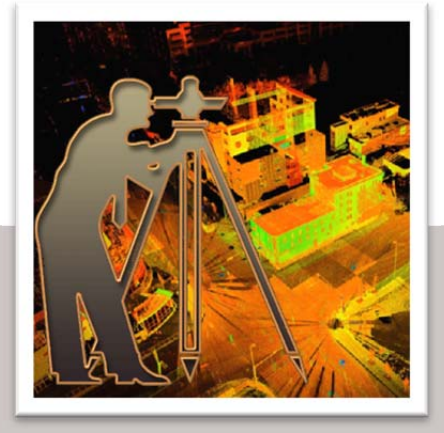
# BRAGG CREEK ASP NETWORK REVIEW

## Traffic Impact Assessment

Date: January 2020



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# BRAGG CREEK ASP – NETWORK REVIEW

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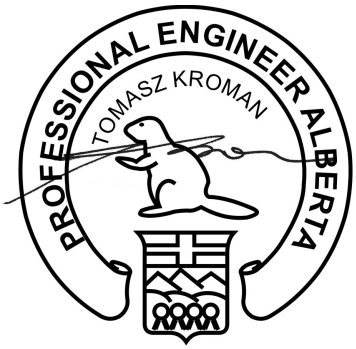


January 15, 2020

PERMIT TO PRACTICE
WATT CONSULTING GROUP LTD.
Signature
Date January 15, 2020
PERMIT NUMBER: P 3818
The Association of Professional Engineers, Geologists and Geophysicists of Alberta

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| | |
|---|---|
| Prepared for: | Rocky View County |
| Our File: | 3685.T01 |
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# 1.0 INTRODUCTION

## 1.1 STUDY BACKGROUND

Rocky View County (RVC) is currently reviewing its plans related to the existing and future development in the Bragg Creek area and has retained Watt Consulting to complete the transportation network analysis in support of this Bragg Creek Area Structure Plan (ASP).

The Hamlet of Bragg Creek (Hamlet) is centred on Highway 22 at the confluence of the Elbow River and Bragg Creek. The existing Hamlet includes a mix of country and hamlet residential and hamlet commercial land uses as defined by the Rocky View County land use bylaws. RVC has developed the long-term Hamlet growth concept plans that require a review in terms of the impact of the planned development on the transportation network and identification of the required network improvements to ascertain if the transportation network will provide the proper long-term level of service.

The main objective of this study is a review of the existing capacity and operational conditions of the transportation network in the area, identification of the future traffic volumes and the required related network improvements to provide an acceptable long term level of service (LOS). The ASP study area is shown in **Figure 1**.

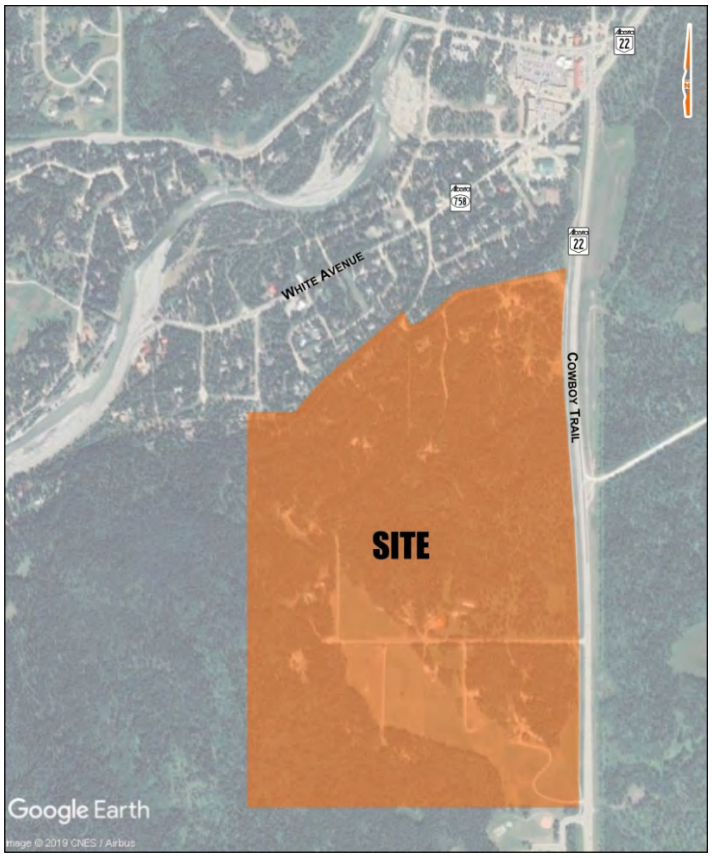



**Figure 1 Study Area**

## 1.2 SCOPE OF WORK

The following scope of work was identified by the RVC staff and summarized in the RFP as follows:

**Bragg Creek ASP Project –Scope of Work (Transportation)**

- Review of existing plans and background information for the area;
- Review of the existing network for capacity and operational conditions;
- Development of traffic estimates, assumptions, and trip generations based on the two land use scenarios within the Bragg Creek expansion area (scenarios and population densities are provided);
- Updates to the existing network model to include future planned infrastructure (i.e. Alberta Transportation (AT) improvements) and other considerations (i.e. secondary access routes, etc.) that are applicable;
- Traffic Counts at key intersections (i.e. East Park Place / Highway 22, and others recommended by the consultant);
- Review of any pedestrian cross-sections of concern;
- Network analysis for the different land use scenarios conducted at the build out date and at a 2040 horizon year;
- Identification of right-of-way (r/o/w) widths for roadways within the plan area as well as offsite (i.e. Highway 22);
- Recommendations and identification of intersectional requirements at the intersections of Highway 22 and internal roadways under both Provincial and County jurisdiction;
- Evaluation of regional infrastructure connections, their timing and possible construction cost
- Identification of current and future constraints (i.e. triggers for improvements, areas where level of service is below the County Servicing Standards and AT standards, etc.) and impacts of the Hamlet expansion area on the road network; and
- Recommendations on infrastructure upgrades within the study area under both Provincial and County jurisdictions.

# 2.0 TRANSPORTATION NETWORK

## 2.1 EXISTING ROAD NETWORK

The ASP study area is located in the southern part of the Hamlet of Bragg Creek, along the west side of Highway 22. It should be noted that the study area includes a road network under the authority, management and control of two different road authorities, namely Rocky View County and Alberta Transportation. Highways 22 and 758 are under the jurisdiction, management and control of Alberta Transportation (AT) while the remaining roads are under the jurisdiction, management and control of RVC.

- **Highway 22** is a two-lane north-south paved provincial highway with a posted speed limit of 80 km/h in the ASP vicinity and located east of the ASP area.
- **Highway 758 / White Avenue** is a two-lane north-south paved provincial highway with a posted speed limit of 40 km/h in the ASP vicinity and located north of the ASP area.
- **Burney Road** is a two lane gravel road with a posted speed limit of 40 km/h under the jurisdiction of RVC and located north of the ASP.
- **Park Place** is a two lane gravel road with a posted speed limit of 40 km/h under the jurisdiction of RVC and located north of the ASP.
- **East Park Place** is a two lane gravel road with a posted speed limit of 40 km/h under the jurisdiction of RVC and located within the ASP.

The existing road network with the existing lane configuration is shown in **Figure 2**. All intersections within the study area currently operate as either STOP controlled or uncontrolled intersections.

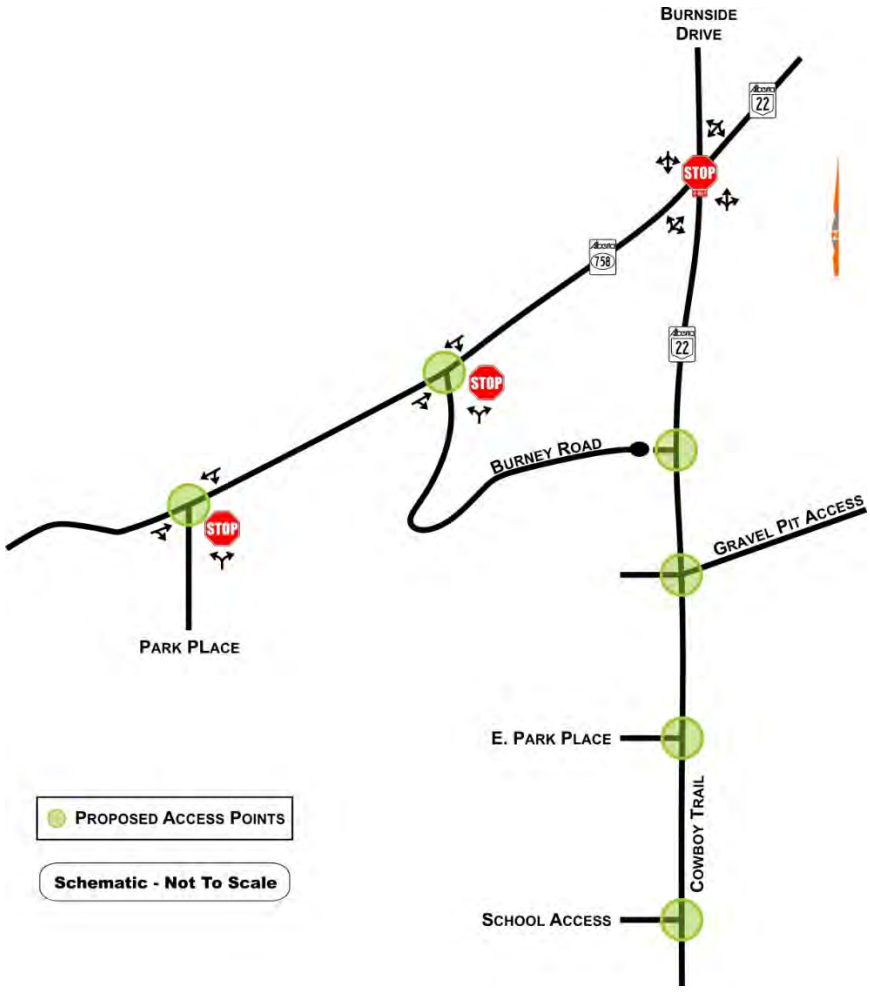



**Figure 2 Existing Transportation Network**

## 2.2 FUTURE ROAD NETWORK

The long-term plans for the transportation network improvements in the study area include an upgrade of the intersection of Highway 22/ White Avenue to a roundabout. Although the timing of those improvements is unknown at this time, analysis was conducted with and without these improvements. Also, for the purpose of the analysis, it has been assumed that the planned upgrades would be realized within the next five years. The future road network is shown in **Figure 3**.


**Figure 3 Future Road Network**

## 3.0 ANALYSIS

The analysis included:

- Review of the existing capacity and operational conditions.
- Identification of the external access points providing access to the planned development.
- Traffic forecast for 5, 10 and 20 year horizons.
- Review of the capacity and operational conditions for the 5, 10 and 20 year horizons including identification of access points into the ASP area and evaluation of their impact on network performance.
- Identification of improvement required.
- Selection of road cross-sections for the ASP area.
- Comments pertaining to accommodation of alternative modes of transportation

The methodology, assumptions, results of the analysis, conclusions and recommendations stemming from those results are summarized in the subsequent sections of this report.

### 3.1 INTERSECTION PERFORMANCE EVALUATION

The operating conditions during the peak hours at the studied intersections were evaluated using the Synchro/SimTraffic software package, which is based on the Highway Capacity Manual (HCM 2010) evaluation methodology.

For un-signalized (stop-controlled) intersections, the Level-of-Service (LOS) is based on the computed delays on each of the critical movements. LOS 'A' represents minimal delays for minor-street traffic movements, and LOS 'F' represents a scenario with an insufficient number of gaps on the major street for minor street motorists to complete their movements without significant delays.

For signalized intersections, the methodology considers the intersection geometry, traffic volumes, traffic signal phasing/timing plan, and also pedestrian volumes. The average delay for each lane group is calculated, as well as the delay for the overall intersection. The operating conditions can also be expressed in terms of volume to capacity (v/c) ratios. LOS criteria for both unsignalized and signalized intersections, as summarized in the Highway Capacity Manual, are illustrated in **Table 1**.

For the purpose of this study, LOS C or better was considered an acceptable intersection LOS with LOS D or better being considered acceptable for any single approach as per the 2017 Alberta Transportation TIA Technical Requirements Southern Region Supplement.

**TABLE 1: LOS CRITERIA FOR INTERSECTIONS**

| Level of Service (LOS) | Average Delay for UNSIGNALIZED Intersection Movements | Average Delay for SIGNALIZED Intersection Movements | Average Delay for ROUNDABOUT Intersection Movements |
|---|---|---|---|
| A | 0 – 10 seconds per vehicle | 0 – 10 seconds per vehicle | 0 – 10 seconds per vehicle |
| B | > 10 – 15 seconds per vehicle | > 10 – 20 seconds per vehicle | > 10 – 15 seconds per vehicle |
| C | > 15 – 25 seconds per vehicle | > 20 – 35 seconds per vehicle | > 15 – 25 seconds per vehicle |
| D | > 25 – 35 seconds per vehicle | > 35 – 55 seconds per vehicle | > 25 – 35 seconds per vehicle |
| E | > 35 – 50 seconds per vehicle | > 55 – 80 seconds per vehicle | > 35 – 50 seconds per vehicle |
| F | > 50 seconds per vehicle | > 80 seconds per vehicle | > 50 seconds per vehicle |

## 3.2 EXISTING CONDITIONS

Analysis of the existing conditions was carried out for the following intersections:

- Highway 22 / White Avenue
- White Avenue / Burney Road
- White Avenue / Park Place

The results of the analysis are summarized in the subsequent sections of this report.

### 3.2.1 EXISTING TRAFFIC VOLUMES

The existing AM and PM peak hour traffic volumes were obtained from Wood Environment & Infrastructure Solutions (February 2019 count), and from traffic counts conducted by WATT at White Avenue / Burney Road and White Avenue / Park Place intersections on Tuesday September 24th and Wednesday September 25th 2019 respectively. The existing AM and PM peak hour traffic volumes are shown in **Figure 4** below.

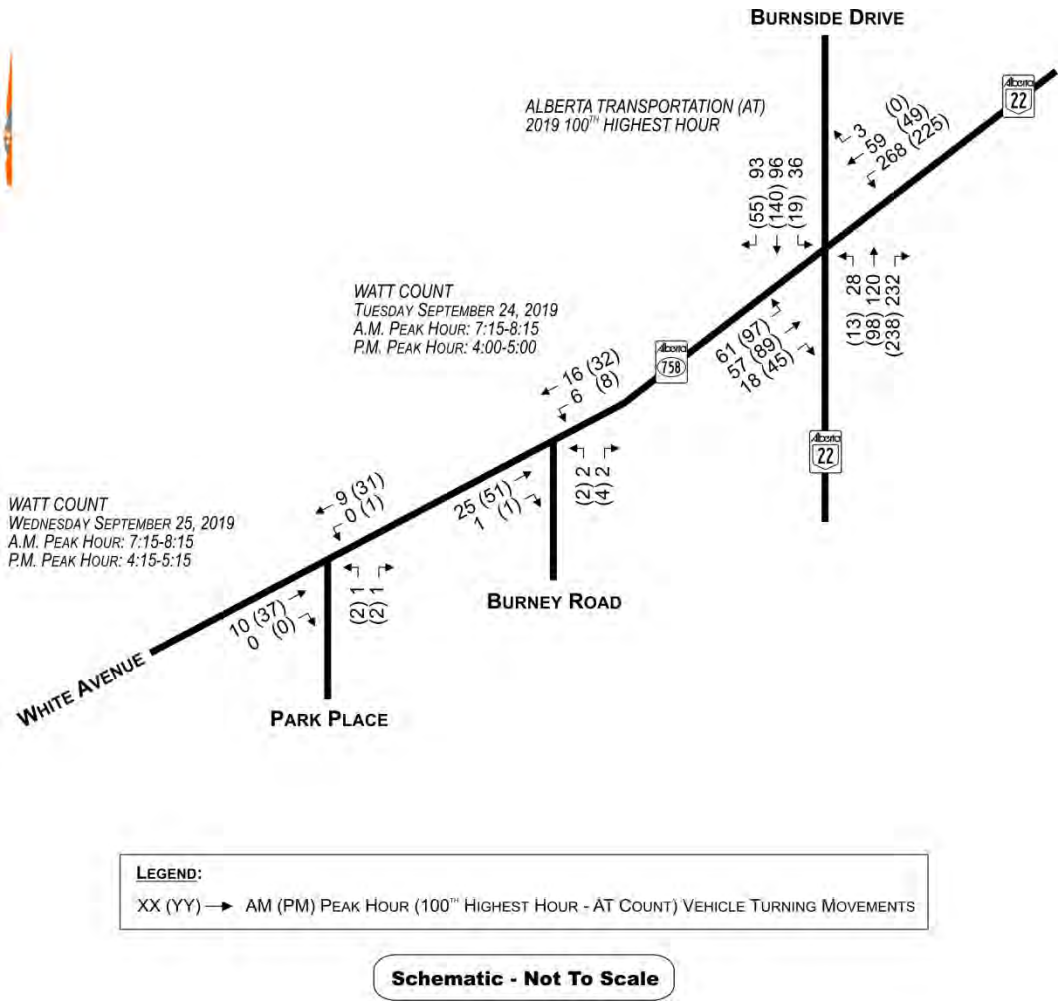



**Figure 4: Existing AM / PM Peak Hour Volumes**

### 3.2.2 EXISTING OPERATING CONDITIONS

Results of the analysis of the existing operating conditions for the intersections of Highway 22 / White Avenue, White Avenue / Burney Road and White Avenue / Park Place are summarized in **Table 2** below.

The results of the analysis indicate that all intersections currently operate at an acceptable level of service.

## TABLE 2 EXISTING CONDITIONS

| EXISTING OPERATING CONDITIONS | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| INTERSECTION / MOVEMENT | | | AM PEAK HOUR | | | | PM PEAK HOUR | | | |
| | | | v/c Ratio | LOS | Delay (s) | Queue (m) | v/c Ratio | LOS | Delay (s) | Queue (m) |
| Park Place / White Avenue (Stop-Controlled) | EB | Through | 0.01 | A | 0.0 | 0.0 | 0.02 | A | 0.0 | 0.0 |
| | | Right | 0.01 | A | 0.0 | 0.0 | 0.02 | A | 0.0 | 0.0 |
| | WB | Left | 0.00 | A | 0.0 | 0.0 | 0.00 | A | 0.0 | 0.0 |
| | | Through | 0.00 | A | 0.0 | 0.0 | 0.00 | A | 0.2 | 0.0 |
| | NB | Left | 0.00 | A | 8.5 | 0.0 | 0.00 | A | 8.7 | 0.1 |
| | | Right | 0.00 | A | 8.5 | 0.0 | 0.00 | A | 8.7 | 0.1 |
| | Intersection Summary | | - | **A** | **0.7** | - | - | **A** | **0.5** | - |
| Burney Road / White Avenue (Stop-Controlled) | EB | Through | 0.02 | A | 0.0 | 0.0 | 0.03 | A | 0.0 | 0.0 |
| | | Right | 0.02 | A | 0.0 | 0.0 | 0.03 | A | 0.0 | 0.0 |
| | WB | Left | 0.00 | A | 0.0 | 0.1 | 0.01 | A | 0.0 | 0.1 |
| | | Through | 0.00 | A | 2.1 | 0.1 | 0.01 | A | 1.5 | 0.1 |
| | NB | Left | 0.00 | A | 8.6 | 0.1 | 0.01 | A | 8.8 | 0.2 |
| | | Right | 0.00 | A | 8.6 | 0.1 | 0.01 | A | 8.8 | 0.2 |
| | Intersection Summary | | - | **A** | **1.5** | - | - | **A** | **1.1** | - |
| Hwy 22 / White Avenue (Stop-Controlled) | NB | Left/Through/ Right | 0.68 | C | 20.3 | 5.1 | 0.64 | C | 18.9 | 4.4 |
| | SB | Left/Through/ Right | 0.43 | B | 14.1 | 2.1 | 0.43 | B | 14.4 | 2.1 |
| | EB | Left/Through/ Right | 0.28 | B | 12.7 | 1.2 | 0.47 | C | 15.4 | 2.4 |
| | WB | Left/Through/ Right | 0.65 | C | 20.9 | 4.6 | 0.56 | C | 18.0 | 3.4 |
| | Intersection Summary | | - | **C** | **18.2** | - | - | **C** | **17.0** | - |

## 3.3 BRAGG CREEK DEVELOPMENT

Detailed information received from RVC staff detailing the expected growth within the Hamlet and in the outlying areas surrounding Bragg Creek is included in **Appendix A**.

### 3.3.1 EXISTING LAND USE SCENARIOS

The land uses within the Hamlet are defined by the Rocky View County Land Use Bylaw as Hamlet Residential Single-Family District (HR-1) Hamlet Commercial District (HC) and Country Residential Districts of R-1, R-2, and R-3.

### 3.3.2 TRAFFIC GENERATION RATE

In discussions with RVC staff, ITE trip generation rates were used for the Hamlet and the Bragg Creek ASP expansion area in keeping with the TIA requirements defined by Alberta Transportation.

### 3.3.3 TRAFFIC FORECAST MODEL AND GROWTH ASSUMPTIONS

The traffic forecast was carried out using the Rocky View County traffic-forecasting model updated with the most current information available pertaining to population and employment within the Hamlet boundaries. The model zone system used in the analysis is shown in **Figure 5**.

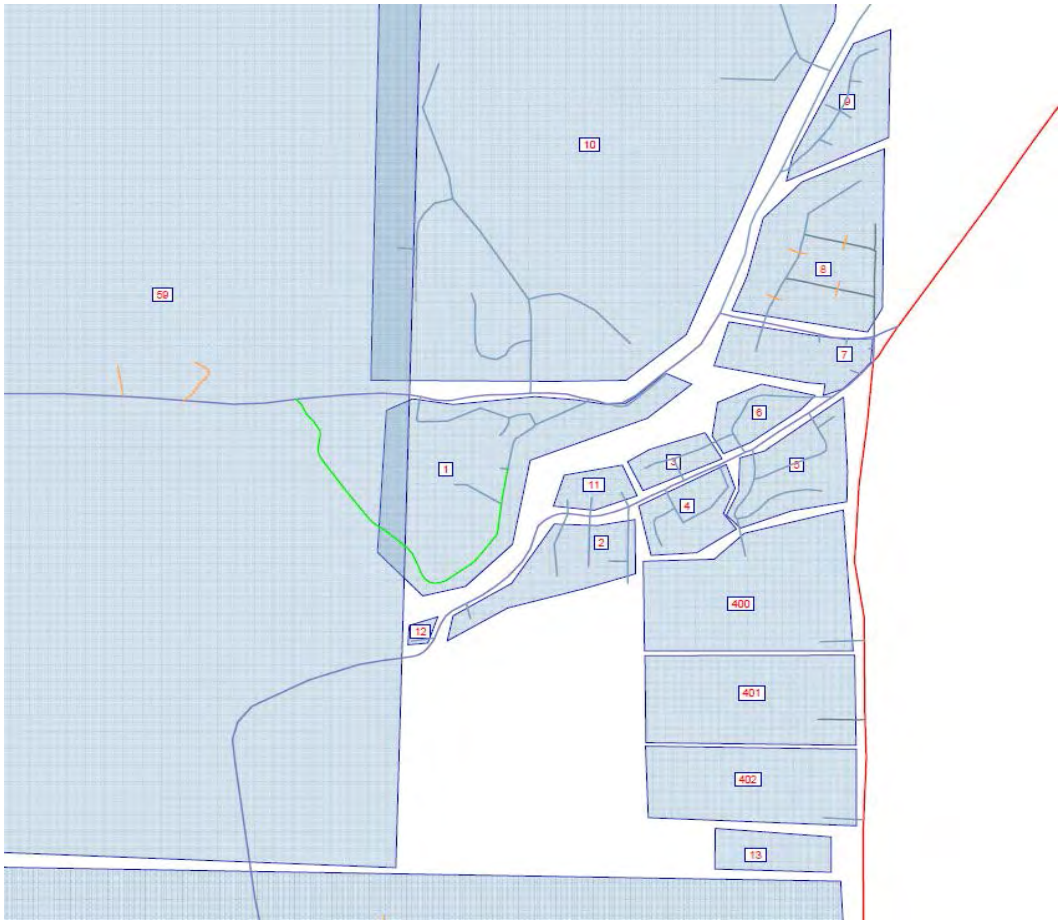



**Figure 5 Zone system used in the analysis**

## 3.4 FUTURE DEVELOPMENT

Detailed information pertaining to the future development expected in the area was provided by RVC and is included in **Appendix A**.

