hospital Sites, only 12 fibers need to be terminated with SC connectors in a fiber distribution panel. The intent of this third bid is to establish the incremental cost difference for an alternate approach to creating the Commercial Network.<sup>4</sup> RHCPP funds cannot be used for the incremental/additional cost of creation of the Commercial Network.

**D. Summary of Costs to Include in All Bids Options**

All costs for design, materials and installation and rights-of-way and permit acquisition for regeneration facilities, as indicated in the attached specifications labeled "Rural Nebraska Project Site Construction Specifications," (Attachment OSP-1) will be included in the Medical Network cost bid. Only the incremental costs of installing the Commercial Network cable are to be included in the Commercial Network bid.

**E. Electronics/Optical Bid**

The requirements for the electronics and optical bid can be found in Attachments E0-1 of this RFP.

**VI. BID DESIGN AND CONSTRUCTION SPECIFICATION DOCUMENTS.**

Each bid is required to comply with the following:

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<sup>4</sup> The basic approach for the Commercial Network is a second, 48 count cable. The alternative approach for the Commercial Network is adding 48 additional fiber strands to the single cable to be used for the Medical Network. See the text accompanying Section VI.c.

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- a. **RUS Underground Construction Specifications:** Bids must comply with all RUS underground construction standards including but not limited to **RUS 515A & 515B**
- b. **RUS Aerial Construction Specifications:** Bids must comply with all RUS aerial construction standards including but not limited to **RUS 515C**
- c. **Site Construction Specifications - See Attachment OSP-1**
- d. **Specifications for Fiber Splicing and Testing - See Attachment OSP-2**
- e. **Network Electronic Specifications and Network Electronic Diagrams - See Attachments EO-1 & EO-2**
  
- f. **Documentation**

Bidders shall include in their bid responses all costs to supply all necessary construction prints and documents, specifications, safety and regulatory compliance with all federal, state, county, city and any other legal jurisdiction to successfully complete the installation of the networks.

Upon awarding of the bid contract, bidder shall provide all engineering and route design documents to RNHN in both electronic and paper copies for the inspection, review and approval of RNHN.

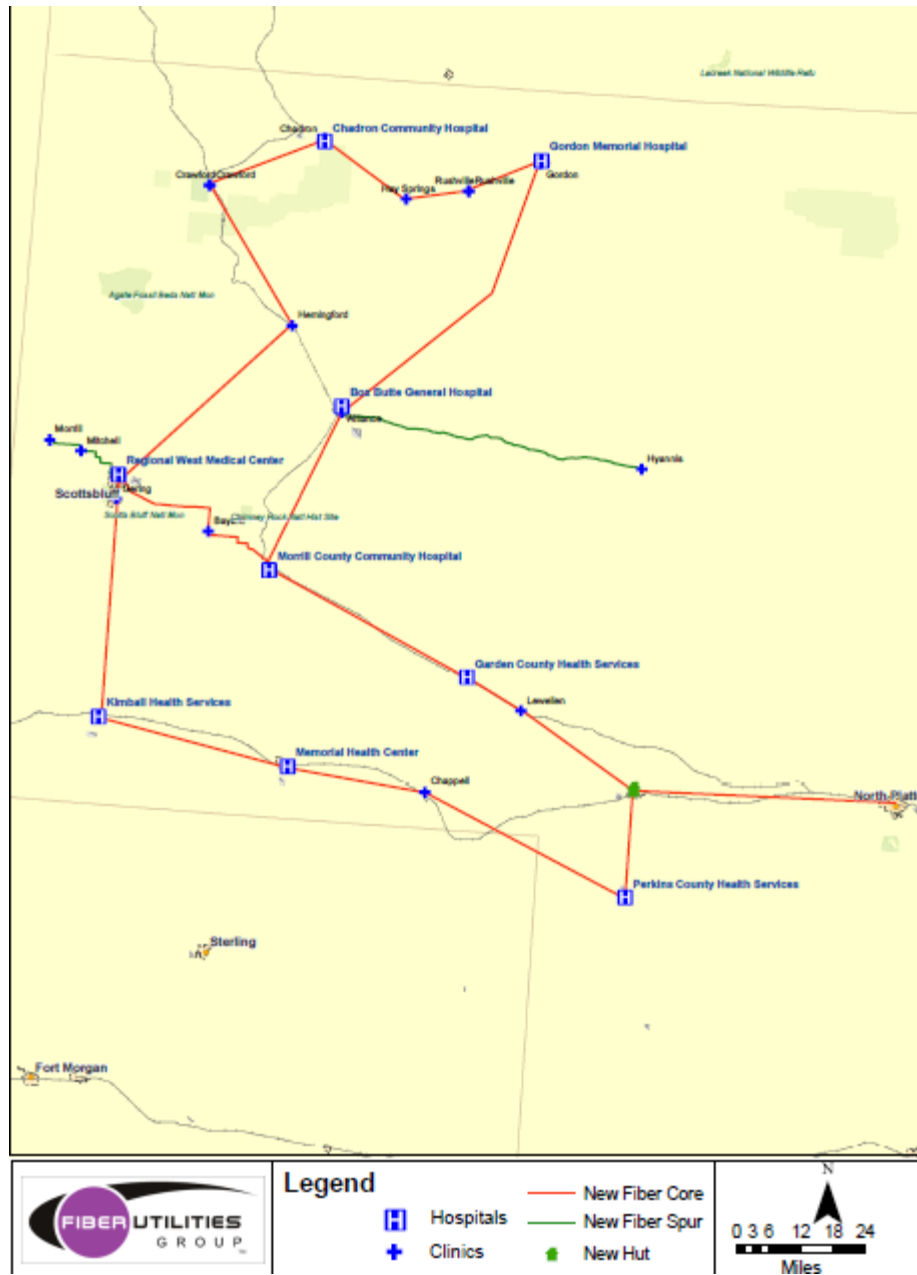
Upon completion of outside plant network fiber cable segments and site construction, bidder shall provide all documents in both paper and an electronic ERSI based format to RNHN marked FINAL. Documentation shall include all outside plant, inside plant, splicing and optical testing per RUS specifications. In addition, outside plant "as-built" must be in ESRI GIS landbase format. All documentation format, content and information shall be reviewed and approved by RNHN before final acceptance and payment.

**g. Bidder Performance Bond Requirements**

A bond will be required from each bidder awarded a contract that guarantees that the bidder will: (a) honor its bid and will sign all contract documents; (b) complete the contract according to its terms and conditions, including price and time; and (c) pay any subcontractors and suppliers the monies they are due as a direct or indirect result of the contract. The bid bond referenced under (a) above must be equal to the difference between the bid awarded to the bidder and the bid awarded as a result of the bidder's default, including any costs incurred by RNHN to re-issue the bid. The performance bond referenced under (b) above may permit the surety to: (i) complete the contract itself through another contractor; (ii) select a new contractor acceptable to RNHN to contract directly with RNHN; or (iii) allow RNHN to complete the work by a contractor selected by RNHN. If a contract is completed pursuant to (i) above, RNHN shall pay the surety the amounts due for such completion in the manner such amounts would have been paid to the bidder if there had been no default. If the contract is completed pursuant to (ii) or (iii) above, and the cost thereof exceeds the balance due under the defaulted contract, the surety shall pay RNHN such excess. The payment bond referenced under (c) above shall be equal to the amount owed to any subcontractor and supplier.

# RNHN Backbone Fiber RFP

## VII. Logical Map Overview (See Attachment G-1: Illustrative Map)



## VIII. Outside Plant Bid Response Format and Documentation

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**a. Medical Network Bid for 24 Count Fiber Optic Cable**

The bids must include a bid for all costs associated with the installation and acceptance per the specifications of the 24 count Medical Network to connect all sites identified in Section III(D). Bid respondents may only provide a bid response for the Medical Network that meets all of the specifications set forth in Section III above. Complete documentation will include all materials, engineering, installation, splicing, optical testing, red lines, GIS electronic ERSI based as-built drawings, permitting, rights-of-way procurement, and compliance with all ordinances, legal and regulatory requirements.

**b. Commercial Network Bid for 48 Count Fiber Optic Cable**

Complete documentation must include a bid for all incremental costs associated with the materials, engineering, installation, splicing, optical testing, red lines, GIS electronic ERSI based as-built drawings, permitting, rights-of-way procurement, and compliance with all ordinances, legal and regulatory requirements.

**c. Single 72 Count Cable Costing Alternative**

The bids must include information that would quantify the cost reduction that would result from **not** having separate cables but only one cable with a 72 count fiber optic cable installed along the exact same route.

**d. Optical Equipment Bid**

The bids must meet the minimum specification requirements for the Ethernet transport devices for the Medical Network listed in Attachment EO-1.

**IX. Leased Circuit Bid**

Leased circuits are a component of this RFP. Responses for the leased circuit portion of this RFP can be found in Attachment LC-1.

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**8. ALTERNATIVES**

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RNHN anticipates that some responses may include potential cost saving alternatives from the items, routes or methods specified in this RFP. RNHN will consider all such alternatives provided that such alternatives are clearly marked "ALTERNATE SOLUTION." However, these responses must, at a minimum, meet the specification requirements outlined herein and must grant RNHN and/or its authorized agents full and complete at-will access to all rights-of-way, as well as full and complete at-will access to all locations (splice points, buildings, fiber sheath, etc.) necessary to operate and maintain the infrastructure.

