



Request for Information

for

**Partnership Opportunity for Leasing of Port-Owned
Optical Fiber Infrastructure**

Issued: Friday, January 18, 2019

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I. Introduction

The Port of Ridgefield plans to build approximately 42 miles of dark fiber in a loop through Ridgefield and the areas north and south, along the I-5 corridor. The fiber will pass through most of the Port District's existing commercial and industrial areas, as well as areas reserved for future economic development initiatives.

The Port seeks to work with potential partners that are interested in leasing some or all of the Port's planned fiber to make affordable and scalable, Gigabit-class broadband available to businesses, economic development areas, first-responder facilities, and other community anchor institutions (CAIs) in the Ridgefield area, as well as to residences.

The Port issues this Request for Information (RFI) to solicit ideas and informal proposals from private sector entities that may have an interest in working with the Port in this regard, potentially by leasing Port-owned fiber assets and by building their own assets within the Port District. The information gleaned from this RFI process will help guide the Port's planning and investment in communications infrastructure, generate favorable terms for public-private collaboration that encourage new investment, and enhance the value of the investment that existing private providers have already made in the Port District. **The Port hopes this initiative will support and accelerate private providers' efforts to improve broadband service options in the County.**

This RFI offers background regarding this effort (Section II); a description of the development efforts taking place in the region (Section III), a brief summary of the Port's policy goals (Section IV); and a description of the planned fiber route (Section V). It then explains the RFI response format and process in the final sections.

II. Background

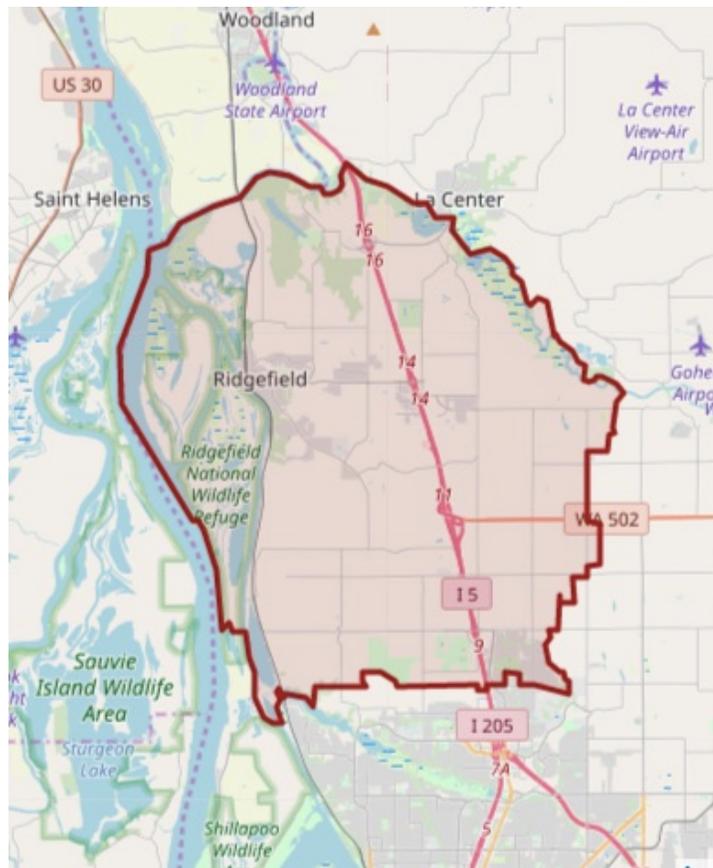
Ridgefield is one of the fastest growing cities in Washington, located on I-5, just north of Vancouver, in the rapidly developing Discovery Corridor. The City more than doubled its population between 2000 and 2010 and City officials are preparing for the population to triple in the next 15 years.¹

The Port District encompasses nearly 57 square miles, including areas to the north and south of the City of Ridgefield (see Figure 1). As a municipal economic development organization, the Port has worked with the City of Ridgefield and other cities along the corridor to make key infrastructure investments, including four new highway interchanges and regional sewer and

¹ Chris Brown, "Ridgefield: Bigger Building Boom in the Forecast," *Clark County Today*, March 8, 2018, <http://www.clarkcountytoday.com/news/ridgefield-bigger-building-boom-in-the-forecast/#.W4lOupNJG1l> (accessed September 2018).

road development, to prepare the area for the current and anticipated influx of new residents and businesses.

Figure 1: Ridgefield Port District



Located 14 miles north of the Washington-Oregon border and less than half an hour from the Portland International Airport, Ridgefield residents enjoy close proximity to the Portland/Vancouver metropolitan area, as well as numerous outdoor recreational activities. There is an enormous amount of new construction planned for the next few years along the corridor, including 2,500 homes in Ridgefield alone, Clark College’s new campus, and a new public medical school at Washington State University Vancouver.

However, a lack of robust and competitive broadband offerings hampers economic development efforts around the Port District. In the Port’s recent Dark Fiber Needs Assessment,² business stakeholders indicated that existing broadband service limits their future growth and the potential expansion of their businesses. A lack of competitive broadband offerings also limits the

² “Dark Fiber Infrastructure Needs Assessment,” *Port of Ridgefield*, July 2017. The document is attached to this RFI as Appendix A.

ability of first responders, medical facilities, and schools to use bandwidth-hungry applications. These applications offer efficiency gains and will be critically important for community anchors as they prepare to meet the needs of a rapidly growing community.

Demand for improved service options is widespread among all stakeholders, as is demonstrated in the Needs Assessment, with a third of respondents expressing a willingness to pay somewhat higher rates (\$100 to \$300 per month) and 14 percent expressing a willingness to pay more than \$300 more per month for 1 Gbps fiber optic service.³

The Port of Ridgefield and its counterparts throughout the state of Washington have long recognized broadband as critical infrastructure for the 21st century, and have worked to persuade the Washington State legislature to extend the right to invest in fiber infrastructure to all Ports, rather than only those in rural counties.⁴ In March 2018, Governor Jay Inslee signed House Bill 2664 into law, granting all Washington State port authorities the opportunity to develop open-access broadband infrastructure for lease to service providers. As a result, the Port of Ridgefield now has the authority to ensure that the Port District has the communication infrastructure it needs to foster balanced development into the next century and to support the rapid growth in population that is underway and projected to intensify in coming years.

To these ends, the Port plans to build a fiber loop that passes through most of Ridgefield's important economic areas and that passes most critical community anchor institutions. The proposed fiber loop is not intended to be an overbuild of existing facilities owned by the private sector. Rather, the Port's goal is to fill gaps by providing access to fiber on diverse routes where private sector fiber is not available for lease. This strategy is intended to facilitate new opportunity for private internet service providers (ISP) and to spur private investment in last mile network infrastructure by lowering the upfront capital costs for service providers interested in entering the market or improving their service offerings.

A map of the planned fiber loop is included in Section V and a detailed map book is attached as Appendix B: Map Book. Please note that the final route for construction will be varied based on responses to this RFI and the Port's assessment of where new fiber can deliver the best economic development outcomes.

III. Why the Discovery Corridor?

The Port of Ridgefield, in collaboration with the City of Ridgefield, La Center, Salmon Creek and Battle Ground, have been working for more than a decade to install state of the art infrastructure

³ Ibid.

⁴ "'Modernized' Law Allows Ports in Washington to Build Fiber Networks," *Port of Ridgefield*, March 26, 2018, <http://portridgefield.org/modernized-law-allows-ports-washington-build-fiber-networks> (accessed November 2018).

and utilities along the Discovery Corridor in order to facilitate new development. Private partners that build facilities to provide broadband services in the area have the opportunity to capitalize on all the investments the Port and Cities have made to allow the area to support rapid growth in the years ahead.

The Portland/Vancouver metropolitan area has grown steadily for decades, but limits to development and soaring real estate prices have created enormous development opportunities for surrounding areas. Ridgefield has seen the fastest residential growth in the entire state of Washington over this past decade. The City more than doubled its population between 2000 and 2010, growing 13 percent between 2016 and 2017, and City officials are preparing for the population to triple in the next fifteen years.⁵ Home prices continuing to rise, despite steady increases in the number of homes for sale.⁶ Furthermore, median household income has grown steadily as well, reaching over \$88,000 in 2016. The Ridgefield School District recently opened a new campus to accommodate additional students and is already planning its next expansion in order to keep up with the growing population. Medical facilities also continue to proliferate along the corridor. Kaiser Permanente and Legacy already have campuses in Salmon Creek, and PeaceHealth owns an undeveloped piece of land in Ridgefield.

Even as the Portland/Vancouver metro area provides a steady source of jobs and opportunity for existing and new Ridgefield residents, the Discovery Corridor represents far more than just a convenient place from which to commute into Vancouver and Portland. The Port and the cities within it came together to create the Discovery Corridor in 1999 with a goal to build up a good mix of residential, commercial, industry, and support services in order to create a thriving economy throughout the area.

To support this visionary strategy, the Port has made a range of strategic investments that poise the Ridgefield region to absorb, manage, and prosper from the projected growth. The Port District has added sewer capacity and other utilities. In addition, the Port has developed extensive new roads and bridges, allowing local traffic to avoid getting on and off I-5. Four new Port-developed I-5 highway interchanges in the Port District help make the district the top area for large development-ready sites in the region. In 2016, the Columbia River Economic Development Council's Employment Land Study identified 16 sites of at least 20 acres that are currently zoned for employment and situated along or very near the Discovery Corridor.

⁵ Chris Brown, "Ridgefield: Bigger Building Boom in the Forecast," *Clark County Today*, March 8, 2018, <http://www.clarkcountytoday.com/news/ridgefield-bigger-building-boom-in-the-forecast/#.W4lOupNJG1> (accessed September 2018).

⁶ Troy Brynelson, "More homes hit market in Clark County; prices go up," *The Columbian*, June 29, 2018, <https://www.columbian.com/news/2018/jun/29/more-homes-hit-market-in-county-prices-up/> (accessed November 2018).

Already, economic development efforts have begun to pay off. Parr Lumber, United Natural Foods Inc. (a.k.a. UNFI), Mason's Builder Supply, a Dollar Tree distribution facility, and a FloServe manufacturing facility have located in the area, with many more businesses currently exploring the idea. Spokane-based Rosauers Supermarkets opened the first grocery store in Ridgefield earlier this year, serving as the anchor tenant in a new retail development. The Cowlitz Tribe recently opened a state-of-the-art casino complex resort on the north end of the corridor; the complex includes restaurants, bars, and retail outlets. The Discovery Corridor also contains the Clark County fairgrounds, the 18,000-seat Sunlight Supply Amphitheater, the Tri-Mountain Golf Course, and numerous wineries and breweries, making it a popular tourist destination.

Higher education institutions in the area continue to grow and are focused on helping students to master the skills needed to thrive in high tech industries such as mechatronics and advanced manufacturing. Washington State University in nearby Vancouver is a significant research institution, with 20 bachelor's, 12 master's and 16 doctoral degree programs. Clark College is also expanding its presence in the Discovery Corridor, adding a 70-acre campus at Boschma Farm in Ridgefield. The College expects the new campus to serve more than 1,000 students by 2020.

The Discovery Corridor offers a high quality of life with a lower cost of living and housing than is available in the Portland and Seattle metropolitan areas. The Columbia River offers numerous boating and outdoor recreation opportunities and the Ridgefield National Wildlife Refuge protects more than 5,200 acres along the river. Residents also have easy access to the Columbia lowlands and the Cascades and Olympic mountain ranges. A vibrant community is developing in the Discovery Corridor, and the Port and cities are working to ensure that the area has the infrastructure in place to support balanced and sustainable growth for many years to come. We anticipate that next generation broadband services will be one more amenity to draw people to the area in the years to come.

IV. The Port's Objectives

The Port seeks private partners that want to invest in the Ridgefield Port District and be a part of its growth strategy and long-term future. The Port seeks input from potential partners regarding the terms and conditions under which they would lease dark fiber from the Port. The Port encourages respondents to share their expertise and preferences in order to maximize the value that this public investment in fiber will have for the private sector. The Port will use the information gleaned from this RFI to guide the technical specifications of the fiber infrastructure, and the policies related to the lease of the fiber.

The Port of Ridgefield was founded in 1940 to promote economic development within the City of Ridgefield and the surrounding areas. It continues this work today, purchasing and developing property for commercial and industrial use. The Port is a community owned investment trust that

makes strategic investments that improve the local economy and enhance the economic well-being of the citizens living within the Port District.

In Ridgefield's early days, close proximity to the Columbia River gave Ridgefield businesses a competitive advantage. Today, one of the most important ways businesses gain a competitive advantage is through direct, diverse fiber connections to the internet. As the attached needs assessment demonstrates, inadequate broadband service options place Ridgefield businesses at a competitive disadvantage and make it more difficult to attract and retain cutting-edge companies to the area. A lack of competitive broadband offerings also hinders the ability of critical community anchor institutions to take advantage of the enormous efficiencies that bandwidth-hungry applications make possible, such as telehealth services, video surveillance and large data set transfers.

The Port intends to invest in a dark fiber loop connecting key economic areas and key anchor institutions to ensure the community has the infrastructure it needs to fully participate and compete in the 21st century.

The primary goals of this initiative are:

- Enable the private sector to provide business-class data transport services at a competitive price to tenants of existing and planned economic development target areas in the Port District
- Enable the private sector to provide competitive broadband service offerings to community anchor institutions in the Port District
- Create opportunity and incentive for private entities to invest in last mile broadband infrastructure in the Port District to serve a wide range of residential, business, and institutional customers
- Enable private sector broadband opportunity in the region, while securing sufficient dark fiber lease revenues from private sector fiber lessees as to enable a return on the Port's fiber investment over a reasonable period of time

Currently, inadequate broadband service options place businesses within the Port of Ridgefield district at a competitive disadvantage. The Port intends to make access to affordable, gigabit-class broadband one of the amenities that will help attract and retain cutting-edge companies to the area.

A lack of competitive broadband offerings also hinders institutions' abilities to take advantage of the enormous efficiencies that bandwidth-hungry applications make possible, such as telehealth services, video surveillance and large data set transfers. A rapidly growing population may place

a strain on those institutions' resources at times. Robust, affordable broadband connections, and the applications they enable, will allow such institutions to do more with available resources.

The Port cannot achieve these goals alone. It seeks partners interested in lighting the Port's dark fiber and providing services and providing services to businesses and community anchor institutions.

An additional goal of this initiative is to improve residential service offerings in the Port District. Higher tiers of residential broadband service will enable residents to telecommute more often, allowing them to spend more time and money in their local community, while enabling workers to live in Ridgefield while working for businesses located elsewhere. It also helps area employers and higher education institutions recruit employees and students. ISPs interested in building out last mile networks to offer services in any of the Port District's rapidly growing residential areas will also have an opportunity to lease dark fiber from the Port.

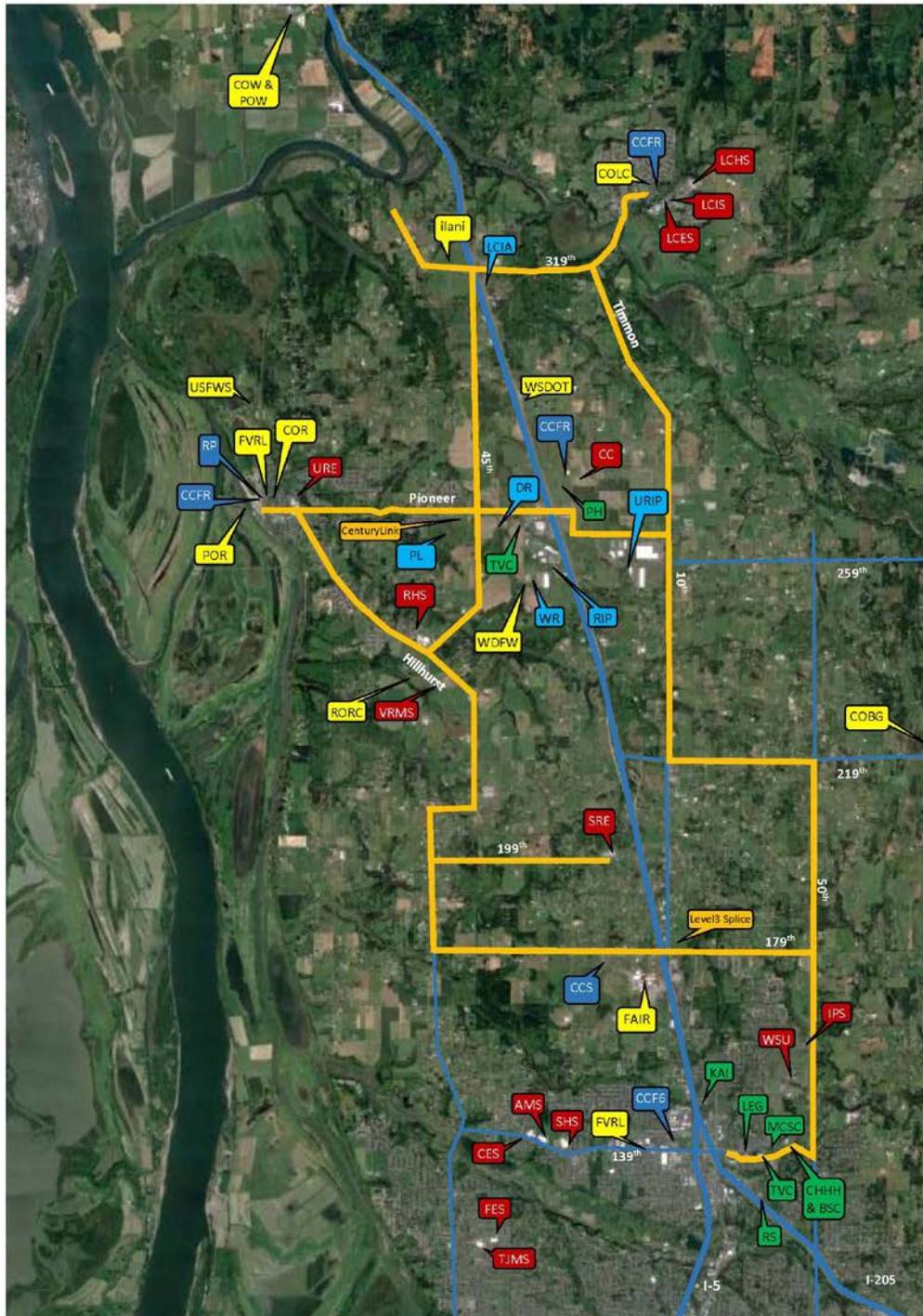
The Port encourages responses from any entity that may be interested in leasing Port fiber to serve businesses, institutions, or residences in the area. The most useful responses to this RFI will articulate how respondents intended use of the Port's fiber will align with the goals of this initiative.

V. Description of the Port's Planned Fiber Loop

The Port's proposed fiber optic network consists of 222,604 feet of fiber optic cable divided into 17 distinct segments. An estimated 201,614 feet is proposed for aerial construction with the balance of 21,058 proposed to be buried underground- with more to be placed underground if and when other road or utility construction reduces the cost of doing so for the Port. The aerial fiber optic cable will be attached to an estimated 996 utility poles. A detailed map book of the proposed fiber network is included as Appendix B.

Figure 2 contains a map of the planned fiber route and nearby community anchor institutions.

Figure 2: Planned Discovery Corridor Fiber Backbone and CAI Locations



Proposed - DRAFT
Port of Ridgefield Dark Fiber Optic
Discovery Corridor Backbone Loop

- Commercial/Industrial
- Civic & Government
- Education/Research
- Emergency Services
- Healthcare
- Dark Fiber Network



Map Legend:

Commercial/Industrial

- LCIA – La Center Industrial Area (planned)
- PL – Pioneer Landing (in construction)
- DR – Discovery Ridge (in construction)
- URIP – Union Ridge Industrial Park (operational, growing)
- WR – Port of Ridgefield Wisdom Ridge (operational, growing)
- RIP – Ridgefield Industrial Park (built out)

Education/Research

- LCHS – La Center High School (La Center Public Schools)
- LCIS – La Center Intermediate School (La Center Public Schools)
- LCES – La Center Elementary School (La Center Public Schools)
- URE – Union Ridge Elementary School (Ridgefield Public Schools)
- RHS – Ridgefield High School (Ridgefield Public Schools)
- VRMS – View Ridge Middle School & Sunset Ridge Intermediate School (Ridgefield Public Schools)
- SRE – South Ridge Middle School (Ridgefield Public Schools)
- IPS – iTech Preparatory High School (Vancouver Public Schools – Tech magnet)
- SHS – Skyview High School (Vancouver Public Schools – STEM magnet)
- AMS – Alki Middle School (Vancouver Public Schools)
- CES – Chinook Elementary School (Vancouver Public Schools)
- FES – Felida Elementary School (Vancouver Public Schools)
- TJMS – Thomas Jefferson Middle School (Vancouver Public Schools)
- WSU – Washington State University (Vancouver Campus)
- CC – Clark College (Boschma Farms Campus)

Civic & Government

- COW & POW – City of Woodland & Port of Woodland
- COLC – City of La Center
- ilani – ilani Casino Resort, Cowlitz Tribe of Indians (will add major hotel in 2019-20)
- USFWS – United States Fish & Wildlife Service Ridgefield National Wildlife Refuge
- FVRL – Fort Vancouver Regional Library system
- COR – City of Ridgefield
- POR – Port of Ridgefield
- WSDOT – Washington State Department of Transportation
- WDFW – Washington Department of Fish & Wildlife (SW Washington Regional HQ)
- RORC – Ridgefield Outdoor Recreation Complex (opens fall 2018)
- COBG – City of Battle Ground
- FAIR – Clark County Fairgrounds, Event Center & Amphitheater

Public Safety/Emergency Services

- CCFR – Clark County Fire & Rescue
- RP – Ridgefield Police Department
- CCS – Clark County Sheriff's Office
- CCF6 – Clark County Fire District 6

Healthcare

- KAI – Kaiser Permanente Salmon Creek Clinic (full service)
- LEG – Legacy Salmon Creek Medical Center (full service)
- RS – Rainier Springs Behavioral Health (full service)
- TVC – The Vancouver Clinic
- CHHH – Community Home Health & Hospice
- BSC – Bonaventure Salmon Creek Senior Living
- MCSC – ManorCare Health Services Salmon Creek
- PH – PeaceHeath Medical System (owns undeveloped property in Ridgefield)

As it is currently planned, the Port's fiber optic cable will complete an approximate loop around the Port District running from the City of La Center in the northeast, to Legacy Hospital in the southeast, west on 179th Street to Northwest 41st Avenue, and then north to Pekin Ferry Road. A segment running west will connect the fiber optic cable to the City of Ridgefield's downtown area and the Lake River waterfront. The loop is completed by a segment from Pekin Ferry Road to the La Center I-5 junction. In addition, a segment running east and west on Pioneer Street will connect the fiber optic loop's east and west sections and serve the development at the Ridgefield I-5 junction.

The fiber loop has been designed to pass in close proximity to all of the Port's existing and planned economic development areas, as well as most of the community anchor institutions in the Port District.

As previously mentioned, the fiber routing is not yet set in stone. If there are other route segments you believe would be more valuable, or if some of the proposed route segments are redundant with what is already available on the commercial market, please indicate so in your response. The Port seeks to understand your priorities for dark fiber routing and what locations and routes will best serve to encourage and stimulate private opportunity and investment.

The Port will use the responses to this RFI not only to determine routing and strategy for the fiber, but also to inform technical details such as strand count and pull box placement.

The Port also seeks input from the respondents to this RFI regarding requirements for fiber maintenance and service level agreements.

VI. RFI Response Format

The Port requests the following information—in as much detail as is practicable—from respondents. We ask that all responses adhere to the following response and page requirements and that respondents follow the order and structure of the requested information, including all numbering as indicated.

Please provide your electronic response in either Microsoft Word or Adobe PDF format, using the following response structure and numbering:

1. **Cover Letter:** Please include company name, address of corporate headquarters, address of nearest local office, contact name for response, and that person's contact information (address, phone, cell, email).
2. **Affirmation:** Affirm that you are interested in gaining access to the Port's fiber assets. Describe how you would use these assets, and how your use would align with the Port's

objectives laid out in Section II. To the extent possible, describe the services and rates you expect to offer in the Ridgefield market.

3. **Existing Operations and Capabilities:** Please help us to understand your operations and capabilities. Describe your existing network operations and your experience lighting and operating dark fiber. Please note whether your existing and planned infrastructure is dedicated or if service is available to all potential end-users. Please note if you already operate a network in or near the Ridgefield area. Include descriptions of the services you offer and your rates in other markets. Share any other information that you feel is relevant to the Port's understanding of your capabilities.
4. **Financial Stability:** Demonstrate your financial stability. If available, include a credit rating from Standard & Poor's, Moody's, or Fitch Investor Services from the most recent rating agency report. Please keep response to one page.
5. **Route Preference:** Provide feedback on the Port's planned fiber route, as it has been described in Section III. Please indicate if you believe there are alternative routes or additional segments the Port should pursue, or if any of the proposed route segments are redundant with what is already commercially available at affordable rates.
6. **Interest in Leasing Fiber:** State whether you would be interested in leasing fiber strands along the routes described above. If so, please describe your favored terms, including:
 - Number of fiber strands
 - Routing of fiber strands (i.e., where you would want to lease fiber; whether you would want it along all or only a portion of the route segments, etc.)
 - Preferred pull-box locations
 - Preference for dedicated or shared cable sheaths
 - Favored lease structure (IRU or simple lease)
 - Favored lease term (length)
 - Particular type of fiber preferred and/or optical performance requirements
 - Required timeframes around installation, maintenance, and repairs
 - Preferred procurement approach (e.g., RFP, auction, or price list for first-come-first-served)

7. **Issues Regarding Long-haul Connections:** In conjunction with nearby ports, the Port of Ridgefield is considering how it can ensure the availability of robust, affordable, long-haul connectivity over fiber to Internet exchange points in Portland and Seattle. Please help us to understand whether adequate long-haul connections already exist in the port district, and if not, whether the lack of such connections may reduce your interest in, or potential to flourish in, the Port District. Please share with us whether you have found such long-haul connections to the north and south to already be commercially available at an affordable price and, if not, what types of service you would seek and at what price.
8. **Issues Regarding Break Out Points:** Although we believe that some commercial carriers already have long-haul fiber running through the Port District along I-5, the Port is concerned that a lack of break-out points may hinder the ability of local providers to access this fiber. The Port is considering building carrier-neutral huts to serve as break out points in order to facilitate new network deployments and expansions in the Port District. Please share whether you believe such an investment will support your deployment efforts, and if so, provide as much technical guidance as is practical so as to maximize the usefulness of these huts.
9. **Performance Parameters:** The Port wants to be sure any infrastructure it helps fund is used to achieve the objectives as are described above. For that reason, the Port is considering attaching performance requirements to lease agreements to incentivize lessees to use the assets in a way that achieves the Port's objectives. Please discuss what kind of performance parameters you feel are fair to attach to a fiber lease agreement, and the effect these parameters may have on your willingness to lease Port assets. Please address what kinds of use, service, or buildout obligations should be associated with the fiber leases, if any. Please also share your willingness to commit to provide adequate services over that infrastructure by describing the potential services and prices.
10. **Leasing Parameters and Structure:** The Port will lease dark fiber on a wholesale basis to private partners. The Port itself will not provide telecommunications or other retail services to end users. The Port seeks input from potential fiber lessees about potential parameters for the leasing arrangement. For example, would potential applicants prefer to bid for fiber leases or to lease on a first-come-first-served basis based on published rates? Should rates be structured to provide volume discounts, with respect to number of strands, number of miles, or both? Should there be a percentage limitation placed on any individual fiber lessee to facilitate competition?
11. **Suggest Other Actions and/or Collaboration Models:** Given the objectives the Port discussed above, are there other actions the Port could take to help achieve these policy

goals? Do you already have plans that will help address these policy goals, and, if so, is there anything the Port can do to enhance or accelerate your efforts?

12. **References:** Please provide a minimum of three references, including contact information, from previous contractual relationships.
13. **Other Data:** Please feel free to share any other data or information you consider relevant to this process and to the Port's efforts on this matter.

VII. Response Process

We ask that all respondents provide all requested material and submit each in the format (structure and page limitations) specified in this RFI.

Please submit at least one electronic copy to Nelson Holmberg, Vice President of Innovation, via email (nholmberg@portridgefield.org) and one paper copy of your RFI response to:

U.S. Postal Service:
Port of Ridgefield
ATTN: Nelson Holmberg, Vice President of Innovation
P.O. Box 55
Ridgefield, WA 98642

In person or service deliveries should be presented to:
Wonder Baldwin, Executive Assistant
Port of Ridgefield
111 W. Division
Ridgefield, WA 98642

All correspondence regarding this RFI should be directed to Nelson Holmberg, Vice President of Innovation. The Port cannot guarantee that any correspondence directed elsewhere will be received or considered.

Letter of Intent

All interested respondents are asked to submit a letter of intent (LOI) via email by 4:00 PM Pacific Standard Time (PST) Thursday, Jan. 31, 2019 to Nelson Holmberg, Vice President of Innovation, Port of Ridgefield, via email to nholmberg@portridgefield.org.

The LOI should include the company name and the name, title, phone number, and email address of the respondent's primary point of contact and should indicate that the respondent intends to submit a formal response to the RFI. The LOI shall be contained in the body of an email, and does not have to be a formal, standalone letter.

Questions

Questions related to this RFI should be emailed to Nelson Holmberg, Vice President of Innovation, Port of Ridgefield (nholmberg@portridgefield.org) by 4:00 PM PST on Friday, Feb. 8, 2019.

Question Responses

The Port will release questions received and responses to these questions to all respondents that have submitted an LOI by 4:00 PM PST on Friday, Feb. 15, 2019.

Response Deadline

Final RFI submissions must be delivered via email and delivered in person or received by mail no later than 4:00 PM PST on Friday, March 15, 2019. Please deliver or mail the final RFI response and the completed required Appendix in a sealed envelope to the following address:

U.S. Postal Service:
Port of Ridgefield
ATTN: Nelson Holmberg, Vice President of Innovation
P.O. Box 55
Ridgefield, WA 98642

In person or service deliveries should be presented to:
Wonder Baldwin, Executive Assistant
Port of Ridgefield
111 W. Division
Ridgefield, WA 98642

Confidentiality of Responses

Any information contained in the proposal that is proprietary must be clearly designated. Marking the entire proposal as proprietary will be neither accepted nor honored. If a request is made to view a vendor's proposal, the Port will comply according to the Open Public Records Act, chapter 42.17 RCW. If any information is marked as proprietary in the proposal, such information will not be made available until the affected vendor has been given an opportunity to seek a court injunction against the requested disclosure.

Summary of RFI Process Deadlines

The following is the schedule for responding to this RFI. The schedule is subject to change:

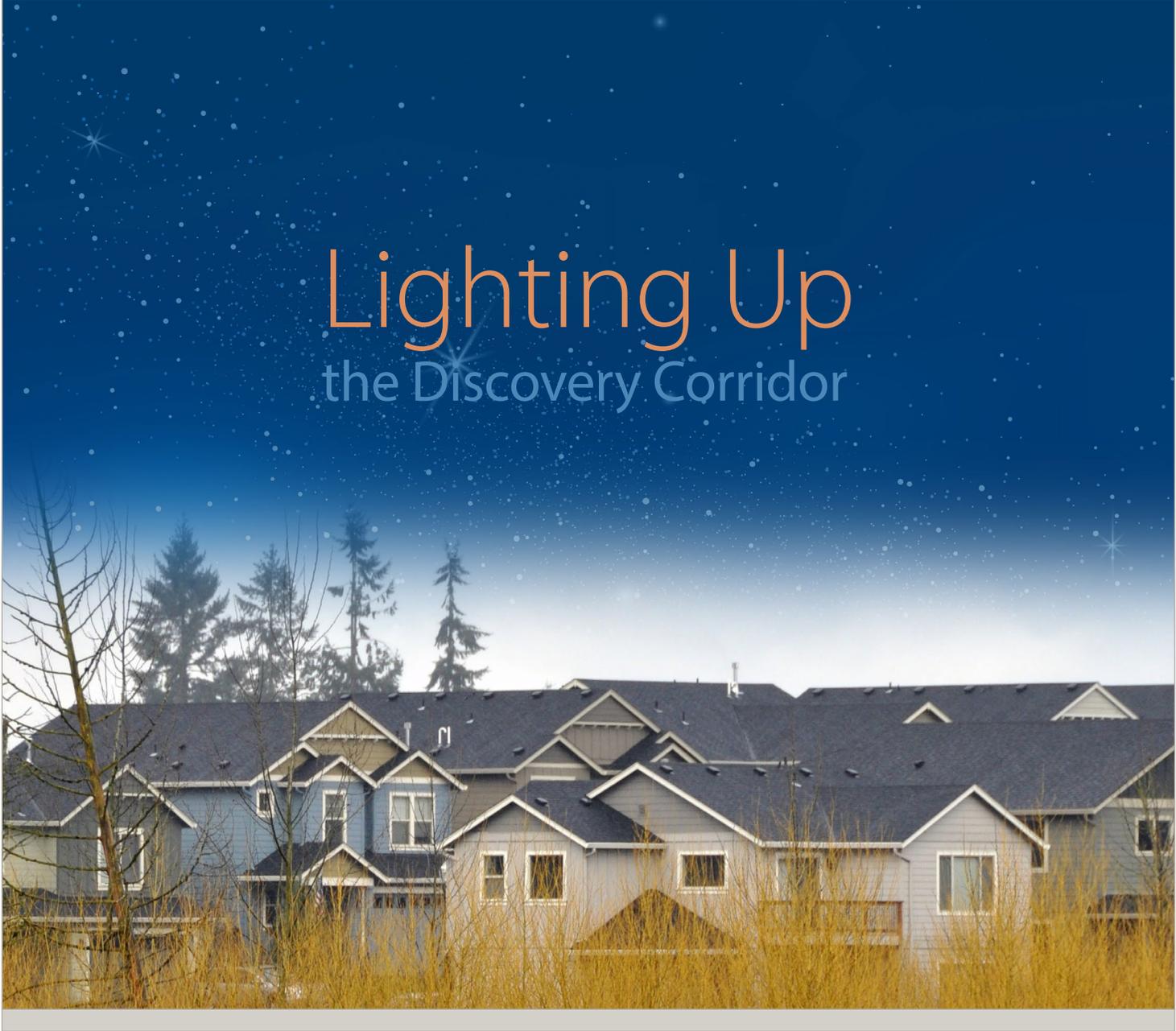
- **Friday, Jan. 18, 2019** – RFI release
- **Friday, Feb. 1, 2019** – Deadline for submitting LOI to respond to RFI
- **Friday, Feb. 8, 2019** – Deadline for submitting questions regarding RFI
- **Friday, Feb. 15, 2019** – Port posts responses to questions regarding RFI
- **Friday, March 15, 2019** – RFI responses due to Port

The Port thanks you in advance for your thoughtful response.

VIII. Personal Presentations

The Port may request any party that provides a compliant response to this RFI make an individual and personal presentation to better explain information or solutions identified in the response. These presentations, if requested by the Port, shall be held at a time and place of mutual convenience.

Appendix A: Needs Assessment



Lighting Up the Discovery Corridor

“Connectivity is mission critical to our area for growing business, competing globally, and providing citizens with access to a world-class education and other innovative services.”

Nelson Holmberg, Vice President, Innovation, Port of Ridgefield

PREPARED FOR

Port of Ridgefield Washington, Dark Fiber Infrastructure Team

ACKNOWLEDGMENTS

The Port of Ridgefield is supported by the community in their mission to “Light up the Discovery Corridor” with the goal of developing a world-class destination for employment and education – and for assuring the realization of its potential for community growth, based in part on a cutting-edge dark fiber optic infrastructure. This report is based on findings and input from the community, the Port, the City, local businesses and institutions.

Project Team

The Port of Ridgefield Washington
BergerABAM
Mackenzie
Riley Research Associates
Financial & Management Consulting



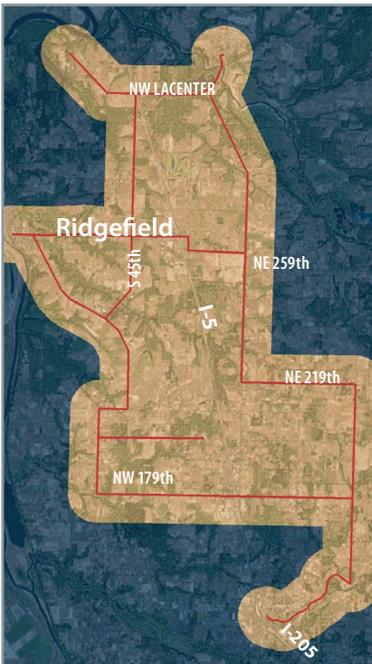
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Lighting up the Discovery Corridor

Fast and reliable broadband services are essential to the economic vitality of Southwest Washington's Discovery Corridor where economic growth has been affected by inadequate broadband access. The Port of Ridgefield is looking to change this dynamic by investing in dark fiber infrastructure to promote world-class, high performance economic development in the Corridor.

The dark fiber study area spans the city and areas north and south along I-5



In order to assess the need and feasibility of such an investment, the Port initiated a dark fiber optics infrastructure needs assessment. This report summarizes the results of the qualitative and quantitative assessment of the need for fiber optic infrastructure in the Discovery Corridor. The dark fiber study area encompasses the City of Ridgefield and areas to the north and south, generally along the I-5 corridor.

Needs Assessment Goals

- Document current and future broadband needs
- Identify the demand for increased bandwidth
- Evaluate industry trends leading to the demand for fiber infrastructure
- Examine case studies to identify how fiber can change economic conditions
- Determine companies that will benefit from the service

What is Dark Fiber Infrastructure?

Dark fiber infrastructure is fiber optic cable that is “dark” or not yet lit by service providers. Following its installation, the fiber network would be available for private carriers/service providers to lease broadband capacity from the Port. The Port has engaged Clark Public Utilities, the Clark Regional Wastewater District, and many other partners and jurisdictions about offsetting part of the costs associated with a new dark fiber network by integrating fiber optic conduit with the installation of other utilities.

Why is Fiber Optic Infrastructure Important?

High-capacity Internet allows the use of a wide variety of applications with positive impacts for people's everyday lives and the broader economy. Whether the operation is a small business or a multinational conglomerate, broadband applications continue to change its way of doing business.

“The dark fiber project would provide the Ridgefield School District greater flexibility interconnecting our schools as the district expands. It would allow for connection redundancy and enable the District to increase service more efficiently.”

- Michael Kenning, Manager of Technology Services, Ridgefield School District

Impacts of existing broadband service

In order to understand the existing broadband service available within the Port district and how the existing service affects its users and their plans for expansion, the project team interviewed a number of stakeholders. Overall, stakeholders report that the existing service is poor and barely meets existing demand.

Business and institutional users indicate they have allocated resources to make the existing service work for their individual needs, but the service is expensive and does not support future growth. Stakeholders also report unreliable service with interruptions during peak usage and no redundancy.



Stakeholders indicate that existing broadband service limits their future growth and the potential expansion of their businesses.

Businesses/institutions that have made significant investments to grow their operations are impacted by the cost of the broadband service and the lack of competition among service providers.



Respondents identify existing limited broadband service as a challenge for employee and student recruitment within the Discovery Corridor. Stakeholders also indicate that the existing service does not support large file sharing and limits their ability to collaborate effectively or efficiently with coworkers, students, and consultants working in other locations.

“Current broadband services impact the University’s ability to transfer and share information along with recruiting faculty and graduate students. The Port’s dark fiber project would enable the University to conduct high-quality research that requires reliable, high-speed service, and would help the University attract new faculty and students.”

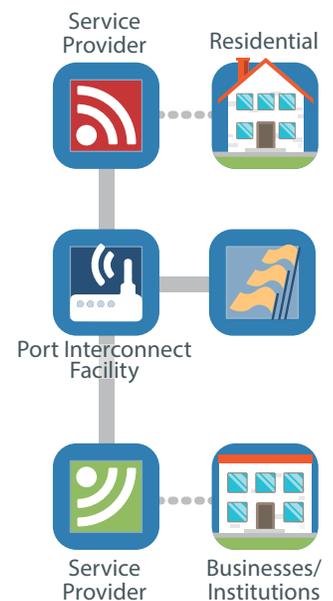
- Renny Christopher, Vice Chancellor of Academic Affairs, WSU-Vancouver

#1 priority
for businesses in the area

When asked to rank the importance of broadband relative to other business location considerations, most stakeholders identified broadband as the most important service.

Transportation and utility infrastructure are also important for business; however, the majority of stakeholders indicate improvements to these traditional infrastructure elements are common in development proposals, while it is more difficult for individual businesses to improve inadequate broadband services.

How a fiber network connects communities



How dark fiber can change economic conditions

Economic growth in rural areas can often be constrained by inadequate broadband access. Schools, hospitals, and public institutions need to be able to move and manage information quickly and efficiently. From small businesses to large multinational conglomerates, broadband applications continue to change the way businesses operate.

Industries advancing in their needs for high-capacity Internet



Manufacturing



Healthcare



Agriculture



Retail



Education



Government



Energy



Small Businesses

In order to determine how dark fiber can change economic conditions, three case studies were developed and summarized to illustrate performance, rates, and potential impacts on the local economy.

Businesses need fast and reliable Internet connections that allow e-commerce and online processing and transactions in order to stay competitive. Broadband applications are shaping the future of our communities and becoming a focus of economic development initiatives in small towns and rural areas. Providing access to broadband has become an economic development focus for many municipalities. There are several ways in which a municipality may improve broadband services for their communities. Dark fiber is one promising opportunity and has proved successful in other small communities.

Port of Skagit

The City of Mount Vernon got into the fiber business in 1995 as a strategy to connect municipal facilities. The Port of Skagit became a partner in 2002 as a solution to their growing and unmet data needs. After engaging service providers for a solution (to little interest), the Port of Skagit engaged the City of Mount Vernon in a partnership to provide a higher level of service.

Currently, the Port of Skagit, in coordination with regional partners, is planning an expanded six-segment dark fiber network to serve communities countywide.

With the Port initially providing fiber infrastructure in direct response to business needs, the impact on business retention is clearly linked. Legacy companies that were initial drivers behind the need remain in the County today. The fiber optic infrastructure has also allowed a Medical Information Network and an economic development partnership that allows Skagit County researchers, growers, producers, and educators to connect locally and globally with peers, partners, and customers.

The impact on the Port's Bayview Business Park has been significant and includes:

- **Skagit Valley Malting developed a state-of-the-art, grain malting facility in coordination with Washington State University and the Port of Skagit**
- **The Washington State University Bread Lab moved into a large facility at the park. The project directly created and retained over 75 jobs**
- **Michigan based Gielow Pickles expanded into a larger processing facility**
- **The Port of Skagit is developing a new, publicly-owned flour mill**
- **Chuckanut Brewing is developing a brewery**

Innovative activity, as measured by patents and federal research grants, has been strong in Skagit County as infrastructure has expanded (including fiber infrastructure). Patents issued were 55% higher over the last five years compared to the average over the previous decade.

Is there demand for dark fiber in the Port District?

Broadband applications have potential to influence a wide variety of industries. These applications are anticipated to become more prevalent in all aspects of daily life and are likely to be drivers of change in many industries. Influential broadband applications – and the demand for them in the Port District are determined through surveys and market analysis.

Prospect Survey

Most of the 40 organizations surveyed indicate they are anticipating growth over the next few years, which will result in increasing demand and higher interest in enhanced online performance. About three-quarters of respondents say they will likely need higher-speed Internet in the next three to five years. Among the most common needs are expanding use of software and business application services.

Expectations for future needs included:

- A proliferation of software to track diagnostics of fleets while on the road
- An expanded use of technology influencing greater demand for data
- Increased need for encryption and cybersecurity, also influencing data demand
- Larger file sizes resulting in increased requirements for data and speed
- Growth in the use of video conferencing
- Urgent need for redundancy based on frequent system failure and lack of other broadband options

Respondents also strongly support the Port's plan to build a dark fiber network and trust the Port's ability to install and maintain the network.

Willingness to Pay

Over half of respondents indicate a willingness to pay a marginally higher rate, between \$100 and \$300, for fiber optic services at a speed of one gigabyte per second. Over 14 percent of respondents are willing to pay over \$300 more per month for one gigabyte service.

Market Analysis

Three broadband applications, the Internet of Things, Mechatronics, and Software as a Service, have increasing influence in a wide variety of industries. As such, these applications will become more prevalent in all aspects of daily life, and are likely to be drivers of change in many industries.

Software as a Service

Software as a Service (SaaS) is software as a hosted service accessed through the Internet, rather than a one-time license model associated with on-site software. SaaS applications are typically sold through a subscription model with an ongoing fee. Some common SaaS companies include Salesforce, Workday, Office 365, NetSuite, AthenaHealth, Slack, Box, Google Apps, and Oracle.

Mechatronics

Mechatronics is a multidisciplinary field of science that describes the integration of mechanical engineering, control theory, computer science, and electronics in engineered systems.

76%

Of local organizations anticipate needing a higher-speed network in the next three to five years for the following business applications:

51%

Share or send documents between company locations

34%

Use video conferencing services

29%

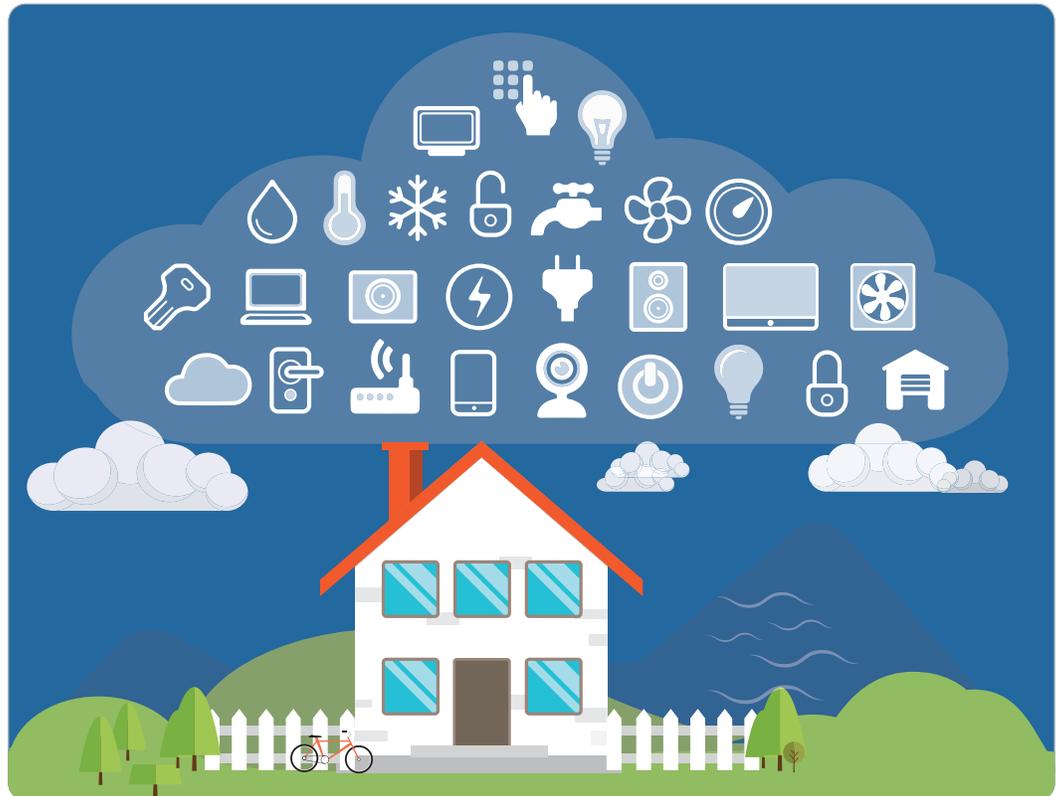
Use Internet-based software such as Google and Office 365

Market Analysis (Continued)

Internet of Things

The Internet of Things (IoT) is a term to describe physical objects with an IP address for Internet connectivity. IoT includes things like smart devices and appliances, wearable technology, connected cars, and healthcare gadgets. IoT appliances can communicate with one another and can be controlled remotely from a mobile device. Applications of IoT technology include smart thermostats and refrigerators; in smart homes, they include lighting, security, and entertainment; and in smart cities, applications include better traffic signal management, trash collection, and parking availability. IoT technology can improve the efficiency of city services and allow real-time responses to residents' everyday needs. Looking for a place to park in a smart city? There's an app for that!

The popularity of wireless home devices has increased the need for broadband dependency to support these technologies



Emerging industries based on Ridgefield's competitive advantages



Manufacturing



Healthcare



Agriculture



Government



Education



Small Businesses

Support for Broadband Demand in Ridgefield

Ridgefield (approximated in this section by the 98642 zip code) has a moderately diverse economy for a community of its size. As of 2015, there were nearly 6,400 employees working in the area. Several sectors have emerged in the economy based on Ridgefield's particular competitive advantages. Among these, warehousing and distribution, farming, food processing, government and education, and professional services prevail and comprise nearly 60% of the local economy. **These sectors align with those identified as influenced by new technologies facilitated by broadband infrastructure.** The next several years are expected to bring further regional economic growth within these sectors of the economy.

