

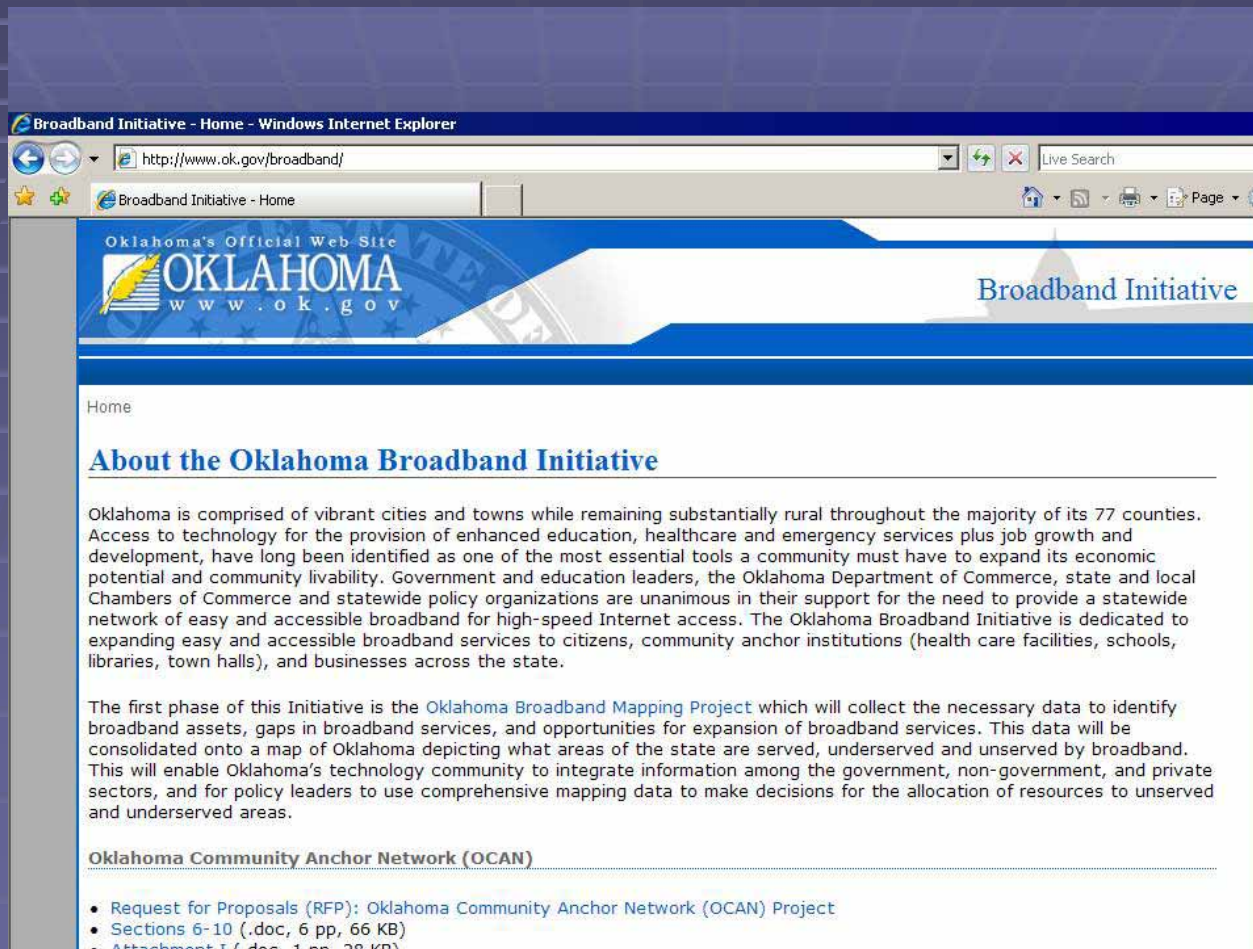
# OKLAHOMA BROADBAND MAPPING PROJECT

- *Oklahoma awarded grant in January, 2010 under the State Broadband Data Development (SBDD) program conducted by the National Telecommunications Information Administration (NTIA) to map Broadband availability across the state and nation depicting served, unserved and underserved areas*
- *State contracted with Sanborn Map Company to collect Broadband service and coverage information from Broadband providers across the state*
- *Of 134 providers in Oklahoma, 76 have participated in this voluntary program*
- *Information gathered from providers is validated by Sanborn and verified by a team at the OU Center for Spatial Analysis*

# OKLAHOMA BROADBAND MAPPING PROJECT

- *Information is basis for creating the Oklahoma Broadband maps and is submitted to NTIA to be incorporated into the National Broadband Maps ([www.broadbandmap.gov](http://www.broadbandmap.gov) )*
- *Provisions of the grant require the State to complete two rounds of data collection and submissions to NTIA each year*
  - *Four have been completed - two in 2010, two in 2011*
- *Oklahoma Broadband Initiative web site: [www.ok.gov/broadband](http://www.ok.gov/broadband)*
  - *Navigate to Oklahoma Broadband Mapping Project*
    - *Coverage maps and Apps for both citizens and Community Anchor Institutions (hospitals, schools, libraries, etc.) to view Oklahoma Broadband maps - fill out Broadband surveys - take speed tests*
    - *Secure App for providers to view and validate the data they have submitted for mapping*

# OKLAHOMA BROADBAND INITIATIVE WEB SITE



The image shows a screenshot of a web browser displaying the Oklahoma Broadband Initiative website. The browser's address bar shows the URL <http://www.ok.gov/broadband/>. The website header features the Oklahoma state seal and the text "Oklahoma's Official Web Site" and "www.ok.gov" on the left, and "Broadband Initiative" on the right. The main content area includes a "Home" link, a section titled "About the Oklahoma Broadband Initiative", and a list of links under the heading "Oklahoma Community Anchor Network (OCAN)".

Home

## About the Oklahoma Broadband Initiative

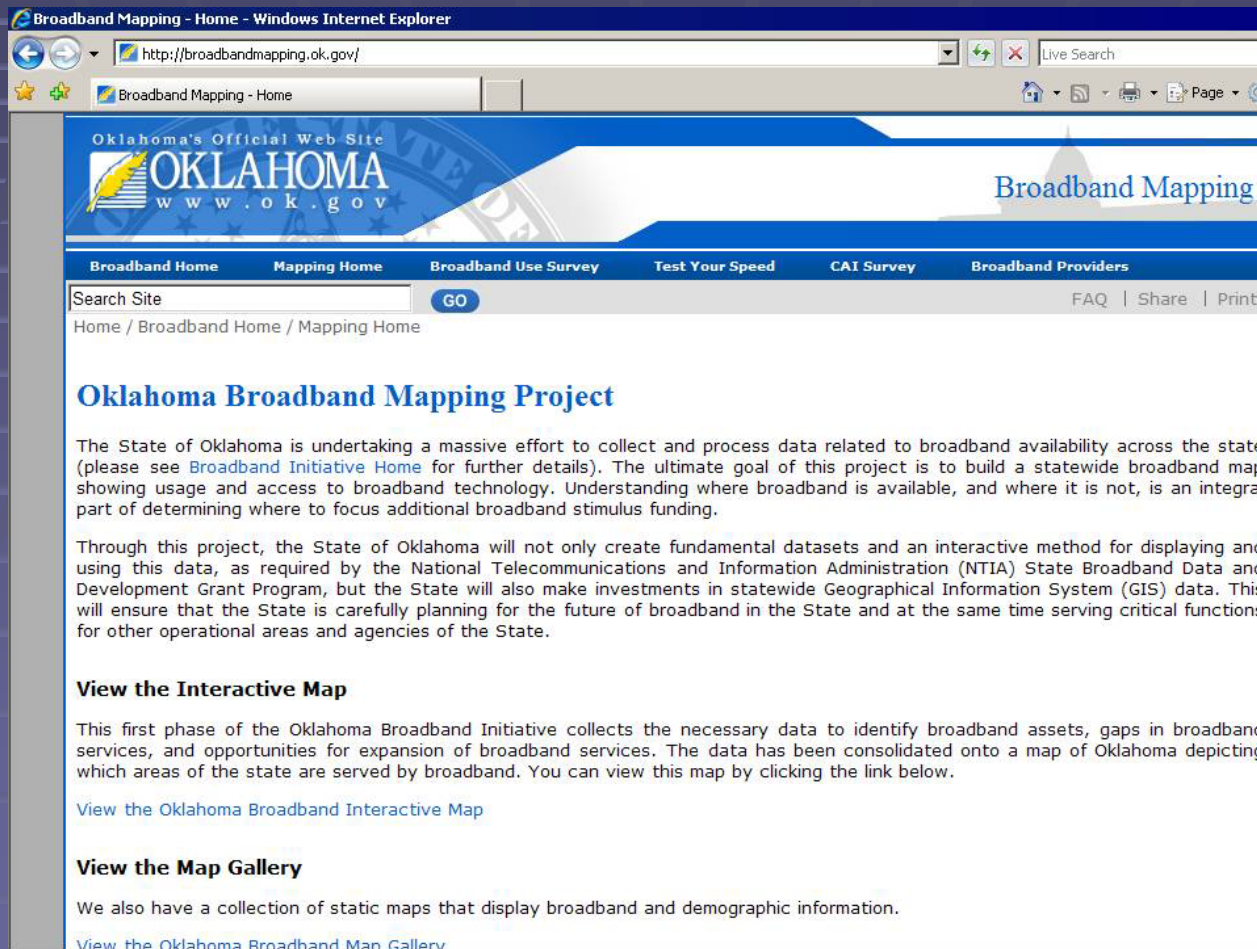
Oklahoma is comprised of vibrant cities and towns while remaining substantially rural throughout the majority of its 77 counties. Access to technology for the provision of enhanced education, healthcare and emergency services plus job growth and development, have long been identified as one of the most essential tools a community must have to expand its economic potential and community livability. Government and education leaders, the Oklahoma Department of Commerce, state and local Chambers of Commerce and statewide policy organizations are unanimous in their support for the need to provide a statewide network of easy and accessible broadband for high-speed Internet access. The Oklahoma Broadband Initiative is dedicated to expanding easy and accessible broadband services to citizens, community anchor institutions (health care facilities, schools, libraries, town halls), and businesses across the state.

The first phase of this Initiative is the [Oklahoma Broadband Mapping Project](#) which will collect the necessary data to identify broadband assets, gaps in broadband services, and opportunities for expansion of broadband services. This data will be consolidated onto a map of Oklahoma depicting what areas of the state are served, underserved and unserved by broadband. This will enable Oklahoma's technology community to integrate information among the government, non-government, and private sectors, and for policy leaders to use comprehensive mapping data to make decisions for the allocation of resources to unserved and underserved areas.

### Oklahoma Community Anchor Network (OCAN)

- [Request for Proposals \(RFP\): Oklahoma Community Anchor Network \(OCAN\) Project](#)
- [Sections 6-10 \(.doc, 6 pp, 66 KB\)](#)
- [Attachment 1 \(.doc, 1 pp, 28 KB\)](#)

# OKLAHOMA BROADBAND MAPPING PROJECT WEB SITE



The screenshot shows a web browser window titled "Broadband Mapping - Home - Windows Internet Explorer". The address bar displays "http://broadbandmapping.ok.gov/". The page header features the Oklahoma state seal and the text "Oklahoma's Official Web Site" and "OKLAHOMA www.ok.gov". The main navigation menu includes links for "Broadband Home", "Mapping Home", "Broadband Use Survey", "Test Your Speed", "CAI Survey", and "Broadband Providers". A search bar is located below the navigation menu, with a "GO" button and links for "FAQ", "Share", and "Print". The main content area is titled "Oklahoma Broadband Mapping Project" and contains the following text:

The State of Oklahoma is undertaking a massive effort to collect and process data related to broadband availability across the state (please see [Broadband Initiative Home](#) for further details). The ultimate goal of this project is to build a statewide broadband map showing usage and access to broadband technology. Understanding where broadband is available, and where it is not, is an integral part of determining where to focus additional broadband stimulus funding.

Through this project, the State of Oklahoma will not only create fundamental datasets and an interactive method for displaying and using this data, as required by the National Telecommunications and Information Administration (NTIA) State Broadband Data and Development Grant Program, but the State will also make investments in statewide Geographical Information System (GIS) data. This will ensure that the State is carefully planning for the future of broadband in the State and at the same time serving critical functions for other operational areas and agencies of the State.

**View the Interactive Map**

This first phase of the Oklahoma Broadband Initiative collects the necessary data to identify broadband assets, gaps in broadband services, and opportunities for expansion of broadband services. The data has been consolidated onto a map of Oklahoma depicting which areas of the state are served by broadband. You can view this map by clicking the link below.

[View the Oklahoma Broadband Interactive Map](#)

**View the Map Gallery**

We also have a collection of static maps that display broadband and demographic information.

[View the Oklahoma Broadband Map Gallery](#)

# OKLAHOMA BROADBAND INTERACTIVE MAP

The screenshot displays the Oklahoma Broadband Interactive Map website within a Windows Internet Explorer browser window. The browser's address bar shows the URL <http://broadbandmapping.ok.gov/OKInteractiveMap.aspx>. The website header features the Oklahoma state logo and the text "Oklahoma's Official Web Site" and "www.ok.gov". The main navigation bar includes links for "Broadband Home", "Mapping Home", "Broadband Use Survey", "Test Your Speed", "CAI Survey", and "Broadband Providers". A search bar is present with a "GO" button and a "BETA MAP" label. Below the search bar, there are links for "Speed Test Results" and "Anchor Institutions". The central map area shows the state of Oklahoma with various cities labeled, including Garden City, Dodge City, Wichita, Tulsa, Oklahoma City, and Fort Worth. The map is overlaid with green and purple areas representing broadband availability. On the right side, a "Mapping" control panel is visible, featuring a "Basemap" dropdown menu set to "Terrain", a "Broadband Map" dropdown menu set to "Broadband Availability", and a legend indicating that green represents "Wireline" and purple represents "Wireless". There is also a "Legislative Districts" dropdown menu set to "None" and an "Available Providers" dropdown menu. The footer of the page contains copyright information for 2011 State of Oklahoma and links for "Accessibility", "Help Desk", "Policies", "About Oklahoma's Web Portal", and "Feedback".

# *OKLAHOMA BROADBAND MAPPING PROJECT*

- The site's interactive maps include ten data layers, which can be toggled on/off. Layers include:
  - Broadband Availability
  - Cable Availability
  - DSL Availability
  - Fiber Availability
  - Mobile Wireless
  - Fixed Wireless
  - Number of Wireline Providers
  - Number of Wireless Providers
  - Wireline Speeds
  - Wireless Speeds

# OKLAHOMA BROADBAND MAPPING PROJECT

- *Project was originally funded for two years but State has been awarded a supplemental grant to fund this project for another three years thru 2014*

Questions?