RNHN is also open to any relevant recommendations, suggestions or proposals that would result in lower construction or operating costs for the networks. All recommendations or alternatives must be within the span and scope of control of RNHN ***and comply with all appropriate USAC rules and regulations pertaining to the RHCPP program.***

## **9. PAYMENT PROCESS**

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Payment is based on 15% funding by RNHN and 85% by FCC funds administered by USAC.

RNHN intends to pay the bidder(s) upon receipt of funding from USAC and revenues for the Commercial Network after successful testing and acceptance of logical network stages or sections.

RNHN expects the selected bidder to provide services as specified. RNHN does not guarantee any minimum compensation to the bidder or any minimum usage or purchase of the bidder's services or products.

Payments are expected to be administered as follows:

- Successful bidder will assist in the completion of a Network Cost Worksheet required by USAC to issue a Funding Commitment Letter (FCL)
- RNHN will be issued a FCL from USAC for services awarded.
- RNHN will place an order with the winning bidder upon receipt of the FCL.
- Bidder will complete installation of any segment(s) or phases per specifications and notify RNHN that the network segment(s) is ready for testing and acceptance.
- RNHN will work with the bidder within ten working days of written notice by the bidder of readiness to complete the testing and acceptance process as outlined in the contract between the bidder and RNHN.
- Upon acceptance,, bidder may invoice RNHN for products or services.
- RNHN will be responsible for directly paying 15% of the invoice upon satisfactory completion of testing and acceptance. At that time, RNHN will also provide the bidder with the necessary documentation required for the bidder to process its 85% payment request directly with USAC.
- Bidder will then countersign each invoice acknowledging receipt of the 15% co-payment and directly submit each invoice to USAC for processing of the 85% balance.
- Contact information for USAC invoice submission will be provided with the acceptance document.

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- USAC payment is expected to be monthly. USAC has informed RNHN that payment directly from USAC to the bidder should be within 30 days of the receipt of a properly processed and submitted invoice.
- Bidder will agree to maintain transaction documentation and records in compliance with FCC rules and USAC document retention requirements, but in any event for a minimum period of five (5) years

Due to the size and scope of the project, RNHN will use its best efforts to accommodate suggested bidder payment requests. For instance, bidders may submit verifiable unit completion suggestions to allow for an efficient payment process (example, payment upon engineering and right-of-way completion, materials acquisition and units of cable installed) Such requests, however, are subject to the discretion of RNHN and must comply with all USAC payment practices. It is expected that invoices will be submitted and paid monthly per USAC payment practices.

## **10. ATTACHMENTS**

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Six Attachments are included as a part of this RFP:

- OSP-1: Site Construction Specifications
- OSP-2: Fiber Optic Splicing and Testing Specifications
- EO-1: Network Electronic Specifications
- EO-2: Network Electronic Diagrams
- LC-1: Leased Circuit Specifications

G1: Illustrative Map

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**ATTACHMENT OSP-1**

**RURAL NEBRASKA HEALTHCARE  
NETWORK**

SITE CONSTRUCTION SPECIFICATIONS

RNHN RFP 2009-00

Prepared by:



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**III. REGENERATION FACILITY LOCATIONS-----**  
**--15**

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## **SECTION ONE**

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### **REMOTE FACILITY SITE GENERAL CONSTRUCTION STANDARDS AND PRACTICES**

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#### **REGENERATION FACILITY/BUILDING REQUIREMENTS**

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Any site that is used for the purpose of regenerating an optical signal or combining multiple routes will use a remote site location and specifications that go along with these sites.

The regeneration site must have redundant diverse entrances with maximum site separation to protect the route integrity dual fiber entrances which will be built from each primary cable route in the right-of way hand hole or splice vault to the regeneration facility (please reference Figure 3.1. 3.1A & 3.2 for an examples). The only exception is if a regeneration cabinet is installed. Only then, may a single cable lateral be used from the 24 count Medical Network. If a single lateral is used from the splice case and hand hole, the fiber count must have at least 48 fibers in it and be placed inside a 4" inch conduit from the hand hole to the cabinet.

The regeneration facility should follow these design characteristics.

- A.** High quality style design to adequately support the required equipment environmental requirements. The regeneration facility must accommodate the initial capacity requirements for the specified optical/electronics equipment with both space, power and HVAC capacity to adequately support growth for the vendors recommended 5 Gigabit system or better.
- B.** Equipped with a manual push button lock or lock box.
- C.** Support environmental requirements to accommodate both initial and future bid specifications.
  - a. If applicable, dry contacts and a heater package with the following alarm points:
    - i. major fail.
    - ii. compressor fail

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- iii. heater fail
  - iv. blower fail
  - v. a SNMP style monitoring port would supersede the above alarm points.
- D.** Two diverse cable entry/access ports, unless a regeneration cabinet is used.
- E.** Sufficient power to support specified growth requirements.
- F.** Smoke alarms with dry contacts
- G.** Minimum two 24 count fiber termination panels. If a regeneration cabinet is specified either one 48 count fiber optic cable may be used from the hand hole to the cabinet or two 24 count fiber optic cables may be used.

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**REMOTE FACILITY SITE PLAN**

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The Remote regeneration facility site plan will be leveled and allow for drainage but also allow for easy traversing of the site to gain access to all doors and or generator. The Site plan should never supersede any local or governing ordinances or specifications.

- A. Regeneration hut/cabinet site placement must provide for unrestricted access and adequately support for the installation of correct size generator and propane tank with enough capacity to run this site for four (4) days. Some local codes are more restrictive and the propane tank may have to be placed further away from the building/cabinet or generator.
- B. If applicable, any propane tank or on site gas storage device will need to be a minimum of 8' away from the facility and or generator. Any local governing rules or code will supersede this design.
- C. If an entrance is required, the entrance or driveway should have minimum of 8" of  $\frac{3}{4}$ " clean road rock or matching road material depending on local ordinances.
- D. The regeneration facility, if required, shall have a foundation that is complainant with both local codes and adequate load distribution requirements.
- E. The generator location shall designed and installed to minimize settling and, it is preferred to be placed with a minimum 4" thick concrete pad placed on top of the two concrete piers, or to minimum local ordinances.

---

**REMOTE FACILITY INTERNAL STRUCTURE**

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The interior structure of this regeneration facility will be required to allow for the following.

- A. Two 24 count fiber termination panels to allow for two 24 count fiber optic cables to be spliced, terminated and stored. If a regeneration cabinet is specified either one 48 count fiber optic cable may be used or two 24 count fiber optic cables. Only 12 fibers will be spliced and terminated for each direction totaling 24 splices.
- B. Door contact to monitor door entry.
- C. SNMP enabled automatic transfer switch capable of remote manual starting and turning off of generator.
- D. Ethernet port or SNMP style monitoring port.

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**POWER REQUIREMENTS**

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The main power system in the regeneration facility is required to provide sufficient power availability to support all equipment for a minimum of four (4) days. The system must be designed with a life span of no less than 20 years after date of installation including these requirements:

- Battery string capable of 8 hours of run time.
- Ethernet (SNMP compatible)
- Form “C” dry alarm contacts

**Battery Backup Requirements**

The Battery string installed should be able to supply all current and future power requirements with adequate voltage for a fully populated site supporting 5 Gigabits of service for at least 8 hours.

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**CABINET & GENERATOR SECURITY ACCESS**

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The regeneration facility must be lockable and have remote site accessibility via a push button access code. The access key for the generator will be stored in a safe location within the regeneration facility for remote hands access.

## **SECTION TWO**

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### **REGENERATION FACILITY ENTRANCE SPECIFICATIONS**

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#### **Regeneration Hut or Hospital Site Redundant Cable Entrance**

Redundant cable entrances at the regeneration locations are required to provide a 99.999% degree of reliability to the overall well being and protection of the network. Two standard size hand holes will serve as the meet me points of the network and these hand holes will never be closer than 50 feet. A single 4 inch HDPE or PVC schedule 40 pipe must be used for both of these interconnection points.

- Minimum 50 foot preferred 100 separation on the splice locations controlling building entrance A and building entrance B
- Any and all cables that enter the meet me hand holes must be labeled with direction and owner.
- All cable must be in some form of conduit and sealed.
- If the facility is a cabinet, two diverse paths will enter the cabinet using the best design to insure maximum separation until they reach the cabinet cable entry points.

Entrance Design Utilizing a Hut Facility.