"The Ridgefield economy would really benefit from this dark fiber project – it would enable people to work locally, keeping them here in Ridgefield where they can eat, shop, and support local businesses."

David Morgan, Owner, Plas Newydd Farm

In addition to the growth that can be assumed for industries in the Ridgefield area, some specific local economic drivers may influence demand for a dark fiber network.



Clark College

Clark College recently acquired a site in Ridgefield for future development of the Clark College Boschma Farms campus. It eventually will include seven buildings, with the first 70,000-square-foot building beginning construction as early as 2019. The development will anchor a higher education presence in Ridgefield for future generations.



Ridgefield School Bond

To address Ridgefield's growing demand for education, voters passed a school bond in 2017 to invest over \$100 million in school facilities. The new campus near Ridgefield High School planned to serve grades 5 through 8 represents a critical initial investment.



PeaceHealth

In its acquisition of Southwest Washington Medical Center, PeaceHealth absorbed a 75-acre site in Ridgefield near the future Boschma Farms campus. The site is slated for development as a medical campus. When this vision comes to fruition, the PeaceHealth campus will create an immediate health care presence in the community, adding to the concentrations already present south of Ridgefield at Salmon Creek that include Legacy Salmon Creek and Kaiser Salmon Creek. Additionally, medical school students from Washington State University (WSU) Elson Floyd College of Medicine will spend two years at the WSU-Vancouver Campus, increasing the need for broadband for the healthcare industry.



Residential Growth

Ridgefield's population more than doubled over 10 years – from 2,147 in 2000 to 4,763 in 2010 – a 121.8 percent increase. During the same period, the population of Clark County as a whole grew 23 percent. Most of the growth in the population of the study area is occurring within the City of Ridgefield. Based on these trends, the City and the dark fiber study area will continue to grow at a higher rate than the County as a whole.

The study area also shows a high propensity for Internet and electronics use. An ESRI Electronics and Internet Market Potential report for the study area shows a high consumption rate, compared to the national average, for a variety of electronic products and Internet applications.

While a market potential index (MPI) of 100 represents the national average, households within the study area are likely to purchase electronics products, such as computers, televisions, tablets, GPS devices, cameras, wireless routers, software, and home theater entertainment centers, at a considerably higher rate than the national average. Each of these categories has an MPI of over 120 for the study area. High MPIs indicate the need for reliable broadband to conduct home and workplace business for about half the population in the study area.

As the influence of Internet connectivity increases in homes and places of employment across the nation, the demand for reliable Internet and connected electronic devices is expected to rise within the Ridgefield dark fiber study area.



89%

Of Ridgefield households utilize the Internet at home

20%

Of these households have children in school who use a computer at home

30% more

Of Ridgefield households use the Internet to make personal and business purchases, travel plans, obtain real estate and financial information, and track investments – up to 30% more than the national average



The Ridgefield area needs dark fiber

Stakeholder input and survey data, together with market findings, add fuel to the Port's initial anecdotal data indicating high demand for increased broadband speed, reliability, and redundancy.

230 acres

Developable employment land within the vicinity of the proposed service area Ridgefield offers.

Major development opportunities include Miller's Landing, Union Ridge, Discovery Ridge, and Wisdom Ridge.



90%

Of respondents support the Port's plan to build a dark fiber network.

These results are a clear statement that the Ridgefield area needs dark fiber infrastructure in order to attract and retain coveted cutting-edge employment in the educational, institutional, and public service sectors.

Furthermore, the assessment revealed a high level of stakeholder, business, and community support for the Port's efforts to build a dark fiber network and initiate a bright future for the Discovery Corridor. These findings can help the Port move forward with confidence as it assesses its resources, the funding necessary to build the network, and the ultimate return on the Port's investment. If the Port can rise to the funding challenge and build a fiber network, there will be significant economic benefits for the Ridgefield area.

"Providing dark fiber infrastructure will be a huge benefit to the City and the Port District in attracting new businesses."

Jeff Niten, Community Development Director, City of Ridgefield



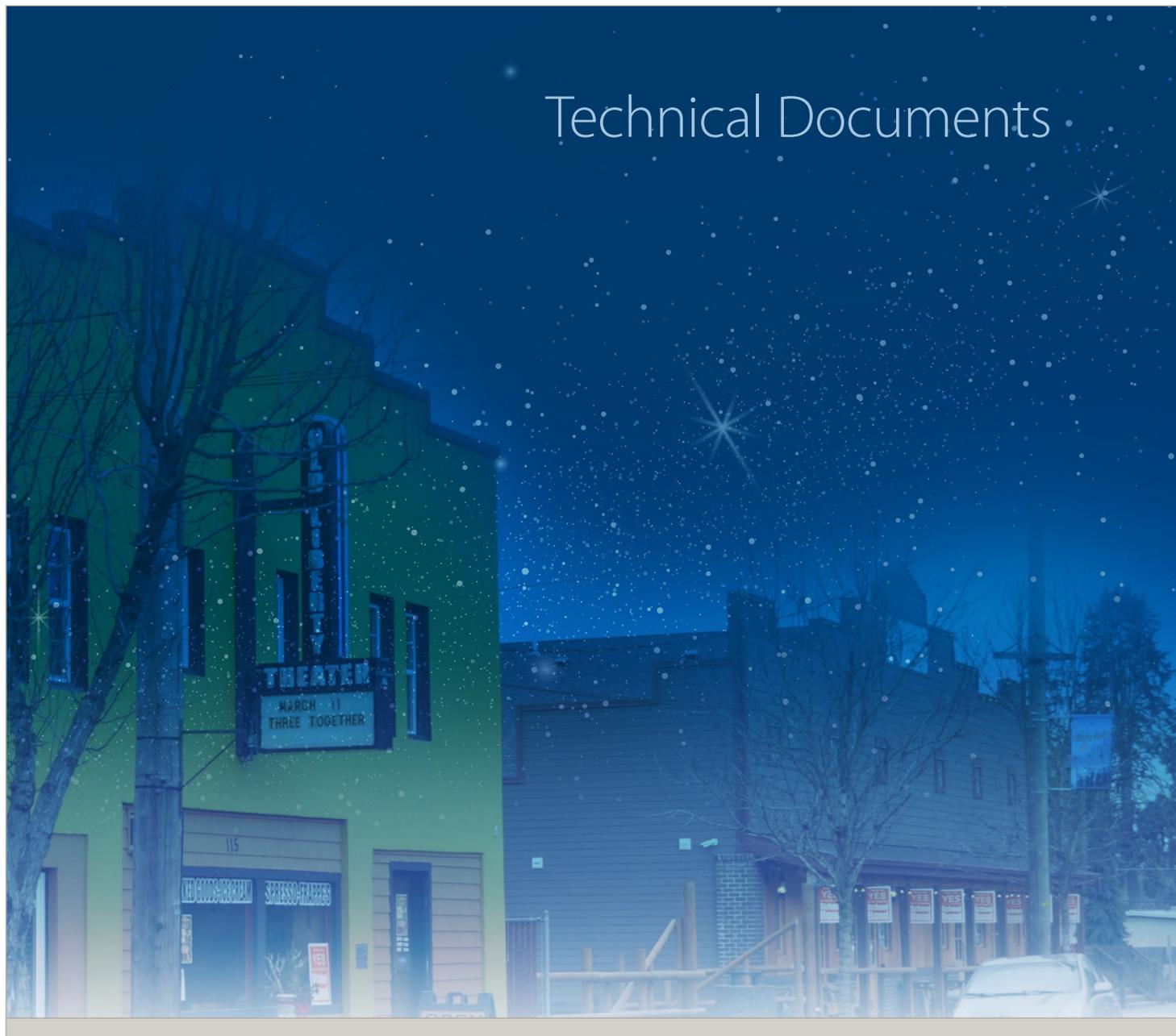
"A variety of smart cities are developing locally and across the globe. Those communities are best prepared for integrated services, and are the most likely to grow and prosper."

Mike Bomar, President, Columbia River Economic Development Council

This summary report is supported by the following technical documents:

- Stakeholder Interviews
- Data Gap Analysis
- Prospect Survey
- Market Analysis
- Case Study Analysis

Technical Documents



Port of Ridgefield Dark Fiber Needs Assessment | Technical Documents

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Introduction

The Port of Ridgefield (Port) initiated a dark fiber optic needs assessment to assess the need and feasibility of investing in dark fiber optic infrastructure within Southwest Washington's Discovery Corridor. The needs assessment included a review of anecdotal information provided by the Port, a series of stakeholder interviews, a prospect telephone survey, and a market analysis. The following technical documents were prepared to present the findings of the needs assessment and support the executive summary.

- [Data Gaps Analysis](#)
- [Stakeholder Interview Summary](#)
- [Prospect Poll Summary](#)
- [Market Analysis](#)

Data Gaps Analysis Memorandum (4/20/2017)

Data Gaps Analysis Memorandum (4/20/2017)

As part of the Port of Ridgefield Dark Fiber Needs Assessment, this memorandum identifies data and information gaps and proposed research methods based on a review of anecdotal research provided by the Port of Ridgefield (Port).

Review Anecdotal Research

The Port has conducted significant outreach and research on the need for improved broadband services within the Discovery Corridor. The Port provided their findings by user category (summarized below). The BergerABAM team discussed the research, noted data gaps, and included research methods through interview, survey, and case study design to inform the Dark Fiber Feasibility Assessment.

Education and Research

Washington State University Vancouver requires additional broadband services in order to transfer data between campuses; expand important programs, such as medical and media-related studies; and provide Wi-Fi bandwidth for students. Clark College is expanding their Ridgefield campus, and improved broadband is required to support new programs, such as mechatronics, advanced manufacturing, advanced composites, health care, and others. The Ridgefield School District has developed a dark fiber network to connect its facilities. The district also provides all students with tablets for online materials and textbooks, yet fiber is not available to serve students' homes.

Economic Development

The Discovery Corridor has excellent infrastructure to serve business growth, with the exception of a dark fiber network. Area businesses, including Mason's Supply Company and Corwin Beverage, have expressed strong support and real-time need for expanded broadband to serve existing and planned business expansion and modernization activities.

Workforce

Workforce limitations reported by Ridgefield and Battleground businesses and startups include the lack of broadband to attract young technical staff. Additionally, residential growth including young families could benefit from telecommute options for metro-area jobs.

Healthcare

Legacy Salmon Creek Medical Center reports growth in digital healthcare and medical recordkeeping, which raises demand for services, and cost savings are likely through the competitive advantages of broadband expansion.

Public Safety

Ridgefield Police and Clark County Fire and Rescue require enhanced broadband services to update their communications infrastructure to serve a growing community.

Data Gaps

The information gathered by the Port is an excellent indicator of dark fiber need in the Discovery Corridor. The BergerABAM team has noted the following data gaps, which inform the research methodology and will guide the feasibility assessment. The following are primary data gaps this study seeks to assess:

- Current internet speeds
- Business expansion plans
- Impact of current broadband service on recruiting and growth plans
- Relative importance of broadband among other business needs

Research Design

The BergerABAM team has worked closely with the Port to develop an effective research design for the Dark Fiber Feasibility Assessment, including the following.

Stakeholder Interviews

Conduct 12 interviews with key stakeholders, including local business, industry, service provider, and economic development interests within the Discovery Corridor. The interviews will seek input on business and community needs and expectations for broadband service. Detailed technical information will be the focus of telephone surveys and case studies.

Prospect Telephone Survey

In order to hear from a range of prospect organizations who operate within the geographic region that the fiber loop may serve, we have created a questionnaire that will cover the following topics:

- Current satisfaction with services
- Current broadband needs
- Expected future needs
- Interest in access to high-speed broadband

In addition, we are probing prospect organizations about their support for the Port's proposed objective, as well as their confidence that the Port can execute the development of the dark fiber loop. Our research will also collect comments from prospects regarding their interest and support for the project.

Market Research and Case Studies

Market research and case study efforts undertaken to date include:

- Developed project glossary materials.
- Developed and informed questions to be included in the stakeholder interviews and telephone surveys.
- Identified case studies, including Port of Whitman County, Port of Skagit, and Port of Morrow (Windwave).
- Developed methodologies and content targets for case study and market assessments.

Market Assessment

Conduct a comprehensive literature review of materials derived from real estate reports, industry organizations, academic journals, and government resources. This information will assist in our preliminary assessment of:

- Industries most disrupted by insufficient fiber infrastructure.
- The forces driving industry change and applications of new technologies (e.g., mechatronics, Software as a Service (SaaS), automated manufacturing, telehealth, E-governance, etc.).
- The impact of the Internet of Things (the integration of internet and computing devices in everyday objects) and e-learning on household demand.

We are also seeking data to support reliable estimates of business and household adoption rates. We are hopeful that telephone surveys and case studies will provide the needed insight.

Case Studies

We expect stakeholder interviews and telephone surveys to inform the case study analysis. We anticipate a mix of quantitative and qualitative inputs, including:

- Scale and character of employment growth since dark fiber implementation.
- Key companies that have located on the network.
- Identifying the number of service providers that have used the network.
- Identifying retail fiber lease rates.
- Gathering information (if possible) on household and business adoption rates or demographics.
- Identify any shifting real estate patterns resulting from the fiber network.

Next Steps

During spring of 2017, the BergerABAM team will conduct in-person stakeholder interviews, telephone surveys, and case studies of several Port-initiated fiber-optics networks. These efforts will supplement the anecdotal data gathered by the Port, and will be coupled with a market analysis and internet speed testing to frame the dark fiber feasibility assessment, findings, and recommendations. During summer 2017, the Port of Ridgefield Dark Fiber Feasibility Assessment report will be completed and delivered. The report will help the Port determine whether it is feasible and advisable to design, invest in, and pursue funding to build a dark fiber network through the Discovery Corridor. If feasible, Port and other investments in dark fiber could assist with business development, education, health, and emergency service advancements for the Port District, with potential for regional expansion.

Stakeholder Interview Summary

Stakeholder Interview Summary

The Port of Ridgefield is proposing to invest in dark fiber optic infrastructure within the Port District. A robust fiber optic system is needed to provide the Port, the City of Ridgefield, and private businesses with the communication channels they need to ensure public safety, provide additional educational opportunities, and promote economic development for the community. Input from current and future users will help identify the existing services, as well as business growth expectations and fiber optic infrastructure needs. To solicit input, the Port's consultant, BergerABAM, conducted a series of stakeholder interviews in mid-April 2017. Interviewers posed a total of eight questions seeking to understand individual and organizational perspectives. A summary of interview responses is provided below.

1. How would you describe the existing broadband services?

The majority of stakeholders reported that existing service is poor and barely meets existing demand. Business/institutional users indicated they have put resources towards making the service work for their individual needs, but it is expensive and does not support future growth. Stakeholders also reported unreliable service with interruptions during peak usage.

2. How has the existing broadband service impacted you or your business or institution?

As noted above, interview respondents indicated that the existing broadband service limits future growth and business expansion. Businesses/institutions that have made significant investments to increase their service are impacted by the cost of the service and the lack of competition among service providers. Respondents identified the existing service as a challenge for employee/student recruitment, as well as business recruitment within the Discovery Corridor. Stakeholders also indicated that existing service does not support large file sharing and limits their ability to collaborate effectively or efficiently with coworkers and consultants in other locations.

3. What are your current broadband needs and how do you currently use broadband (email, video streaming, file sharing, etc.)?

Most respondents indicated they use broadband for email, file sharing, video streaming, and internet browsing. A few respondents also use broadband for voice-over IP telephone service.

4. How does broadband service availability and quality rank relative to other business location considerations (i.e. availability of utility infrastructure, availability of transportation infrastructure, workforce, etc.)? Please rank 1 to 3, where 1 is most important and 3 is least important.

Individual responses to this question varied based on the needs of the stakeholder. The rankings included in the table below represent an average of the seven responses received.

Business Location Consideration	Ranking
Broadband service availability and speed	1
Transportation access	2
Infrastructure availability	2
Quality of education in the area	2
Workforce available	2

5. Do you have plans to expand your business that are impacted by the availability of broadband? Or are there services you are unable to provide based on the current broadband service?

As noted in response to question 2, future growth and development of businesses and institutions are impacted by the availability of broadband. The current services limit expansion and have budget implications. Respondents indicated that dark fiber infrastructure would provide greater flexibility and enable them to offer additional services such as community-wide Wi-Fi and distance learning. Stakeholders also indicated that increased service would positively impact recruitment – new businesses to Ridgefield and new employees, faculty, and students to existing businesses and institutions.

6. Have you considered relocating your business because of broadband services?

While most stakeholders interviewed are not part of businesses or institutions that can easily relocate, respondents did indicate that a dark fiber network would be a tool for economic development and recruitment. One respondent also noted that they have considered additional office space outside of Ridgefield, but additional commute times and logistics make that option infeasible.

7. Do you have adequate redundancy in service?

Stakeholders indicated that there is currently no redundancy in service, or that redundancy is poor and does not meet demand.

8. Is there anything else you'd like to add?

All respondents indicated that a dark fiber network would positively impact the Ridgefield community and the economic development potential of the Discovery Corridor. Respondents reiterated the need for fast, redundant service to attract businesses and young professionals. It was also noted that a dark fiber network could help sustain small businesses, extending online retail opportunities.

Following the interviews, respondents were asked if a quote could be used in the dark fiber feasibility assessment report. Most respondents were willing to provide quotes, but requested approval of language prior to use. The quotes will be gathered and sent back through stakeholders for use in the final report.

Stakeholders Interviewed

- Renny Christopher, Vice Chancellor of Academic Affairs, WSU-Vancouver
- David Morgan, Owner, Plas Newydd Farm
- Michael Kenning, Manager of Technology Services, Ridgefield School District
- Jeff Niten, Community Development Director, City of Ridgefield
- Mike Bomar, President, Columbia River Economic Development Council
- Ron Oslow, Mayor City of Ridgefield
- Jeff Swanson, City Manager, City of Battle Ground

Prospect Poll Summary

Prospect Poll Summary

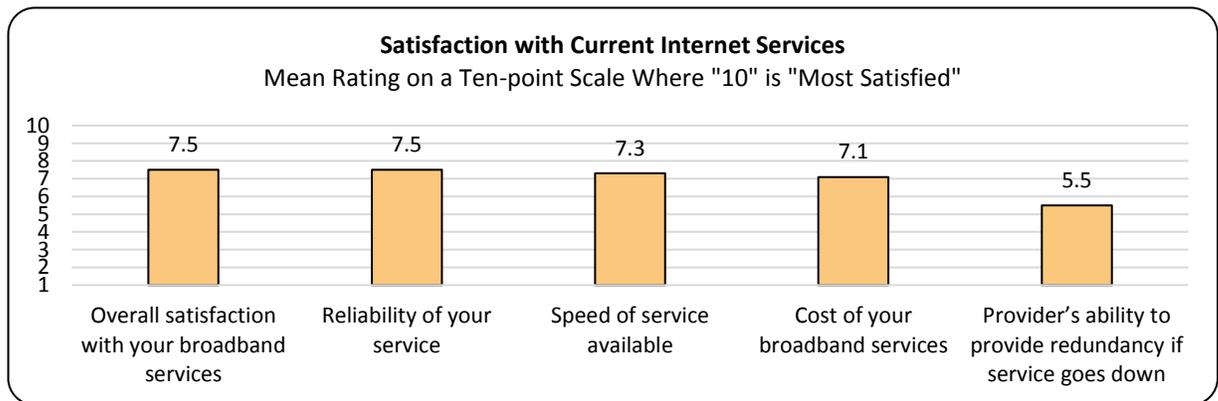
Executive Overview

Riley Research Associates surveyed some 40 organizations in varying industries in the Ridgefield, Washington area to determine their need for and interest in the Port of Ridgefield's idea for building and maintaining a dark fiber installation. This exploratory study targeted organizations by size and by their likelihood of utilizing high speed internet services.

- In addition to email and general use, organizations are also using the internet for uploads or downloads between locations (51%), file sharing (39%), data storage/backup (39%), online banking (34%), and credit card processing (34%).
 - Many also use software services provided over the internet. The most common included video conferencing (34%), Google Cloud Services (29%), Office 365 (27%), Adobe Creative Cloud (27%) and Dropbox (24%).
- About half of respondents get their internet through Comcast, with CenturyLink being the second most-common provider (17%).
 - About one-third have cable internet (32%), and slightly fewer have fiber (29%).
- Most of the local organizations surveyed were unaware that Ridgefield is considering the feasibility of bringing dark fiber to the area, with 28% saying they were very aware and 14% saying they were somewhat aware; 58% were unaware.
- Most were anticipating growth of their organization in the next few years, and expected there to be more demand for and higher interest in online activities. About three-quarters said they would likely have a need for higher speed internet in the next few years.
 - All of those in education, finance, healthcare, hospitality, and a majority of those in fire, police, and manufacturing indicated a high likelihood they will need faster speeds.
- Organizations were enthusiastic about the proposed plan. In addition to higher speeds, they also desire more redundancy of backed-up data, and the increase in support it could lend their business operations.
 - The primary concern with the proposal was cost, including the costs for the Port to build the infrastructure as well as the costs to deliver the broadband service.
- Over half of the organizations surveyed would be willing to pay increased monthly charges to access fiber optic services at a speed of one giga-byte per second (53%), while about one-third would likely not be willing to pay more, and 12% were unsure.
 - Respondents would pay an average of \$218 per month; including about one-third who would pay between \$100 and \$300 (32%), and 14% who would pay more than \$300.
 - Certain types of firms appeared willing to pay more, including those in Ridgefield (\$276) and within 10 miles of Ridgefield (\$267); those in Education (\$633), IT services (\$480), Business services

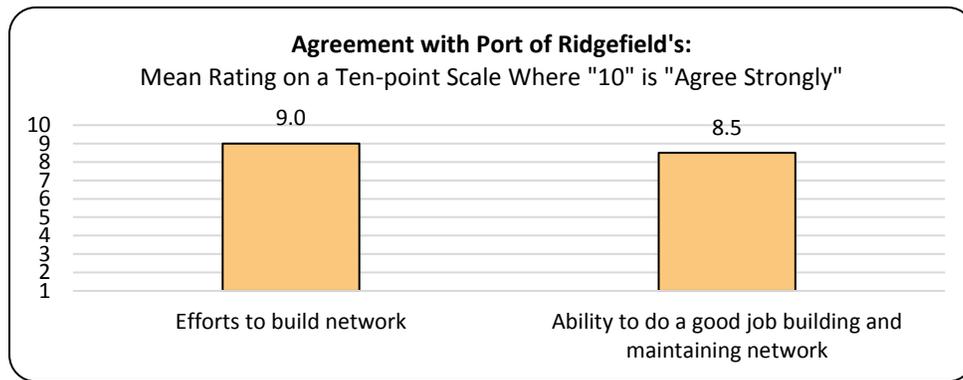
(\$388). Those most interested also included current internet customers of K20 (\$850) and Frontier (\$850); and CIOs or IT professionals (\$450).

- Those in Ridgefield (98642) generally expressed higher interest than others. They were most likely to anticipate a need for faster internet speeds in the next few years (88% vs 65%-75%), were willing to pay more for fiber optic services than those outside Ridgefield (\$276/month vs. \$197), and were more likely to pay at least \$100 more per-month for speeds of one giga-byte per second (40% vs. 15%).
- Organizations rated their satisfaction with current internet connections. Respondents were only moderately satisfied with their internet services, with the highest ratings for *overall service* and *reliability of service* (mean of 7.5 each, on a ten-point scale where “10” is the “most satisfied”).
 - Satisfaction with available backup (redundancy) was very low (5.5/10).
 - Organizations in Ridgefield (98642) gave lower satisfaction ratings than those in other zip codes (ranging from 0.3 points lower to 4.1 points lower on the 10-point scale).
 - Those who said they would likely need higher speed internet in the next few years tended to give lower satisfaction ratings than those who do not foresee that need.



- Respondents strongly agreed with the Port of Ridgefield’s plan to build a dark fiber network, with a mean rating of 9.0. More than half gave the highest rating of “10,” while just 6% provided a rating of “5” or less; 15% were unsure.
 - Organizations in Ridgefield (98642) and those in adjacent zip codes to Ridgefield were much more likely than those further away to agree with the Port’s plan to build a dark fiber network (9.1 vs. 6.5).
- Respondents also strongly agreed the Port of Ridgefield would do a good job at building and maintaining a dark fiber network, with a mean rating of 8.5 (out of 10). More than one-third gave a “10” rating, and just 6% gave a rating of “5” or less; about one-third were unsure.

- Ridgefield businesses were much more likely than those outside the area to feel the Port would do a good job with the dark fiber network (9.4 vs. 5.0-7.9).



Full Summary

Introduction

The Port of Ridgefield, Washington is considering the feasibility of building a local dark fiber optic loop, which they would lease to Internet Service Providers (ISPs) and others to provide fiber to organizations in the Ridgefield area. In order to determine interest, as well as any concerns or opportunities, BergerABAM asked Riley Research Associates to conduct a telephone survey among Ridgefield-area organizations.

Methodology

Riley Research Associates (RRA) worked with BergerABAM to develop a questionnaire that could be used across multiple industries in the Ridgefield, Washington area. RRA identified area organizations that, based on their industry or employee size, may have a high interest or need in utilizing dark fiber for a more accessible and reliable high-speed internet infrastructure.

Industries included manufacturing, fire and police services, education, finance, hospitality, healthcare, retail, telecom, and IT services. RRA identified the contact in the key organizations that were responsible for planning or managing their internet, phone service, or other communications technology.

RRA reached a total of 43 key organizations. Two of these indicated initially they did not have a high need for these types of services, and were only included in the first two questions. A total of 41 respondents completed the entire survey. Interviews were conducted between April 14th and April 27th, 2017 using our in-house call center.

The following report includes question-by-question analysis, with demographic insights included when statistically significant. Results are presented in percentage form, with the percentage sign being cited on the top row of each table. When a response was not given, it is indicated by a dash ("-"). In instances when a response was mentioned by at least one person, but fewer than one percent, it is indicated by "0%." Responses do not always add to 100% due to rounding and/or accepting multiple responses. Verbatim responses are provided in full, edited for spelling and grammar consistency, and included in the appendix. Cross tabulations are bound separately.

Results

Q1. You may have heard that the Port of Ridgefield is looking into the feasibility of building a local dark fiber optic loop, which they would lease to Internet Service Providers (ISPs) to provide fiber to organizations in the Ridgefield area. Were you aware of this discussion?

About two-fifths of respondents were aware of Port of Ridgefield’s examination of the feasibility of bringing dark fiber to Ridgefield-area organizations, while 58% were not familiar with the discussion.

	Total
Total Participants	43
Very aware	28%
Somewhat aware	14%
Not aware	58%

Q2a. For background, the Port of Ridgefield is looking at options for providing more accessible and reliable high-speed Internet infrastructure. The Port believes internet connectivity is a critical component of successful economic development activity in our region and will provide a direct competitive advantage to existing companies as well as for recruiting new enterprises. The Port is in the initial phases of evaluating the demand for a “dark fiber” project. If it goes forward, the port would build fiber optic infrastructure, then lease that infrastructure to local organizations and private companies for data transmission, cable TV, and Internet access. Organizations would be able to lease dark fiber infrastructure from local service providers, that lease from the port, such as Comcast or Century Link. In concept, it’s similar to building a shell of a building then leasing that structure to various tenants. Dark fiber requires less power, has a higher capacity, often has better signal strength, is more immune to interference, and has built-in redundancy making it more reliable than existing networks. What are your initial thoughts, pro or con?

Organizations were enthusiastic about the proposed plan, saying they would appreciate higher speeds, the redundancy of backed-up data, and the increase in support it could lend their business operations.

The primary concern with the proposal was cost, including the price to build the infrastructure and costs to deliver it. (See the verbatim appendix for a full list of responses.)

Q3. How likely is it that your organization will be needing a higher speed network in the next few years? (Aided)

About three-quarters of respondents expected their organization to need a higher speed network in the next few years, while just 20% said it was unlikely they would need this, and 5% were unsure. Half said their organizations were very likely to need a higher speed network.

Although not statistically significant, those in Ridgefield (98642 zip code) were more likely than others to foresee a need for higher speed network (88% vs. 65%-75% of others). Additionally, all respondents in education, finance/insurance, healthcare, and hospitality indicated they were likely to have a need for higher speed internet in the next few years; 80% of fire/police services also expressed the likelihood of needing higher speeds, as well as 69% of manufacturers.

	Total
Total Participants	41
Likely	76%
Very likely	51
Somewhat likely	24
Unlikely	20%
Not very likely	10
Very unlikely	10
Unsure	5%
Unsure / Depends	5

Q4. Besides email and web surfing, what are your organization's most critical uses for the internet? (Aided, Multiple Responses)

About half of the surveyed organizations use the internet for uploads and downloads between locations, and many use it for file sharing, data storage, online banking, and credit card processing.

	Total
Total Participants	41
Uploads or downloads between company locations	51%
File sharing	39
Data Storage / Backup / Cloud Storage	39
Online banking	34
Credit Card Processing	34
Web hosting	20
Video conferencing	20
Phone service / VoIP	17
Distance learning	15
Video/Television	12
Social Media / Marketing	12
Online Research	12
Ethernet between multiple locations	10
Retail point-of-sale systems	7
Internal financial needs	7
Business Applications Software (SaaS)	5
Customer Relationship Management (CRM)	2
Miscellaneous	15
None / No others	2
Refused	7

Miscellaneous uses

- Cyber security, server maintenance plans, data backup service.
- ERP, CAD, handle through Frontier back to Connecticut.
- Shared network
- We connect to the federal government. The connection can't fail us or we will be back to using paper and pencil and it's too slow. It must be very dependable a lot of data and it must be secure too.
- We use the intra-net point to point. Don't know; we may already have it in place.
- When information hits us and we send it out; we are concerned about reliability. We send out alerts to fire fighters. Also, to get info between fire fighters and patients and the ER. The ability for ER and doctors to see our reports ASAP. The ability to send info reliably. Our stations are all networked together we do roll call online.

Q5. I'm going to run through a short list of software services that are provided exclusively over the internet, and I'd like to know if your organization currently utilizes any of them. You can just say yes or no after each. (Aided, Multiple Responses)

The most commonly used software services included video conferencing, Google Cloud, Office 365, Adobe Creative Cloud, and Dropbox.

	Total
Total Participants	41
Video Conferencing	34%
Google Cloud Services	29
Office 365	27
Adobe Creative Cloud	27
Dropbox	24
Amazon Web Services	20
One Drive	17
Skype for Business	15
Microsoft Azure	10
IBM Soft Layer Cloud	5
Others specific to your business or industry	12
None	12
Don't know / Refused	12

Miscellaneous

- Connect ad aid dispatch
- We use Zoom
- Back up data on our own system
- For insurance, our system is on the cloud all day long, Applied Systems
- AWS- Amazon Web Service

Q6. (If “None” to Q5) How likely are you to begin using any of these in the next few years? Are you:

Of those who did not currently use any online software services, none expected to have a need for them in the next few years.

	Total
Total Participants	5
Not very likely	60
Not likely at all	40

Q7. How do you expect your needs to change over the next five years and how will that impact your internet service connection?

See the verbatim appendix for full list of responses.

Q8. Which company provides your organization’s internet service or regional network? (Unaided)

Comcast / Xfinity was the most commonly-used internet provider, with half of respondents utilizing their services. CenturyLink was used by 17%, and other service providers were used by few organizations.

	Total
Total Participants	41
Comcast / Xfinity	51%
CenturyLink	17
K20	7
Frontier	5
Verizon Fios	2
Miscellaneous	12
Don't know / Refused	15

Miscellaneous providers

- [Integra Telecom](#)
- [ION - at Comcast](#)
- [ITT](#)
- [Silver Star Telecom](#)
- [Sprint “hot spot”](#)

Q9. Can you tell me the kind of internet service connection your organization uses? (Aided)

About one-third of respondents used a cable internet connection, while nearly as many used a fiber service, and few used other connections; many were unsure which type their organization used.

	Total
Total Participants	41
Cable	32%
Fiber	29
Wireless	7
T1 (over phone line)	7
DSL / ADSL (over phone line)	2
Not sure	22

Q10. Can you tell me the speed of the service you use?

Most were unable to name their upload or download speed. See verbatim appendix for responses of those who were able.

Q11. On a one to ten scale, where 10 is "most satisfied" and 1 is "least satisfied", how satisfied are you with the following aspects of your broadband, internet connections, or regional network?

Respondents were moderately satisfied with their broadband, internet connections, or regional network. The highest ratings were in regards to their overall service and reliability of service, with each receiving a 7.5 mean rating. The speed of service and cost of service received slightly lower mean ratings (7.3 and 7.1, respectively). Respondents were least satisfied with their provider's ability to provide redundancy in case of a service disruption (5.5).

Although not statistically significant, those who said they would be unlikely to need higher speed internet in the next few years gave higher satisfaction ratings than those who are likely to for each aspect. Those who were in Ridgefield (98642 zip code) or within 14 miles of the city gave much lower satisfaction ratings than those who were further outside of the area.

Mean Ratings	Mean
e. Overall satisfaction with your broadband services	7.5
b. Reliability of your service	7.5
a. Speed of service available	7.3
d. Cost of your broadband services	7.1
c. Your provider's ability to provide redundancy, in case service goes down	5.5

Total Participants = 41	Not at all satisfied				Extremely satisfied						NA
	1	2	3	4	5	6	7	8	9	10	
b. Reliability of your service	2%	-	2%	5%	2%	2%	10%	32%	15%	10%	20%
a. Speed of service available	2	2	2	-	2	7	15	24	12	7	24
c. Your provider's ability to provide redundancy, in case service goes down	12	12	-	7	7	2	5	7	15	7	24
e. Overall satisfaction with broadband services	2	-	-	-	10	7	10	20	20	7	24
d. Cost of your broadband services	2	2	-	2	2	10	15	20	12	5	29

Q12. (If less than "6" to any of Q11a-e) Why the less-than-stellar ratings?

See verbatim appendix for full list of responses.

Q13. (If less than "6" to Q11a) You indicated less-than-perfect ratings for speed. Why haven't you upgraded? (Unaided. Multiple Responses)

Those who indicated low satisfaction for speed indicated they haven't upgraded because the option is not available to them or because of cost.

	Total
Total Participants	7
Service is not available in my area	29%
Price is too high	14
Miscellaneous	43
Don't know if anyone provides services in my area	14

Miscellaneous reason

- Our company has bought many trucking companies and we have been working to consolidate all together. We will do it as capital allows.
- It's not my decision, I would have to ask the corporate office.
- Government.

Q14. What would be the key consideration for you, in terms of deciding whether or not to utilize a new high speed network, such as the one I've described?

Price and reliability of service were the biggest factors in determining whether or not they'd have a need for these services. See verbatim appendix for full list of responses.

Q15. Looking to the future, if Ridgefield were to build a fiber optic loop, most organizations would likely access the service through one of the various broadband companies in the area.

What, if anything, would your organization pay per-month to use fiber optic services to access the internet at a speed of one giga-byte per-second?

About one-third said their organization would not pay anything additional to access fiber optic services at a speed of one giga-byte per second, while just over half (53%) would pay something, and 12% were unsure.

Those who were willing to pay more each month generally would be willing to pay between \$100 and \$300 more, and 14% would pay more than \$300 per month, with a mean of \$218 more per month.

Although not statistically significant, those indicating the highest mean amounts they'd be willing to pay included: those in the 98642 zip code (\$276), those within 10 miles of Ridgefield (\$267), and within 10-14 miles of Ridgefield (\$217); Education (\$633), IT services (\$480), Business services (\$388); those who currently receive internet from K20 (\$850) and Frontier (\$850); and CIOs or IT professionals (\$450).

	Total
Total Participants	41
Nothing / \$0	34%
Less than \$100	7
\$100-\$199	17
\$200-\$299	15
\$300-\$999	7
\$1,000 or more	7
Not sure / Depends	12
Mean	218

Q16a. *If that one giga-byte per-second service was offered at a cost of \$500 per month, how likely would your company be to adopt this service? (Aided)*¹

Q16b. *If that one giga-byte per-second service was offered at a cost of \$100 per month, how likely would your company be to adopt this service? (Aided)*

At a cost of \$500 per month, about one-fifth said their organization would be likely to adopt the service, while 37% would be unlikely and 42% were unsure. While not statistically significant, most of those in Ridgefield were unsure (60%), while the rest were likely to pay \$500 a month (40%).

At a cost of \$100 per month, the likelihood to use the service increases substantially, with nearly three-quarters saying it would be likely, just 5% saying it would be unlikely, and 32% saying they were unsure. While not statistically significant, a vast majority of those in Ridgefield were likely to pay \$100 a month (75%), while the rest were unsure (25%).

	\$500	\$100
Total Participants	19	22
Likely	21%	64%
Very likely	16	59
Somewhat likely	5	5
Unlikely	37%	5%
Not very likely	11	5
Not likely at all	26	-
Unsure	42%	32%
Don't know / Refused	42	32

¹ The question originally used the amount of \$500 per month, but was revised to \$100 per month about halfway through data collection.

Q17. On a ten-point scale, where 10 means "agree strongly" and 1 means "disagree strongly," to what extent do you agree or disagree with the Port of Ridgefield's efforts to build the dark fiber network?

Respondents strongly agreed with the Port of Ridgefield's plan to build a dark fiber network, with a mean rating of 9.0. More than half gave the highest rating of "10," while just 6% provided a rating of "5" or less; 15% were unsure.

While not statistically significant, the highest ratings were among those:

- In IT services, education, finance/insurance (10.0 each)
- Who get internet through K20 and Frontier (10.0 each)
- Who get internet through Comcast (9.4)
- Who were likely to need higher speed internet (9.2)
- Who were in the 98642 zip code (9.1) or within 10 miles from Ridgefield (9.2)

While still considerably high, the lowest ratings were among those:

- In business services (8.0)
- Who get their internet from CenturyLink (8.1)
- Who said they were unlikely to need higher speed internet in the next few years (8.1)

	Total
Total Participants	41
1 - Disagree strongly	2%
2	2
5	2
8	10
9	15
10 - Agree strongly	54
Don't know / Refused	15
Mean	9.0

Q18. On that same scale, to what extent do you agree or disagree that the Port of Ridgefield would likely do a good job building and maintaining a dark fiber network?

Respondents also strongly agreed the Port of Ridgefield would do a good job at building and maintaining a dark fiber network, with a mean rating of 8.5. More than one-third gave a perfect "10" rating, and just 6% gave a rating of "5" or less; about one-third were unsure.

Agreement varied among different groups. While not statistically significant, the lowest ratings were among those:

- Who said they were unlikely to need higher speed internet (5.8)
- In business services (6.7) and IT services (7.0)
- Within 10-14 miles from Ridgefield (7.0)

The highest ratings were among those:

- In fire/police services and finance/insurance (10.0 each)
- Who get internet through K20
- In education (9.3)
- Who were in the 98642 zip code (9.4) or within 10 miles of Ridgefield (9.3)
- Who were likely to need higher speed internet (9.2)
- CIOs and IT professionals (9.1)
- Who get their internet through CenturyLink or Frontier (9.0 each)

	Total
Total Participants	41
1 - Disagree strongly	2%
2	2
5	2
7	7
8	10
9	
10 - Agree strongly	37
Don't know / Refused	34
Mean	8.5

Organization Characteristics

Q19. About how many total employees does your organization have at your Clark County location or locations?

	Total
Total Participants	41
Less than 10 employees	39%
10-19	12
20-99	22
100 or more	17
No response	10
Mean	92

Q20. About how many internal and external people access the Internet at your location on a regular basis?

	Internal	External
Total Participants	41	41
Less than 10 internal employees	46%	37%
10-49	22	10
50-99	2	2
100-499	12	12
500-999	5	2
1,000-9,999	2	12
10,000 or more	-	10
No response	10	15

Q21. Which of the following best describes your role: Are you someone who influences the decisions, someone who makes the decisions, or both?

	Total
Total Participants	41
Influencer	32%
Decision-maker	2
Both	56
Refused	10

Q22. About how many miles from Ridgefield is your work?

	Total
Total Participants	41
Less than 10 miles	49%
10-14 miles	32
15-20 miles	17
No response	2
Mean	8

Q23. What is your title?

See verbatim appendix for more detailed list of titles/roles.

	Total
Total Participants	41
IT	32%
Owner	22
Operations Manager	7
Manager	7
Chief Information Officer	5
Vice President	5
Miscellaneous	22

Record gender

	Total
Total Participants	43
Male	84%
Female	16

Zip code

	Total
Total Participants	43
Primary Region (Ridgefield)	40%
98642	40
Secondary Region (Adjacent to Ridgefield)	49%
98674	19
98686	14
98685	7
98660	7
98604	2
Tertiary Region	12%
98665	2
98661	2
98683	2
98671	2
98664	2

City

	Total
Total Participants	43
Vancouver	37%
Ridgefield	40
Woodland	19
Battleground	2
Washougal	2

Industry

	Total
Total Participants	43
Manufacturing / Supply	33%
Fire / Police	14
IT service	12
Education	9
Finance / Insurance	9
Business Services	7
Hospitality / Entertainment	5
Healthcare	5
Retail	2
Nonprofit / Religious organization	2
Telecom	2

Verbatims

Q2a. What are your initial thoughts, pro or con? First, what could be good about this idea?

Ridgefield (98642)

- Beneficial, don't know if we would use it. We are remodeling, and need fiber optic. Our systems are older; a T1 line. It's in the remodel, it is in the plans to use fiber optics
- For school district, it will allow us redundancy. We have internet through the state, but it would give us another option
- Good idea. Don't know how many other business would be to be able to support it. We have fiber here. We have CenturyLink and Comcast coming into the building. It may take a while for this to become a reality, but I think it's great and I can revisit it in a year or so. I'll keep an eye out for it
- Good step forward
- Good, we need the ability to move large amounts of information
- Great idea. We use fiber now. We use 2 different ones. For large business, it would be the best. We do PCI compliance, Cisco Networking, Cyber Security for Fortune 500 companies in Hillsboro and surrounding areas. We are with Frontier and use Comcast as a backup. Our fiber is through Frontier
- Hope some other 3rd company, other than Comcast and CenturyLink, come in to give us other options. I would hate Comcast to lease it, that is not in any of our best interests. You have Dish, which is poor service. It's just both companies don't provide good service
- Husband works for Comcast; I understand some of it. I don't make decisions on who we use. We have CenturyLink; the main issue we have is with the weather. A cable was cut when the crew went out to fix a down tree. Our service went out, we had to close the bank for the whole day. If we could get something better, CenturyLink is spotty. It would be great to have fiber optic if they understand our needs and weaknesses, and could provide for that
- I have fiber already by CenturyLink we have 10 users here; all our servers are here in Ridgefield. The other (Seattle and elsewhere) 11- have private ports - copper ports that link to cloud based system. If we disconnect it we lose. There is no internal IT department just me and Justin in IT, I am the system ops guy. If it was between \$100-500, we would love it. We would have to think about it
- If we lease it from the Port rather than Comcast, we would be all over it. Comcast would increase our cost
- I'm all for it
- No one likes CenturyLink; they have nothing. Comcast won't come. I don't get it. I have a tower on my home. I use a hotspot from Sprint. CenturyLink doesn't have fiber, they are horrible they oversell a bad product
- Positive
- Provide better service then I'm all for it. When I go to S. F. or San Diego the service is much faster than ours here. Important for businesses to help bring in bigger companies, we need that here
- Sounds good, more speed is better
- Sounds great! You must go through my senior team to get approvals
- Very positive; I move to consider fiber is better than copper-based. I like the redundancy situation for the future

Q2a. What are your initial thoughts, pro or con? First, what could be good about this idea? Secondary Region

(98604, 97629, 98674, 97660, 97685, 98686)

- Cost; we have Comcast now and it's fast. We have 8-9 people who go online. You can never be too fast. We pay \$150 a month, and it goes down 1-2 times
- Don't see any down side

- Don't see anything wrong with it. Could be a good thing. Don't know how easy it would be to get service
- Excellent! We use inside the building now in Hazel Dell; moving to Ridgefield, a new building. I'd like to see it there
- Fiber is always better than cable -copper scale ability
- Good if it's not too much money. I have to the main office in Glendora, CA
- Good, but the last mile is the hard part; its nearby, but never coming into the building. Don't know if it will go that far
- If it doesn't fault regulation for service providers. License requirements. Now you are a competitor to other service providers. Ambitious plan. Need to coordinate with other services that need to access it; security concerns, where is it installed? Internal security, you may have to build county cages, so others have access.
- If it makes it easier for internet use considering all the internet people use
- In La Center, one company owns the line for internet service, they rip us off every month; they have a monopoly. I can see Ridgefield would own it and charge us too much. It's not an advantage to customers now; it's a \$100/month you can't get anything else, so it's too expensive. If Ridgefield owns it, they get to state price and we would just have to pay
- It's a good idea. We do struggle with internet and phone reliability
- Like the idea. Now we have CenturyLink on the phones. Any chance to get more speed and data is a good thing
- Need is clear for this community. It's a real challenge, but it isn't here. To have the Port step up is wonderful. We are a high education land grant institution, here to teach, learn and research. It was similar at the Port of Whitman in Pullman, it had a positive impact. We don't have it here, but I needed it. Benefit is affordable and reliable service. Redundancy is so important, we don't have it. When internet is obstructed we have no options. Students are going to other states that can offer higher speeds. In the year 2017, we should have it. It creates infrastructure and modern access. It speaks volumes for Ridgefield to have it on par with other community's in the area. It's critical for us and students and staff. Ninety-three percent of the students who study here, stay in the region. WSU does not endorse it, but the needs are here and the role is clear. As a resident, I live and breathe on the internet, I would pay whatever price
- Not good- All the major carriers are passing laws to prevent you from doing this. Faster is always good with the providers. CenturyLink is not good. Comcast is better, they have a new wire plant. CenturyLink uses old wiring. Level 3 providers in Portland; guy built a loop around Portland, then he sold his company and went to Hawaii to build another one. It's stupid. Why put the money in when Comcast already has it? Manager would be under a political thumb. Budget will suffer and then they must start firing people
- On fiber now with CenturyLink. We are Boise Corps from Boise Idaho.
- Plenty of access now. Huge line under I-5 corridor that is available. If you want to send us something just send a letter to Legacy Health 1919 NW Lovejoy, Portland, OR
- Probably would be a good idea. I agree with what they feel it would bring. Cost is the key consideration. Also, other companies might come with better ideas. Hopefully the Port is in touch with the top edge people in technology and should know if this would be useful for many years. I assume this would be a draw for other businesses
- Sounds good. Would it extend to Woodland? Interesting
- Sounds positive might benefit
- Used fiber optic in the past. Not sure with this size if there would be impact. This hotel has 89 rooms

- Very supportive. We will have a new campus in Ridgefield soon. Need reliability and continuity on campus

Tertiary Region (98665, 98661, 98683, 98671, 98664)

- I'm a facility base provider. Competition is too much- Makes we want to pack up and leave town. A lot of people do this; what is the value added to customers? Do they have service if it gets broken? This makes it a free-for-all to anyone who wants to buy-in. We help with residential deployments. Getting fiber to residents requires a high fiber count; more expensive
- Increased bandwidth is plus
- No real use for it. We do manufacturing. There is no parent company
- Recommend to district to look at purchasing dark fiber rather than lease it themselves. I have a local provider; it would be competition. We use K20, it will be 100gig soon, it's carrier class with it has very positive reviews. Cost effective to schools has not overseen private vendors. Legislature helps with 60-70% of costs. High schools use Video Serve-DDOS service. No ISPs offer that. 'Black hat' can block your connection. We are only ones that offer that protection. K20 protects our ISP service K20 provides it; 90% of schools are on it. HS is on it, so they have access too. Buildings are interconnected from the HS, use us as a backup circuit E rate can't pay for it. Six hundred dollars to twelve hundred dollars is the cost we pay. A percentage of the government will pay; go through FCC, as high as 85%. Ridgefield is 75% of the cost. We are growing at 50% a year. We must provide service. Schools use a ton of chrome books. Need Wi-Fi and pipes that can handle the load. Port of Ridgefield would be a good back up.
- Sounds good. We really have sites in Vancouver area and then beyond around Kelso and Longview. Not sure we would have a need, but feel free to send an email with this information to me, so I can send it to the right people: memossbach@doc1wa.gov

Q2b. What concerns or drawbacks could you foresee? Ridgefield (98642)

- Cost increase
- Cost it is not cheap to build; what would the lease cost be? Would that be in line with what you could pay someone else? I hope it would be less with the fact of bringing it to everyone; if the locals will see enough value in it. What are the lease costs going to be
- Don't have to use K20 internet, I can use anything. U of WA they operate it
- None. As an ER provider, we depend heavily on the internet to transfer info about public safety throughout stations. Reliability is critical. We need extremely high speeds of data transfer
- None. Those of us who live in the sticks want it. We need it to get more high-class people and business. Comcast said if I dig the ditch they could get it to me
- Nothing if it works better than it is now. I'd have to use it and see, but anything would be an improvement at this point
- Struggle with service here. Connected to 12 other stores; this location seems to give us grief. There are lapses in coverage. Existing switches that provide service are old, the gears are outdated, and not able to work; seems like the tech is always patching it together
- The 2 companies have a monopoly on it. Comcast should pay for it. The city should tax Comcast for having to get fiber from them

Secondary Region (98604, 97629, 98674, 97660, 97685, 98686)

- Price (2)

- Comcast, has it in place; they are the best right now. Not sure, don't know the cost, but we need high speed internet. Don't care who builds it
- Competition is good
- Connect location together; reaching us. Comcast is cheaper. Don't see value to us, as a smaller company
- Depending on the cost, it needs to make sense cost-wise
- From business - none. We have fiber
- If it doesn't affect wildlife
- If the ISPs sell to community it won't work. You're just adding a layer
- No only positive
- None. I see copper being replaced; the sooner the better
- Not aware. Port of Whitman plan went from 2 providers to 17; competition is good, it increases quality
- Positive cost to return. Possible changes in technology that would outdate it too soon
- Price is locked-in; owned by a small group; they own right of way
- Security. Regulatory license being a service provider, there is federal trade commissions. If you're a vendor you follow any state or county regulatory issues

Tertiary Region (98665, 98661, 98683, 98671, 98664)

- If the IT fiber got cut you need 24-7 control service center i.e., if a tree falls
- Not now, must see when it occurs

Q7. How do you expect your needs to change over the next five years and how will that impact your internet service connection? Ridgefield (98642)

- A bit of growth
- Aligned with OMB, Daimler Ford and Detroit Diesel. The future is the next generation providing diagnostics for trucks while they are running down the road
- Bandwidth will increase. I see more online growth
- Expanding the use of technology which will increase our demand
- Increased encrypted information, we will need greater amount of data
- Just the normal growth
- My contract will be up in 5 years; I will be looking at contracts, what is available, and what is more competitive
- Not much different than last year, but faster is better
- Not really, I don't buy on EBay, but I go there to look
- Not sure, not a lot more growth
- Some growth. Residents need faster speeds for movies, or to buy service/apps they want
- We are doing a pilot: when you can text your banker. An app called the 'Best Financial Friend.' We would do video conference and video chatting. We would need the speed and reliability
- We will grow. I see the need for more bandwidth. More items have not been online will suddenly be online
- With the remodel, traffic will grow, need more data to transfer and send

Secondary Region (98604, 97629, 98674, 97660, 97685, 98686)

- As business grows
- Demand for quicker information access upload and download speeds will grow

- Don't use internet much
- Growth, the amount of traffic; we depend on the cloud more and more
- I see 30% growth over current usage
- If we grow, it would serve us
- Increase bandwidth, we are limited; it must connect back East and bounce back. We use one policy to handle all sites. Government access, we are a defense contractor
- It will only increase. Break ground on 30,000 sq. ft. expansion, we will grow. We will hire new people get more equipment
- Keep up with the times, as things evolve
- More demanding; we have planned for that. Capacity, how much we are doing with it
- Newer technology, we need more bandwidth
- No, I'm not your customer
- Plan to increase our capacity from 1 to 10gigs. Then to 40 gigs and 100 gigs
- We are not growing
- We are so small
- We will have more needs, faster service, bigger files
- You must ask corporate

Tertiary Region (98665, 98661, 98683, 98671, 98664)

- Fifty percent growth
- We are growing
- Won't change, we put together rebar. Vancouver is main office

Q10. Can you tell me the speed of the service you use? If you aren't sure, I can give you a website called speedtest.net where you can instantly determine your speed, just type in: "speedtest.net" and let me know what you get for your download and upload speeds. (As necessary) If you are using a wireless connection, the performance of the network router could potentially influence the results.