### 3.4.1 PROPOSED LAND USE

Two land use scenarios were considered in this analysis and are summarized in **Table 3**. The planned ASP area is to include only residential development in both land use scenarios.

**TABLE 3: ANALYZED LAND USE SCENARIOS**

| | Land Use Scenario 1 | | Land Use Scenario 2 | |
|---|---|---|---|---|
| Year | Starting Population | Final Population | Starting Population | Final Population |
| Year 0 to Year 5 | 20 | 20 | 20 | 20 |
| Year 5 to Year 20 | 20 | 864 | 20 | 1271 |

### 3.4.2 TRAFFIC GENERATION

Based on the land use information provided by RVC, the expected numbers of trips generated by the considered land use scenarios are summarized in **Table 4**. As PM peak hour represents the highest volume during the 24 h period, the PM peak volumes were selected to be used in further analysis.

**TABLE 4: TRIP GENERATION**

| Land use | Units | TRIP GENERATION RATE | | | | TRIPS GENERATED PM PEAK HOUR | | | Comments |
|---|---|---|---|---|---|---|---|---|---|
| | | PM PEAK HOUR (IB/OB) | | | | TOTAL | IB | OB | |
| Residential(Single Family) Scenario 1 | 320 | 0.99 | / 1000 sqft | 66% | 34% | 317 | 209 | 108 | 10th Edition ITE 210 |
| Residential(Single Family) Scenario 2 | 471 | 0.99 | / 1000 sqft | 66% | 34% | 466 | 308 | 159 | 10th Edition ITE 210 |

## 3.5 PROPOSED ACCESS SCHEME

One of the purposes of this analysis was to determine the optimal access scheme for the proposed development. To address this issue and based on the network surrounding the proposed development, six different access locations were considered (**Figure 2**). These analyzed access concepts included:

1. Park Place via White Avenue
2. Burney Road via White Avenue
3. Burney Road via Highway 22
4. Gravel Pit Access via Highway 22
5. East Park Place via Highway 22
6. Banded Peak School via Highway 22

All access locations were reviewed based on two criteria; the sight distance at the access location and traffic interception defined as percentage of traffic generated by the development using the specific access point.

### 3.5.1 SIGHT DISTANCE ANALYSIS

The existing sight distances at all of the proposed access points were determined during the site reconnaissance. The results of the site reconnaissance review are summarized in **Figure 6** below.

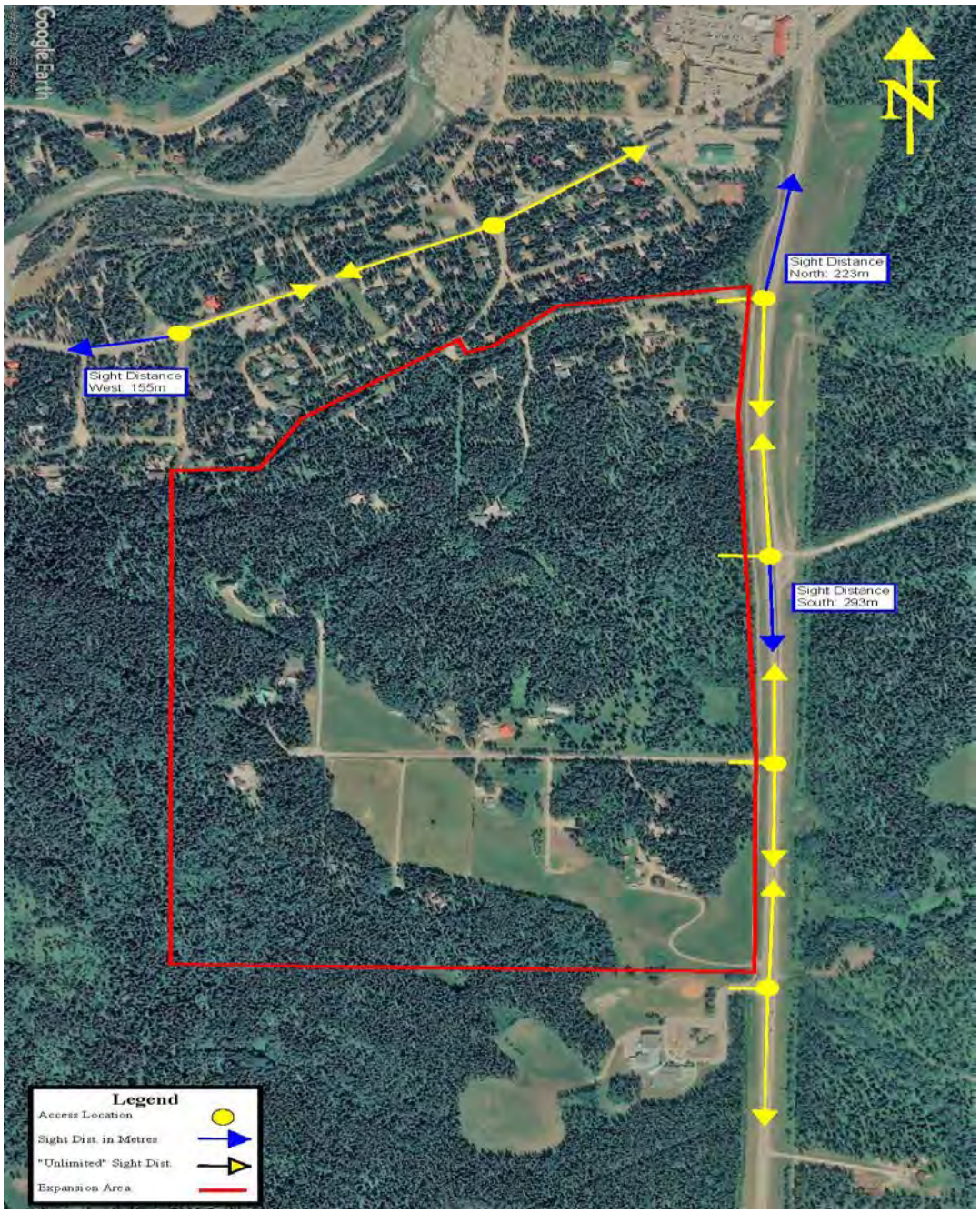



**Figure 6: Site Reconnaissance**

The results of the site reconnaissance indicate that all of the considered access locations meet the required sight distance design guidelines when using the passenger (P) design vehicle. However, during the site reconnaissance it was observed that the potential gravel pit access location to the proposed development may present additional construction challenges given that Highway 22 is in a partial cut to the west side of Highway 22 at this location.

### 3.5.2 TRAFFIC EVALUATION PROCESS

In order to compare the proposed access locations and determine which locations are preferred, they were analyzed in a sequence as summarized in **Table 5**.

**TABLE 5: ACCESS LOCATION ANALYSIS**

| Option | White Avenue | | Highway 22 | | | |
|---|---|---|---|---|---|---|
| | Burney Road | Park Place | Burney Road | Gravel Pit Access | East Park Place | Banded Peak School |
| 1 | • | • | | | | |
| 2 | • | • | • | | | |
| 3 | • | • | | • | | |
| 4 | • | • | | | • | |
| 5 | • | • | | | | • |
| 6 | • | | • | | | |
| 7 | • | | | • | | |
| 8 | • | | | | • | |
| 9 | • | | | | | • |
| 10 | | • | | • | | |
| 11 | | • | | | • | |
| 12 | | • | | | | • |

- Denotes analyzed access location

A sensitivity analysis was also conducted to determine the preferred access on Highway 22 and the effect of multiple accesses to the proposed development. The approach to the sensitivity analysis is summarized in **Table 6** below.

**TABLE 6: ACCESS LOCATION – SENSITIVITY ANALYSIS**

| Option | Highway 22 | | White Avenue | |
|---|---|---|---|---|
| | East Park Place | Banded Peak School | Burney Road | Park Place |
| 1 | • | • | | |
| 2 | • | • | • | • |
| 3 | • | • | • | |
| 4 | • | • | | • |

- Denotes analyzed access location

### 3.5.3 PROPOSED ACCESS SCHEME TRIP DISTRIBUTION

The traffic forecast and traffic generated by the proposed development were assigned to the adjacent road network for each of the analyzed horizons using the Visum traffic modelling software. A detailed summary of the cell by cell assignment is attached in **Appendix B**.

*It should be underlined that the RVC model does not account for alternative modes of transportation and therefore its results should be considered conservative as they do not reflect reductions associated with transit, bicycle and pedestrian only trips.*

The results of the traffic distribution are summarized in **Table 7**. For evaluation purposes, only the 20 year time horizon was analyzed as the recommended access management scheme should operate at an acceptable LOS past the 20 year horizon.

### TABLE 7: COMPARISON OF ACCESS OPTIONS TRAFFIC DISTRIBUTION

| Scenario 1 | | | Scenario 2 | | |
|---|---|---|---|---|---|
| Access Point | 20 Year Volume | % of Volume | Access Point | 20 Year Volume | % of Volume |
| **No Access to Highway 22** | | | | | |
| Park Place | 74 | **39%** | Park Place | 109 | **40%** |
| Burney Road | 114 | **61%** | Burney Road | 166 | **60%** |
| **White Avenue (Park Place + Burney Road) and Highway 22 Access Points** | | | | | |
| White Ave (Park Pl + Burney Rd) | 189 | **86%** | White Ave (Park Pl + Burney Rd) | 275 | **86%** |
| Hwy 22 - Burney Rd Extension | 32 | **14%** | Hwy 22 - Burney Rd Extension | 45 | **14%** |
| White Ave (Park Pl + Burney Rd) | 114 | **61%** | White Ave (Park Pl + Burney Rd) | 166 | **61%** |
| Hwy 22 - Gravel Pit Access | 74 | **39%** | Hwy 22 - Gravel Pit Access | 108 | **39%** |
| White Ave (Park Pl + Burney Rd) | 119 | **63%** | White Ave (Park Pl + Burney Rd) | 171 | **62%** |
| Hwy 22 - East Park Place | 70 | **37%** | Hwy 22 - East Park Place | 103 | **38%** |
| White Ave | 115 | **61%** | White Ave | 166 | **61%** |
| Hwy 22 - Banded Peak School | 74 | **39%** | Hwy 22 - Banded Peak School | 108 | **39%** |
| **White Avenue (Burney Road Only) and Highway 22 Access Points** | | | | | |
| Burney Road | 156 | **83%** | Burney Road | 218 | **79%** |
| Hwy 22 - Burney Rd Extension | 33 | **17%** | Hwy 22 - Burney Rd Extension | 57 | **21%** |
| Burney Road | 94 | **49%** | Burney Road | 136 | **49%** |
| Hwy 22 - Gravel Pit Access | 96 | **51%** | Hwy 22 - Gravel Pit Access | 140 | **51%** |
| Burney Road | 101 | **53%** | Burney Road | 144 | **53%** |
| Hwy 22 - East Park Place | 88 | **47%** | Hwy 22 - East Park Place | 130 | **47%** |
| Burney Road | 89 | **47%** | Burney Road | 128 | **47%** |
| Hwy 22 - Banded Peak School | 100 | **53%** | Hwy 22 - Banded Peak School | 146 | **53%** |
| **White Avenue (Park Place Only) and Highway 22 Access Points** | | | | | |
| Park Place | 73 | **39%** | Park Place | 106 | **39%** |
| Hwy 22 - Gravel Pit Access | 116 | **61%** | Hwy 22 - Gravel Pit Access | 168 | **61%** |
| Park Place | 77 | **41%** | Park Place | 112 | **41%** |
| Hwy 22 - East Park Place | 111 | **59%** | Hwy 22 - East Park Place | 162 | **59%** |
| Park Place | 77 | **41%** | Park Place | 113 | **41%** |
| Hwy 22 - Banded Peak School | 111 | **59%** | Hwy 22 - Banded Peak School | 161 | **59%** |

Results of the analysis indicate that:

i. **White Avenue**: Burney Road/White Avenue connection is preferred over Park Place/White Avenue.

ii. **Highway 22**: When evaluated individually, access at Gravel Pit Access Road, East Park Place and Banded Peak School are essentially equal from a traffic perspective since they accommodate similar percentage of the development generated traffic.

In addition to above analysis, a sensitivity analysis was conducted to analyze the preferred access on Highway 22 and the effects of multiple access points on White Avenue. The results of the sensitivity analysis are summarized in **Table 8.**

### TABLE 8: RESULTS OF THE SENSITIVITY ANALYSIS

| Scenario 1 | | | Scenario 2 | | |
|---|---|---|---|---|---|
| Access Point | 20 Year Volume | % of Volume | Access Point | 20 Year Volume | % of Volume |
| **No Access to White Avenue** | | | | | |
| East Park Place | 117 | **62%** | East Park Place | 171 | **62%** |
| Banded Peak School | 71 | **38%** | Banded Peak School | 103 | **38%** |
| **White Avenue (Park Place + Burney Road) and Highway 22 (East Park Place + Banded Peak School)** | | | | | |
| White Ave (Park Pl + Burney Rd) | 89 | **47%** | White Ave (Park Pl + Burney Rd) | 129 | **47%** |
| Hwy 22 - (E. Park Pl. + Banded Peak Sch.) | 99 | **53%** | Hwy 22 - (E. Park Pl. + Banded Peak Sch.) | 145 | **53%** |
| **White Avenue (Burney Road Only) and Highway 22 (East Park Place + Banded Peak School)** | | | | | |
| White Ave - Burney Road | 69 | **37%** | White Ave - Burney Road | 102 | **37%** |
| Hwy 22 - (E. Park Pl. + Banded Peak Sch.) | 119 | **63%** | Hwy 22 - (E. Park Pl. + Banded Peak Sch.) | 173 | **63%** |
| **White Avenue (Park Place Only) and Highway 22 (East Park Place + Banded Peak School)** | | | | | |
| White Ave - Park Place | 52 | **28%** | White Ave - Park Place | 76 | **28%** |
| Hwy 22 - (E. Park Pl. + Banded Peak Sch.) | 136 | **72%** | Hwy 22 - (E. Park Pl. + Banded Peak Sch.) | 198 | **72%** |

Results of the sensitivity analysis lead to the following conclusions:

i. Highway 22: Access at East Park Place is preferred as compared to the Banded Peak School location.

ii. Access at Burney Road coupled with accesses at East Park Place and Banded Peak School provide for more desirable traffic distribution as they reduce the traffic through the existing street system to 37%, equivalent to 69 trips/h in Scenario 1 and 102 trips/h in Scenario 2.

### 3.5.4 TRIP DISTRIBUTION CONCLUSIONS

Based on the results of the analysis, the following conclusions could be drawn from a traffic perspective;

i. White Avenue: - Burney Road/White Avenue connection is preferred over Park Place/White Avenue.

ii. Highway 22 :
   a. When evaluated individually, access at the Gravel Pit Access Road, East Park Place and Banded Peak School will result in similar traffic distribution.
   b. Access at the Gravel Pit Access Road may present construction challenges given that Highway 22 is in partial cut to the west side of Highway 22 (refer to photos in **Appendix C**).
   c. East Park Place is preferred as compared to Banded Peak School access.
   d. Access at Burney Road coupled with accesses at East Park Place and Banded Peak School provide far more desirable traffic distribution.

In conclusion based on results of the sight distance analysis and the results of the trip distribution analysis, the accesses to the Bragg Creek Expansion Area selected for further analysis were Burney Road via White Avenue and East Park Place via Highway 22.

### 3.5.5 PROPOSED ACCESS SCHEME OPERATING CONDITIONS

With the expected growth rates and the analyzed land use scenarios (Scenario 1 and 2, Section 3.4.1 of this report), the operating conditions of each time horizon are summarized below. It should be noted that in each time horizon the intersection of Highway 22 / White Avenue has been analyzed both with and without the proposed roundabout improvement in place.

The peak hour volumes used for the intersection analysis for all future time horizons were generated by the Visum modelling for the Bragg Creek Expansion Area. The Visum results are included in **Appendix D**.

The peak hour turning movement volumes at the 5 year time horizon can be seen in **Figure 7** below:

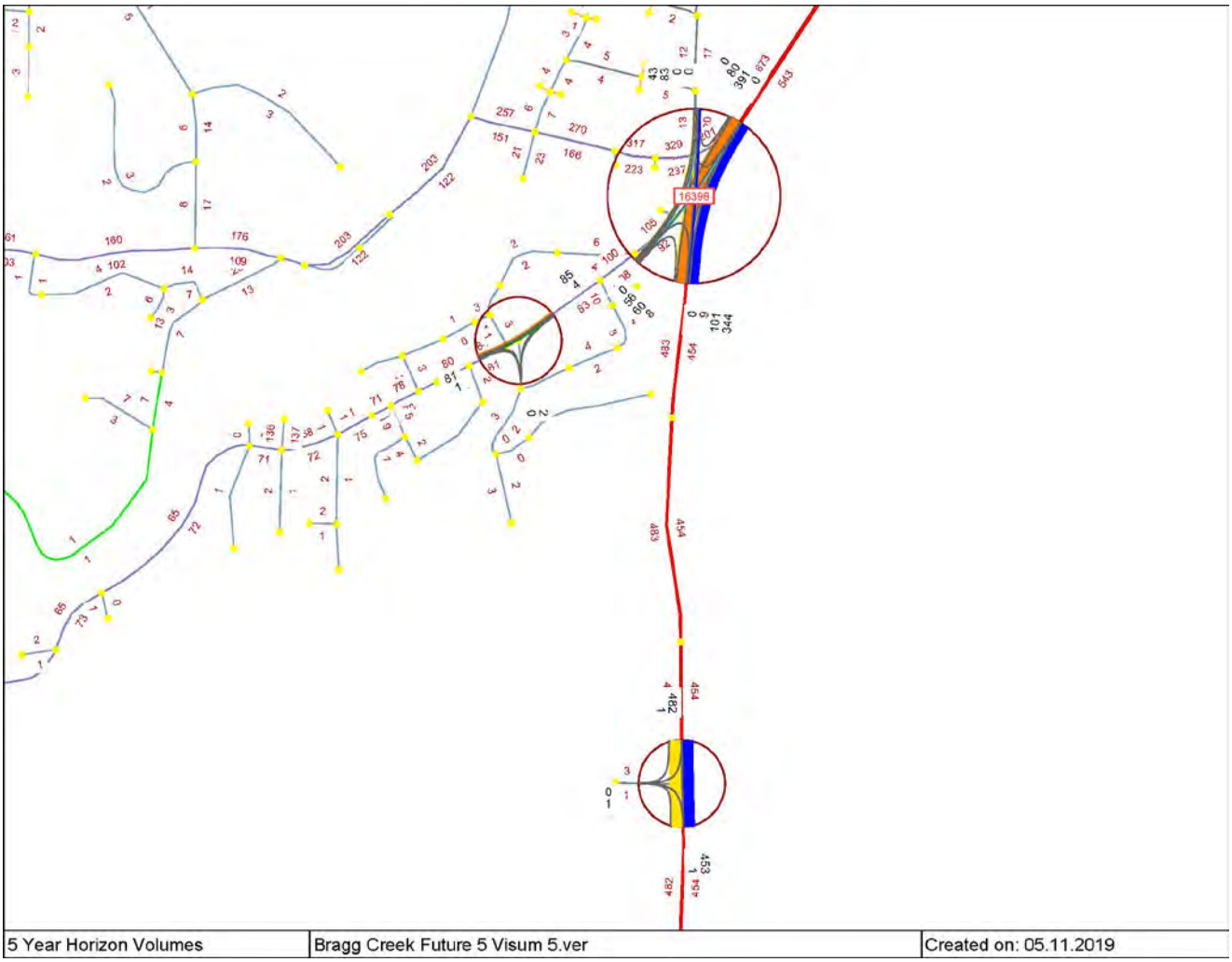



**Figure 7: 5 Year Peak Hour Volumes (2024 horizon Year)**

The operating conditions of the 5-year time horizon for both Scenario 1 and 2 are seen in **Table 9** below.

### TABLE 9: 5 YEAR OPERATING CONDITIONS

| FUTURE 5 YEAR OPERATING CONDITIONS - SCENARIO 1 & 2 | | | | | | |
|---|---|---|---|---|---|---|
| **INTERSECTION / MOVEMENT** | | | **PM PEAK HOUR** | | | |
| | | | **v/c Ratio** | **LOS** | **Delay (s)** | **Queue (m)** |
| **East Park Place / Hwy22 (Stop-Controlled)** | EB | Left | 0.00 | B | 11.5 | 0.0 |
| | | Right | 0.00 | B | 11.5 | 0.0 |
| | NB | Left | 0.00 | A | 0.0 | 0.0 |
| | | Through | 0.00 | A | 0.0 | 0.0 |
| | SB | Through | 0.31 | A | 0.0 | 0.0 |
| | | Right | 0.31 | A | 0.0 | 0.0 |
| | **Intersection Summary** | | - | **A** | **0.0** | - |
| **Burney Road / White Avenue (Stop-Controlled)** | EB | Through | 0.06 | A | 0.0 | 0.0 |
| | | Right | 0.06 | A | 0.0 | 0.0 |
| | WB | Left | 0.03 | A | 0.2 | 0.7 |
| | | Through | 0.03 | A | 2.3 | 0.7 |
| | NB | Left | 0.02 | A | 8.9 | 0.5 |
| | | Right | 0.02 | A | 8.9 | 0.5 |
| | **Intersection Summary** | | - | **A** | **0.3** | - |
| **Hwy 22 / White Avenue (Stop-Controlled) UNIMPROVED** | NB | Left/Through/ Right | 0.83 | D | 32.2 | 8.4 |
| | SB | Left/Through/ Right | 0.27 | B | 12.9 | 1.1 |
| | EB | Left/Through/ Right | 0.28 | B | 13.2 | 1.1 |
| | WB | Left/Through/ Right | 0.93 | E | 47.7 | 11.1 |
| | **Intersection Summary** | | - | **D** | **34.3** | - |
| **Highway 22 / White Avenue IMPROVED** | | | | | | |
| **Hwy 22 / White Avenue (Roundabout) IMPROVED** | NB | Left/Through/ Right | 0.42 | A | 7.4 | 20.4 |
| | WB | Left/Through/ Right | 0.46 | A | 8.3 | 22.7 |
| | SB | Left/Through/ Right | 0.18 | A | 6.5 | 5.8 |
| | EB | Left/Through/ Right | 0.17 | A | 6.5 | 5.6 |
| | **Intersection Summary** | | - | **A** | **7.6** | - |

Results of the Analysis indicate that at the 5-year time horizon all analyzed intersections will operate at an acceptable LOS with the exception of Highway 22 / White Avenue. If a roundabout is implemented at this location, it will operate at an acceptable LOS.