Figure 3.1

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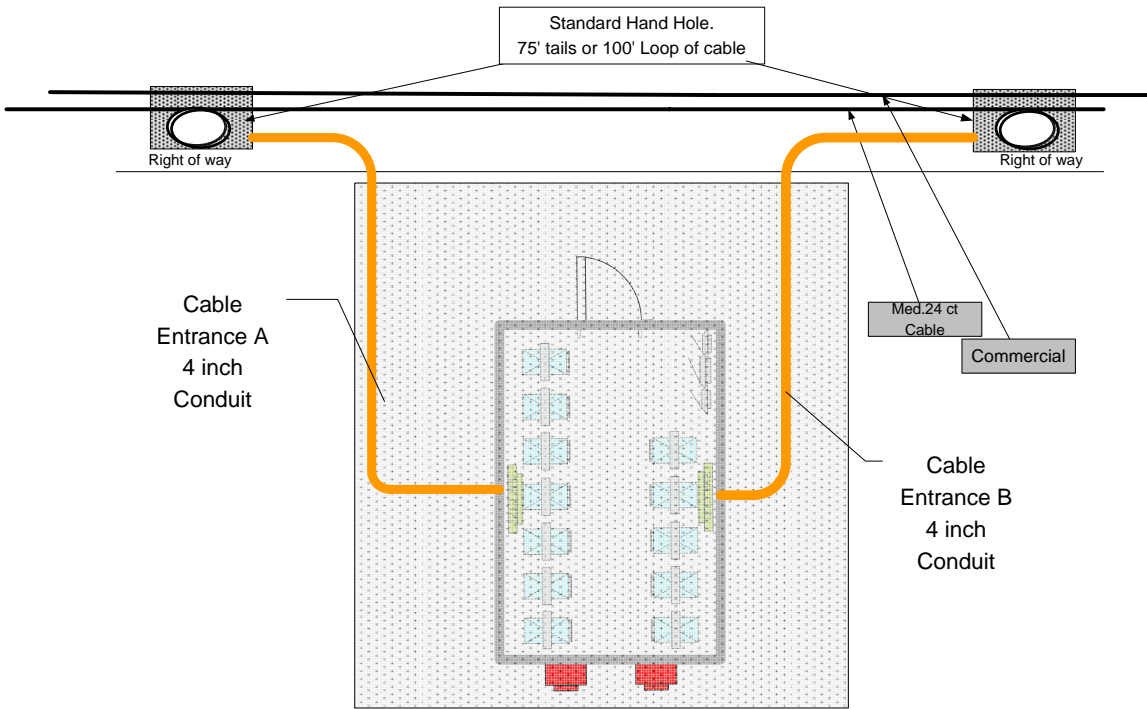
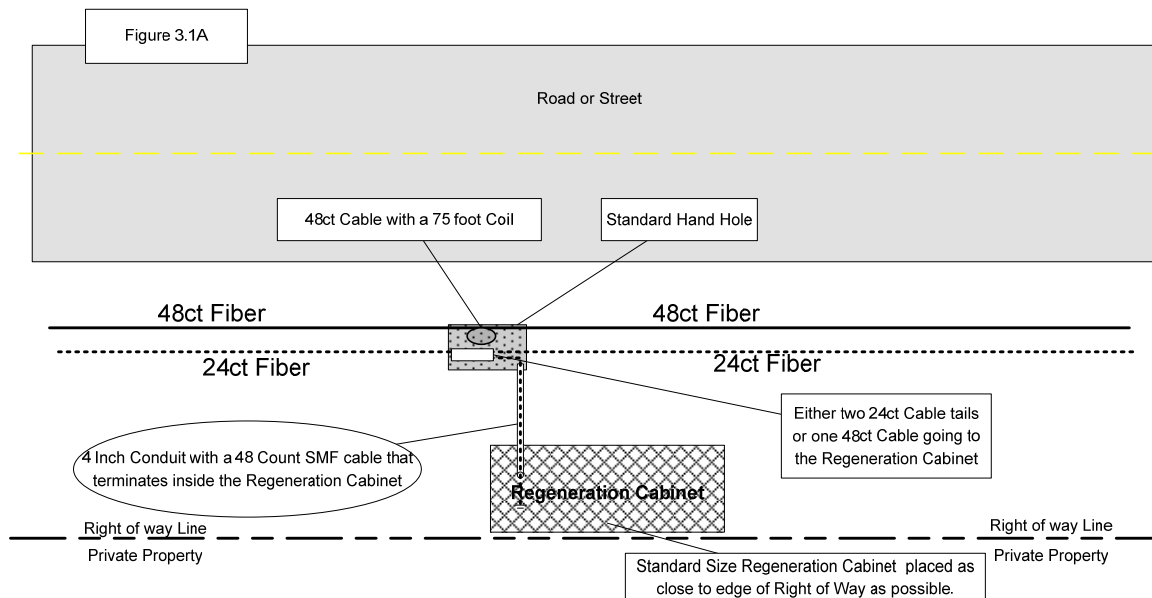


Figure 3.1 A – Entrance Using a Regeneration Facility Cabinet

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**Only if a regeneration cabinet is installed will the design allow for a single cable with 48 fibers (24 East, 24 West) to be installed from the hand hole to the fiber termination panel.**

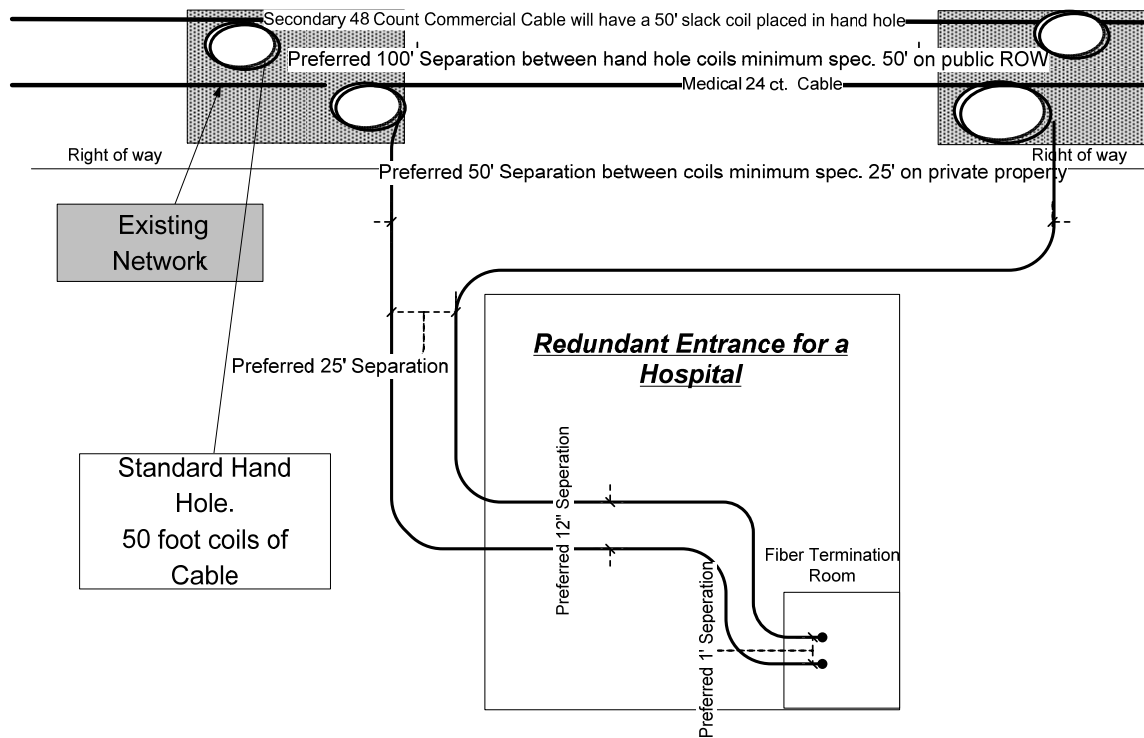
### Hospital Facility Cable Entrance

The purpose of redundant cable entrances at the medical facility locations is to provide a high degree of reliability to the overall well being and protection of the network. Two standard size hand holes will serve as the meet me points of the network and these hand holes will never be closer than 50 feet.

- Minimum 50 foot, preferred 100 separation on the splice locations controlling building entrance A and building entrance B on public right of way situations.
- Minimum of 25' but preferred 50 foot separation in private medical facility right of way situations.
- Minimum of 12' but preferred 25' separation once any cable enters the medical facility.
- Any cable that enters a facility must be placed in plenum rated duct or changed to a plenum rated cable and must comply with any and all local governing codes or ordinances related to such placement.