Downloads

Downloads	Uploads
500	500
143	140
100	100
100	100
100	100
2000	2000
1000	1000
	2000

Q12a. Why the less-than-stellar rating for the speed of service available?

- Don't provide
- No choice; we are defense. We do what the home office wants or requires of us
- Not that good; it goes out
- Once or twice a quarter it goes down
- Very slow

- We put more demand on the service. We see bottlenecks, we have 4-5 servers in company. Some service would have to come from service providers
- Wish it were faster. When I go to see a video for CNN, it takes 20 secs before it comes on. I get 'the spinning wheel of death.' When it takes too long to get to EBay, I wait a bit, or I turn it off

Q12b. Why the less-than-stellar rating for the reliability of your service?

- Don't provide
- Drops in and out
- Goes down
- Had a couple of outages. When we go down, we are out. We have been down 2-3 times
- Not that good; sometimes it goes out
- Six times a year, and usually out all day

Q12c. Why the less-than-stellar rating for your provider's ability to provide redundancy?

- We don't have it (5)
- They don't provide it (4)
- Don't have it, if Comcast is down we are down. Happens several times a year. If internet is down phones are down, and VOIP
- Don't have redundancy, it just goes out
- None, it's a complete outage
- Not great
- Not sure. We look at natural disasters that might occur here; we are testing it
- One trick pony; cable company may have stuff in the backend I'm not aware of

Q12d. Why the less-than-stellar rating for the cost of your broadband services?

- Come from a place when it was cheaper and better
- Cost is ridiculous; they charge business rates, and in my home I get the same internet and I pay less
- Could be faster
- Don't provide
- Little high
- Not fast
- Reasonable I guess
- Too slow

Q12e. Why the less-than-stellar rating for your overall satisfaction with your broadband services?

- Don't have
- Drop outs, slow
- Need more data capabilities
- Not fast, goes down
- Not fast, limit capacity, no redundancy
- Not fast, we have outages
- Not reliable, low speed
- Redundancy, down time issues. Not getting reliable service, should not be down, ever

Q14. What would be the key consideration for you, in terms of deciding whether or not to utilize a new high speed network, such as the one I've described? Ridgefield (98642)

- Cost (3)
- Cost for MB; the value for what it max caps in terms of performance
- Cost, reliability; cost is key
- Depends on if we have a choice from another company
- Depends on the future endeavors of the customer preference, and how they do their banking
- Good back up, redundancy to make it more robust
- How much and quality; 1 gig vs 50- Google fiber speeds are so high; upload and download speeds, depends
- I would do it for the right price
- If the cost stays the same; I pay \$225 per month
- If we had issues with speed, but we are doing well
- Just make sure the provider has employees that understand the problems and go fix things immediately
- Look at longer term price structure that was controllable longer-term, and ease of support
- Price, must compare
- Speed, reliability, cost
- Talk to IT

Secondary Region (98604, 97629, 98674, 97660, 97685, 98686)

- Company attitude
- Compare price
- Cost
- Cost, we can't pay as much as the costs in Portland
- Doubt if I would use it. I know what happens when a small entity starts it. TDS -others would find it great product
- New alternate path and capacity; can I get the 40 and 100 we want
- Not allowed; government contractor
- Not my decision
- Price is the big one
- Price, service
- Reliability, cost
- Speed, reliability
- Value vs cost
- We have one now

Tertiary Region (98665, 98661, 98683, 98671, 98664)

- Area needs
- I already have it
- I'm a competitor
- Price per performance, if it faster
- Reliability

Organization name

Manufacturing / Supply

Mason's Supply Company (MASCO)
Western star
Advanced Electric Signs Inc.
CalPortland Company
Epic Polymer Systems Corp.
Lamiglas Inc.
Lifeport Inc.
Boise Cascade Co
Burgeners Woodworking Inc
DCB Industries Inc
Pro Tech Industries
Salmon Creek Machine
Flowserve Corp
Superior RV Manufacturing

Fire / Police

Clark County Fire and Rescue
Ridgefield Police
WA. State Patrol
Clark County Sheriff Office
Dept. of Corrections

IT service

IT Computer Guys
L Technology Group
New Era Tek
Battle Ground Computers
Bellika Computers

Finance / Insurance

Columbia Credit Union
Sterling Bank Services Inc.
US Bank National Association
Woodland Insurance Agency Inc

Hospitality / Entertainment

Ilani Resort
Vancouver Hospitality Partner LLC
Clark County Amphitheater

Education

Clark College
Washington State University Vancouver
EDS Education Service District 112

Business Services

Big Al's Specialty Movers
Reality Pro.
Red Line Marketing

Healthcare

Ridgefield Family Medicine
Legacy Salmon Creek Medical Center

Education

Ridgefield School District

Telecom

Silver Star Telecom

Retail

Toy Train Heaven Inc

Non-profit / Religious organization

North Pacific Union Conference of Seventh Day Adventist

Appendix: Questionnaire

Hello, my name is _____ with Riley Research, and I’m calling on behalf of the Port of Ridgefield to hear your thoughts about some plans for the Ridgefield – La Center area.

(IF NO KNOWN CONTACT) Who in your organization is responsible for planning or managing your internet, phone service or other communications technology? (GET PHONE / EMAIL)

(IF NECESSARY) We're not trying to sell anything. The Port of Ridgefield is interested in hearing feedback from organizations who might benefit from or have possible interest in access to fiber optic cable. All of your responses will be anonymous and combined with other local organizations.

Q1. You may have heard that the Port of Ridgefield is looking into the feasibility of building a local dark fiber optic loop, which they would lease to Internet Service Providers (ISPs) to provide fiber to organizations in the Ridgefield area.

Were you aware of this discussion?

(Clarify response as needed)

- | | |
|------------------|-------------|
| Yes – Very aware | Not aware |
| Somewhat aware | No response |

For background, the Port of Ridgefield is looking at options for providing more accessible and reliable high-speed Internet infrastructure.

The Port believes internet connectivity is a critical component of successful economic development activity in our region and will provide a direct competitive advantage to existing companies as well as for recruiting new enterprises.

The Port is in the initial phases of evaluating the demand for a “dark fiber” project.

If it goes forward, the port would build fiber optic infrastructure, then lease that infrastructure to local organizations and private companies for data transmission, cable TV, and Internet access.

Organizations would be able to lease dark fiber infrastructure from local service providers, that lease from the port, such as Comcast or Century Link.

In concept, it’s similar to building a shell of a building then leasing that structure to various tenants.

Dark fiber requires less power, has a higher capacity, often has better signal strength, is more immune to interference, and has built-in redundancy making it more reliable than existing networks.

What are your initial thoughts, pro or con?

Q2a. First, what could be good about this idea?

Q2b. What concerns or drawbacks could you foresee?

Q3. How likely is it that your organization will be needing a higher speed network in the next few years? (Read list as necessary)

- | | |
|--------------------|-----------------|
| Very likely | Very unlikely |
| Somewhat likely | Not very likely |
| (Unsure / Depends) | |

Q4. Besides email and web surfing, what are your organization’s most critical uses for the internet?

(Read list as necessary. Multiple responses)

- 01 Online banking
- 02 Web hosting
- 03 Phone service / VoIP
- 04 Video conferencing
- 05 Video/Television
- 06 File sharing
- 07 Social Media / Marketing
- 08 Data Storage / Backup / Cloud Storage
- 09 Online Research
- 10 Credit Card Processing
- 11 Business Applications Software (SaaS)
- 12 Ethernet between multiple locations
- 13 Uploads or downloads between company locations
- 14 Distance learning
- 15 Retail point-of-sale systems
- 16 Internal financial needs
- 17 Customer Relationship Management (CRM) (customer data tracking)
- 97 (None / No others)
- 98 Other (specify)
- 99 (Refused)

Q4b. Other uses

Q5. I’m going to run through a short list of software services that are provided exclusively over the internet, and I’d like to know if your organization currently utilizes any of them. You can just say yes or no after each.

(Read list. Multiple responses)

- 01 Office 365
- 02 One Drive
- 03 Dropbox
- 04 Skype for Business
- 05 Adobe Creative Cloud
- 06 Amazon web services
- 07 Microsoft Azure
- 08 IBM softlayer cloud
- 09 Google cloud services
- 10 Video Conferencing
- 11 Or any others specific to your business or industry?
- 12 (None)
- 13 (Don't know / Refused)

Q5b. Other

Q6. How likely are you to begin using any of these in the next few years? Are you:

(Read list)

- 1 Very likely
- 2 Somewhat likely
- 3 Not very likely
- 4 Not likely at all
- 9 (Don't know / Refused)

Q7. How do you expect your needs to change over the next five years and how will that impact your internet service connection?

Q8. Which company provides your organization’s internet service or regional network?

(Do not read list, but clarify as necessary)

- 01 CenturyLink
- 02 Verizon Fios
- 03 Comcast / Xfinity
- 04 Dish (satellite)
- 05 Tanger Telecom
- 06 TDS
- 07 LSN (regional)
- 08 Time Warner
- 09 Electric Lightwave
- 10 K20
- 11 Frontier
- 98 Other (specify)
- 99 (Don't know / Refused)

Q8b. Other provider

Q9. And can you tell me the kind of internet service connection your organization uses?

(Help as necessary)

- 1 Cable
- 2 Wireless
- 3 DSL / ADSL (over phone line)
- 4 T1 (over phone line)
- 5 Fiber
- 6 Phone line / Dial up
- 7 Other
- 9 (Not sure)

Q10. Can you tell me the speed of the service you use?

If you aren't sure, I can give you a website called speedtest.net where you can instantly determine your speed, just type in: "speedtest.net" and let me know what you get for your download and upload speeds

(As necessary) If you are using a wireless connection, the performance of the network router could potentially influence the results.

Downloads
Uploads

Q11. On a one to ten scale, where 10 is "most satisfied" and 1 is "least satisfied", how satisfied are you with the following aspects of your broadband, internet connections, or regional network?

- 01 1 - Not at all satisfied
- 02 2
- 03 3
- 04 4
- 05 5
- 06 6
- 07 7
- 08 8
- 09 9
- 10 10 - Extremely satisfied
- 99 (Don't know / Refused)

Q11a. The speed of the service available

Q11b. The reliability of your service

Q11c. Your provider’s ability to provide redundancy, in case service goes down

Q11d. The cost of your broadband services

**Q11e. How satisfied are you with your broadband services, overall
(If less than “6” to Q11a-e)**

Q12a. Why the less-than-stellar rating for the speed of service available?

Q12b. Why the less-than-stellar rating for the reliability of your service?

Q12c. Why the less-than-stellar rating for your provider's ability to provide redundancy?

Q12d. Why the less-than-stellar rating for the cost of your broadband services?

Q12e. Why the less-than-stellar rating for your overall satisfaction with your broadband services?

**Q13. You indicated less-than-perfect ratings for speed. Why haven't you upgraded?
(Unaided. Multiple responses)**

- | | |
|--|---|
| <input type="checkbox"/> 1 Price is too high | <input type="checkbox"/> 5 We're locked into a contract |
| <input type="checkbox"/> 2 Service is not available in my area | <input type="checkbox"/> 6 Not currently needed |
| <input type="checkbox"/> 3 Don't know if anyone provides services in my area | <input type="checkbox"/> 8 Other (specify) |
| <input type="checkbox"/> 4 Too much of a hassle | <input type="checkbox"/> 9 (Don't know / Refused) |

Q13b. Other reason

Q14. What would be the key consideration for you, in terms of deciding whether or not to utilize a new high speed network, such as the one I've described?

Q15a. Looking to the future, if Ridgefield were to build a fiber optic loop, most organizations would likely access the service through one of the various broadband companies in the area.

What, if anything, would your organization pay per-month to use fiber optic services to access the internet at a speed of one giga-byte per-second? (Enter all 9s if refused)

1 giga byte per second / per-month _____

- | | |
|--|--|
| <input type="checkbox"/> 1 Nothing | <input type="checkbox"/> 5 \$300-\$999 |
| <input type="checkbox"/> 2 Less than \$100 | <input type="checkbox"/> 6 \$1,000 or more |
| <input type="checkbox"/> 3 \$100-\$199 | <input type="checkbox"/> 9 No response |
| <input type="checkbox"/> 4 \$200-\$299 | |

Q16a. If that one giga-byte per-second service was offered at a cost of \$500 per month, how likely would your company be to adopt this service? (Read list)

- | | |
|--|---|
| <input type="checkbox"/> 1 Very likely | <input type="checkbox"/> 4 Not likely at all |
| <input type="checkbox"/> 2 Somewhat likely | <input type="checkbox"/> 9 (Don't know / Refused) |
| <input type="checkbox"/> 3 Not very likely | |

Q16b. If that one giga-byte per-second service was offered at a cost of \$100 per month, how likely would your company be to adopt this service?

(Read list)

- | | |
|--|---|
| <input type="checkbox"/> 1 Very likely | <input type="checkbox"/> 4 Not likely at all |
| <input type="checkbox"/> 2 Somewhat likely | <input type="checkbox"/> 9 (Don't know / Refused) |
| <input type="checkbox"/> 3 Not very likely | |

Q17. On a ten-point scale, where 10 means "agree strongly" and 1 means "disagree strongly," to what extent do you agree or disagree with the Port of Ridgefield's efforts to build the dark fiber network?

- | | |
|---|--|
| <input type="checkbox"/> 01 1 - Disagree strongly | <input type="checkbox"/> 07 7 |
| <input type="checkbox"/> 02 2 | <input type="checkbox"/> 08 8 |
| <input type="checkbox"/> 03 3 | <input type="checkbox"/> 09 9 |
| <input type="checkbox"/> 04 4 | <input type="checkbox"/> 10 10 - Agree strongly |
| <input type="checkbox"/> 05 5 | <input type="checkbox"/> 99 (Don't know / Refused) |
| <input type="checkbox"/> 06 6 | |

Q18. On that same scale, to what extent do you agree or disagree that the Port of Ridgefield would likely do a good job building and maintaining a dark fiber network?

- | | |
|---|--|
| <input type="checkbox"/> 01 1 - Disagree strongly | <input type="checkbox"/> 07 7 |
| <input type="checkbox"/> 02 2 | <input type="checkbox"/> 08 8 |
| <input type="checkbox"/> 03 3 | <input type="checkbox"/> 09 9 |
| <input type="checkbox"/> 04 4 | <input type="checkbox"/> 10 10 - Agree strongly |
| <input type="checkbox"/> 05 5 | <input type="checkbox"/> 99 (Don't know / Refused) |
| <input type="checkbox"/> 06 6 | |

Q19. About how many total employees does your organization have at your Clark County location or locations?

Employees _____

- | | |
|---|--|
| <input type="checkbox"/> 1 Less than 10 employees | <input type="checkbox"/> 4 100 or more |
| <input type="checkbox"/> 2 10-19 | <input type="checkbox"/> 9 No response |
| <input type="checkbox"/> 3 20-99 | |

Q20. About how many internal and external people access the Internet at your location on a regular basis? (Enter all 9s if refused)

Internal _____ External _____

Internal employees

- | | |
|--|---|
| <input type="checkbox"/> 1 Less than 10 internal employees | <input type="checkbox"/> 5 500-999 |
| <input type="checkbox"/> 2 10-49 | <input type="checkbox"/> 6 1,000-9,999 |
| <input type="checkbox"/> 3 50-99 | <input type="checkbox"/> 7 10,000 or more |
| <input type="checkbox"/> 4 100-499 | <input type="checkbox"/> 9 No response |

External employees

- | | |
|--|---|
| <input type="checkbox"/> 1 Less than 10 external employees | <input type="checkbox"/> 5 500-999 |
| <input type="checkbox"/> 2 10-49 | <input type="checkbox"/> 6 1,000-9,999 |
| <input type="checkbox"/> 3 50-99 | <input type="checkbox"/> 7 10,000 or more |
| <input type="checkbox"/> 4 100-499 | <input type="checkbox"/> 9 No response |

Q21. Which of the following best describes your role: Are you someone who influences the decisions, someone who makes the decisions, or both?

- 1 Influencer
- 2 Decision-maker
- 3 Both
- 9 (Refused)

Q22. About how many miles from Ridgefield is your work?

Miles _____

- 1 Less than 10 miles
- 2 10-14 miles
- 3 15-20 miles
- 9 No response

Q23. And what is your title?

- 1 IT
- 2 Owner
- 3 Chief Information Officer
- 4 Operations Manager
- 8 Miscellaneous
- 9 No response

Q24. Would you be willing to allow the Port of Ridgefield to potentially share your thoughts about the value of the proposed fiber loop? We will not share your all your answers to this survey, just the comments you have made.

- 1 Yes
- 2 No
- 9 (Refused)

Q24a. What is your name?

Q24b. Is this the best phone number to reach you?

Q24c. And may I have your email address?

Those are all the questions I have. On behalf of The Port of Ridgefield, thank you for your opinions. Have a great day!

Record gender

- 1 Male
- 2 Female

Organization name: _____

Number of employees _____

Zip code

- 01 98642
- 02 98604
- 03 98629
- 04 98674
- 05 98660
- 06 98685
- 07 98686
- 08 98665
- 09 98868
- 10 98661
- 11 98000

City

- 1 Vancouver
- 2 Ridgefield
- 3 Woodland
- 4 Battleground
- 5 Washougal

Industry

- 01 Fire / Police
- 02 Education
- 03 IT service
- 04 Manufacturing / Supply
- 05 Business Services
- 06 Retail
- 07 Hospitality / Entertainment
- 08 Healthcare
- 09 Non-profit / Religious organization

Market Analysis

Market Analysis

Introduction

In 2014, Harvard Business School’s Robert Kaplan famously declared that fiber infrastructure was more important than roads in the support of economic growth. Technologies requiring high-capacity broadband are increasingly ubiquitous in all sectors of the economy. From small businesses to large multinational conglomerates, broadband applications continue to change the way businesses operate. Economic growth in rural areas can often be constrained by inadequate broadband access. Schools, hospitals, and public institutions need to be able to move and manage information quickly and efficiently. Businesses need fast and reliable internet connections that allow for e-commerce and online processing and transactions, in order to stay competitive in an increasingly tech-centered economy. Because of this, the provision of high speed internet is increasingly becoming a focus of economic development initiatives in small towns and rural areas.

Broadband Applications

High-capacity internet allows for the proliferation of a wide variety of applications which can positively impact people's everyday lives and the broader economy. This report reviews some of the industries most likely to be impacted by advancing technologies, and the factors driving that change.

Generally, internet connections are rated by their ability to send and receive information, measured in megabits per second (Mbps). Table 1 shows the network download speed required for some increasingly common broadband applications.²

	Network Download Speed			
	4 Mbps	10 Mbps	20 Mbps	50 Mbps
Multi-point video conferencing	Not Adequate	Adequate	Adequate	Adequate
Download high-definition video	Not Adequate	Not Adequate	Adequate	Highly Adequate
Server backup (one terabyte capacity)	Not Adequate	Not Adequate	Not Adequate	Highly Adequate
Telecommuting	Not Adequate	Not Adequate	Not Adequate	Highly Adequate
Distance learning	Not Adequate	Not Adequate	Not Adequate	Highly Adequate
Telemedicine	Not Adequate	Not Adequate	Not Adequate	Highly Adequate

Models of Broadband

Broadband generally refers to high speed internet access. The term includes several high-speed transmission technologies such as: digital subscriber line (DSL), cable modem, wireless, satellite, broadband over powerlines (BPL), or fiber. These transmission technologies each have different benefits and drawbacks related to speed, cost, reliability and ease of installation. Table 2 below summarizes the general strengths and weakness for these broadband transmission technologies.

² “This information is adapted from research conducted by the SBA into the bandwidth requirements for a number of business-oriented applications (using the categories of highly adequate, adequate, and not adequate) (Columbia Telecommunications Corporation, 2010). For a file of any content up to two MBs, 20 seconds is considered highly adequate, 20–25 seconds is adequate, and more than 25 seconds is considered not adequate. For downloading larger files of any content up to two GBs, for example high-definition videos, a time of up to 10 minutes is considered highly adequate, 10–15 minutes is adequate, and more than 15 minutes is not adequate.” <http://www.firstmonday.org/ojs/index.php/fm/article/view/4066/3355>

³ <http://www.firstmonday.org/ojs/index.php/fm/article/view/4066/3355>

TABLE 2. STRENGTHS AND WEAKNESS OF BROADBAND TRANSMISSION Technologies

	Strengths	Weaknesses
Digital Subscriber Line (DSL)	<ul style="list-style-type: none"> • Faster internet speeds than dial-up. • Fast enough to suit the needs of most home users. • Less expensive than cable. 	<ul style="list-style-type: none"> • Not as fast as cable • Not as widely available as cable • DSL is distance limited; the further the main line, the weaker the signal, and the slower the connection.
Cable Modem	<ul style="list-style-type: none"> • As opposed to DSL, the quality of a cable connection does not depend on distance so speed is guaranteed regardless. • Cable access range from about 3 to 10 Mbps, which is essentially 3 to 4 times faster than DSL.⁴ • Wide availability. 	<ul style="list-style-type: none"> • More expensive than DSL or Fiber. • Significantly slower than Fiber Internet speeds • Unlike DSL, which runs on a dedicated line, cable connections are typically shared amongst customers, making it a slightly less secure option. • Cable is dependent on the number of users on the network and in the local area, causing data traffic to slow down and become congested. • Construction fees and connection fees are variable and may affect pricing.
Fiber	<ul style="list-style-type: none"> • Capable of transmitting data much faster than all other options over greater distances. • Fiber optic cables cost less to maintain, so the cost of service tends to be much less than cable and competitive with DSL. • Fiber is immune to all sorts of interference, since the conductor is glass and cannot generate electricity. Fiber can come in direct contact with high-voltage electrical equipment, power lines and lightning, without affecting performance. 	<ul style="list-style-type: none"> • Not yet widely available in many places. • Requires installation of new fiber infrastructure.
Wireless	<ul style="list-style-type: none"> • Can serve remote or sparsely populated areas, using longer-range directional equipment, where DSL or cable would be expensive to provide. 	<ul style="list-style-type: none"> • More difficult to secure than wired local networks, and can be more vulnerable to attack by unauthorized users. • Wireless networks generally have less transmission throughput than wired local networks, as they are limited to the maximum speed of the wireless network in a specific area of the practice.
Broadband over Powerlines (BPL)	<ul style="list-style-type: none"> • Speeds are comparable to DSL and cable. • BPL can be provided to homes using existing electrical connections and outlets. • Since power lines are installed virtually everywhere, there is no need to build new broadband facilities. 	<ul style="list-style-type: none"> • BPL is an emerging technology and with availability in limited areas.
Satellite	<ul style="list-style-type: none"> • Can be cost effective where building out underground circuits would be expensive to construct. • Can serve rural areas with limited options for high speed internet. • Most areas in North America are covered and eligible for Satellite service. • Installation of the satellite broadband antennas is extremely quick compared to the installation of new underground circuits which could take months. 	<ul style="list-style-type: none"> • Satellite service often has data caps, which allow internet traffic up to a certain cap. Additional charges could be applied if the cap is surpassed. • Satellite signal can be interrupted in storms or adverse weather. • Internet can experience higher latency because of the distance the signal travels. • Speeds are generally not as fast as DSL, cable or fiber. Tasks that require high speeds, like video chatting or online gaming may not be possible.

⁴ <http://fiberforall.org/fiber-vs-cable-vs-dsl/>

It is difficult to state and compare the maximum speeds of different transmission technologies, as broadband speed is contingent on backhaul capacity to scale, which in-turn require backbone or regional capacity. For some technologies, speed is a function of the number of users utilizing the network. Maximum speeds range from the technical maximum the technology could optimally achieve to the “typical” range observed in advertised literature. Technical maximums are rarely available commercially. Table 3 below compares the typical speeds observed for each broadband transmission technology, compared to the maximum speeds these technologies are optimally capable of.

TABLE 3. Comparison of Typical and Theoretical Maximum Broadband Speeds		
	Typical Available Range	Technical Maximum
Digital Subscriber Line (DSL)	<ul style="list-style-type: none"> • Speeds vary widely by location: • New technologies such as ADSL are pushing limits well over 20mbps. • Maximum speeds in most areas such Ridgefield are likely to have a maximum of at 7mbps. 	~100 mbps
Cable Modem	4 to 12 mbps ⁵	~300 mbps
Fiber	1GB	~10GB
Wireless	5 to 12 mbps with a peak of 50 mbps ⁶	Unknown
Broadband over Powerlines (BPL)	Unknown, the maximum reported is up to 3 mbps	Unknown
Satellite	<ul style="list-style-type: none"> • 12-15 mbps is typical • The maximum advertised is 25 mbps 	50 mbps

In the Ridgefield market, Comcast and CenturyLink hold most of the market share for internet service in the area but several other companies also operate in the area. Internet service providers in the Ridgefield area include: Comcast, CenturyLink, Verizon, Charter, Time Warner, Electric Light Wave, HughesNet, Megapath, Telephone & Data Systems, Sawtooth, and Level3. The service providers in the Ridgefield market quote a wide range of maximum broadband speed rates for residential and business uses, utilizing a variety of transmission technologies.

- **Maximum Residential Broadband speeds quoted for the Ridgefield Market:**
 - Comcast: 100 mbps (Cable)
 - CenturyLink: 25 mbps (DSL)
 - Telephone & Data Systems: 10 mbps (DSL)
 - Huges Net: 25 mbps (Satellite)
- **Maximum Business Broadband speeds quoted for the Ridgefield Market:⁷**
 - Comcast: 100 mbps (Cable)
 - CenturyLink: 25 mbps (DSL)
 - HugesNet: 25 mbps (Satellite)
 - Megapath: 3 mbps (copper wire)
 - Telephone & Data Systems: 10 mbps (DSL)
 - Sawtooth: 1GB (Fiber)
 - Level3: 1GB (Fiber)

⁵ <https://www.verizonwireless.com/archive/mobile-living/network-and-plans/4g-lte-speeds-compared-to-home-network/>

⁶ <https://www.verizonwireless.com/archive/mobile-living/network-and-plans/4g-lte-speeds-compared-to-home-network/>

⁷ <https://www.highspeedinternet.com/wa/ridgefield?zip=98642#business-providers>

Several high-speed transmission technologies can connect remote or rural areas. However, fiber is capable of transmitting data faster over greater distances than other models.⁸ In the first quarter of 2017, the average Internet speed of the United States was 10.7 Mbps.⁹ Fiber-optic Internet can offer some homes download speeds up to 500 Mbps, allowing the use of multiple devices without slowing performance.¹⁰ The challenge to creating fiber broadband access is typically the installation and maintenance of infrastructure. Because of this, many municipalities are exploring ways of providing fiber infrastructure. There are several models a municipality (generally sponsored by a city or port) can adopt in order to improve broadband services for their communities:

- **Public Service providers** use fiber and broadband resources to connect to public institutions with fiber or wireless connectivity.
- **Open access providers** own extensive fiber networks and lease to service providers. Governments light the fiber and equip the network with the electronics necessary for service providers to connect to the local network.
- **Infrastructure providers** provide dark fiber services and conduit. Dark fiber is the core product of most infrastructure providers, which is leased to community organizations, businesses, and broadband providers.
- **Retail providers** equip business districts or residential areas with fiber infrastructure and provide direct service to these areas.
- **Public-private partnerships** allow local governments to invest in a broadband network without operating it. Local governments and one or more private organizations work together to plan, fund, build, and maintain a broadband network.¹¹

Dark Fiber Leasing

The provision of dark fiber is a model many local governments are exploring as a way to bring high-capacity broadband into a community and encourage investment. Pricing for Dark Fiber varies widely. Most often, dark fiber is priced per strand per mile over a set period of time. A typical model involves a 10- or 20-year Indefeasible Right of Use Lease (IRU), where the customer pays up front for the IRU and annually for maintenance¹². The lease price typically covers fibers on the existing fiber network, and the customer is responsible for connecting their facility to the fiber network. Pricing for dark fiber ranges broadly, contingent on a range of factors including, metro vs. rural, distance, expensive crossings (i.e. rivers/bridges), maintenance contracts, ring/redundancy requirements, term of the contract, and the competitive market. Table 4 presents a comparison of regional dark fiber lease rates converted to a standard per strand mile basis.

⁸ <http://fiberforall.org/fiber-vs-cable-vs-dsl/>

⁹ <http://www.dslreports.com/shownews/US-28th-in-Average-Wireless-Broadband-Speeds-139719>

¹⁰ <http://fios.verizon.com/beacon/pros-cons-different-types-internet/>

¹¹ http://www.bbcmag.com/2016mags/May_June/BBC_May16_SevenModels.pdf

¹² <http://www.ctcnet.us/DarkFiberLease.pdf>

TABLE 4. Comparison of Regional Dark Fiber Lease Rates¹³

Entity	Price per Strand Mile
Burbank Water & Power	\$135 to \$200 depending on number of strands and length of contracts
CoastCom	\$40 to \$50
Grant County PUD	\$55 for strands 1&2 (\$20 for additional)
Central Lincoln PUD	\$37.50
Springfield Utility Board	\$19.00
City of Bellevue, Washington	\$47.50
Bonneville Power Administration	\$30 to \$45
Palo Alto Utilities	\$177 to \$295 depending on number of strands
Sacramento Regional Transit	\$60 to \$125 depending on location
City of Santa Clarita	\$80

Exhibited dark fiber lease rates among Ports in Washington State fall in the \$15 to \$17 range per month (per strand-mile) for long-haul backbone and \$100 per month (per strand-mile) for short distances.

Factors Driving Broadband Demand

Certain broadband applications have potential to influence a wide variety of industries. As such, these applications are anticipated to become more prevalent in all aspects of daily life, and are likely to be drivers of change in many industries. Three increasingly influential broadband applications described in more detail below are the Internet of Things, Mechatronics, and Software as a service.

The Internet of Things

The Internet of Things (IoT) is a term to describe physical objects with an IP address for internet connectivity. This term includes things like smart devices and appliances, wearable technology, connected cars, and healthcare gadgets. IoT appliances can communicate with one another and may be controlled remotely from a mobile device. The application of IoT technology may be seen in smart appliances like thermostats and refrigerators; in smart homes in the forms of lighting, security, entertainment; and in smart cities to better manage traffic signals, emptying bins, and parking availability. According to one study, “Future trends indicate that growing use of miniaturized sensors and smart devices will lead to applications tailored to individual consumers’ environments and preferences that rely on always-on, higher speed broadband connections.”¹⁴ IoT technology holds vast potential to improve connectivity and efficiency for a wide variety of industries; it is likely that IoT will be influential in shaping the future of many industries including healthcare, manufacturing, agriculture, retail, government, and energy.

Mechatronics

Mechatronics is a multidisciplinary field of science that describes the integration of mechanical engineering, control theory, computer science, and electronics in engineered systems. The term mechatronics has been around since the 1960s to describe the blend of mechanics and electronics,¹⁵ but advances in technology in recent years have led to an exponential increase in applicability of mechatronics across multiple fields. Mechatronics have a vast array of applications including: automation, control systems, automotive engineering, sensing and control systems, data logging, maintenance, manufacturing systems, robotics, structural dynamics systems, consumer products and

¹³ Eugene Water and Electric Board, Feb 2017

¹⁴ <http://www.firstmonday.org/ojs/index.php/fm/article/view/4066/3355>

¹⁵ <https://www.engr.ncsu.edu/mechatronics/what-mech.php>

mobile apps. Mechatronics technology is often integrated into IoT devices, so the same industries likely to be heavily influenced by the IoT will need access to mechatronics technology; healthcare, manufacturing, agriculture, retail and energy will all be shaped by advances in sensing, control systems, and automation. As mechatronics grow in influence, access to educational institutions that provide exposure to, and training in, these technologies will become increasingly important.

Software as a Service

Software as a Service (SaaS) is software as a hosted service accessed through the internet, rather than a one-time license model associated with on-site Software. SaaS applications typically are sold through a subscription model with an on-going fee. SaaS often requires less up-front resources to acquire software and reduce the risks associated with software acquisition.¹⁶ Some common SaaS companies include: Salesforce, Workday, Office 365, NetSuite, AthenaHealth, Slack, Box, Google Apps, and Oracle. Many of these companies offer services like marketing, data management and analytics, conferencing, and workplace management and human resources, which benefit a wide variety of industries. Other SaaS applications are targeted towards specific industries, such as online medical recordkeeping for healthcare, or engineering simulation software.

Additionally, SaaS applications are growing as a tool for information sharing. As industries become more data intensive and increasingly reliant on information sharing, the need to transfer large amounts of data between facilities becomes critical for business operations. SaaS file transfer applications provide a means for transferring large amounts of data quickly and securely. These applications are particularly useful for industries producing data intensive products such as satellite images and mapping, digital films and tv ads, CAD images and blueprints, and music files.¹⁷ Additionally, these SaaS applications provide solutions for companies and organizations that need to share large amounts of information between distant facilities, as is often the case with educational and research facilities, hospitals, financial institutions and government offices.

The increase of broadband Internet access has facilitated the proliferation of SaaS applications by allowing these remotely hosted applications to share information quickly, reliably over great distances, and to offer speeds comparable to traditional software.¹⁸ Following this line of thinking, the expansion of broadband access will allow more companies, in more remote areas, to reap the benefits of the variety of SaaS applications available.

Industries Most Impacted by Technology Trends and Broadband Demand

Sectors such as the media, entertainment, and retail have quickly adopted technologies that require high-capacity broadband, while a wide array are becoming increasingly dependent on high-speed connection speeds. Some industries quickly advancing in their needs for high-capacity internet are healthcare, manufacturing, agriculture, retail, education, government, energy, and small businesses; certain broadband applications show exceptional promise for these industries.

Manufacturing and Distribution

The industrial sector has quickly become a sector highly dependent on technology to organize and operate tools and machines, and to track products and people. Industrial uses such as manufacturing, packaging, warehousing and distribution are obvious beneficiaries of mechatronics, as automation and

¹⁶ <https://msdn.microsoft.com/en-us/library/aa905332.aspx>

¹⁷ <http://www.eweek.com/database/10-industries-that-are-making-the-most-of-big-data>

¹⁸ <https://msdn.microsoft.com/en-us/library/aa905332.aspx>

robotics can greatly increase efficiency in production processes, and control systems can aid in tracking and monitoring products and activities. Mechatronics have a wide variety of applications in the industrial manufacturing sector: automation, robotics, sensing and control systems, computer-aided and integrated manufacturing systems, packing, machine tool design and control, laser-based manufacturing systems, optimization in manufacturing, and specialized cooling and airflow for appliances and equipment. Mechatronics design tools allow companies to determine optimal design before beginning construction, and this ability to determine the 'right-size' of machine parts during the design phase can greatly reduce the cost and time of manufacturing.¹⁹ Mechatronics can also be employed to determine the precise amount of energy required to operate equipment.²⁰ The ability to reduce raw materials waste during production and enhance energy efficiency during operations indicates that mechatronics will be valuable in enhancing the sustainability of manufacturing industries. Overall, mechatronics applications can enhance the speed, efficiency, and quality of manufacturing industries; access to these technologies will likely be critical for manufacturing companies to remain competitive.

Mechatronics and IoT technology have further revolutionized the efficiency and reliability of logistics and distribution centers. These technologies can be used to track inventory, manage restocking, and provide updates on arrivals, departures, and movement of inventory. IoT technology is already being used to optimize truck routes and track the speed, safety, and fuel efficiency of trucks. Sensors can be used to send alerts when equipment needs maintenance or to monitor the condition of products during shipment. Robotics and other mechatronics applications can be used for automated packaging including "in-line scan weight dimensioning, pack sheet documentation print, fold and insert technology, automatic or semi-automatic carton taping, and print-and-apply labeling to auto-apply the compliance, carton content and shipping labels," which can greatly reduce the amount of time required for order fulfillment.²¹ All of these technologies facilitate the development of 21st Century integrated logistics centers offering the competitive advantage of greater speed to market and lower labor costs for packing, shipping and restocking.

Healthcare

There are many ways technology has been and can be incorporated into healthcare; because of this, the industry is likely to see a growing amount of need for high-capacity broadband. Some of the benefits of broadband for healthcare include: the replacement of time-consuming paper records with electronic medical records, real-time transmission of medical imagery, remote monitoring of patients, information sharing between physicians and remote specialists in emergencies, and the ability to empower patients for recovery by linking them to social networks and information.²² A 2013 study reported that the healthcare system in the United States could save 30 billion a year by connecting medical devices to electronic medical records, through reducing clinician time manually entering information, adverse events, redundant testing, and the length of stay due to information delays.²³ Medical mechatronics and Internet of Things technology are starting to appear through the healthcare spectrum, from wearable health gadgets and sensors and implanted medical devices that help providers and patients track health indicators, to the use of robotics for surgery. Telehealth is gaining popularity as a means of distribution of health-related services and information, a development that could help fill the gap in rural areas lacking adequate healthcare services. SaaS applications are deployed for medical practice management,

¹⁹ <https://www.automationworld.com/motion-control-systems/mechatronics-packaging-its-not-rocket-science>

²⁰ <https://www.automationworld.com/motion-control-systems/mechatronics-packaging-its-not-rocket-science>

²¹ <http://www.numinagroup.com/2017/01/28/mechatronics-shows-path-higher-productivity-order-fulfillment-automation/>

²² http://broadband.masstech.org/sites/mbi/files/documents/building-the-network/Innovative_Uses_Broadband_WMmass_p_RPAs.pdf

²³ <http://www.westhealth.org/wp-content/uploads/2015/02/The-Value-of-Medical-Device-Interoperability.pdf>

medical record keeping, hospital administration, and medical research and analysis.²⁴ The Federal Communications Commission understands the opportunities broadband can provide for healthcare providers, and has established several objectives and programs, such as the Rural Health Care Program, to help ensure health care providers have access to affordable broadband. Table 5 below shows the minimum recommended bandwidth speed for various health care facilities.

Type of Healthcare Practice	Megabits per second
Single Physician Practice	4
Small Physician Practice (2-4 physicians)	10
Nursing Home	10
Rural Health Clinic (approximately 5 physicians)	10
Clinic/Large Physician Practice (5-25 physicians)	25
Hospital	100
Academic/Large Medical Center	1,000
Single Physician Practice	

Agriculture

Mechatronics and the Internet of Things could also come to play a vital role in agriculture. Farmers have started to use connected sensors to monitor crops and livestock, and boost efficiency, health, and productivity. Robotic arms may be employed for fertilizing, seeding, cropping, cleaning and monitoring vegetation.²⁶ Sensors on equipment, satellite images, and weather tracking may be employed to help determine precisely how much water and fertilizer are required.²⁷ Many agricultural technology solutions are already available for use. However, the fields where these applications would be applied often have poor internet reception, which impacts machine-to-machine communication, and can be a limiting factor in product adoption.²⁸ Increasing broadband access for agricultural areas could help improve the livelihoods for farmers, while helping them meet the food demands of a growing population.

Retail

Technology has changed consumer buying behavior, and retailers have been quick to adapt. The retail industry has been an early adopter of many technological advances. E-commerce has developed into a robust sector, with small businesses and large retailers alike shifting towards online sales. E-commerce accounts for a growing proportion of total sales; according to Census data, e-commerce accounted for 8.1% of total sales in 2016, compared to just over 3% in 2007. Mobile apps are growing in popularity, both to increase convenience and options for consumers, and to help business collect and share information. IoT devices may assist retailers by collecting data on consumer habits, tailoring the customer experience through mobile apps, optimizing supply chain operations, and creating new revenue streams. Because of these opportunities, IoT technology is expected to be an especially influential broadband application in the retail industry. According to a recent survey, retailers are

²⁴ <http://www.investopedia.com/articles/investing/010715/top-medical-healthcare-software-companies.asp>

²⁵ <https://www.healthit.gov/providers-professionals/fags/what-recommended-bandwidth-different-types-health-care-providers>

²⁶ <http://www.laccei.org/LACCEI2009-Venezuela/p109.pdf>

²⁷ https://bits.blogs.nytimes.com/2015/08/03/the-internet-of-things-and-the-future-of-farming/?_r=0

²⁸ http://www.deere.com/en_US/docs/financial/farm_matters/issue_7/rural_wireless_broadband_powers_agriculture.html?CID=NLC_JDF_en_US_FarmMatters_WirelessBroadband_Issue7_07312014

planning major investments in technology over the next 5 years, with 70% reporting plans to invest in Internet of Things, 68% in machine learning and cognitive computing, and 57% in automation.²⁹

Education

From Pre-K to higher education, access to high-speed broadband is already critical for educational institutions to be able to access and manage information. There is widespread acceptance of the need for high-capacity broadband for primary and secondary education, and it has been a focus of the Federal Communications Commission and the Federal E-rate Program to expand broadband access for educational institutions, particularly in rural areas. Despite this, many schools are still lacking. According to data collected by the Federal E-rate Program, 41 percent of schools have not yet met the FCC's short-term connectivity goal of 100 Mbps per 1,000 users, and an even higher percentage are struggling to meet their long-term goal of 1 Gbps per 1,000 users.³⁰ Out-of-school access is also an issue for many students, as 10 percent of Americans and 40 percent of rural areas lack access to speeds of at least 25 Mbps for downloads and 3 Mbps for uploads.³¹ Advancing computer literacy training is of growing importance to prepare students for an increasingly tech-oriented economy; expanding broadband access for schools will be critical in order to do so.

Educational technologies such as video conferencing, electronic textbooks, online instruction, and other distance learning applications are becoming an integral part of education, particularly in higher education; these applications require a substantial amount of bandwidth to send and receive copious amounts of information quickly and reliably.³² Furthermore, educational institutions need access to high-capacity internet in order to deliver high-quality, competitive STEM programs and produce the technical skills necessary to advance research and produce a competitive workforce in science and engineering fields.

Government

Most municipalities provide some degree of e-government services, or online services and information provided by a government agency, usually in the form of online information and communications, applications for permits and licenses, and mapping. E-government services do not typically require a large amount of bandwidth, as most e-government services are limited to uploading and downloading forms. Geographic information systems (GIS), however, are widely utilized and require a connection speed of at least 10 Mbps to function without significant delays.³³ "Smart Cities" technology may be used to manage and increase efficiency in a wide variety of government functions and services. IoT sensors and control systems may be used to control city lighting and traffic signals, manage and track availability of fleet and vehicle parking areas, and manage waste storage and pick up.³⁴ A wide variety of other advances in technology will influence the public sector. GPS analytics may help transportation departments better determine demand for public transit and public bicycles, and can progress real-time traffic analytics. Sensors can be deployed to monitor leaks and pollution in municipal water infrastructure. Drones, sensors, and computer vision can potentially monitor and identify security and safety issues. Many municipalities are also increasing public involvement and transparency through video casting public meetings and hearings. Access to high-capacity broadband will allow municipalities

²⁹ <https://www.forbes.com/sites/louiscolombus/2017/03/19/internet-of-things-will-revolutionize-retail/#7afc07e85e58>

³⁰ https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-6A1.pdf

³¹ https://apps.fcc.gov/edocs_public/attachmatch/FCC-16-6A1.pdf

³² <http://www.firstmonday.org/ojs/index.php/fm/article/view/4066/3355>

³³ <http://www.firstmonday.org/ojs/index.php/fm/article/view/4066/3355>

³⁴ <https://www2.deloitte.com/us/en/pages/technology-media-and-telecommunications/articles/telecommunications-industry-outlook.html>

to take full advantage of technologies that will allow more efficient, effective governance, while reducing the cost of many services.

Energy

Mechatronics and the Internet of Things hold vast potential for regulating energy consumption and improving energy efficiency. There is ample opportunity to deploy IoT devices in homes and places of business to regulate temperature and improve the efficiency of appliances. Smart thermostats allow users to create schedules for heating and air conditioning, adjust temperature automatically in individual rooms, and can be controlled remotely from other IoT connected devices such as smart phones. Mechatronics can be applied to determine and deliver precisely the correct amount of energy to operate machinery. Applications of mechatronics and IoT are expected to become commonplace in managing residential and business energy efficiency.

Advances in smart grid technology could transform the way regions receive power on a much larger scale. The nation's current electrical power infrastructure is aging and overtaxed. The U.S. Department of Energy and energy suppliers are thinking forward about a transition to a smart grid. Smart grid technologies will deploy sensors, controls, and other technologies to communicate with each other to deliver energy more reliably and efficiently, and reduce frequency and duration of power outages through automatic rerouting.³⁵ Some operational measures such as smart meters and appliances may be applied piecemeal, but the full implementation of a smart grid will require large-scale coordination and will develop over time, as technological developments create new opportunities. The smart grids of the future are expected to enable electricity companies to meet rising demand, increase reliability of power supplies, improve energy efficiency, and integrate renewable energy sources into power networks.³⁶

Small Businesses and Startups

Access to reliable broadband is critical for small businesses and startup companies. E-commerce provides new opportunities for companies with little upfront capital or resources. Software as a Service is a growing tool for large and small business alike, but creates specific opportunities for small companies. Traditional one-time license software often entailed large upfront costs, and required IT personnel to manage the deployment of the software infrastructure at the client's location, often putting software out of reach for small organizations. Software as a Service, on the other hand, reduces commitment of upfront resources.³⁷

Information Sharing Between Facilities

Many of the industries and technologies described above require broadband capacity for on-site Wi-Fi communications within a given facility. However, as industries become more dependent on big data, the need to transfer large amounts of data back and forth between facilities becomes critical. Businesses and institutions with firm-to-firm linkages will have a substantial need for broadband connections between facilities. Education and research institutions often need to send large data between campuses. Manufacturing and engineering firms need to be able to link research/engineering to production facilities. Increasingly so, this relationship represents a feedback loop as well, with data collection and processing in the production chain informing future design and process iterations. Media and broadcasting companies need to share multiple high-resolution files between offices. Healthcare facilities require the capability to transfer full patient records and imagery. Financial Services industries and

³⁵ <https://energy.gov/oe/services/technology-development/smart-grid>

³⁶ <http://www.intel.com/content/dam/www/public/us/en/documents/white-papers/iot-smart-grid-paper.pdf>

³⁷ <https://msdn.microsoft.com/en-us/library/aa905332.aspx>

Summary of Survey Results

In May 2017, project partner Riley Research Associates conducted surveys across a diverse group of stakeholders. While the results of this effort are detailed elsewhere in this report, several survey questions were specifically included to inform this market assessment, which are summarized here.