# Broadband Validation and Planning

10/28/2011

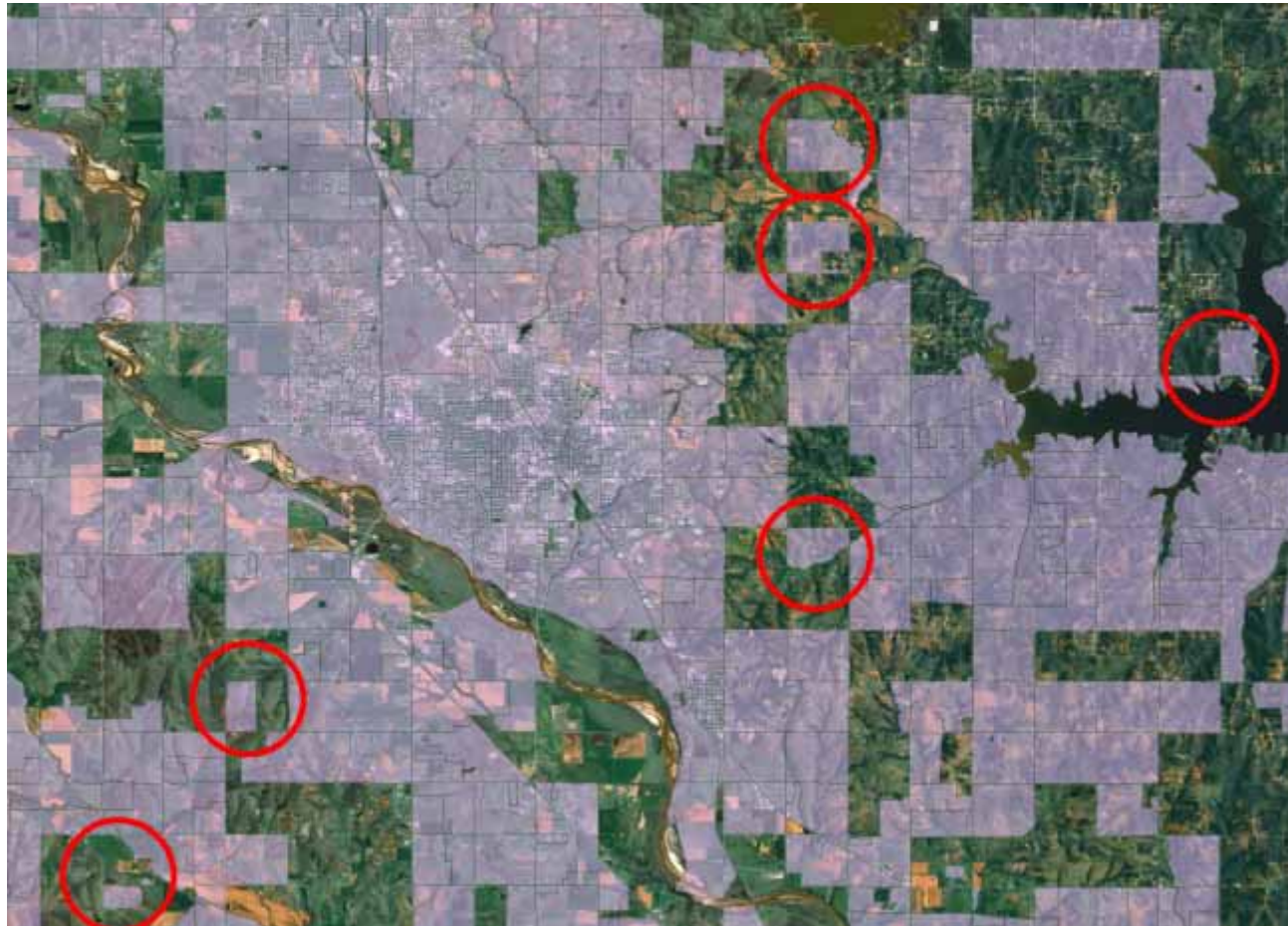


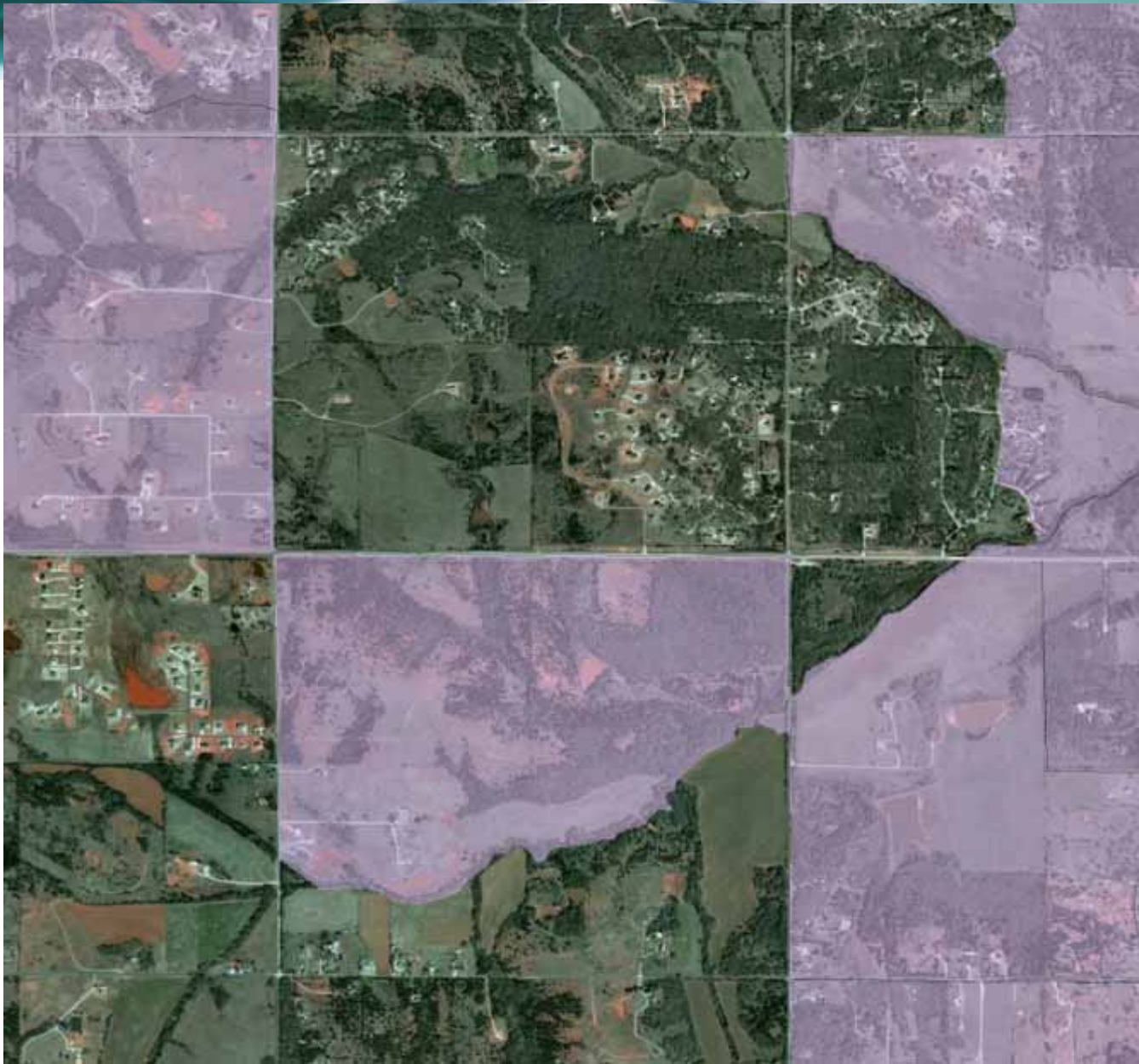
# Independent Validation by OUCSA

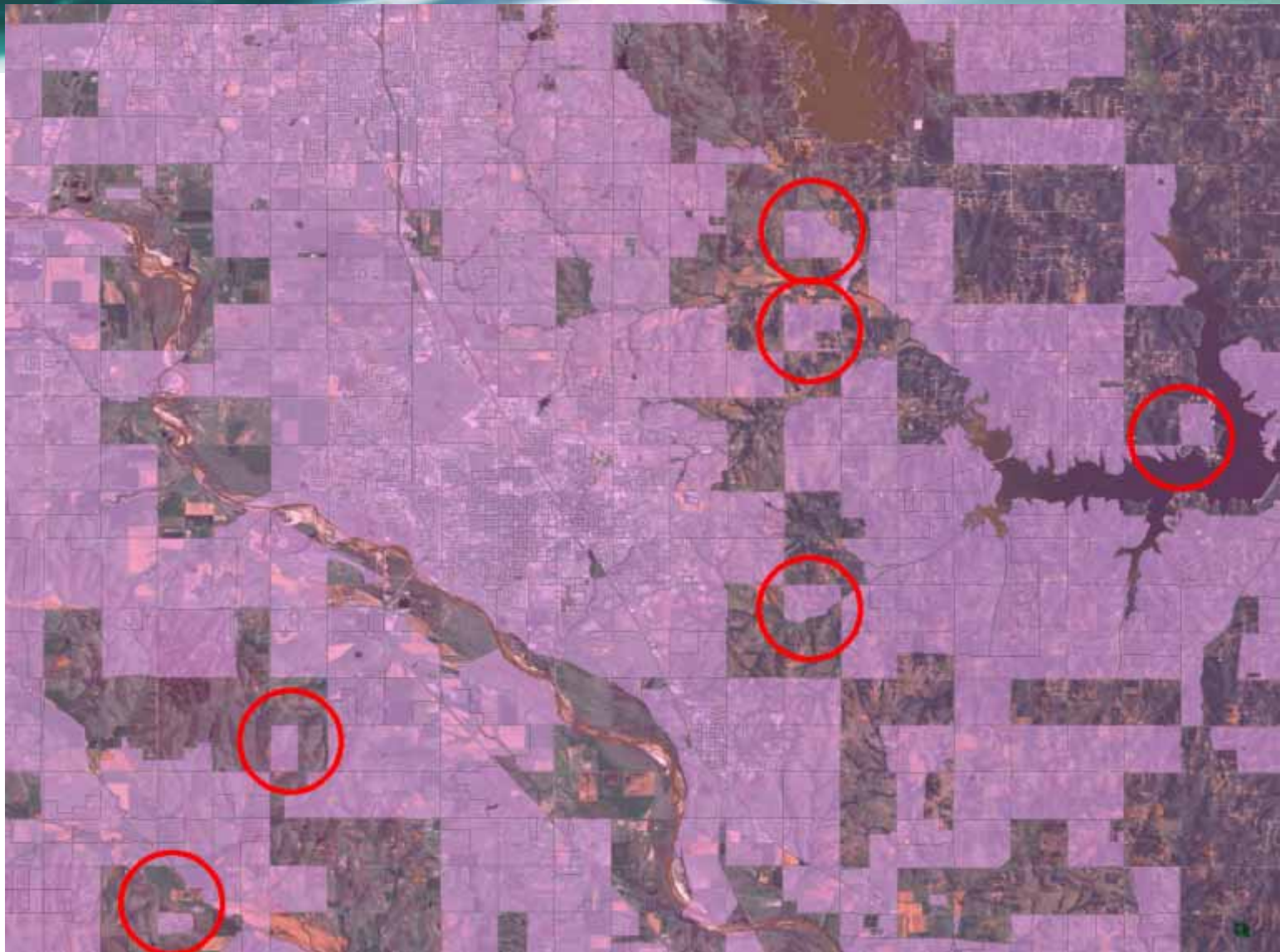
- Validation independent of Sanborn data processing and compilation
- Broadband coverage map provided by Sanborn
- Bottom-up approach to determining broadband availability across the state with an emphasis on reaching **unserved** and **underserved** populations through surveys
- Validate the broadband coverage map:
  - **False positive**: blocks mapped as served but not
  - False negative: blocks mapped as unserved but are
- Priority: focused on false positive
- Estimate the percentage of population and household in false positive

# Examples of blocks in question

east Norman; wirelines only







**With wireless coverage, the entire area is shown fully covered.**

# Examples of false negative



# OUCSA Validation Activities

## Survey

Mail out

Email

Snowball Sampling

Telephone

Face-to-Face

# OUCSA Validation Activities

## Survey

On-line at..

<https://selectsurvey.net/ouit/TakeSurvey.aspx?SurveyID=m42M7o8>

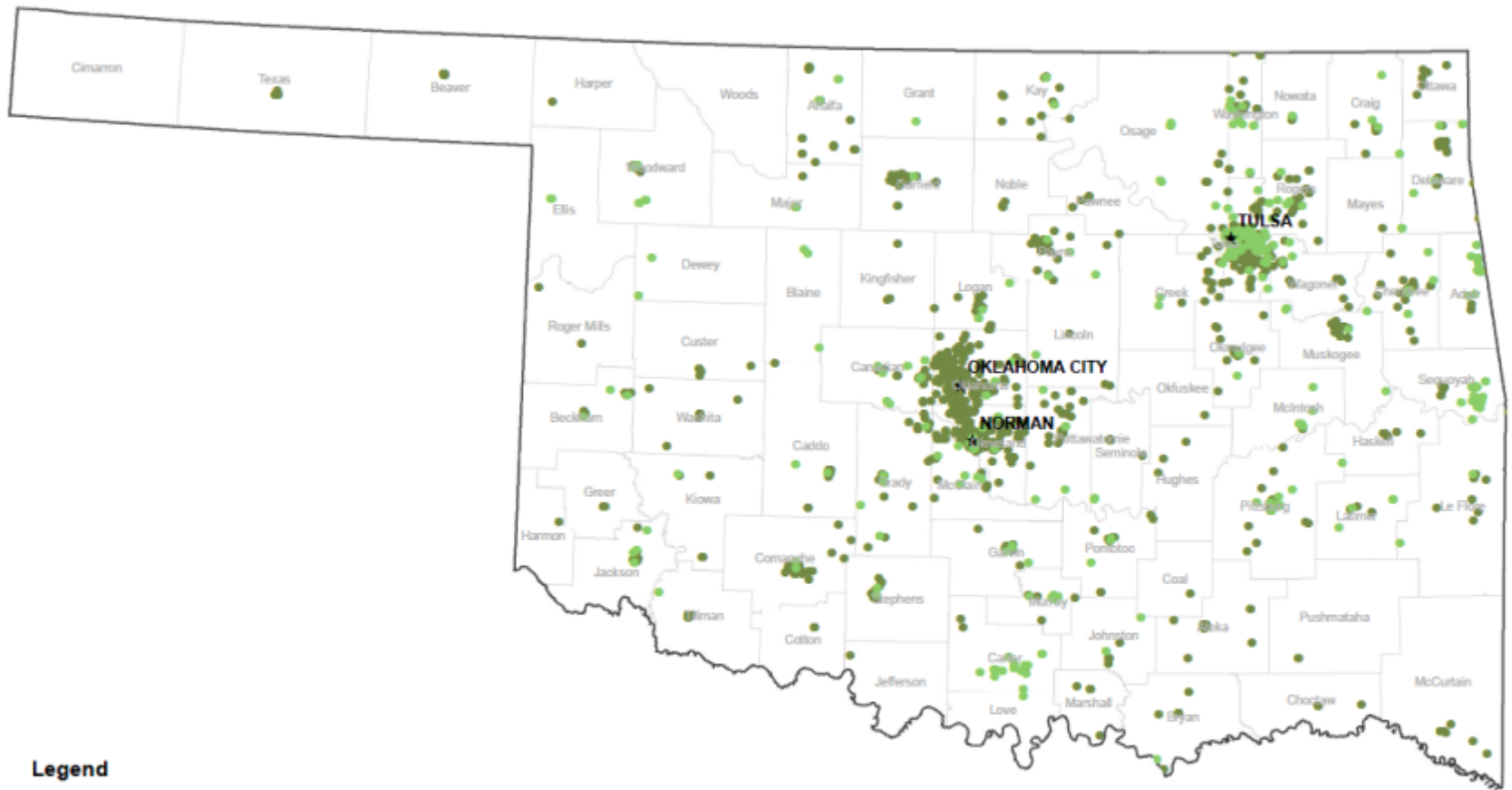
Adobe clickable form at...

<http://ags.ou.edu/~myuan/broadbandsurvey.pdf>



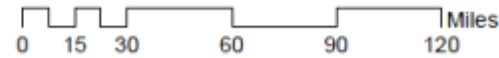
# OUCSA Validation Activities

- Telephone
  - Contact with community Anchor Intuitions (CAIs) in areas where there is a lack of information for mapping.
    - Current calling area: NW quadrant of the state with over 4,000 organizations to contact.
    - Also ask CAI representatives to forward broadband survey, speed test and other information materials to family, friends, colleagues, etc.
    - To increase our completion rate, 3 part-time phone surveyors have been hired to assist in conducting phone interviews
      - Each interviewer works 6 – 10 hours per week
      - Working on obtaining working phone numbers for all organizations on the CAI list.
  - Once CAI completed, we will start calling private business listings in identified unserved/underserved areas.
    - We will continue to look for other publically available phone listings for individuals/organizations within the target counties.



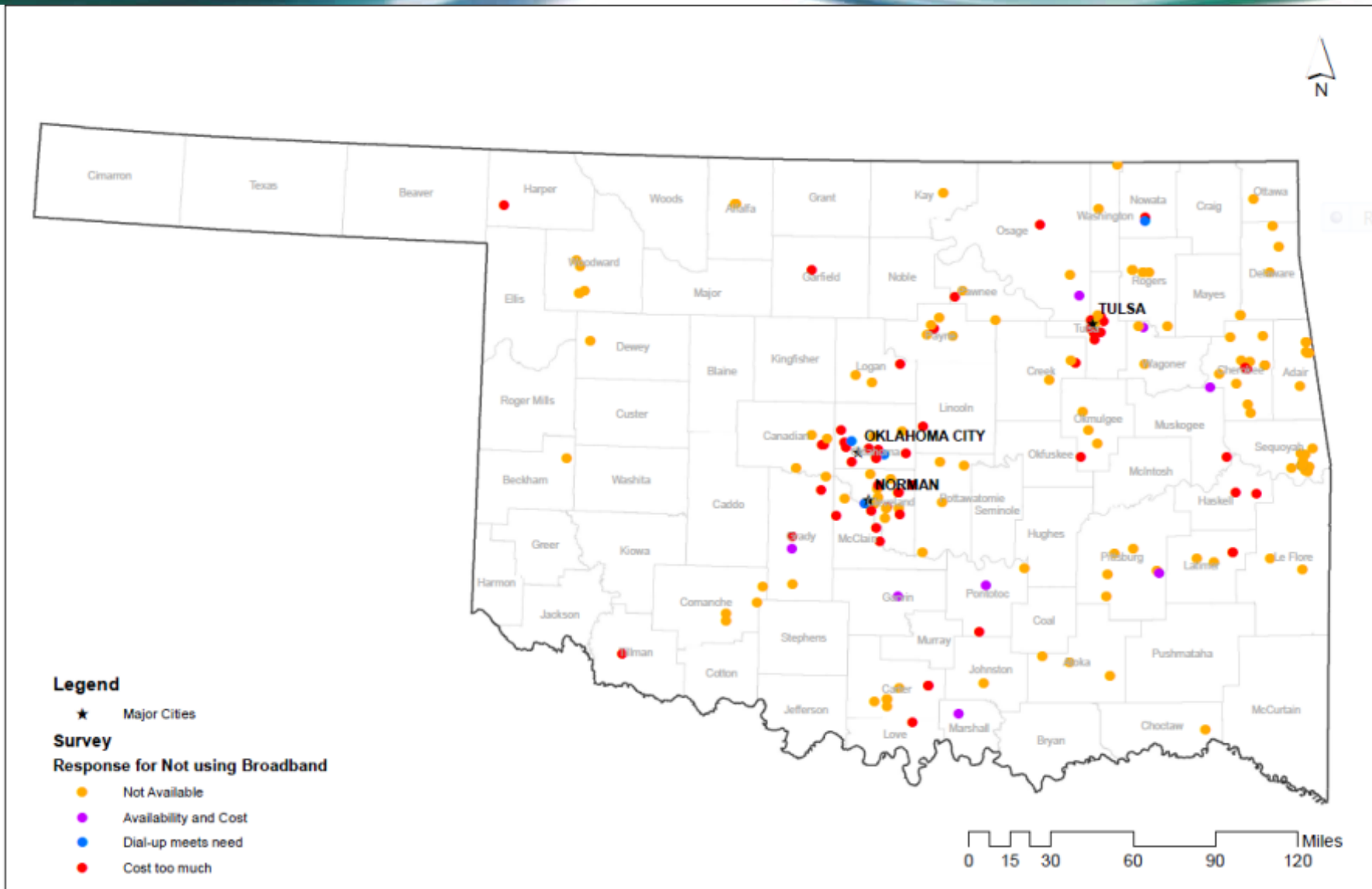
**Legend**

- ★ Major Cities
- Mail Survey
- Online Survey



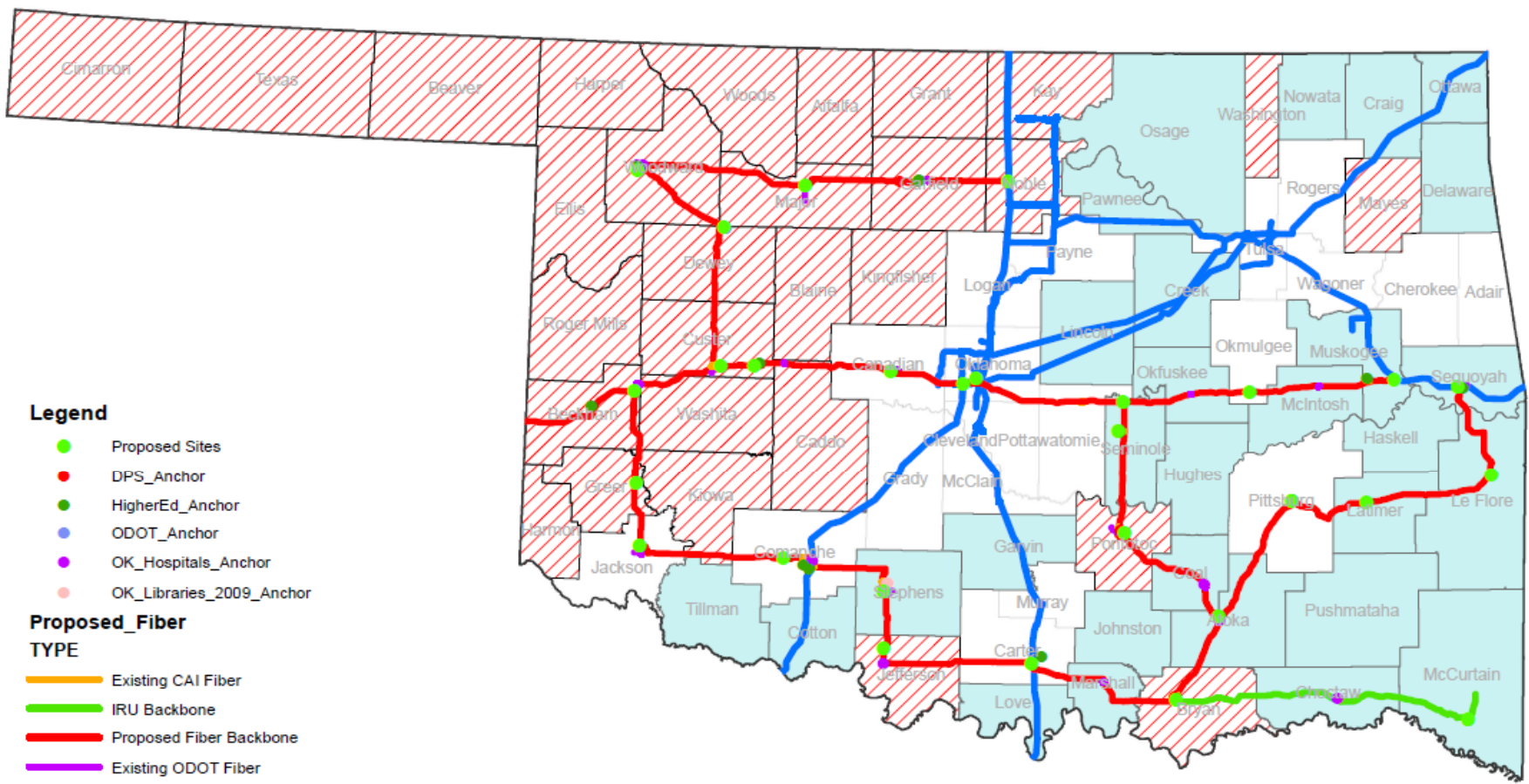
All Survey Points  
Broadband Validation and Data Gathering





## Non-Use Survey Points Broadband Validation and Data Gathering





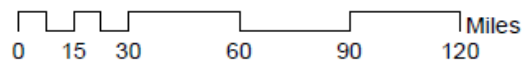
**Legend**

- Proposed Sites
- DPS\_Anchor
- HigherEd\_Anchor
- ODOT\_Anchor
- OK\_Hospitals\_Anchor
- OK\_Libraries\_2009\_Anchor

**Proposed\_Fiber**

**TYPE**

- Existing CAI Fiber
- IRU Backbone
- Proposed Fiber Backbone
- Existing ODOT Fiber
- State Fiber
- CAI Call Area PH2 - Sep 2011
- CAI Call Area PH 1 - May 2011



**CAI Calling Areas**  
Broadband Validation and Data Gathering





## OUCSA Validation Activities

- Targeting 1400 calls per month for September and October with students calling.
- Twitter, Wordpress.com and Facebook social media campaigns
  - An event notification was added in August on Craigslist.
- Face-To-Face
  - When traveling for activities, have started stopping at small communities along route to ask about broadband services at local businesses
  - Identify community targets for ground canvass campaign



# OUCSA Validation/Planning Activities

- Conduct analysis of maps to identify unserved/underserved pockets in the state.
- Develop Media campaign and Statewide Taskforce to assist and support effort
- Begin ground canvassing campaign in targeted unserved and underserved areas.
- Presentations at state conferences that attract professional groups with a vested interest in a strong broadband backbone
- Identify key leaders and organizations that work with rural, vulnerable or underserved groups in the state.