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Figure 3.2 Hospital Facility Cable Entrance Design



### Clinic Site Design Requirements

#### Clinic Fiber Backbone Access & Design Specifications

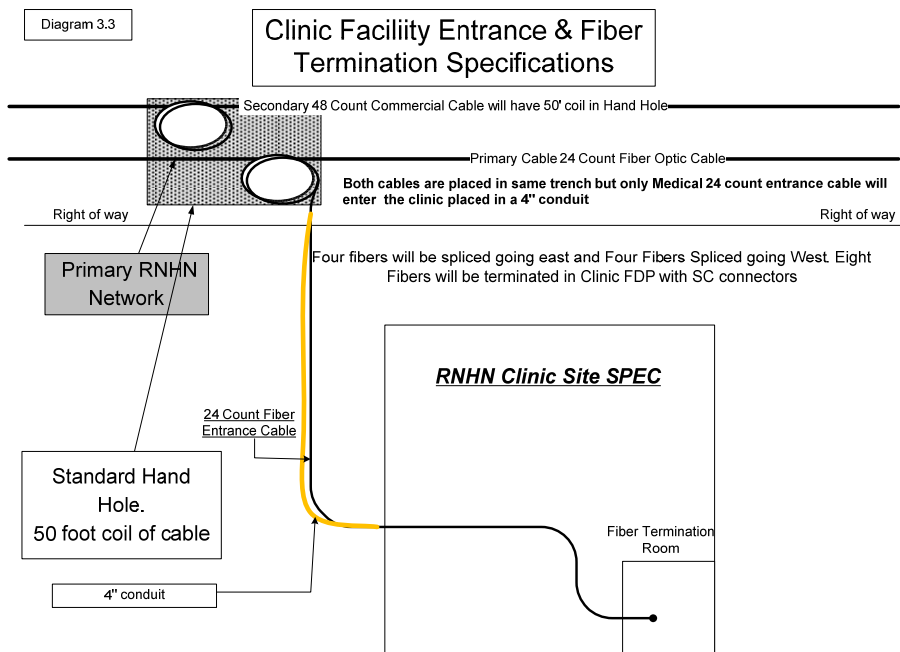
The clinics will have a single access cable from the clinic facility to the primary route. See diagram 3.3 for reference. If more than one clinic is required to be connected together (example, in a daisy chain) (see diagram 3.4) the last clinic must have the 24 count fiber access cable routed back to the primary 24 count backbone cable to insure ring continuity. This design will insure that if a fiber cut occurred at one site, it would not cause an outage for multiple sites.

**SPECIAL NOTE:** Only a single clinic may be connected directly to a hospital, regeneration site or the Medical Network 24 count cable by a single, non-redundant fiber path.

All clinics will need a minimum of 30 minutes of UPS uninterruptible power supply. All equipment will be mounted in a standard equipment rack in a room that will provide sufficient HVAC required by the electronic equipment you specify. All fiber will be terminated with SC connectors in an fiber distribution panel mounted in the rack.

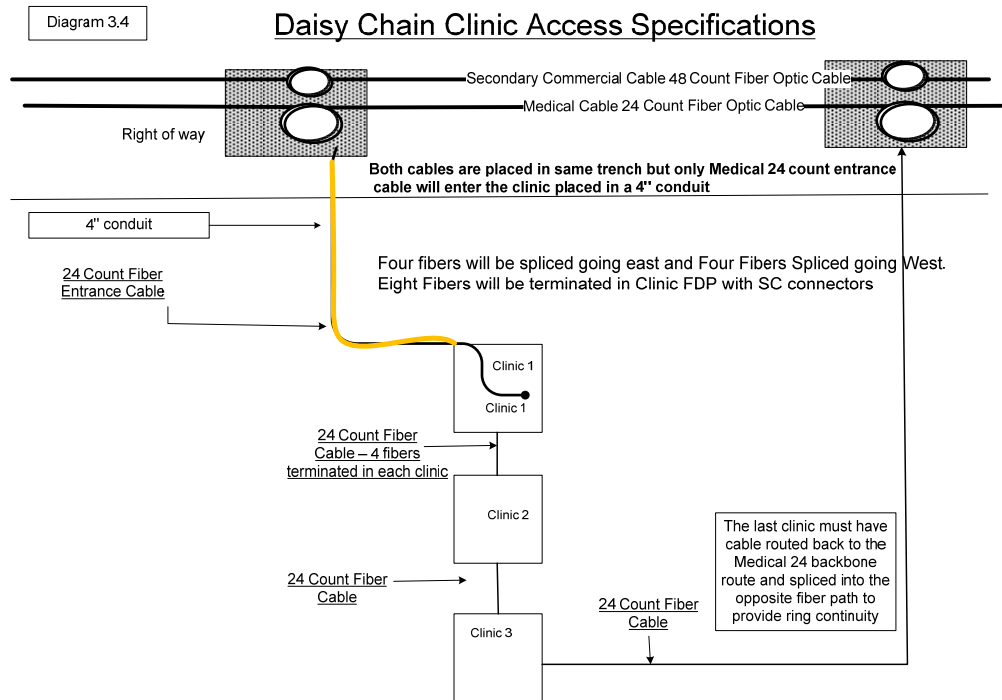
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**Single Clinic Connectivity Design:** (See diagram 3.3)



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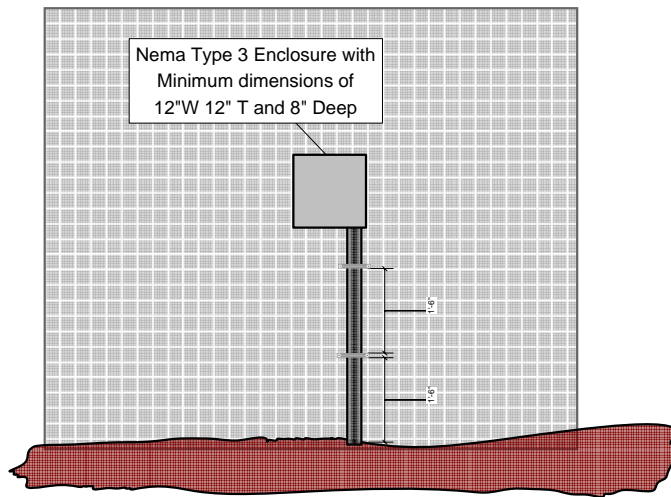
**Multi-Clinic Connectivity Requirement:** (See diagram 3.4)



**A. BUILDING ENTRANCE RISER SPECIFICATIONS**

- Follow all of the installation, material and grounding requirements.
- The riser material will be 4 inch EMT.
- The pipe will need to be mounted directly to the structure with 5/16 inch Tapcon hardware or 5/16 inch drop in style anchors.
- The pipe must be secured every 18" of rise or to local code. Local code will supersede this requirement.
- Standard pipe straps with the sole purpose of securing pipe to a wall shall be used.
- A NEMA Type 3 enclosure with the minimum dimensions or 12" wide by 12" tall by 8" deep shall be mounted over the wall penetration then mounted directly to the 2" PVC pipe with a pipe to housing connector.
- The Riser pipe to pull box installation should be offset to allow for easy bending of the cable.
- No cable storage will be left in this box.  
The pull box must be secured to the building using the factory style mounting holes supplied.

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**B. INSTALLATION REQUIREMENTS**

1. Installation shall comply with the latest edition of the National Electric Code and other national, state and local codes as applicable.
2. Pull boxes will be required after 180 degrees of directional change and after every 120 feet of vertical rise (10 floors). Pull boxes will be mounted securely to the building structure and will not depend on the conduit for support. Pull boxes shall have removable covers and will be installed in such a way that the covers will be accessible.
3. Relocating and disconnecting of any existing equipment within the building shall be coordinated with building management.
4. All metallic conduits shall be bonded to the building ground system.
5. All conduits shall be sealed (plugged), after cable installation at the point of interface and will be clearly marked to facilitate location.
6. Pull boxes should be clearly marked "RNHN " on the cover for identification.
7. All conduits shall be clearly marked "RNHN " on each floor on a vertical rise. On a horizontal run, place a tag every 20' and each directional change.

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**C. MATERIAL REQUIREMENTS**

1. Materials will comply with those standards as established by UL or NEMA and shall be commercial grade. All materials will be new and free from defects.
2. Conduits shall be 2 inch EMT (Electrical Metallic Tubing). EMT fitting shall be gland or set screw type and each conduit shall be equipped with a pull tape or rope. Place a plastic bushing on the exposed ends of the conduit to protect the fiber from chaffing. The exact requirements for location of conduit within the building shall be verified with the building owner.
3. Large radius sweeps shall be provided where required for offset or change in direction of conduit. The minimum required radius is 36". If it is not possible to provide 36" minimum radius, pull boxes providing the same radii capability will be required.
4. Pull through pull boxes will be typically 16" wide x 16" long x 8" deep with the conduit entering at each end. Pull boxes shall meet code requirements and will generally be placed to improve ease of pulling cable and inner duct.
5. The cable will be secured at pull boxes on vertical runs with a RNHN approved slip Kellum grip.

**D. GROUNDING SCENARIOS**

The preferred method is to install dielectric cable for building entrances.

1. When using dielectric fiber optic cable, you should run a #12 locate wire to the pull box or hand hole just outside of the building by each cable entrance.
  - a) Hand hole: Place the ground rod in the hand hole.
  - b) Pullbox: Place the ground rod near the conduit entrance and place a locate block inside the pull box or on the building adjacent to the pull box, near ground level. Place a #6 ground wire from the locate block to the ground rod.
2. If an armored cable is used, the sheath should be grounded in the following manner:
  - a) At shelters, place a hand hole just outside of each cable entrance and use an AT&T ground closure model 2500 (or equivalent) to break the sheath and

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ground the field side of the armor. It will not be necessary to ground the sheath again at the rack since it is such a short distance.