Satisfaction with Existing Service

Overall, survey respondents were moderately satisfied with existing services levels. When ranked on a scale of 1-10, overall satisfaction averaged a score of 7.5. Reliability (7.5) and speed (7.3) scored well, with redundancy (5.5) scoring low. The survey found that a measurable share of respondents currently has access to fiber (29%) infrastructure; but cost factors, limited choice and competition, and redundancy were limiting factors. However, these scores were contrasted by comments throughout the survey expressing concern about service levels and future need.

Likelihood of Future Need for Increased Broadband

Respondents of the survey clearly anticipate expanded need for high speed internet in the coming years, with 76% of participants indicating a likely growing need. Among these, over half (51%) indicated they were “very likely” to need expanded internet service over the next few years.

Among the most common needs are an expanded use of software and business application services. For example, over 34% of respondents indicated they use video conferencing services, and 51% file share or send documents between company locations. Other common applications among local businesses and institutions include Google Cloud (29%), Office 365 (27%), Dropbox (24%), and Amazon Web Services (20%). Themes common in the verbatim responses included:

- A proliferation of software to track diagnostics of fleets while on the road.
- An expanded use of technology influencing greater demand for data.
- Increased need for encryption and cybersecurity will influence data demand.
- Larger file sizes will increase data needs and speed requirements.
- Growth in video conferencing utilization.

Key Considerations

Cost of service and reliability were the principal considerations among respondents when considering the adoption of future expanded broadband service, indicating that demand for broadband internet in market is fairly elastic.

Willingness to Pay

Reflecting price sensitivity in the market, the survey found 34% of respondents were unwilling to pay any amount above and beyond their current costs for expanded service. This rate is expected, as it roughly correlates with the share of respondents that did not see a need for expanded service in the near future. However, among the 53% who indicated a willingness to pay a marginally higher rate, a range between \$100 and \$300 was most common. Over 14% of respondents were willing to pay more than \$300 extra per month for one gigabyte service. From these findings, we can generally conclude that those with a need for expanded service in the market have a marginal willingness to pay for the service.

Employment Concentrations and Outlook

Ridgefield (as approximated in this section by the 98642 zip code) has a moderately well-diversified economy for a community of its size. As of 2015, there were nearly 6,400 employees working in the area.³⁸ Several prevailing sectors have emerged in the economy based on the unique competitive advantages Ridgefield presents. Among these, warehousing and distribution, crop farming, food processing, government and education, and professional services prevail. Collectively, these sectors comprise nearly 60% of the local economy. Further, these sectors align well with those identified as influenced by new technologies facilitated by broadband infrastructure. The next several years are expected to bring further growth to the region in these sectors of the economy. Except for Agriculture, the Washington State Employment Department is forecasting solid growth ranging from 0.9% to 3.6% in these sectors.

TABLE 6: FORECASTED AVERAGE ANNUAL EMPLOYMENT GROWTH RATES THROUGH 2019, SW WASHINGTON EMPLOYMENT REGION

NAICS	Sector/Industry Type	AAGR (through 2019)
42, 48, 49	Warehouse & Distribution	2.1%
11	Crop Farming/Agriculture	0%
54, 55, 56	Professional Services	3.6%
311, 312	Food and Beverage Processing	0.9%
92, 61	Government and Education	1.3%

Source: Washington State Employment Security

Other Economic Factors Influencing Economic Demand

Clark College

Clark College recently acquired a site in Ridgefield that will be the future home of the Clark College Boschma Farms campus. The campus will eventually include seven buildings, with the first 70,000-square-foot building beginning construction as early as 2019. The development will anchor a higher education presence in Ridgefield for a generation.

Ridgefield School Bond

Adding to Ridgefield's growing educational demands, in 2017 voters passed a school bond that will include investments of over \$100 Million. A new campus for 5th through 8th graders is planned as a critical element of initial investments. The campus will be located near Ridgefield High School.

PeaceHealth

In its acquisition of SW Washington Medical Center, PeaceHealth absorbed a 75-acre site in Ridgefield near the future Boschma Farms campus. The site was initially slated for a future medical campus. More recent concept plans call for a mix of uses including medical office, research, laboratory, professional services, and supporting commercial retail. When this vision comes to fruition, the PeaceHealth campus will create an immediate employment and health care presence in the community in addition to concentrations already present south of Ridgefield at Salmon Creek.³⁹

³⁸ Minnesota IMPLAN Group (2015)

³⁹ Legacy Salmon Creek, Kaiser Salmon Creek

Abundant Industrial and Commercial Land

In a region where land suitable to accommodate employment growth is increasingly scarce, Ridgefield offers abundant opportunities. Ridgefield offers at least 230 acres of developable employment land within the vicinity of the proposed service area. Major development opportunities include Miller’s Landing, Union Ridge, Discovery Ridge, and Wisdom Ridge.

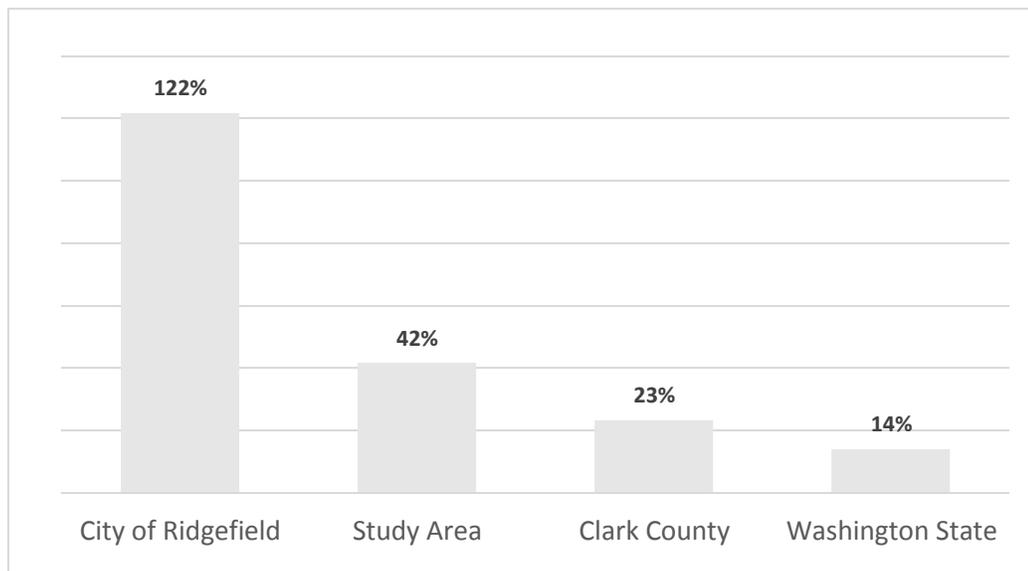
Household Demand

The population in the Ridgefield area has grown rapidly in recent years. As population in the area rises, the area is likely to see increased demand for access to high-capacity broadband networks. To assess population change and potential broadband demand in the area that would be affected by a fiber network, this section refers to the study area delineated in Figure 1 of this report.

Household Growth Forecast in Potential Future Service Area

The population of the City of Ridgefield has more than doubled since 2000, with a 121.8% increase in population - from 2,147 in 2000, to 4,763 in 2010.⁴⁰ The population within the Dark Fiber Network Study Area also grew rapidly during this time, though at a lower rate than the city; the study area’s population increased 41.6% - from 10,333 in 2000, to 13,633 in 2010,⁴¹ with most of the study area’s population growth occurring within the City of Ridgefield. Population within the study area grew at a greater rate between 2000 to 2010 than Clark County as a whole (23.2%) or Washington State (14.1%).

Figure 2: Population Percent Change, 2000-2010



Source: ESRI, U.S. Census Bureau

If past growth trends are an indication, it can be assumed that the City of Ridgefield and the Dark Fiber Network study area will continue to grow at a greater rate than Clark County as a whole. The Washington Office of Financial Management forecasts population growth of nearly 27% for Clark County from 2016 post-census estimates to 2040.⁴² Table 7 below shows Washington State Growth

⁴⁰ US Census Bureau, 2000 and 2010 Estimates.

⁴¹ ESRI Community Profile, derived from US Census Bureau data.

⁴² Office of Financial Management Washington State Growth Management 2012 Medium County Projections.

Management Population Projections for Clark County, and population projections for the study area if the study area grows at the same rate as the County.

TABLE 7: Population Projections				
Area	2016	2020	2030	2040
Clark County	461,010	477,884	536,717	585,137
Study Area	16,743	17,356	19,492	21,250

Using this conservative estimate, it can be assumed that the population of the study area will be at least 21,250 by 2040. However, the actual number will most likely be greater if the City of Ridgefield continues to grow faster than the County.

Household Propensities to Consume Broadband

The Ridgefield study area shows a high propensity for internet and electronics usage. Within the study area, 89.2% of households have access to the internet at home, 88.1% have used the internet in the last 30 days, and 47.4% have used the internet at work in the last 30 days.⁴³ An ESRI Electronics and Internet Market Potential report for the study area shows a high consumption rate, compared to the national average, for a variety of electronic products and internet applications.⁴⁴ A Market Potential Index (MPI) of 100 represents the national average. Households within the study area are likely to purchase electronics products such as computers, televisions, tablets, GPS devices, cameras, wireless routers, software, and home theater entertainment centers at a considerably higher rate than the national average; each of these categories has an MPI of over 120 for the area in consideration. Households in this study area also have an MPI of over 120 for a variety of factors related to high internet consumption; households in the study area are significantly more likely than the national average to use a computer and the internet at work, to have children under 18 using a home computer, to use the internet to make personal and business purchases, to make travel plans, to obtain real estate and financial information, and to track investments. Using the internet to trade and track investments and make business purchases are categories with exceptionally high MPIs (135 and 131, respectively).

These high Market Potential Index numbers indicate that access to reliable broadband is essential to conduct business for about half the population in the study area. Additionally, about 20% of the population has school age children who use a computer at home, and the area as a whole is inclined to use the internet and products requiring internet for a variety of entertainment purposes. As the influence of internet connectivity increases in homes and places of employment across the nation, demand for reliable internet and connected electronic devices can be expected to rise within this study area.

Ridgefield School District Growth

The Ridgefield School District has seen higher than average enrollment increases for the past three years, and enrollment is expected to continue to rise at a comparable rate in the coming years. The Ridgefield School District’s enrollment for the 2016-17 school year was 2,806, a 12.3% increase from the previous year. The 2015-16 school year saw a 7.2% enrollment increase from the previous year, and 2014-15 saw a 6.4% enrollment increase from the previous year. This compares to an average annual enrollment increase of 1.82% over the ten years prior (2004-2014). Enrollment is forecasted to rise at a relatively high

⁴³ Data from ESRI via consumer surveys.

⁴⁴ A Market Potential Index measures the relative likelihood of adults or households in area to exhibit certain consumer behavior or purchasing patterns compared to the U.S. An MPI of 100 represents the national average.

rate over the next four years, with an average annual percent increase of 6.7%, reaching an estimated 3,633 students by the 2020-2021 school year. As the school district grows, demand on broadband networks will increase as a growing number of students become reliant on educational technology applications in schools and homes.

Other Factors Influencing Broadband Demand

Use as an Economic Development Tool

In today's economic environment, maintaining a well-trained and high-quality workforce is an essential economic development asset in the recruitment and retention of companies. To offer this critical human capital, a community must be an attractive place to live. As exemplified in the MPI data in the previous section, Ridgefield's population growth is being driven by younger, marginally more affluent families with high technology demands. In this respect, a continued lack of consumer service will become an increasingly limiting factor in the recruitment of workforce talent.

The presence of broadband infrastructure has also been found to correlate to more prosperous communities. A 2014 study⁴⁵ found a positive correlation between communities with one-gigabyte broadband service and per-capita GDP.

Impact on Real Estate Feasibility

In the context of over 230 acres of employment land available in the community, access to broadband infrastructure has been found to increase the value of real estate, and by extension make development more feasible.⁴⁶ A 2014 study by the University of Colorado Boulder⁴⁷ found that the presence of one-gigabyte fiber optic internet correlated to a 7% premium in real estate values.

Conclusion

The need for high-capacity internet access is growing among a wide variety of industries. Broadband applications are likely to shape the future of healthcare, manufacturing, agriculture, retail, education, government, energy, and small businesses. Because of this, providing access to broadband has become an economic development focus for many municipalities. There are several ways in which a municipality may improve broadband services for their communities. The provision of dark fiber is one promising opportunity many municipalities are exploring as it allows for the fastest transmission speeds.

⁴⁵ Sosa, David. Early Evidence Suggests Gigabit Broadband Drives GDP. Analysis Group Report (2014)

⁴⁶ Clark County lacks observations in the local market to calculate premiums vis-à-vis fiber access.

⁴⁷ Fiber to the Home Council. University of Colorado Boulder (2014)

Case Studies

Case Studies

To illustrate successful implementation of dark fiber infrastructure in rural communities elsewhere in the Pacific Northwest, Mackenzie developed three case studies summarizing network performance, achievable rates and adoption levels (where available) and the potential impact on the local economy. These case studies were derived from desktop research and interviews with Port directors and/or staff among surveyed communities. Interviews for this report included:

- Joe Poire, Executive Director, Port of Whitman County
- Jaynie Bentz, Assistant Manager, Port of Lewiston
- Patsy Martin, Executive Director, Port of Skagit

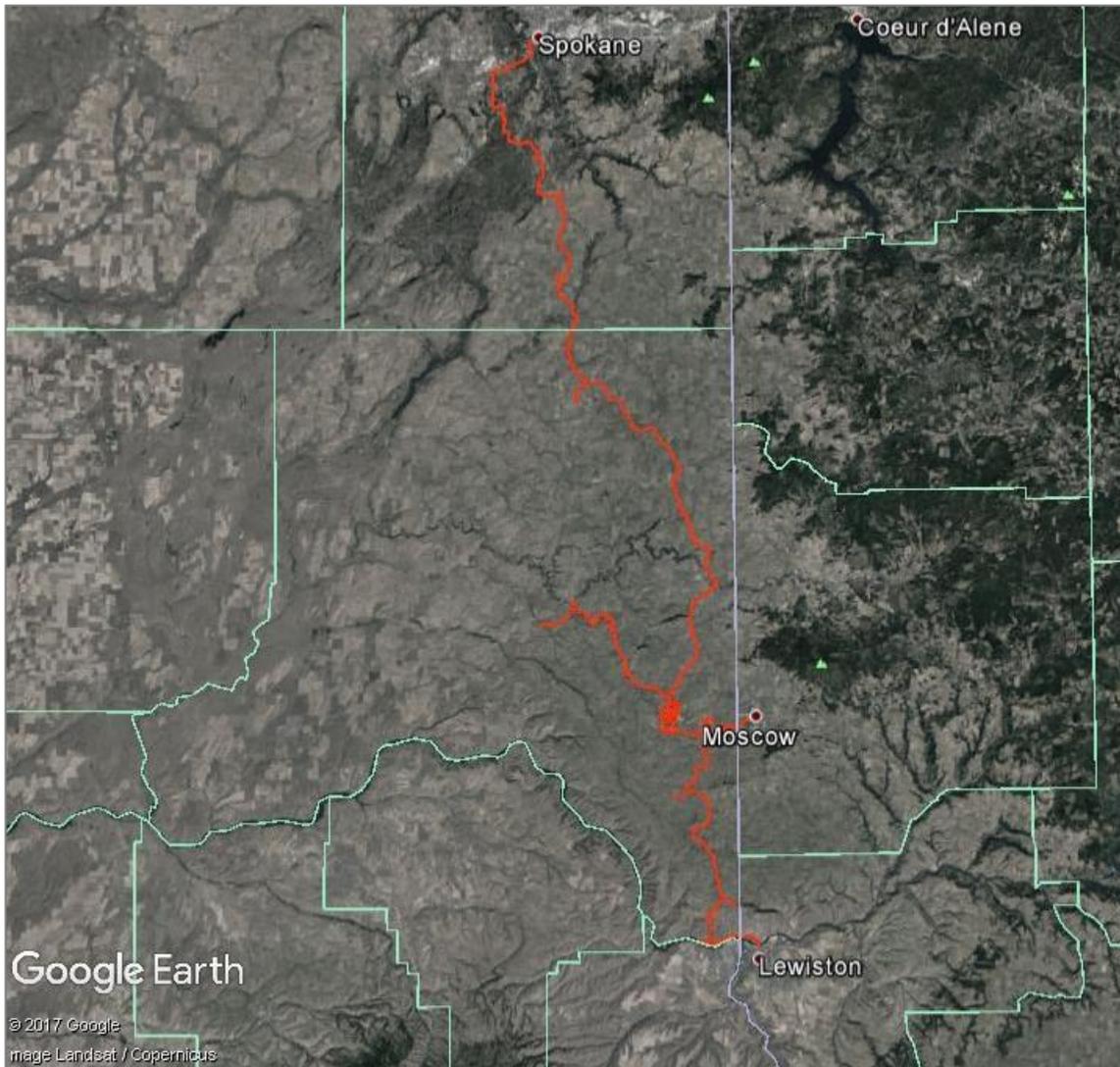
At the direction of the Port of Ridgefield and the BergerABAM project team, representatives from service providers were not contacted as a part of this effort.

Port of Whitman

The Port of Whitman has been installing Dark Fiber infrastructure for over 17 years. Today's infrastructure is an expansive network covering hundreds of miles from Spokane to Lewiston, connecting major institutions (Washington State University, University of Idaho), hospitals, businesses, and industrial parks.

The original network was built with internal capital from the Port, which saw a business case for its investment. The Port's network recently received a \$14 million upgrade. The greatest share of this infusion was funded through the Broadband Technology Opportunities Program (BTOP), which was part of the American Recovery and Reinvestment Act to jump start the economy following the Great Recession. Roughly \$2 million in investment was directly from the Port. Before the improvement, the Port of Whitman County had a fiber-optic line that connected Moscow, Pullman, Colfax and St. John, about 25 miles northwest of Colfax. The recent investment added service from Clarkston to Spokane. The Port adds new infrastructure and service on an annual basis, with a standing budget allocation of \$600,000 per year for new service drops.

Map of Service Area



Providers and Lease Rates

The Port of Whitman has 14 different service providers using its fiber optic network. Its network has attracted large Regional Bells (Comcast, CenturyLink, Verizon) as well as small local providers (First Step Internet, Spectrum, Cable One). In Washington State, Ports are only allowed to lease to licensed providers (RCW 53.08.370), so the Port of Whitman does not lease directly to institutions or firms. The Port's fiber backbone has providers offering ultra-high-speed internet to businesses and institutions, but over 75% of the traffic on the network is backhaul for service providers, including Verizon wireless 4G service. This suggests that a significant share of broadband traffic is indirectly utilizing the Port's infrastructure.

The Port leases its open access network to internet service providers on a per-mile basis. The port charges \$105 per-mile for short distance connections less than 100 miles. This is generally limited to connections linking the backbone to the community. For long-haul service greater than 100 miles, the Port charges ISP's \$15.84 per-mile per-strand.

Because the Port of Whitman does not provide user service and the number of providers and service levels are exceedingly broad, the Port does not track household or business broadband rates. However,

the Port reported that local lease rates are competitive with urban service rates. The Port has not yet entered the Fiber to the Premises (FTTP) market but plans to in the future.

Because the Port of Whitman does not lease directly to consumers, it has little data on the number or share of businesses or household absorption rates for broadband service. However, over 300 business accounts are known to utilize high-speed service on the network through ISPs. In other words, providers would have better insight into adoption rates, but are unlikely to disclose that information. However, for new construction and tenanting on the margin, the Port of Whitman is observing 100% adoption in its business park.

Impact on the Local Economy

In addition to major hospitals and medical facilities, two major educational institutions (Washington State University, University of Idaho) are linked through the Port's network. The impact of these institutions on the regional economy is profound, specifically the technology transfer of institutional research and technologies for commercial applications. Historically, the region has struggled to keep tech transfer businesses locally as they begin to scale. This has changed somewhat in recent years, with an increasing number of firms being retained locally. While the Port reports that its Fiber Optic infrastructure has yet to materialize as an influential recruitment tool, the impact on retention has been realized.

Because the Port's infrastructure has been in place for many years, it is difficult to assess if its presence has had a measurable impact on innovative activities as measured by Patents and Technology Transfer Grants Funding⁴⁸. Over the last 15 years, companies in communities served by the Port's infrastructure have received 55 STTR⁴⁹ grants and nearly 500 patents⁵⁰.

⁴⁸ Countless government, private, and non-profit grant programs exist. This analysis considers the Small Business Administration's Small Business Technology Transfer (STTR) program that provides federal funding for innovation research and development. Participating agencies include the Department of Defense, Department of Energy, Department of Health and Human Services, the National Aeronautics and Space Administration (NASA), and the National Science Foundation.

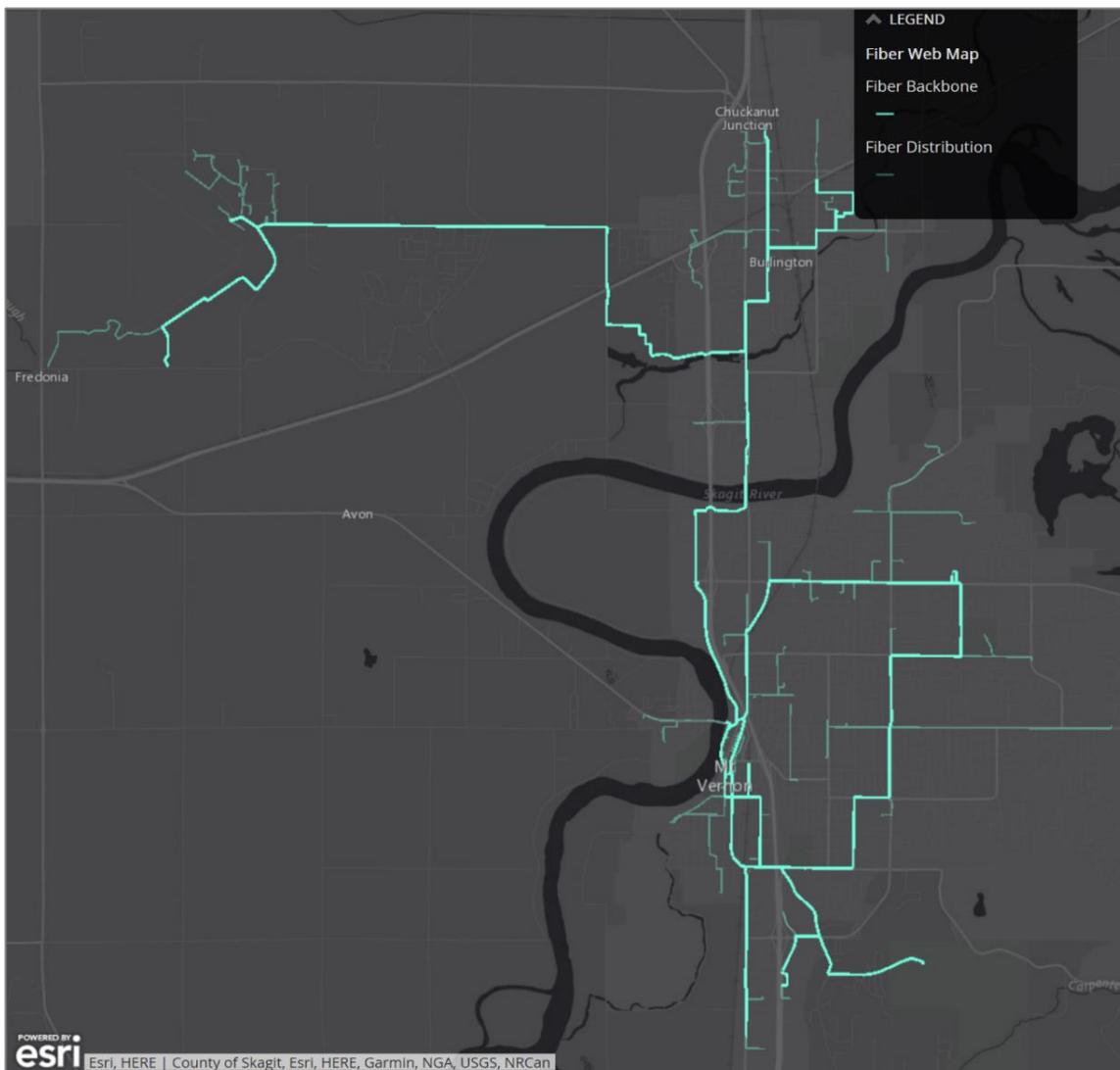
⁴⁹ Small Business Administration STTR Program (<https://www.sbir.gov/sbirsearch/award/all>)

⁵⁰ U.S. Patent and Trade Office (<https://www.uspto.gov/>)

Port of Skagit

The City of Mount Vernon got into the fiber business as far back as 1995 in an effort that began as a strategy to connect municipal facilities. The city has added service incrementally over time to serve other parts of the community. The Port of Skagit became a partner in 2002. This decision was driven explicitly by businesses engaging in the Port for a solution to their growing and unmet data needs. Many businesses in the Port's service area were on dial-up service at the time. After engaging service providers for a solution (to little interest), the Port of Skagit engaged the City of Mount Vernon in a partnership to provide a higher level of service. Through these efforts, the Skagit Regional Airport and the Port's Bayview Business Park were connected with fiber infrastructure in 2008. The Port's current open-access model charges subscribers a one-time fee to connect service (the Port's tenants have had fees historically waived). Under the Port/City's "semi-lit" model, ISPs leasing on the network pay a percentage of their fees to the Port. Funding for the existing multijurisdictional network came from a range of partners, including; Port of Skagit, Skagit County Mount Vernon School District, Washington Community Economic Revitalization Board (CERB), City of Mount Vernon, City of Burlington, 0.09 Rural Economic Development, among others.

Map of Service Area



Currently, the Port of Skagit in coordination with regional partners is planning an expanded six segment dark fiber network to serve communities countywide. The cost of the network is expected to approach roughly \$2.8 million with roughly \$18,375 in annual operating costs. The Port has received roughly \$1.2 million in funding for the project.

Providers and Lease Rates

The Port of Skagit counts seven providers on its existing network. They are almost exclusively small providers, including; PogoZone, Allixo, Noel Communications, and CSS Communications. on the existing “semi-lit” system, the Port receives connection fees in addition to a 15% share of ISP revenue for service on its network. The Port of Skagit reported that their model has exhibited a 15-year ROI. For the expanded dark fiber network currently planned, the Port and its partners are modeling revenue forecasts using a \$50 per stand mile assumption.

Commercial broadband service offered by ISPs range from 50mbps (\$99 per month on average) to 1,000mbps (only available by custom quote). Up to 100mbps was available for \$199 per month in this market.

With collaboration from public and private sector partners, the network’s fiber has been extended to 107 public sector establishments (libraries, schools, utilities, etc.) and at least 125 businesses throughout the county, mostly in Mount Vernon and Burlington. While countywide business absorption rates remain difficult to track without the participation of service providers, the Port of Skagit offered a useful example from its experience at the Port’s Bayview Business Park. When first implemented, one-third of existing tenants linked to the network immediately, with another on-third adding service over the subsequent five-years.

Impact on the Local Economy

With the Port initially providing fiber infrastructure in direct response to business needs, the impact on business retention is clearly linked. Legacy companies Team Corporation (vibration testing for high-tech and aerospace) and Hexcel (advanced materials for aerospace) have a global presence and were initial drivers behind the need. Both companies remain in Skagit County today. The impact of fiber optic infrastructure on innovation and economic conditions in Skagit County is further exemplified by two examples.

Medical Information Network-North Sound (MIN-NS)

MIN-NS provides healthcare information technology services for communities from Whidbey Island to Concrete, Stanwood to Orcas Island. Based in Mount Vernon, Washington, MIN-NS was formally founded in 2010 as a 501(c)3 non-profit by public hospital districts in the area. MIN-NS acts as an independent and trusted resource for the community's healthcare data. The organization's Health Information Exchanges (HIEs) provide secure, HIPAA compliant file sharing services that allow for improved communication and care coordination across organizational boundaries. MIN-NS enables data sharing through its secure connections with statewide HIEs and local Skilled Nursing Facilities, Area Agency on Aging, EMS, therapists, home health agencies, and Hospice. In addition to HIE services, MIN-NS provides a variety of network and professional services to support patient care teams across the region, including: medical extranet, ISP broadband services to provide secure internet access for healthcare organizations, IT consulting, account management and training, and help desk support services. As MIN-NS has evolved they have also become a USAC service provider, a credentialed government contractor and a participant in rural connectivity grants.

Skagit Valley Innovation Partnership Zone

The Skagit Valley has emerged as a regional leader in companies using new and advanced technologies for value-added agriculture. This industry cluster has organized around the region's natural resource (high-value agricultural land), legacy businesses, and educational institutions, including Washington State University and Skagit Valley College. To further development of this cluster, local and regional leaders worked to establish an Innovation Partnership Zone (IPZ) in Skagit County around the industry. An IPZ as defined by the Washington Department of Commerce is:

"An IPZ is an economic development partnership that involves at least three of the following: educational institutions, research laboratories, public economic development organizations, local governments, chambers of commerce, private companies, and workforce training organizations. These IPZs target existing or emerging industry sectors that are of statewide importance, and each represents a specific geographic area."⁵¹

The Skagit Valley IPZ is dedicated to providing innovation in value-added agriculture through research and technology. Sponsor partners include Washington State University, local government (Port of Skagit, Skagit County, City of Mount Vernon, City of Burlington), and the private sector (Skagit Valley Malting, Knutzen Farms), among others. Among the core components of the IPZ business plan is to provide infrastructure to promote product development and innovation, specifically:

"An infrastructure element important to the success of this collaborative venture is the ability to easily connect to the digital world. Led by the City of Mount Vernon, Skagit County offers high speed, broadband fiber optic internet connectivity. This fiber optic network makes it possible for Skagit County researchers, growers, value-added producers and educators to easily connect locally and globally with peers, partners and prospective customers."⁵²

The impact on the Port's Bayview Business Park has been significant. Specific outcomes have included:

- Skagit Valley Malting developed a permeant state of the art live grain malting facility in coordination with Washington State University and the Port of Skagit.
- The Washington State University Bread Lab moved into a 12,000-square foot facility at the park. The project directly created and retained over 75 jobs.
- Michigan based Gielow Pickles expanded into a 36,000 square processing facility.
- The Port of Skagit is developing an new publicly owned flour mill.
- Chuckanut Brewing is developing an 8,000 square foot brewery.

In addition of the creation and success around the IPZ, innovative activity as measured by patents and federal research grants has been strong in Skagit County as infrastructure has expanded (including fiber infrastructure). Between 2000 and 2015 we discovered 184 patents issued and 29 STTR research grants received. Patents issued were 55% higher over the last five years compared to the average over the previous decade.

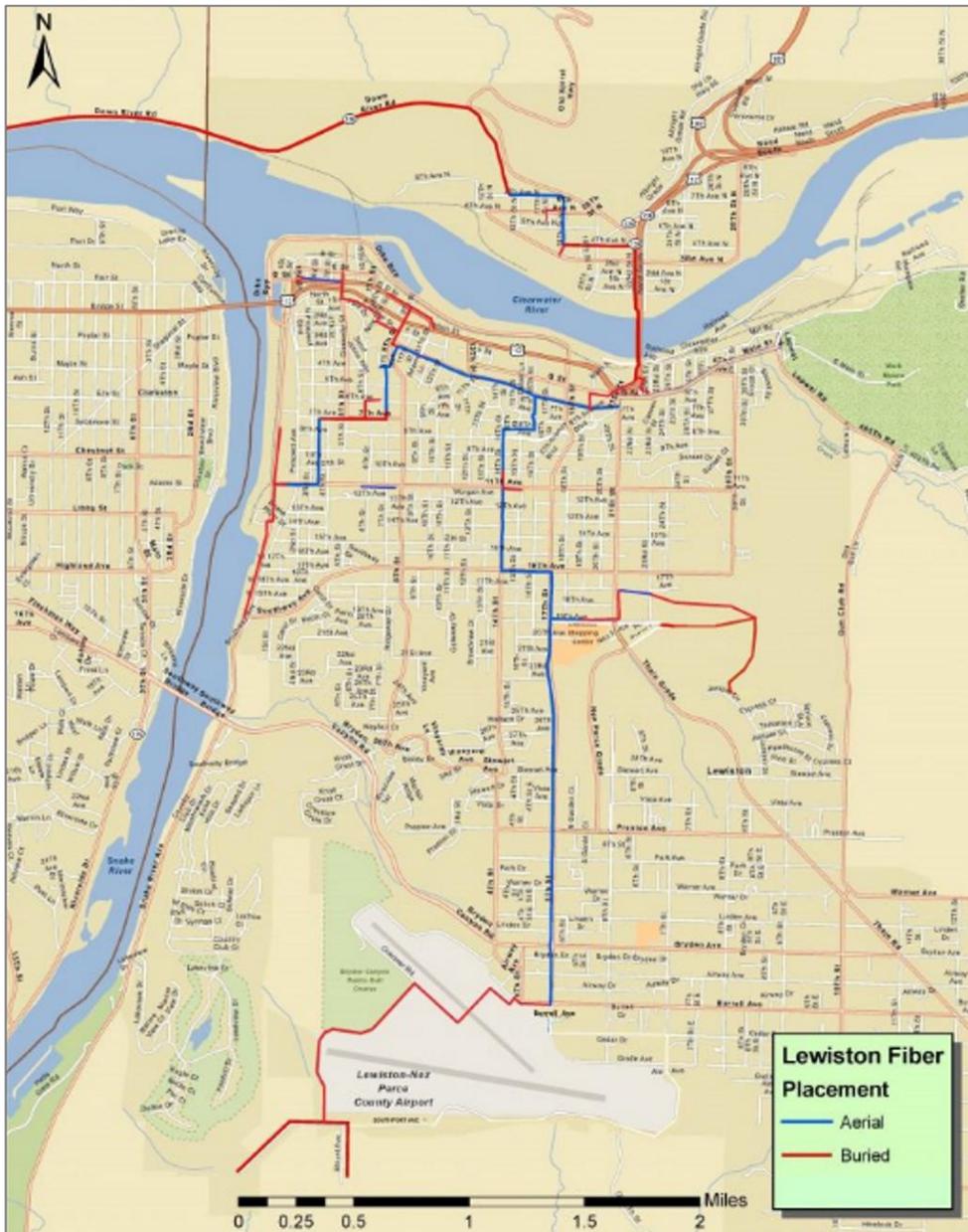
⁵¹ Washington State Department of Commerce. IPZ Program, 2016 Biannual Report (December 2016)

⁵² <http://choosewashingtonstate.com/wp-content/uploads/2015/12/IPZ-Skagit-Valley-Business-Plan.pdf>

Port of Lewiston

The Port of Lewiston's entry into the Dark Fiber market is relatively recent, with early conversations beginning (in coordination with the Port of Whitman) in 2014. The first phase of construction was completed in 2016. A second phase is currently under construction and Phase III is being planned for 2018.

Map of Service Area



The Port of Lewiston has a special tax allocation for economic development infrastructure projects. This source totals roughly \$400,000 per year. An additional \$200,000 to \$300,000 is appropriated by the board for economic development annually. A portion of these funds are being allocated for the Port's fiber optic infrastructure construction.

Providers and Lease Rates

The Port of Lewiston currently has five service providers on its network with a sixth contract pending (undisclosed). Lewiston's providers are generally small scale local providers. In the state of Idaho, Ports can also direct lease to institutions who may light fiber with their own equipment. Lewis & Clark State College (LCSC) was among the first contracts on the network. Current providers include:

- [Lewis & Clark State College](#)
- [First Step Internet](#)
- [Noel Communications](#)
- [NoaNet](#)
- [Idaho Regional Optic Network \(IRON\)](#)

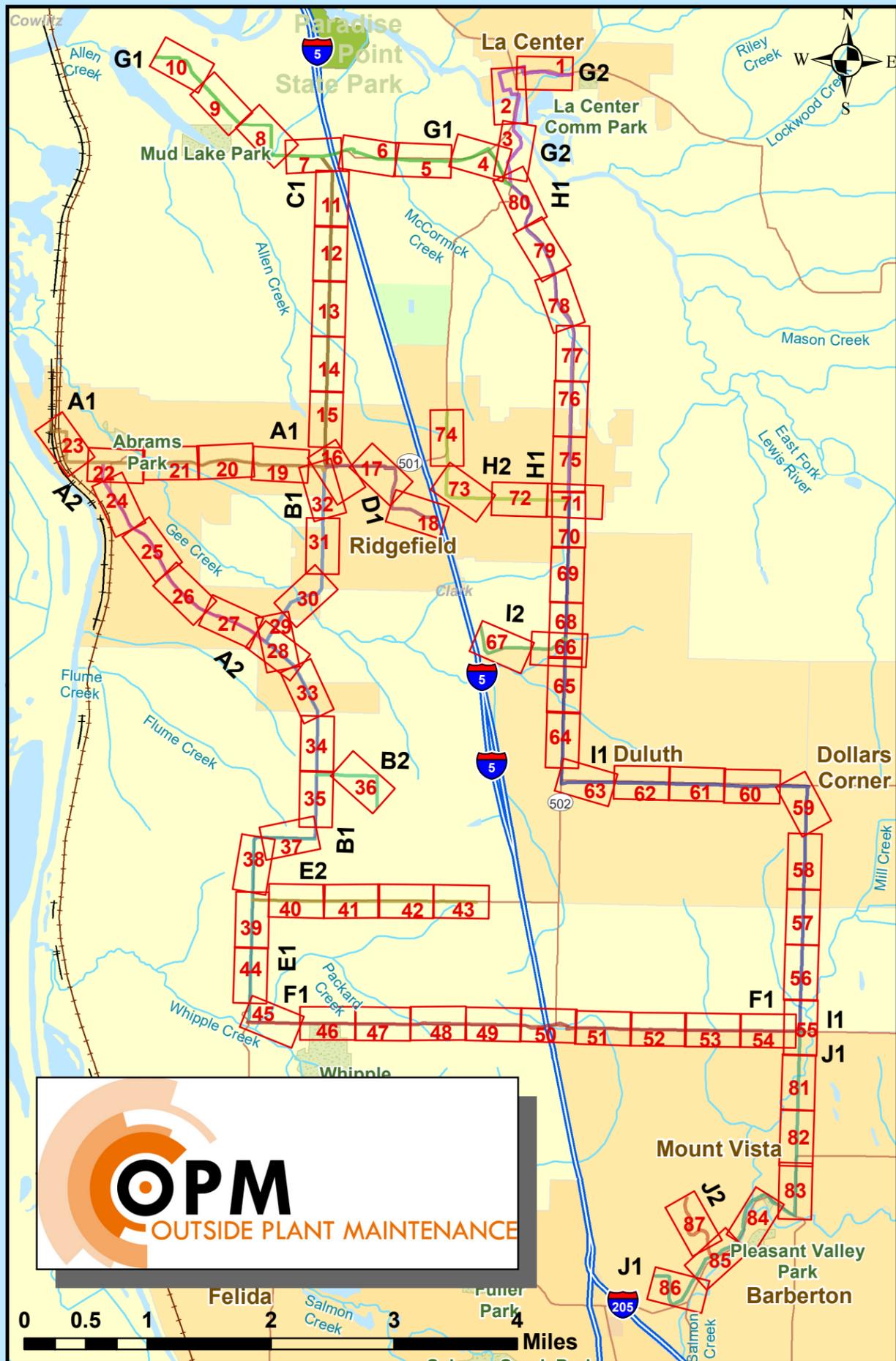
The Port of Lewiston's pricing model for dark fiber is an open access rate of \$180 per strand-mile per month. The Port had initially explored the common \$0.02 per-foot per-strand model but it was not feasible given its community based short-line network as well as the orientation of the community in relation to hubs. Like other communities, rates for high-speed (1GB+) service is quoted on an individual basis based on capacity, strands, term, and cost of connection/service.

Impact on the Local Economy

With service only being offered in the community since 2016, the impact of fiber optic service on the local economy has not had sufficient time to develop. Many of Lewiston's largest employers have connected to the network including the School District, LCSC, St. Joseph Medical Center, Schweitzer Electronic Labs (SEL). SEL recently doubled down on its manufacturing operations at the Business and Technology Park. At the Port's Southport Industrial Park, major employers including ATK Sporting (formally Blount). As a recruitment tool, the Port reports that fiber optic infrastructure is a standard request on location Requests for Information (RFIs).

The emergence of fiber optic infrastructure has further contributed to the prospective redevelopment of Downtown Lewiston. A single investor recently purchased 13 downtown properties with the purpose of redevelopment and repositioning. This investment group was included in the planning an advocacy for fiber connectivity through Downtown.

Appendix B: Map Book



LEGEND ALL PAGES

- Stationing
- Initial fiber Placement**
 - Aerial
 - Buried
- Utility Poles**
 - Distribution Pole
 - 115KV Pole
 - Secondary Pole
 - Lighting Pole
 - Guy-Stub
- Roads**
- Railroad**
- Tax Lots**
- Right of Way**
- Encumbrances**
- School Locations**
- School Parcels**
- Parks**
- Water**

Proposed Port of Ridgefield Fiber Outside Plant Maintenance

Document Conventions:

Stationing interval: 500 ft
 North orientation rotates to page alignment
 Pages overlap to maintain scale
 Distance measurements are Planar

Build Summary:

Aerial 201,614 ft.
 Buried 21,058 ft.
 Intersected Poles 996

Map Projection All Pages:

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 False_Northing: 0.0
 Central_Meridian: -120.5
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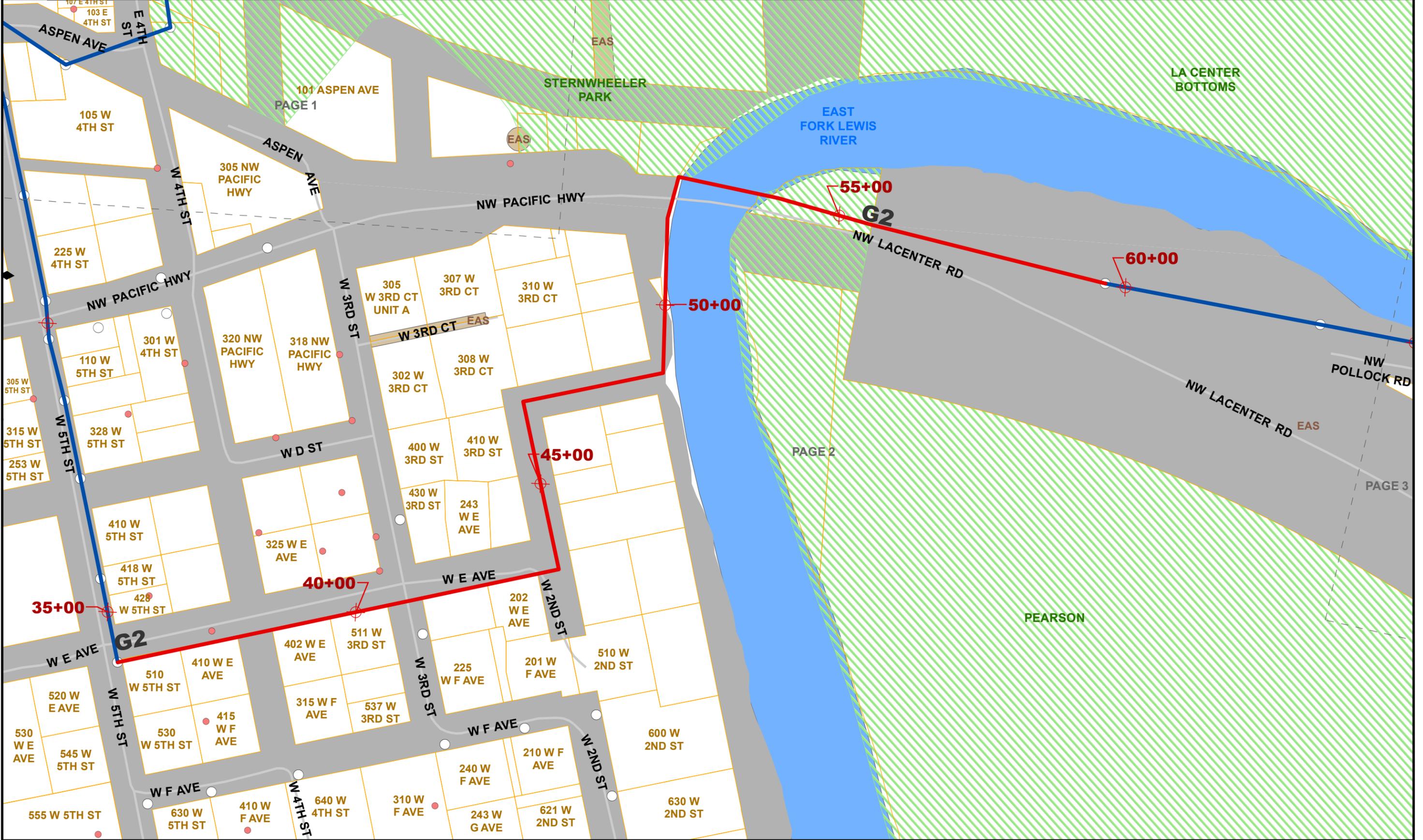
Fiber Look-Up Page Index

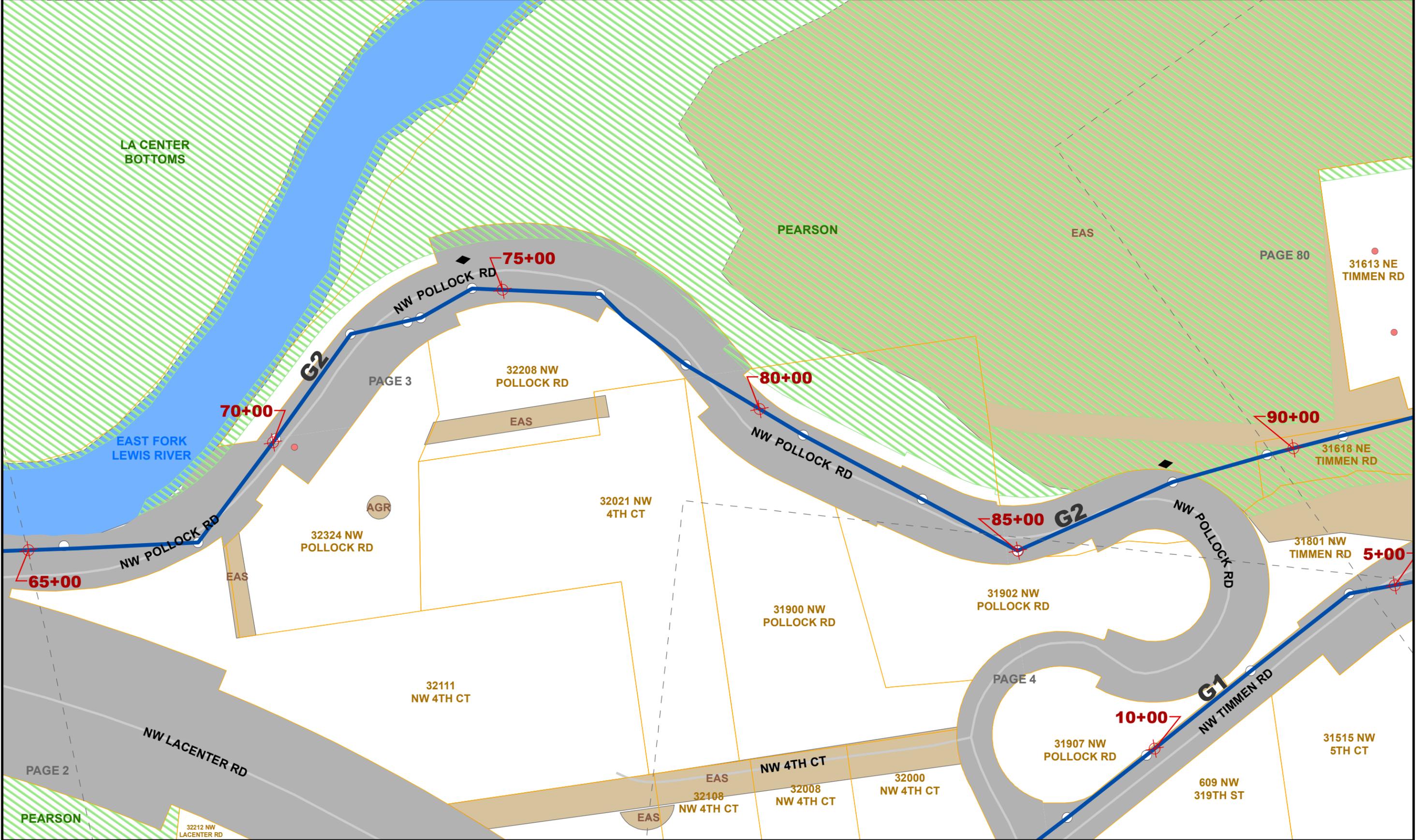
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A2	22, 24-28	11,011 ft
B1	29-37	17,827 ft
B2	35-36	3,881 ft
C1	7 11-16	13,781 ft
D1	16-18	6,926 ft
E1	37-39	10,455 ft
E2	39-43	9,577 ft
F1	45-55	24,029 ft
G1	80 4-10	19,089 ft
G2	80 1-3	9,461 ft
H1	70-80	14,563 ft
H2	71-74	8,897 ft
I1	55-65 68-70	33,228 ft
I2	66-67	4,738 ft
J1	55, 81-86	17,922 ft
J2	85, 87	3,513 ft