The Peak hour volumes for the land use Scenario 1 and 2 for the 10-year time horizon are shown in **Figures 8** and **9** below:

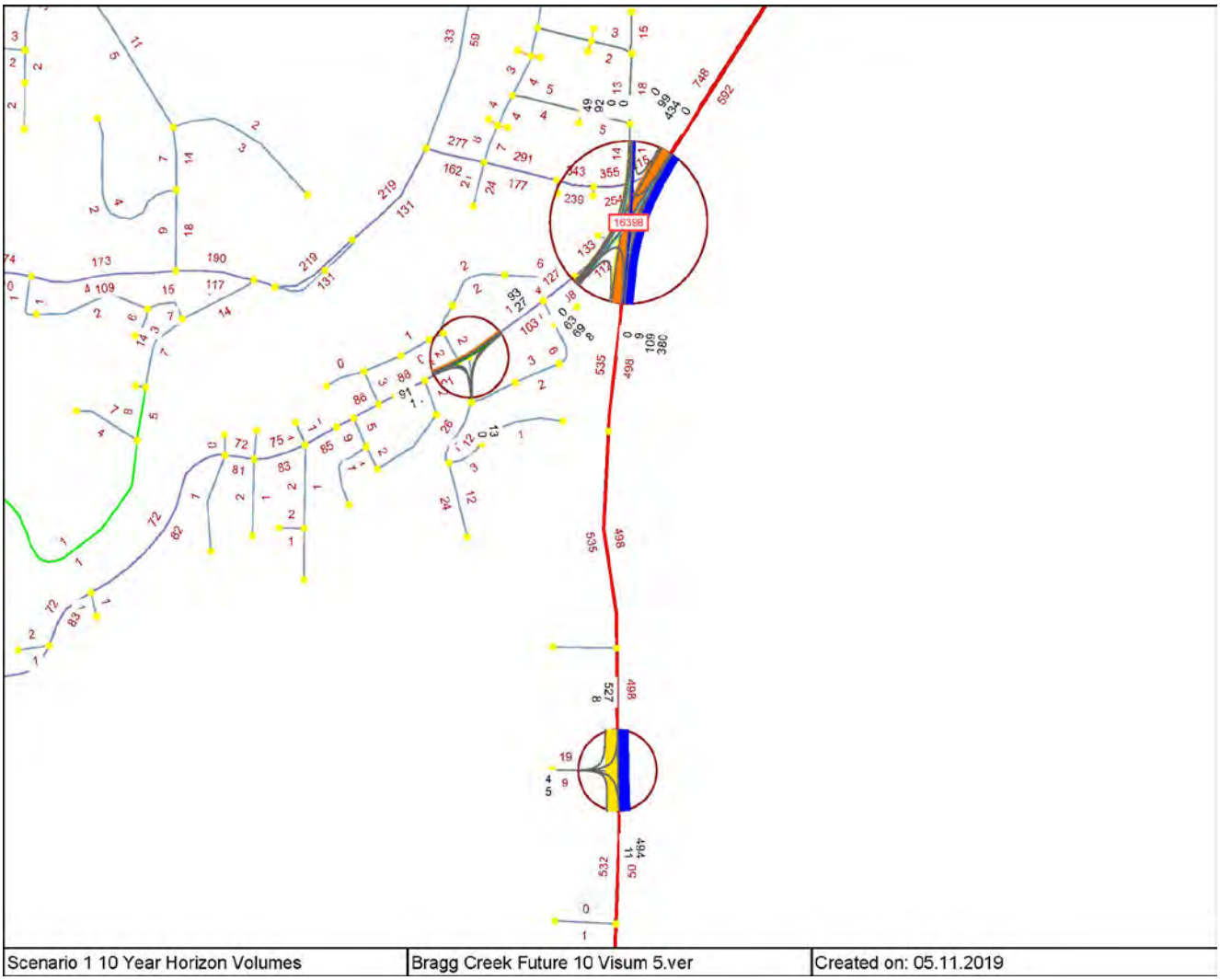



**Figure 8: Scenario 1 - 10 Year Peak Hour Volumes (2029 horizon year)**

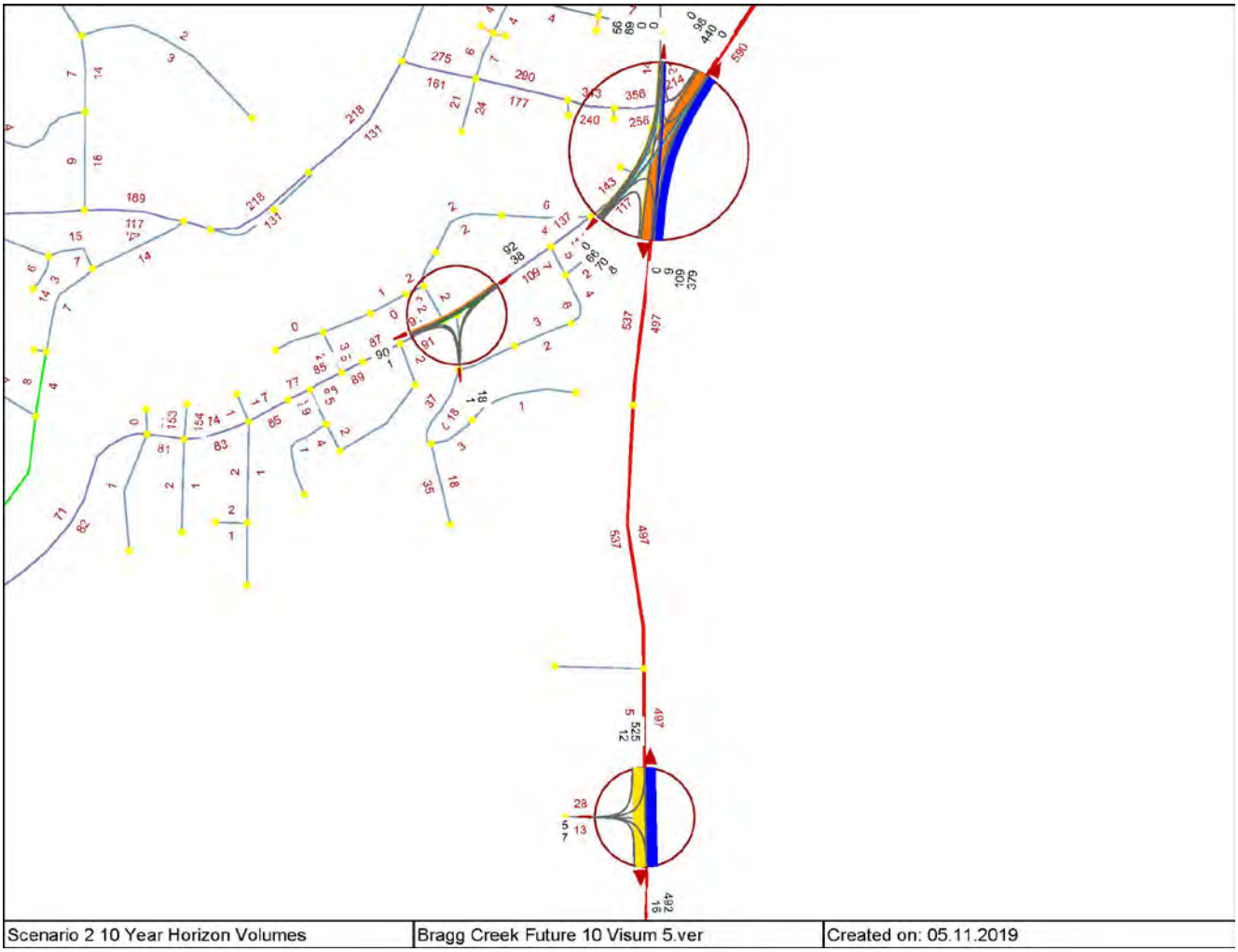



**Figure 9: Scenario 2 - 10 Year Peak Hour Volumes**

The operation conditions at the 10 year time horizon for both Scenario 1 and 2 are summarized in **Tables 10** and **11** below:

### TABLE 10: SCENARIO 1 - 10 YEAR OPERATING CONDITIONS

**FUTURE 10 YEAR OPERATING CONDITIONS - SCENARIO 1**

| INTERSECTION / MOVEMENT | | | PM PEAK HOUR | | | |
|---|---|---|---|---|---|---|
| | | | v/c Ratio | LOS | Delay (s) | Queue (m) |
| East Park Place / Hwy22 (Stop-Controlled) | EB | Left | 0.03 | C | 16.5 | 0.7 |
| | | Right | 0.03 | C | 16.5 | 0.7 |
| | NB | Left | 0.01 | A | 0.2 | 0.3 |
| | | Through | 0.01 | A | 0.3 | 0.3 |
| | SB | Through | 0.34 | A | 0.0 | 0.0 |
| | | Right | 0.34 | A | 0.0 | 0.0 |
| | **Intersection Summary** | | - | **A** | **0.3** | - |
| Burney Road / White Avenue (Stop-Controlled) | EB | Through | 0.06 | A | 0.0 | 0.0 |
| | | Right | 0.06 | A | 0.0 | 0.0 |
| | WB | Left | 0.02 | A | 0.2 | 0.5 |
| | | Through | 0.02 | A | 1.8 | 0.5 |
| | NB | Left | 0.01 | A | 8.8 | 0.4 |
| | | Right | 0.01 | A | 8.8 | 0.4 |
| | **Intersection Summary** | | - | **A** | **1.5** | - |
| Hwy 22 / White Avenue (Stop-Controlled) UNIMPROVED | NB | Left/Through/ Right | 0.94 | E | 50 | 11.7 |
| | SB | Left/Through/ Right | 0.32 | B | 14.1 | 1.4 |
| | EB | Left/Through/ Right | 0.33 | B | 14.6 | 1.4 |
| | WB | Left/Through/ Right | 1.11 | F | 99.5 | 18.6 |
| | **Intersection Summary** | | - | **F** | **62.5** | - |
| **Highway 22 / White Avenue IMPROVED** | | | | | | |
| Hwy 22 / White Avenue (Roundabout) IMPROVED | NB | Left/Through/ Right | 0.47 | A | 8.2 | 24.0 |
| | WB | Left/Through/ Right | 0.53 | A | 9.7 | 28.3 |
| | SB | Left/Through/ Right | 0.21 | A | 7.4 | 7.0 |
| | EB | Left/Through/ Right | 0.21 | A | 7.2 | 6.7 |
| | **Intersection Summary** | | - | **A** | **8.6** | - |

Results of the Analysis indicate that at the Scenario 1 10-year horizon all intersections will operate at an acceptable LOS with the exception of Highway 22 / White Avenue.
A single lane roundabout at this location is expected to operate at an acceptable LOS A.

## TABLE 11: SCENARIO 2 - 10 YEAR OPERATING CONDITIONS

| FUTURE 10 YEAR OPERATING CONDITIONS - SCENARIO 2 | | | | | | | |
|---|---|---|---|---|---|---|---|
| **INTERSECTION / MOVEMENT** | | | **PM PEAK HOUR** | | | |
| | | | **v/c Ratio** | **LOS** | **Delay (s)** | **Queue (m)** |
| **East Park Place / Hwy22 (Stop-Controlled)** | EB | Left | 0.04 | C | 16.1 | 1.0 |
| | | Right | 0.04 | C | 16.1 | 1.0 |
| | NB | Left | 0.02 | A | 0.2 | 0.4 |
| | | Through | 0.02 | A | 0.5 | 0.4 |
| | SB | Through | 0.34 | A | 0.0 | 0.0 |
| | | Right | 0.34 | A | 0.0 | 0.0 |
| | **Intersection Summary** | | - | **A** | **0.4** | - |
| **Burney Road / White Avenue (Stop-Controlled)** | EB | Through | 0.06 | A | 0.0 | 0.0 |
| | | Right | 0.06 | A | 0.0 | 0.0 |
| | WB | Left | 0.03 | A | 0.2 | 0.7 |
| | | Through | 0.03 | A | 2.3 | 0.7 |
| | NB | Left | 0.02 | A | 8.9 | 0.5 |
| | | Right | 0.02 | A | 8.9 | 0.5 |
| | **Intersection Summary** | | - | **A** | **2.0** | - |
| **Hwy 22 / White Avenue (Stop-Controlled) UNIMPROVED** | NB | Left/Through/ Right | 0.95 | F | 50.8 | 12.3 |
| | SB | Left/Through/ Right | 0.33 | B | 14.3 | 1.4 |
| | EB | Left/Through/ Right | 0.34 | B | 14.8 | 1.5 |
| | WB | Left/Through/ Right | 1.13 | F | 105.0 | 19.3 |
| | **Intersection Summary** | | - | **F** | **64.9** | - |
| **Highway 22 / White Avenue IMPROVED** | | | | | | |
| **Hwy 22 / White Avenue (Roundabout) IMPROVED** | NB | Left/Through/ Right | 0.47 | A | 8.3 | 24.0 |
| | WB | Left/Through/ Right | 0.54 | A | 9.8 | 28.9 |
| | SB | Left/Through/ Right | 0.22 | A | 7.5 | 7.2 |
| | EB | Left/Through/ Right | 0.21 | A | 7.3 | 7.0 |
| | **Intersection Summary** | | - | **A** | **8.7** | - |

Results of the Analysis indicate that at the Scenario 2 10-year time horizon all intersections will operate at an acceptable LOS with the exception of Highway 22 / White Avenue.
A single lane roundabout constructed at this location will operate at an acceptable LOS A.

The Peak hour volumes for Scenario 1 and 2 for the 20 year time horizon are shown in **Figure 10** and **11** below:

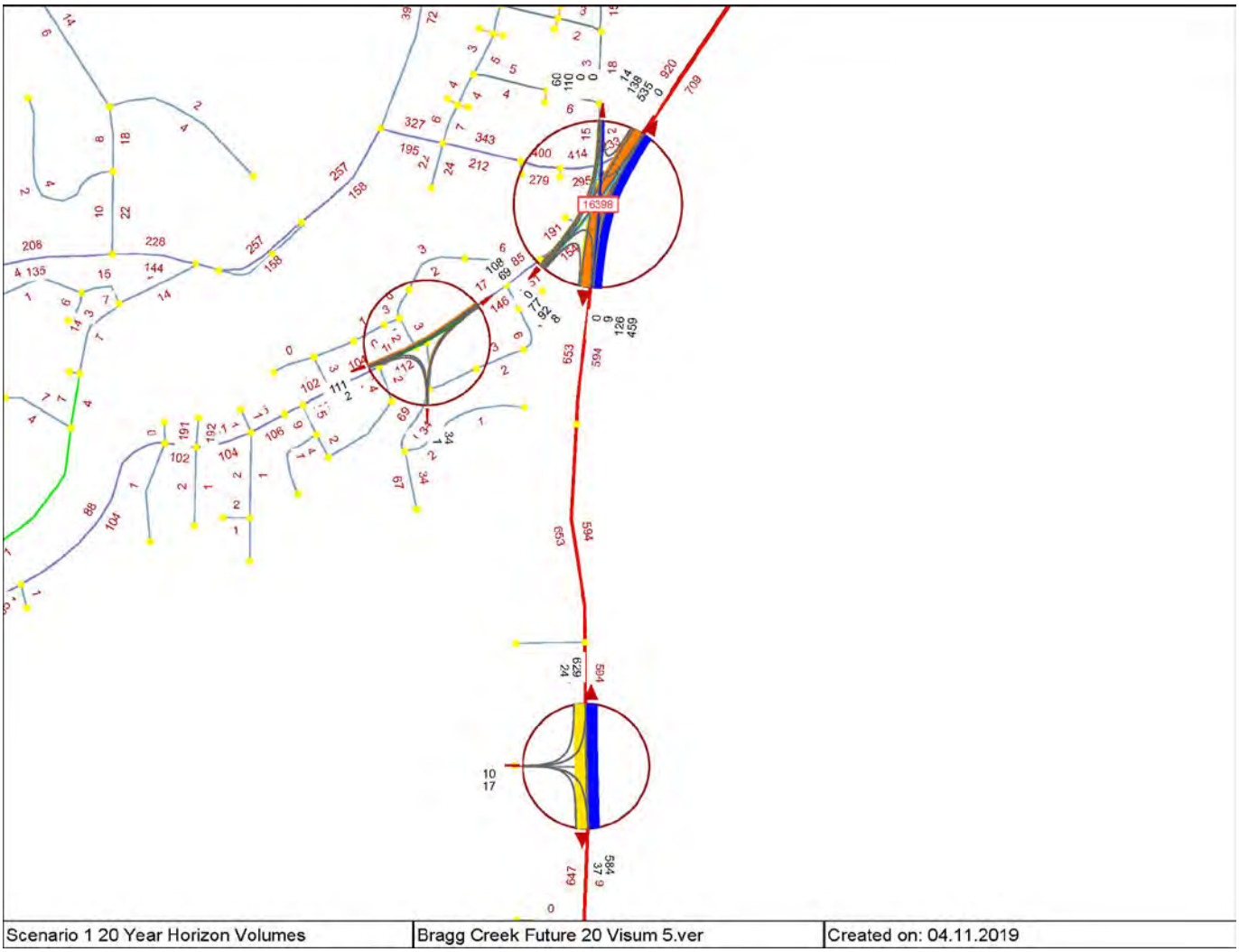



**Figure 10: Scenario 1 - 20 Year Peak Hour Volumes**

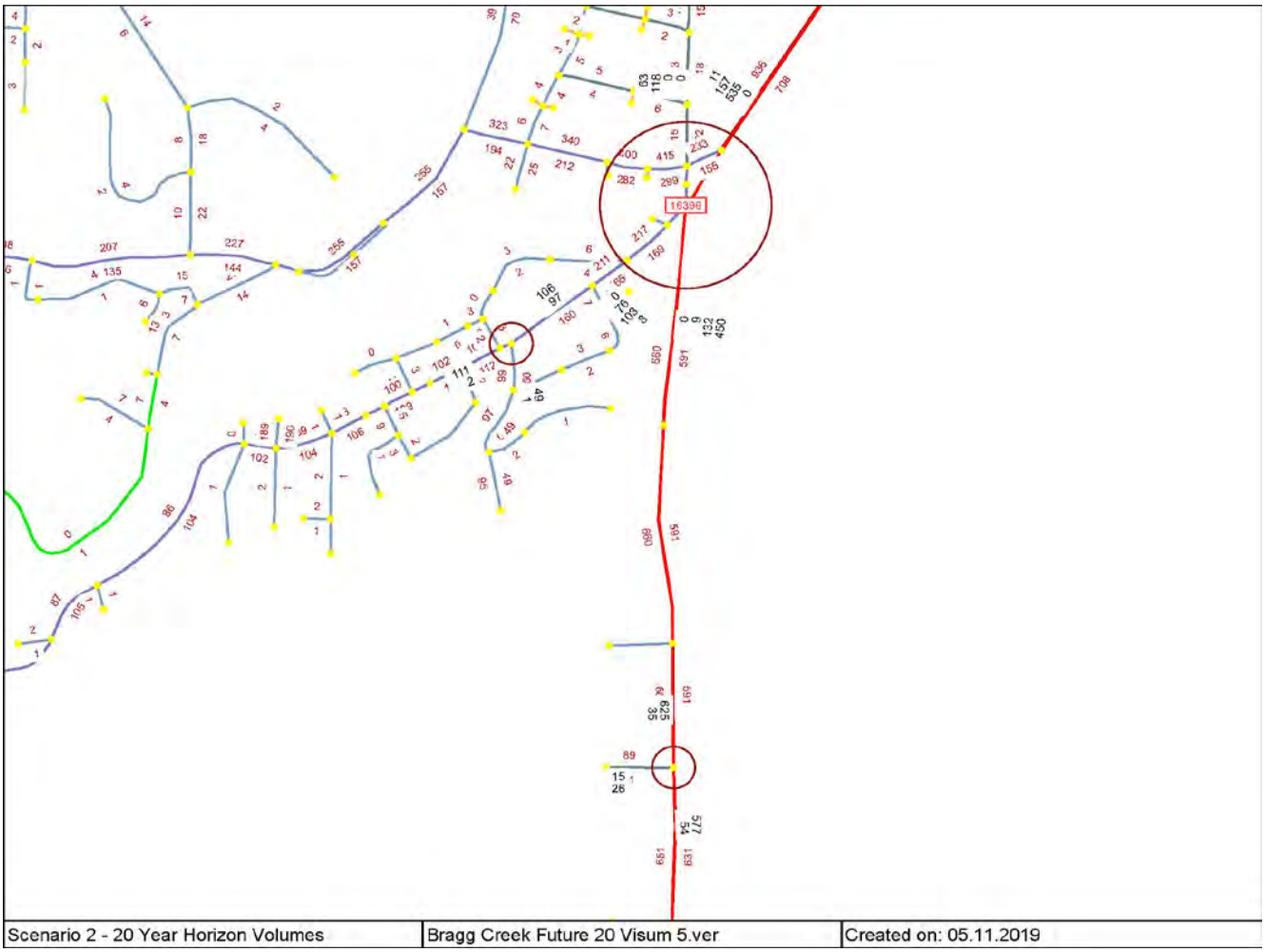



**Figure 11: Scenario 2 - 20 Year Peak Hour Volumes**

The operation conditions at the 20 year time horizon for both Scenario 1 and 2 are summarized in **Tables 12** and **13** below:

### TABLE 12: SCENARIO 1 - 20 YEAR OPERATING CONDITIONS

| FUTURE 20 YEAR OPERATING CONDITIONS - SCENARIO 1 | | | | | | |
|---|---|---|---|---|---|---|
| **INTERSECTION / MOVEMENT** | | | **PM PEAK HOUR** | | | |
| | | | **v/c Ratio** | **LOS** | **Delay (s)** | **Queue (m)** |
| **East Park Place / Hwy22 (Stop-Controlled)** | EB | Left | 0.12 | C | 21.4 | 3.1 |
| | | Right | 0.12 | C | 21.4 | 3.1 |
| | NB | Left | 0.04 | A | 0.7 | 1.1 |
| | | Through | 0.04 | A | 1.2 | 1.1 |
| | SB | Through | 0.42 | A | 0.0 | 0.0 |
| | | Right | 0.42 | A | 0.0 | 0.0 |
| | **Intersection Summary** | | - | **A** | **1.0** | - |
| **Burney Road / White Avenue (Stop-Controlled)** | EB | Through | 0.07 | A | 0.0 | 0.0 |
| | | Right | 0.07 | A | 0.0 | 0.0 |
| | WB | Left | 0.05 | A | 0.4 | 1.3 |
| | | Through | 0.05 | A | 3.2 | 1.3 |
| | NB | Left | 0.04 | A | 9.1 | 1.0 |
| | | Right | 0.04 | A | 9.1 | 1.0 |
| | **Intersection Summary** | | - | **A** | **2.7** | - |
| **Hwy 22 / White Avenue (Stop-Controlled) UNIMPROVED** | NB | Left/Through/ Right | 1.18 | F | 122.1 | 20.1 |
| | SB | Left/Through/ Right | 0.41 | C | 16.3 | 1.9 |
| | EB | Left/Through/ Right | 0.44 | C | 17.5 | 2.2 |
| | WB | Left/Through/ Right | 1.5 | F | 255.7 | 35.9 |
| | **Intersection Summary** | | - | **F** | **155.7** | - |
| **Highway 22 / White Avenue IMPROVED** | | | | | | |
| **Hwy 22 / White Avenue (Roundabout) IMPROVED** | NB | Left/Through/ Right | 0.58 | B | 10.7 | 33.6 |
| | WB | Left/Through/ Right | 0.71 | B | 14.9 | 91.2 |
| | SB | Left/Through/ Right | 0.30 | A | 9.9 | 10.0 |
| | EB | Left/Through/ Right | 0.30 | A | 9.5 | 10.1 |
| | **Intersection Summary** | | - | **B** | **12.3** | - |

Results of the analysis indicate that at the Scenario 1 20-year time horizon all intersections will operate at an acceptable LOS with the exception of Highway 22 / White Avenue.
A single lane roundabout constructed at this location will operate at an acceptable LOS B.