- b) At other buildings, place a hand hole just outside of the building at each cable entrance and use an AT&T ground closure model 2500 (or equivalent) to break the sheath and ground the field side of the armor. If the armored cable travels through sections of the building to get to the rack such that voltages could be induced onto the armor, that section of armor needs to be grounded at the entrance using a separate ground rod in the hand hole. In other designated facilities/sites, place an AT&T ground closure in the storage box, as close to the field side of the fiber as possible and run a #6 jacketed ground over to the master ground bar. All other locations, ground at the entrance to the room or if a good location at the entrance is not available, ground the sheath at the rack and take the jacketed #6 to the building ground within the room.

**E. LOCATE WIRE**

A #12 THW copper wire will be used for locating purposes. This wire shall accompany all ductwork. This wire will have its own ground. Complete the locate wire installation including grounding with the conduit installation.

## **SECTION THREE**

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### **RIGHT OF WAY PROTECTION AND RESTORATION**

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#### **A. GENERAL**

The contractor shall protect the right-of-way and minimize the damage from construction operation.

Good soil erosion practices shall be practiced during all construction operations.

Depending on the location of the work, the federal and state environmental protection agencies or others may stipulate construction practices and crew behavior requirements in or around environmentally sensitive areas, such as cultural resource sites. Vendors shall adhere to any such stipulated construction practices and crew behavior requirements.

#### **B. RESTORATION**

The contractor shall keep the premises where work is being performed in a neat, clean, and orderly condition, and upon completion of the work, contractor shall remove all tools and equipment from the premises, and any debris shall be removed and disposed of by contractor.

The right-of-way shall be restored to its original or better condition within 24 hours or as soon as practicable, following cable placing operations.

Where the cable is plowed in place, restoration shall be accomplished by driving a tractor or heavy truck over the plow furrow until the plowed area conforms to the

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surrounding terrain. A vibratory roller having a weight of three tons and a width of 4-6' may also be used.

In areas where open trench methods are used and backfill mounded over the trench, grading or filling will be required for final restoration of the right-of-way.

All rock and debris brought to the surface and left after backfilling shall be removed and disposed of, as directed by RNHN .

All areas disturbed by the construction activities shall be restored and re-seeded per the Department of Transportation requirements as follows (or equivalent requirements set forth by the Department of Transportation in the state where the construction is located):

## **SECTION FOUR**

### **REQUIRED REGENERATION FACILITIES LOCATIONS**

The intent of the specification is to allow the bidder to have both the flexibility and design creativity to provide connectivity solutions for the two RNHN networks. The bid design requires that the regeneration facility(ies) be located as close as possible to the address listed in RFP Section III. Bidders will be allowed to have a regeneration facility located up to **but not exceeding 1,500 feet from the address specified.**

If the bidder includes a regeneration facility location that is a greater distance than 1,500 feet, it **MUST BE CLEARLY CALLED OUT** in their RFP response. No leased premises may be included as part of the response. All regeneration facilities must be a separate, free standing location.

**See Section III for the required regeneration locations in the RFP.**

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**Attachment OSP-2**

Rural Nebraska Health Care Network

FIBER OPTIC SPLICING AND TESTING SPECIFICATIONS

RNHN RFP 2009-00

Prepared by:



**RNHN**  
**Backbone Fiber RFP**

## **Section One**

### **SPICING CONSIDERATIONS FOR FIBER OPTIC CABLES**

- I. **Fiber Specifications:** The fiber used in OSP construction should comply with TIA 492 Standard on single mode fiber.

**II. Bidder Fiber Test and Acceptance Requirements**

Bidder must comply with RUS Telecommunication Program Standards & Specifications – Section 1755 RUS specifications for all cable acceptance, splice arrangements, armor cable continuity, method of measurements, and testing.

- III. **Personnel Safety:** The following safety precautions shall be observed:

Safety glasses shall be worn when handling glass fibers;

Never view open-ended fibers with the naked eye or a magnifying device (improper viewing of a fiber end that is transmitting light may cause irreparable eye damage); and

Dispose of bare scrap fibers by using the sticky side of a piece of tape to pick up and discard loose fiber ends. Fiber scraps easily penetrate the skin and are difficult to remove.

**IV. Equipment Requirements:**

Fiber optic splices shall be made in areas where temperature, humidity, and cleanliness can be controlled. Fusion splicing techniques may require a splicing vehicle equipped with a work station that will allow environmental control.

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Only fusion splicing techniques are permitted on RNHN projects.

Fusion splicing machines shall be kept in proper working condition. Regular maintenance in accordance with the machine manufacturer's recommendations shall be observed.

A certified optical time domain reflectometer (OTDR) shall be used for testing splices. The OTDR shall be stationed at the access point or launch point for testing individual splices as they are made and for end-to-end signature tests for the fiber optic link.

V. **Completion of the Splice:**

In accordance with the method of splicing selected by the borrower, the splice shall be completed by fusing the splice.

Each spliced fiber shall be routed through the organizer tray one at a time as splices are completed. The fibers shall be organized one at a time to prevent tangled spliced fibers. The splice case manufacturer's recommendation shall be followed concerning the splice tray selection.

VI. **Fiber Optic Testing Documentation:** Fiber optic testing shall be performed in accordance with Rural Utility Specifications RUS Form 515, Standard For Acceptance Tests and Measurements of Telephone Plant and Section 1755. See internet link:

[http://www.usda.gov/rus/telecom/publications/pdf\\_files/rus\\_form\\_515-draft8-2005.pdf](http://www.usda.gov/rus/telecom/publications/pdf_files/rus_form_515-draft8-2005.pdf)

Required formats to be delivered to RNHN upon project completion:

1. Bi-directional OTDR Reading
  - a. Medical Network 24 Count Cable – tested between each required facility endpoint and or regeneration facility.
  - b. Commercial Network 48 Count Cable – tests of optical spans not to exceed 60 miles. OTDR tests are required to be performed between 40 and 60 miles.
2. Format of information delivery
  - a. Map of test points for each cable with A & Z locations identified
  - b. Deliver a paper OTDR Trace Report – revealing A & Z locations, fiber # for all fibers
  - c. PDF of OTDR Trace Reports – labeled
  - d. Electronic format Trace file .TRC of all fibers by cable, with A & Z locations

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- VII. **Cable Acceptance:** Installed cable shall be tested and pass the inventory and acceptance testing specified in the Telephone System Construction Contract (Labor and Materials), RUS Form 515 and Section 1755.

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**ATTACHMENT EO-1**

# **RURAL NEBRASKA HEALTHCARE NETWORK**

NETWORK ELECTRONIC SPECIFICATIONS

RNHN RFP 2009-00

Prepared By:



## **NETWORK ELECTRONICS OVERVIEW**

Network electronics shall include three distinct functions described here. The transport network shall consist of Layer 2 Ethernet switches referred to as Switch in the logical diagrams. The IP

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network shall consist of Layer 3 routers and switches that create a network of connections that home to core routers that enable routes among the hospitals and to external entities such as the Internet, National Lambda Rail, and Internet 2. The Medical Network shall consist of SNMP Based alarm collectors at each site with out of band access either through POTS lines or cellular modems. A brief description of the logical connectivity follows, along with specifications for the individual components required for the bid response. Final quantities of items shall be based on the physical design delivered in the Outside Plant section of this RFP.

The Layer 2 network shall be Ethernet switches using SFP based transmitters to connect hospitals and clinics together diversely through the optical fiber path delivered in the OSP section of this RFP. Switches shall be installed redundantly to ensure the east and west paths can be isolated on separate equipment to ensure that a component failure does not result in loss of connectivity to a site. Regeneration sites may include only one switch. The Layer 2 network should separate hospital capacity from clinic capacity. The Medical Network should have a backbone capacity of 2 gigabits with a redundant 1 gigabit access connection for each hospital. The Medical Network must accommodate growth to 5 gigabits backbone capacity. The clinic backbone should have a capacity of 1 gigabit with redundant 1 gigabit access connection for each clinic.

The IP network shall consist of dual edge routers in each hospital connected diversely to Layer 2 switches and consist of a single edge router in each clinic connected diversely to Layer 2 switches. Each edge router shall have a path configured to one of two core routers also connected to the Layer 2 network. These core routers shall have BGP enabled and will act as gateways to all external connectivity. As such, the edge routers shall form a network with connectivity being managed by the core routers. The core routers should accommodate leased gigabit Ethernet connections for outside connectivity.

The Medical Network shall consist of a console server at each end point. This console server shall be connected to all dry contact wiring, and shall be capable of connection to SNMP ports, POTS lines, environmental sensors and RS-232 management ports. Configuration and connectivity of the console servers to a central system shall be the responsibility of the management organization, not part of this RFP.

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Responses to the Network Electronics component of this RFP shall include:

Specific quantities of each network component required to create a functional network at all hospitals, clinics and at two core router locations

Incremental cost to increase hospital backbone capacity to 5 gigabits in 1 gigabit increments

Five years pre-paid maintenance on each component

Installation and documentation of all components

Configuration and documentation of all components to enable IP (Layer 3)

Test Data consisting of the following:

1. Layer 2
  - a. throughput
  - b. connectivity among switches
2. Layer 3 (IP Network)
  - a. throughput
  - b. connectivity among routers
  - c. connectivity to Denver for each router
3. Medical Network
  - a. proper function of dry contacts
  - b. proper function of environmental sensors

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**ETHERNET SWITCHES**

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**CAPACITY**

- Hospital support initial capacity of 2 Gbps.
- Clinics support initial capacity of 1 Gbps.
- Support growth to 5 Gbps of capacity.