# Face to Face: Communities Along the Proposed Fiber Route

Ada	Checotah	Geary	Meridian	Shady Point
Addington	Cleo Springs	Granite	Midwest City	Shawnee
Alderson	Clinton	Haileyville	Millerton	Soper
Altus	Coalgate	Hartshorne	Mooreland	Stringtown
Arapaho	Comanche	Henryetta	Oakland	Taloga
Ardmore	Cornish	Hinton	Okemah	Texola
Atoka	Cromwell	Hugo	Oklahoma City	Tushka
Bennington	Del City	Idabel	Panama	Valliant
Blair	Duncan	Kingston	Phillips	Warner
Bokchito	Durant	Kiowa	Poteau	Waurika
Boswell	El Reno	Krebs	Putnam	Weatherford
Bowlegs	Elk City	Lahoma	Red Oak	Weleetka
Brent	Empire City	Lehigh	Ringling	Wilburton
Broken Bow	Enid	Lone Grove	Sallisaw	Wilson
Byng	Erick	Madill	Savanna	Wister
Cache	Fairview	Marlow	Sawyer	Woodward
Caddo	Fanshawe	McAlester	Sayre	Yukon
Caney	Fort Towson	McLoud	Seiling	Lawton
Canute	Foss	Mead	Seminole	
Central High	Garvin	Meno	Shady Grove	

# OKLAHOMA BROADBAND PLANNING PROJECT

- *Planning project is a component of the Mapping project with separate funding that was awarded as part of the Mapping grant*
- *State has now collected Broadband service and coverage information from Broadband providers for two years yielding a base of information and maps from which to launch the Planning project*
- *The University of Oklahoma Center for Spatial Analysis, which has a team performing verification of provider data for the Mapping project, will also have a team working on the Planning project*
- *Project is commencing this quarter and will be completed in fourth quarter of 2013*



# *PLANNING PROJECT PRIMARY TASKS*

- OUCSA will support the following goals and tasks for the broadband planning project:
- Analyze mapping data and, based on the Oklahoma Broadband coverage maps and responses from mailings and phone surveys, define the challenges and opportunities to adoption of broadband faced by different demographic and social groups
- Create maps to show regional differences in broadband adoption challenges and develop education materials and a public relations campaign tailored to the regional challenges and opportunities identified
- Collect consumer data concerning the use of broadband in underserved and unserved areas, including information technology capabilities and understanding

## *PLANNING PROJECT PRIMARY TASKS, Cont.*

- Collect cost data (monthly fees and usage limits) at cities and towns across Oklahoma where previous tasks suggest that cost is a factor for broadband adoption and compare the cost/fees with average household income in different ethnic groups
- Assemble statewide meetings for professional and tribal communities: conservation, county assessors, public safety, emergency managers and first responders, public school administrators, tribal governments, mayors, etc.
- Prepare and hold display booths at statewide meetings with survey sheets available for attendees to fill out or take away for further distributions
- Identify and develop priorities and strategies for expanding broadband accessibility in the underserved and unserved areas

## *PLANNING PROJECT PRIMARY TASKS, Cont.*

- Invite leaders from communities and organizations to participate on a Broadband Planning Committee to discuss and evaluate the data and prioritize areas for broadband expansion and promotion
- Develop a plan and materials tailored to Oklahoma for a consumer education and awareness initiative to increase the adoption and utilization of broadband throughout Oklahoma
- Develop and hold workshops and community meetings across regions and towns in the state for public education and outreach
- Develop a strategic plan that will leverage community colleges, schools, libraries, hospitals and other key community-based facilities to promote broadband applications and realize broadband potential for community development

Questions?

# OKLAHOMA COMMUNITY ANCHOR NETWORK (OCAN) PROJECT

- *In August, 2010 the state received a grant award in the amount of \$73,998,268 for a Middle Mile CCI (Comprehensive Community Infrastructure) project under the BTOP (Broadband Technology Opportunities Program)*
- *Broadband Last Mile vs. Middle Mile:*
  - *Last Mile – The connection between your home (or wireless device) and your broadband service provider*
  - *Middle Mile - The connections between your broadband service provider and the Internet*

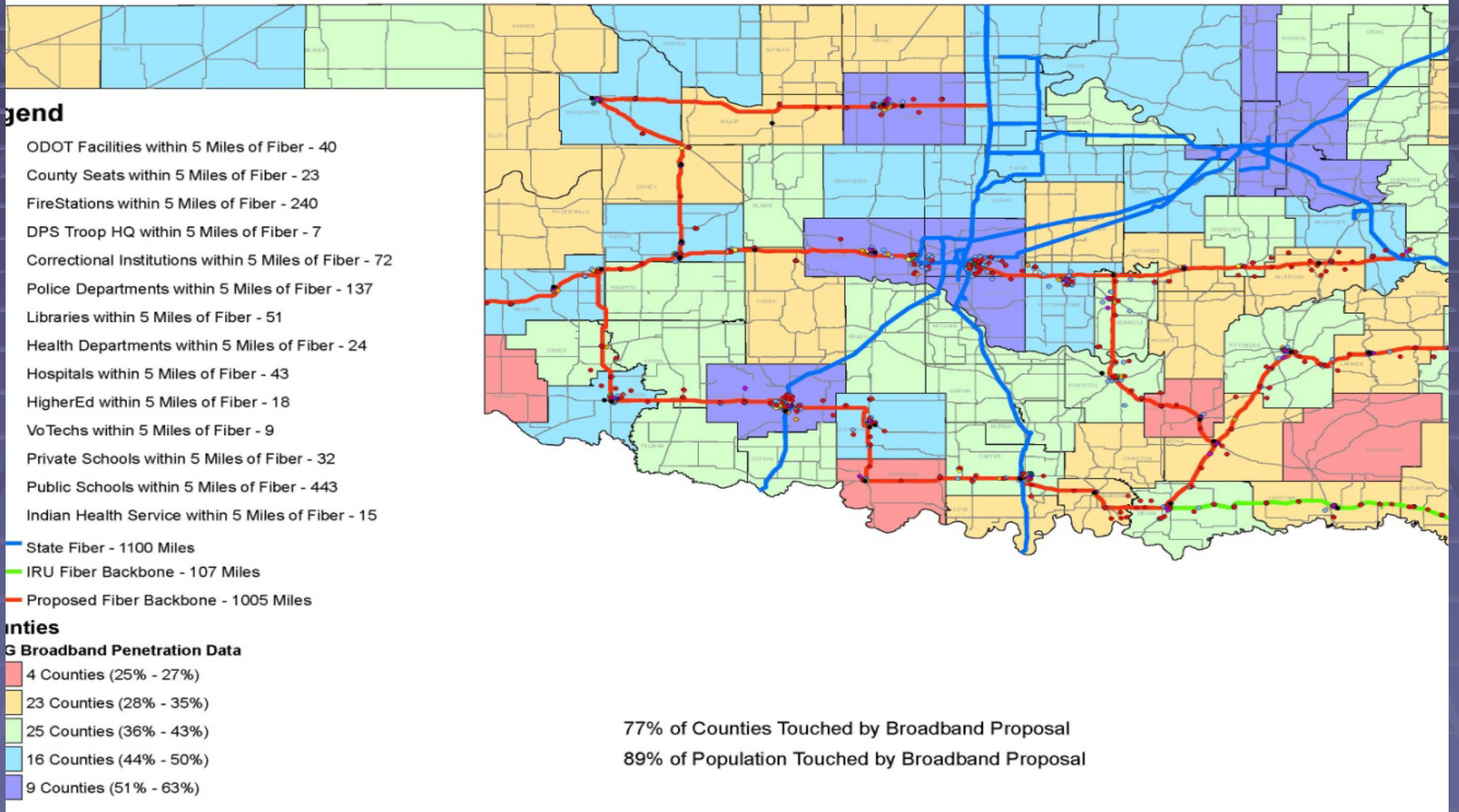
# OCAN Continued

- *The Oklahoma Community Anchor Network (OCAN) project will complete a build out of 1,005 miles of new Middle Mile fiber infrastructure*
- *The OCAN project route touches 35 of Oklahoma's 77 counties, approximately 89% of the state's population, and is on state highway right-of-way*
- *The OCAN project will directly connect 32 anchor institutions in underserved and unserved areas of the state where the broadband penetration rate barely reaches 25%*
- *Within five miles of the OCAN project are 1,154 Community Anchor Institutions including schools, libraries, medical or health care providers, public safety entities, community colleges, institutions of higher education, along with other community support organizations and government facilities*

## OCAN Continued

- *When built, the OCAN project will provide the Middle Mile fiber infrastructure commercial providers can connect to for high speed broadband*
- *Commercial providers will provide the Last Mile connections to community Anchor Institutions not directly connected to the OCAN project fiber*

# State of Oklahoma Map - Broadband Proposal for Fiber Backbone



OCAN Project Fiber Backbone is shown in Red



# O CAN PROJECT STATUS

- Environmental Assessment Completed
- Engineering Design To Be Completed by Mid-November
- RFP for 16 Communications Huts – Bids Awarded to Two Vendors
- RFP for 1,000+ Miles of Fiber Optic Cable – Bids Being Reviewed
- RFP's for Construction To Be Issued in December when Engineering Designs Completed – Project divided into 31 segments
- RFP's for Additional Materials – Conduit, Handholes, Etc. – To Be Issued

Questions?

# Oklahoma State Broadband Initiative

## Proposed Fiber Routes by Packages with Segments



### Legend

#### Proposed Sites

##### Hut Required

- NO
- YES
- Workforce OK
- DPS Anchor
- OK Hospitals Anchor
- OK Libraries Anchor
- HigherEd Anchor

#### Proposed Fiber Routes

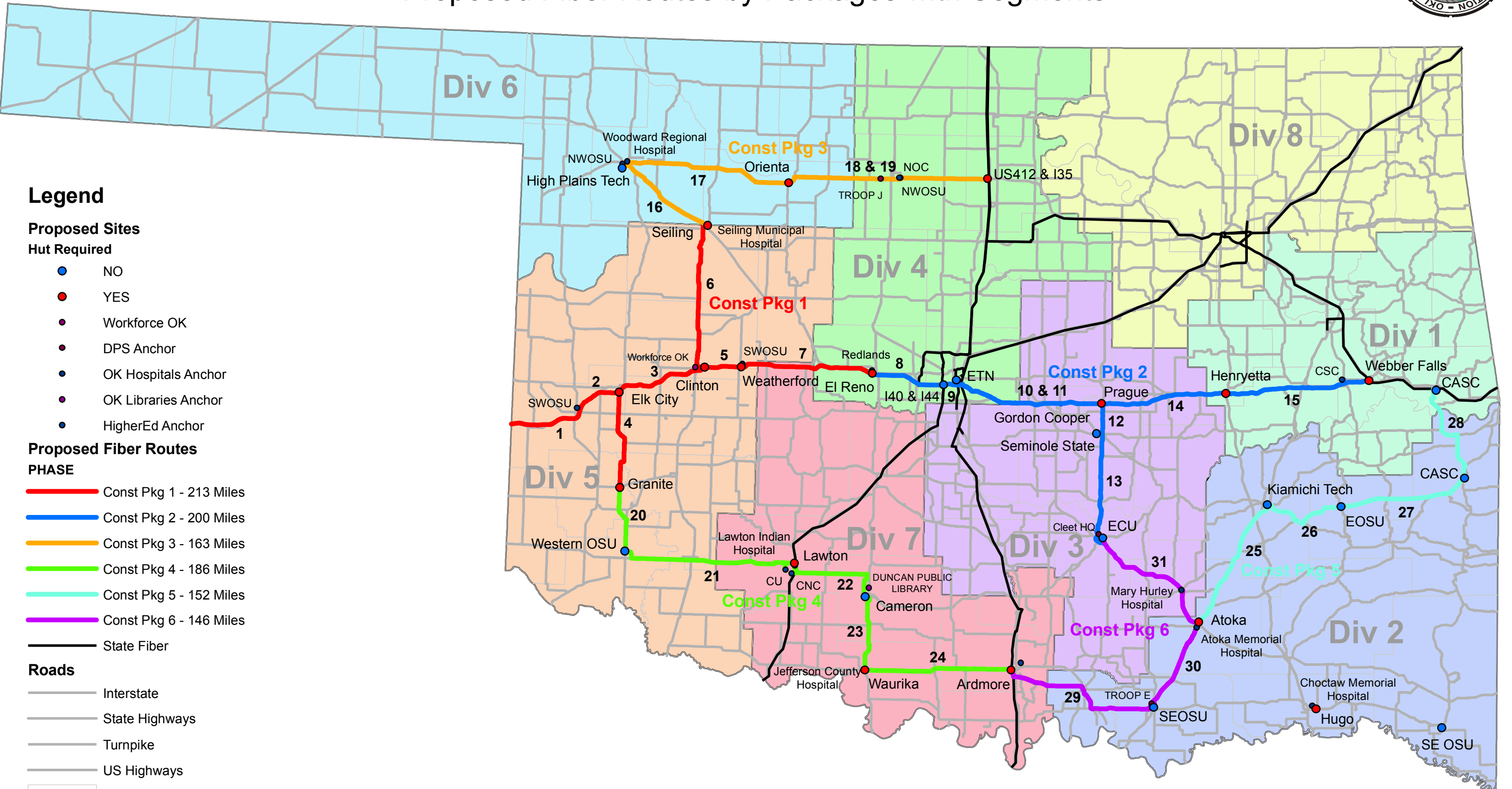
##### PHASE

- Const Pkg 1 - 213 Miles
- Const Pkg 2 - 200 Miles
- Const Pkg 3 - 163 Miles
- Const Pkg 4 - 186 Miles
- Const Pkg 5 - 152 Miles
- Const Pkg 6 - 146 Miles

##### State Fiber

##### Roads

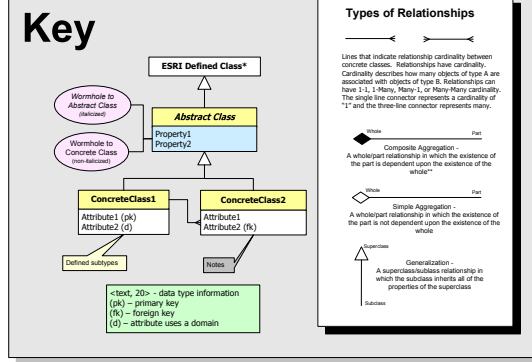
- Interstate
- State Highways
- Turnpike
- US Highways
- Counties



# ArcGIS Telecom Data Model

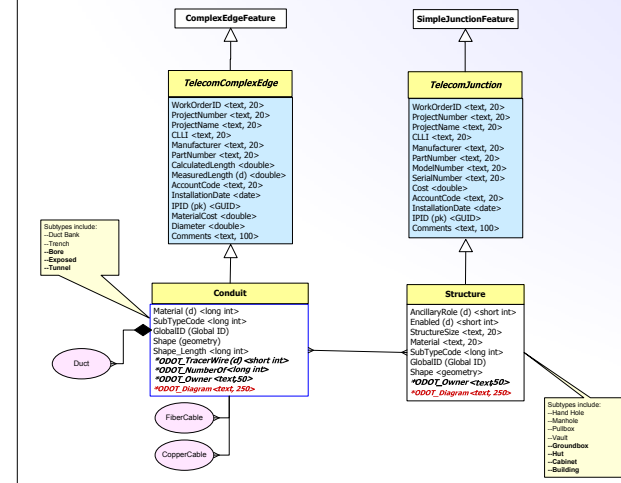
ODOT Telecomm Data Model Version: 6.0  
ULM Design Version: 6.0  
Date: 2/13/2011

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Last Revised: 4/27/2010 Maintained by ESRI

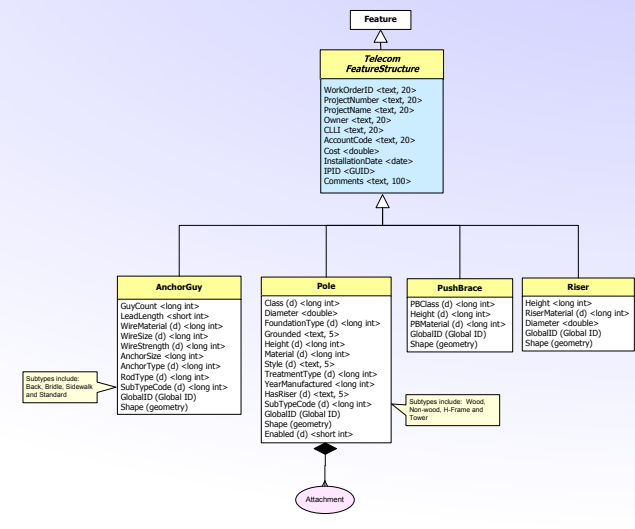


\*Each ESRI Defined Class has a Meta Data subclass that contains the following attributes: CreationUser, DateCreated, DateModified, and LastUser.