## TABLE 13: SCENARIO 2 - 20 YEAR OPERATING CONDITIONS

| FUTURE 20 YEAR OPERATING CONDITIONS - SCENARIO 2 | | | | | | |
|---|---|---|---|---|---|---|
| **INTERSECTION / MOVEMENT** | | | **PM PEAK HOUR** | | | |
| | | | **v/c Ratio** | **LOS** | **Delay (s)** | **Queue (m)** |
| **East Park Place / Hwy22 (Stop-Controlled)** | EB | Left | 0.18 | C | 23.1 | 5.2 |
| | | Right | 0.18 | C | 23.1 | 5.2 |
| | NB | Left | 0.07 | A | 1.0 | 1.7 |
| | | Through | 0.07 | A | 1.7 | 1.7 |
| | SB | Through | 0.42 | A | 0.0 | 0.0 |
| | | Right | 0.42 | A | 0.0 | 0.0 |
| | **Intersection Summary** | | - | **A** | **1.5** | - |
| **Burney Road / White Avenue (Stop-Controlled)** | EB | Through | 0.07 | A | 0.0 | 0.0 |
| | | Right | 0.07 | A | 0.0 | 0.0 |
| | WB | Left | 0.07 | A | 0.6 | 1.9 |
| | | Through | 0.07 | A | 4.0 | 1.9 |
| | NB | Left | 0.06 | A | 9.2 | 1.5 |
| | | Right | 0.06 | A | 9.2 | 1.5 |
| | **Intersection Summary** | | - | **A** | **3.4** | - |
| **Hwy 22 / White Avenue (Stop-Controlled) UNIMPROVED** | NB | Left/Through/ Right | 1.20 | F | 128.8 | 20.6 |
| | SB | Left/Through/ Right | 0.44 | C | 17.0 | 2.1 |
| | EB | Left/Through/ Right | 0.46 | C | 18.1 | 2.3 |
| | WB | Left/Through/ Right | 1.55 | F | 278.2 | 38.0 |
| | **Intersection Summary** | | - | **F** | **167.4** | - |
| **Highway 22 / White Avenue IMPROVED** | | | | | | |
| **Hwy 22 / White Avenue (Roundabout) IMPROVED** | NB | Left/Through/ Right | 0.59 | B | 10.9 | 33.9 |
| | WB | Left/Through/ Right | 0.73 | C | 15.8 | 102.5 |
| | SB | Left/Through/ Right | 0.33 | B | 10.5 | 11.4 |
| | EB | Left/Through/ Right | 0.32 | A | 9.9 | 10.9 |
| | **Intersection Summary** | | - | **B** | **12.8** | - |

Results of the Analysis indicate that at the Scenario 2 20-year time horizon all intersections will operate at an acceptable LOS with the exception of Highway 22 / White Avenue.
A single lane roundabout constructed at this location will operate at an acceptable LOS B.

### 3.5.6 CONCLUSIONS

Based on the future operational conditions of the analyzed intersections, the required improvements include an upgrade of Highway 22 / White Avenue intersection from STOP controlled to a single lane roundabout. Based on the results of the analysis, it would be desirable to implement these improvements prior to the 5-year horizon.

### 3.5.7 ROAD CROSS-SECTIONS

Rocky View County requested recommendations pertaining to the recommended cross-sections of the access roads servicing the proposed development.

For both analyzed time horizons, all access points to the expansion area could be served by an Urban Residential Collector with a 20 metre standard right-of-way (ROW) as per the Section 400 of the RVC Servicing Standards.

Results shown on **Figures 10** and **11** indicate that the expected daily volume in vehicles per day (vpd) on any access road segment leading to the proposed development is not expected to exceed 1060 vpd and 1500 vpd for Scenario 1 and 2 respectively.

Urban Residential Collectors have capacity of up to 5000 vpd which exceeds the projected traffic for the proposed development and it could be constructed within the existing 20 metre ROW. Also widening of the standard ROW at these access locations is not required as the results of the analysis showed that no more than two driving lanes would be required on the approach roads to service traffic generated by the proposed development.

However, it should be noted that the existing access roads have been constructed to a gravel surface; consequently it would be prudent to plan their upgrade to meet the Urban Residential Collector paved standard.

## 4.0 ACTIVE MODES

Pathways and parkways in the surrounding area are shown in **Figure 12**. The active modes plan for the expansion area should include linking the proposed road network to the existing pathway system, such as Banded Peak Trail which runs North-South along the west side of Highway 22. The active modes plan for the expansion area should also include pedestrian infrastructure that is consistent with the Rocky View County's Active Transportation Plan for South County (ATPSC) such as paved shoulders.

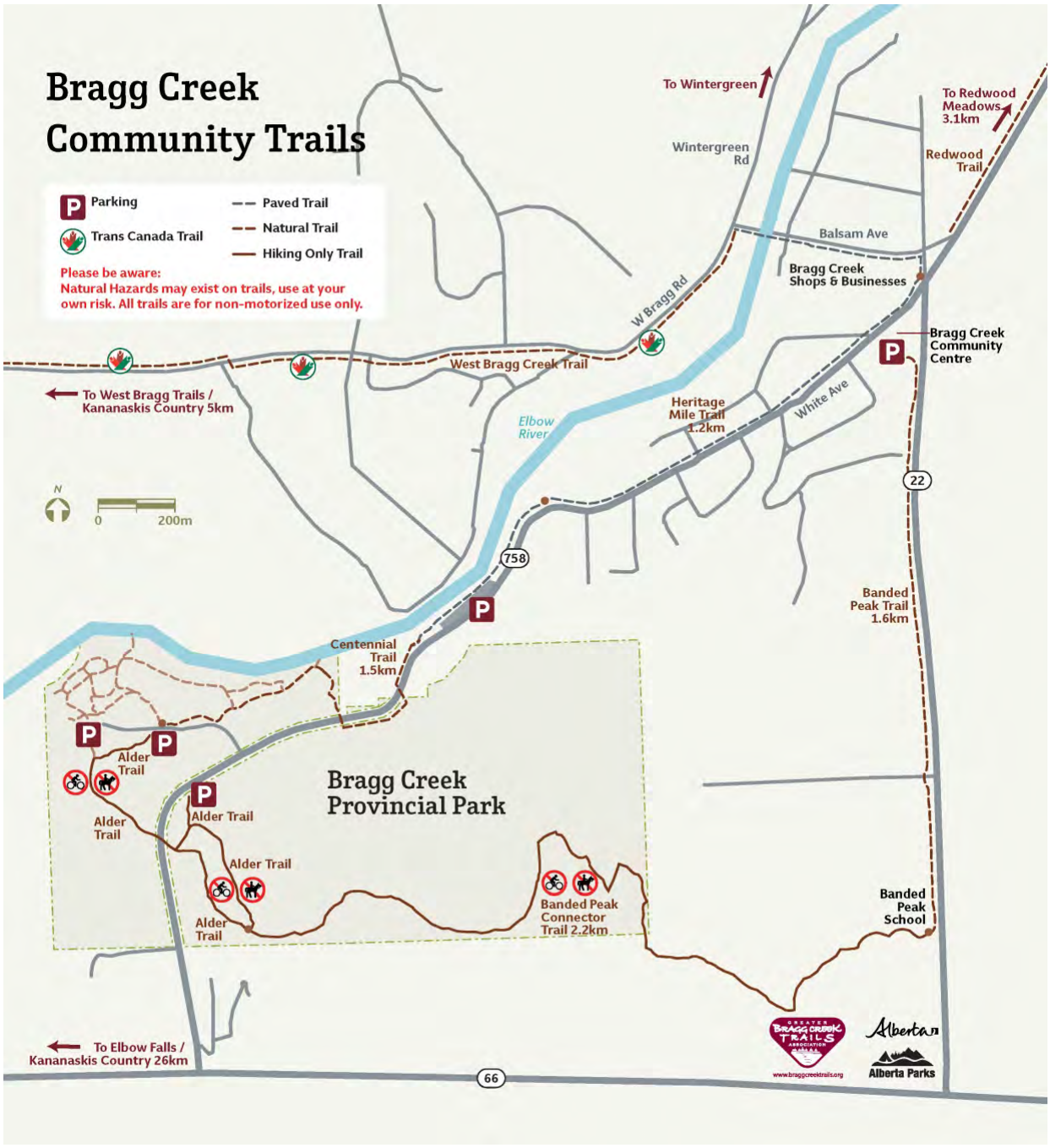



**Figure 12: Existing Pathway System**

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

The results of the analysis led to the following conclusions/recommendations:

- The results of the traffic distribution analysis show that accesses to the proposed development should be provided via Burney Road and East Park Place to achieve the best traffic distribution. Should additional access locations be required, the additional access that could be considered should be located at Banded Peak School and subsequently at Park Place.
- Based on the results of the analysis, improvements to the network are expected to be required by the 5-year time horizon (**Table 9** Section 3.4.7). The improvements are limited to construction of a single lane roundabout at the intersection of Highway 22 / White Avenue.
- Dimensions of the rights-of-ways at development access locations can be maintained, however the road classification of the access roads should be upgraded to that of an Urban Residential Collector as per the current RVC Servicing Standards.
- Currently, all existing access roads have a gravel surface, planning for their upgrade to the Urban Residential Collector paved standard is recommended.
- A traffic monitoring program should be introduced to ensure that the schedule of improvements reflects actual traffic conditions and the actual development progression in the area.

# 6.0 ADITIONAL ANALYSIS

## 6.1 INTRODUCTION

As per the request of Rocky View County staff, additional analysis was conducted to ascertain the impacts of using an alternative access scheme to the Bragg Creek Expansion Area. The alternative access scheme considered included street connection using Park Place and White Avenue as well as East Park Place and Highway 22.

## 6.2 ALTERNATIVE ACCESS SCHEME OPERATING CONDITIONS

As per the assumptions summarized in Section 3.5.5 of this report, the analysis was conducted using the expected growth rates and the analyzed land use scenarios (Scenario 1 and 2, Section 3.4.1). The operating conditions expected at each analyzed time horizon using the alternative access scheme are summarized below. It should be noted that in each time horizon, the intersection of Highway 22 / White Avenue has been analyzed both with and without the proposed roundabout improvement in place.

The peak hour volumes used for the intersection analysis for all future time horizons were generated by the Visum modelling for the Bragg Creek Expansion Area. The Visum results are included in **Appendix D**.

The peak hour turning movement volumes at the 5 year time horizon with the alternative access scheme can be seen in **Figure 13** below:

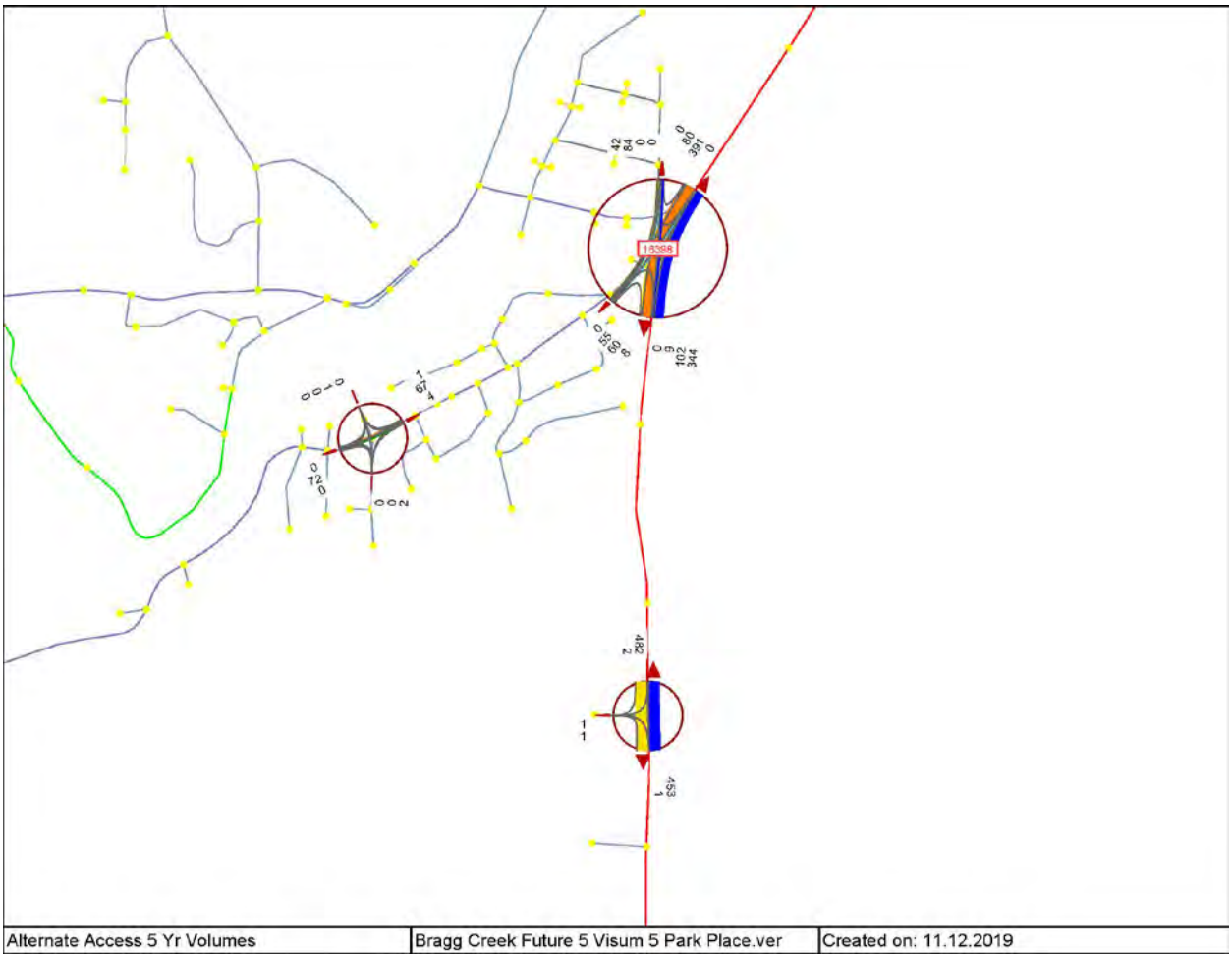



**Figure 13: Alternative Access 5 Year Peak Hour Volumes**

The alternative access operating conditions of the 5-year time horizon for both Scenario 1 and 2 are seen in **Table 14** below.

## TABLE 14: ALTERNATIVE ACCESS 5 YEAR OPERATING CONDITIONS

| ALTERNATE ACCESS FUTURE 5 YEAR OPERATING CONDITIONS - SCENARIO 1 & 2 | | | | | | |
|---|---|---|---|---|---|---|
| **INTERSECTION / MOVEMENT** | | | **PM PEAK HOUR** | | | |
| | | | **v/c Ratio** | **LOS** | **Delay (s)** | **Queue (m)** |
| **East Park Place / Hwy22 (Stop-Controlled)** | EB | Left | 0.01 | C | 15.2 | 0.1 |
| | | Right | 0.01 | C | 15.2 | 0.1 |
| | NB | Left | 0.00 | A | 0.0 | 0.0 |
| | | Through | 0.00 | A | 0.0 | 0.0 |
| | SB | Through | 0.31 | A | 0.0 | 0.0 |
| | | Right | 0.31 | A | 0.0 | 0.0 |
| | **Intersection Summary** | | - | **A** | **0.0** | - |
| **Park Place / White Avenue (Stop-Controlled)** | EB | Through | 0.05 | A | 0.0 | 0.0 |
| | | Right | 0.05 | A | 0.0 | 0.0 |
| | WB | Left | 0.00 | A | 0.0 | 0.1 |
| | | Through | 0.00 | A | 0.3 | 0.1 |
| | NB | Left | 0.00 | A | 0.0 | 0.0 |
| | | Right | 0.00 | A | 8.7 | 0.0 |
| | **Intersection Summary** | | - | **A** | **0.3** | - |
| **Hwy 22 / White Avenue (Stop-Controlled) UNIMPROVED** | NB | Left/Through/ Right | 0.83 | D | 32.2 | 8.4 |
| | SB | Left/Through/ Right | 0.27 | B | 12.9 | 1.1 |
| | EB | Left/Through/ Right | 0.28 | B | 13.2 | 1.1 |
| | WB | Left/Through/ Right | 0.93 | E | 47.7 | 11.1 |
| | **Intersection Summary** | | - | **D** | **34.3** | - |
| **Highway 22 / White Avenue IMPROVED** | | | | | | |
| **Hwy 22 / White Avenue (Roundabout) IMPROVED** | NB | Left/Through/ Right | 0.42 | A | 7.4 | 20.4 |
| | WB | Left/Through/ Right | 0.46 | A | 8.3 | 22.7 |
| | SB | Left/Through/ Right | 0.18 | A | 6.5 | 5.8 |
| | EB | Left/Through/ Right | 0.17 | A | 6.5 | 5.6 |
| | **Intersection Summary** | | - | **A** | **7.6** | - |

Results of the Analysis indicate that at the 5-year time horizon, all analyzed intersections of the alternative access scheme will operate at an acceptable LOS with the exception of Highway 22 / White Avenue. If a roundabout is implemented at this location, this intersection will operate at an acceptable LOS A.

The Peak hour volumes for the land use Scenario 1 and 2 for the 10-year time horizon with the alternative access scheme are shown in **Figures 14** and **15** below:

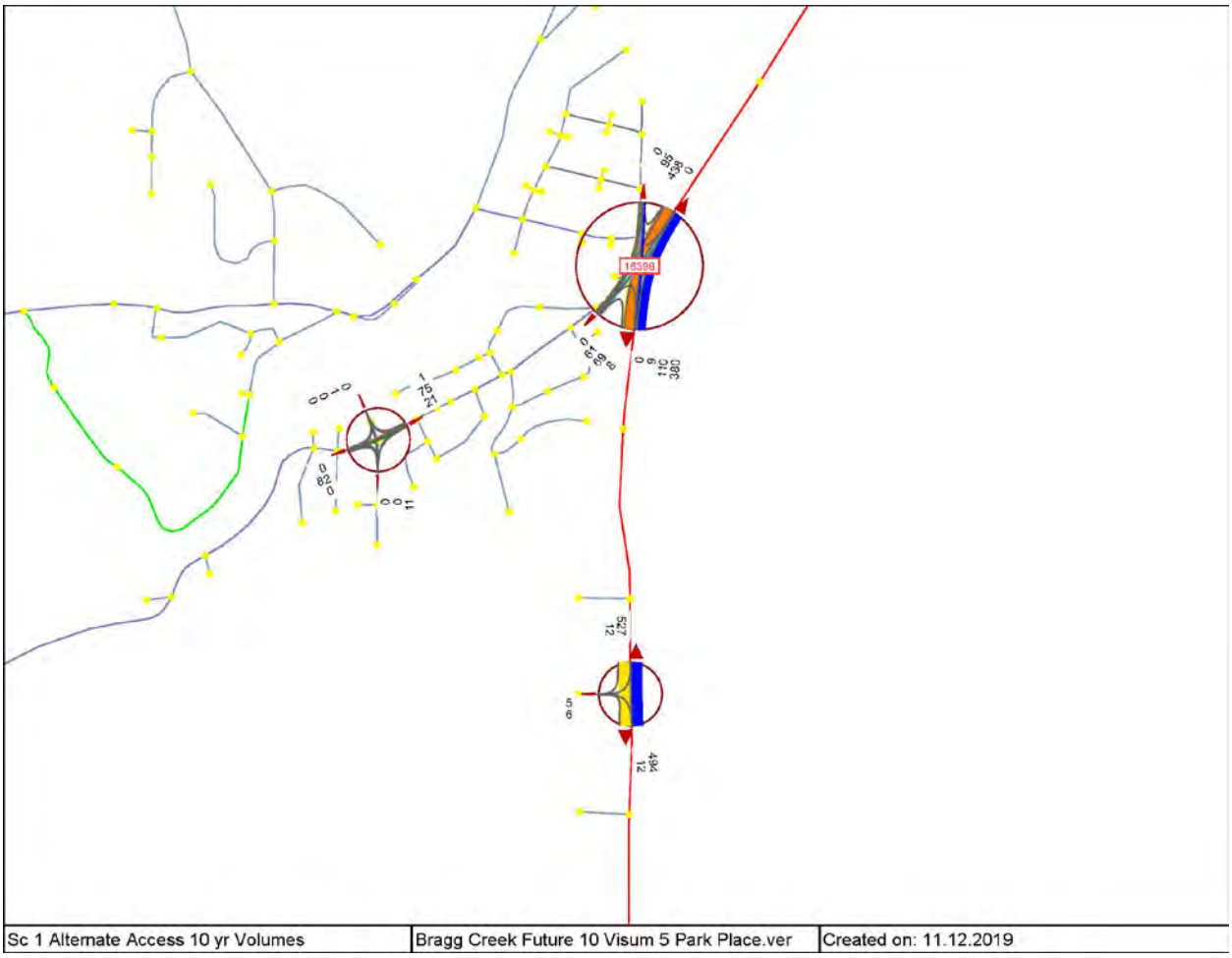



**Figure 14: Alternative Access Scenario 1 – 10 Year Peak Hour Volumes**

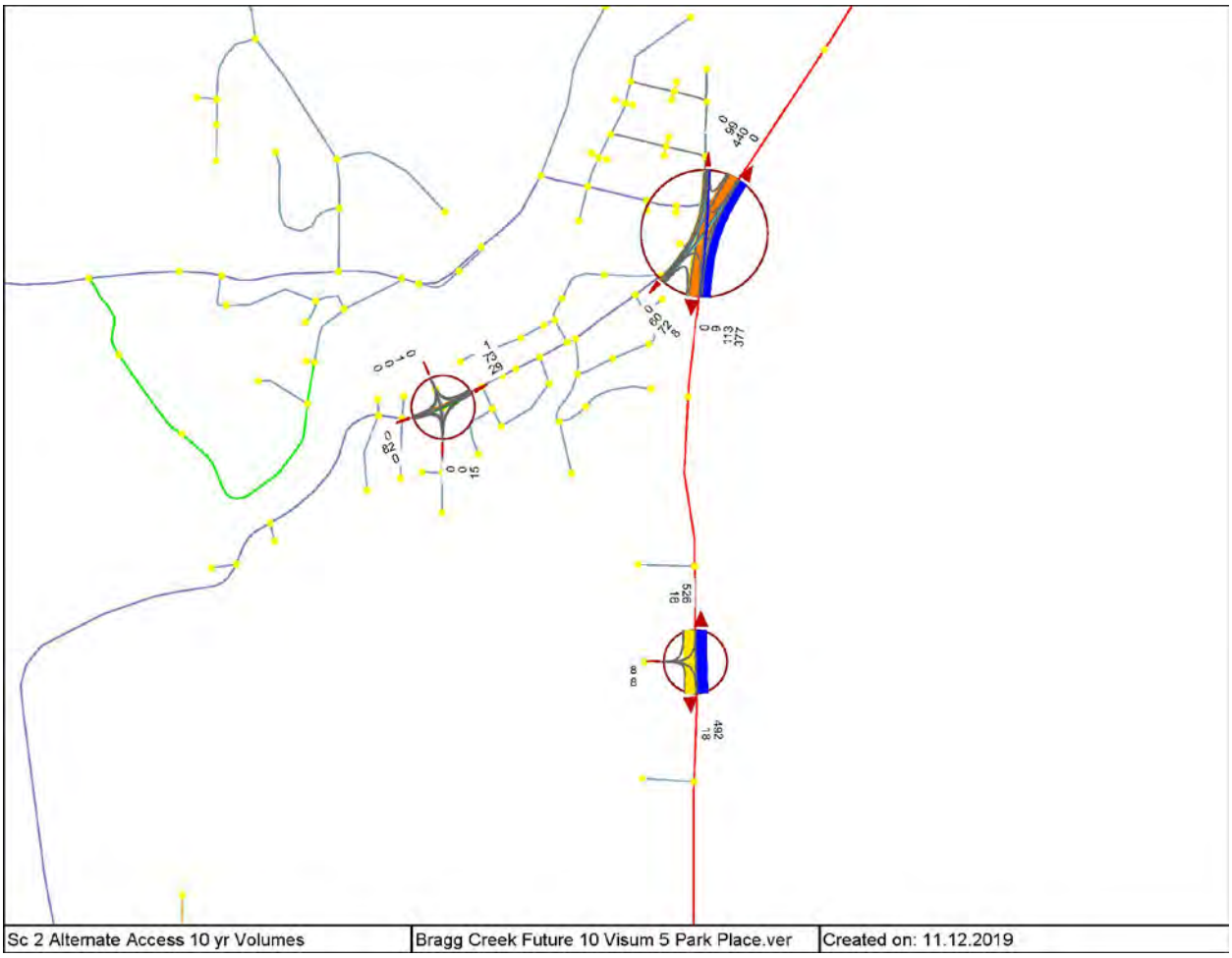



**Figure 15: Alternative Access Scenario 2 – 10 Year Peak Hour Volumes**

The alternative access operation conditions at the 10 year time horizon for both Scenario 1 and 2 are summarized in **Tables 15** and **16** below:

## TABLE 15: ALTERNATIVE ACCESS SCENARIO 1 – 10 YEAR OPERATING CONDITIONS

| ALTERNATE ACCESS FUTURE 10 YEAR OPERATING CONDITIONS - SCENARIO 1 | | | | | | |
|---|---|---|---|---|---|---|
| **INTERSECTION / MOVEMENT** | | | **PM PEAK HOUR** | | | |
| | | | **v/c Ratio** | **LOS** | **Delay (s)** | **Queue (m)** |
| **East Park Place / Hwy22 (Stop-Controlled)** | EB | Left | 0.04 | C | 16.4 | 0.9 |
| | | Right | 0.04 | C | 16.4 | 0.9 |
| | NB | Left | 0.01 | A | 0.2 | 0.3 |
| | | Through | 0.01 | A | 0.4 | 0.3 |
| | SB | Through | 0.34 | A | 0.0 | 0.0 |
| | | Right | 0.34 | A | 0.0 | 0.0 |
| | **Intersection Summary** | | - | **A** | **0.3** | - |
| **Park Place / White Avenue (Stop-Controlled)** | EB | Through | 0.05 | A | 0.0 | 0.0 |
| | | Right | 0.00 | A | 0.0 | 0.0 |
| | WB | Left | 0.02 | A | 0.1 | 0.4 |
| | | Through | 0.02 | A | 1.7 | 0.4 |
| | NB | Left | 0.00 | A | 0.0 | 0.0 |
| | | Right | 0.01 | A | 8.8 | 0.3 |
| | **Intersection Summary** | | - | **A** | **1.4** | - |
| **Hwy 22 / White Avenue (Stop-Controlled) UNIMPROVED** | NB | Left/Through/ Right | 0.95 | F | 50.3 | 11.7 |
| | SB | Left/Through/ Right | 0.32 | B | 14.1 | 1.4 |
| | EB | Left/Through/ Right | 0.32 | B | 14.5 | 1.4 |
| | WB | Left/Through/ Right | 1.11 | F | 98.5 | 18.5 |
| | **Intersection Summary** | | - | **F** | **62.3** | - |
| **Highway 22 / White Avenue IMPROVED** | | | | | | |
| **Hwy 22 / White Avenue (Roundabout) IMPROVED** | NB | Left/Through/ Right | 0.47 | A | 8.2 | 24.1 |
| | WB | Left/Through/ Right | 0.53 | A | 9.6 | 28.3 |
| | SB | Left/Through/ Right | 0.21 | A | 7.4 | 6.9 |
| | EB | Left/Through/ Right | 0.21 | A | 7.2 | 6.7 |
| | **Intersection Summary** | | - | **A** | **8.6** | - |

Results of the Analysis indicate that at the Scenario 1 10-year horizon, all intersections of the alternative access scheme will operate at an acceptable LOS with the exception of Highway 22 / White Avenue.