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**INTERFACES**

- Gigabit Ethernet
- Replaceable SFP optics

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**LINK AND PATH PROTECTION**

- IEEE 802.3ad LACP
- IEEE 802.1w RSTP

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**ETHERNET STANDARDS**

- VLAN tunneling (Q-in-Q)
- IEEE 802.1ab Link Layer Discovery Protocol
- IEEE 802.3ah EFM OAM
- IEEE 802.1s MSTP
- VLAN Translation
- Classification based on IEEE802.1d priority
- Committed and excess information rate

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**NETWORK MANAGEMENT**

- SNMP, SNMP MIB II (RFC 1213)
- Y.1731 performance monitoring
- IEEE 802.1ag connectivity fault management
- RADIUS client
- Syslog
- Port mirroring
- Broadcast containment
- SSH2

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**CHASSIS**

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- Redundant hot swappable AC/DC power supplies.

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**CORE ROUTER**

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**CAPACITY**

- Support throughput of 10 Gbps.

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**INTERFACES**

- Support Gigabit Ethernet interfaces
- Support IEEE 802.3ad LACP

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**STANDARDS**

- Able to support up to 1,000,000 IPv4 routes.
- Support for MPLS, BGP, OSPF.
- Support VPLS, RFC 2547 VPNs

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**NETWORK MANAGEMENT**

- SNMP, SNMP MIB II (RFC 1213)
- RADIUS authentication
- Remote syslog
- SSH

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**CHASSIS**

- NEBS compliant
  - AC or DC powered versions.
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**EDGE ROUTER**

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**CAPACITY**

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- Support throughput of 1 Gbps.

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**INTERFACES**

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- Support Gigabit Ethernet interfaces
- Support IEEE 802.3ad LACP

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**STANDARDS**

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- Able to support up to 512,000 IPv4 routes.
- Support for MPLS, BGP, OSPF.
- Support VPLS, RFC 2547 VPNs

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**NETWORK MANAGEMENT**

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- SNMP, SNMP MIB II (RFC 1213)
- RADIUS authentication
- Remote syslog
- SSH

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**CHASSIS**

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- NEBS compliant
- AC or DC powered versions.

## **CONSOLE SERVER**

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### Interfaces

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- 2 x 10/100 Ethernet interfaces
- 8 x RS-232 serial ports
- 12 x dry contacts

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### SENSORS

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- 1 x temperature and humidity sensor
- 1 x water sensor

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### FEATURE SUPPORT

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- Web-based management interface
- SSH secure access
- SNMP management capable
- Modem dial-in access

## **CLINIC ETHERNET SWITCHES**

Ethernet Switches

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### **CAPACITY**

- Support capacity of 1 Gbps

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### **INTERFACES**

- Gigabit Ethernet
- Replaceable SFP optics

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### **LINK AND PATH PROTECTION**

- IEEE 802.3ad LACP
- IEEE 802.1w RSTP

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### **ETHERNET STANDARDS**

- VLAN tunneling (Q-in-Q)
- IEEE 802.1ab Link Layer Discovery Protocol
- IEEE 802.3ah EFM OAM
- IEEE 802.1s MSTP
- VLAN translation
- Classification based on IEEE802.1d priority
- Committed and excess information rate

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### **NETWORK MANAGEMENT**

- SNMP, SNMP MIB II (RFC 1213)
- IEEE 802.1ag connectivity fault management
- RADIUS client
- Syslog
- Port mirroring
- Broadcast containment
- SSH2

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### **CHASSIS**

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- Single power supply acceptable

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**ATTACHMENT EO-2**

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NETWORK ELECTRONIC DIAGRAMS

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DIAGRAM ONE

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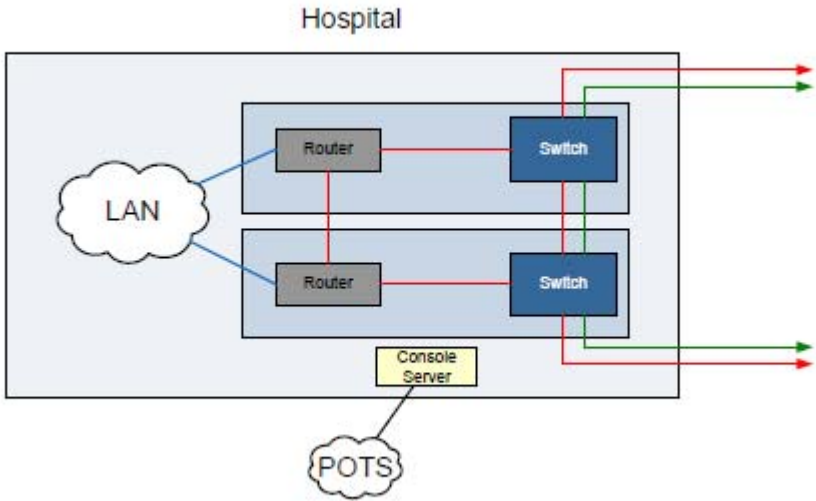
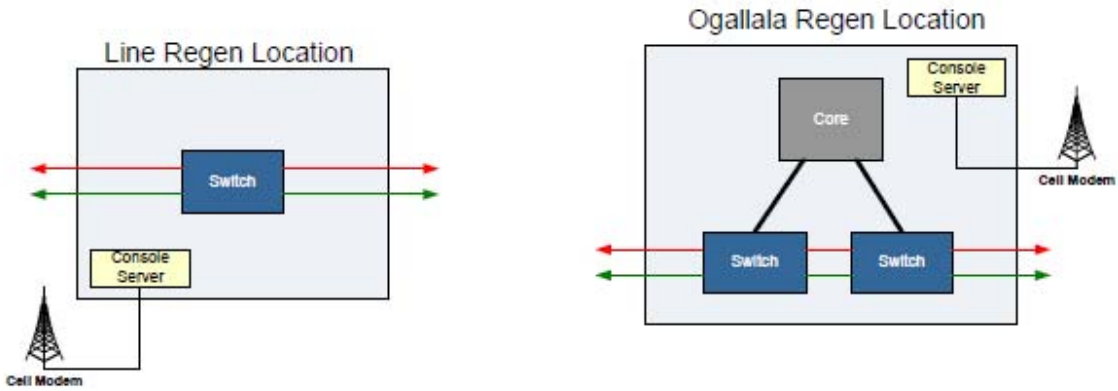
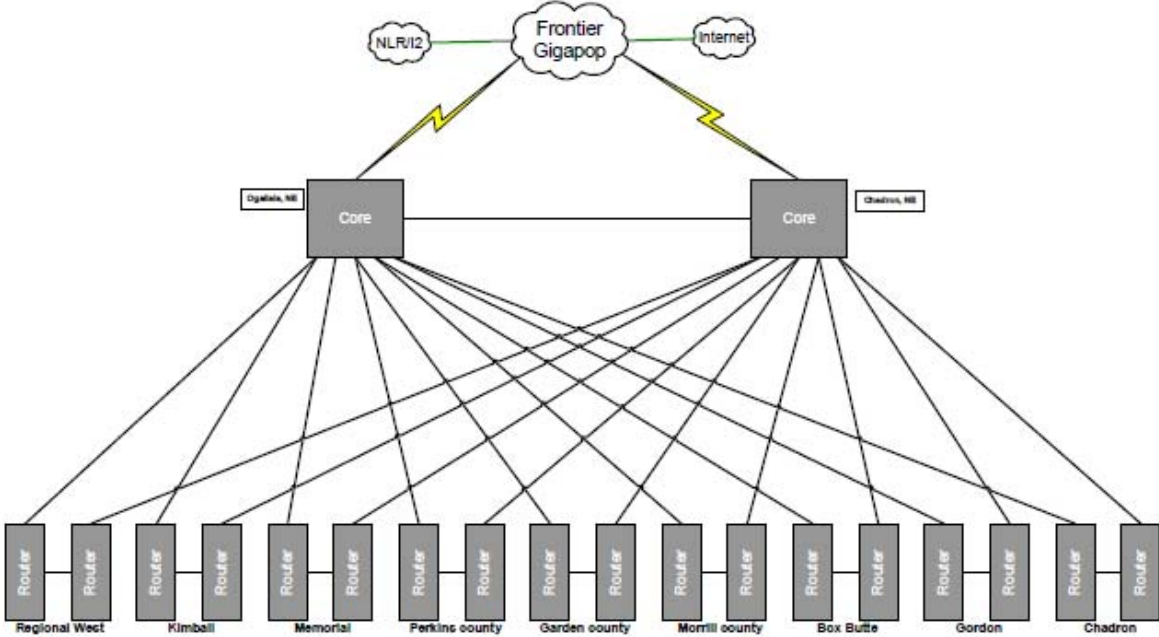


DIAGRAM TWO



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DIAGRAM THREE



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DIAGRAM FOUR  
(Core Router Location)