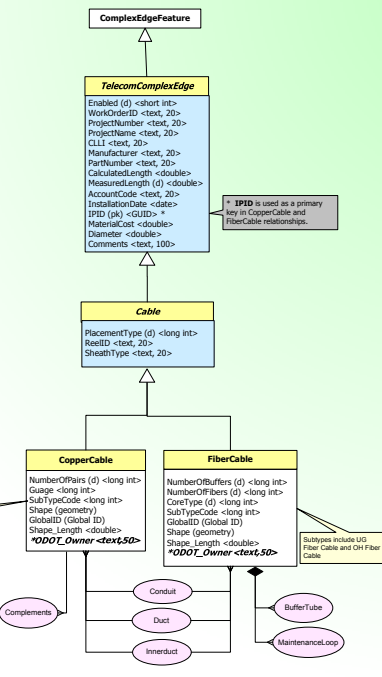
## Underground Structures



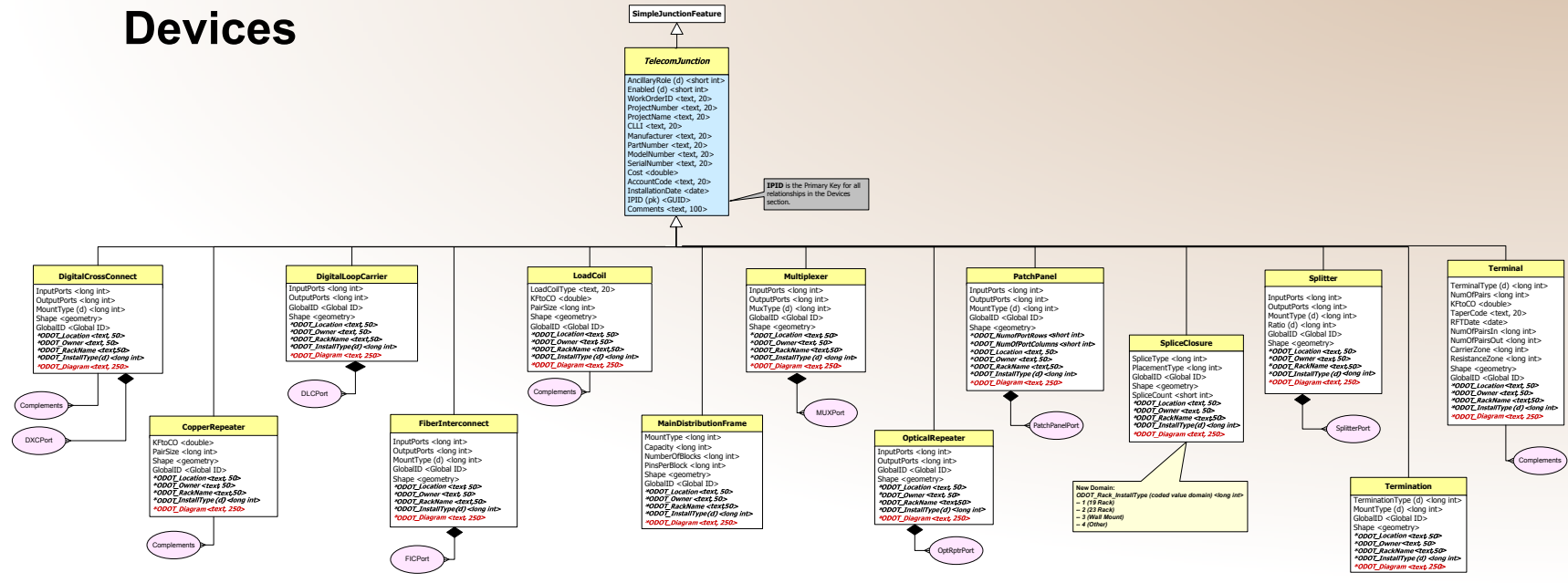
## Overhead Facilities



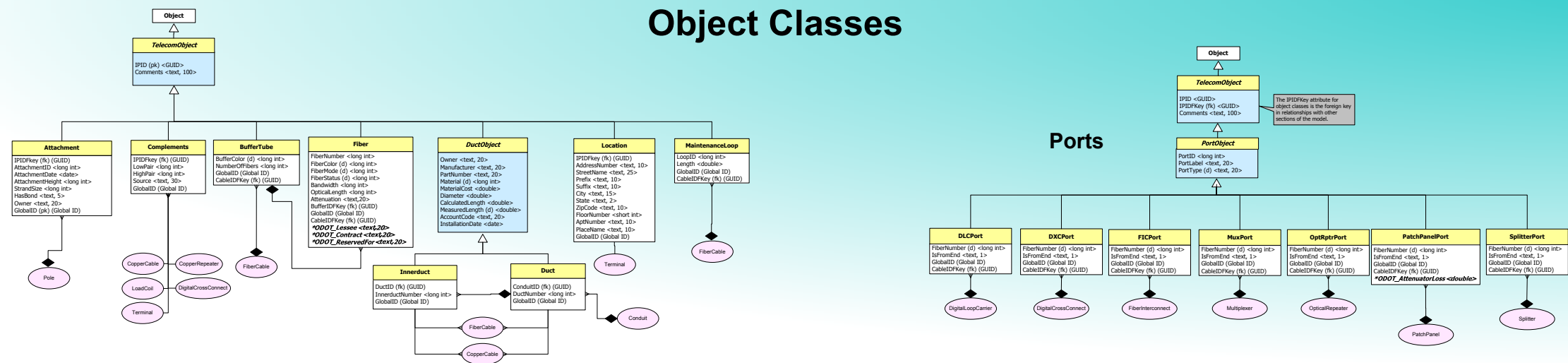
## Cables



## Devices

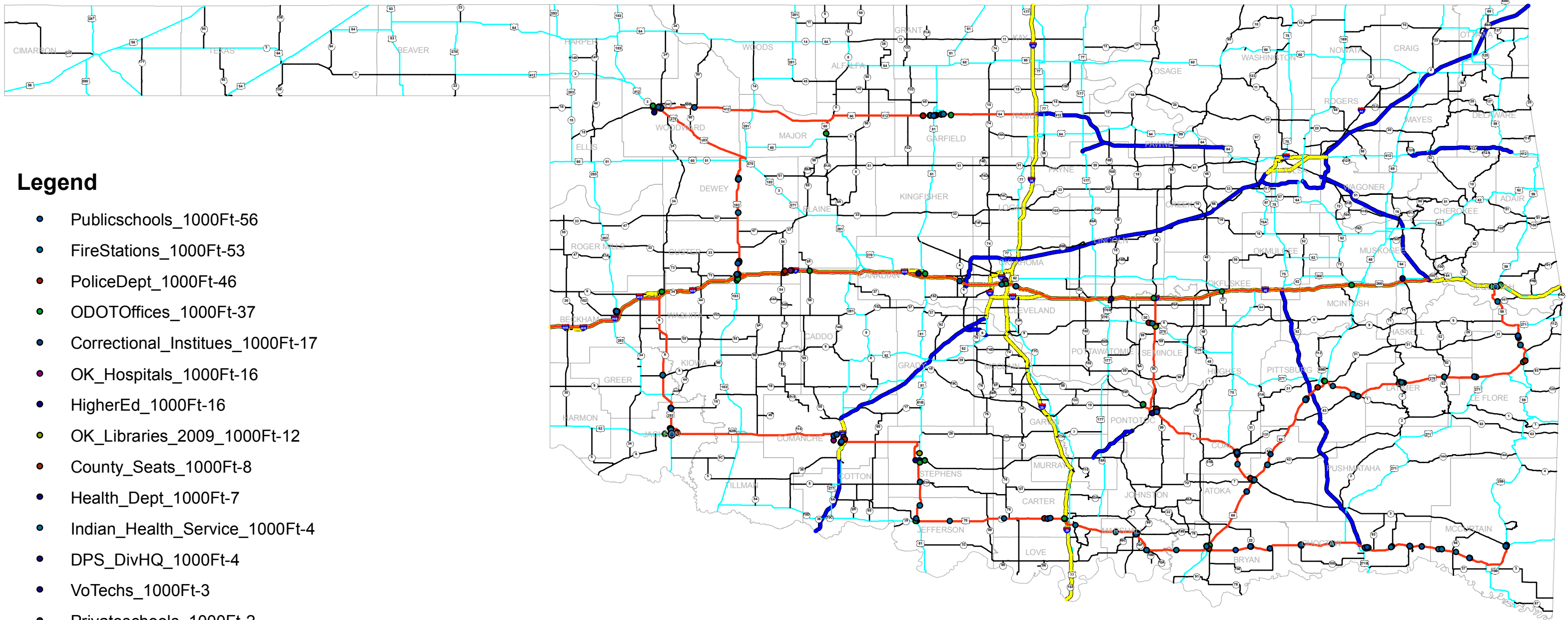


## Object Classes



# Oklahoma State Broadband Initiative

## Public Facilities within 1000 Ft of Proposed Fiber



### Legend

- Publicschools\_1000Ft-56
- FireStations\_1000Ft-53
- PoliceDept\_1000Ft-46
- ODOTOffices\_1000Ft-37
- Correctional\_Institues\_1000Ft-17
- OK\_Hospitals\_1000Ft-16
- HigherEd\_1000Ft-16
- OK\_Libraries\_2009\_1000Ft-12
- County\_Seats\_1000Ft-8
- Health\_Dept\_1000Ft-7
- Indian\_Health\_Service\_1000Ft-4
- DPS\_DivHQ\_1000Ft-4
- VoTechs\_1000Ft-3
- Privateschools\_1000Ft-2

— Proposed\_Fiber

— Interstates

— State Hwys.

— Turnpikes

— U.S. Hwys.

□ Counties\_alb

STATE OF OKLAHOMA  
DEPARTMENT OF TRANSPORTATION

PLAN OF PROPOSED  
STATE HIGHWAY  
FIBER OPTIC CABLE AND CONDUIT  
INSTALLATION PROJECT

XXXXXX AID PROJECT NO. XXXX-XXX(X)XX

US-XXXX

GARFIELD COUNTY

STATE JOB NO. XXXXX(X)  
CONTROL SECTION NO. XXX-XX-XX

DESCRIPTION	REVISIONS	DATE

INDEX OF SHEETS

1. TITLE SHEET
2. PAY QUANTITIES AND NOTES
3. AERIAL SHEET LAYOUT
- 4.-51 FIBER OPTIC AND CONDUIT PLANS
- 52.-XX. FIBER, CONDUIT, AND STRUCTURE DETAIL SHEETS

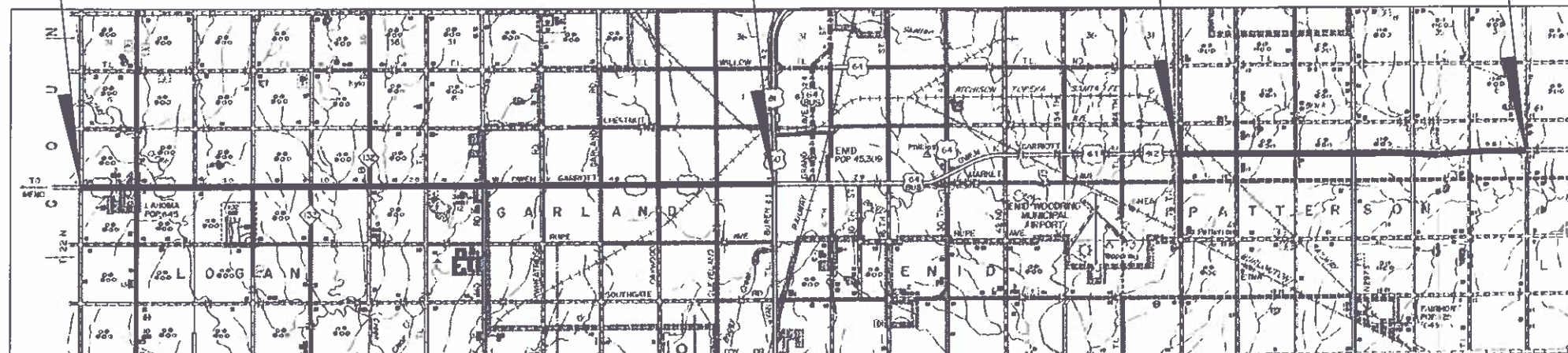
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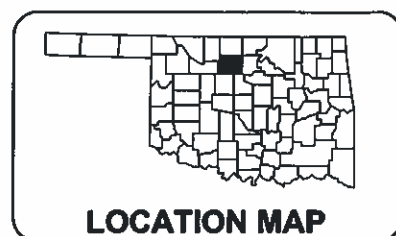
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END PROJECT

STA. 800+00.00  
BEGIN PROJECT

STA. 1121+00.00  
END PROJECT

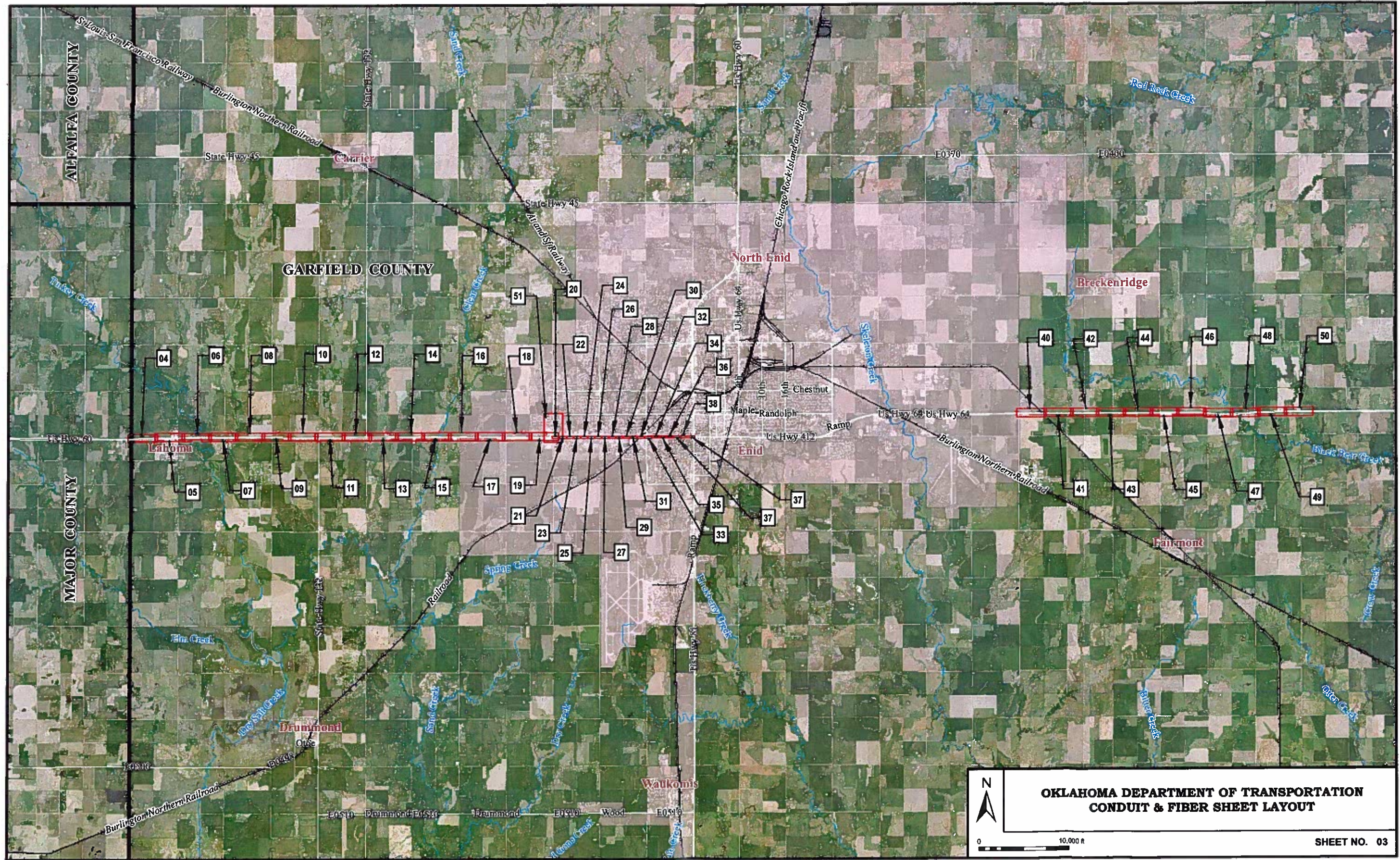


ROADWAY LENGTH \_\_\_\_\_X.00 FT \_\_\_\_X MI  
TOTAL PROJECT LENGTH \_\_\_\_\_X FT \_\_\_\_X MI  
EXCEPTIONS \_\_\_\_\_NONE  
EQUATIONS \_\_\_\_\_NONE



2009 OKLAHOMA STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION-ENGLISH GOVERN.  
APPROVED BY THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY  
ADMINISTRATION. JANUARY 04, 2010

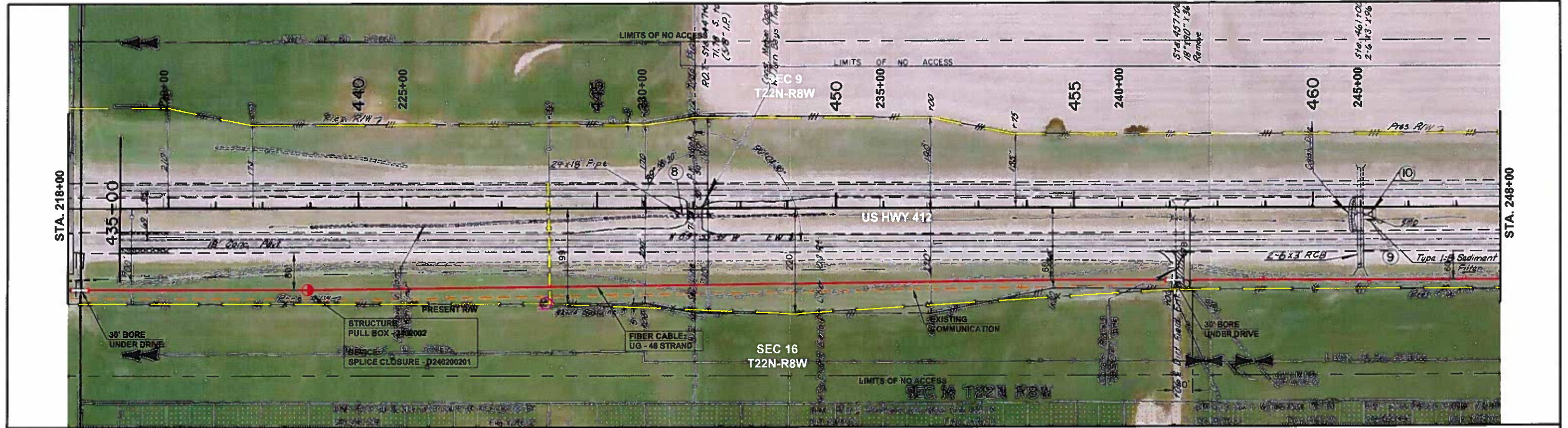
XXXXX XXXXXX OKLA. REG. NO. XXXXX		DATE
OKLAHOMA DEPARTMENT OF TRANSPORTATION		DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION
DATE APPROVED		DATE APPROVED
BY		BY
CHIEF ENGINEER		DIVISION ADMINISTRATOR
SWO NO. XXXX(X)	PROJ. NO. XXXX-XXX(X)XX	SHEET NO. 1



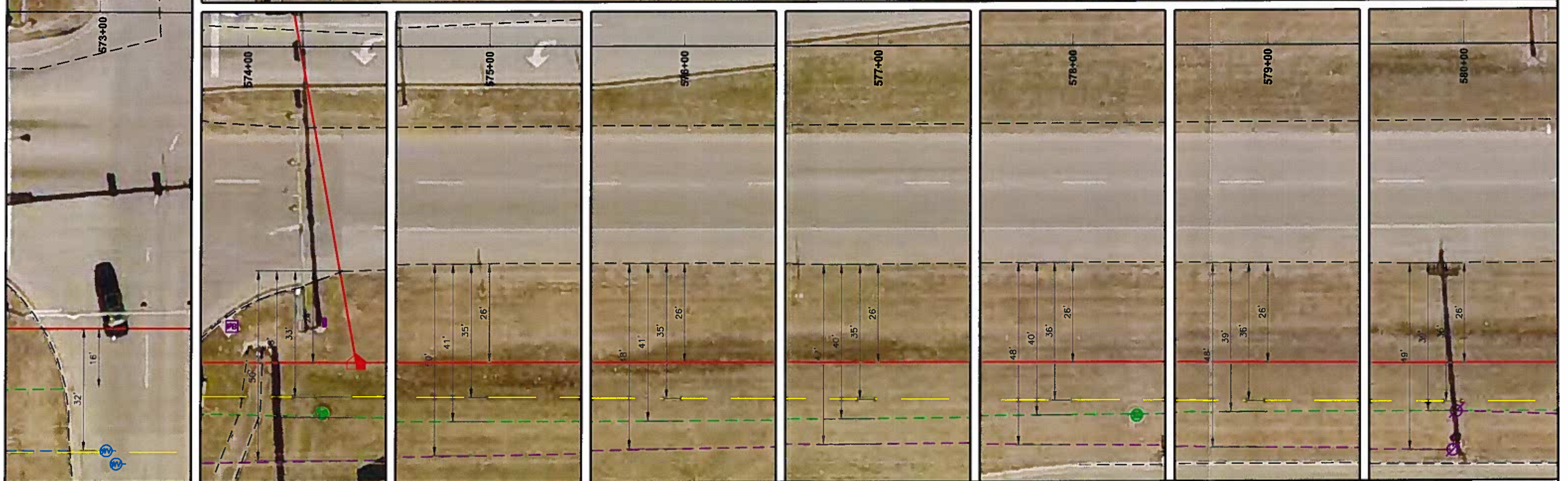
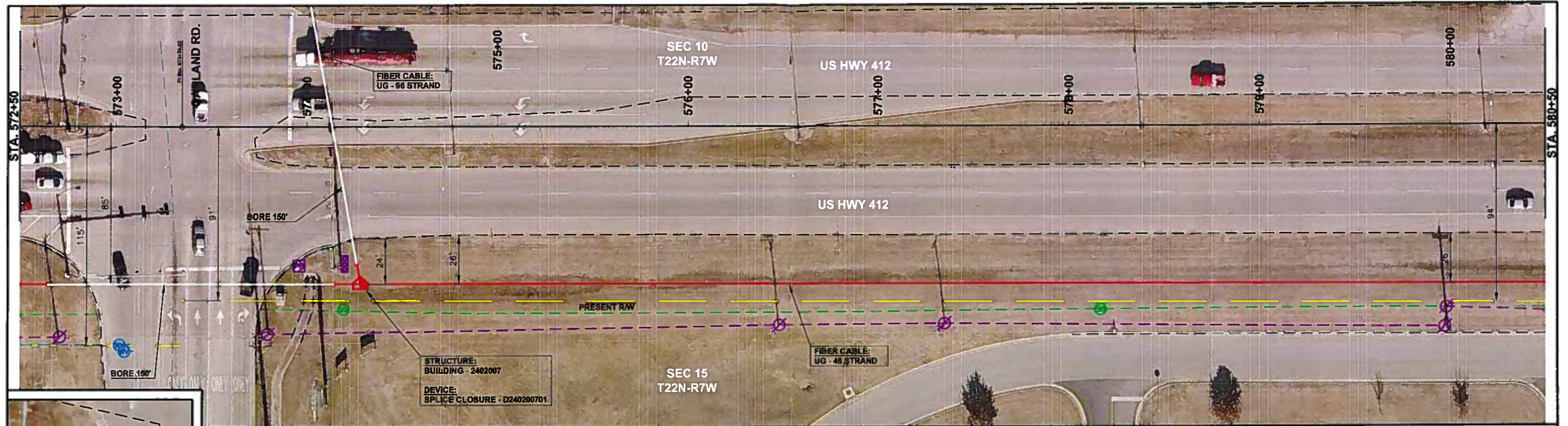
**OKLAHOMA DEPARTMENT OF TRANSPORTATION  
CONDUIT & FIBER SHEET LAYOUT**