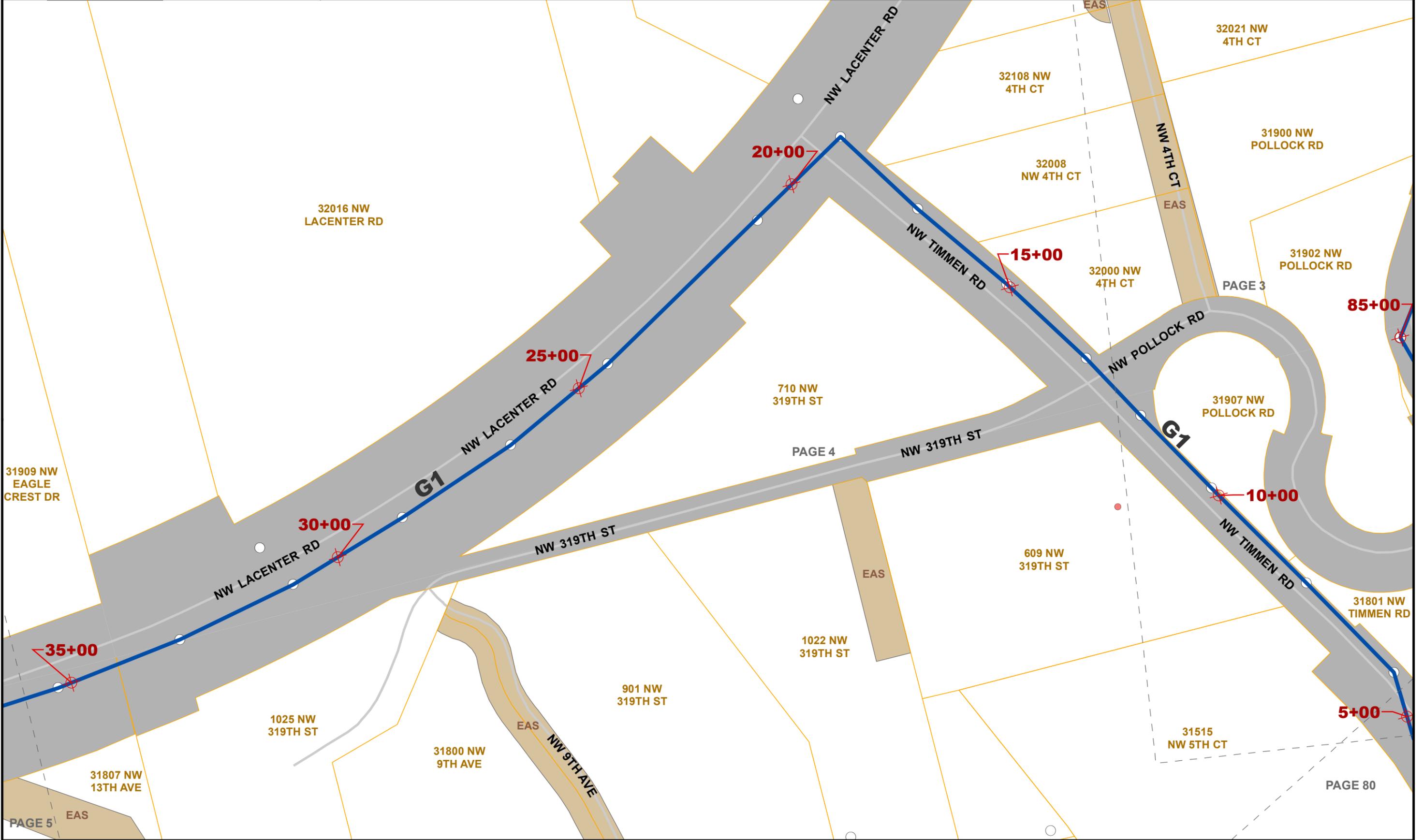
Fiber Junction Look-UP

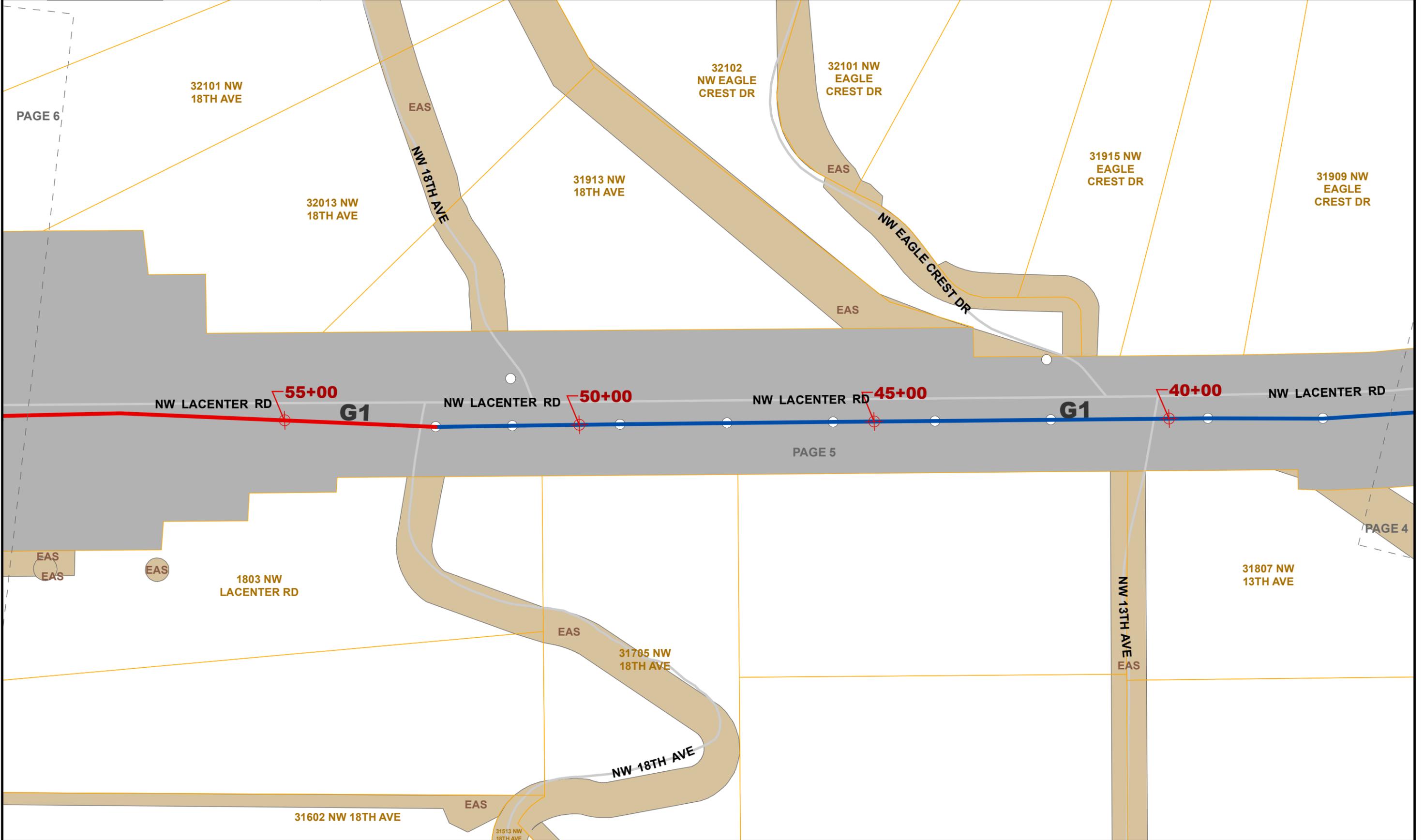
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A2, B1	29
B1, B2	35
B1, E1	37
C1, G1	7
E1, F1	45
F1, I1, J1	55
I1, I2	66
I1, H1, H2	71
G1, G2, H1	80
J1, J2	85

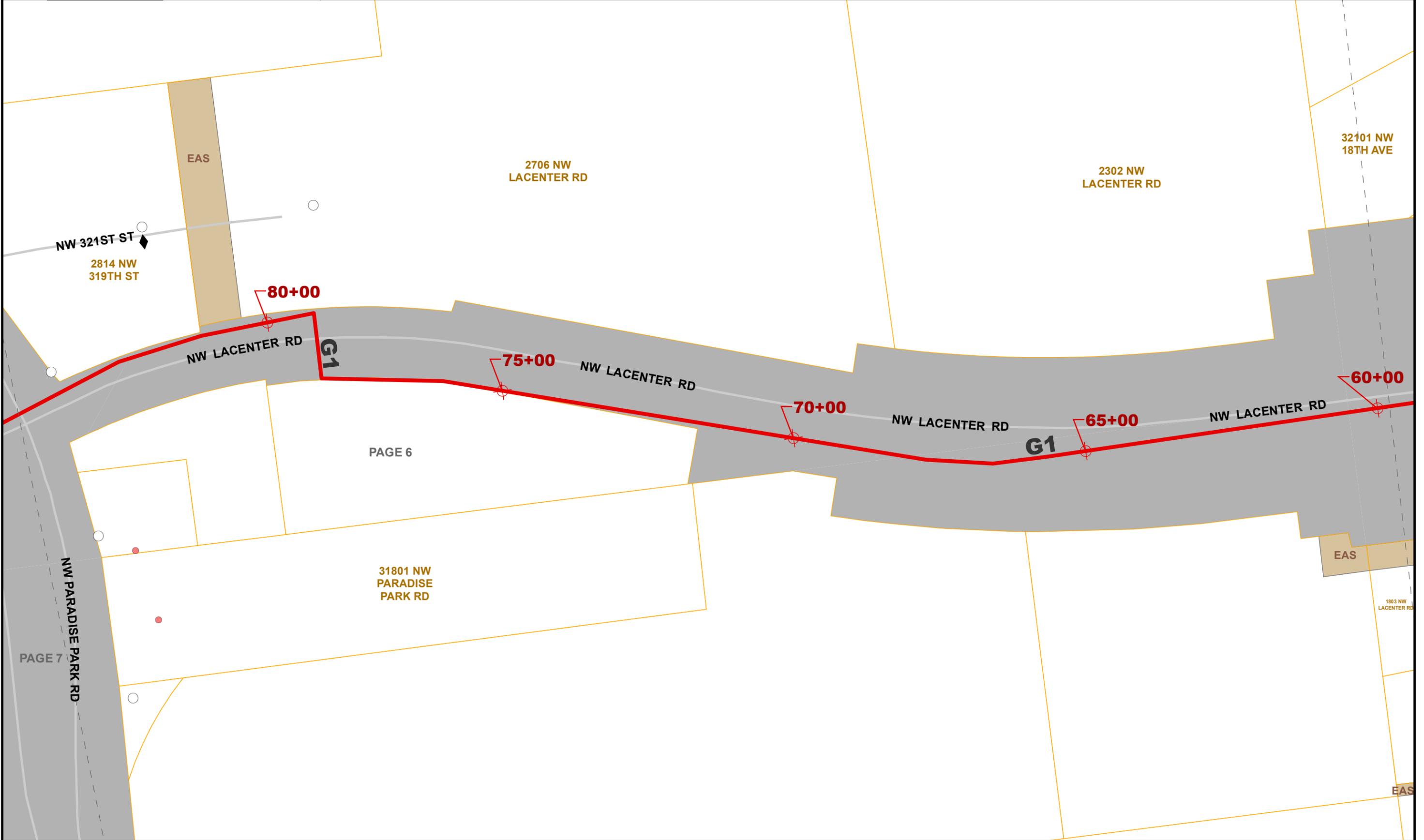


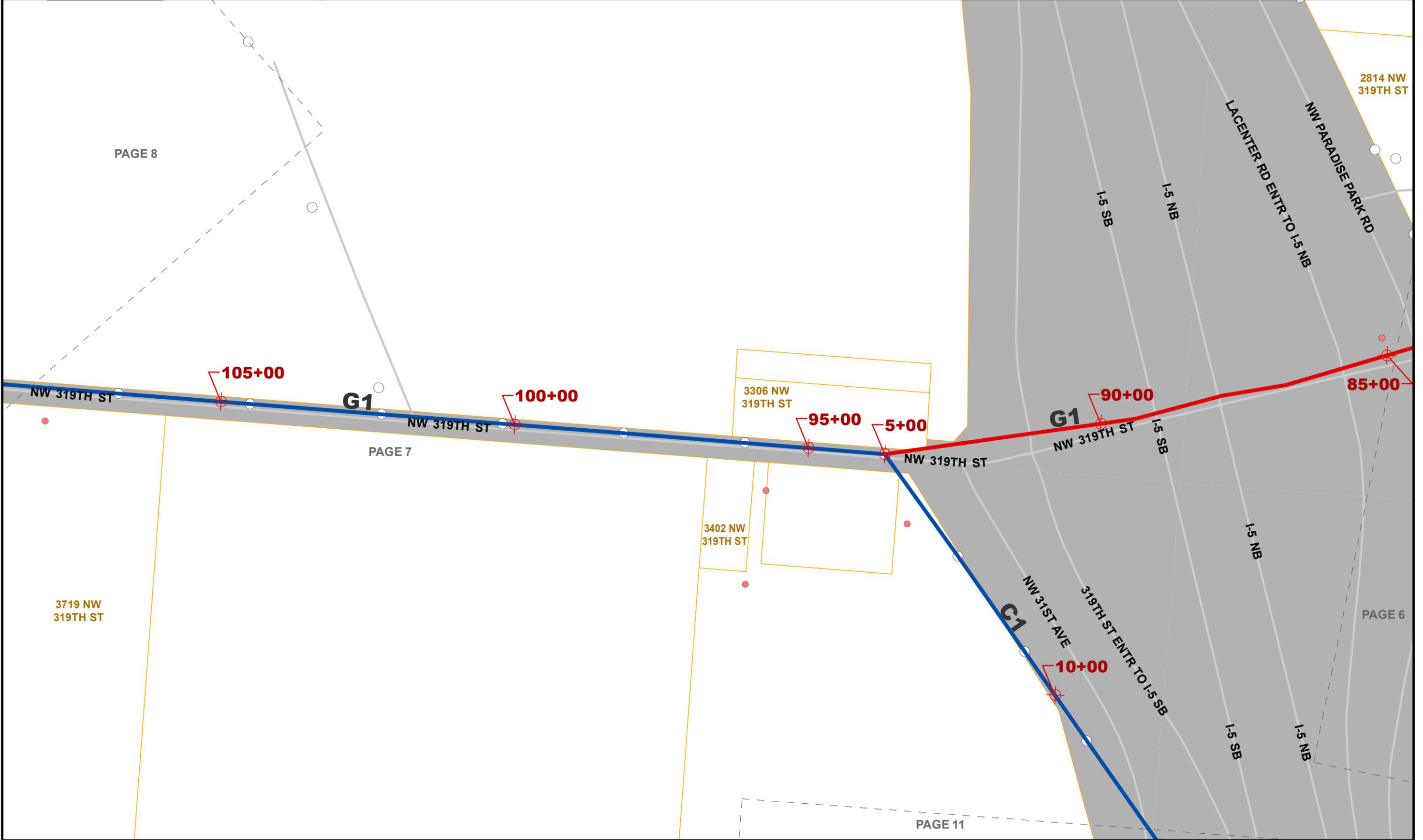


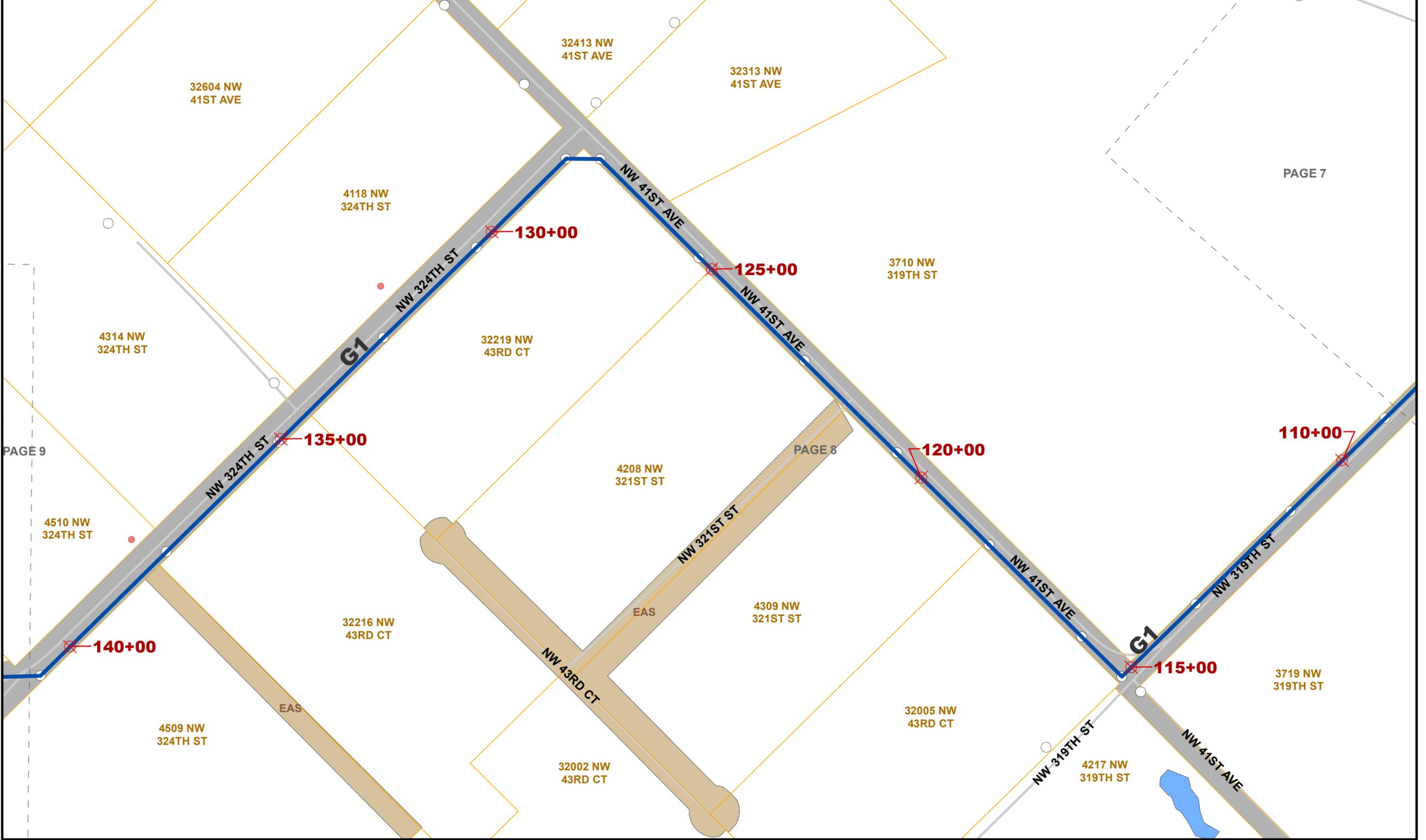




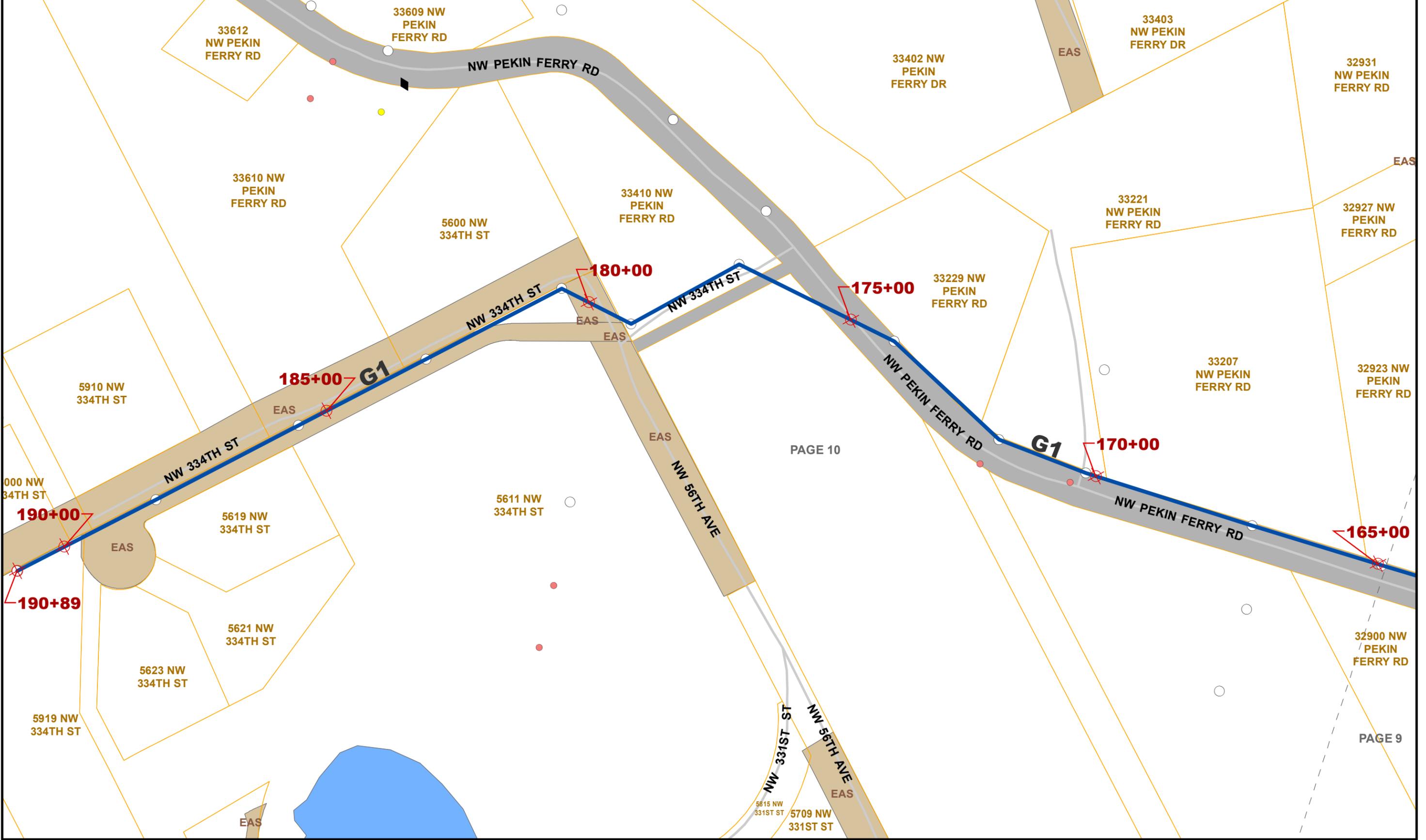


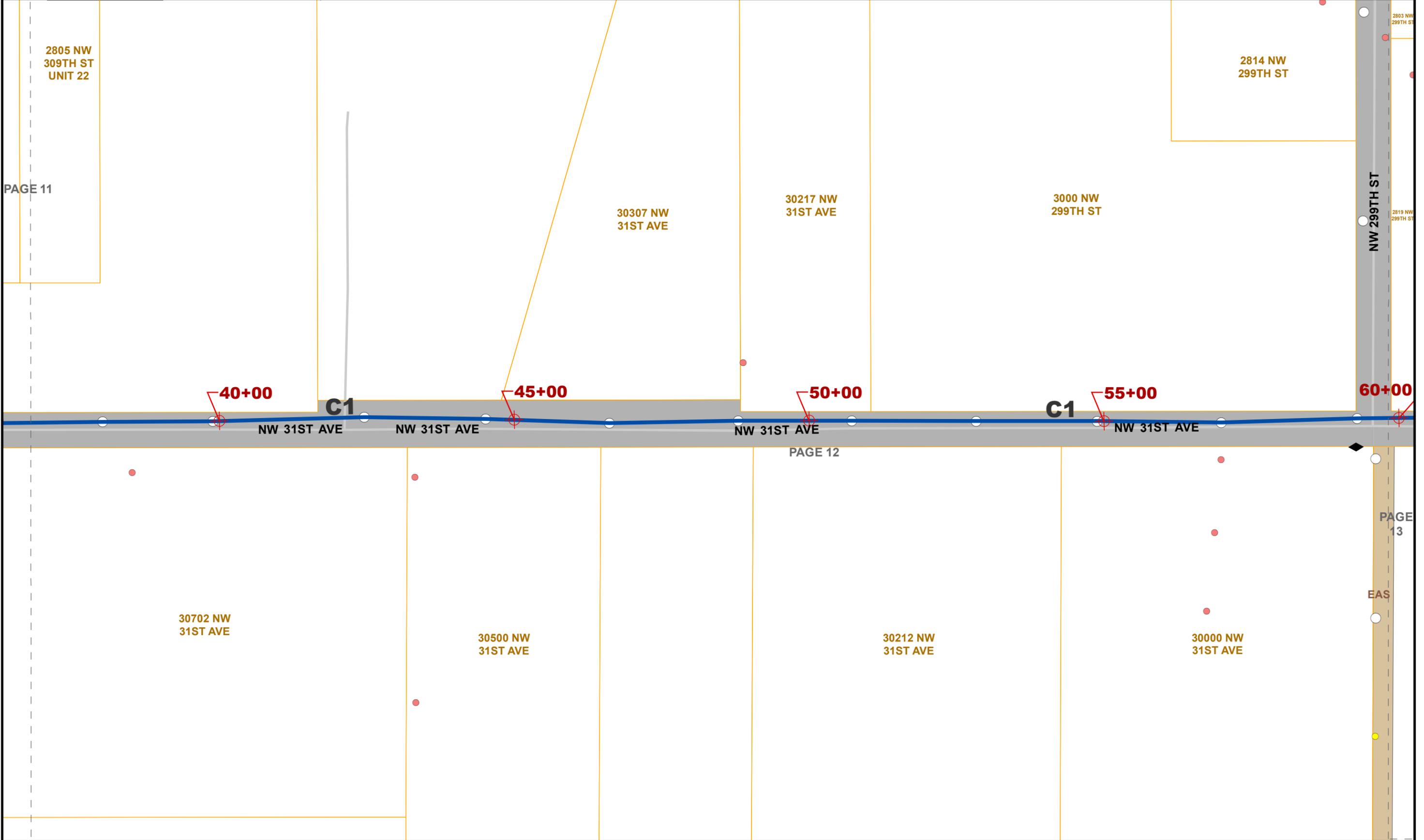














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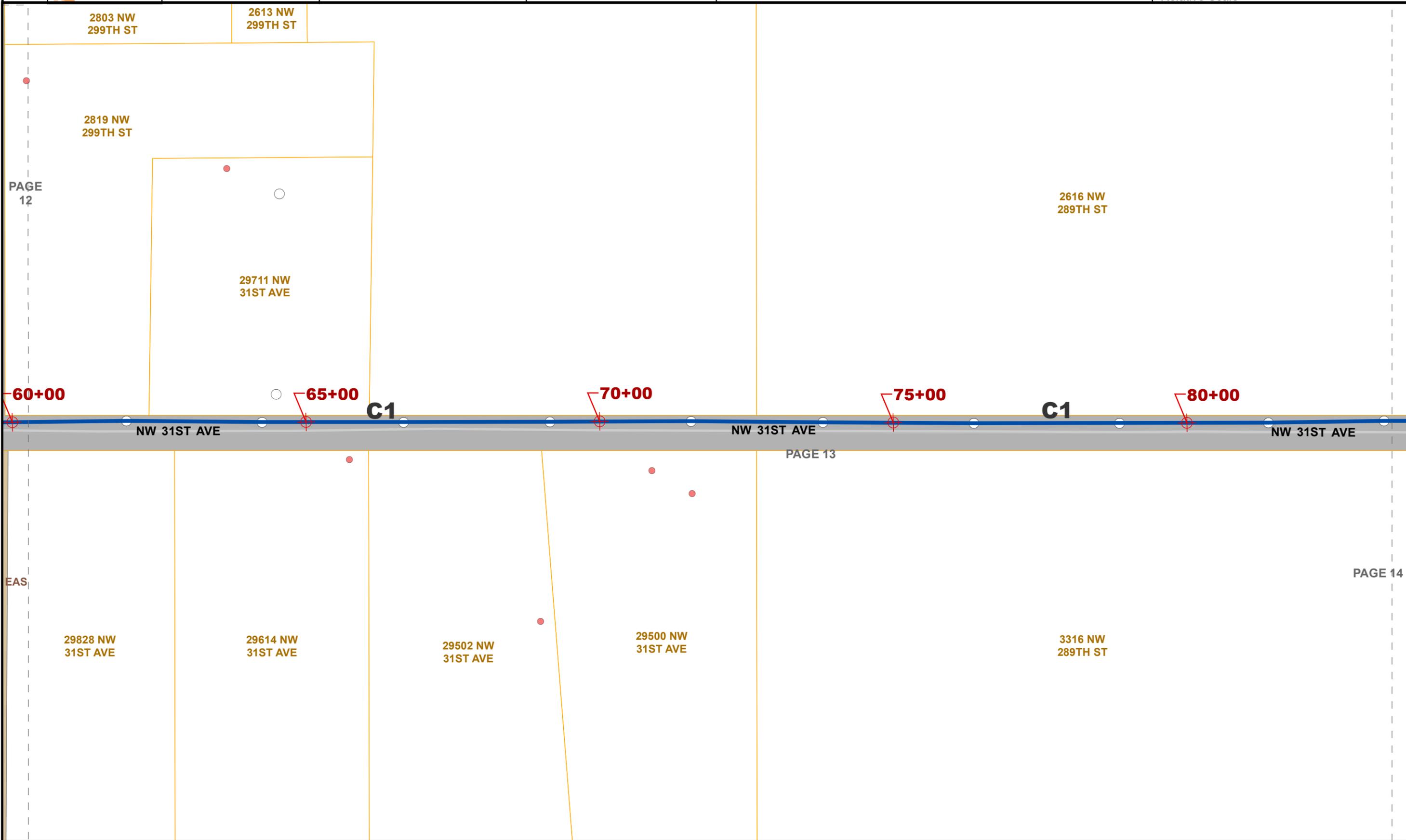
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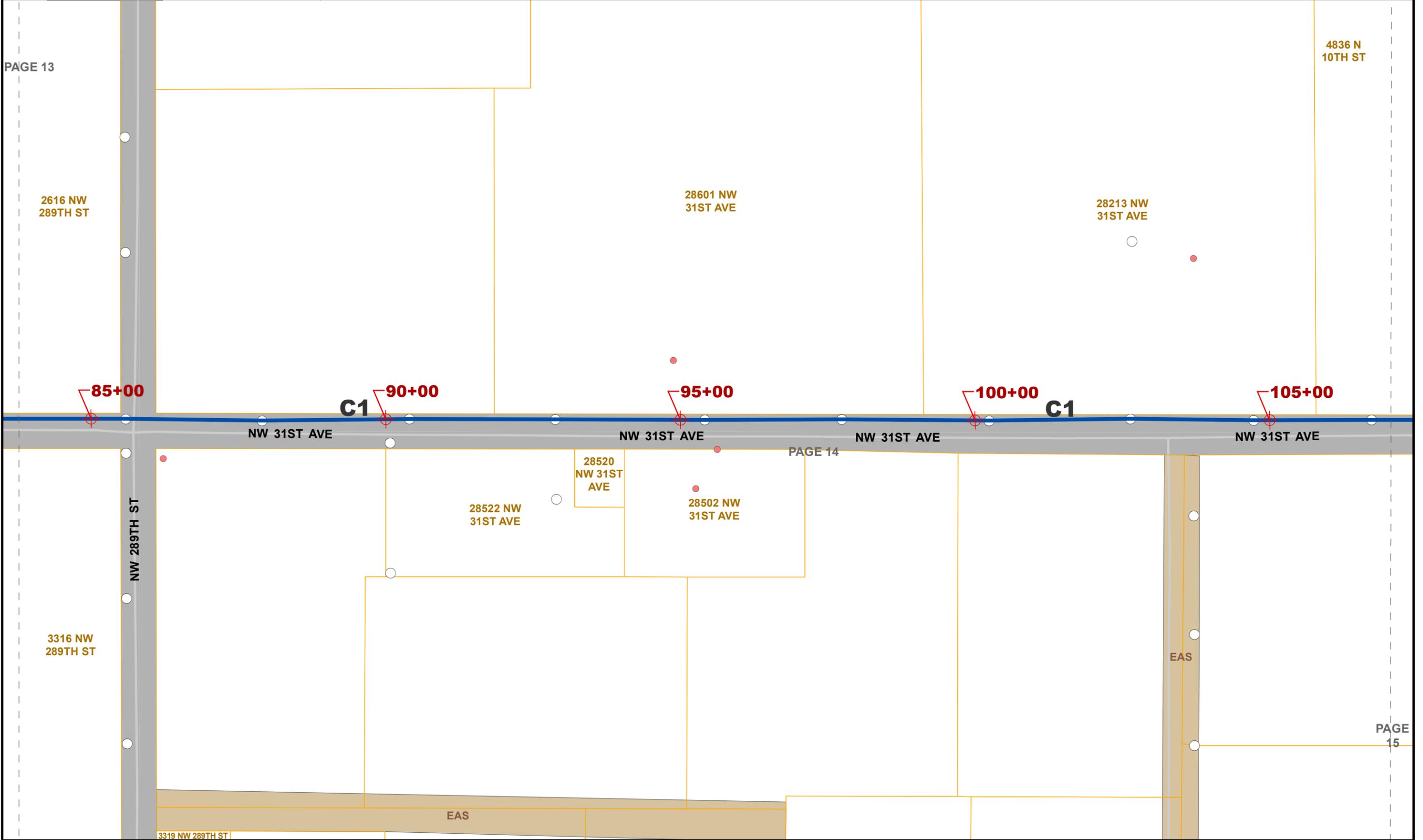
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 Revision: Date: 6/14/2016

Page 13 of 87
 Total Fiber: 222,672 ft

State WA County CLARK
 Poles Intersected: 996

Absolute Scale **1:1,800**
 Relative Scale **1 inch = 150 feet**







— Aerial ⚓ Stationing
 — Buried █ ROW

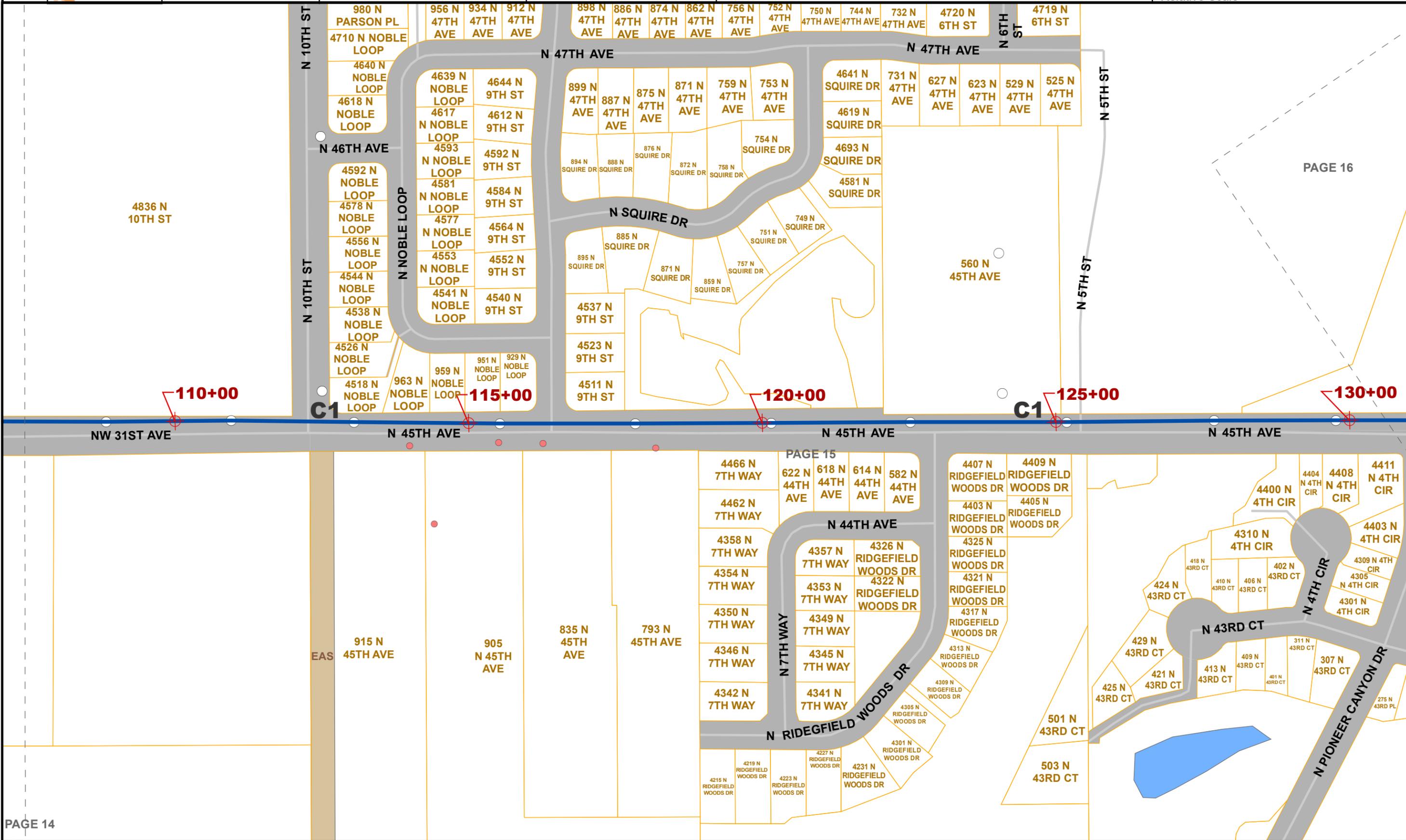
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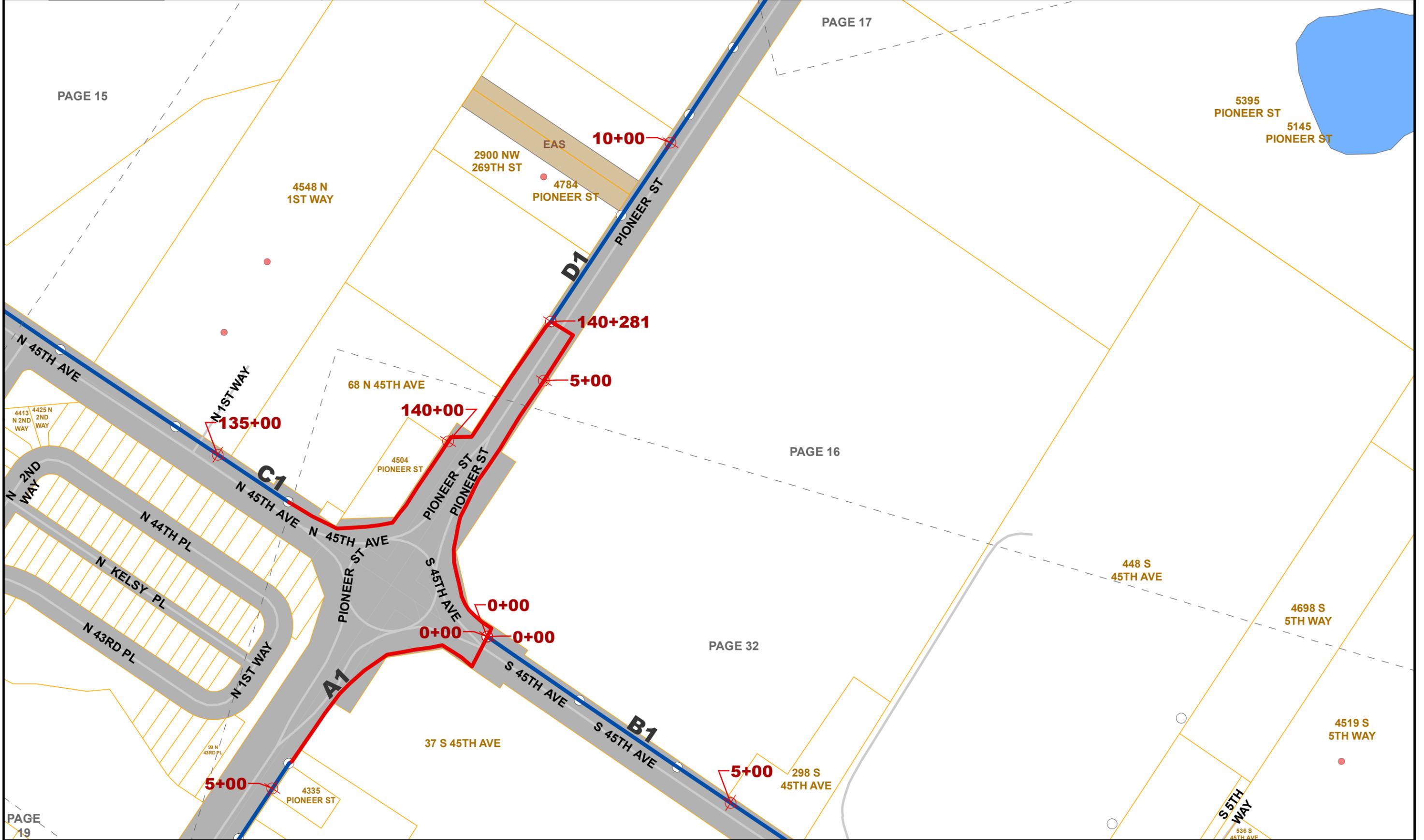
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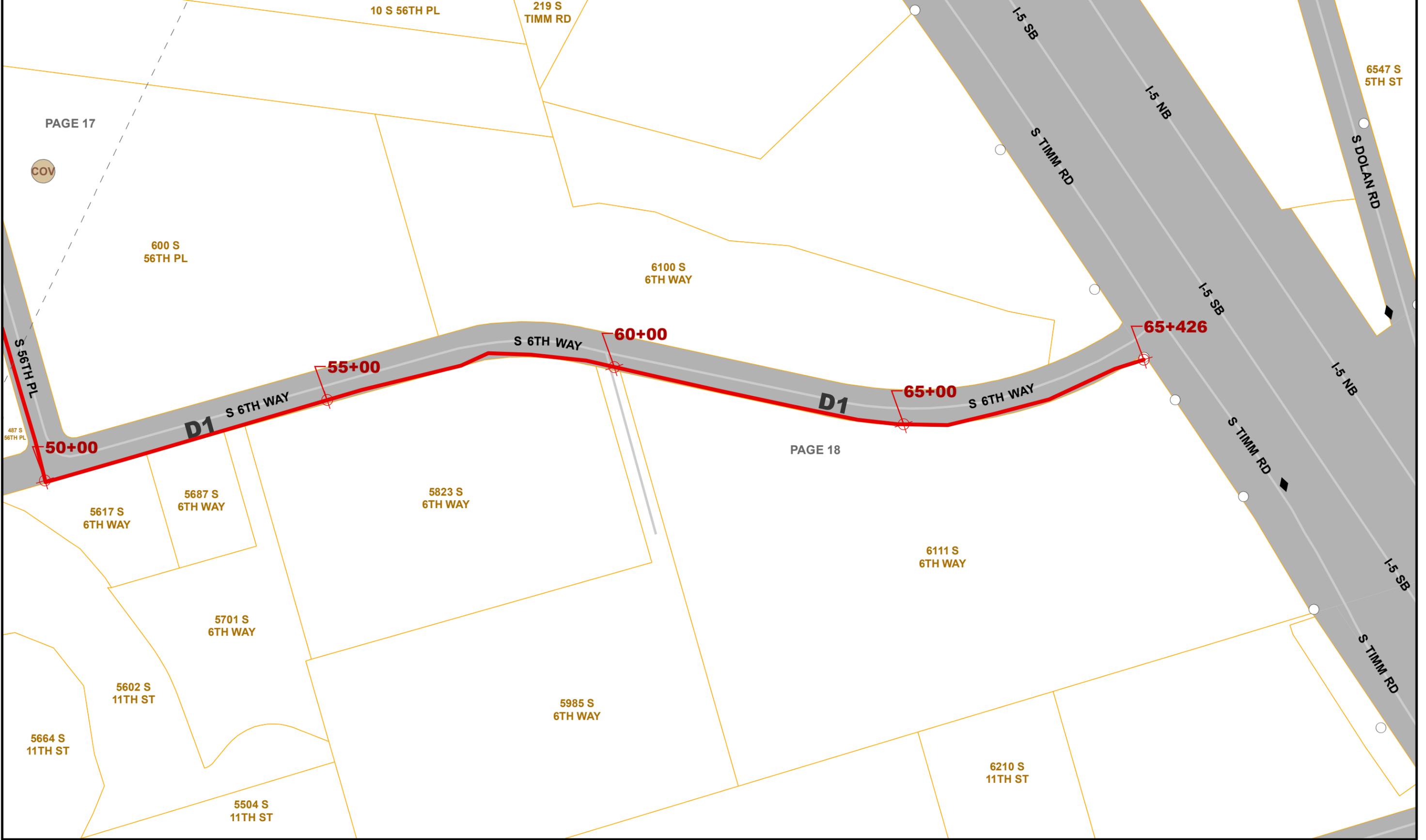
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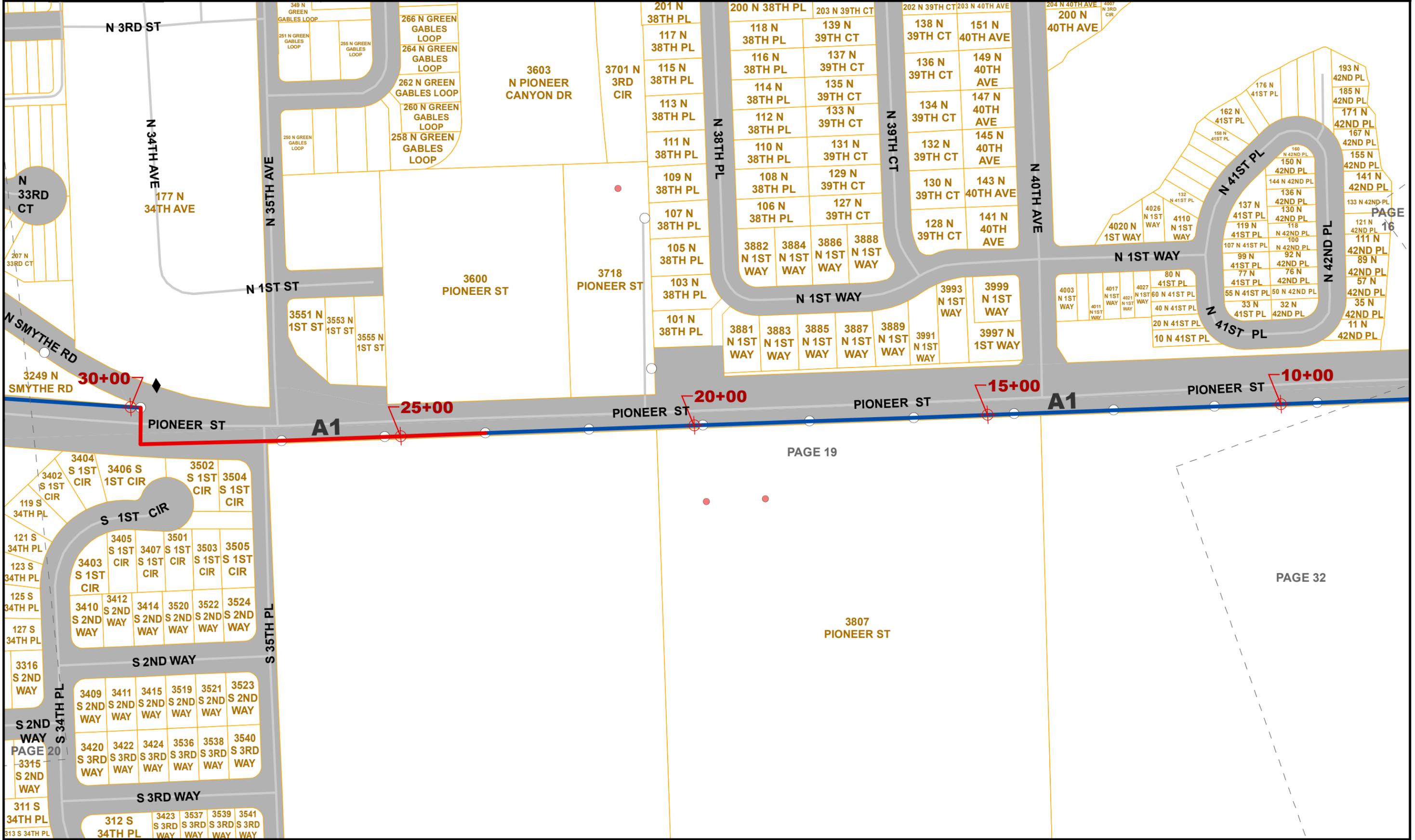
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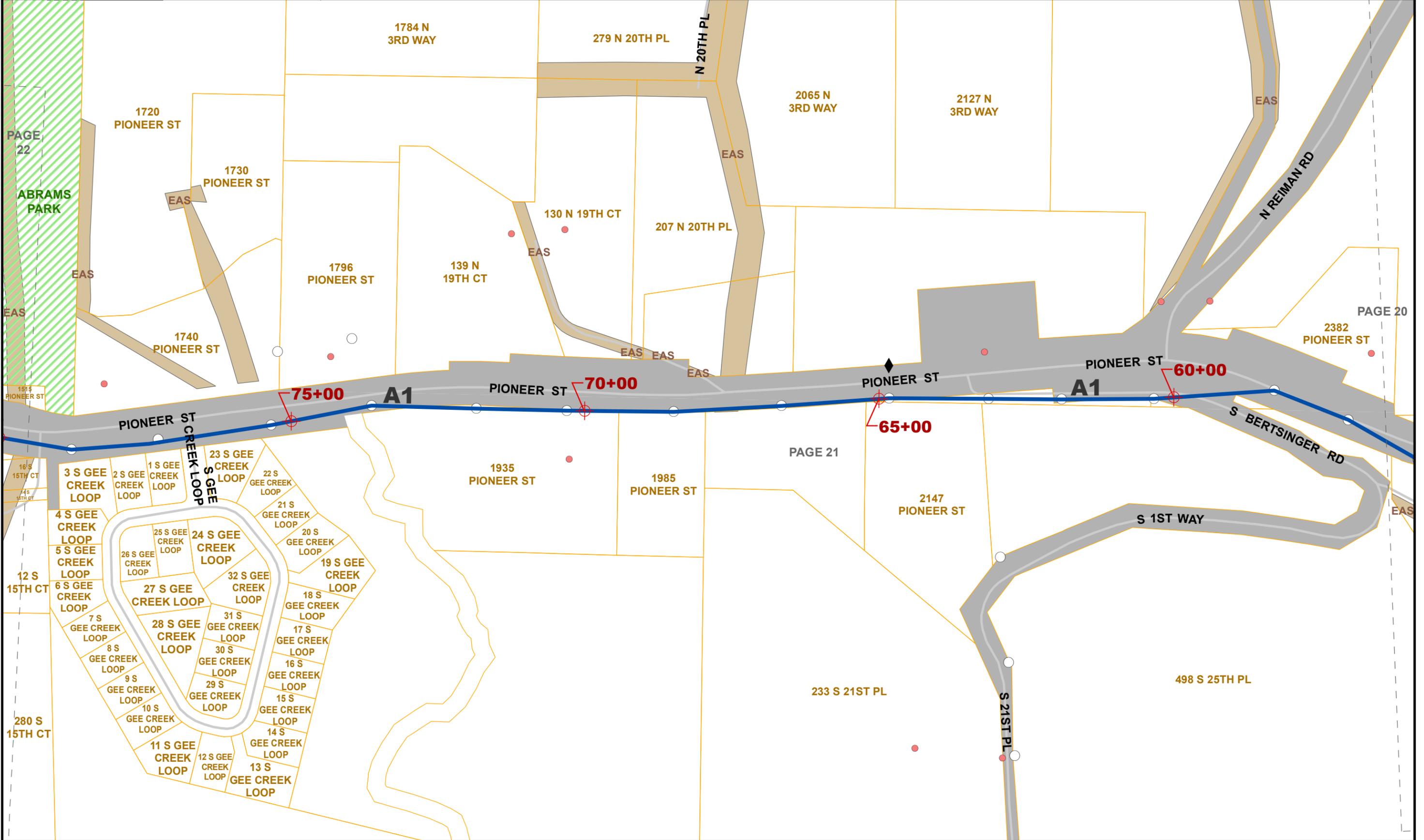