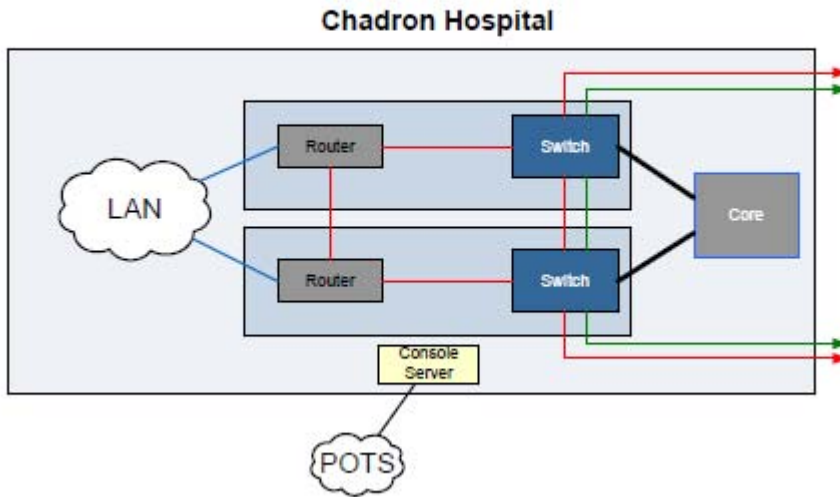
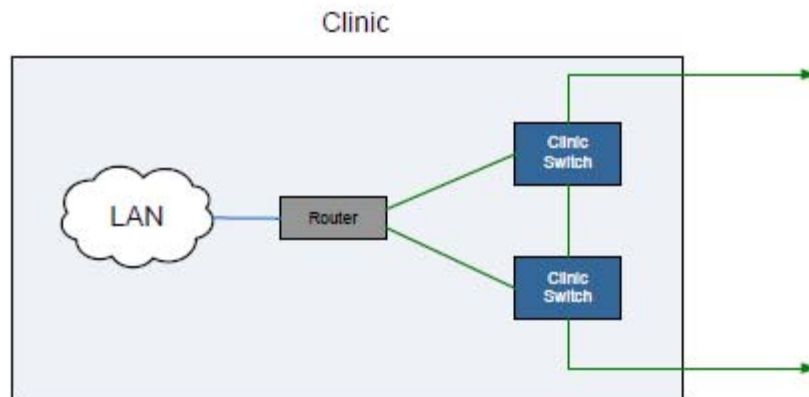
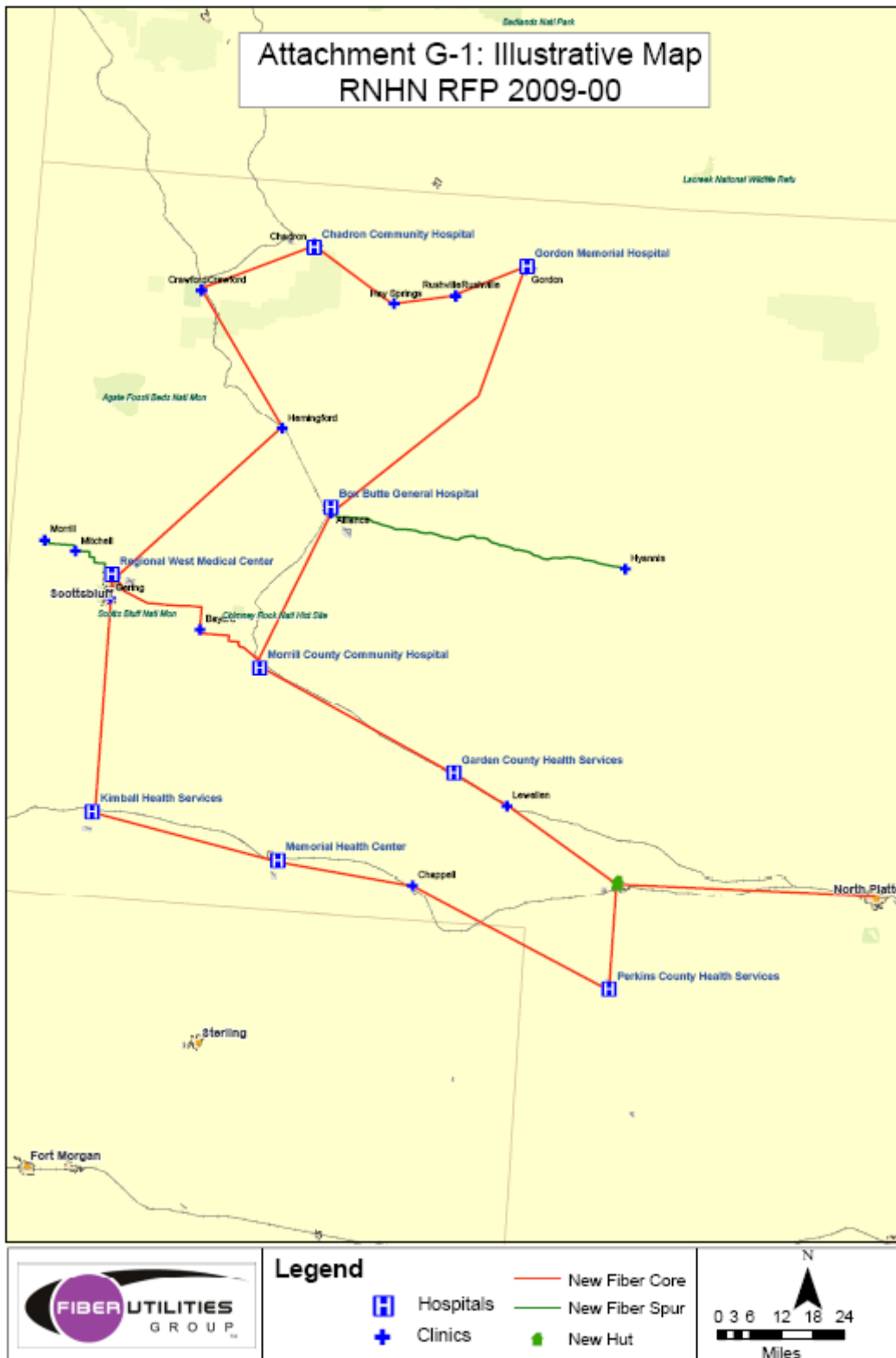


DIAGRAM FIVE



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**ATTACHMENT LC-1**

# **RURAL NEBRASKA HEALTHCARE NETWORK**

Leased Circuit Requirements

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LEASED CIRCUIT REQUIREMENTS

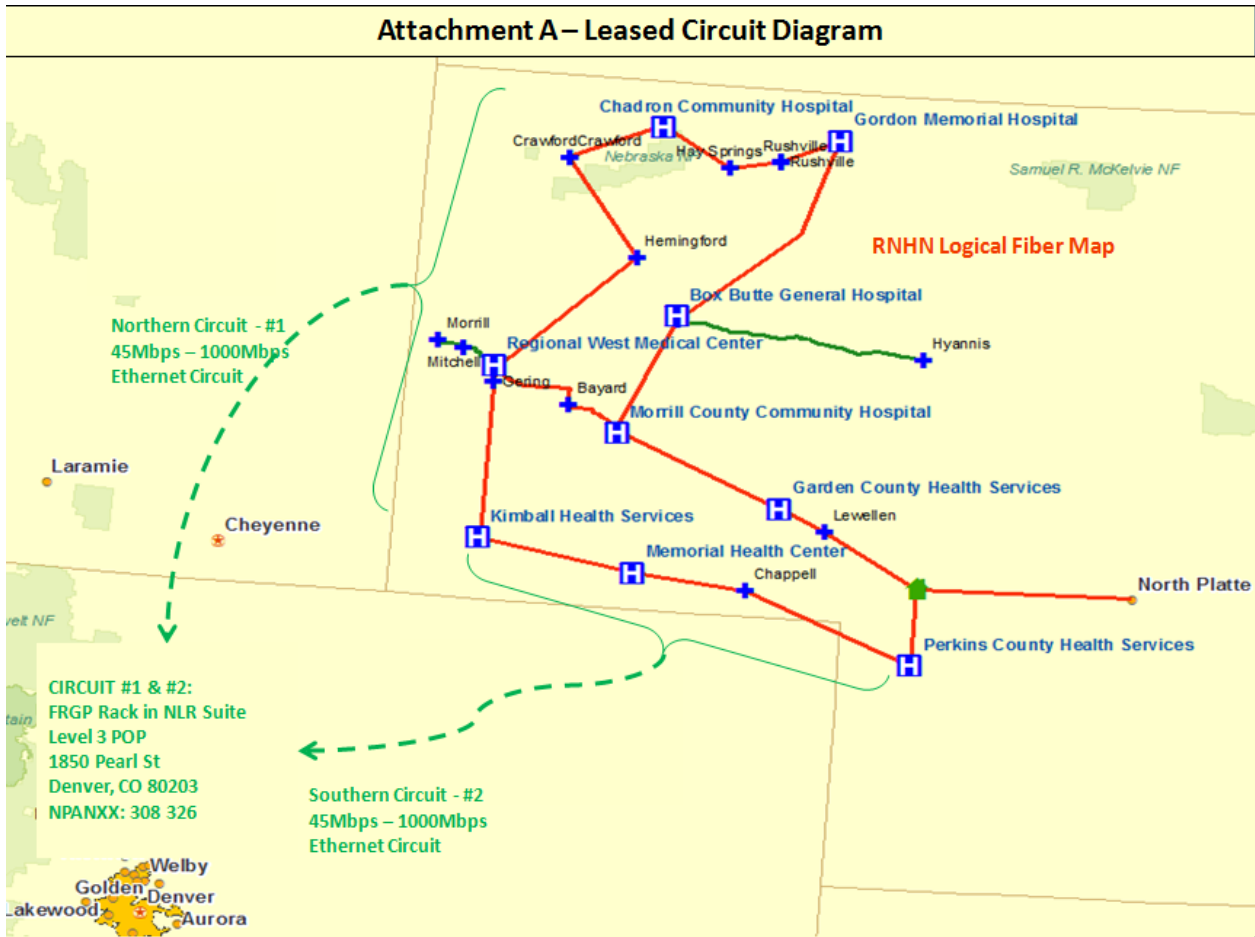


FIGURE 1 –LEASED CIRCUIT DIAGRAM

Figure 1 above is a logical representation of the overall network (both the RNHN networks and the leased network circuit).