SHEET NO. 03

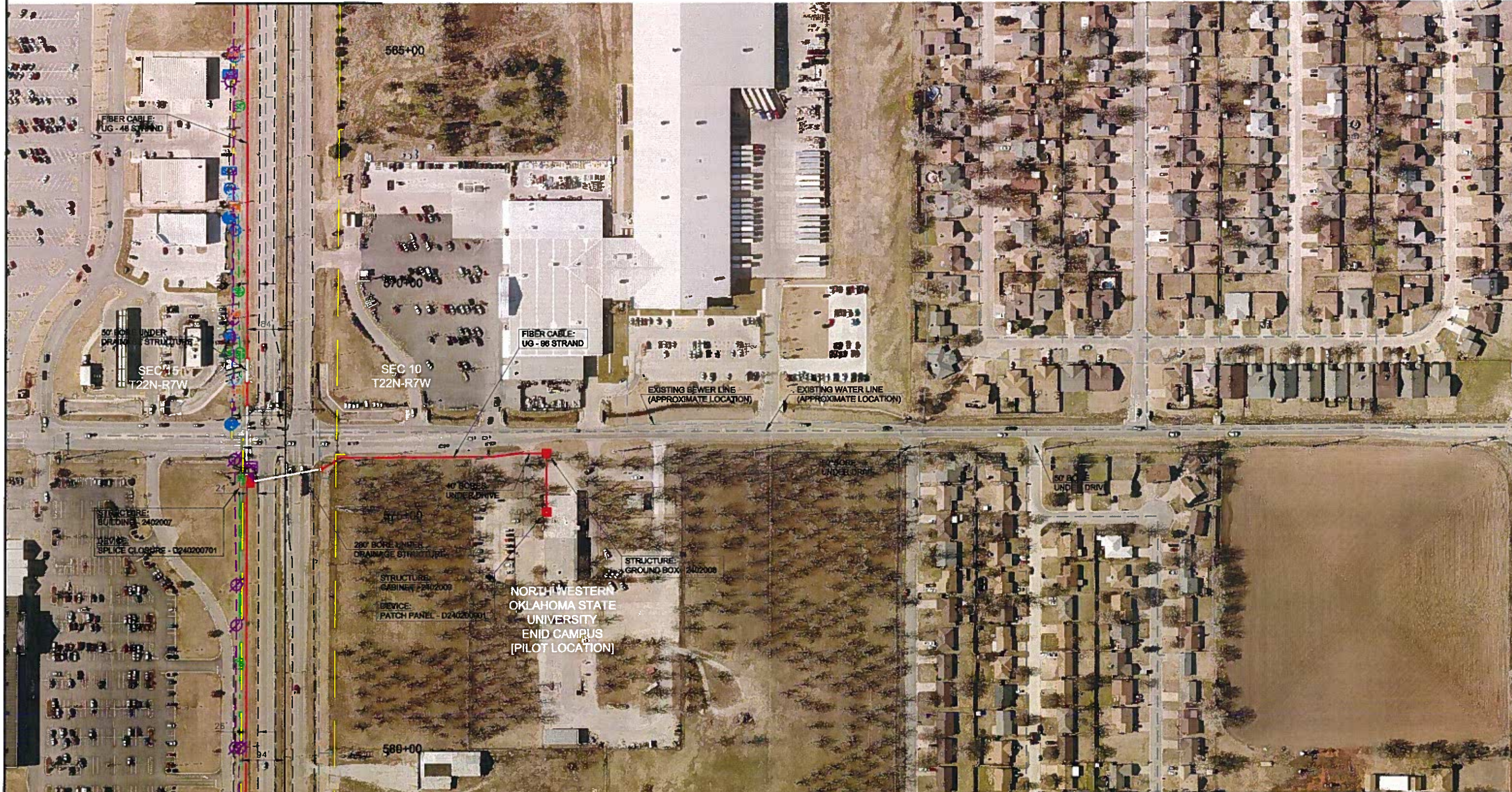






	PROPOSED CENTERLINE PROPOSED FIBER OPTIC CABLE & CONDUIT COMMUNICATION LINE ELECTRIC LINE GAS LINE WATER LINE SANITARY SEWER LINE	FLOWLINE EDGE OF ROADWAY BUILDING LINE FENCE LINE RIGHT OF WAY LIMITS OF NO ACCESS DRAINAGE STRUCTURE	PROPOSED HAND HOLE PROPOSED MANHOLE PROPOSED PULLBOX PROPOSED VAULT PROPOSED GROUND BOX	PROPOSED HUT PROPOSED CABINET PROPOSED BUILDING PROPOSED ROUTE FLAG PROPOSED SERVICE POLE	PROPOSED ISOPED PROPOSED POLE SIGN TELEPHONE PEDESTAL TUG MARKER	FIBER OPTIC METER POWER POLE LIGHT POLE SIGNAL POLE ELECTRIC PULL BOX ELECTRIC SERVICE	WATER VALVE WATER METER FIRE HYDRANT SPRINKLER CONTROL VALVE SPIGOT SANITARY SEWER MANHOLE	GAS VALVE GAS MARKER GAS METER VENT PIPE GATE POST STORM SEWER MANHOLE	N PLAN: 0 12.5' 25' 50' DETAIL: 0 6.25' 12.5' 25'	FIBER OPTIC DESIGN PILOT GARFIELD COUNTY <b>FIBER OPTIC CABLE &amp; CONDUIT          INSTALLATION PLAN</b> JOB PIECE NO. JOB PIECE SHEET NO. 20
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STA. 564+00



STA. 581+00



	PROPOSED CENTERLINE		FLOWLINE
	PROPOSED FIBER OPTIC CABLE & CONDUIT		EDGE OF ROADWAY
	COMMUNICATION LINE		BUILDING LINE
	ELECTRIC LINE		FENCE LINE
	GAS LINE		RIGHT OF WAY
	WATER LINE		LIMITS OF NO ACCESS
	SANITARY SEWER LINE		DRAINAGE STRUCTURE

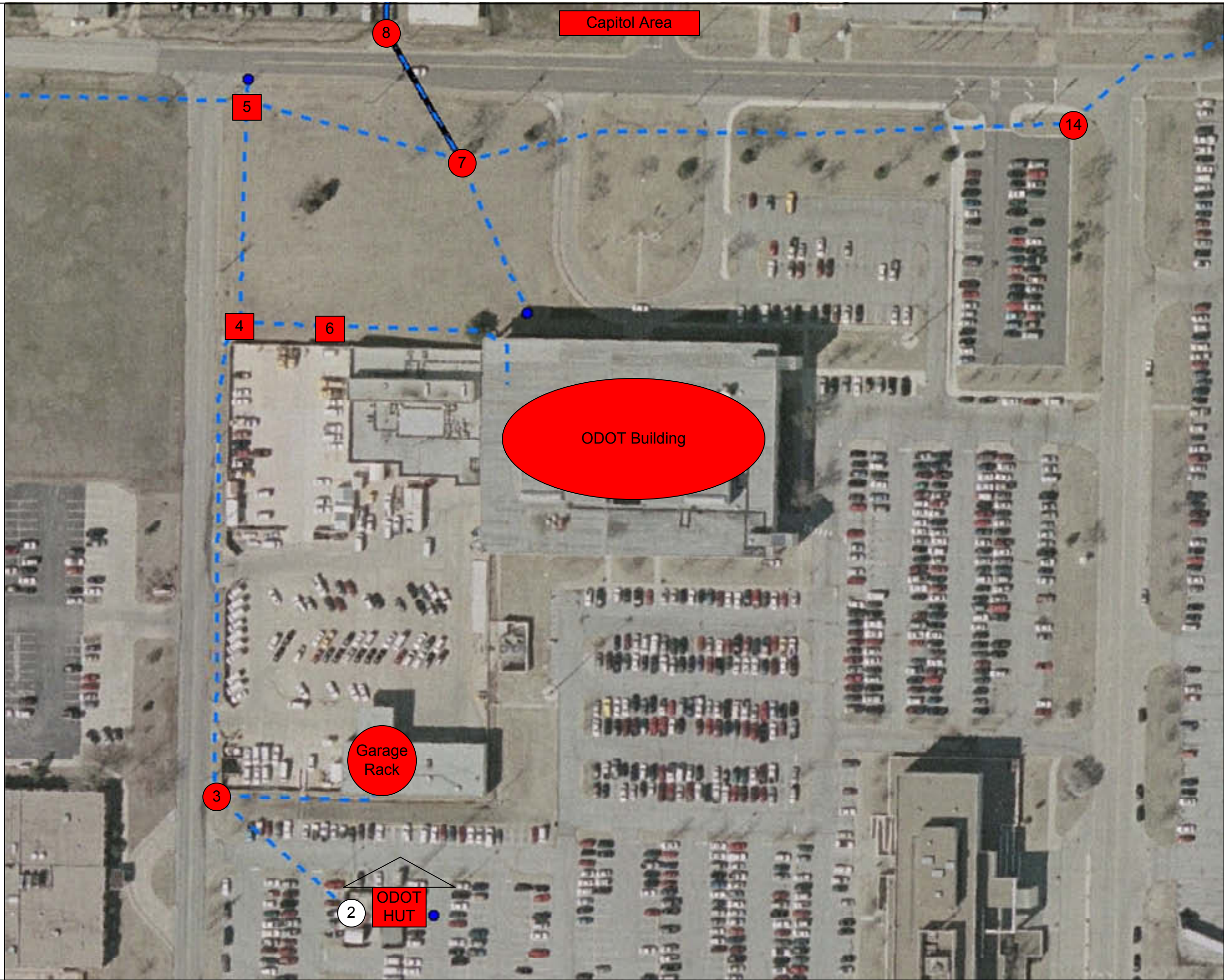
	PROPOSED HAND HOLE		PROPOSED HUT
	PROPOSED MANHOLE		PROPOSED CABINET
	PROPOSED PULLBOX		PROPOSED BUILDING
	PROPOSED VALVE		PROPOSED ROUTE FLAG
	PROPOSED GROUND BOX		PROPOSED SERVICE POLE

	PROPOSED BIOPED		FIBER OPTIC METER
	PROPOSED POLE		POWER POLE
	SIGN		LIGHT POLE
	TELEPHONE PEDestal		SIGNAL POLE
	TUG MARKER		ELECTRIC PULL BOX
			ELECTRIC SERVICE

	WATER VALVE		GAS VALVE
	WATER METER		GAS MARKER
	FIRE HYDRANT		GAS METER
	SPRINKLER CONTROL VALVE		VENT PIPE
	SPROUT		GATE POST
	SANITARY SEWER MANHOLE		STORM SEWER MANHOLE



FIBER OPTIC DESIGN PILOT GARFIELD COUNTY  
**FIBER OPTIC CABLE & CONDUIT  
 INSTALLATION PLAN**  
 JOB PIECE NO. \_\_\_\_\_ JOB PIECE \_\_\_\_\_ SHEET NO. 51



Capitol Area

ODOT Building

Garage Rack

ODOT HUT

5

8

7

4

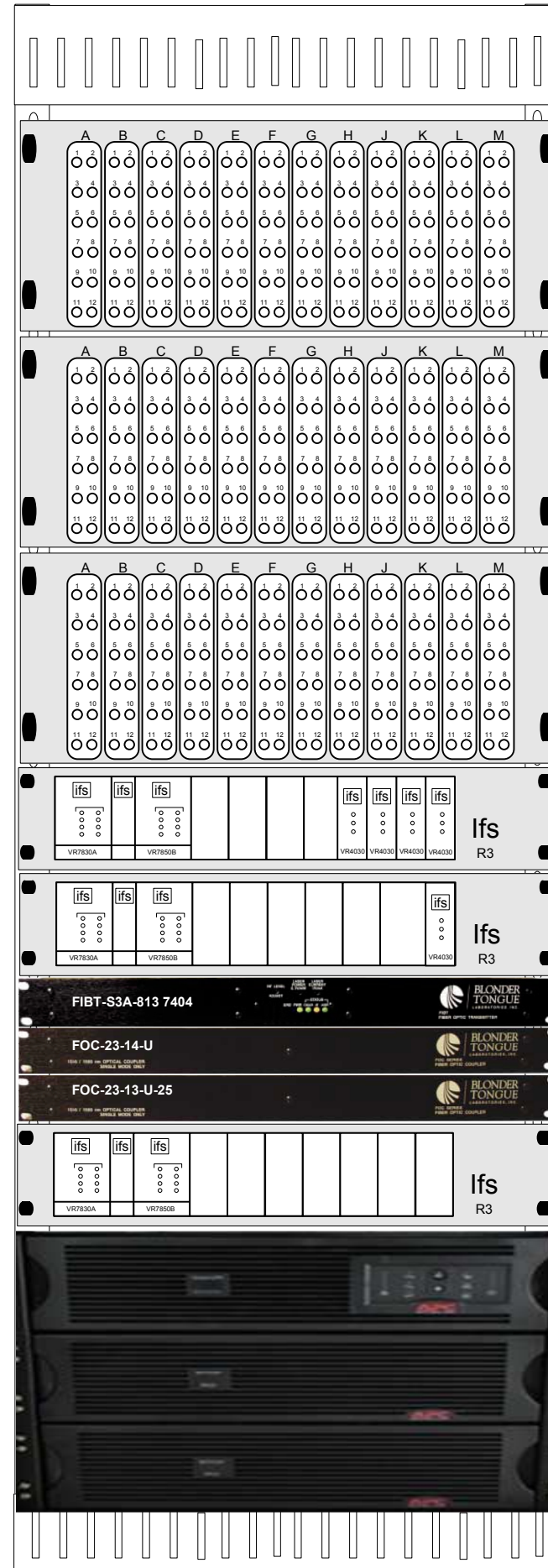
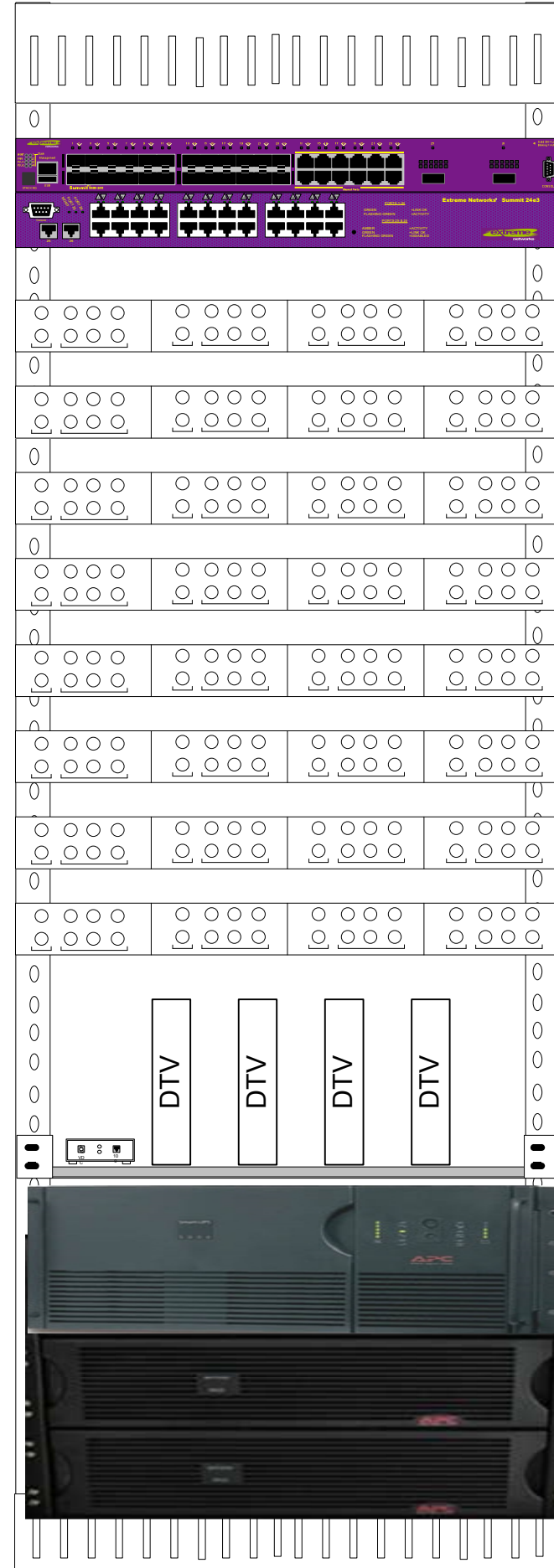
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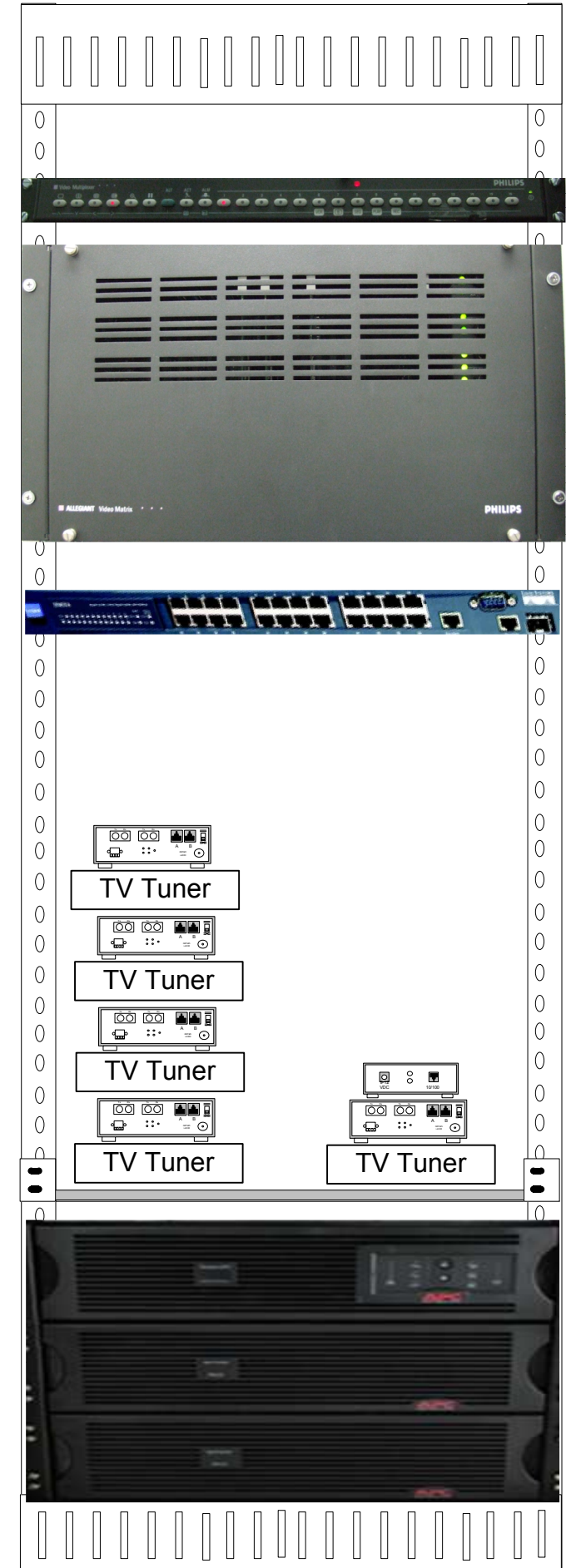
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14