A single lane roundabout at this location is expected to operate at an acceptable LOS A.

## TABLE 16: ALTERNATIVE ACCESS SCENARIO 2 – 10 YEAR OPERATING CONDITIONS

| ALTERNATE ACCESS FUTURE 10 YEAR OPERATING CONDITIONS - SCENARIO 2 | | | | | | |
|---|---|---|---|---|---|---|
| **INTERSECTION / MOVEMENT** | | | **PM PEAK HOUR** | | | |
| | | | **v/c Ratio** | **LOS** | **Delay (s)** | **Queue (m)** |
| **East Park Place / Hwy22 (Stop-Controlled)** | EB | Left | 0.06 | C | 17.7 | 1.5 |
| | | Right | 0.06 | C | 17.7 | 1.5 |
| | NB | Left | 0.02 | A | 0.3 | 0.5 |
| | | Through | 0.02 | A | 0.6 | 0.5 |
| | SB | Through | 0.35 | A | 0.0 | 0.0 |
| | | Right | 0.35 | A | 0.0 | 0.0 |
| | **Intersection Summary** | | - | **A** | **0.5** | - |
| **Park Place / White Avenue (Stop-Controlled)** | EB | Through | 0.05 | A | 0.0 | 0.0 |
| | | Right | 0.00 | A | 0.0 | 0.0 |
| | WB | Left | 0.02 | A | 0.2 | 0.5 |
| | | Through | 0.02 | A | 2.3 | 0.5 |
| | NB | Left | 0.00 | A | 0.0 | 0.0 |
| | | Right | 0.02 | A | 8.8 | 0.4 |
| | **Intersection Summary** | | - | **A** | **1.8** | - |
| **Hwy 22 / White Avenue (Stop-Controlled) UNIMPROVED** | NB | Left/Through/ Right | 0.95 | F | 51.1 | 11.8 |
| | SB | Left/Through/ Right | 0.33 | B | 14.2 | 1.4 |
| | EB | Left/Through/ Right | 0.33 | B | 14.6 | 1.4 |
| | WB | Left/Through/ Right | 1.13 | F | 104.4 | 19.4 |
| | **Intersection Summary** | | - | **F** | **65.0** | - |
| **Highway 22 / White Avenue IMPROVED** | | | | | | |
| **Hwy 22 / White Avenue (Roundabout) IMPROVED** | NB | Left/Through/ Right | 0.47 | A | 8.2 | 24.1 |
| | WB | Left/Through/ Right | 0.54 | A | 9.8 | 28.9 |
| | SB | Left/Through/ Right | 0.22 | A | 7.5 | 7.2 |
| | EB | Left/Through/ Right | 0.21 | A | 7.3 | 6.8 |
| | **Intersection Summary** | | - | **A** | **8.7** | - |

Results of the Analysis indicate that at the Scenario 2 10-year time horizon, all intersections of the alternative access scheme will operate at an acceptable LOS with the exception of Highway 22 / White Avenue.

A single lane roundabout constructed at this location will operate at an acceptable LOS A.

The Peak hour volumes for Scenario 1 and 2 for the 20 year time horizon with the alternative access scheme are shown in **Figures 16** and **17** below:

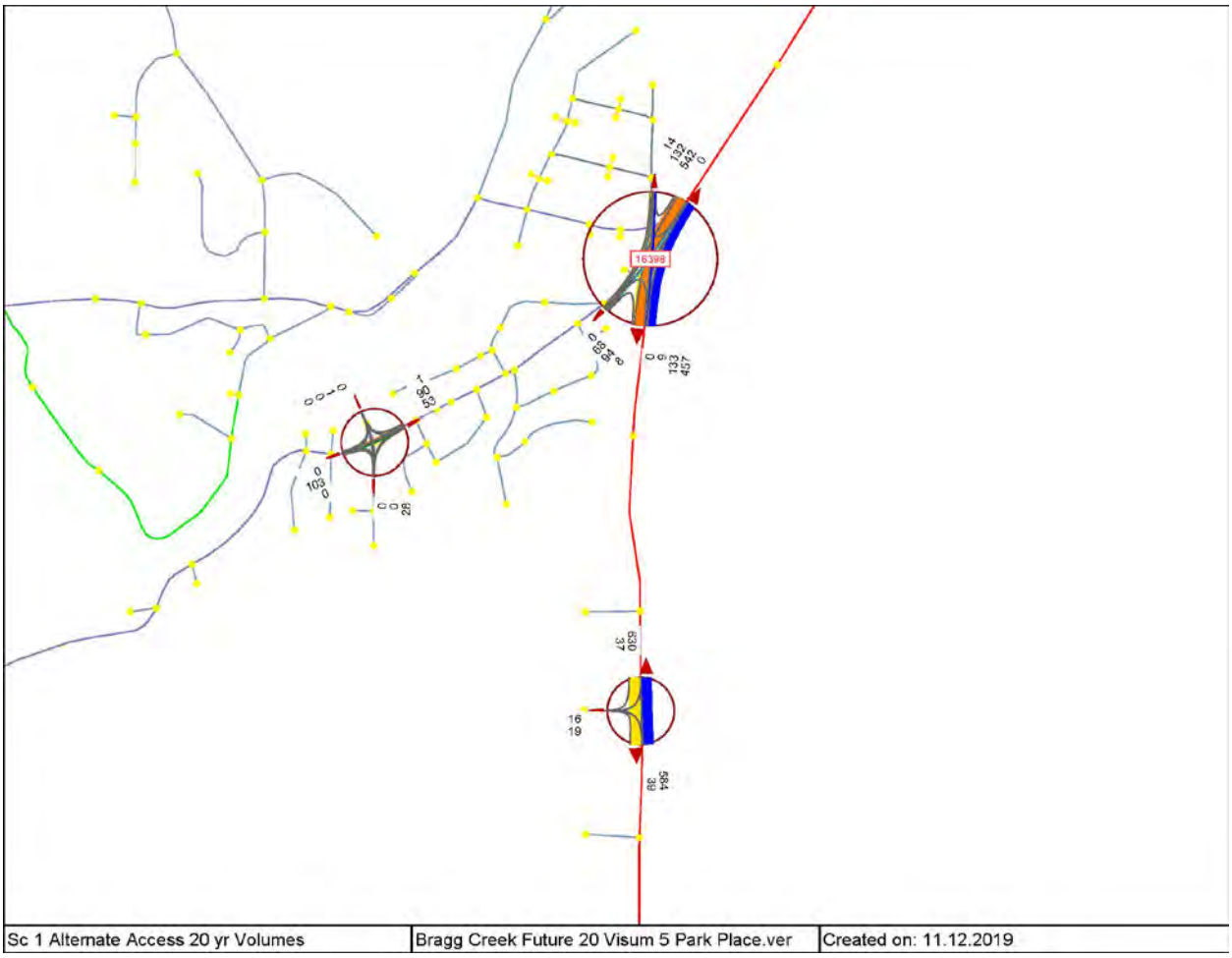



**Figure 16: Alternative Access Scenario 1 – 20 Year Peak Hour Volumes**

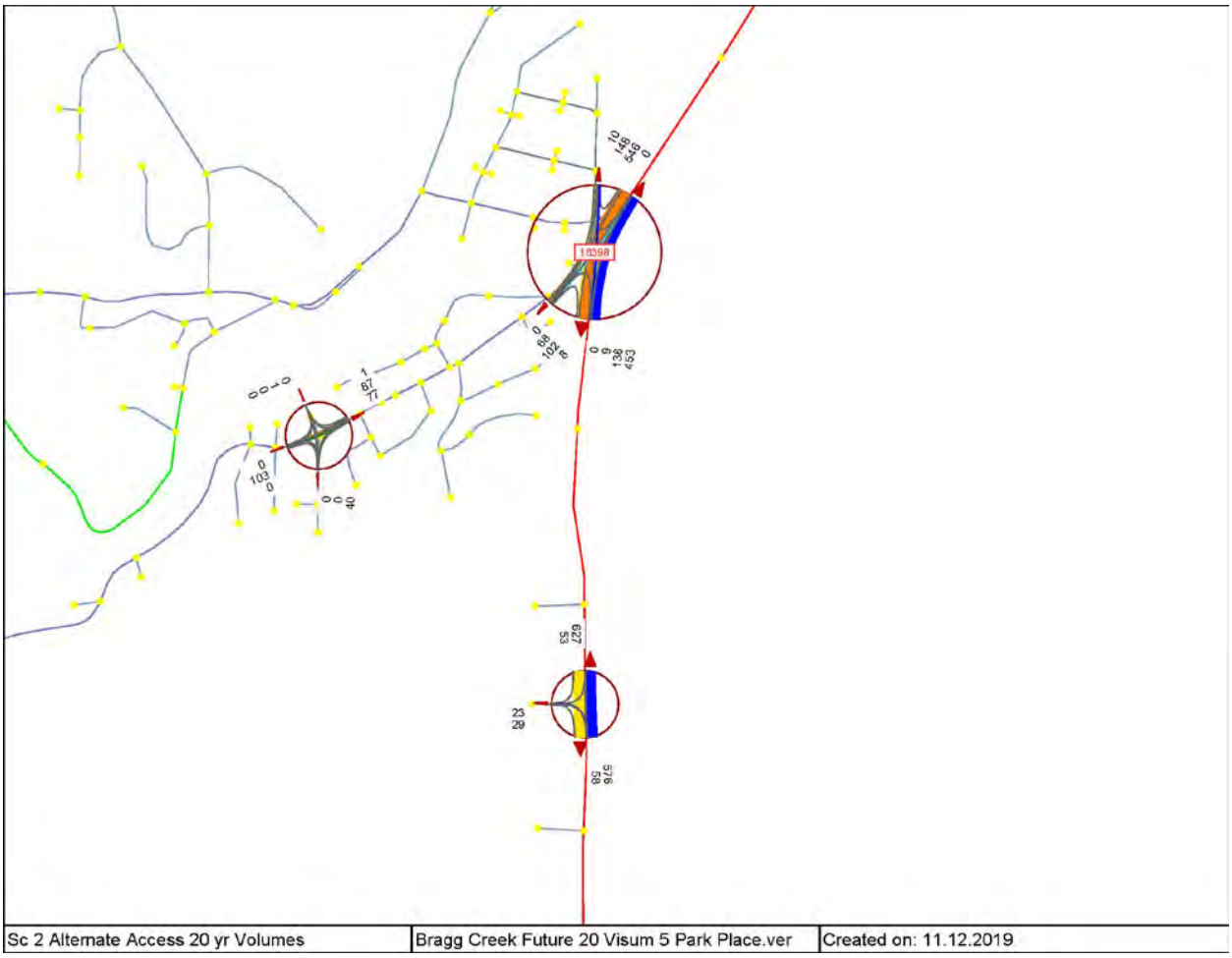



**Figure 17: Alternative Access Scenario 2 – 20 Year Peak Hour Volumes**

The alternative access operation conditions at the 20 year time horizon for both Scenario 1 and 2 are summarized in **Tables 17** and **18** below:

## TABLE 17: ALTERNATIVE ACCESS SCENARIO 1 – 20 YEAR OPERATING CONDITIONS

| ALTERNATE ACCESS FUTURE 20 YEAR OPERATING CONDITIONS - SCENARIO 1 | | | | | | |
|---|---|---|---|---|---|---|
| **INTERSECTION / MOVEMENT** | | | **PM PEAK HOUR** | | | |
| | | | **v/c Ratio** | **LOS** | **Delay (s)** | **Queue (m)** |
| **East Park Place / Hwy22 (Stop-Controlled)** | EB | Left | 0.17 | C | 24.0 | 4.7 |
| | | Right | 0.17 | C | 24.0 | 4.7 |
| | NB | Left | 0.05 | A | 0.7 | 1.2 |
| | | Through | 0.05 | A | 1.2 | 1.2 |
| | SB | Through | 0.43 | A | 0.0 | 0.0 |
| | | Right | 0.43 | A | 0.0 | 0.0 |
| | **Intersection Summary** | | - | **A** | **1.2** | - |
| **Park Place / White Avenue (Stop-Controlled)** | EB | Through | 0.07 | A | 0.0 | 0.0 |
| | | Right | 0.00 | A | 0.0 | 0.0 |
| | WB | Left | 0.04 | A | 0.3 | 1.0 |
| | | Through | 0.04 | A | 3.0 | 1.0 |
| | NB | Left | 0.00 | A | 0.0 | 0.0 |
| | | Right | 0.03 | A | 9.0 | 0.8 |
| | **Intersection Summary** | | - | **A** | **2.5** | - |
| **Hwy 22 / White Avenue (Stop-Controlled) UNIMPROVED** | NB | Left/Through/ Right | 1.19 | F | 125.7 | 20.7 |
| | SB | Left/Through/ Right | 0.41 | C | 16.1 | 1.9 |
| | EB | Left/Through/ Right | 0.42 | C | 16.8 | 2.0 |
| | WB | Left/Through/ Right | 1.49 | F | 249.9 | 35.6 |
| | **Intersection Summary** | | - | **F** | **155.2** | - |
| **Highway 22 / White Avenue IMPROVED** | | | | | | |
| **Hwy 22 / White Avenue (Roundabout) IMPROVED** | NB | Left/Through/ Right | 0.59 | B | 10.6 | 34.2 |
| | WB | Left/Through/ Right | 0.71 | B | 14.8 | 90.3 |
| | SB | Left/Through/ Right | 0.30 | A | 9.9 | 10.0 |
| | EB | Left/Through/ Right | 0.29 | A | 9.3 | 9.4 |
| | **Intersection Summary** | | - | **B** | **12.2** | - |

Results of the analysis indicate that at the Scenario 1 20-year time horizon all intersections of the alternative access scheme will operate at an acceptable LOS with the exception of Highway 22 / White Avenue.

A single lane roundabout constructed at this location will operate at an acceptable LOS B.

## TABLE 18: ALTERNATIVE ACCESS SCENARIO 2 – 20 YEAR OPERATING CONDITIONS

| ALTERNATE ACCESS FUTURE 20 YEAR OPERATING CONDITIONS - SCENARIO 2 | | | | | | |
|---|---|---|---|---|---|---|
| **INTERSECTION / MOVEMENT** | | | **PM PEAK HOUR** | | | |
| | | | **v/c Ratio** | **LOS** | **Delay (s)** | **Queue (m)** |
| **East Park Place / Hwy22 (Stop-Controlled)** | EB | Left | 0.26 | D | 27.6 | 8.2 |
| | | Right | 0.26 | D | 27.6 | 8.2 |
| | NB | Left | 0.07 | A | 1.1 | 1.9 |
| | | Through | 0.07 | A | 1.9 | 1.9 |
| | SB | Through | 0.44 | A | 0.0 | 0.0 |
| | | Right | 0.44 | A | 0.0 | 0.0 |
| | **Intersection Summary** | | - | **A** | **1.9** | - |
| **Park Place / White Avenue (Stop-Controlled)** | EB | Through | 0.07 | A | 0.0 | 0.0 |
| | | Right | 0.00 | A | 0.0 | 0.0 |
| | WB | Left | 0.06 | A | 0.5 | 1.4 |
| | | Through | 0.06 | A | 3.8 | 1.4 |
| | NB | Left | 0.00 | A | 0.0 | 0.0 |
| | | Right | 0.05 | A | 9.0 | 1.1 |
| | **Intersection Summary** | | - | **A** | **3.2** | - |
| **Hwy 22 / White Avenue (Stop-Controlled) UNIMPROVED** | NB | Left/Through/ Right | 1.21 | F | 131.7 | 21.1 |
| | SB | Left/Through/ Right | 0.43 | C | 16.8 | 2.1 |
| | EB | Left/Through/ Right | 0.44 | C | 17.4 | 2.2 |
| | WB | Left/Through/ Right | 1.54 | F | 272.7 | 37.8 |
| | **Intersection Summary** | | - | **F** | **167.0** | - |
| **Highway 22 / White Avenue IMPROVED** | | | | | | |
| **Hwy 22 / White Avenue (Roundabout) IMPROVED** | NB | Left/Through/ Right | 0.59 | B | 10.8 | 34.6 |
| | WB | Left/Through/ Right | 0.73 | C | 15.8 | 102.2 |
| | SB | Left/Through/ Right | 0.32 | B | 10.4 | 11.0 |
| | EB | Left/Through/ Right | 0.31 | A | 10.0 | 10.4 |
| | **Intersection Summary** | | - | **B** | **12.8** | - |

Results of the analysis indicate that at the Scenario 2 20-year time horizon all intersections of the alternative access scheme will operate at an acceptable LOS with the exception of Highway 22 / White Avenue.

A single lane roundabout constructed at this location will operate at an acceptable LOS B.

## 6.3 CONCLUSIONS – ADDITIONAL ANALYSIS

Based on the expected post development operating conditions, the alternative access scheme will require the same improvements as the original proposed access scheme. These improvements include the upgrade of Highway 22 / White Avenue from STOP controlled to a single lane roundabout. Based on the results, it would be desirable for these improvements to be implemented prior to the 5-year horizon.

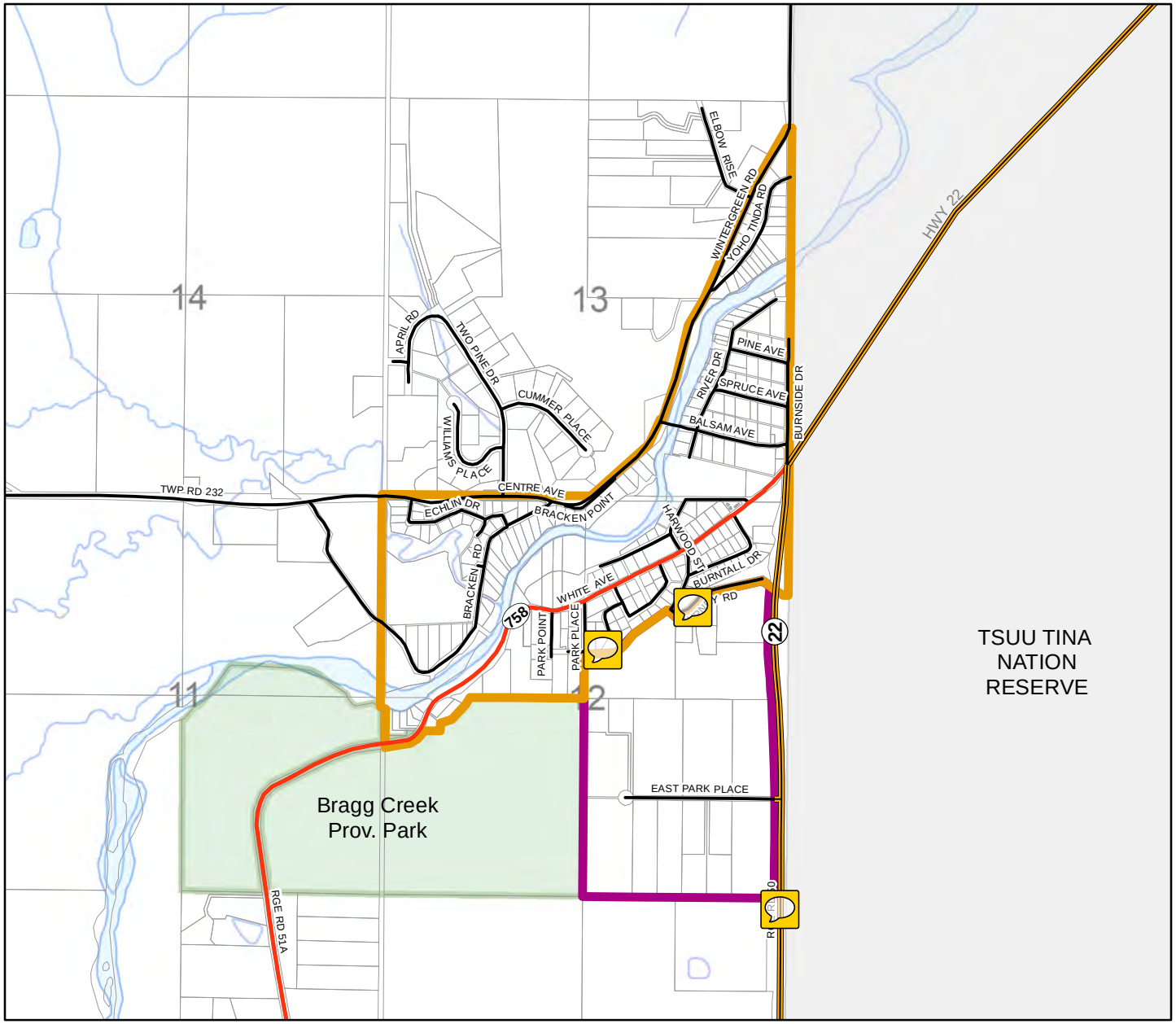
The 2017 Alberta Transportation TIA Technical Requirements Southern Region Supplement state that operating conditions of LOS C or better is considered an acceptable overall LOS for the intersection while LOS D or better is considered an acceptable LOS for any single approach to the intersection.

Rocky View County staff requested comments as to the acceptability of operating conditions at the intersection of East Park Place and Highway 22 as related to the results of the additional analysis.