RNHN seeks bids meeting the connectivity specifications set forth in this RFP which connect the Medical Network to the Front Range Giga-Pop (FRGP). The request is for 2 circuits from any of the 9 hospital locations in the RNHN. These circuits are required to be diverse back to Denver. The hospital addresses are listed below in Table 2.

Table 2. RNHN Hospital Addresses

NETWORK LOCATION	ADDRESS	CITY	ST	ZIP	NPA NXX
Box Butte General Hospital	2101 Box Butte Ave	Alliance	NE	69301	308-762
Morrill County Community Hosp	1212 S Street	Bridgeport	NE	69336	308-262
Chadron Community Hospital	821 Morehead St	Chadron	NE	69337	308-432
Gordon Memorial Hospital	300 E 8th St	Gordon	NE	69343	308-282
Perkins County Hospital	900 Lincoln Ave	Grant	NE	69140	308-352
Kimball Health Svc	505 S Burg St	Kimball	NE	69145	308-235

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<b>Garden County Health Svc</b>	<b>1100 W 2nd St</b>	<b>Oshkosh</b>	<b>NE</b>	<b>69154</b>	<b>308-772</b>
<b>Regional West Medical Ctr</b>	<b>4021 Avenue B</b>	<b>Scottsbluff</b>	<b>NE</b>	<b>69361</b>	<b>308-635</b>
<b>Memorial Health Ctr</b>	<b>645 Osage St</b>	<b>Sidney</b>	<b>NE</b>	<b>69162</b>	<b>308-254</b>

The leased network circuits must provide a minimum of 45Mbps up to a Gig-E symmetrical Ethernet over any transport technology selected by the vendor.

The Layer 2 transport can be pure Ethernet over fiber (with or without wave division multiplexing), Ethernet over SONET, or Ethernet over wireless licensed spectrum. Whatever transport technology is chosen, the connection must be capable of passing 802.1Q VLAN tags through the lit services connections.

The interface at the network location points of presence will be a Layer 2 backbone switch with a Gig-E interface connected via a single mode, LC jumper to a 1310 small form pluggable (SFP) optic.

Each network location listed as a circuit interconnection option will provide adequate: a) physical space, b) conditioned power, c) environmental control, and d) controlled security for required equipment.

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**FRGP INTERCONNECTION**

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The FRGP location in Denver may terminate at any of the following locations: (in order of priority)

1. FRGP rack in the National LambdaRail suite, in the Level 3 POP at 1850 Pearl Street, Denver, CO
2. FRGP rack on the University of Colorado Denver Campus at 1200 Larimer, Denver, CO
3. Rocky Mountain Inter-Exchange (RMIX) at 910 15<sup>th</sup> Street, Denver, CO

There is no guarantee of space availability, sufficient power, or any other collocation arrangement for these locations. Vendors must contact the location owners to discuss such collocation arrangements. Vendors are solely responsible for determining and securing collocation sites for the term of the leased network circuits.

Non-recurring charges and monthly recurring charges incurred as a result of the network collocation site chosen for interconnection are the responsibility of the vendor, and subject to vendor-negotiated collocation agreements with the location owner(s).

RNHN is open to discussion during the scheduled vendor conference calls of possible alternative interface points of presence.

It is anticipated that the interface at the FRGP will be a Layer 3 router with a Gig-E interface connected via a single mode, LC jumper to a 1310 small form pluggable (SFP) optic.

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**BANDWIDTH REQUIREMENTS**

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Provided it meets all specifications stated in this RFP, the project is technology / infrastructure and vendor agnostic regarding the underlying transport medium employed to deliver bandwidth to the endpoint network elements. If wireless technology is utilized it must be licensed spectrum.

The minimum bandwidth requirement for the connection between the RNHN fiber network and the FRGP is 45Mbps of symmetrical Ethernet. Bandwidth may be proposed at higher levels than 45Mbps if desired (up to 1 Gbps) in one of the following increments:

- 45 Mbps, (DS3)
- 100 Mbps, (Fast-Ethernet)
- 150 Mbps, (OC-3)
- 600 Mbps, (OC-12)
- 1,000 Mbps (Gig-E)

The goal of these requirements is to support the basic electronic health records systems as well as the tele-health and educational applications anticipated in the near future.

### **AVAILABILITY REQUIREMENTS**

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Availability is a percentage of total time that service is operative when measured over a 30 consecutive day (720 hour) period. Ethernet service is considered inoperative when service is degraded to a level in which the packets are not passed between the user point of demarcation and the host point of demarcation. The end-to-end availability test standard for Ethernet service specified for the leased network circuits is:

<b>Specification</b>	<b>Availability</b>
Single Cable Entrance	99.5%

The response time by the vendor shall be no greater than 3 hours from notification by the network operator or the end user of the service interruption. Vendor shall provide proactive notification and update the network managers hourly on progress attempts to fix the incident. Vendor shall also provide an escalation contact list.

These requirements will be included in the contract with successful vendors.

### **PERFORMANCE REQUIREMENTS**

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Performance is noted in terms of packet loss and latency. Packet Loss Ratio is defined as percentage of in-profile Ethernet frames not reliably delivered between the edge router to the ingress/egress point of the core network router over a given measurement interval.

Latency is defined as the average time it takes a packet to travel from the edge router to the ingress/egress point of the RNHN network router over a given measurement interval.

The Packet Loss Ratio and Latency standards for end-to-end portions of Ethernet service are

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<b>SPECIFICATION</b>	<b>MONTHLY AVERAGE</b>
Packet Loss Ratio	No more than 0.5%
Latency	No more than 60ms

These requirements will be included in the contract with successful vendors.

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**LEASED CIRCUITS CAPACITY AND MAINTENANCE  
REQUIREMENTS**

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Operations and maintenance of leased circuits capacity by the vendor is required for the lit capacity to function correctly. Such operations and maintenance of the lit capacity must be provided either pursuant to the terms of the fifteen (15) year capacity IRU with a five (5) year right of renewal by RNHN, or pursuant to the terms of any alternative proposal made pursuant to the “Alternatives” Section of the RFP.

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**TESTING AND ACCEPTANCE**

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Vendors are required to fully describe their service / performance level agreements in their bid submissions.

These service / performance agreements must minimally meet the criteria explicitly defined in the RFP requirements.

Service and performance level details will be considered material criteria for awarding contracts.

As a specific contract(s) is awarded under this program, a testing and acceptance process will be outlined on an individual case basis by the network operator for each specific contract awarded based on the information provided in the proposal of the winning vendor(s). This testing and acceptance process will be consistent with customary and normal industry procedures and practices used to validate and verify the technology used to deliver the required bandwidth and the needs of the users of the access connections.

Testing and acceptance verification procedures will be performed by the network operator.

Upon the successful verification of service / performance criteria as outlined in the bid via completion of the testing and acceptance process, a formal acceptance document will be issued to the vendor by the network operator.

Vendors may invoice RNHN for services immediately upon receipt of the acceptance document. Payment is subject to the “Payment Process” section below.

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**FIFTEEN (15) YEAR LIT CAPACITY IRU**

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RNHN is a long-term initiative designed to improve patient care through broadband connectivity.

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All bids meeting the specifications listed in the RFP should be priced as a fifteen (15) year lit capacity IRU with a five (5) year renewal right by RNHN. No other terms will be considered or accepted except as set forth below in "Alternatives."

A fifteen (15) year lit capacity IRU is defined as a one-time, up-front payment covering all costs, which explicitly includes operations and maintenance (see "Lit Capacity and Equipment Operations and Maintenance Requirements" of the RFP) from the time of acceptance (see "Testing and Acceptance" of the RFP) through to the end of the consecutive fifteen (15) years.

All bids must contain a renewal clause that must be at the sole option of RNHN and shall not "evergreen" without explicit RNHN approval. Under the terms of the renewal clause, RNHN and vendor may renegotiate more favorable terms if mutually desired. Moreover, the renewal will include the required maintenance and operation of the lit capacity.