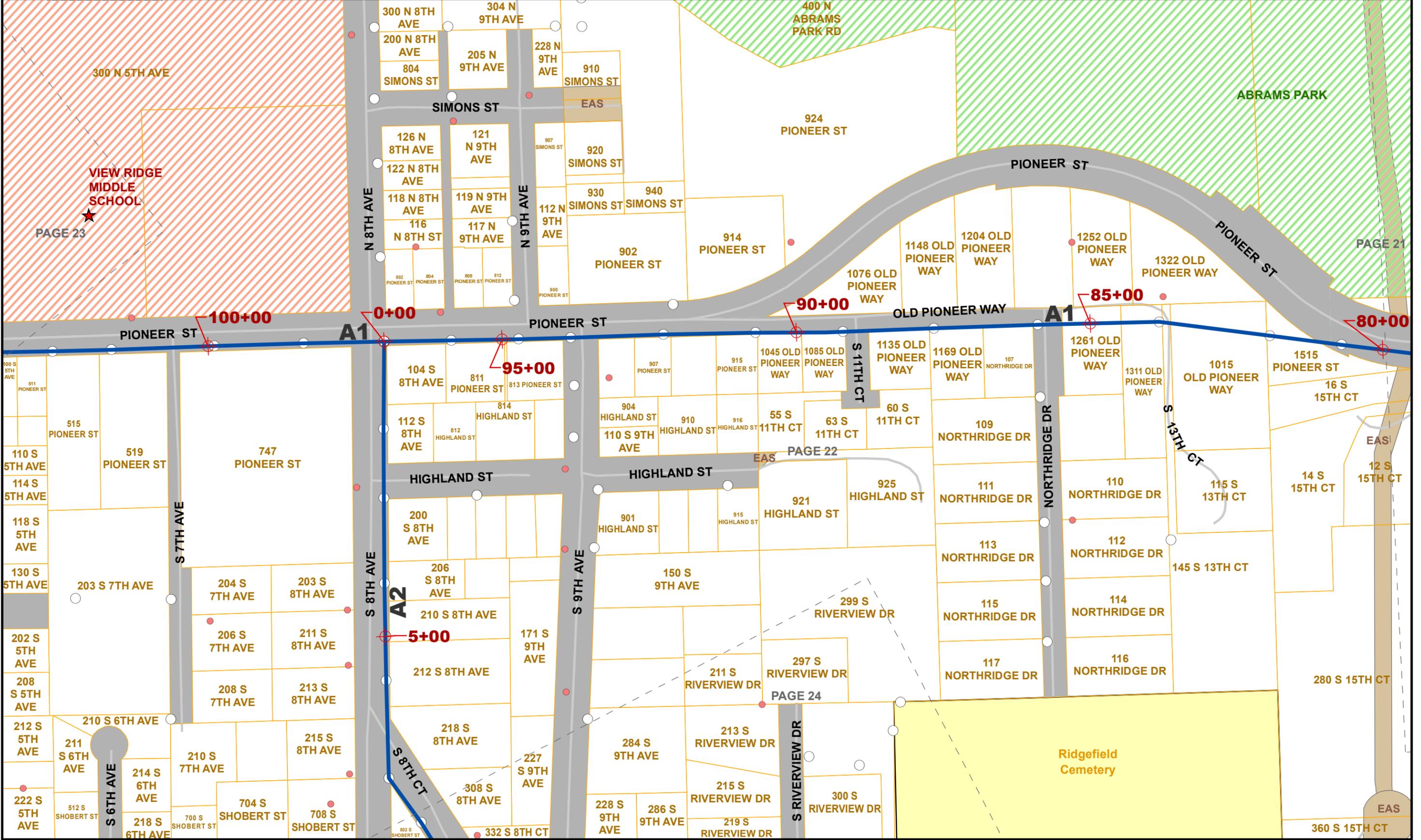
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PAGE 20







— Aerial ⚓ Stationing
 — Buried █ ROW

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Project **Ridgefield Fiber**
 Revision: Date: 6/14/2016

Page 23 of 87
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State WA County CLARK
 Poles Intersected: 996

Absolute Scale **1:1,800**
 Relative Scale **1 inch = 150 feet**



VIEW RIDGE MIDDLE SCHOOL ★
 PAGE 22

PAGE 23

EAGLE'S VIEW



— Aerial ⚓ Stationing
 — Buried █ ROW

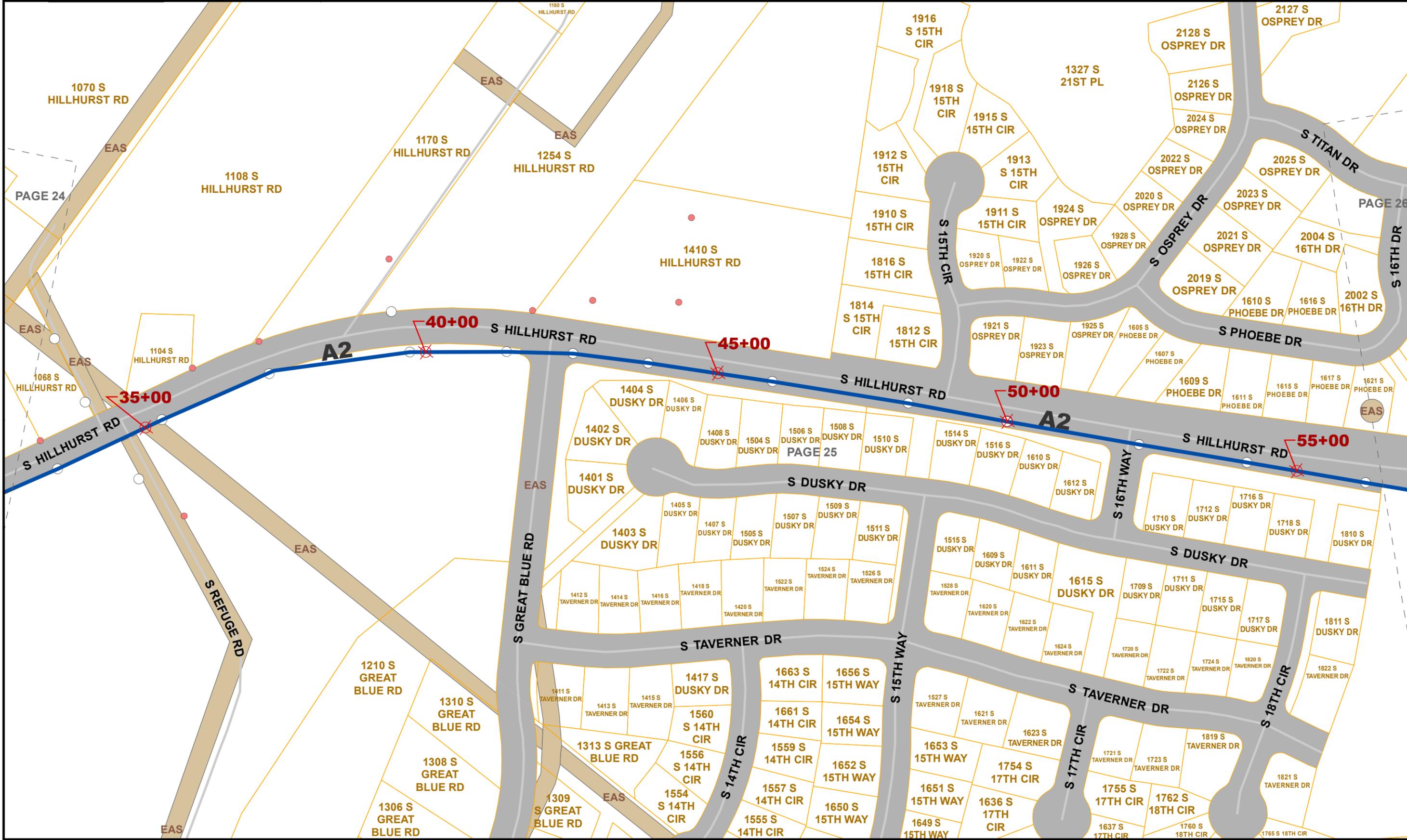
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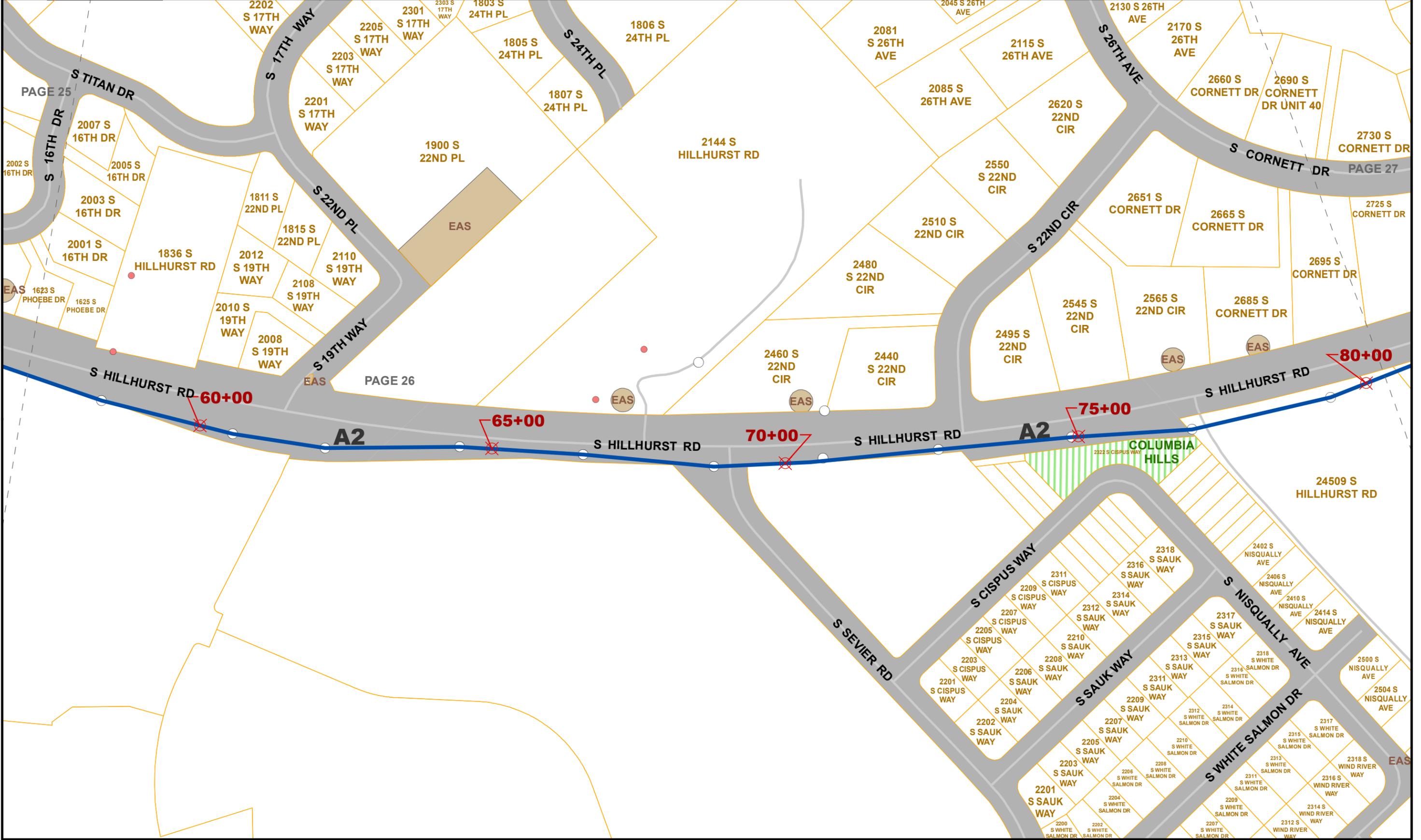
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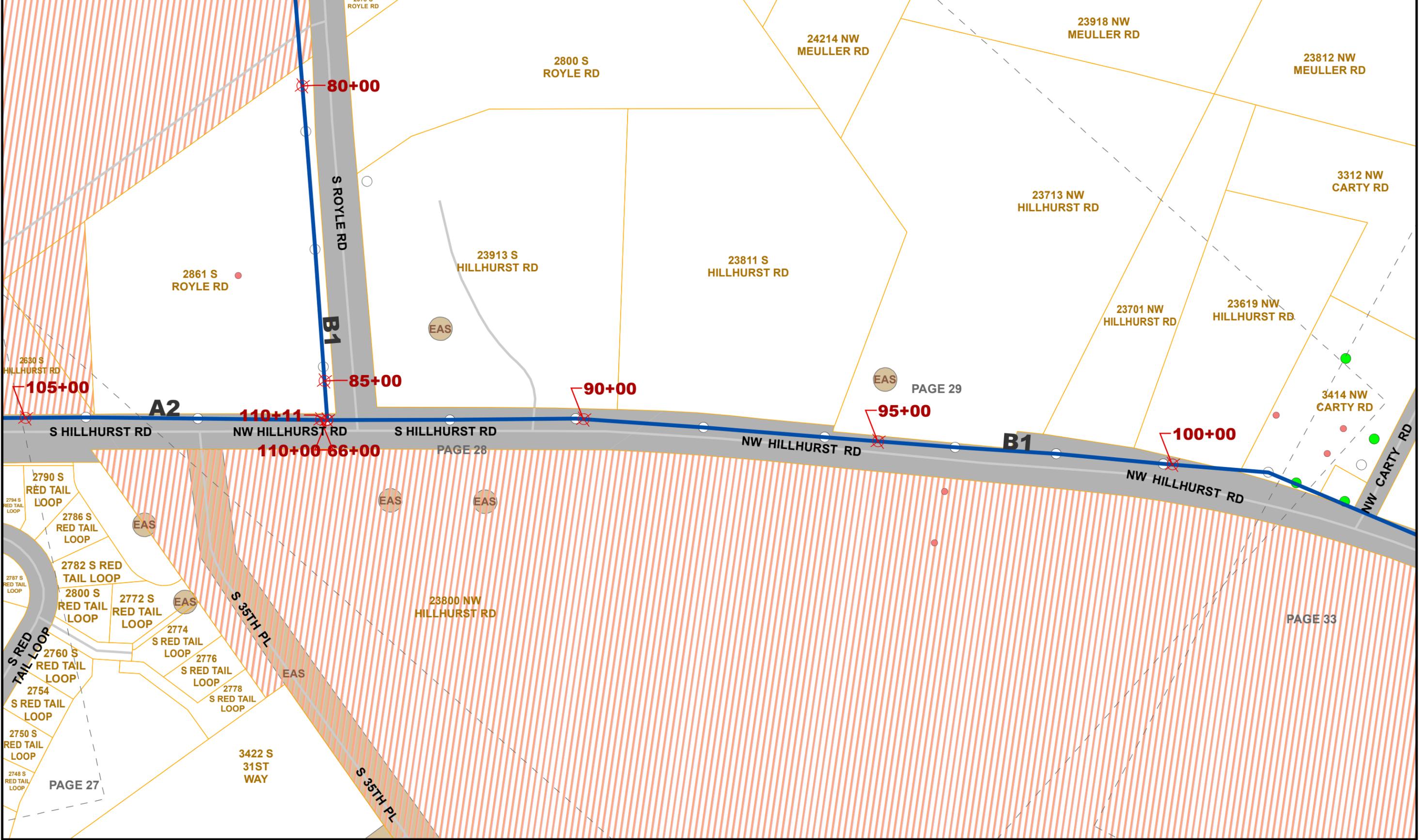
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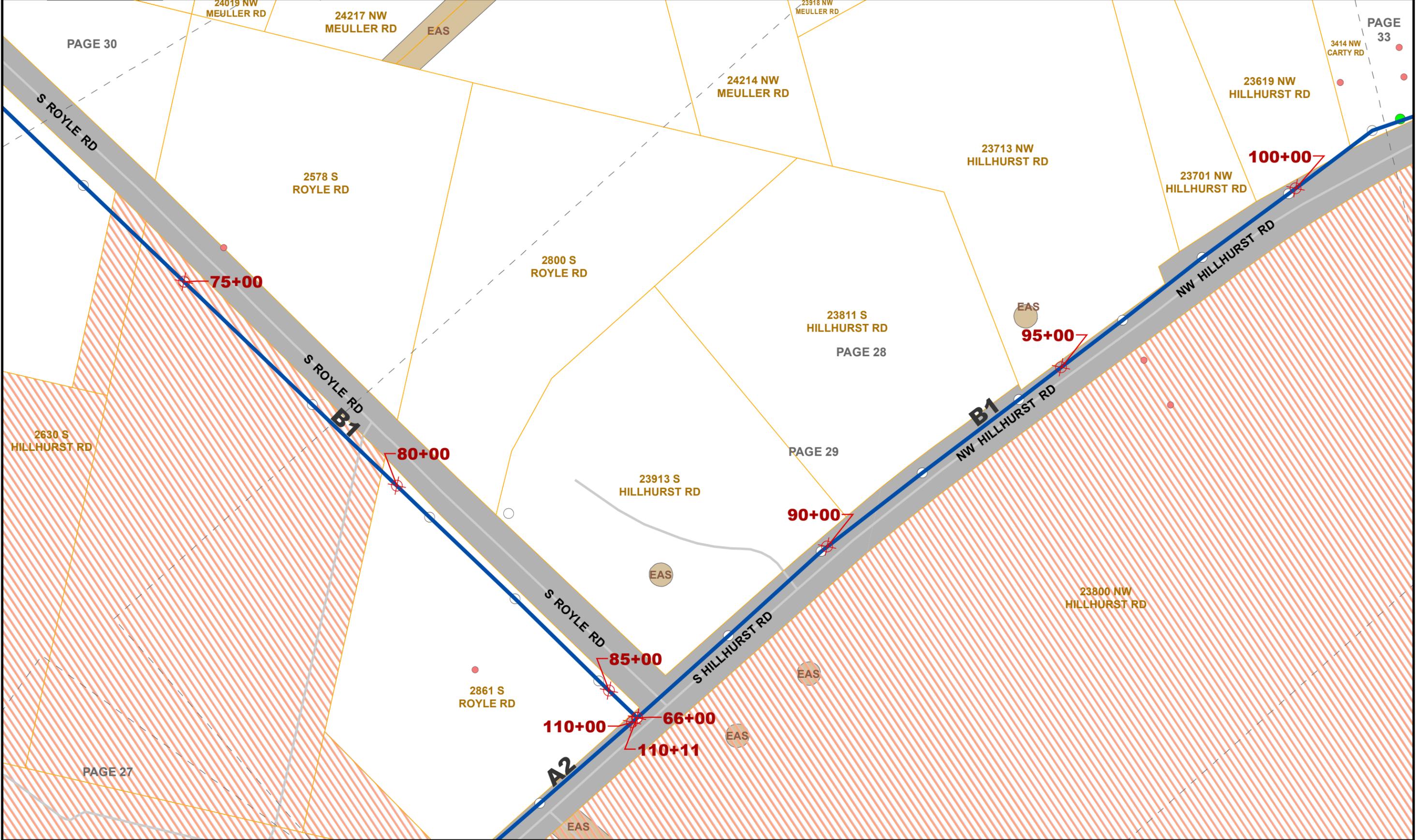
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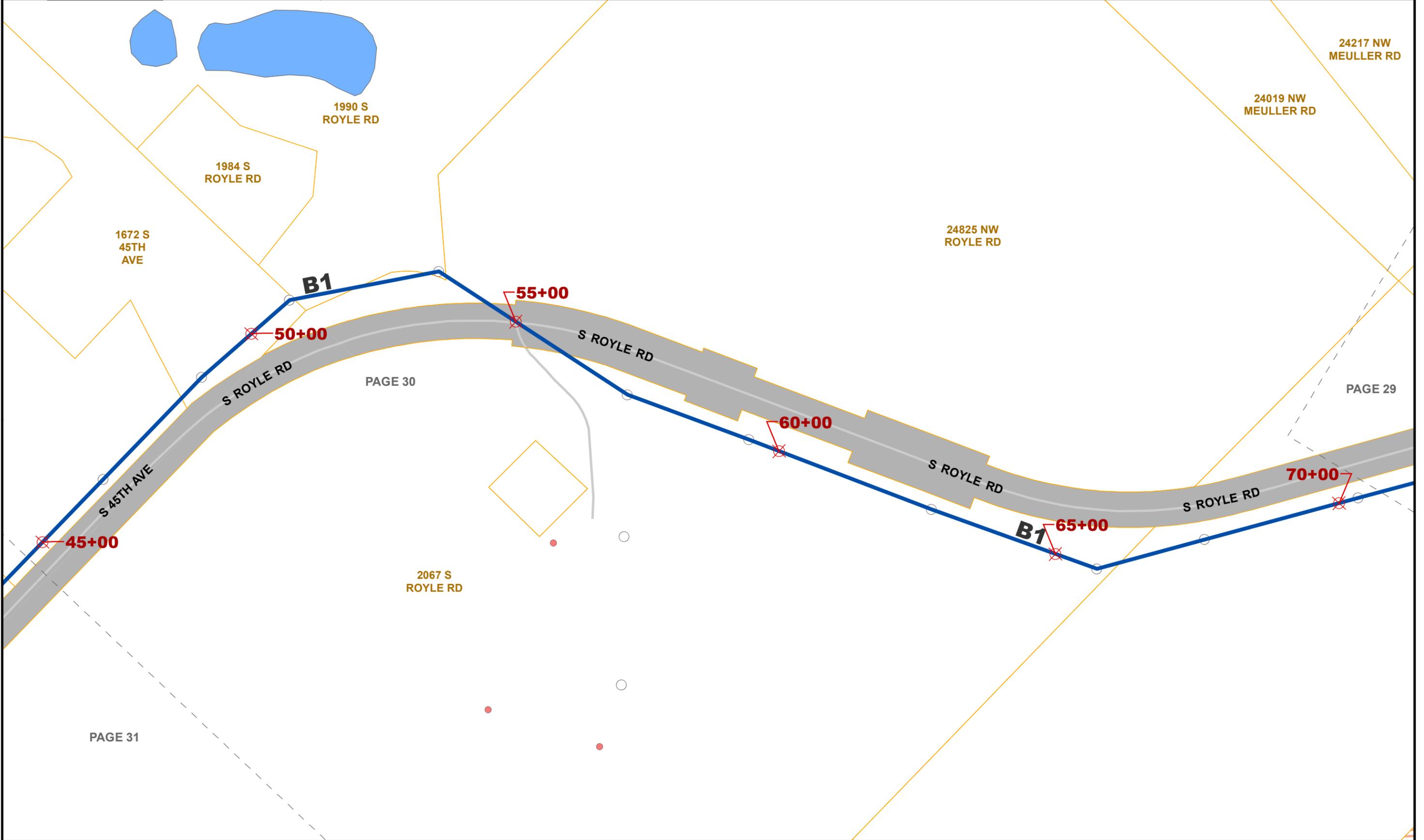
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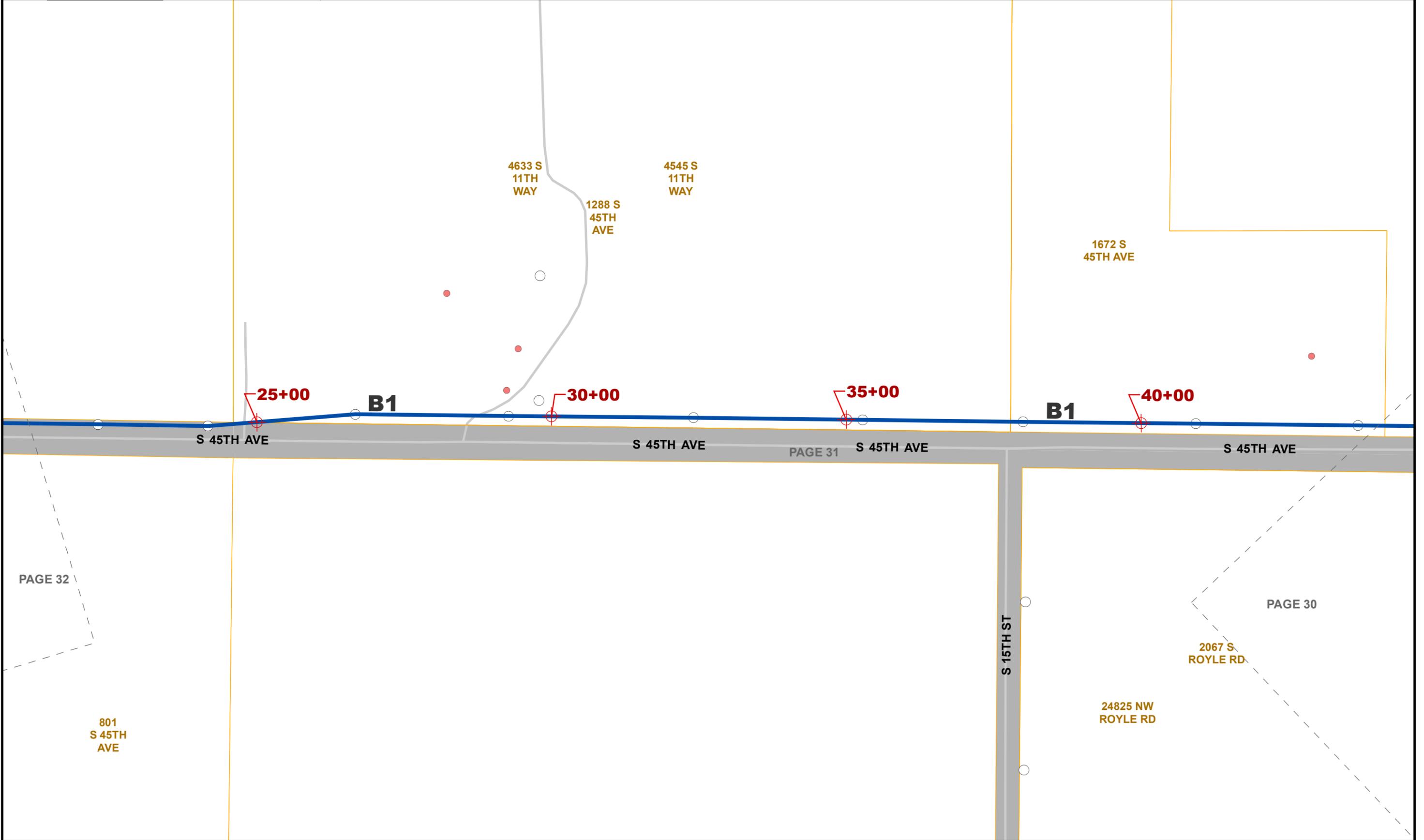














— Aerial ⚓ Stationing

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Project **Ridgefield Fiber**

Page 32 of 87

State WA

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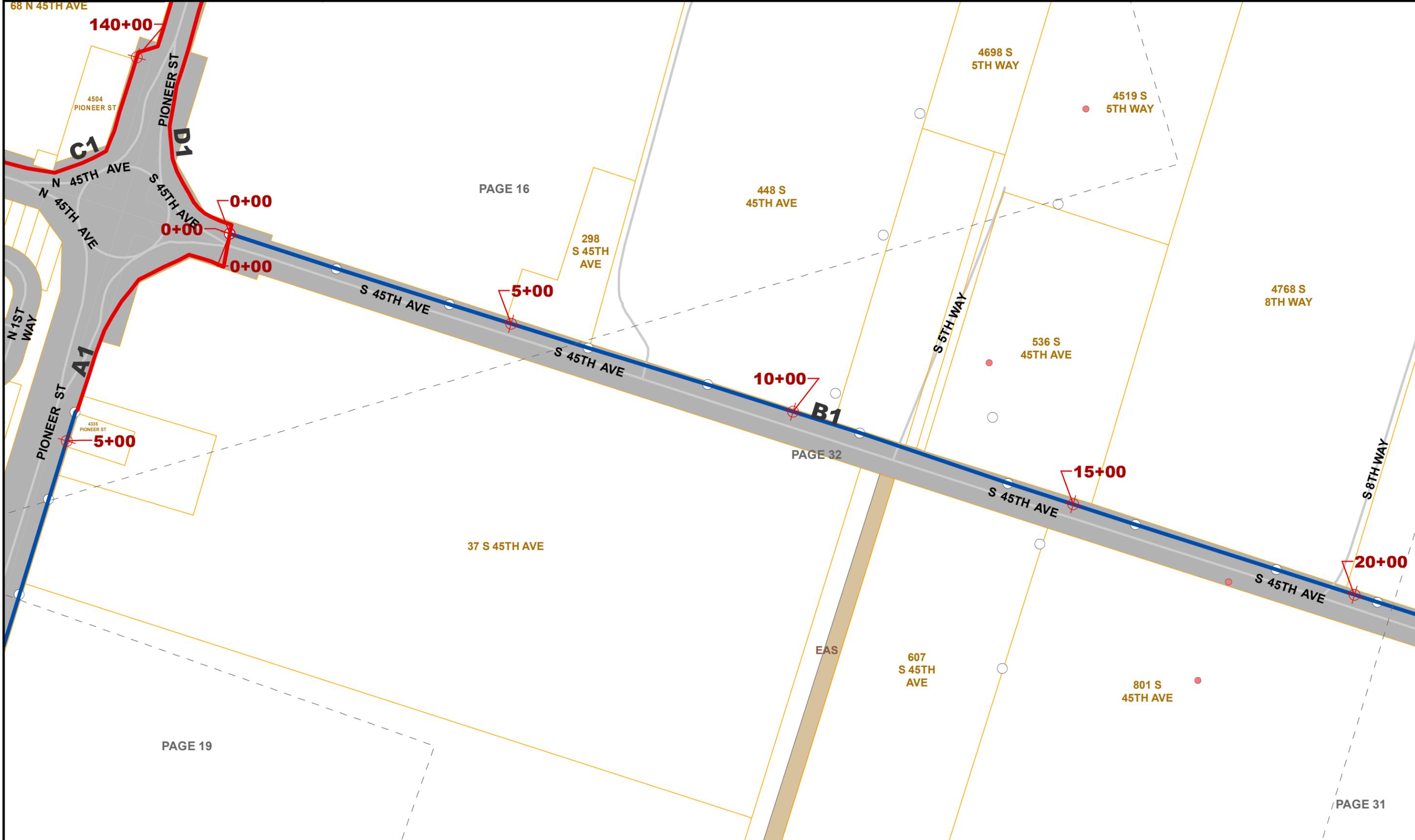
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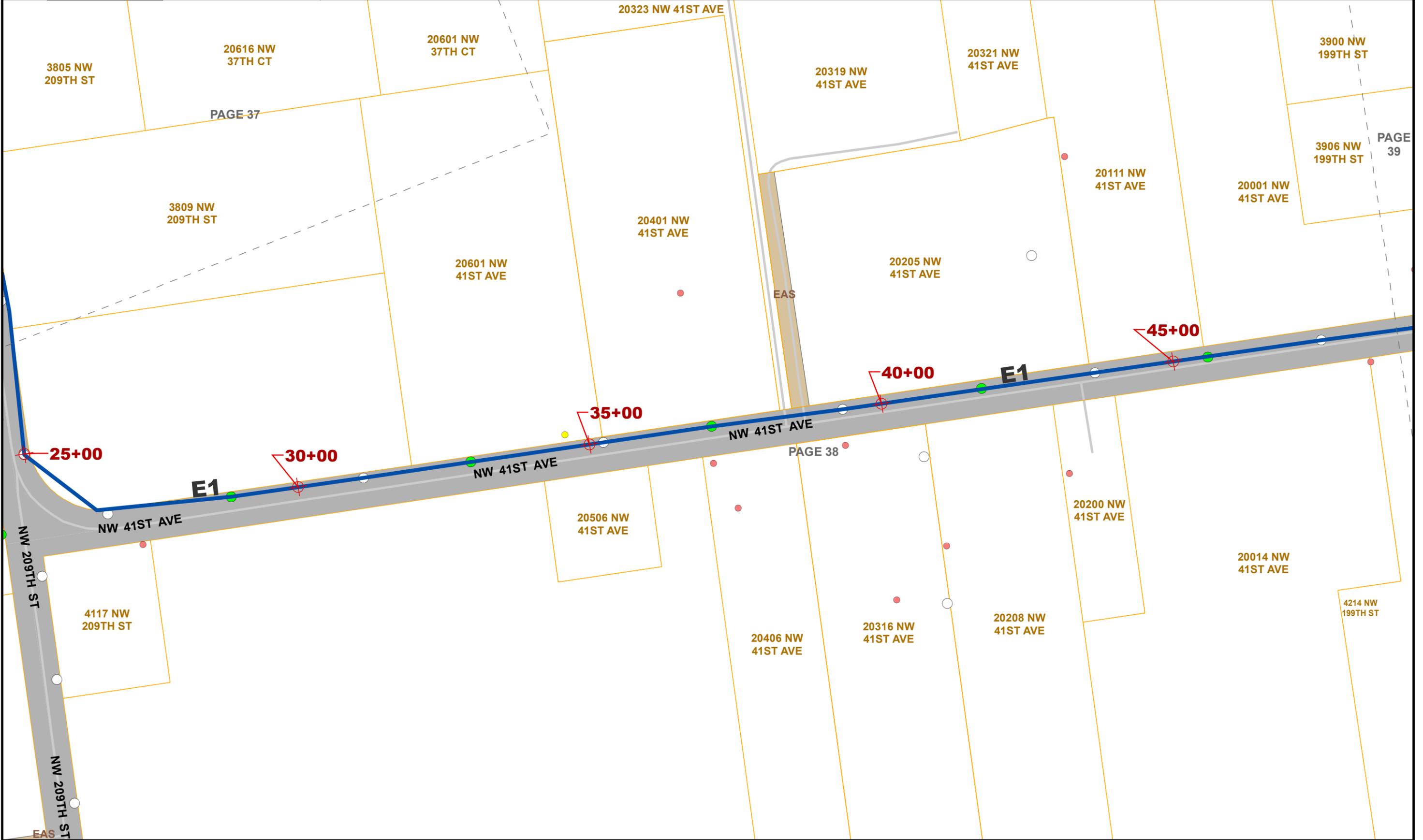
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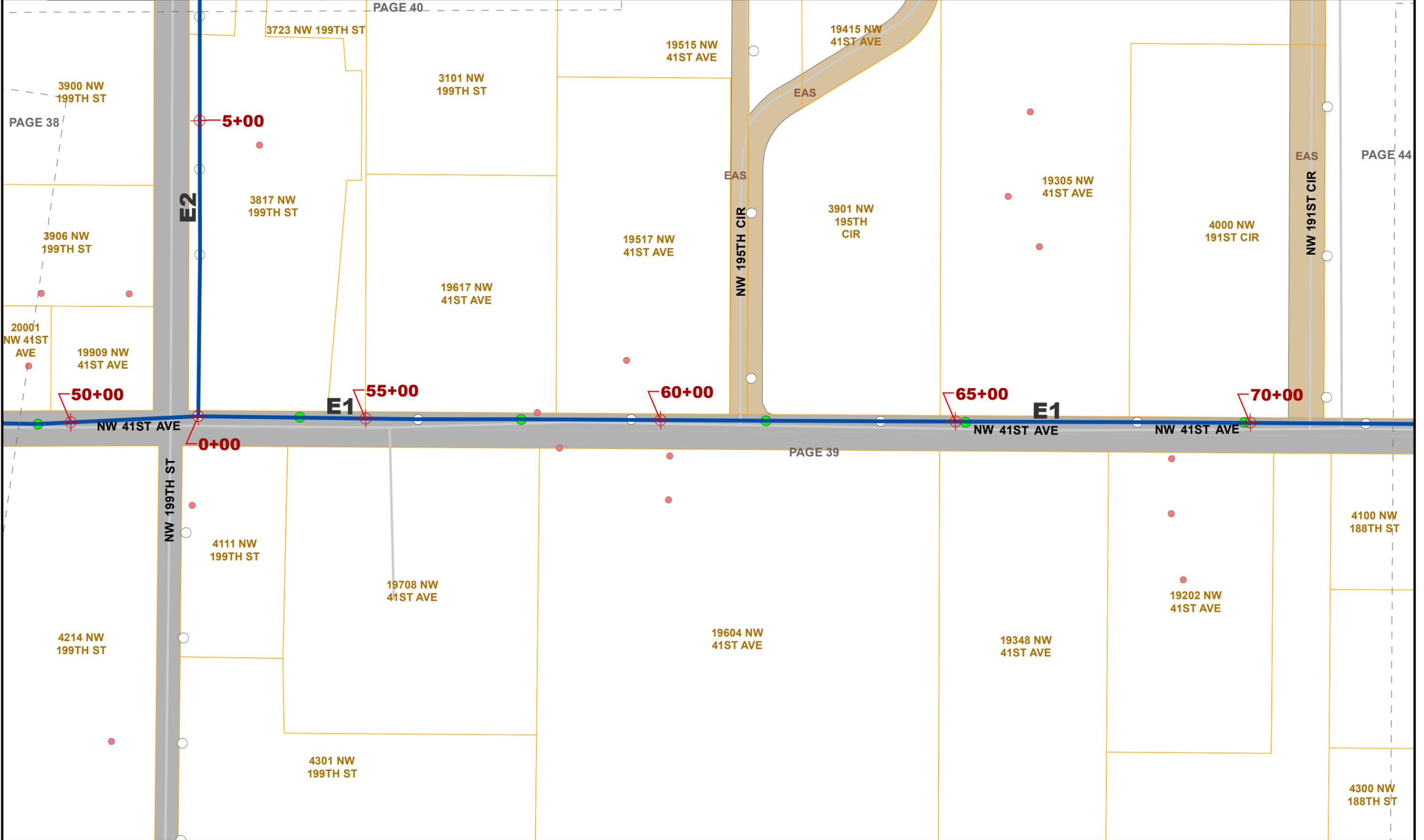
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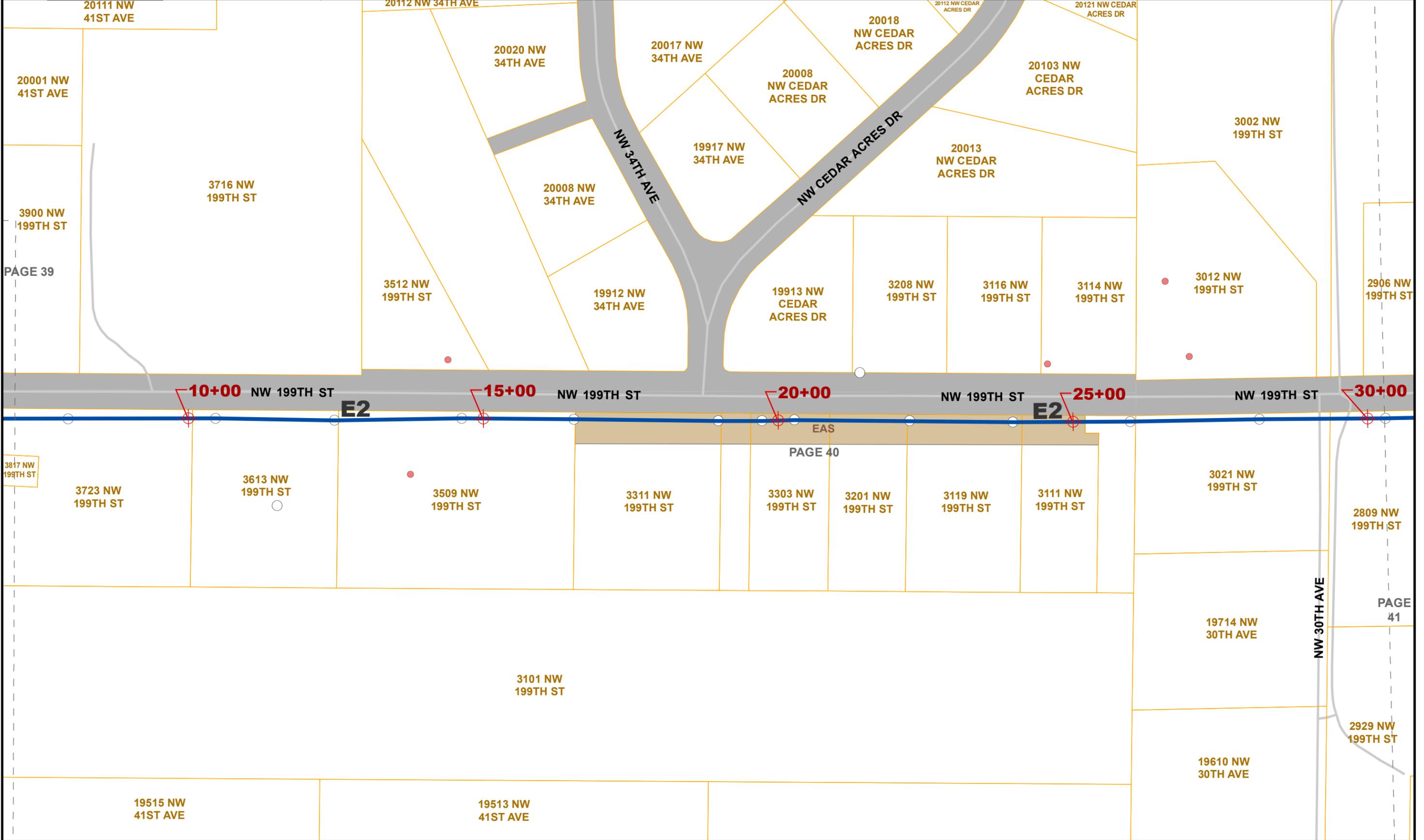
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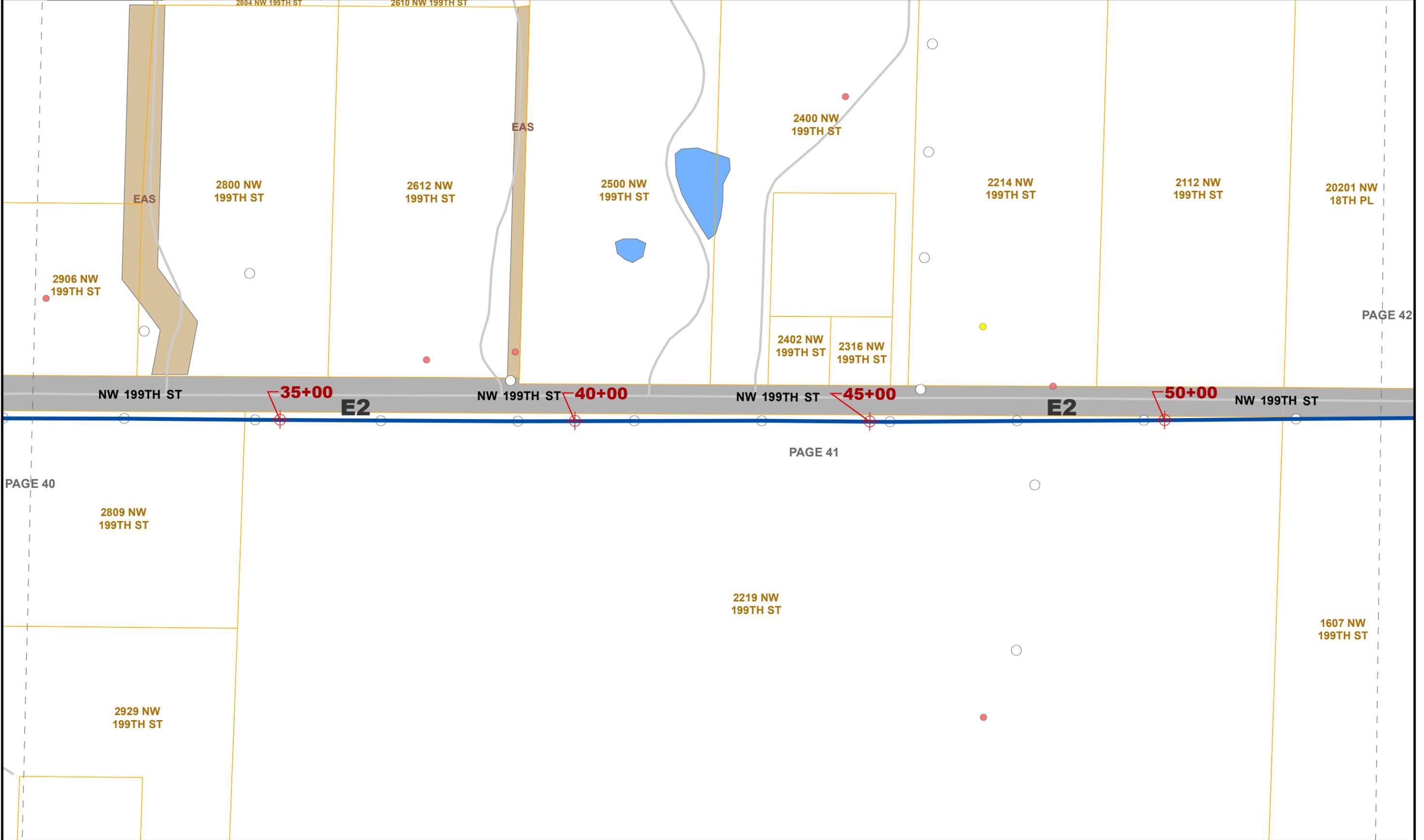