As per the results of the analysis summarized in **Tables 14** through to **18,** the overall LOS for this intersection is LOS A for all horizons. It should be noted the eastbound approach on East Park Place at this intersection reaches LOS D at the Scenario 2 20-year horizon (**Table 18**). However, this is still an acceptable approach LOS as per the 2017 Alberta Transportation TIA Technical Requirements Southern Region Supplement.

# APPENDIX A: PROPOSED DEVELOPMENT

# Map 6:
# Road Network

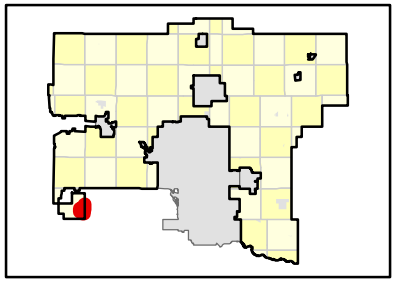



Road Network

## Highways

PRIMARY HWY

SECONDARY HWY



0 0.25 0.5 1
Km

N

This map is conceptual in nature. No measurements or area calculations should be taken from this map.

## Scenario 1: Hamlet size Development (1/4 acre lots across the developable areas)

| | Acres |
|---|---|
| **Total Developable area (after 15% slopes)** | **120** |
| Assuming 30% dedication to road, utilities, stormwater | 36 |
| Assuming 10% dedication for Municipal Reserve | 12 |
| Remaining developable area | **72** |

| **Servicing & Lot number calculation** | **Potential lots** | **Potential population** | **Water** | **Wastewater** |
|---|---|---|---|---|
| Calculations | | | **3** | |
| Hamlet Development (0.25 acre lots) | 288 | 864 | | |

*Note: County Servicing Standard Sec. 600 assume 4.5 person per household*

## Scenario 2: Hybrid (Acreage in the north and 1/4 acre lots to the south)

| | Acres |
|---|---|
| **Total Developable area (after 15% slopes)** | **120** |
| Assuming 30% dedication to road, utilities, stormwater | 36 |
| Assuming 10% dedication for Municipal Reserve | 12 |
| Remaining developable area | **72** |

| **Servicing & Lot number calculation** | **Potential lots** | **Potential population** | **Water** | **Wastewater** |
|---|---|---|---|---|
| Calculations | | | **3** | |
| North area - Acreage Development (± 31 acres with 2 acre lots) | 16 | 47 | | |
| South area - Hamlet Development (± 41 acres with 0.10 acre lots) | 408 | 1,224 | | |
| **Total** | **424** | **1,271** | | |

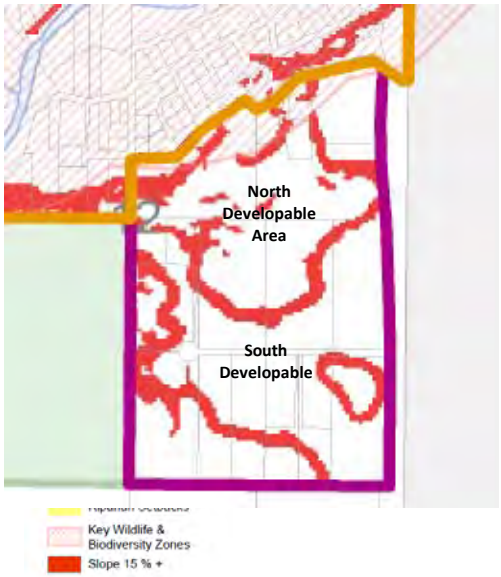
*Note: County Servicing Standard Sec. 600 assume 4.5 person per household*

| | |
|---|---|
| **North Developable area (after 15% slopes)** | **52** |
| Assuming 30% dedication to roads, utilities, stormwater | 15.6 |
| Assuming 10% dedication for Municipal Reserve | 5.2 |
| **Remaining developable area** | **31.2** |

| **Servicing & Lot number calculation** | **Potential lots** | **Potential population** | **Water** | **Wastewater** |
|---|---|---|---|---|
| Calculations | | | **3** | |
| Acreage Development (2 acre lots) | 16 | 47 | | |

| | |
|---|---|
| **South Developable area (after 15% slopes)** | **68** |
| Assuming 30% dedication to road, utilities, stormwater | 20.4 |
| Assuming 10% dedication for Municipal Reserve | 6.8 |
| Remaining developable area | **40.8** |

| **Servicing & Lot number calculation** | **Potential lots** | **Potential population** | **Water** | **Wastewater** |
|---|---|---|---|---|
| Calculations | | | **3** | |
| Hamlet Development (0.1 acre lots) | 408 | 1,224 | | |



**Bragg Creek Hamlet and Hamlet Expansion Area**


**Notes:** the roads in red and yellow fall under Alberta Transportation's jurisdiction. The lands located east of highway 22 are Tsuu T'ina.

# APPENDIX B: MODEL INFORMATION

**EXISTING RESIDENTS**

| | |
|---|---|
| **Area 1 – Hamlet North (Yoho Tinda)**<br>23 residences x 2 people per household | 46 people |
| **Area 2 – Hamlet North of Balsam**<br>39 residences x 2 people per household | 78 people |
| **Area3 – Erika Subdivision**<br>64 residences x 2 people per household | 128 people |
| **Area 4 – White Avenue Part 1**<br>74 residences x 2 people per household | 148 people |
| **Area 5 – White Avenue Part 2**<br>26 residences x 2 people per household | 52 people |
| **Area 6- Hamlet Core** | None |
| **Total Estimates** | **452 people** |

**PROJECTED RESIDENTS**

| | |
|---|---|
| **Area 1 – Hamlet North (Yoho Tinda)**<br>24 residences x 2.5 people per household | 60 people |
| **Area 2 – Hamlet North of Balsam**<br>50 residences x 2.5 people per household | 125 people |
| **Area3 – Erika Subdivision**<br>75 residences x 2.5 people per household | 187.5 people |
| **Area 4 – White Avenue Part 1**<br>74 residences x 2.5 people per household | 185 people |
| **Area 5 – White Avenue Part 2**<br>38 residences x 2.5 people per household | 95 people |
| **Area 6- Hamlet Core** | 87.5 people |
| **Total Projected Residents** | **740 people** |

**NUMBER OF EMPLOYEESS**

| | |
|---|---|
| **Area 1 – Hamlet North (Yoho Tinda)** | None |
| **Area 2 – Hamlet North of Balsam** | ± 17 Employees |
| **Area3 – Erika Subdivision** | None |
| **Area 4 – White Avenue Part 1** | ± 10 Employees |
| **Area 5 – White Avenue Part 2** | ± 5 Employees |
| **Area 6- Hamlet Core** | ± 130 Employees |
| **Total Estimate** | **± 162 Employees** |

**Area 1 – Hamlet North (Yoho Tinda)**


| | |
|---|---|
| **Estimated Existing Residents**<br>23 residences x 2 people per household | 46 people |
| **Projected Residents**<br>24 residences x 2.5 people per household | 60 people |
| **Employment** | None |

**Area 2 – Hamlet North of Balsam**


| | |
|---|---|
| **Estimated Existing Residents**<br>39 residences x 2 people per household | 78 people |
| **Projected Residents**<br>50 residences x 2.5 people per household | 125 people |
| **Employment (existing)**<br>Seven (7) Hamlet Commercial lots.<br>Check DP records for Roll 03913059, 03913048, 03913050, 03913046, 03913077, 03913049, 03913051 for details. | ± 17 employees |

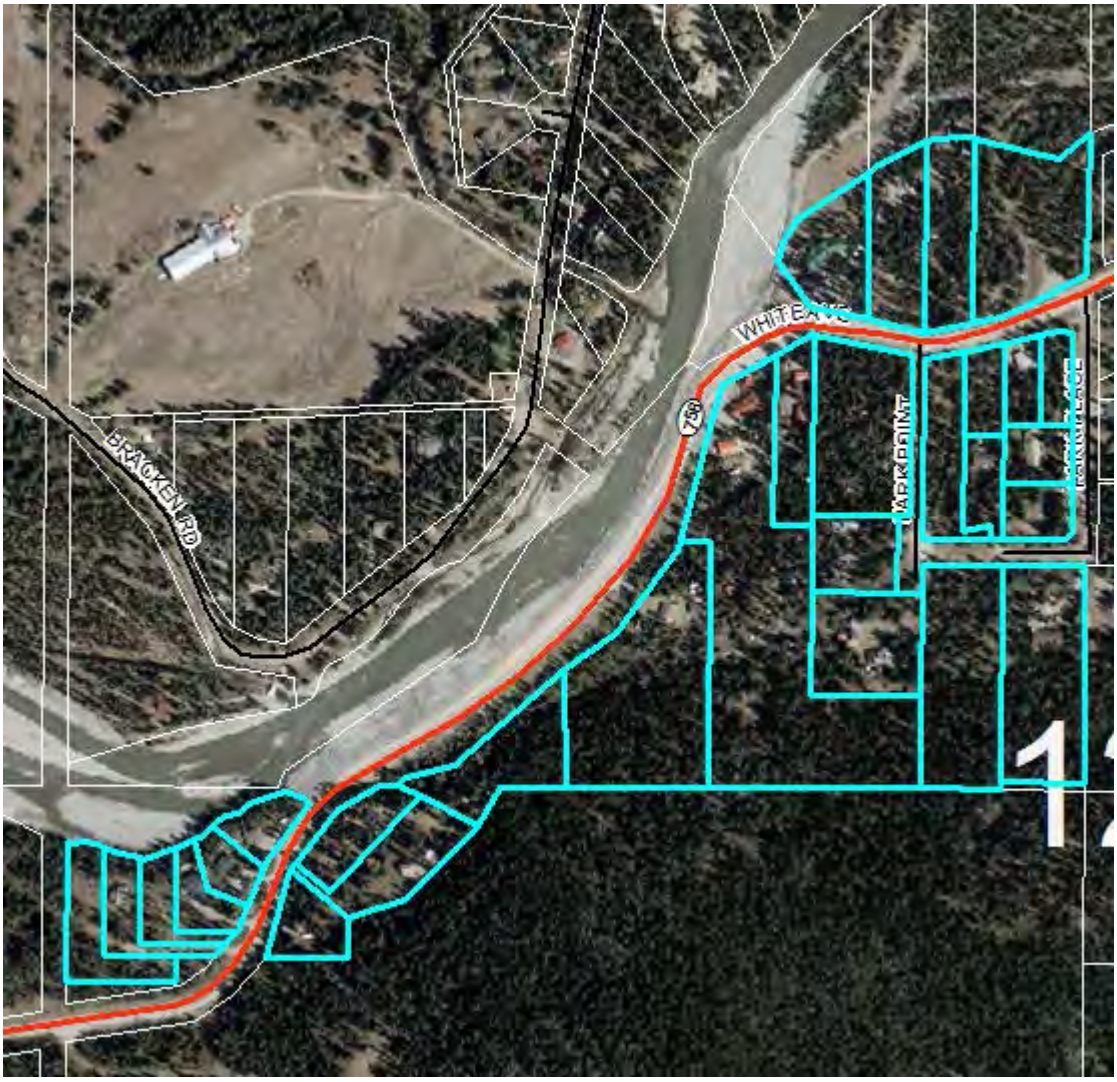
**Area3 – Elkana Subdivision**


| | |
|---|---|
| **Estimated Existing Residents**<br>64 residences x 2 people per household | 128 people |
| **Projected Residents**<br>75 residences x 2.5 people per household | 187.5 people |
| **Employment**<br>Check DP records Roll 03912119 for details. | None |

**Area 4 – White Avenue Part 1**


| | |
|---|---|
| **Estimated Existing Residents**<br>74 residences x 2 people per household | 148 people |
| **Projected Residents**<br>75 residences x 2.5 people per household | 185 people |
| **Employment**<br>Check DP records for Roll 03912014, 03912067, 03912128, 03912068, 03912016, and 03912131 for details. | ± 10 employees |

**Area 5 – White Avenue Part 2**




| | |
|---|---|
| **Estimated Existing Residents** 26 residences x 2 people per household | 52 people |
| **Projected Residents**<br>38 residences x 2.5 people per household | 95 people |
| **Employment**<br>Check DP records Roll 03912101 for details. | ± 5 employees |

**Area 6 – Hamlet Core**


| | |
|---|---|
| **Estimated Existing Residents** | None |
| **Projected Residents**<br>• Existing HR-1 Lot area: 11.61 acres<br>• Minimum lot size of ± 0.23 ac<br>• Assume 30% PUL and Road dedication<br>• Development Area: 8.127 acres<br>• Potential HR-1 development: 35 lots<br>• Assume 2.5 people per lot = 87.5 people | 87.5 people |
| **Employment**<br>Check DP records Roll 03913040, 03913045, 03913103, 03913001, 03913075, 03913101, 03912070, 03913043, 03913076, 03913002, 03913173, 03913044 for details. | ± 130 employees |

# APPENDIX C: PHOTO INVENTORY


P

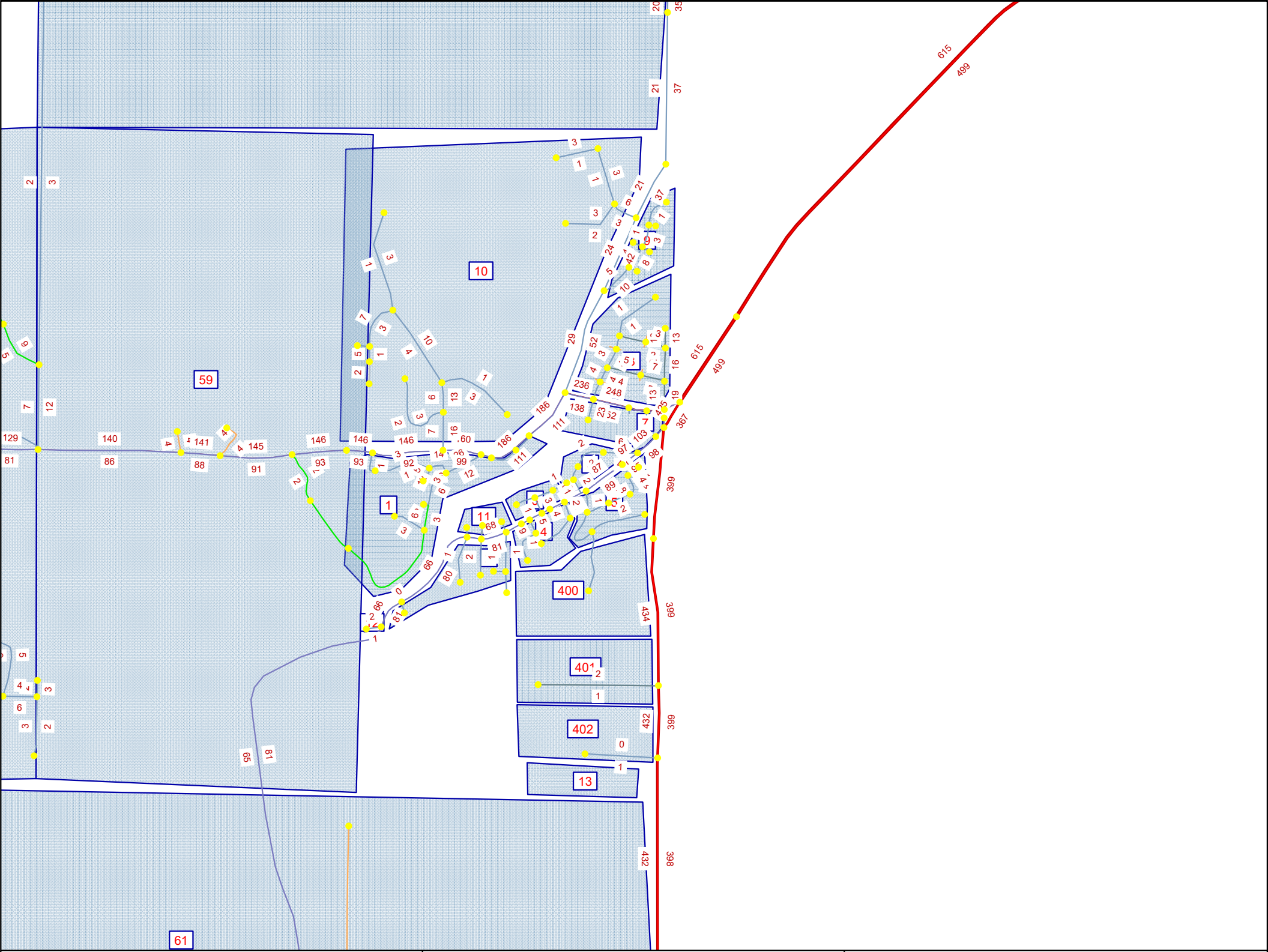

P


Bragg Creek
Calgary
50

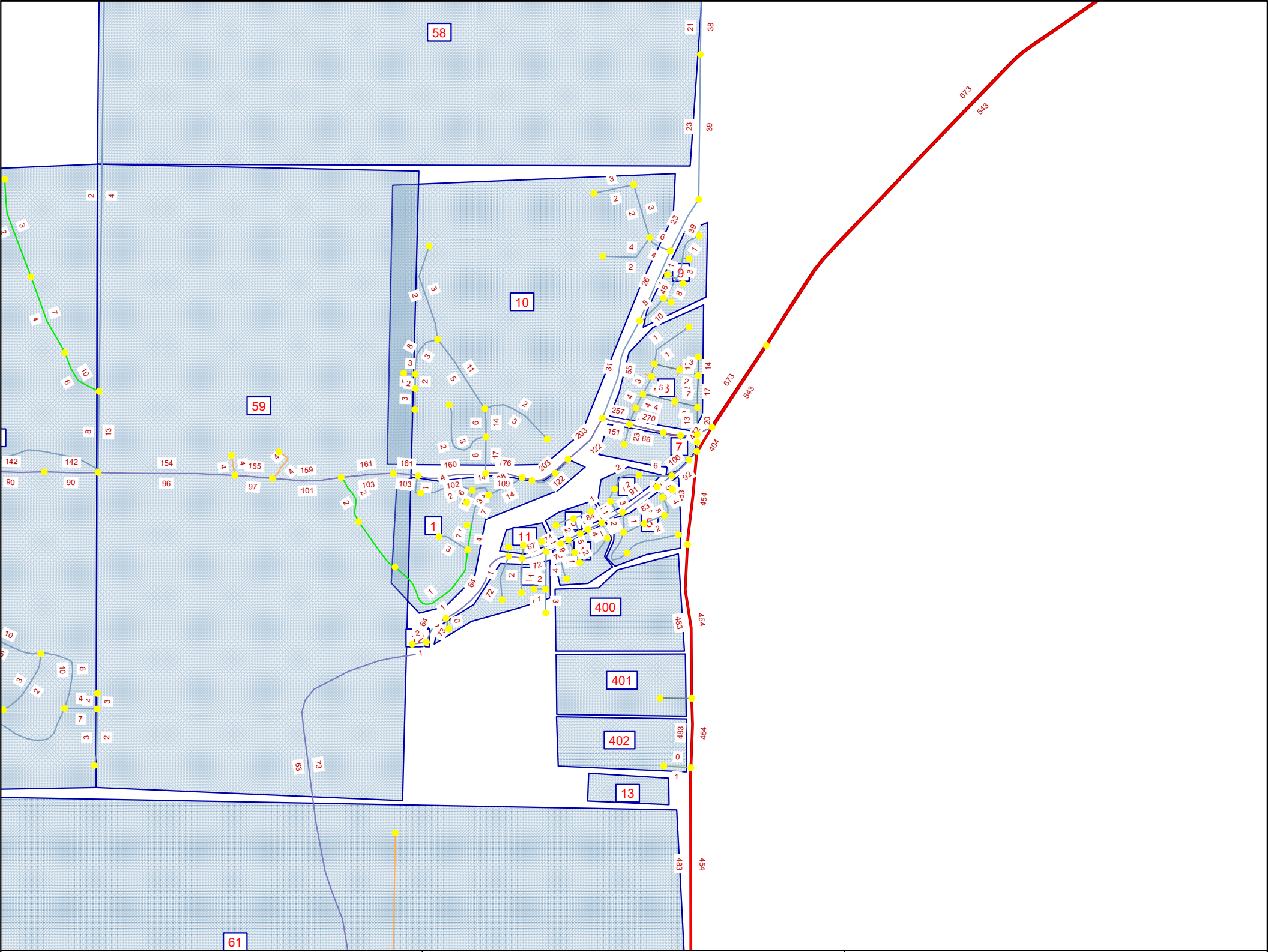

Banded Peak
Veterinary Hospital


Banded Peak
Veterinary Hospital

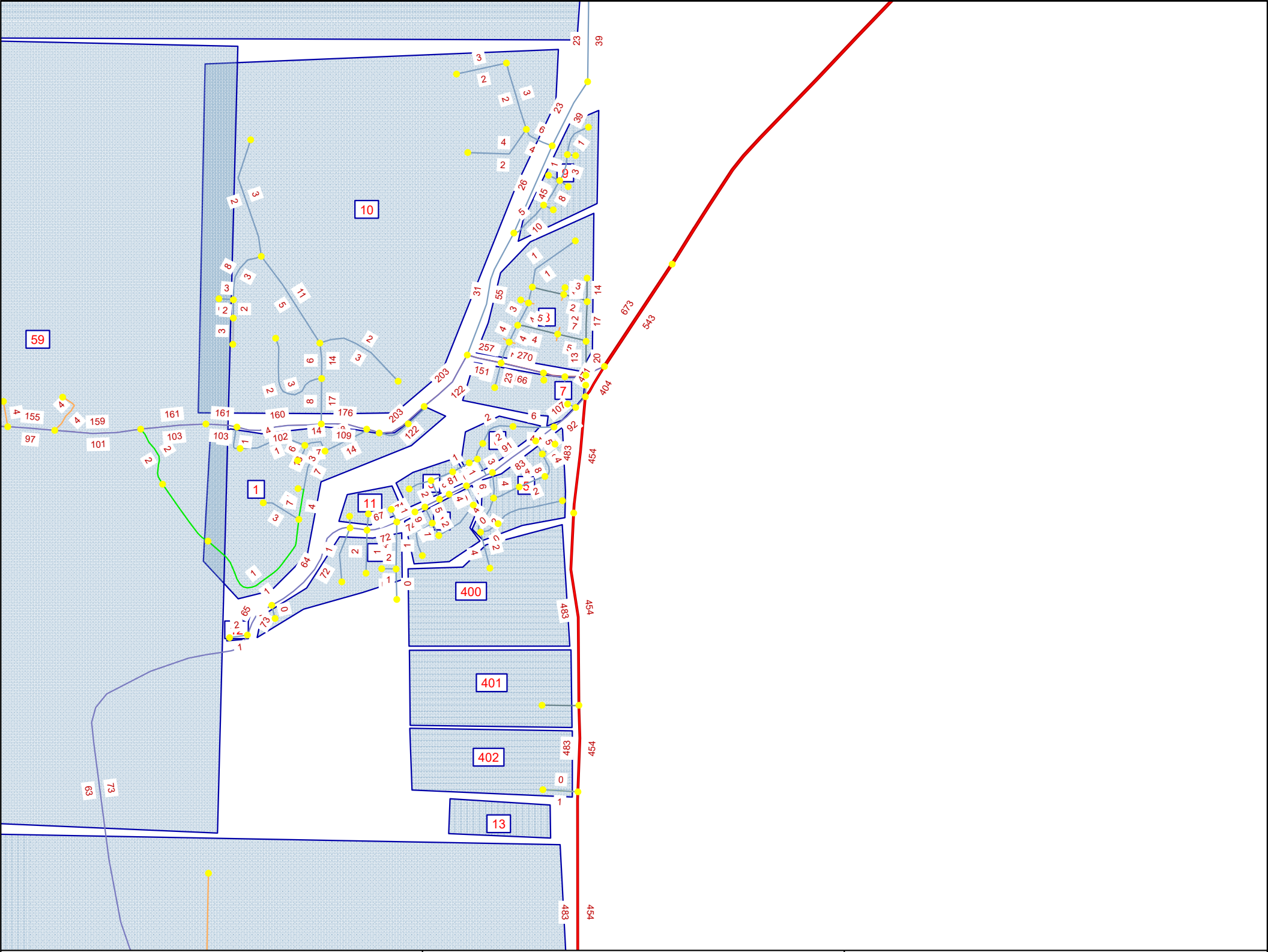
# APPENDIX D: VISUM, SYNCHRO/SIDRA RESULTS