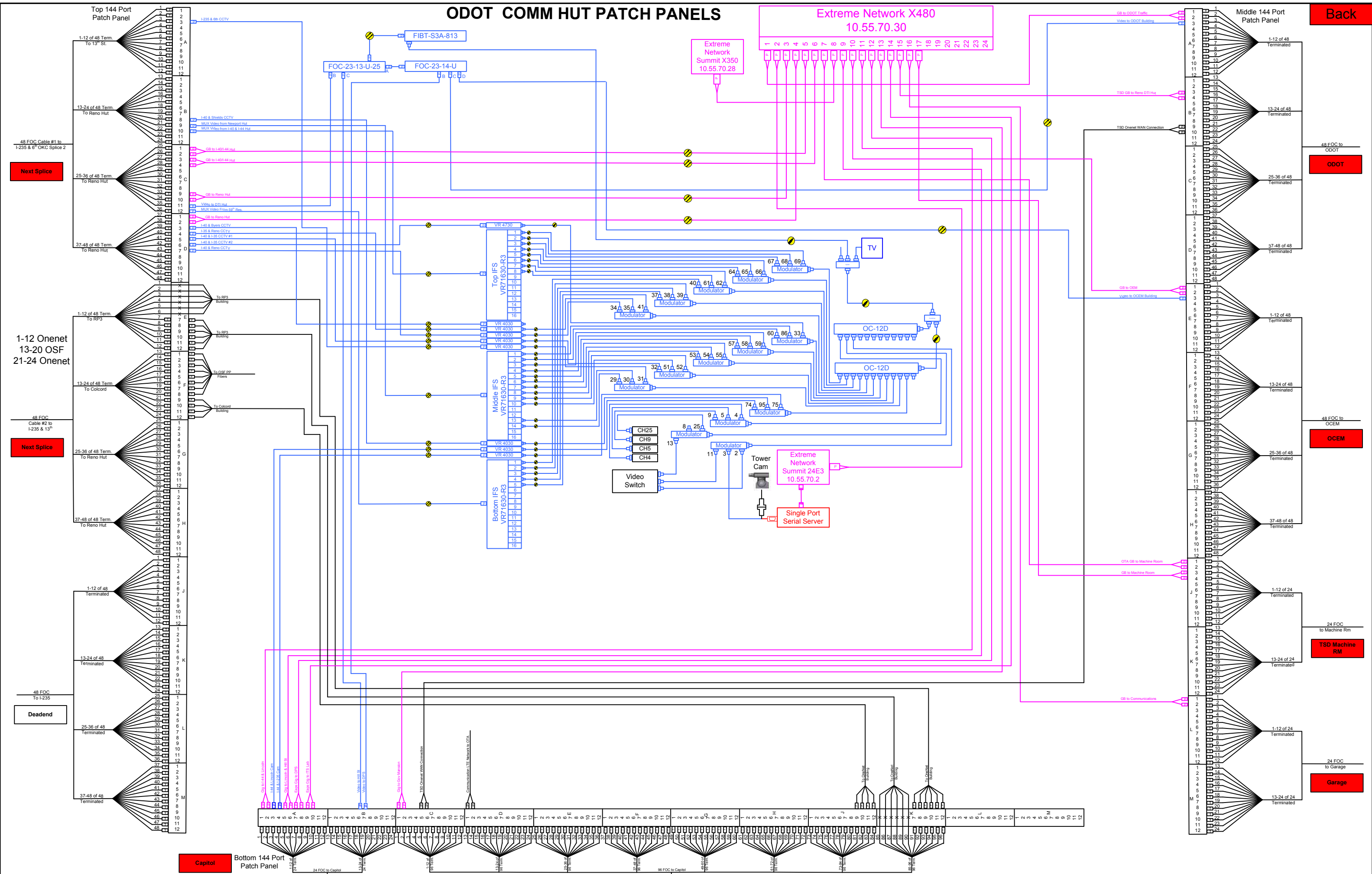
# ODOT Comm Hut Racks



Detailed View of Patch Panels & Equipment



# ODOT COMM HUT PATCH PANELS



Back

Capitol Bottom 144 Port Patch Panel

TSD Machine RM

Garage

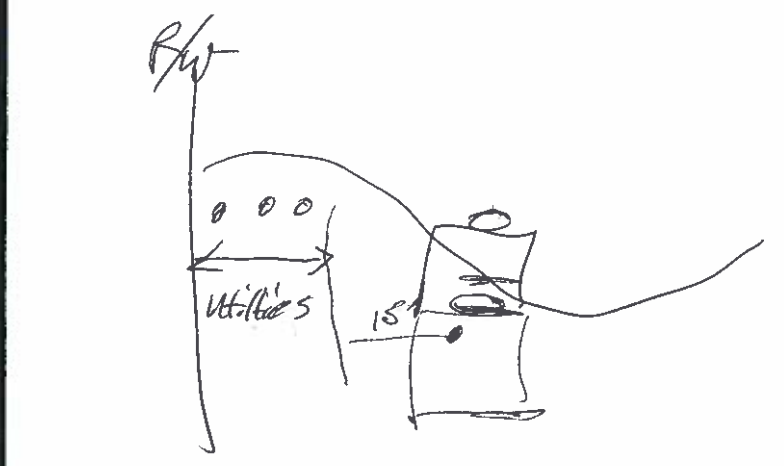
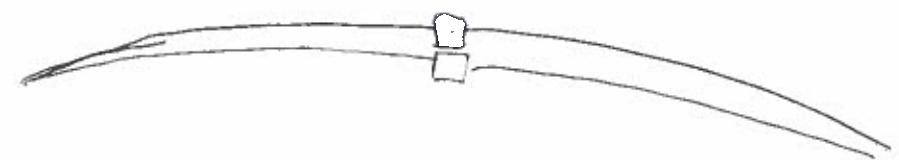
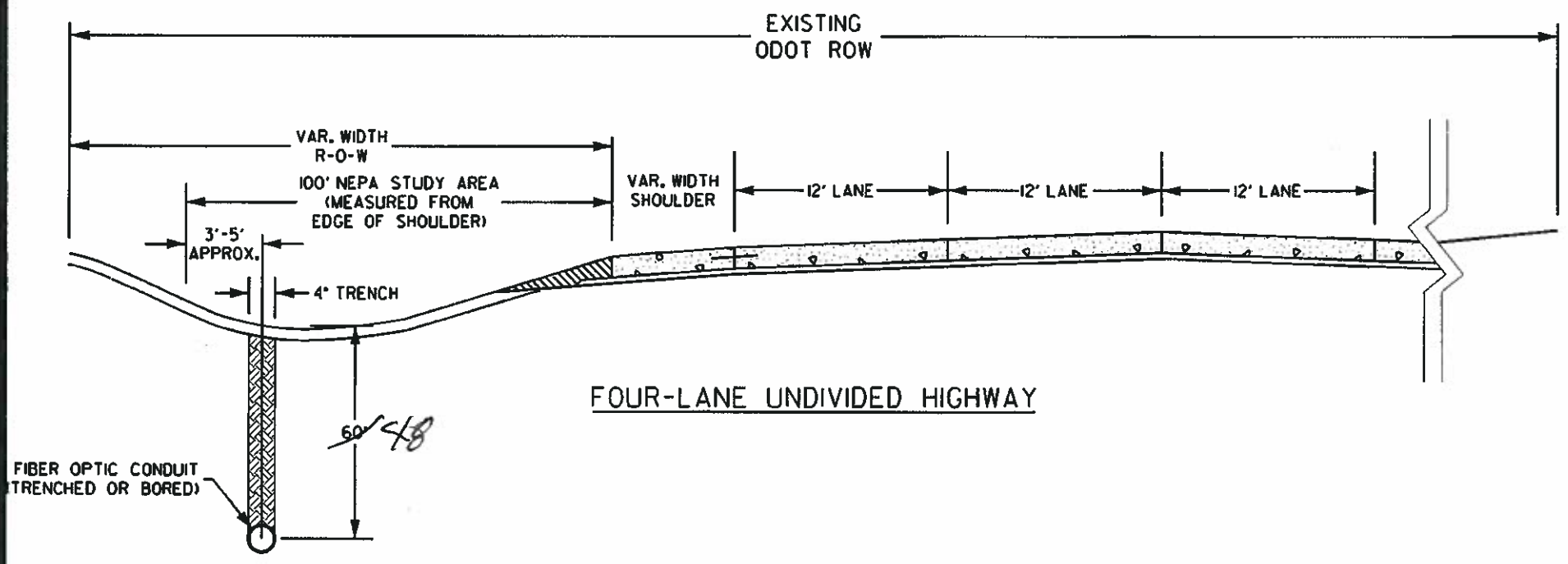
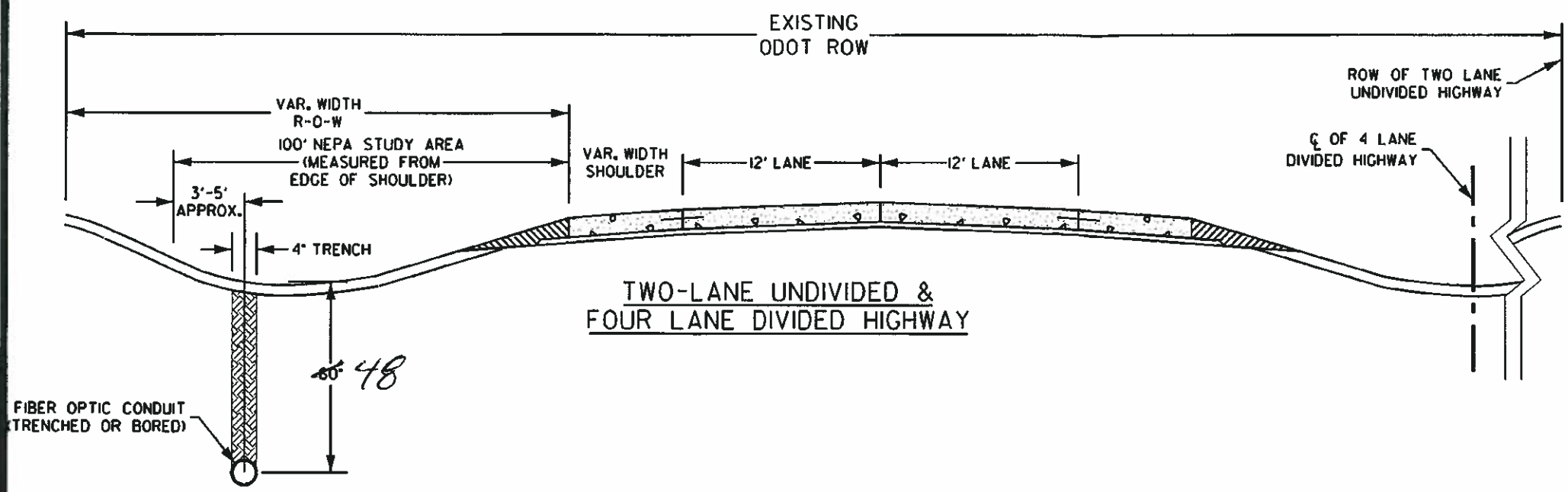
ODOT

OCEM

Next Splice

Next Splice

Deadend

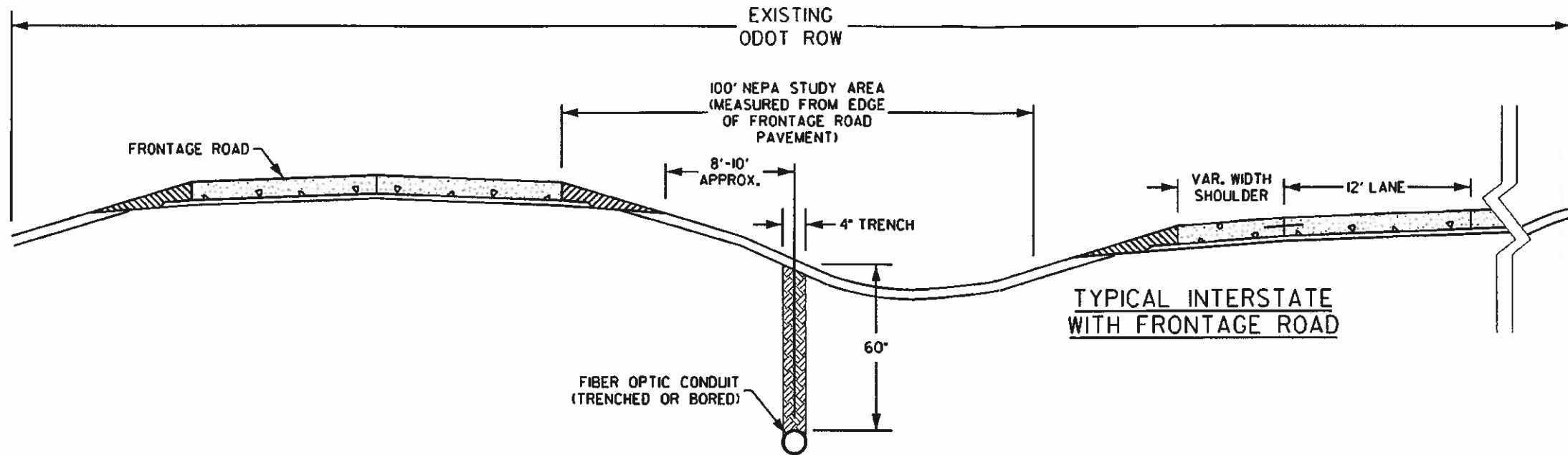


- GENERAL NOTES:
1. FIBER OPTIC CONDUIT SHALL BE PLACED ON THE SOUTH SIDE OF EAST-WEST ROUTES AND ON THE EAST SIDE OF NORTH-SOUTH ROUTES.
  2. ALL CONSTRUCTION AND INSTALLATION OF CONDUIT SHALL BE ON EXISTING ODOT RIGHT-OF-WAY AND/OR CITY RIGHT-OF-WAY BY PERMIT.

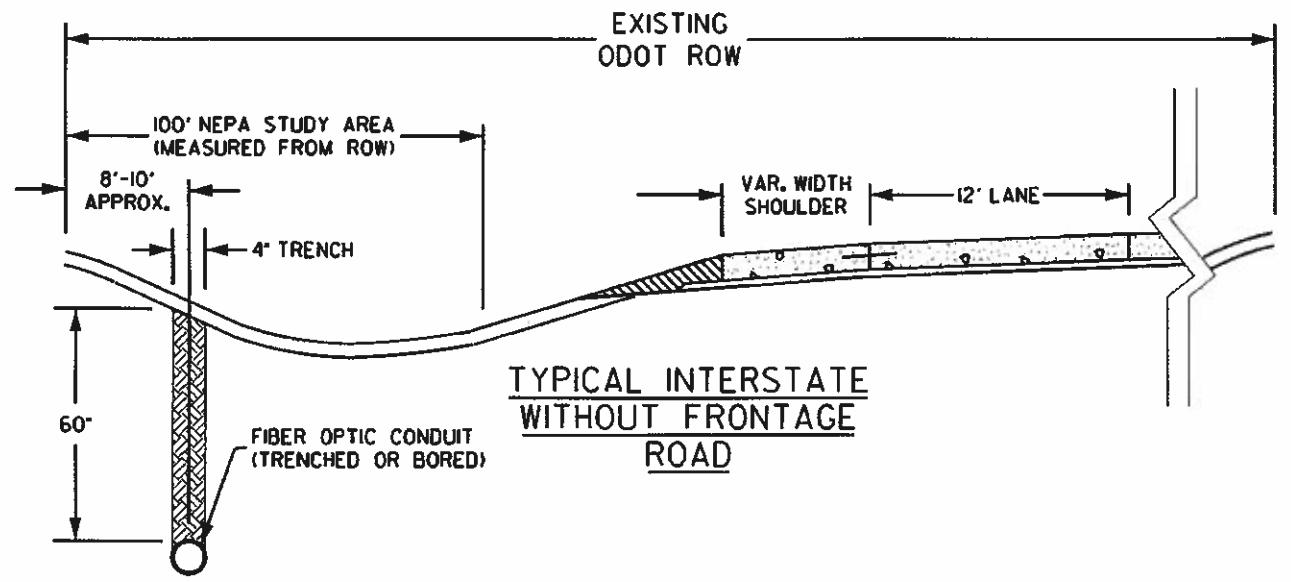
DRAWINGS ARE NOT TO SCALE.

FIBER OPTIC TRENCHING AND CROSSING DETAILS		Drawn	JER	8/10
		Design	JER	8/10
		Checked	ARS	8/10
		TECH SERVICES DIV ALAN STEVENSON		
STATE OF OKLAHOMA		DEPARTMENT OF TRANSPORTATION		
DIVISION		STATE JOB NO. 28123104		
		SHEET NO. 1		

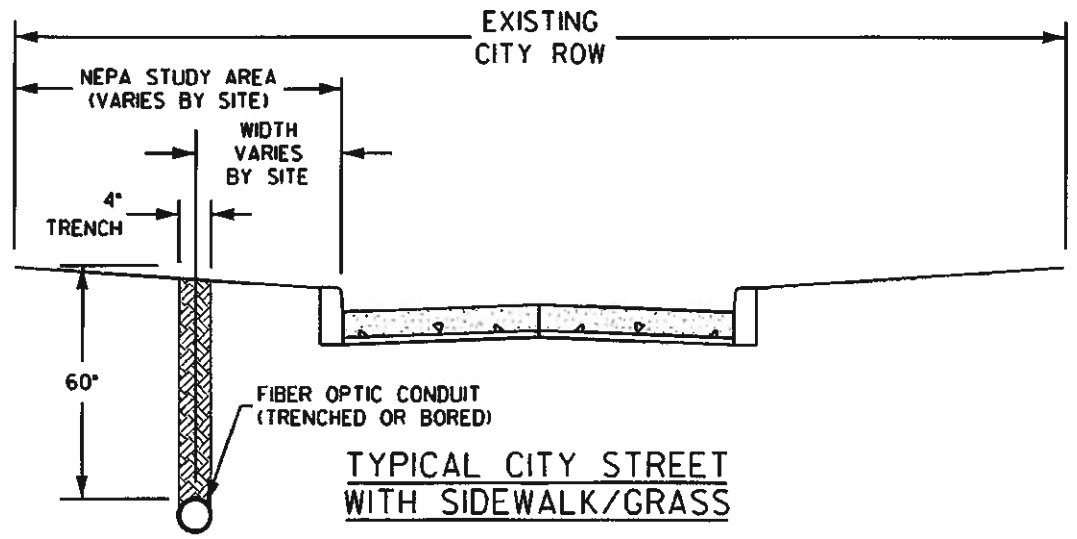
REV. NO.	DESCRIPTION	REVISIONS	DATE



TYPICAL INTERSTATE WITH FRONTAGE ROAD



TYPICAL INTERSTATE WITHOUT FRONTAGE ROAD



TYPICAL CITY STREET WITH SIDEWALK/GRASS

- GENERAL NOTES:
1. FIBER OPTIC CONDUIT SHALL BE PLACED ON THE SOUTH SIDE OF EAST-WEST ROUTES AND ON THE EAST SIDE OF NORTH-SOUTH ROUTES.
  2. ALL CONSTRUCTION AND INSTALLATION OF CONDUIT SHALL BE ON EXISTING ODOT RIGHT-OF-WAY AND/OR CITY RIGHT-OF-WAY BY PERMIT.

DRAWINGS ARE NOT TO SCALE.