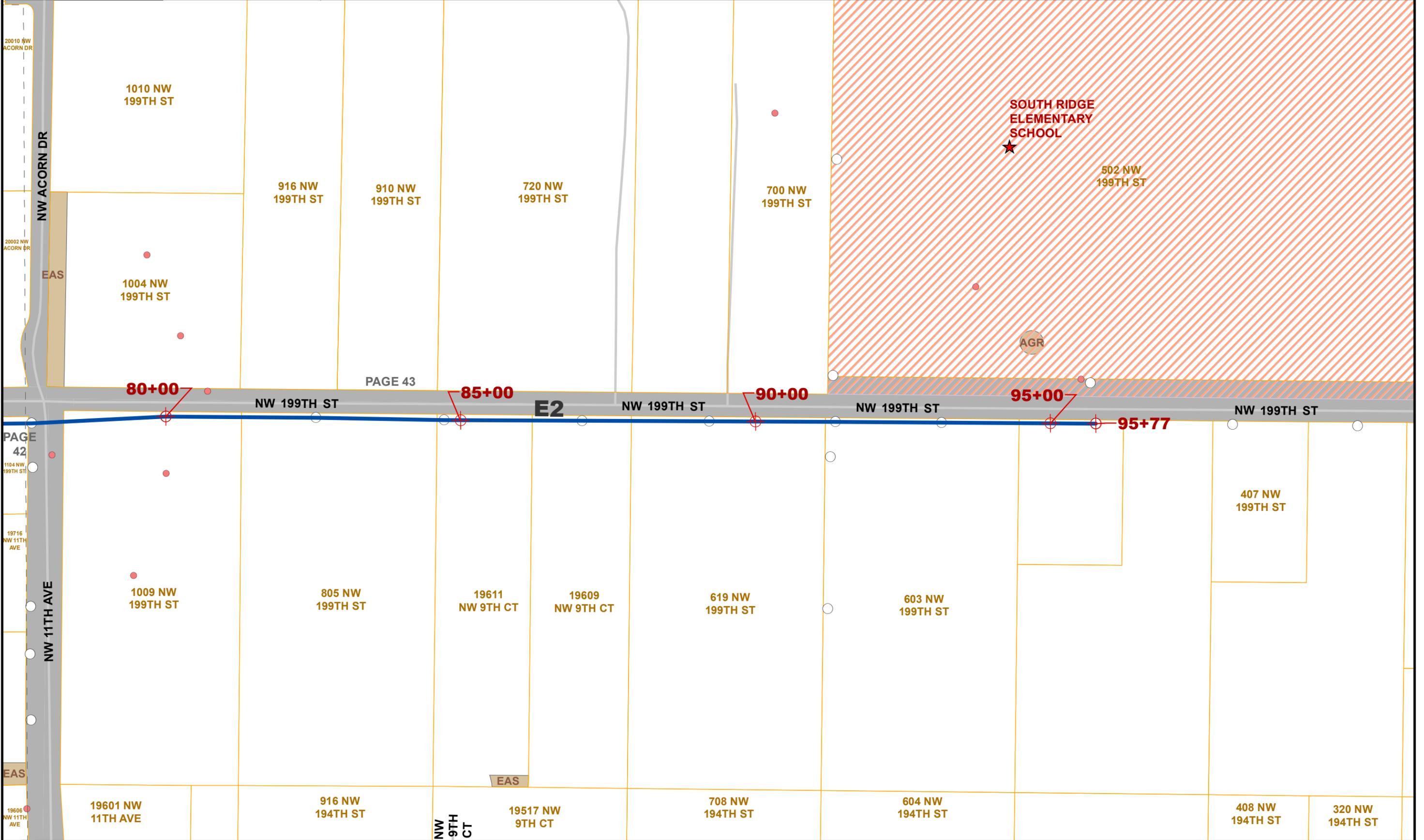


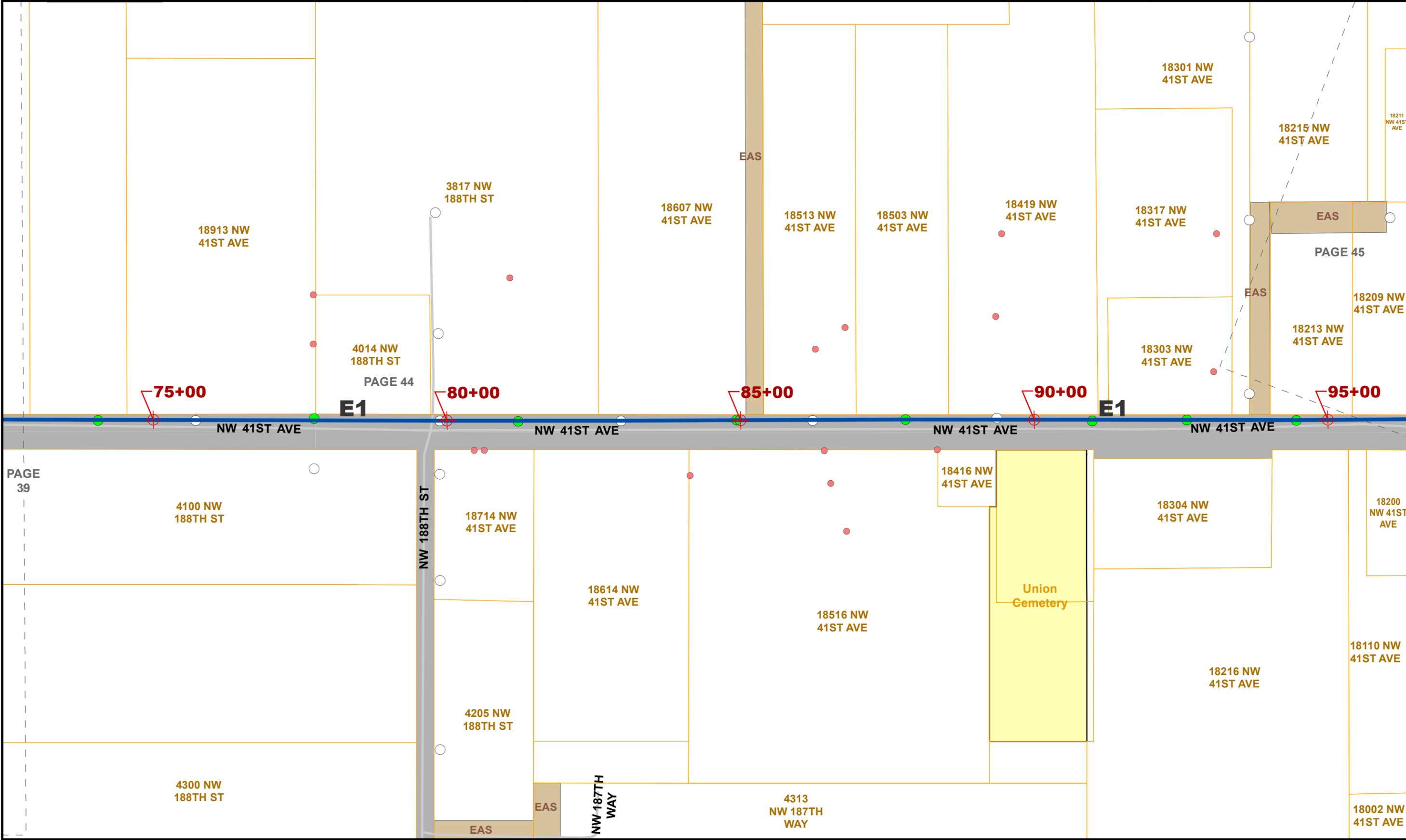


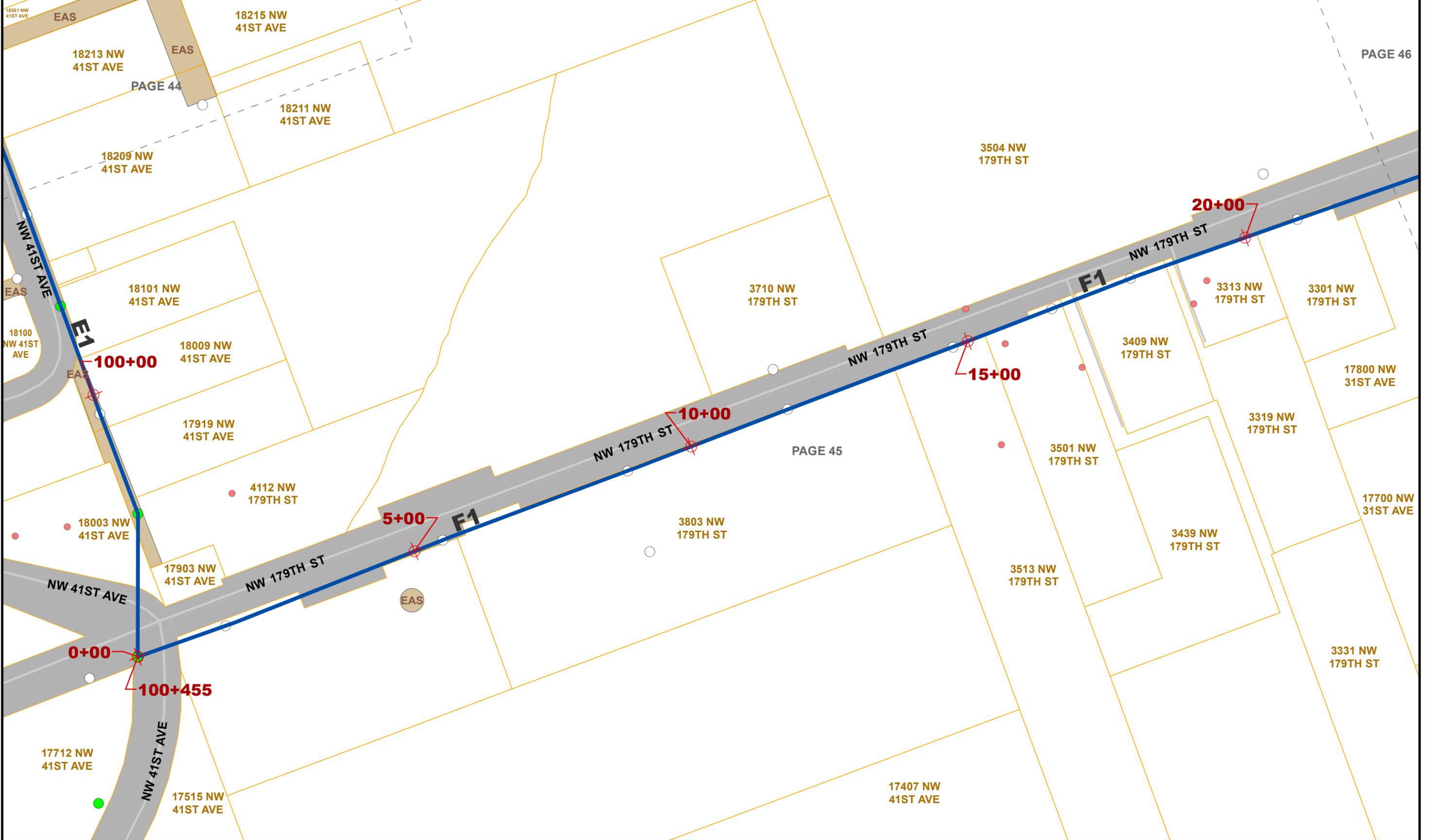


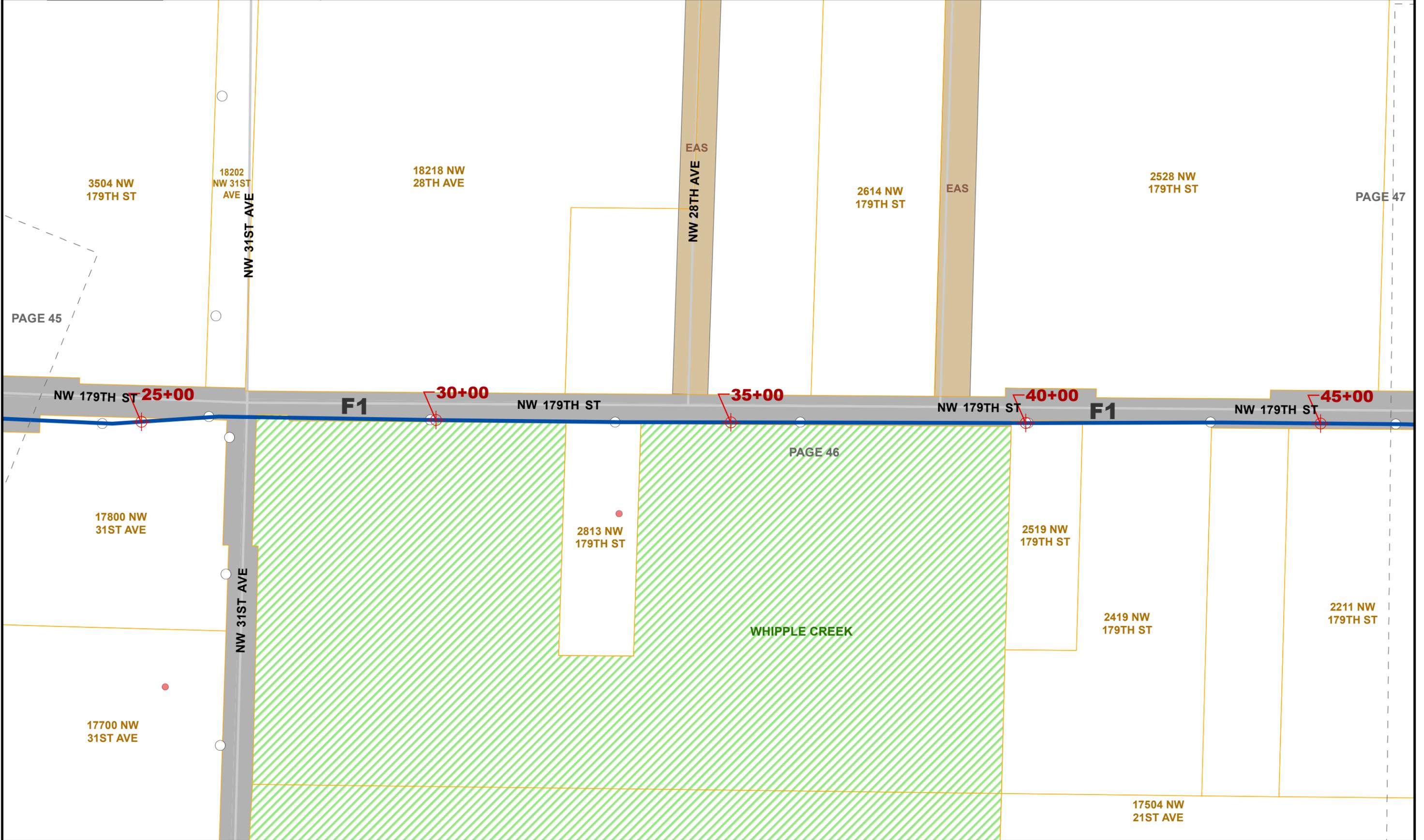


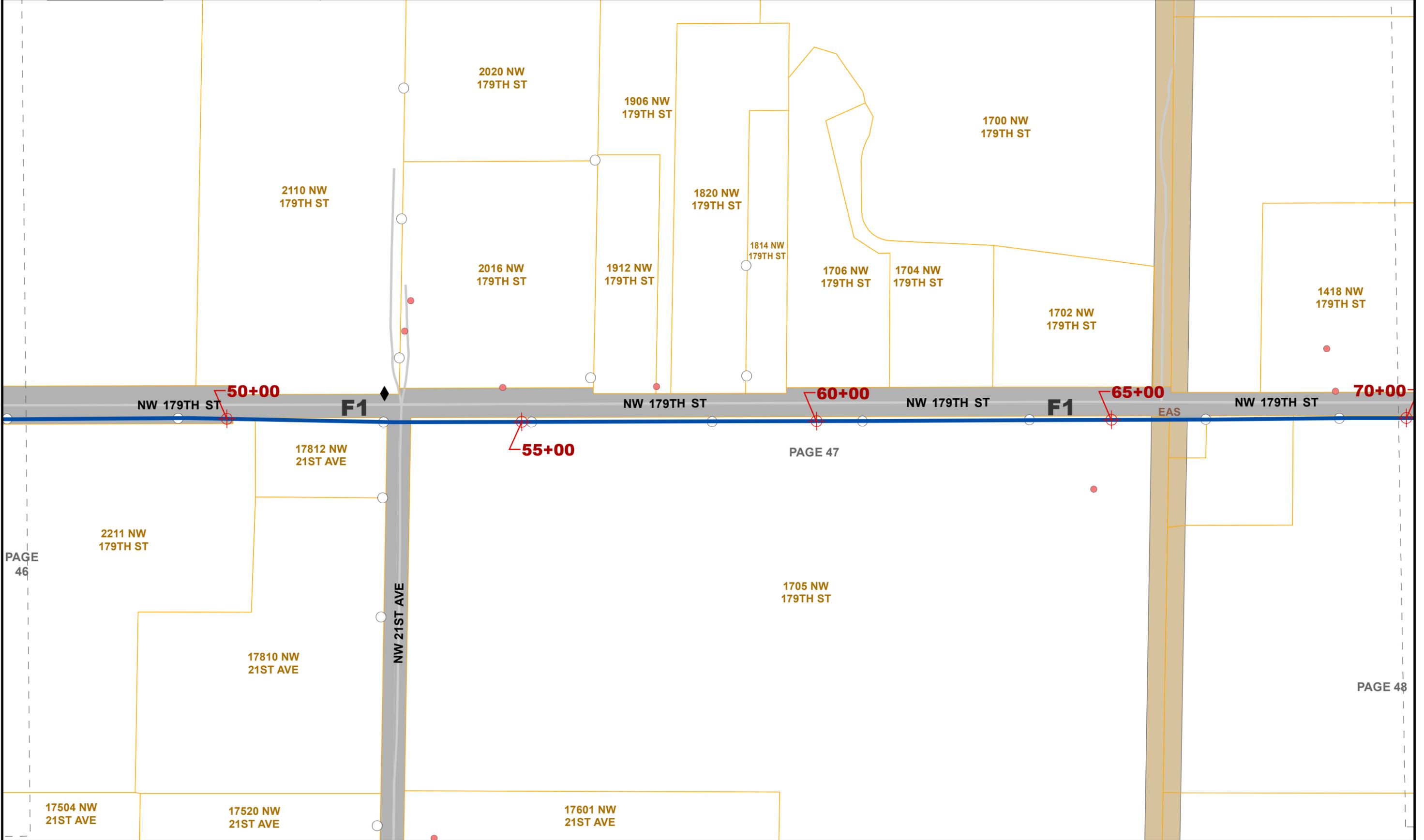




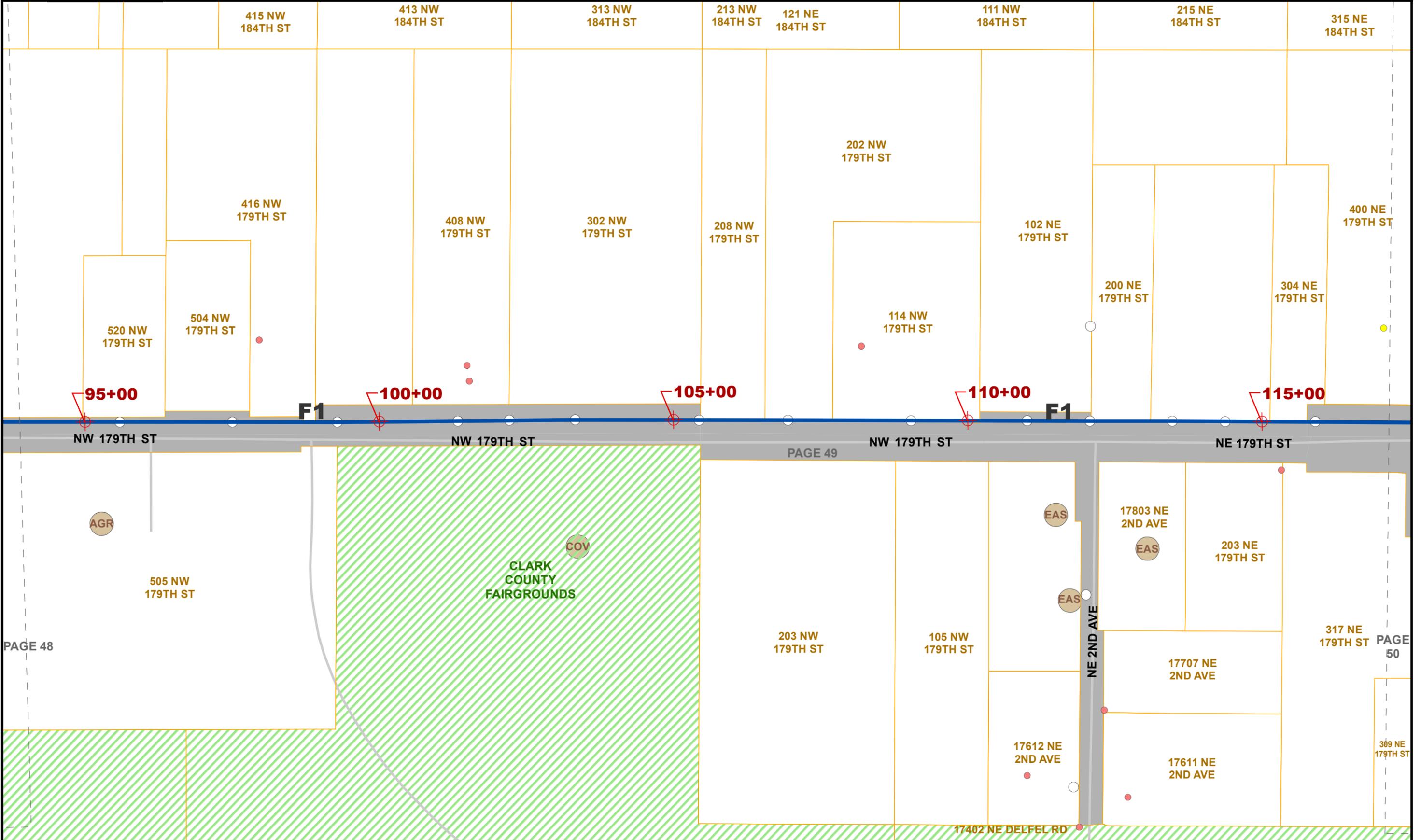


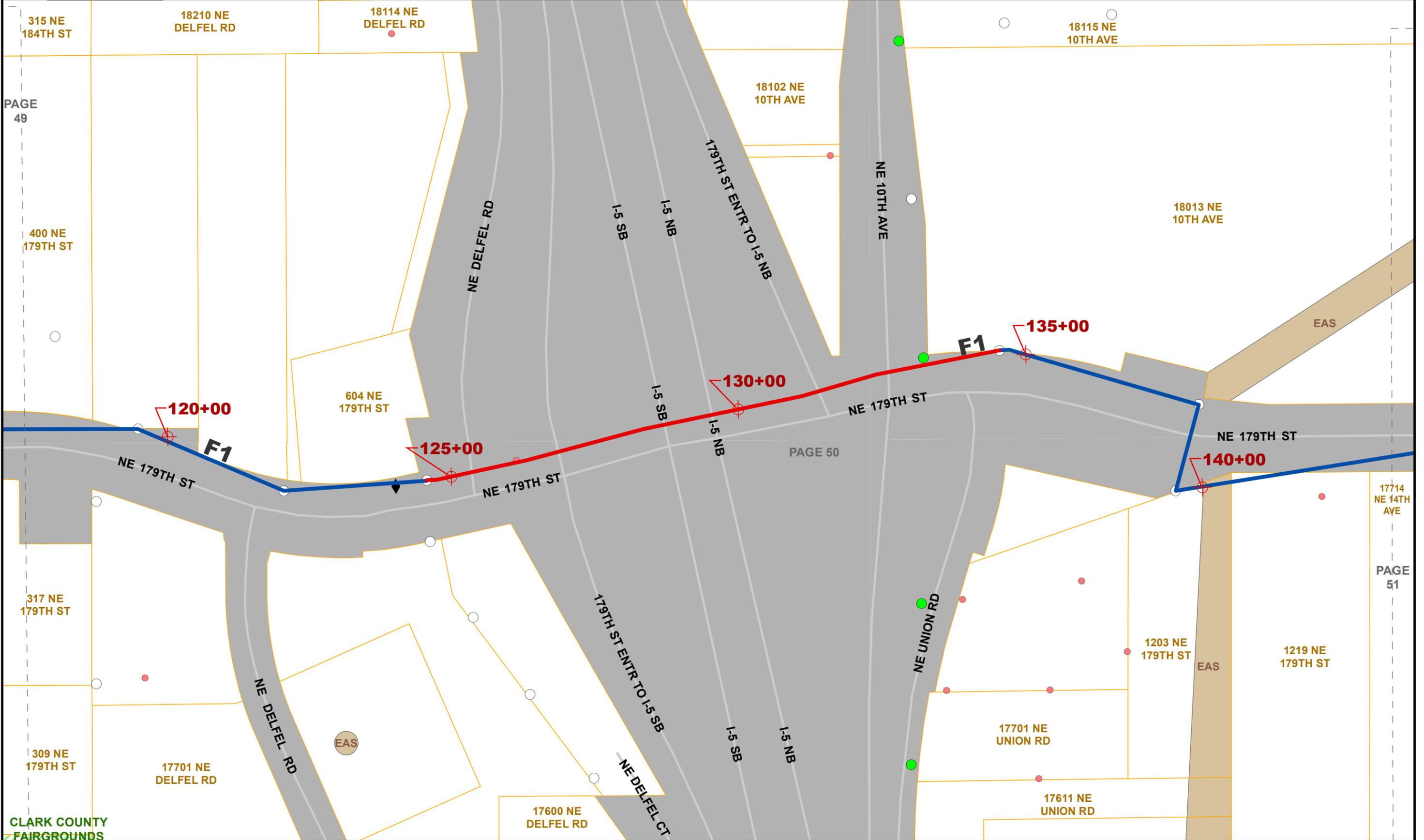




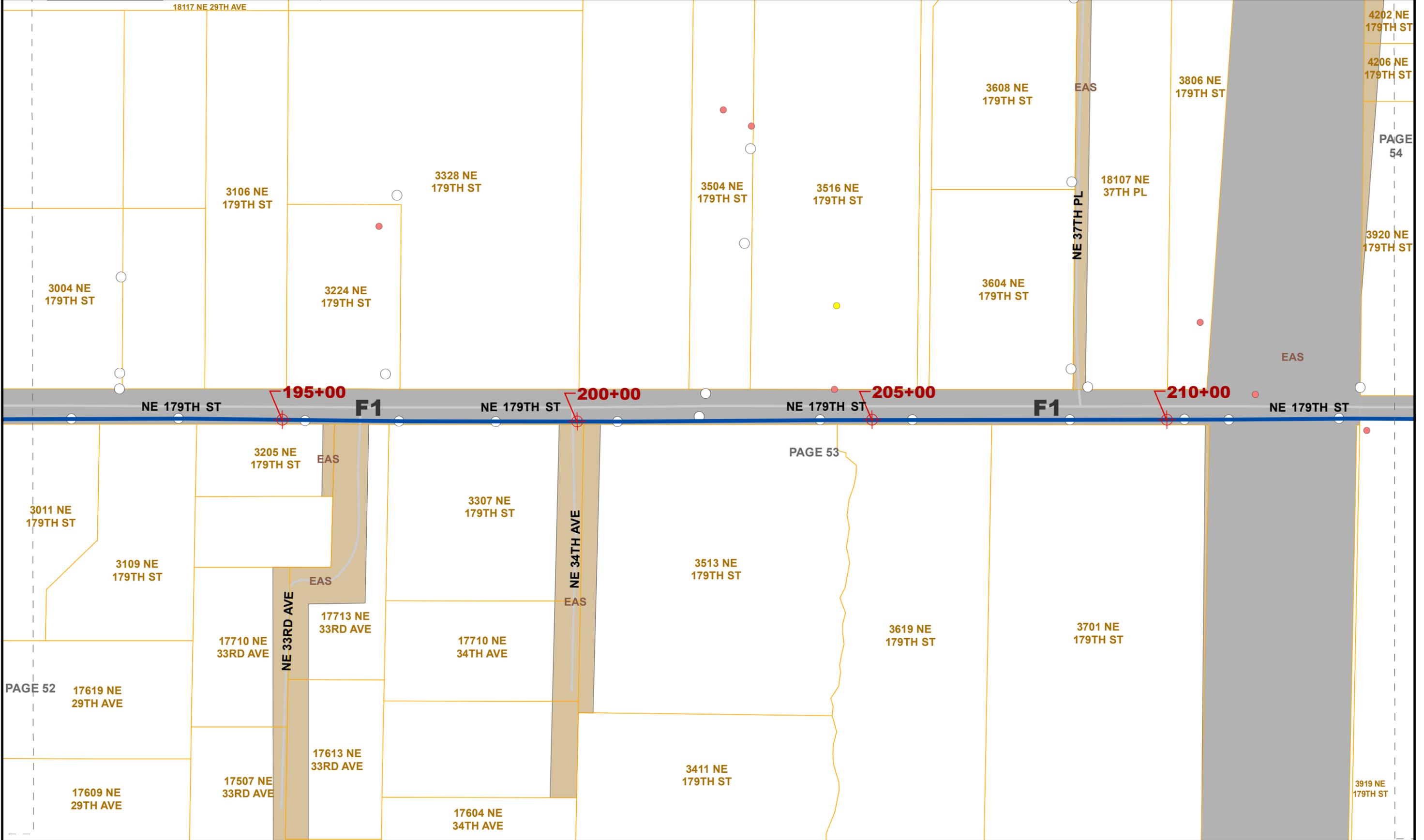


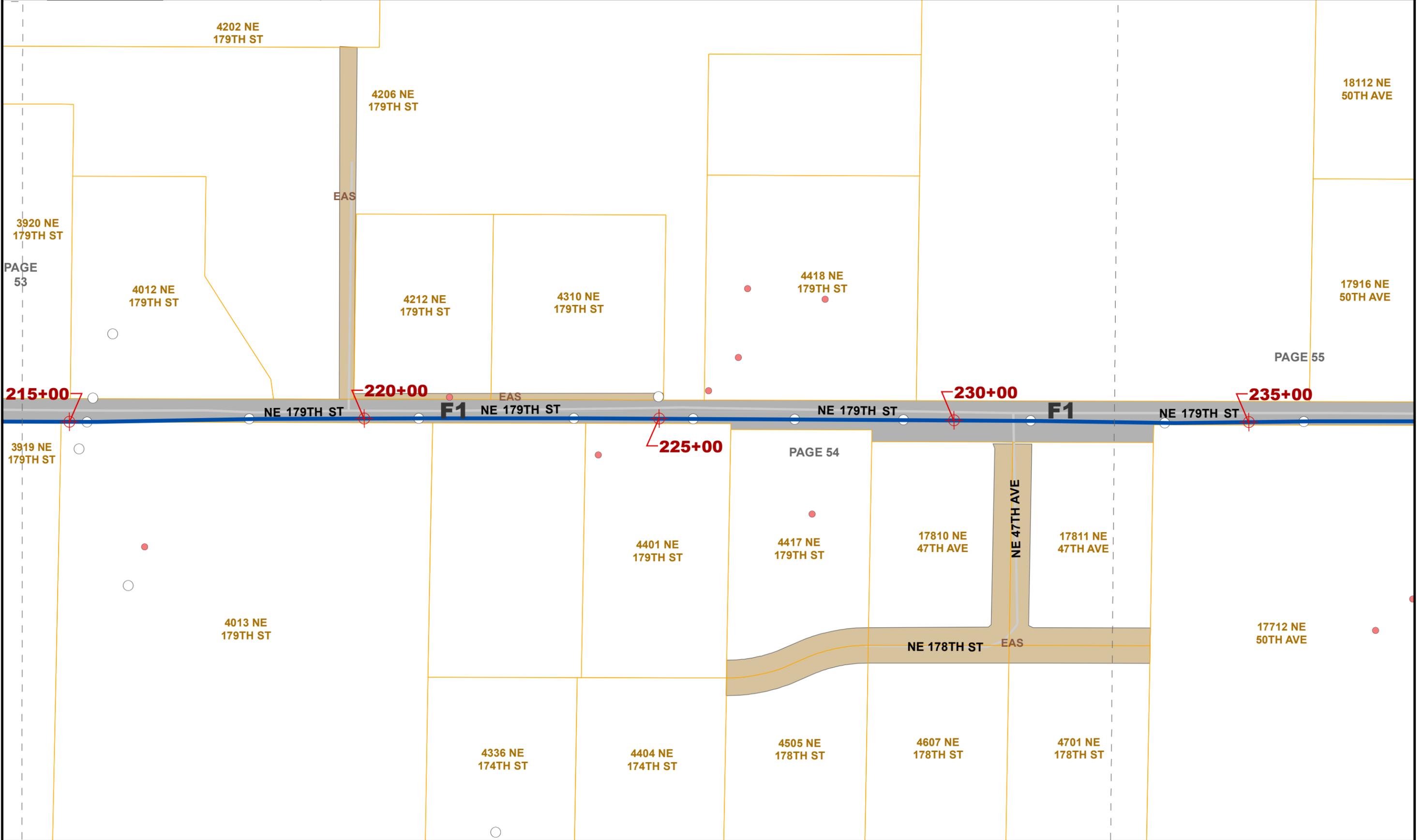


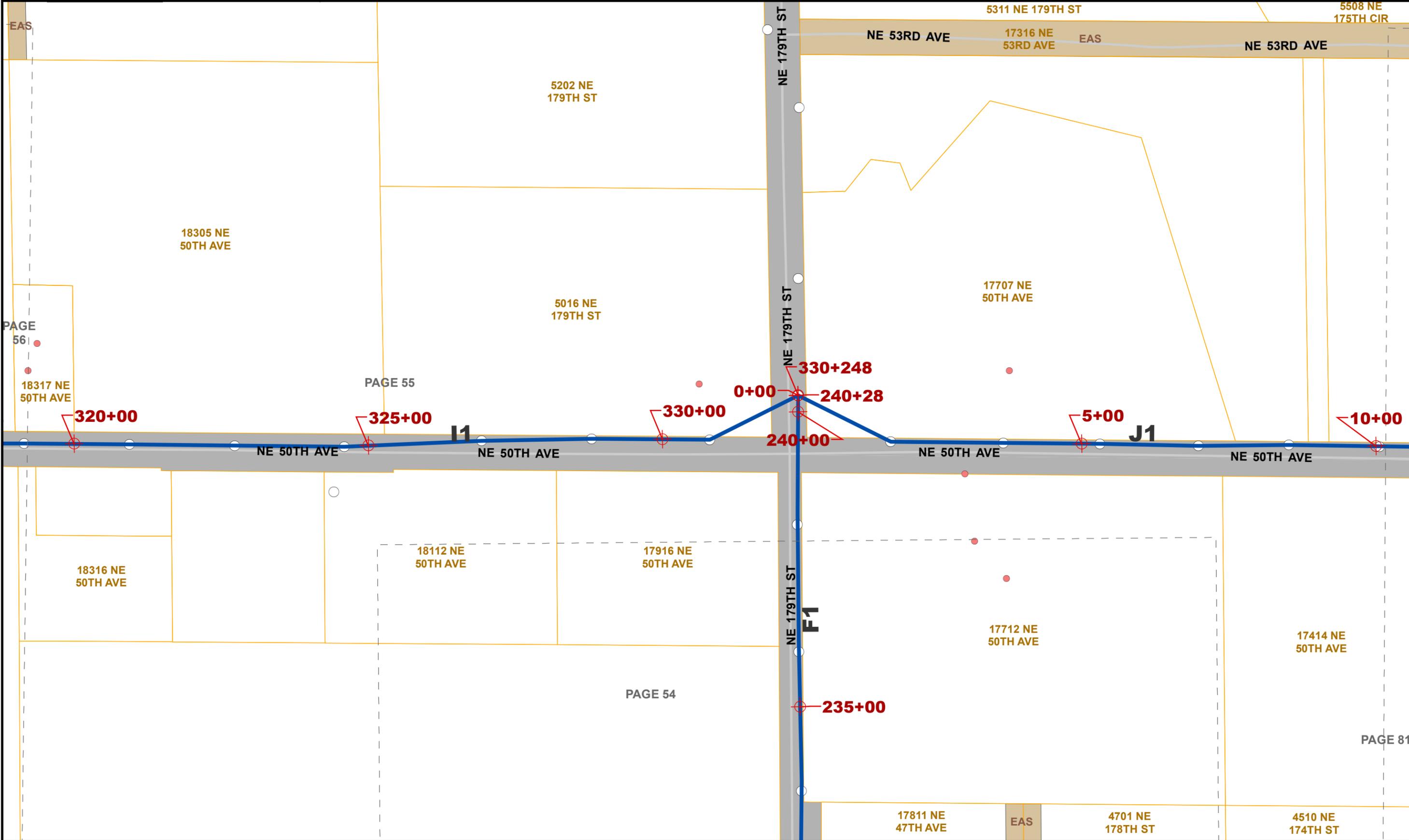


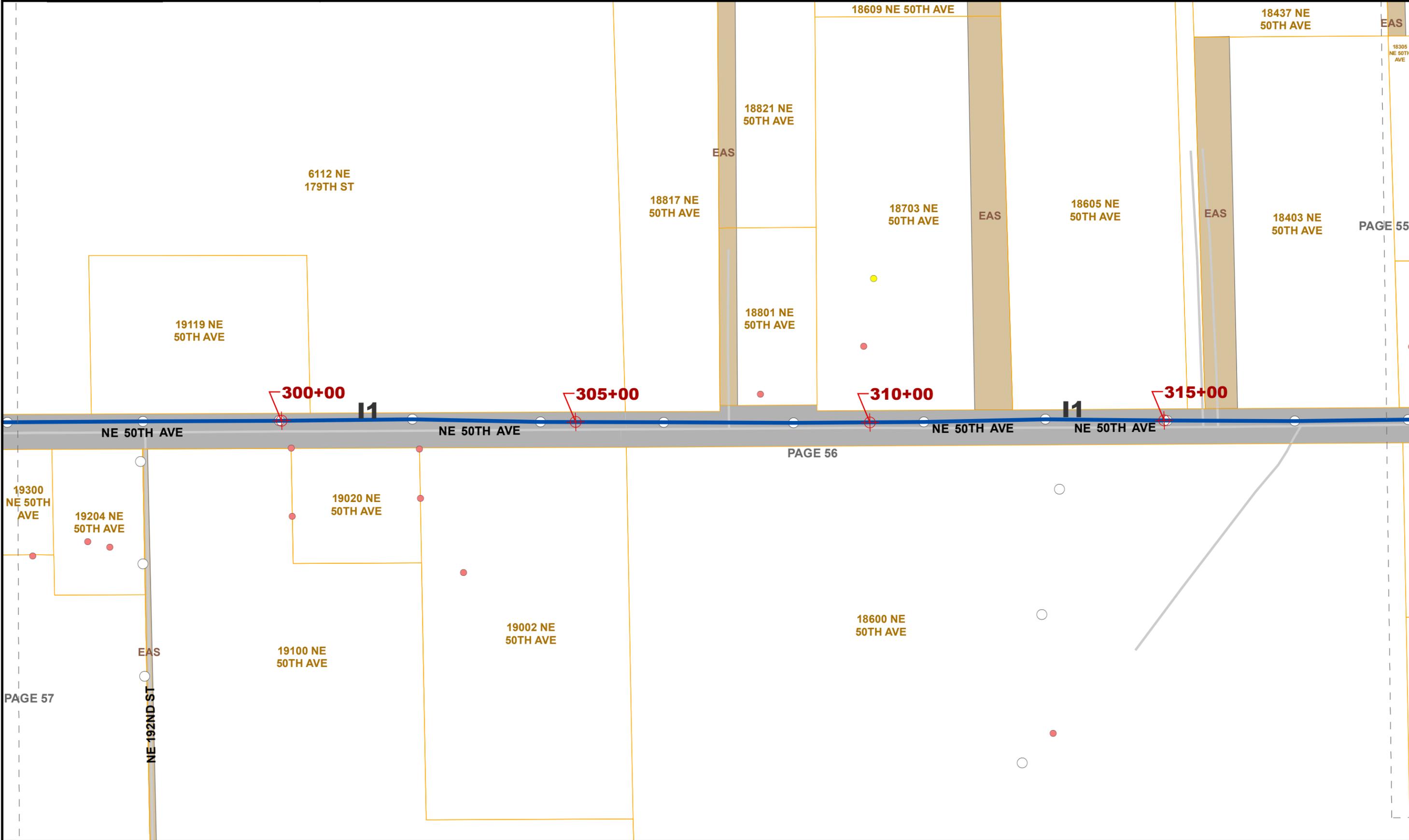












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— Aerial ⚓ Stationing
 — Buried █ ROW

Staked by: **RCG** Date: 6/14/2016
 Placed by: **RCG** Date: 6/14/2016

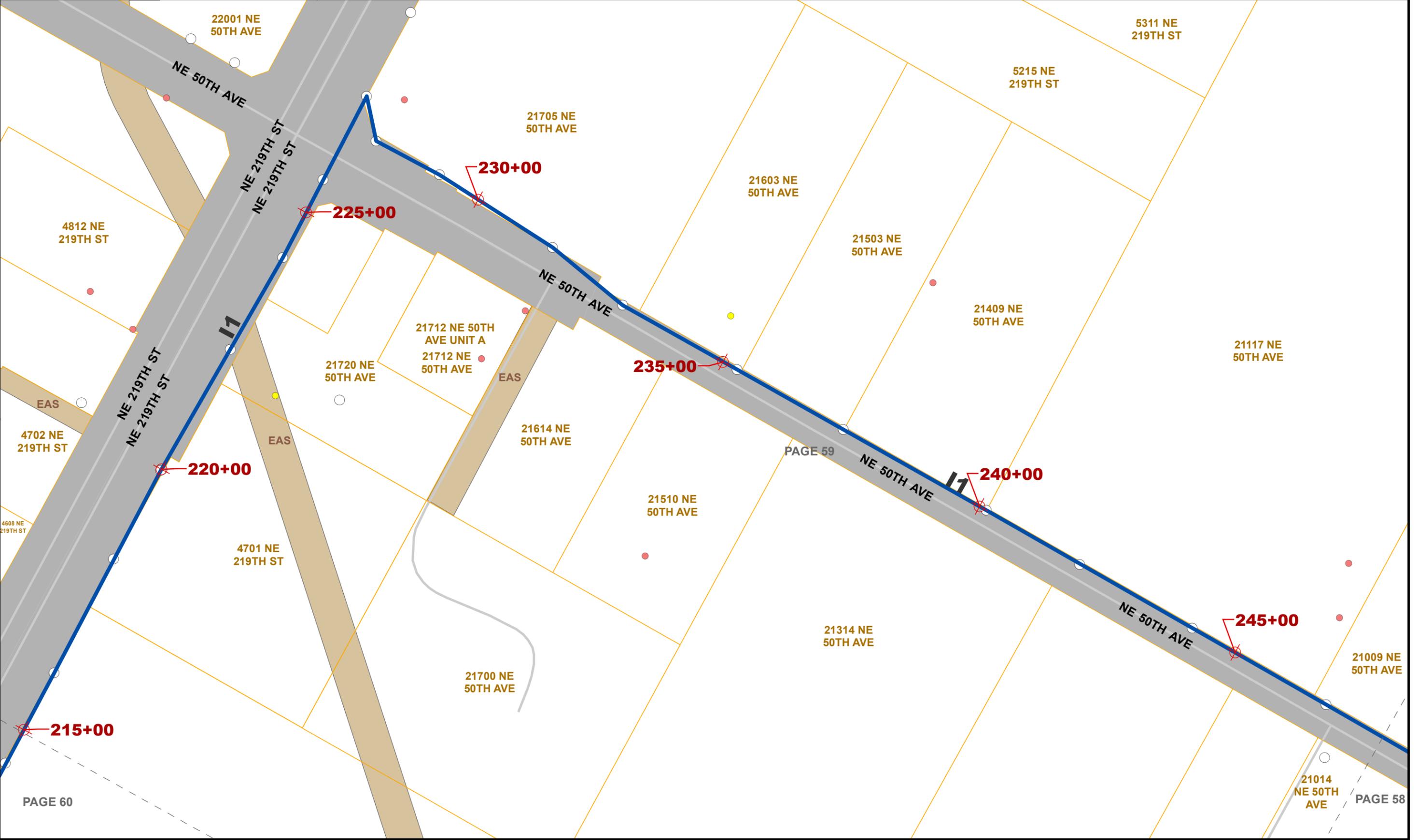
Project **Ridgefield Fiber**
 Revision: Date: 6/14/2016