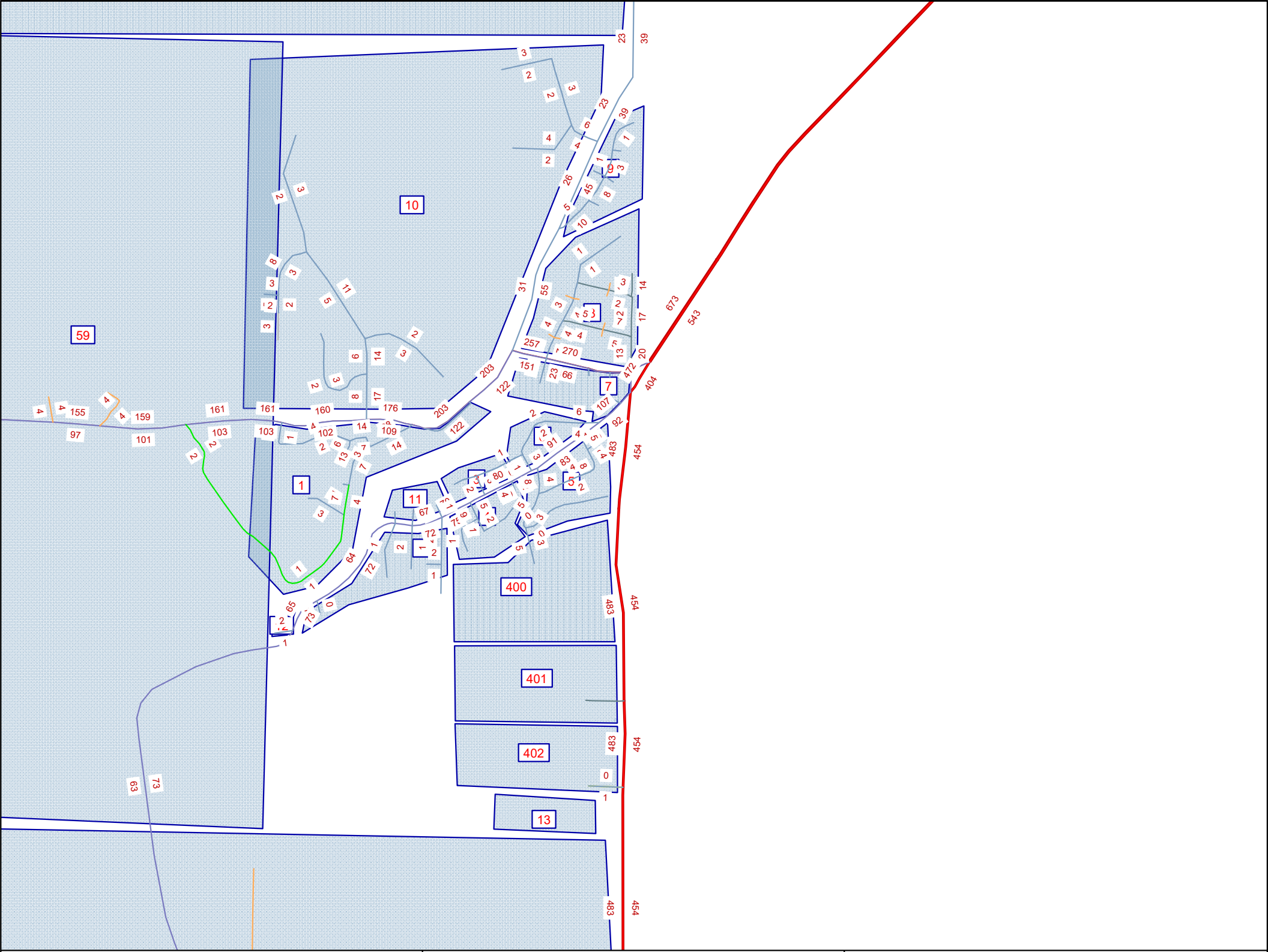

| | | |
|---|---|---|
| Existing Conditions | Bragg Creek Visum.ver | Created on: 13.01.2020 |



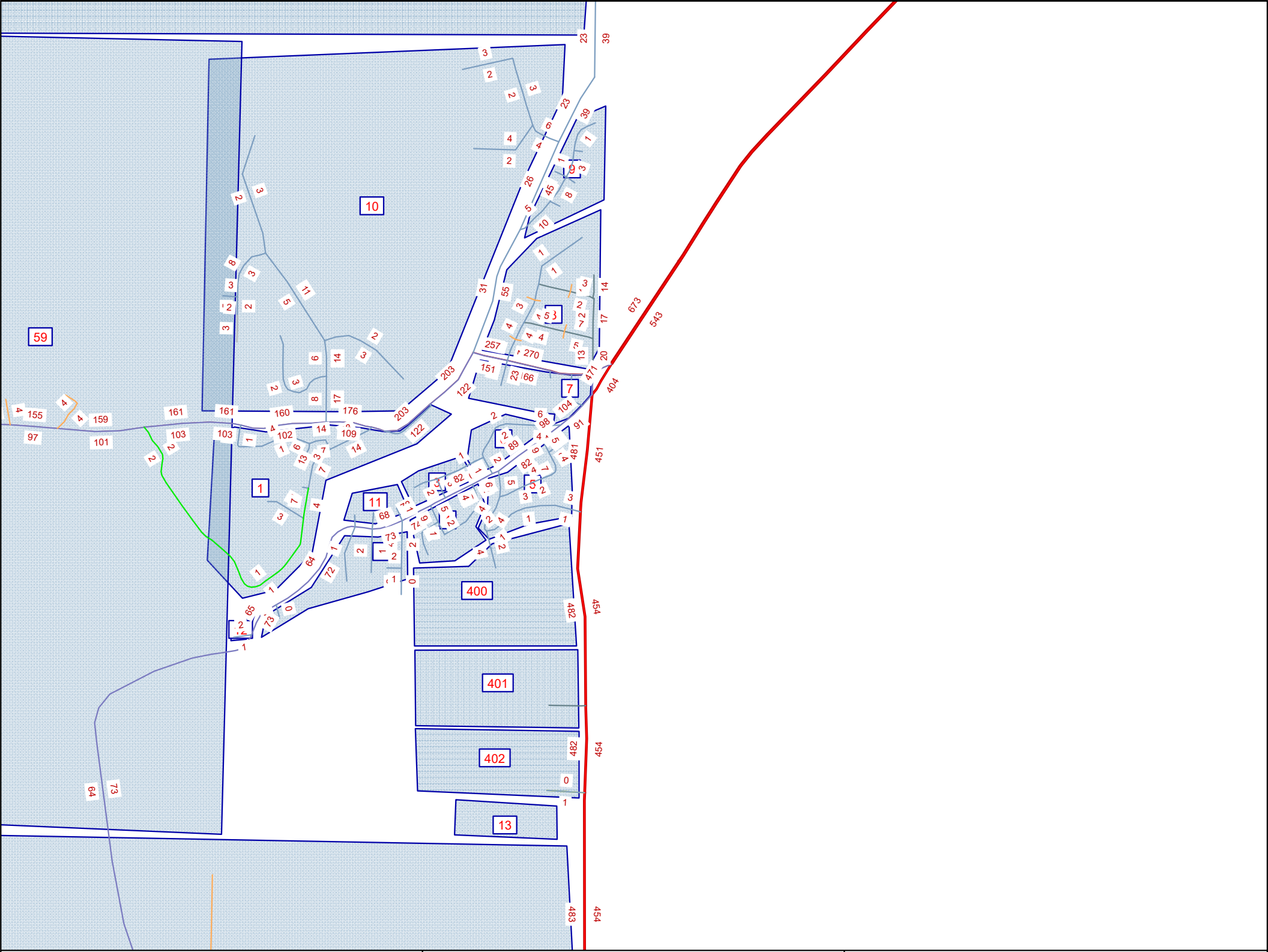

| 5 Year Access Opt 1 | Bragg Creek Future 5 Visum 1.ver | Created on: 13.01.2020 |
|---|---|---|



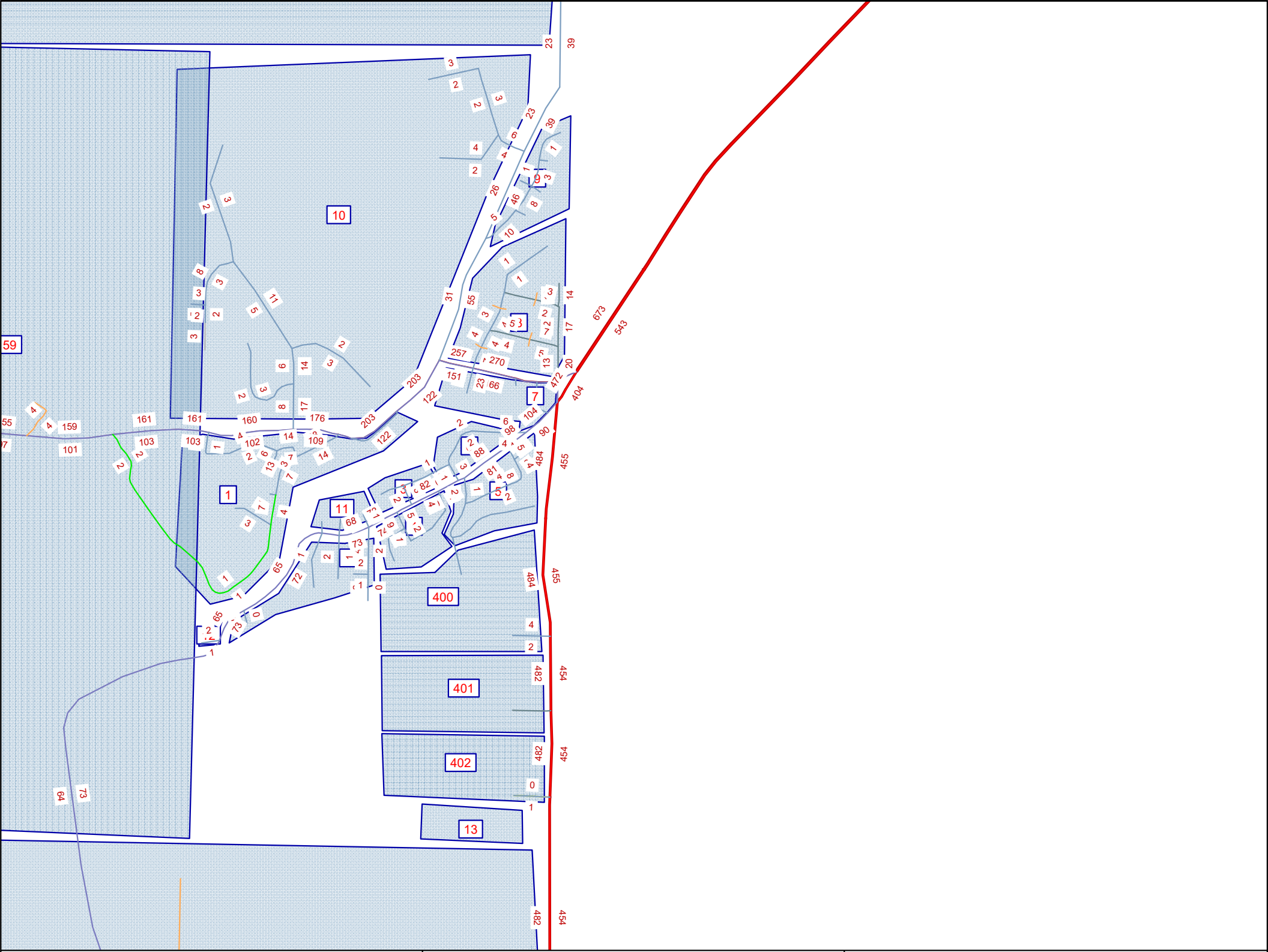

| | | |
|---|---|---|
| 5 Year Opt 2 | Bragg Creek Future 5 Visum 1+2.ver | Created on: 13.01.2020 |



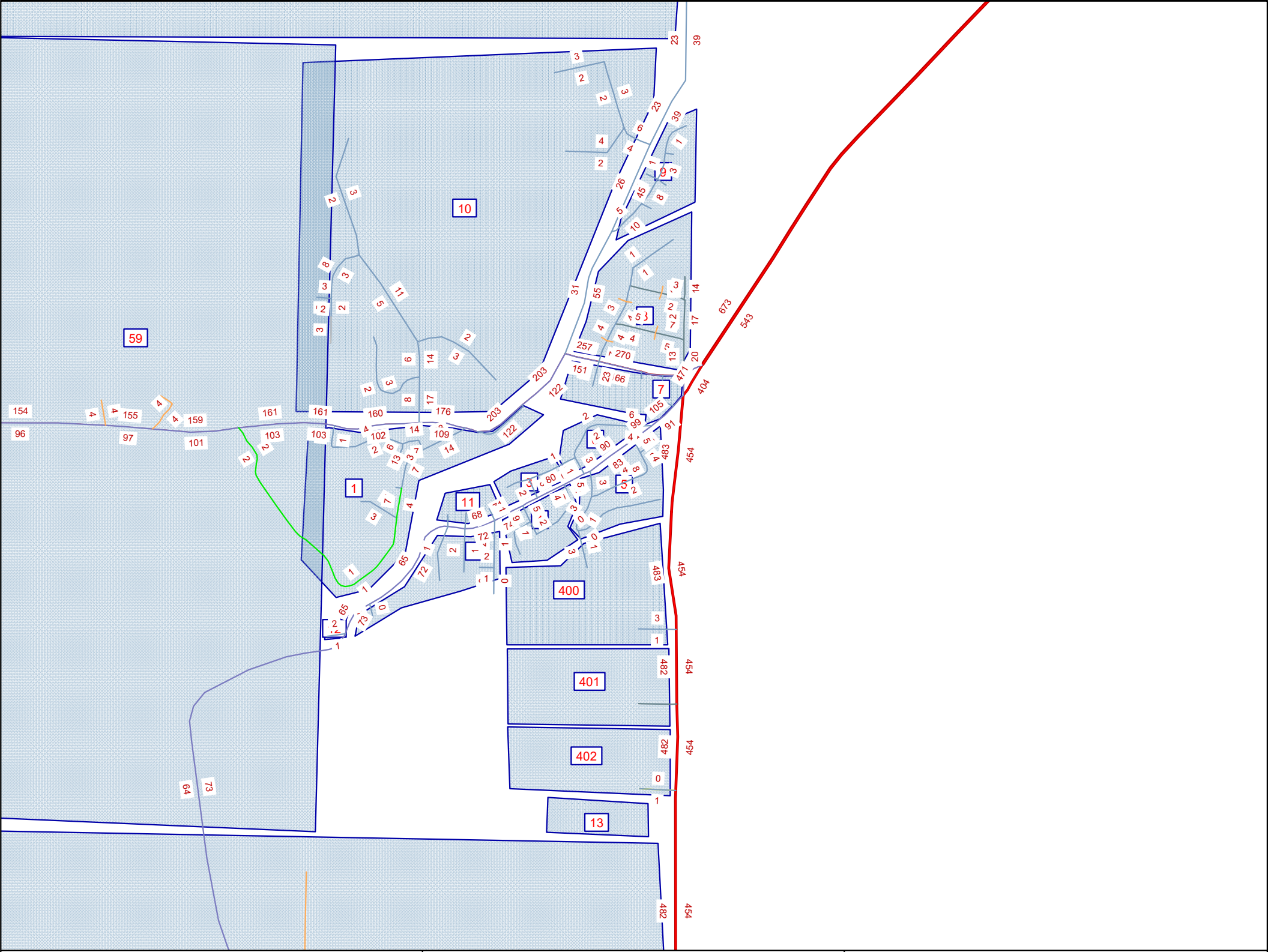

| | | |
|---|---|---|
| 5 Year Opt 3 | Bragg Creek Future 5 Visum 2.ver | Created on: 13.01.2020 |



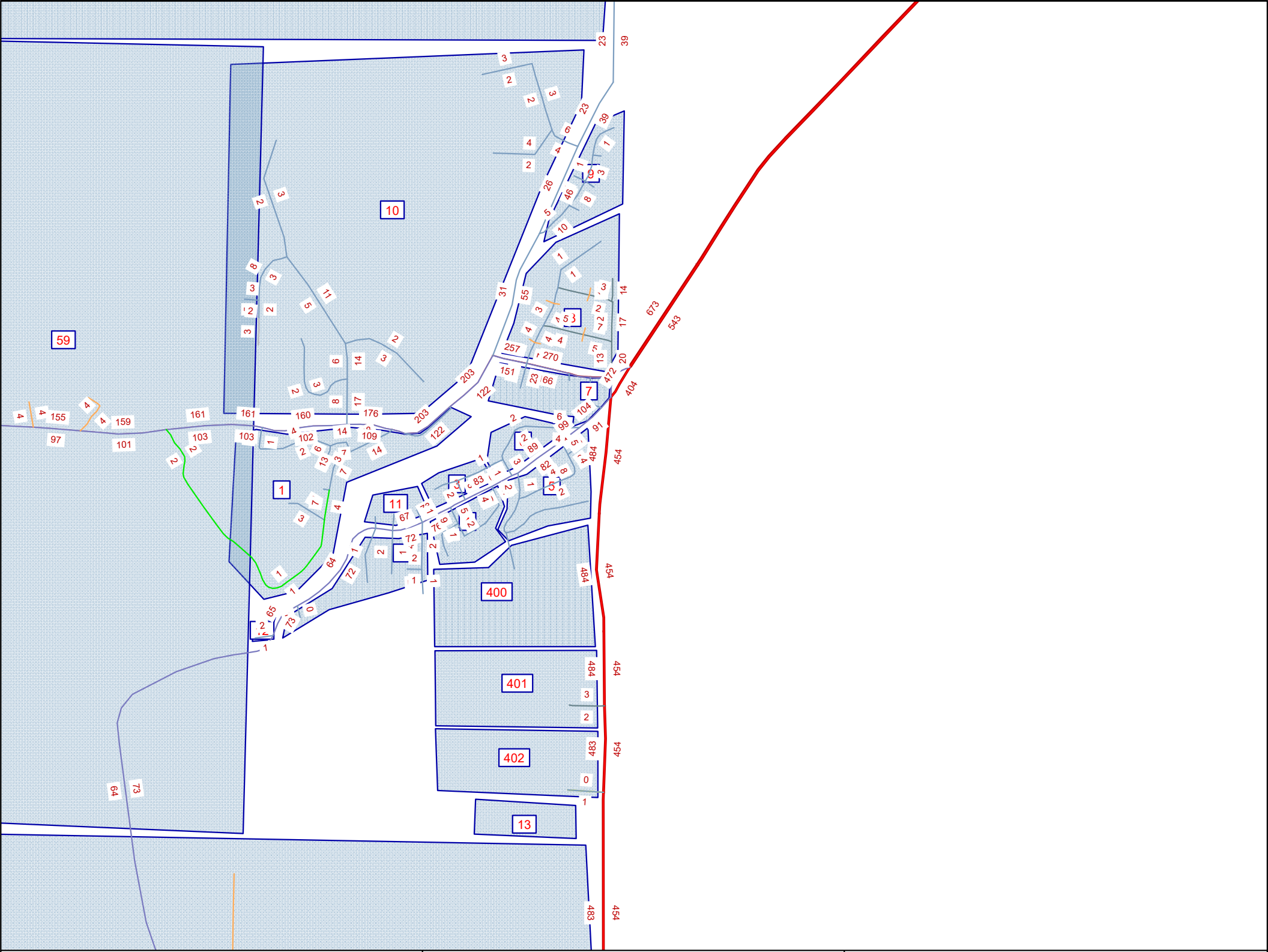

| | | |
|---|---|---|
| 5 Year Opt 4 | Bragg Creek Future 5 Visum 3.ver | Created on: 13.01.2020 |



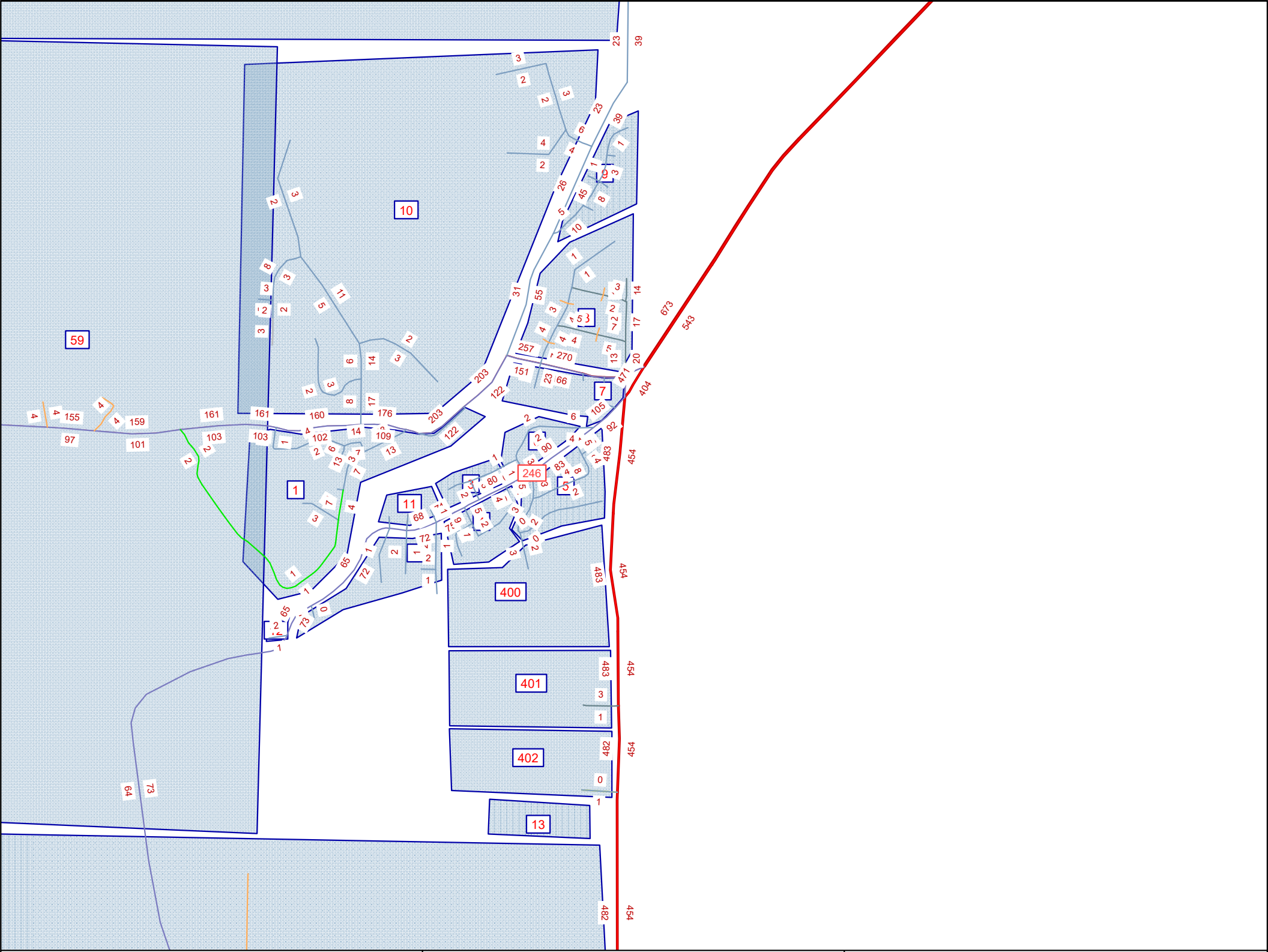

| | | |
|---|---|---|
| 5 Year Opt 5 | Bragg Creek Future 5 Visum 4 Park Place.ver | Created on: 13.01.2020 |