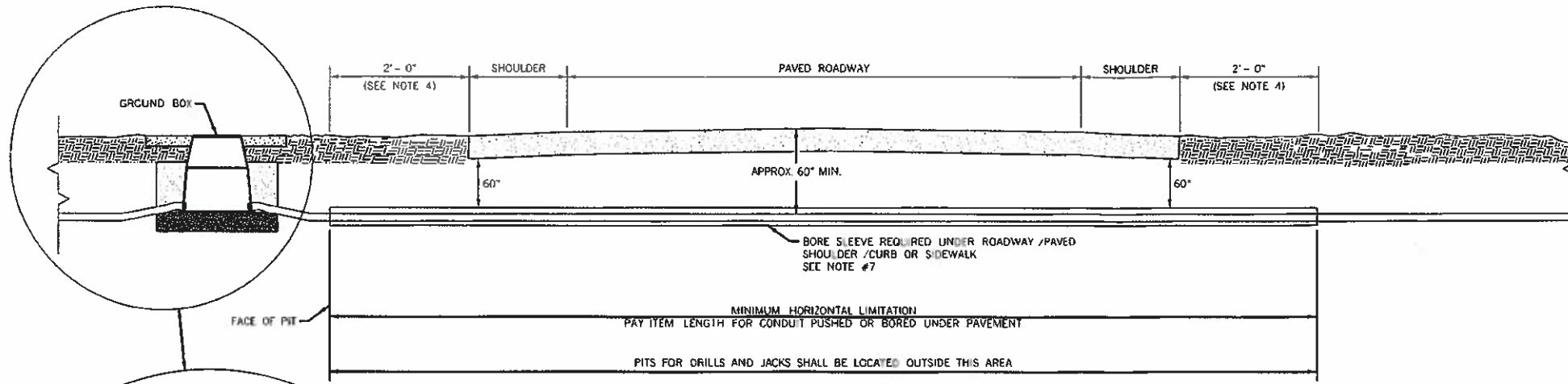
FIBER OPTIC TRENCHING AND CROSSING DETAILS		Drawn	J.E.K.	8/10
		Design	J.E.K.	8/10
STATE OF OKLAHOMA		Checked	ARS	8/10
		TECH SERVICES DIV ALAN STEVENSON		
DEPARTMENT OF TRANSPORTATION		VARIOUS COUNTIES		

**GENERAL NOTES:**

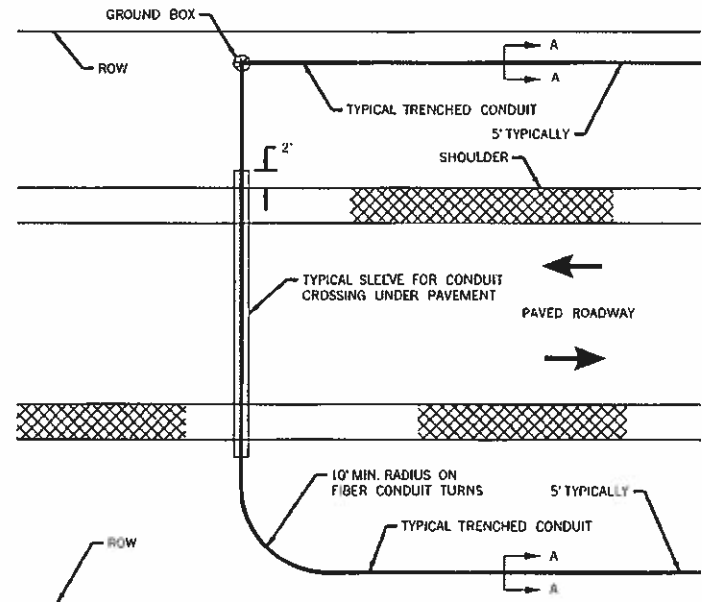
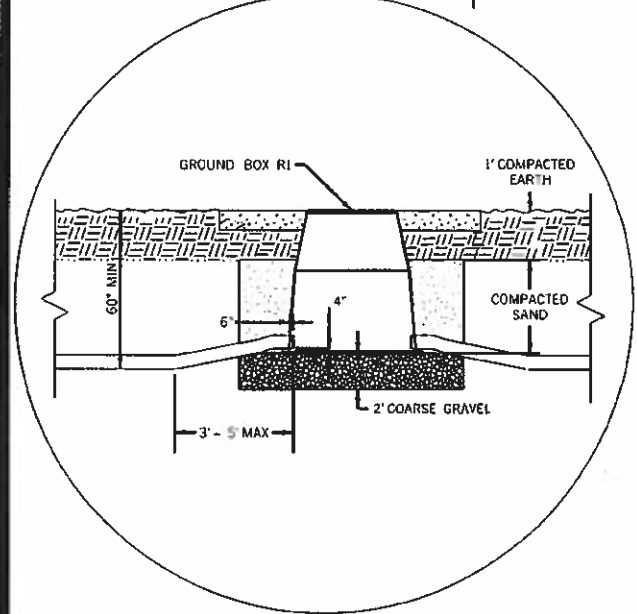
1. THE TRENCH SHALL BE BACKFILLED IN APPROXIMATELY SIX (6) INCH LAYERS AND TAMPED TO A 95% DENSITY OF THE SURROUNDING EARTH.
2. THERE SHALL BE APPROXIMATELY SIXTY (60) INCHES BETWEEN THE RIGHT-OF-WAY AND THE TRENCHED CONDUIT, UNLESS OTHERWISE SPECIFIED IN THE PLANS.
3. CONDUIT RUNS ARE SUGGESTED. ACTUAL ALIGNMENT OF RUNS MAY BE ALTERED WITHIN O.D.O.T. R/W, WITH ITS DIVISION APPROVAL.
4. IF TRENCHED CONDUIT MUST CROSS UNDER EXISTING GUARDRAIL, IT SHOULD PASS BETWEEN POSTS AND AS CLOSE TO PERPENDICULAR TO THE RAIL AS POSSIBLE.
5. THERE SHALL BE NO MORE THAN FOUR (4) 90 DEGREE BENDS (360 DEGREES TOTAL) OF ALL THE BENDS IN A SINGLE RUN OF CONDUIT.
6. ALL TRENCHED CONDUIT SHALL BE FOR SECONDARY VOLTAGES, UNLESS OTHERWISE SPECIFIED IN THE PLANS.
7. ALL BORED CONDUIT SHALL BE IN PLACED IN A PROTECTIVE SLEEVE.
8. THE CONDUIT MUST BE INSTALLED TO FIT EXISTING CONDITIONS AND ALL DISTURBED AREAS MUST BE REPAIRED OR RESTORED TO ORIGINAL CONDITION BY THE CONTRACTOR. THERE WILL BE NO PAY ITEM FOR THIS WORK.
9. ALL CONDUIT TERMINATIONS WILL BE PROTECTED WITH DUST CAPS. EACH DUST CAP MUST BE SECURED BY TAPE. ANY CONDUIT LEFT EXPOSED OVERNIGHT SHALL HAVE PROTECTIVE DUST CAPS INSTALLED AND SECURED (TAPE ALONE SHALL NOT BE PERMITTED).
10. ANY INCIDENTAL WORK REQUIRED WHILE TRENCHING OR BORING FOR THE POLY CONDUIT RUNS SUCH AS REMOVING AND/OR REPLACING OF EXISTING FENCES, GUARDRAIL OR ETC... SHALL BE INCLUDED IN THE L.F. PRICE BID FOR TRENCHING OR BORING CONDUIT PAY ITEMS. ANY DAMAGE TO FENCES, GUARDRAIL, BUILDING, COMM HUTS ETC... SHALL BE REPAIRED OR REPLACED TO THE ENGINEERS SATISFACTION, AT THE CONTRACTORS EXPENSE. ALL COST OF INSTALLATION, MATERIALS, LABOR AND INCIDENTALS NECESSARY TO INSTALL CONDUIT, DUST CAPS OR FUSION COUPLERS SHALL BE INCLUDED IN OTHER ITEMS OF WORK.
11. ANY DAMAGE TO CONDUIT (KINK, TEARING, CUTTING, ETC...) WILL RESULT IN THE CONDUIT BEING REJECTED AND REPLACED WITH NEW CONDUIT AT THE CONTRACTORS EXPENSE.
12. FIBER OPTIC CONDUIT SHALL BE PLACED ON THE SOUTH SIDE OF EAST-WEST ROUTES AND ON THE EAST SIDE OF NORTH-SOUTH ROUTES.
13. ALL CONSTRUCTION AND INSTALLATION OF CONDUIT SHALL BE ON EXISTING ODOT RIGHT OF WAY AND/OR CITY RIGHT OF WAY BY PERMIT.
14. DRAWINGS ARE NOT TO SCALE.

**MATERIAL NOTES:**

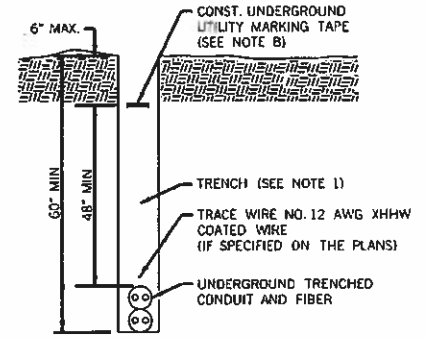
- A. MATERIAL FOR CABLE IN DUCT CONDUIT SHALL BE RIGID GALVANIZED STEEL OR SCH. 40 PVC PLASTIC.
- B. THE UNDERGROUND UTILITY MARKING TAPE SHALL BE A MINIMUM OF 4 MIL THICKNESS, 6 INCHES WIDE, POLYETHYLENE TAPE. COLOR SHALL BE IN ACCORDANCE WITH AWWA UNIFORM COLOR CODE. TAPE USED TO MARK UNDERGROUND FIBER CABLE SHALL BE SAFETY RED COLOR WITH PRINTED LEGEND "CAUTION FIBER LINE BURIED BELOW". THE TAPE SHALL BE SIMILAR TO REEF INDUSTRIES, INC. STOCK # 0571415 OR APPROVED EQUAL. THE COST OF THE TAPE SHALL BE INCLUDED IN THE TRENCHING PAY ITEM.
- C. THE CONTRACTOR SHALL INSTALL A PULL LINE IN ALL CONDUITS BETWEEN GROUND BOXES, POLE FOOTINGS AND CABINETS. PULL LINE SHALL BE MULE TAPE BY NEPTCO, INC. OR APPROVED EQUAL. EQUIVALENT MULE TAPE WIRE OR ANY OTHER APPROVED MATERIAL THAT HAS A MINIMUM BREAKING STRENGTH OF 600 LBS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SECURING THE PULL LINE AT EACH END OF THE CONDUIT AND ALSO FOR CAPPING THE CONDUIT ENDS TO PREVENT DEBRIS FROM PLUGGING THE CONDUIT. INSTALLATION, CAPPING AND SECURING PROCEDURES SHALL BE APPROVED BY THE ENGINEER. THE COST OF ALL MATERIALS, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THIS WORK SHALL BE INCLUDED IN THIS ITEM OF WORK.
- D. ALL "SCHEDULE 40 PLASTIC CONDUIT" MATERIAL SHALL BE HIGH DENSITY POLYETHYLENE (REFER TO STANDARD SPEC 709.02 (B)) EXCEPT THE FOLLOWING REQUIREMENTS MUST BE MET:  
 NEMA TC-2, GRADE 34, 100% VIRGIN RESIN MATERIAL AND PRE-LUBRICATED.  
 FOR MORE INFORMATION ON HIGH DENSITY POLYETHYLENE, CONTACT CAREY HOLT OF INTEGEL CORP. AT 1 (800) 551-5108.
- E. ALL POLY (HDPE) CONDUIT RUNS LESS THAN 1055' (TRENCHED OR BORED) SHALL BE ONE CONTINUOUS PIECE OF CONDUIT NO SPLICES OR JOINTS WILL BE ALLOWED. ALL CONDUIT RUNS SHALL START AND END AT THE GROUND BOX LOCATIONS.
- F. NO MORE THAN ONE FUSION JOINT PER 1500 ADDITIONAL FEET OF CONDUIT SHALL BE ALLOWED. FUSION COUPLING SHALL BE A CPM: 5754062 PUSAMATIC FUSION COUPLER BY CENTRAL PLASTICS, BOX 3129 SHAWNEE, OK 74802-3129, PHN (405) 273-8302 OR APPROVED EQUAL.



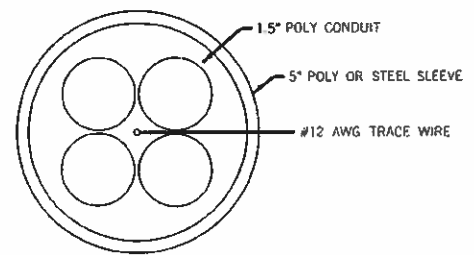
**CONDUIT CROSSING UNDER PAVEMENT**



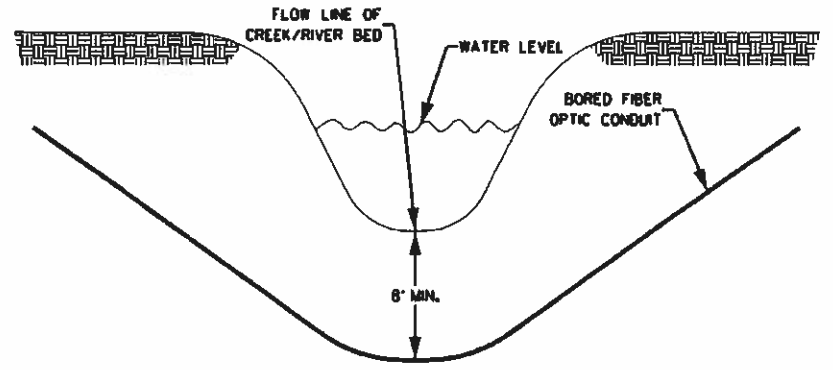
**CONDUIT DETAIL**



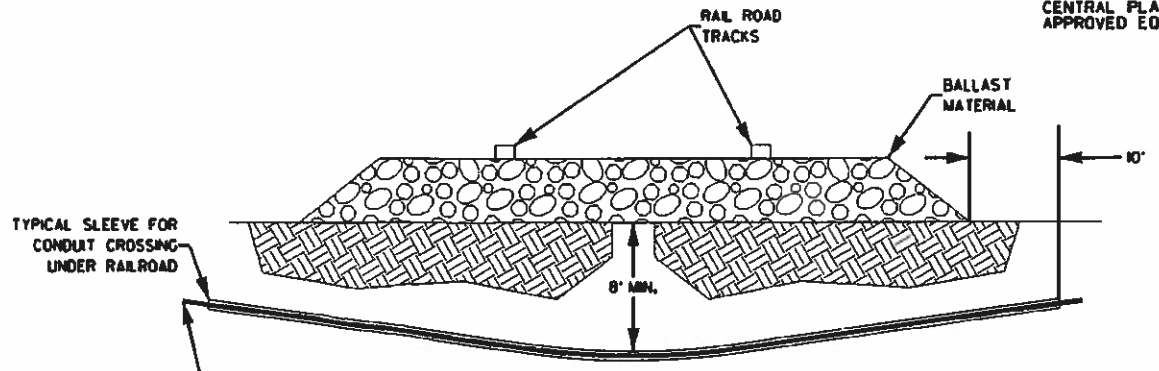
**SECTION "A-A"**



**TYPICAL SLEEVE CROSS SECTION**



**TYPICAL CREEK/RIVER CROSS SECTION**



**TYPICAL RAILROAD CROSS SECTION**

FIBER OPTIC TRENCHING AND CROSSING DETAILS		Drawn	JEK	8/10
		Design	JEK	8/10
		Checked	ARS	8/10
		TECH SERVICES DIV ALAN STEVENSON		
STATE OF OKLAHOMA	DEPARTMENT OF TRANSPORTATION			



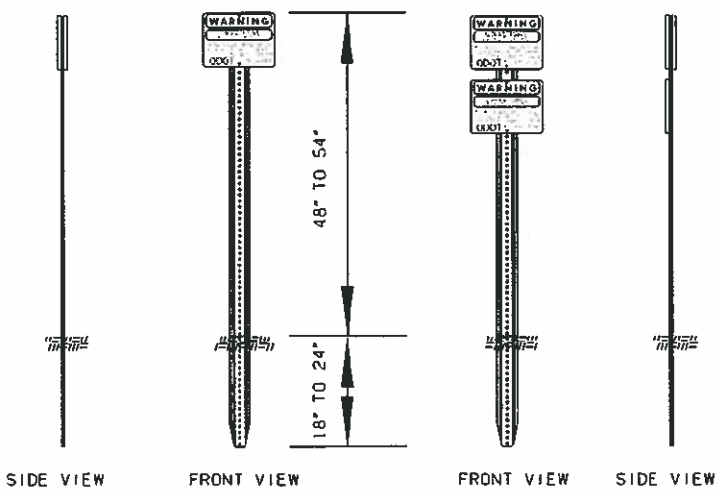
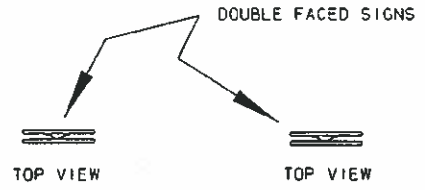
DATE	DESCRIPTION	REVISION	BY

**WARNING**

**BURIED CABLE**  
FIBER OPTICS CABLE ROUTE

BEFORE DIGGING, TRENCHING OR PUSHING PIPE IN THIS VICINITY CALL "OKIE" AT 1-800-522-6543 & **ODOT** AT 1-405-521-2861

LETTERS CUT OUT OF BLACK PATCH  
BLACK LETTERS ON WHITE PATCH  
BLACK LETTERS ON ORANGE BACKGROUND

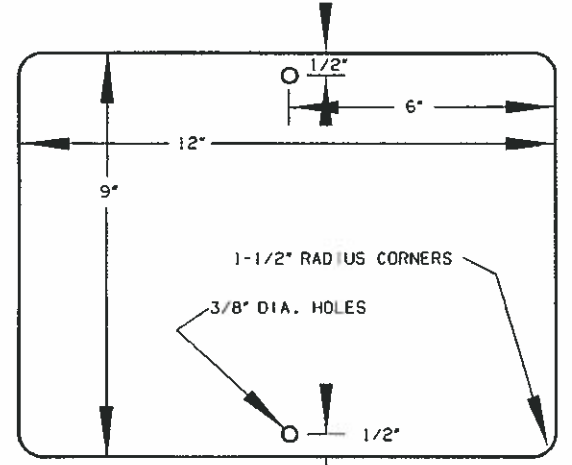


(A) (B)  
**TYPICAL SIGN PLACEMENT**

(A) FOR PLACEMENT ALONG FIBER ROUTE  
(B) FOR PLACEMENT AT GROUND BOX LOCATIONS

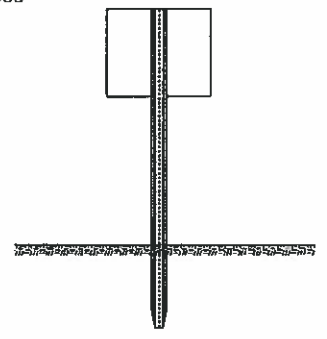
- GENERAL NOTES:**
- BURIED FIBER OPTIC CABLE ROUTE SIGNS (FRONT/BACK) SHOULD BE PLACED ON THE RIGHT-OF-WAY FENCE ON EACH SIDE OF A ROADWAY/HIGHWAY CROSSING AND AT APPROXIMATELY 1500' INTERVALS ALONG THE FIBER ROUTE OR AS DIRECTED BY THE ENGINEER (TWO SIGN FACES REQUIRED).
  - A DOUBLE (STACK) ROUTE SIGN MARKER SHALL BE PLACED AT GROUND BOX LOCATIONS (THREE SIGN FACES REQUIRED).
  - SEE ODOT STANDARDS SBS1-1, GMS1-1, GMS2-1 & FCM1-1 (LATEST REVISIONS) FOR SIGN BLANK, FOOTING AND CHANNEL POST DETAILS.
  - EACH SIGN BLANK SHALL CONSIST OF APPROXIMATELY 0.65 S.F. OF SHEET ALUMINUM SIGN (TWO OR THREE BLANKS ARE REQUIRED FOR EACH SIGN ASSEMBLY).
  - COST BID FOR SIGN INSTALLATION SHALL INCLUDE FABRICATION OR PURCHASE OF TWO OR THREE SIGN BLANKS AND FACES, A SIX (6) FOOT W-FLANGE POST (1.12 - 2 LBS. PER FOOT) OR APPROVED EQUAL, TWO OR FOUR SETS OF 1/4" BOLTS AND NUTS AND THE INSTALLATION OF THE SIGN ASSEMBLY.
  - W-FLANGE POST SHALL BE GALVANIZED AS PER ATSM A123 SPECIFICATIONS.
  - NUTS AND BOLTS ARE TO BE GALVANIZED AS PER ATSM A123 SPECIFICATIONS OR CADMIUM PLATED. ALL BOLTS ARE TO EXTEND PAST THE SECURING NUT A MINIMUM OF 1/4" TO A MAXIMUM OF 1/2".