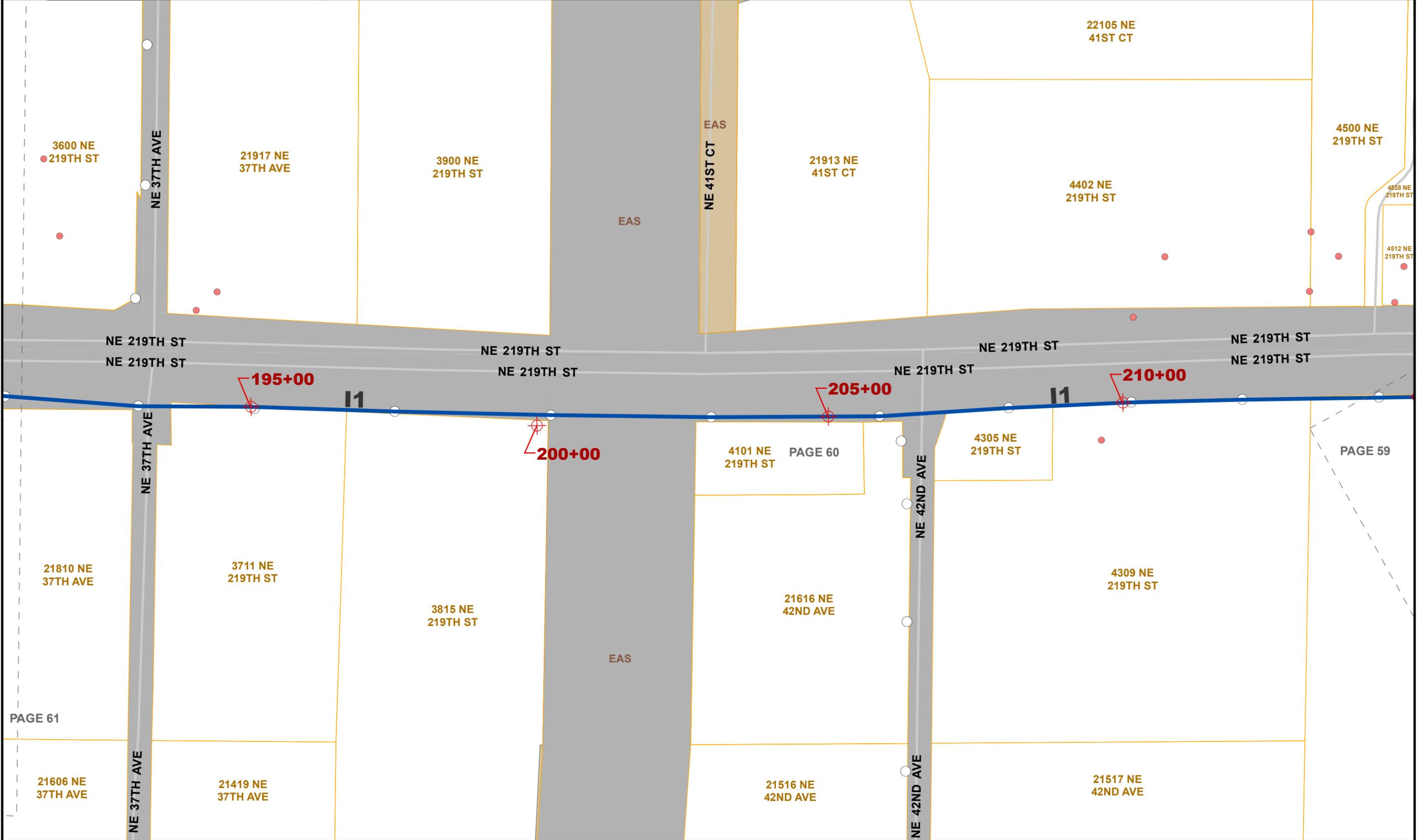
Page 58 of 87
 Total Fiber: 222,672 ft

State WA County CLARK
 Poles Intersected: 996

Absolute Scale **1:1,800**
 Relative Scale **1 inch = 150 feet**

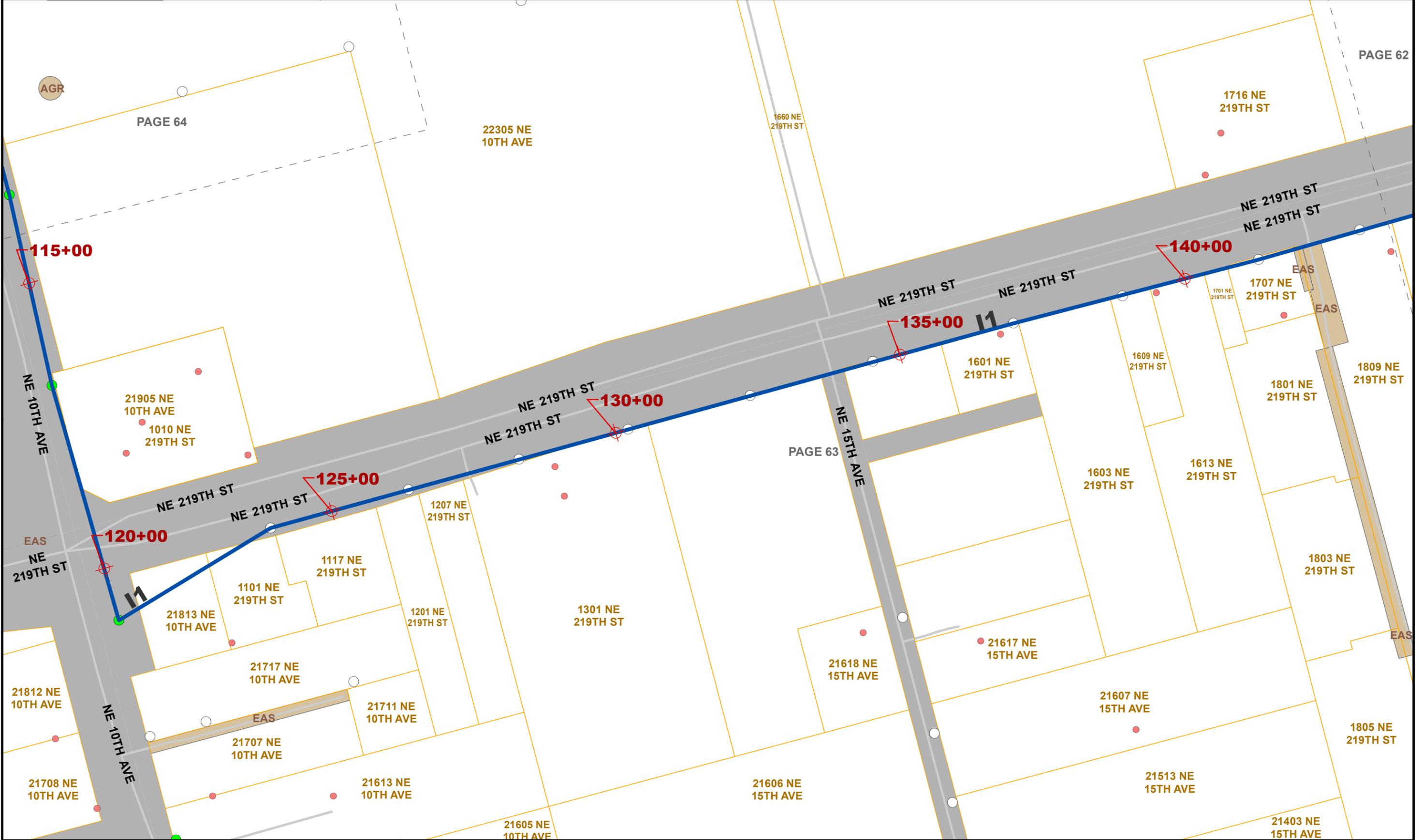


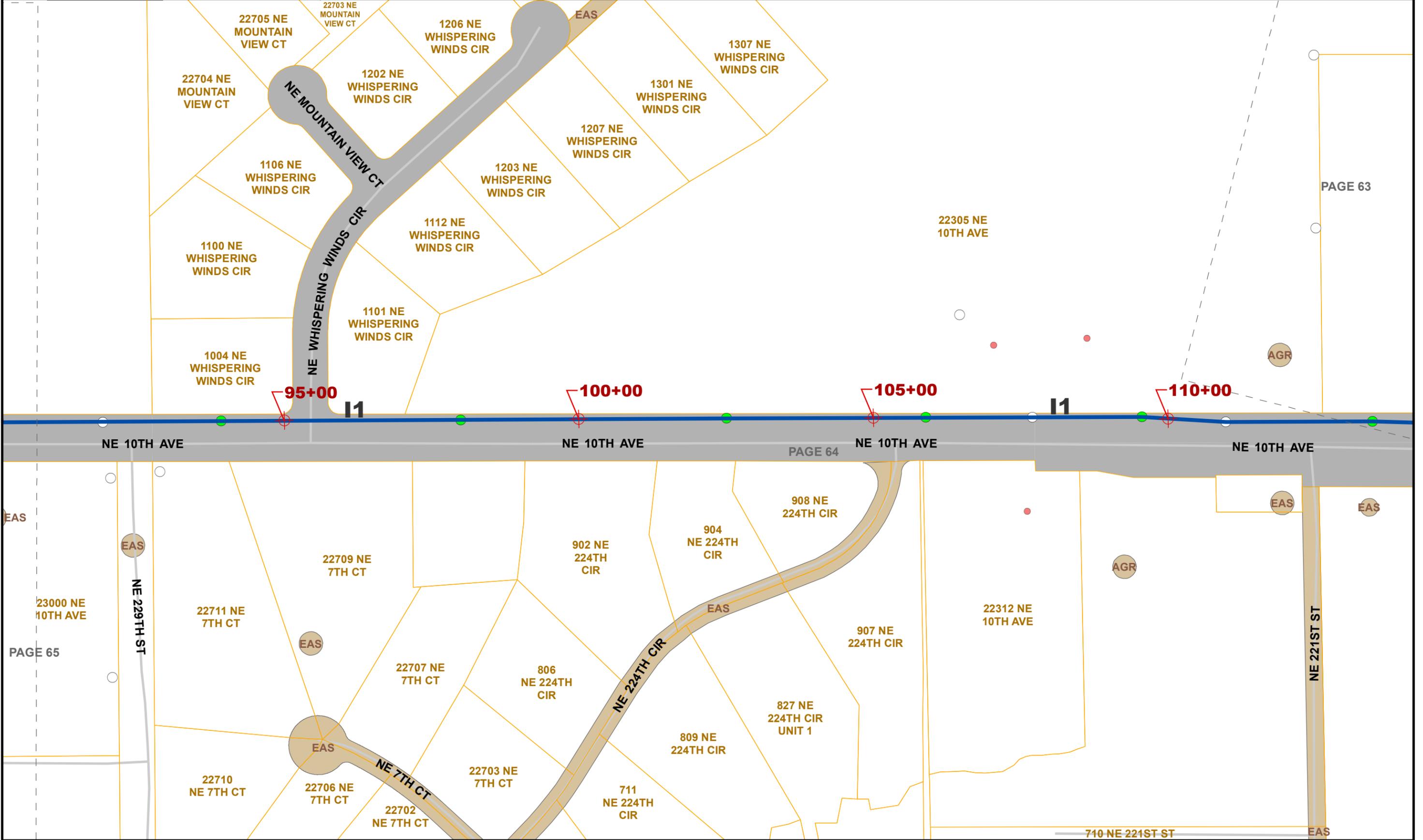


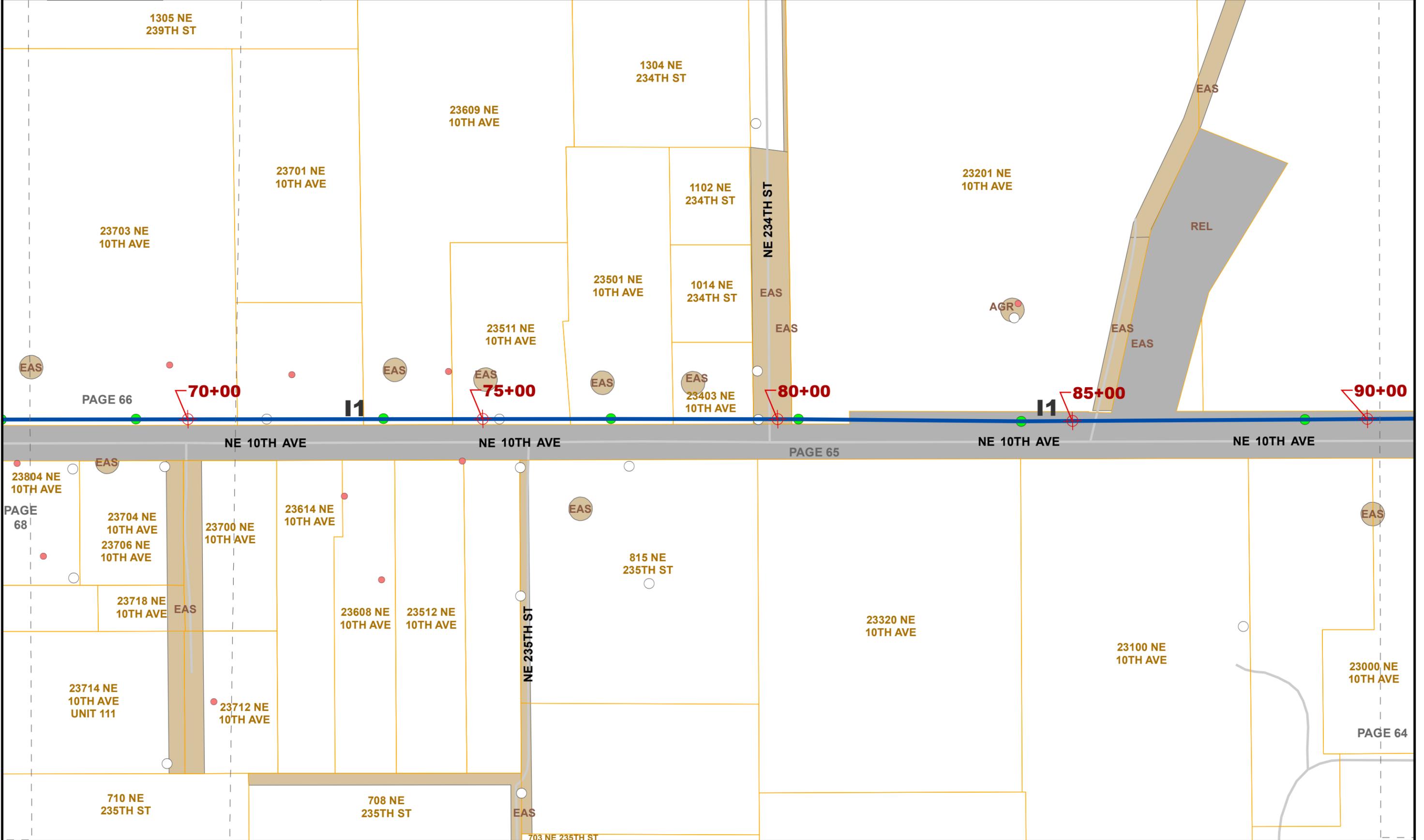


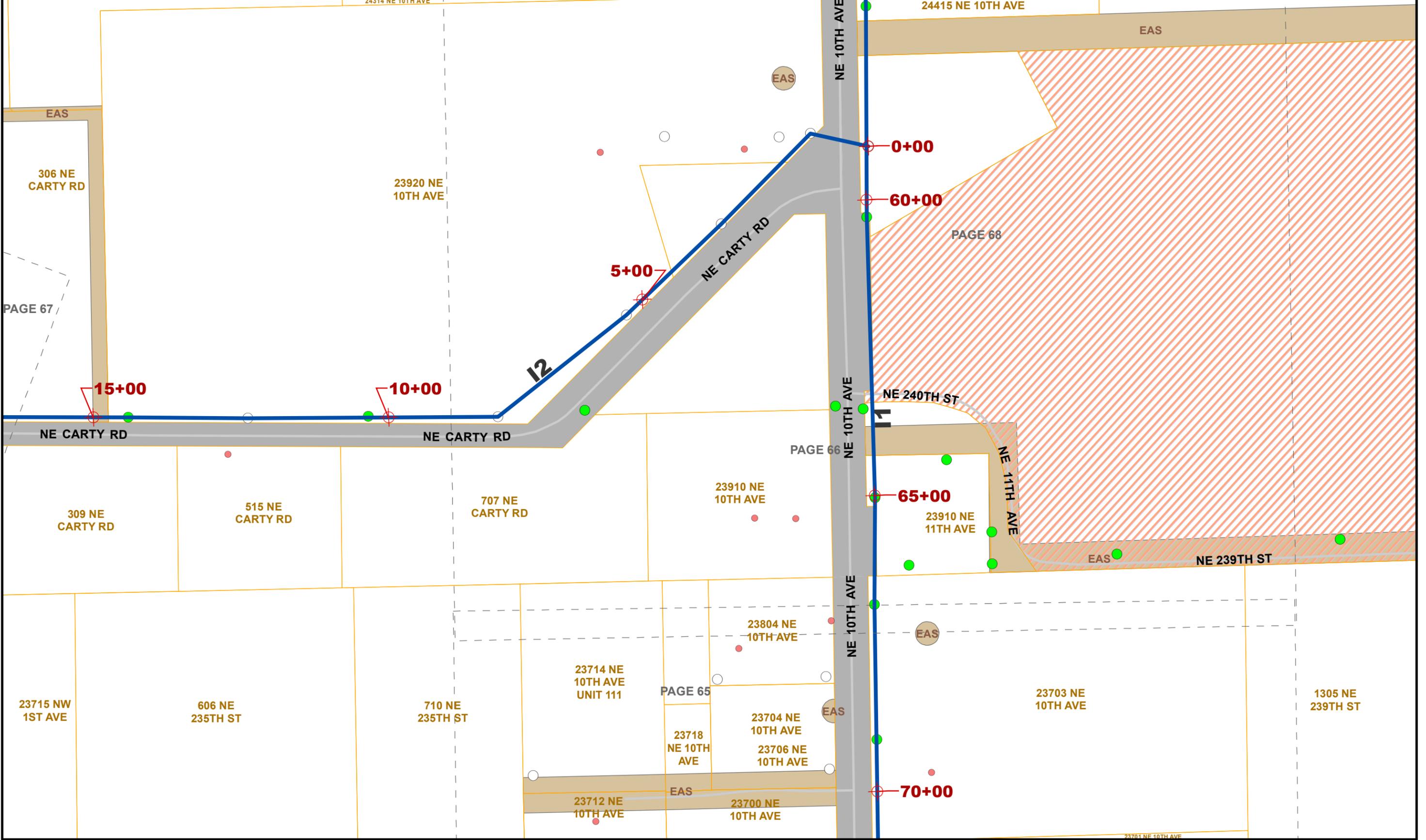


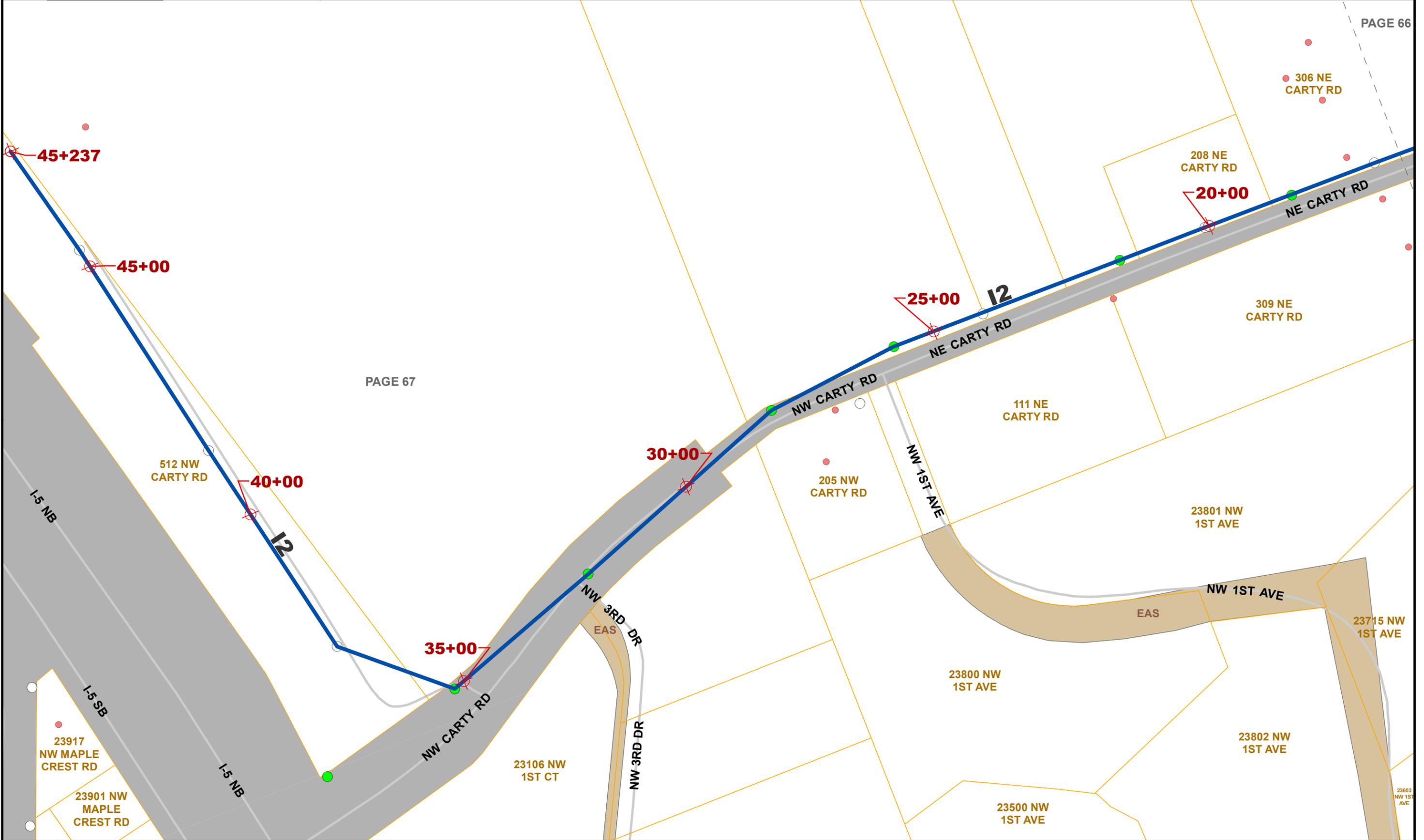


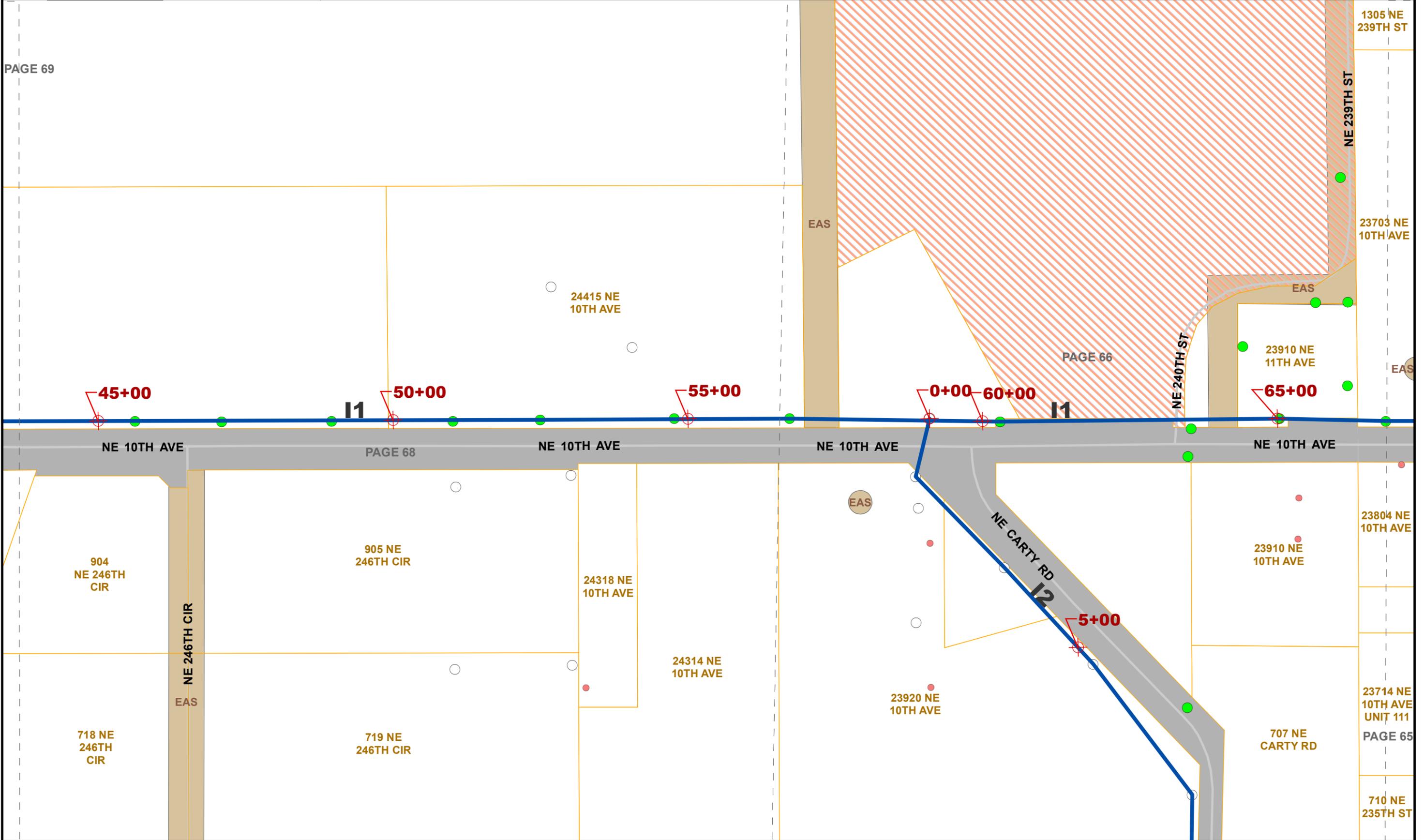


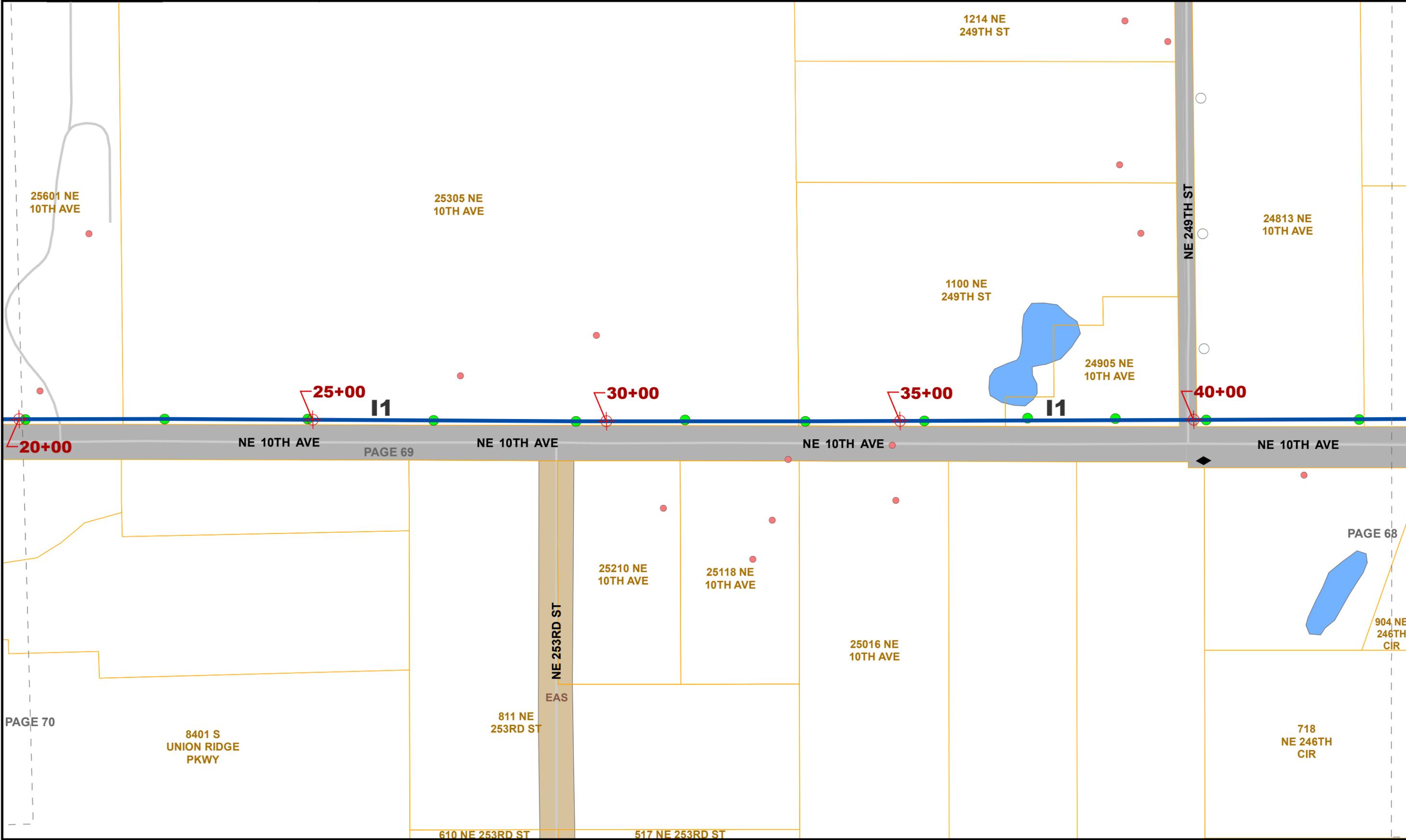


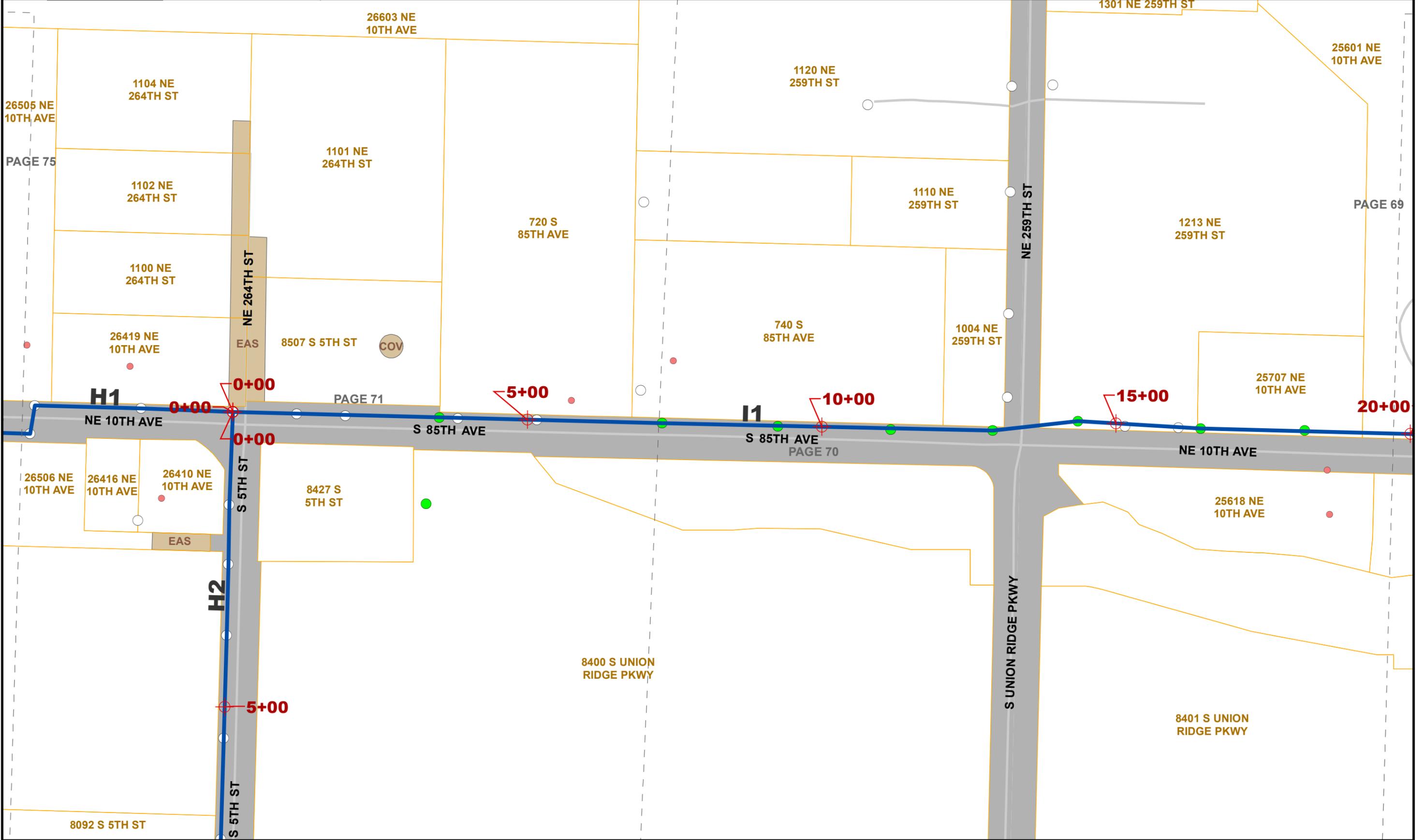


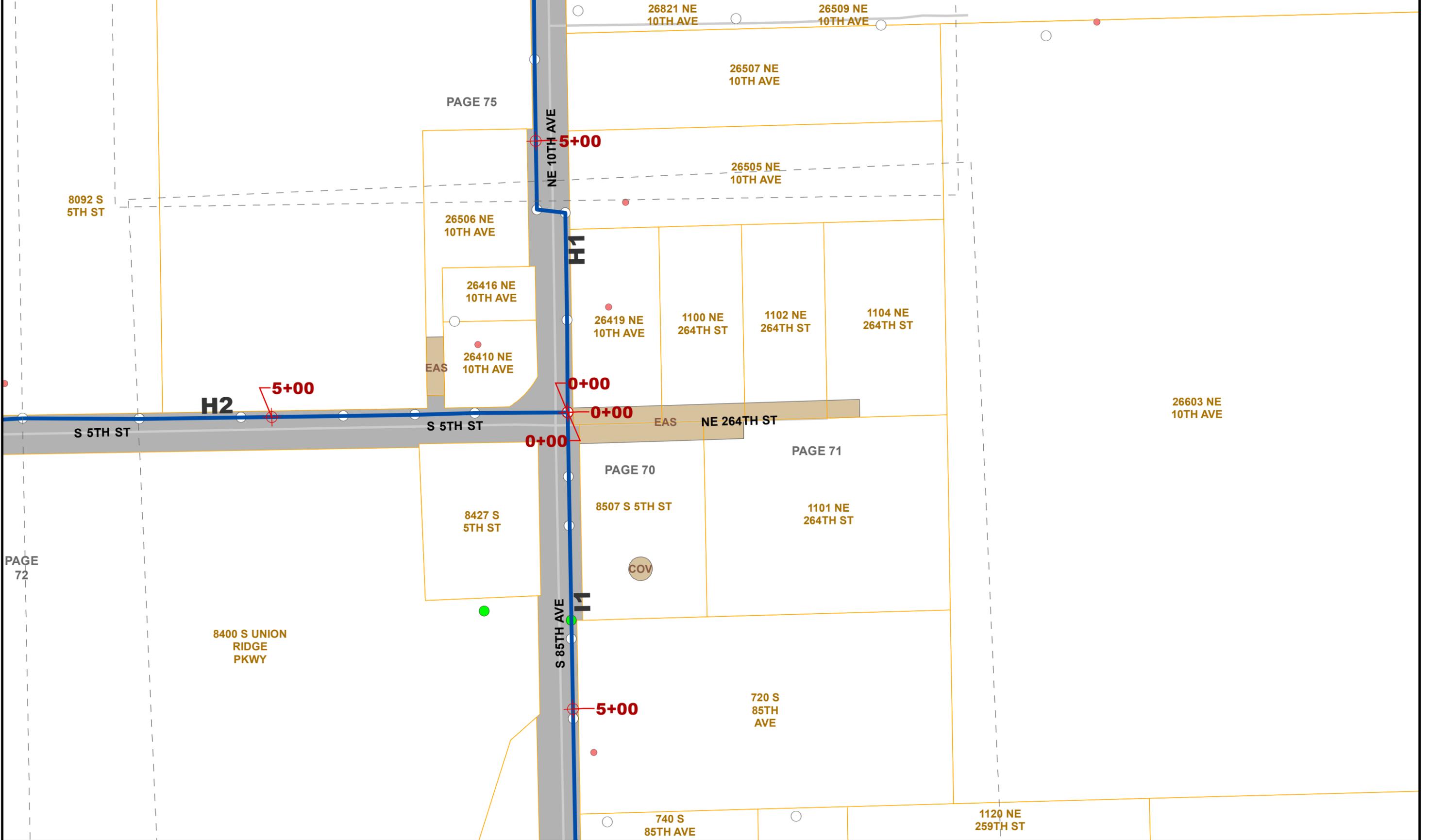


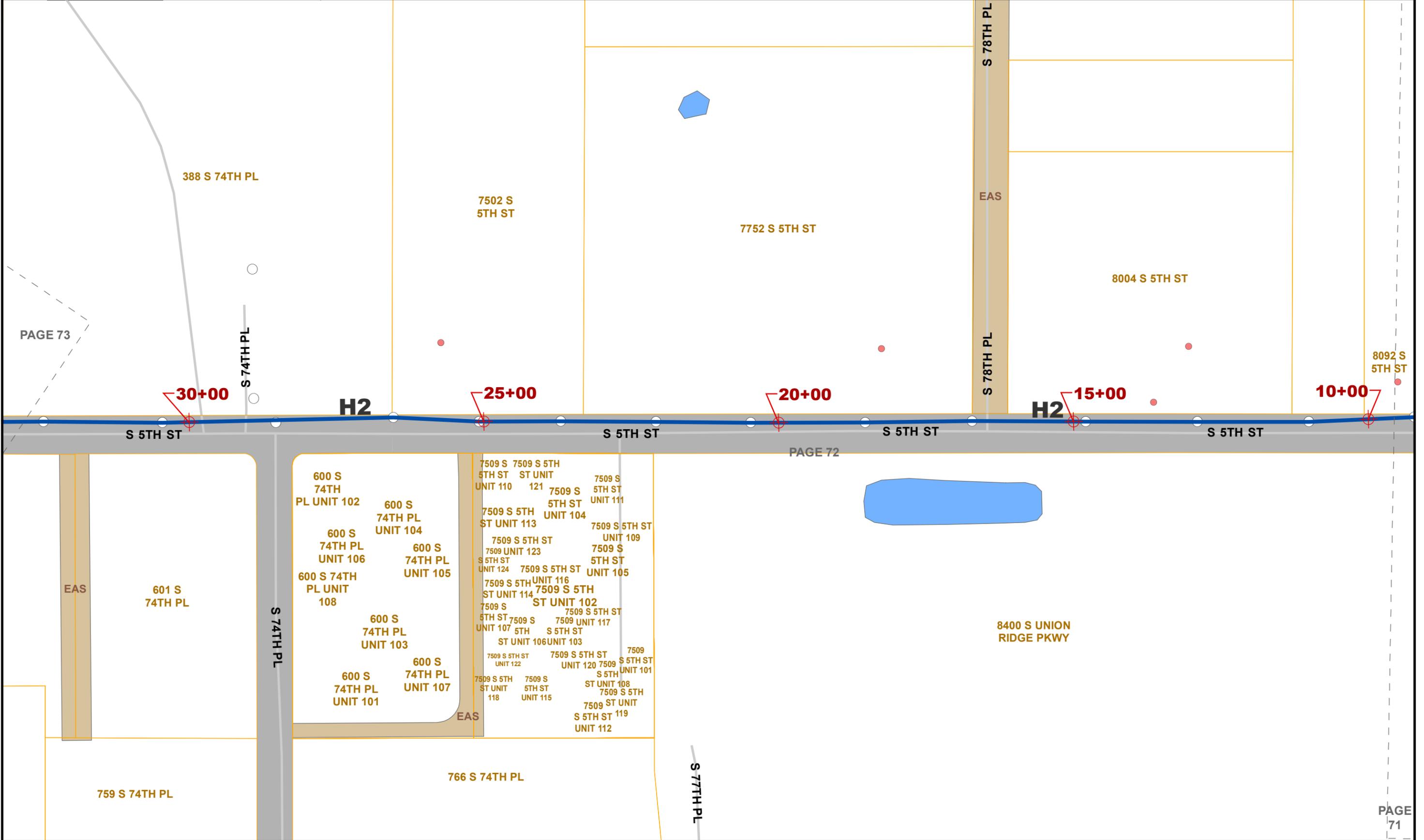




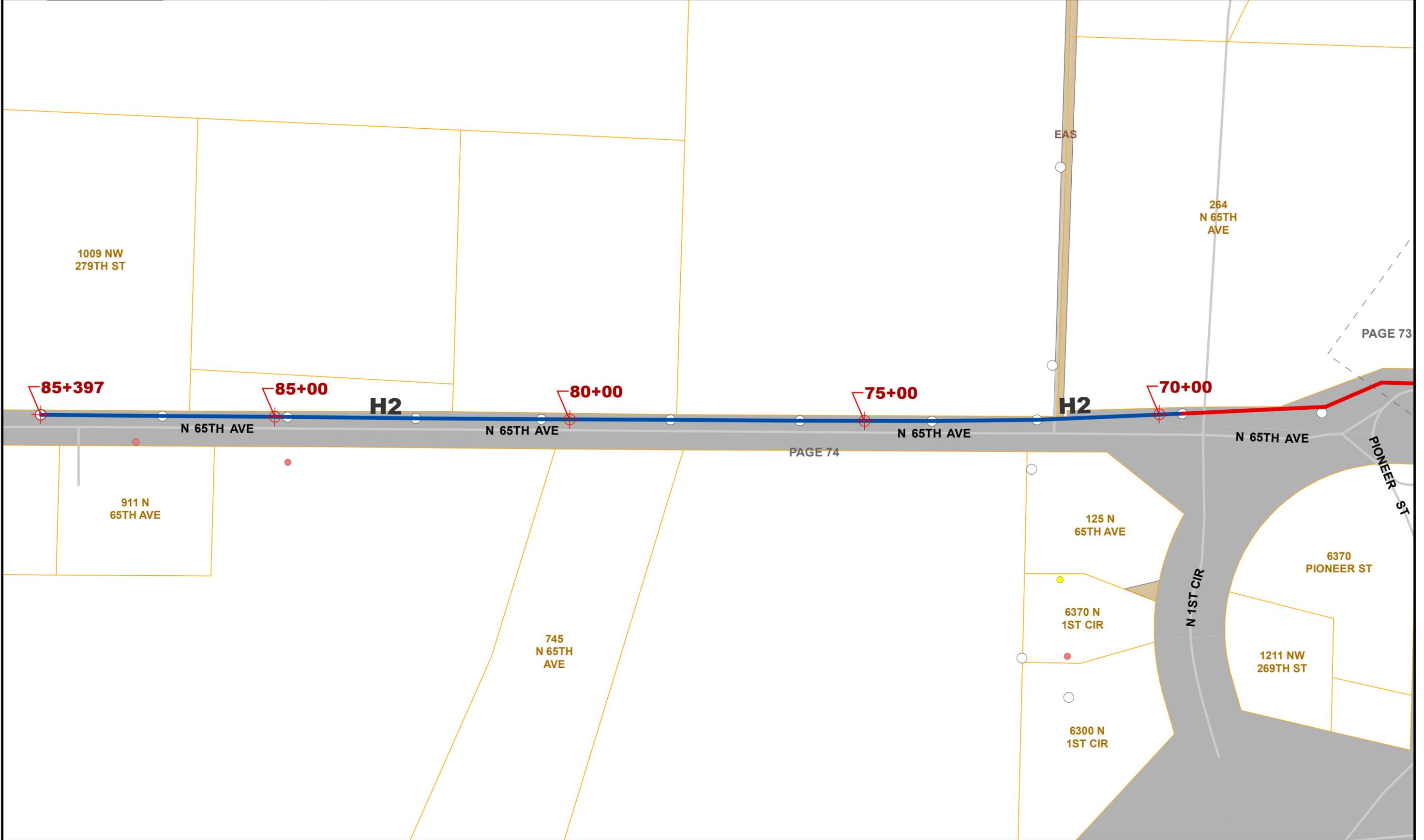


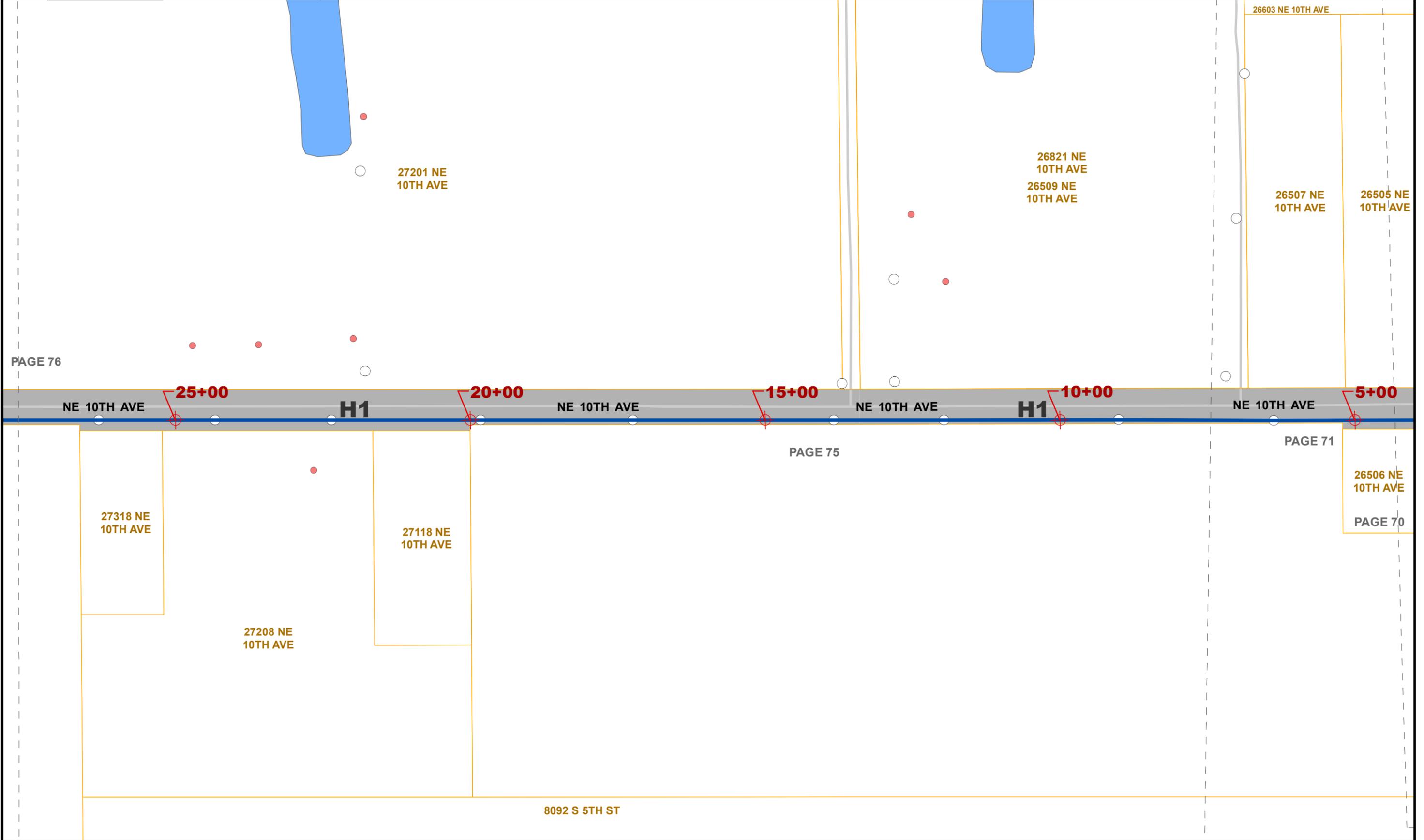




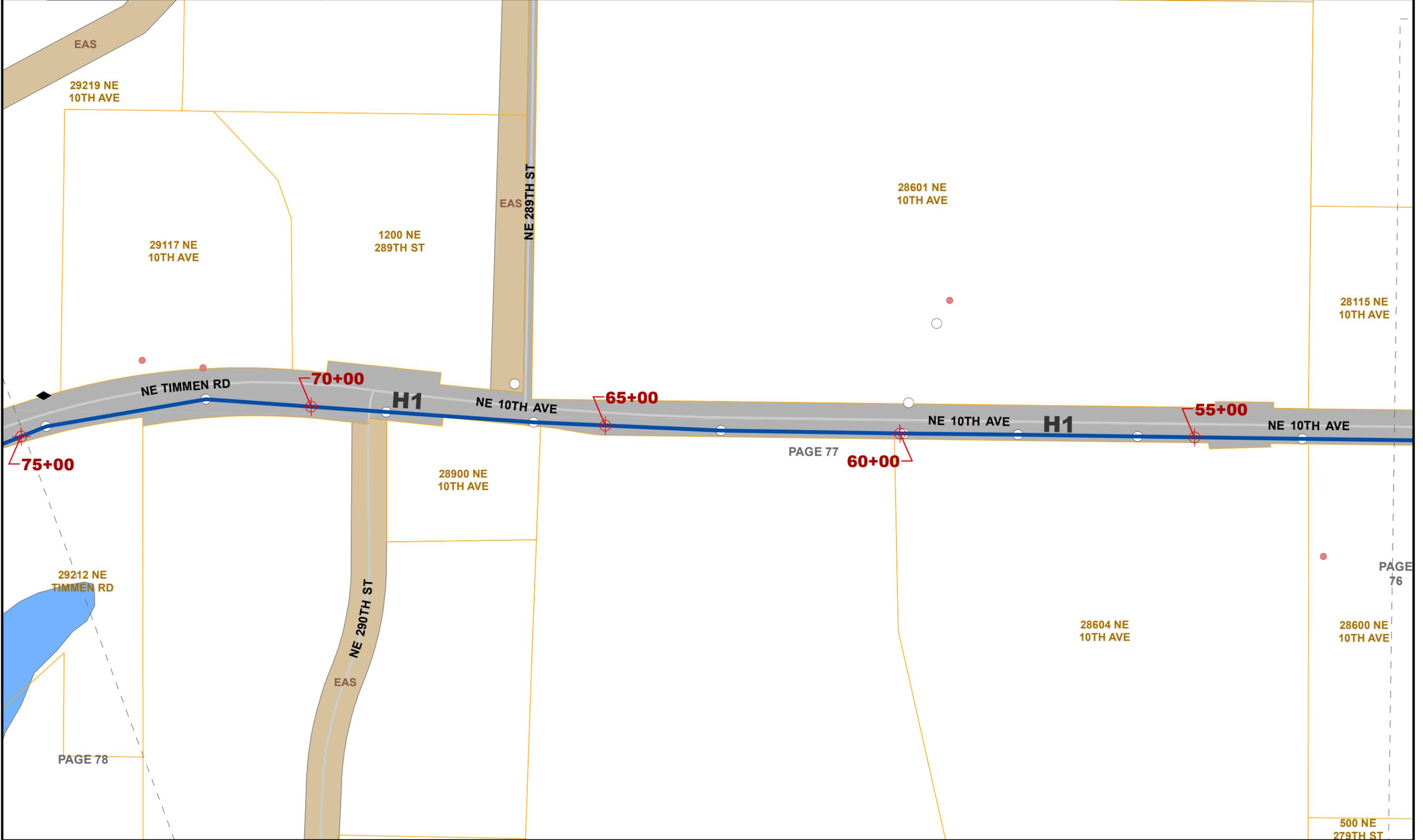














— Aerial ⚓ Stationing
 — Buried █ ROW

Staked by: **RCG** Date: 6/14/2016
 Placed by: **RCG** Date: 6/14/2016

Project **Ridgefield Fiber**
 Revision: Date: 6/14/2016

Page 78 of 87
 Total Fiber: 222,672 ft

State WA County CLARK
 Poles Intersected: 996

Absolute Scale **1:1,800**
 Relative Scale **1 inch = 150 feet**