**FIBER OPTIC ROUTE MARKER**  
BLACK LETTERING ON AN ORANGE SIGN FACE



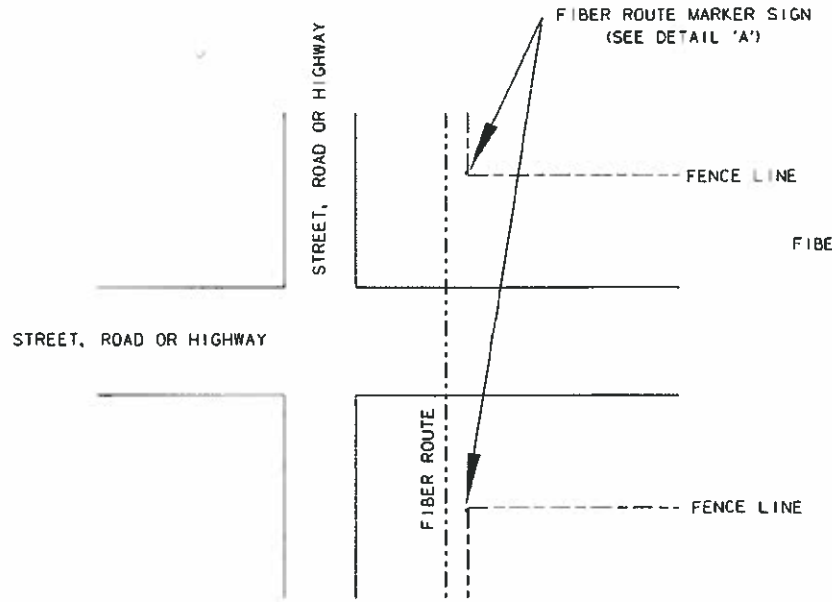
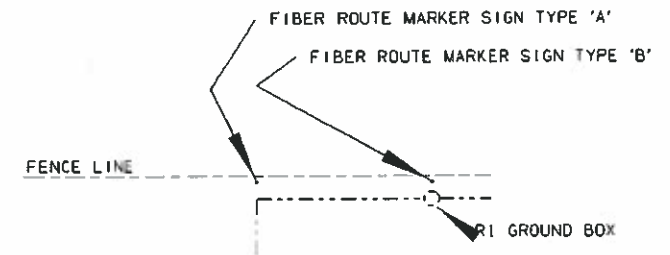
SIGN BLANK B 1209  
(ALUMINUM ALLOY 6061-T6 OR APPROVED EQUAL)  
(0.063" THICKNESS)

A SOURCE FOR FIBER OPTIC ROUTE SIGNS:  
VALCUN UTILITY SIGNS AND PRODUCTS, INC.  
P.O. BOX 1850  
FOLEY, ALABAMA 36536  
ATTN: THERESA NOLTE  
1-800-426-1314  
www.valcuninc.com  
PART # 0803350  
(or approved equal)



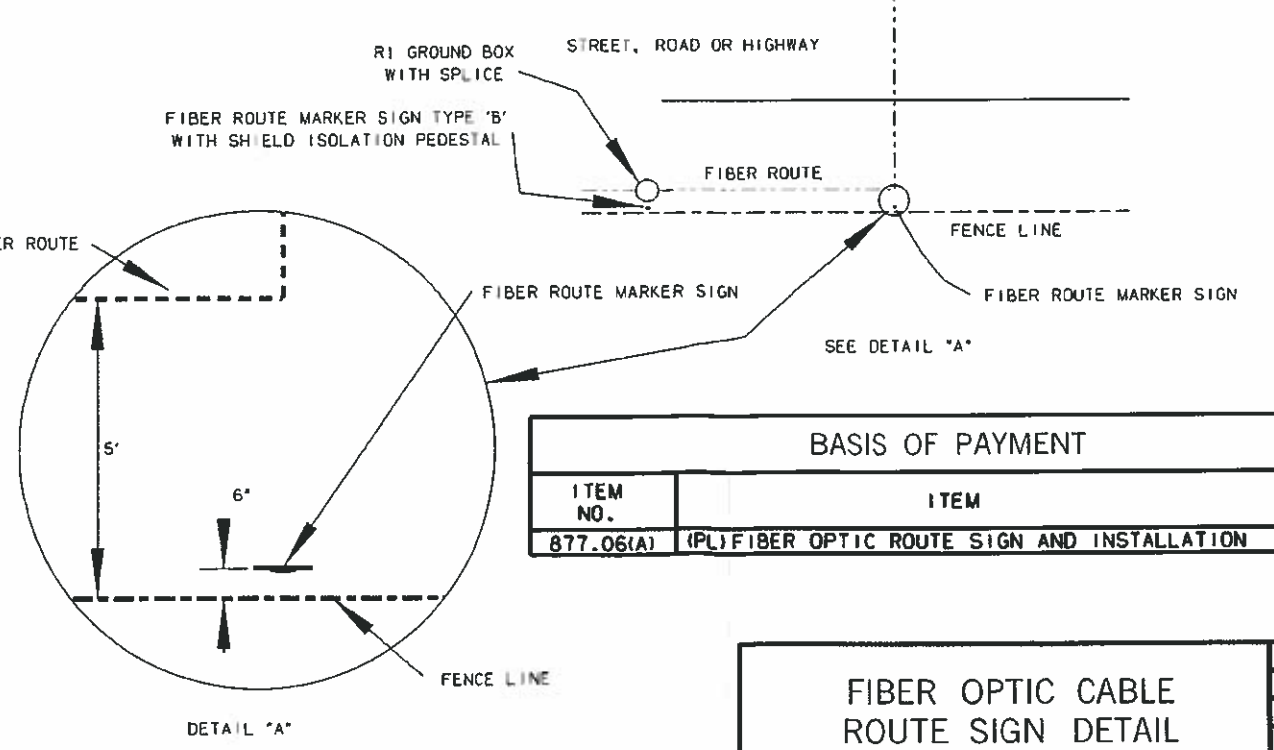
**TYPICAL FLANGE CHANNEL MOUNTING DETAIL**  
(2 LBS./FT.)

SEE ODOT STANDARDS SBS1-1, GMS1-1, GMS2-1 & FCM1-1  
(LATEST REVISIONS) FOR DETAILS



**TYPICAL SIGN PLACEMENTS**

(FOR FIBER ROUTES RUNNING PARALLEL OR CROSSING STREETS, ROADS OR HIGHWAYS)



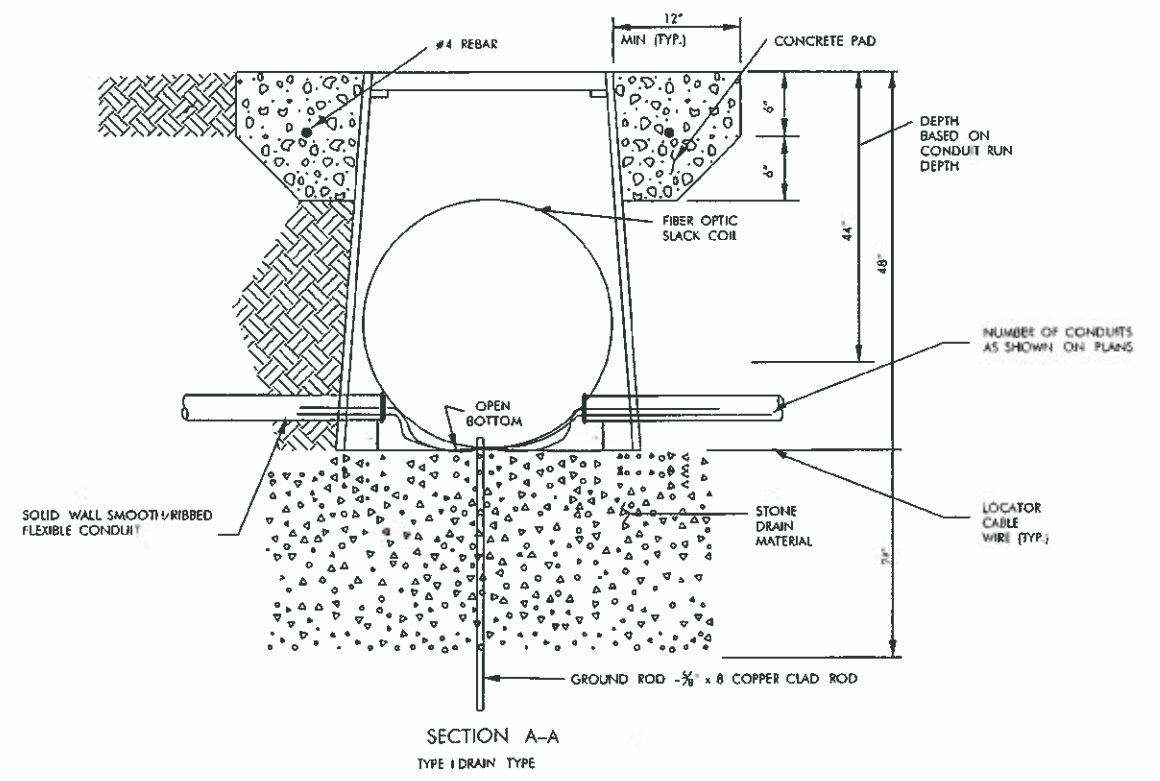
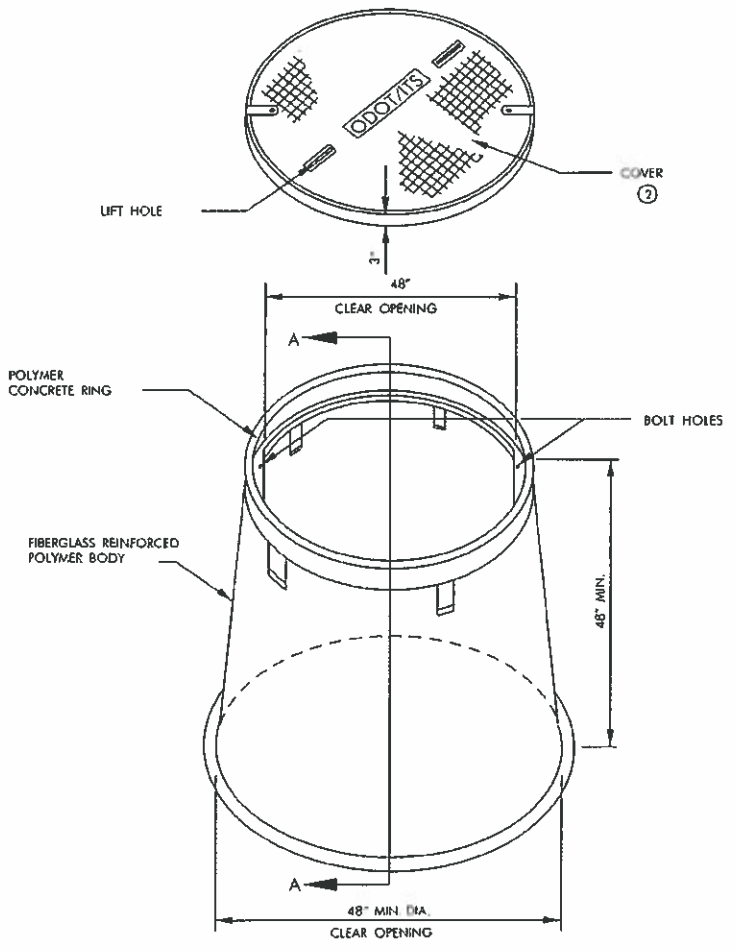
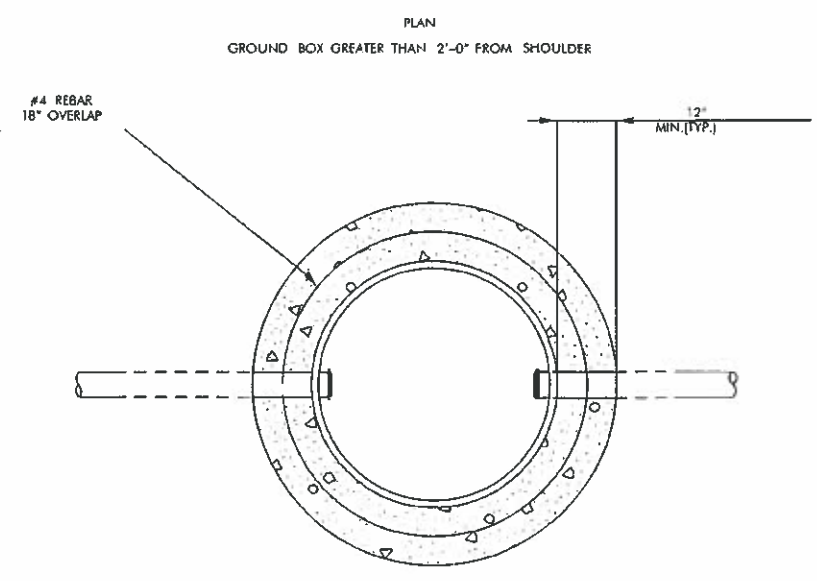
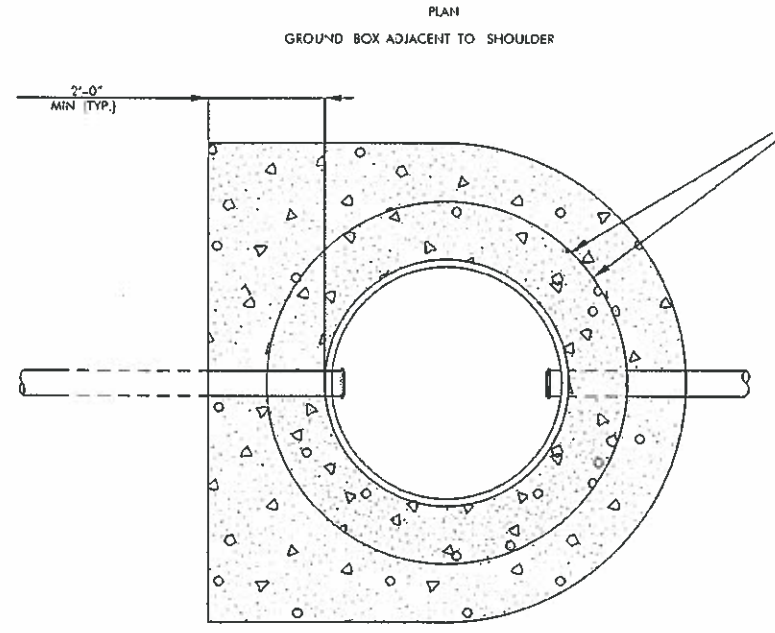
BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
877.06(A)	(PL) FIBER OPTIC ROUTE SIGN AND INSTALLATION	EA.

**FIBER OPTIC CABLE ROUTE SIGN DETAIL**

DESIGN	GSC	406
CHECK	RSM	406
APPROVED	ARS	406
TRAFFIC ENGINEERING ALAN R. STEVENSON		
STATE OF OKLAHOMA	DEPARTMENT OF TRANSPORTATION	
DIVISION 8	STATE JOB NO. 20290(04)	SHT. NO. 380

(DRAWINGS - NOT TO SCALE)

REV. NO.	DESCRIPTION	DATE



CLASS "A" CONCRETE / REINFORCING STEEL QUANTITIES	GROUND BOX LESS THAN 2'-0" FROM SHOULDER	GROUND BOX GREATER THAN 2'-0" FROM SHOULDER
	CLASS "A" CONCRETE	0.95 CU. YDS.
REINFORCING STEEL	11.54 LBS.	11.54 LBS.

**TAPING DETAIL**  
 CONTRACTOR SHALL MARK ALL CONDUCTORS, FIBER, COMMUNICATION CABLES AS THEY ENTER & LEAVE ANY GROUND BOX, PULL BOX, ITS CABINET, SIGNAL CABINET, DMS, POLE, STRUCTURE, ETC. WHERE WIRE IS ACCESSED OR VISIBLE WITH COLOR CODED ELECTRICAL TAPE OR USING COLOR CABLE TIES (40 lbs) AS FOLLOWS:

DMS	120V/240V POWER	LOAD	BLACK & BROWN
		NEUTRAL	WHITE & BROWN
CABINETS	120V POWER	LOAD	BLACK & ORANGE
		NEUTRAL	WHITE & ORANGE

CONTRACTOR SHALL MARK EACH CONDUCTOR WITH COLORED TAPE. THE TAPE SHALL CONSIST OF A HALF-LAP LAYER OF TAPE COVERING A SIX INCH LENGTH OF THE CONDUCTOR. THIS MARKING WILL BE PLACED 6" AWAY FROM THE CONDUIT ENTERING OR LEAVING THE ABOVE ACCESS LOCATIONS AND/OR AT ACCESS POINTS SUCH AS HAND HOLES IN POLES & STRUCTURES. GROUND BOXES & CABINETS SHALL NOT BE PAID FOR UNTIL PROPER AND CORRECT MARKING OF CONDUCTOR IS COMPLETED TO ENGINEERS SATISFACTION.

**MATERIALS SPECIFICATIONS**

- CIRCULAR GROUND BOX TEXT SHALL BE 1" HIGH AND CENTERED. IT SHOULD READ:  
ODOT/ITS
- R-1 GROUND BOX INSTALLATIONS TO INCLUDE BOLTED DOWN WITH PENTA-HEAD BOLTS, 3 SETS OF 4 - 6" CABLE HOOKS; CONTRACTOR SHALL PROVIDE ODOT WITH 3 PENTA WRENCHES AND 12 EXTRA PENTA BOLTS PER PROJECT.

**NOTES:**

- R-1 GROUND BOX FRAMES AND COVERS SHALL BE POLYMER CONCRETE.
- R-1 GROUND BOX COVERS SHALL HAVE AN APPROVED WHEEL LOAD OF 10,000 LBS AND BE UV STABILIZED.
- IF SUBSURFACE CONDITIONS EXIST WHICH PROHIBIT THE PLACEMENT OF THE GROUND ROD IN A VERTICAL POSITION, THE ROD MAY BE DRIVEN AT AN OBLIQUE ANGLE NOT TO EXCEED 45 DEGREES FROM VERTICAL OR BURIED IN A TRENCH AT LEAST 30 IN DEEP. CONNECTION TO GROUND ROD SHALL BE CAD WELDED.
- THE CIRCULAR R-1 GROUND BOX COVER SHOULD BE SIZED TO FIT A BOX WITH A MINIMUM CLEAR OPENING OF 48".
- APPROVED GROUND BOX CONTACT INFORMATION:

ARMORCAST PRODUCTS COMPANY  
 TELEPHONE: (818) 982-3600  
 PART NUMBERS - (A6001695A-OKDOT, A7000177)

NEWBASIS  
 TELEPHONE: (909) 787-0600  
 PART NUMBERS - (FCC340000404, FCV54003604, FFR54001207)

DESIGN	RSM	04/06
DRAWN	GSC	04/06
CHECKED	RSM	04/06
APPROVED	ARS	04/06
SQUAD		

OKLAHOMA DEPARTMENT OF TRANSPORTATION  
 TRAFFIC DIVISION

TYPICAL GROUND BOX R-48 DETAIL

PROJECT NO. 20290 (04) SHEET NO. 372

8/24/12/05