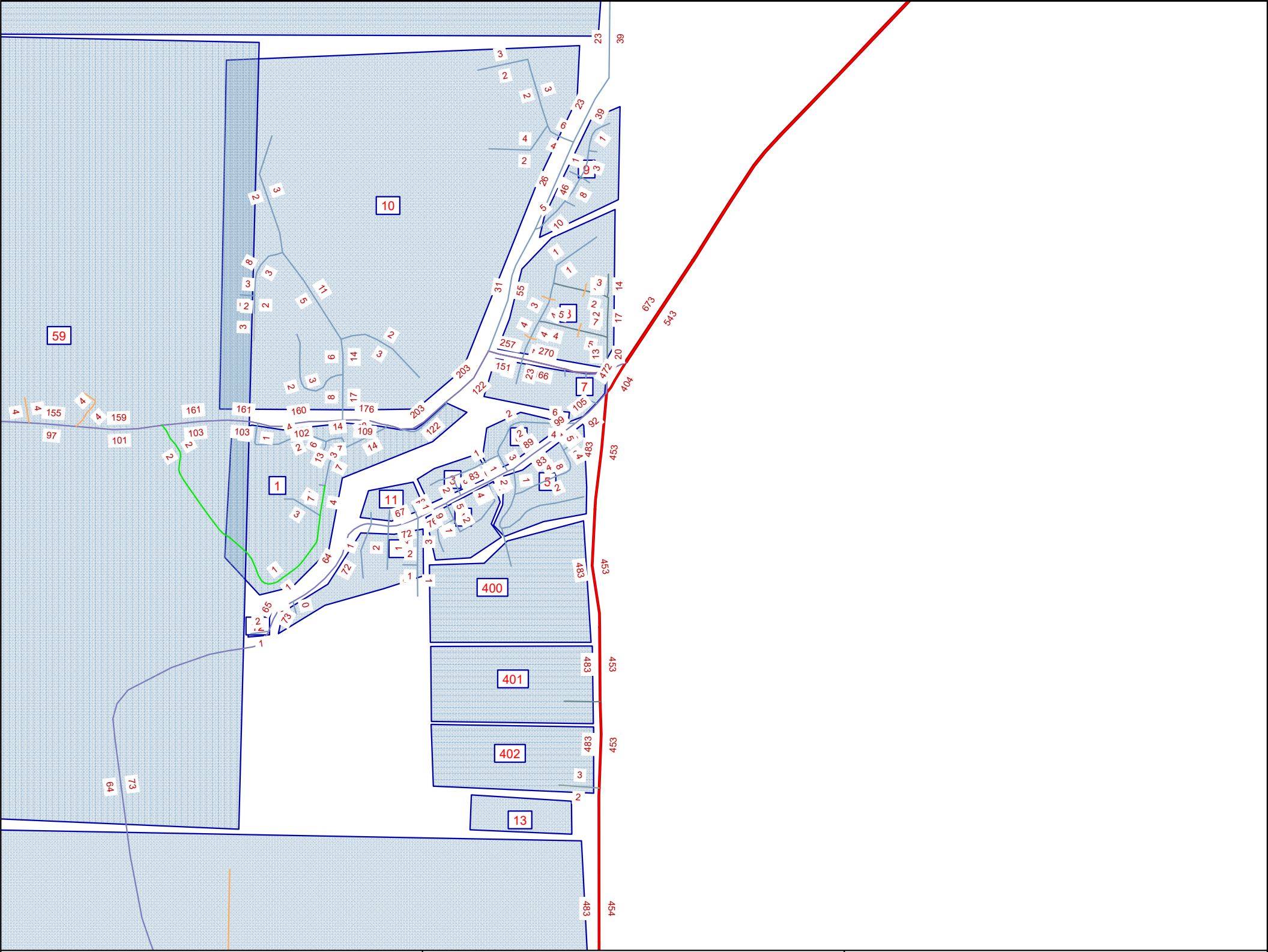

| | | |
|---|---|---|
| 5 Year Opt 6 | Bragg Creek Future 5 Visum 4.ver | Created on: 13.01.2020 |



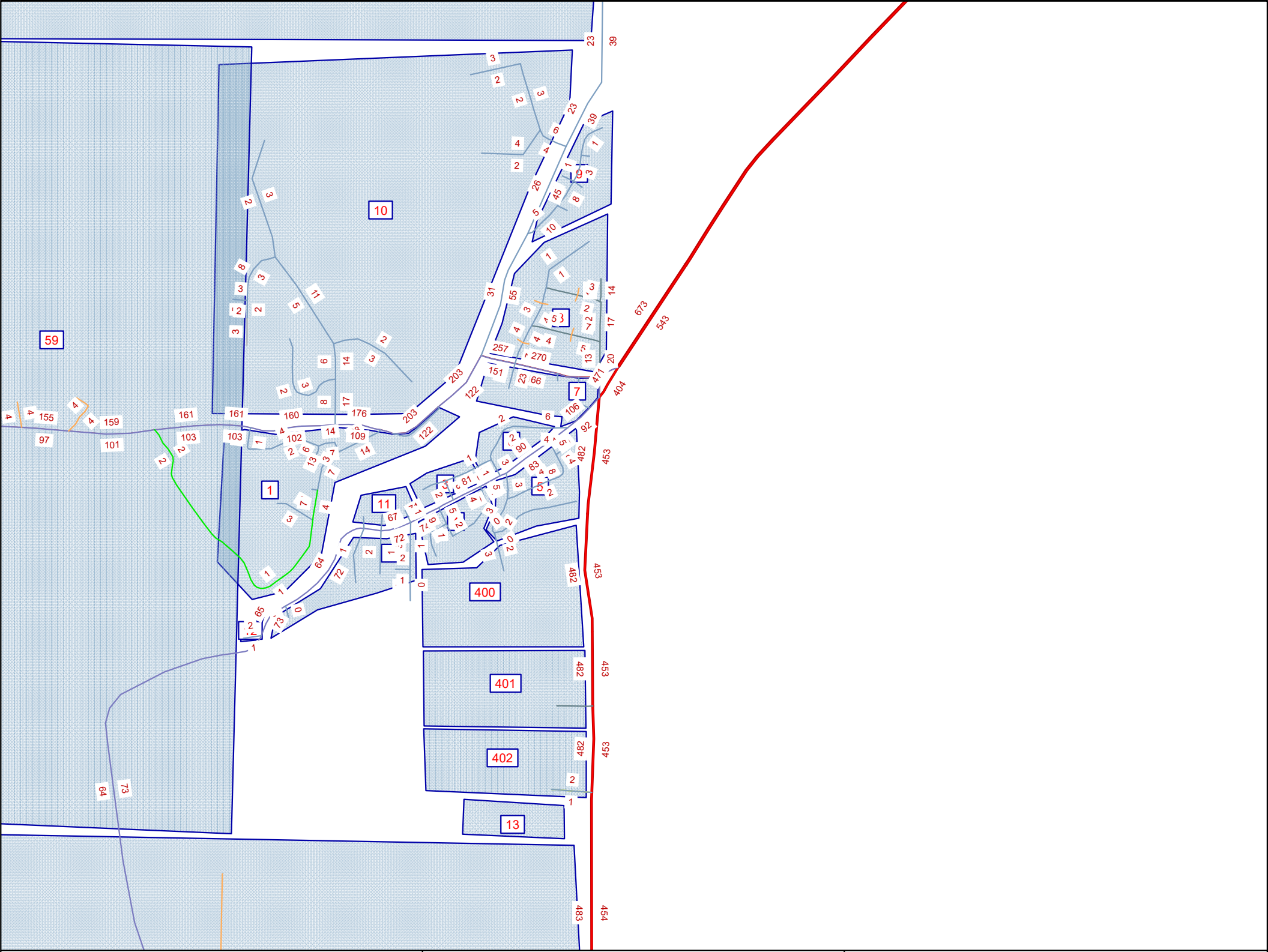

| | | |
|---|---|---|
| 5 Year Opt 7 | Bragg Creek Future 5 Visum 5 Park Place.ver | Created on: 13.01.2020 |

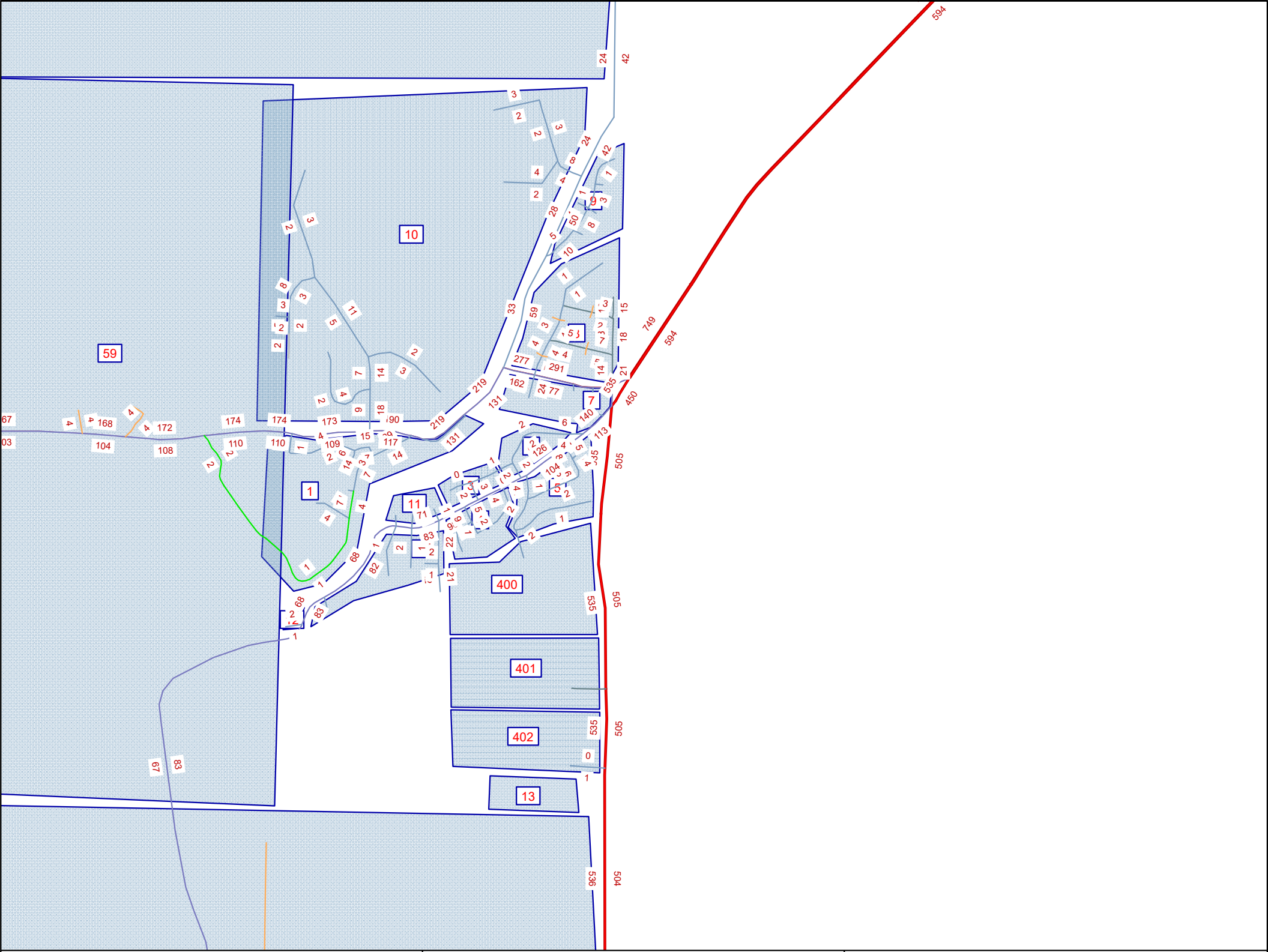



| | | |
|---|---|---|
| 5 Year Opt 7 | Bragg Creek Future 5 Visum 5.ver | Created on: 13.01.2020 |

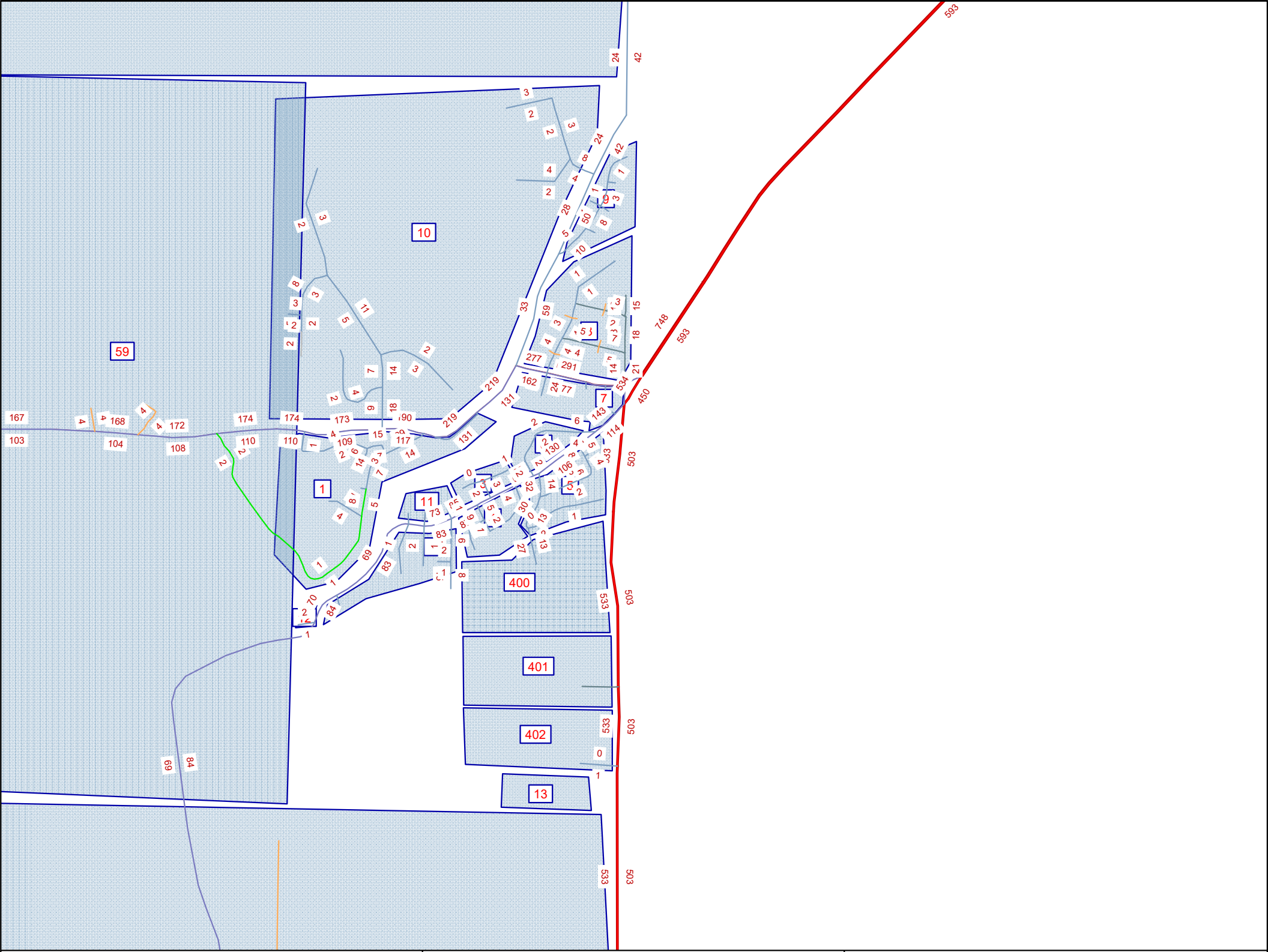



| | | |
|---|---|---|
| 5 Year Opt 9 | Bragg Creek Future 5 Visum 6 Park Place.ver | Created on: 13.01.2020 |

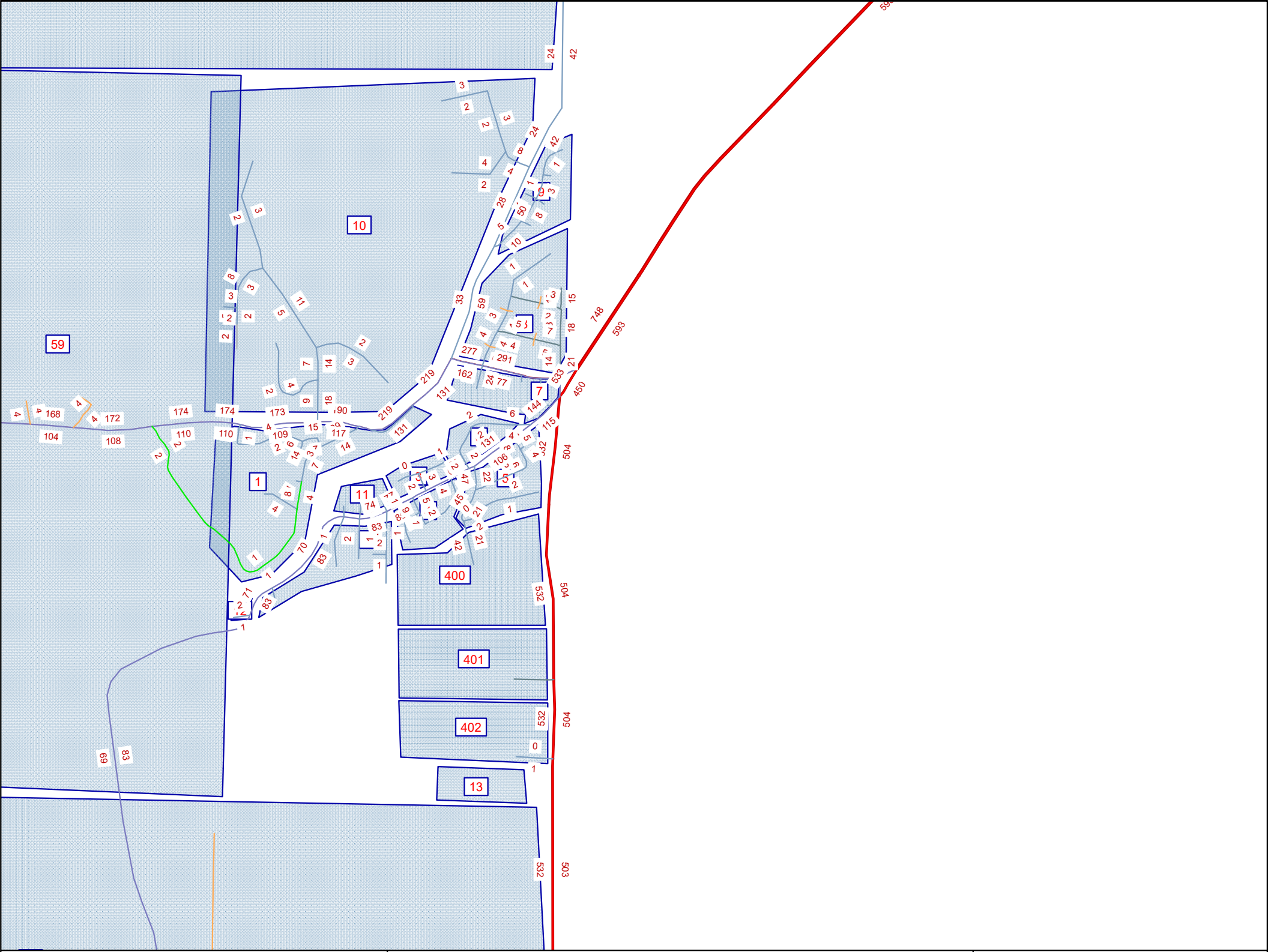

10
59
1
11
400
401
402
13
7
5
543
673
404
453
482
454
483



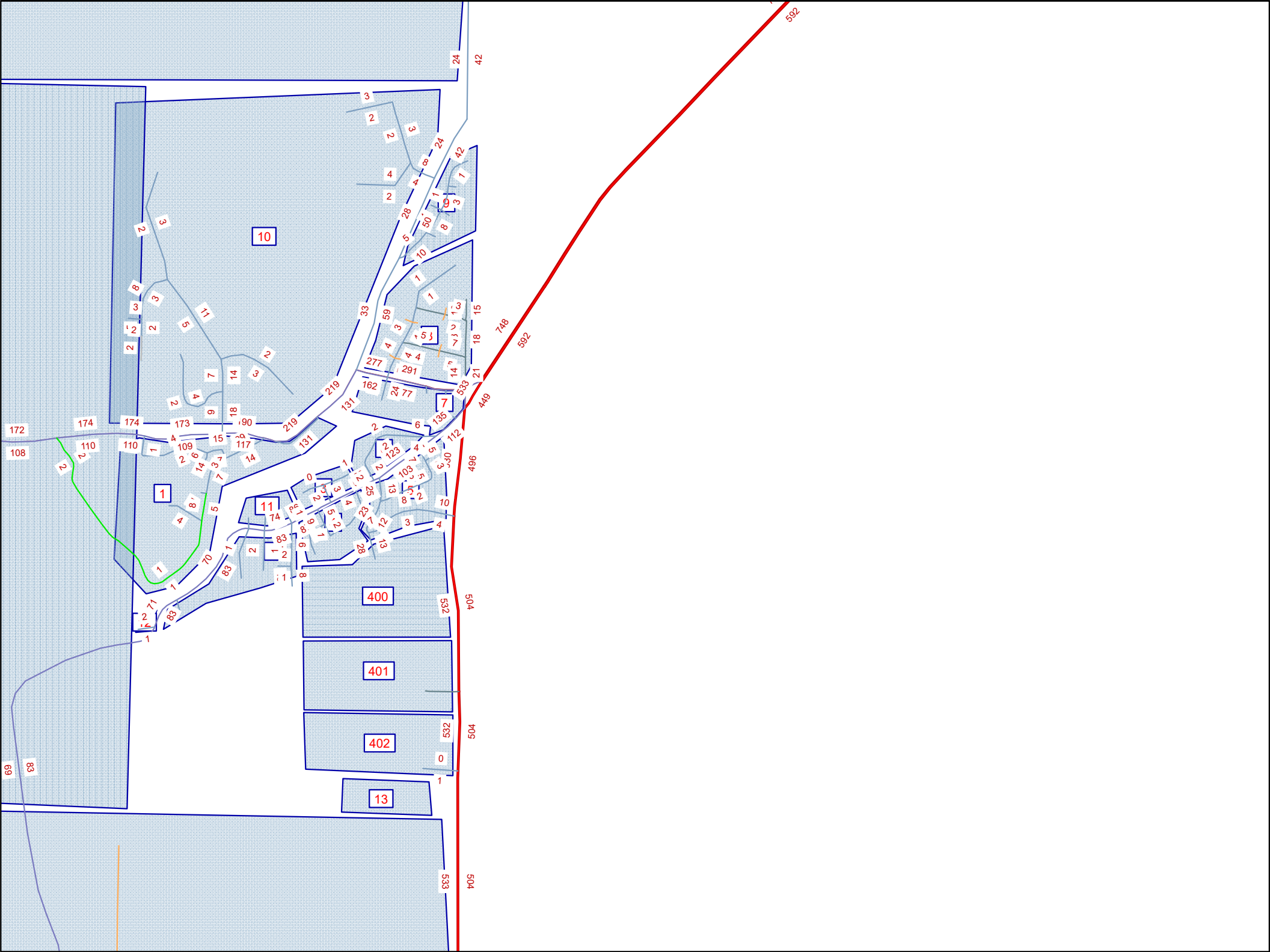

| | | |
|---|---|---|
| 10 Year Sc 1 Opt 1 | Bragg Creek Future 10 Visum 1.ver | Created on: 13.01.2020 |




| | | |
|---|---|---|
| 10 Year Sc 1 Opt 2 | Bragg Creek Future 10 Visum 1+2.ver | Created on: 13.01.2020 |




| | | |
|---|---|---|
| 10 Year Sc 1 Opt 3 | Bragg Creek Future 10 Visum 2.ver | Created on: 13.01.2020 |

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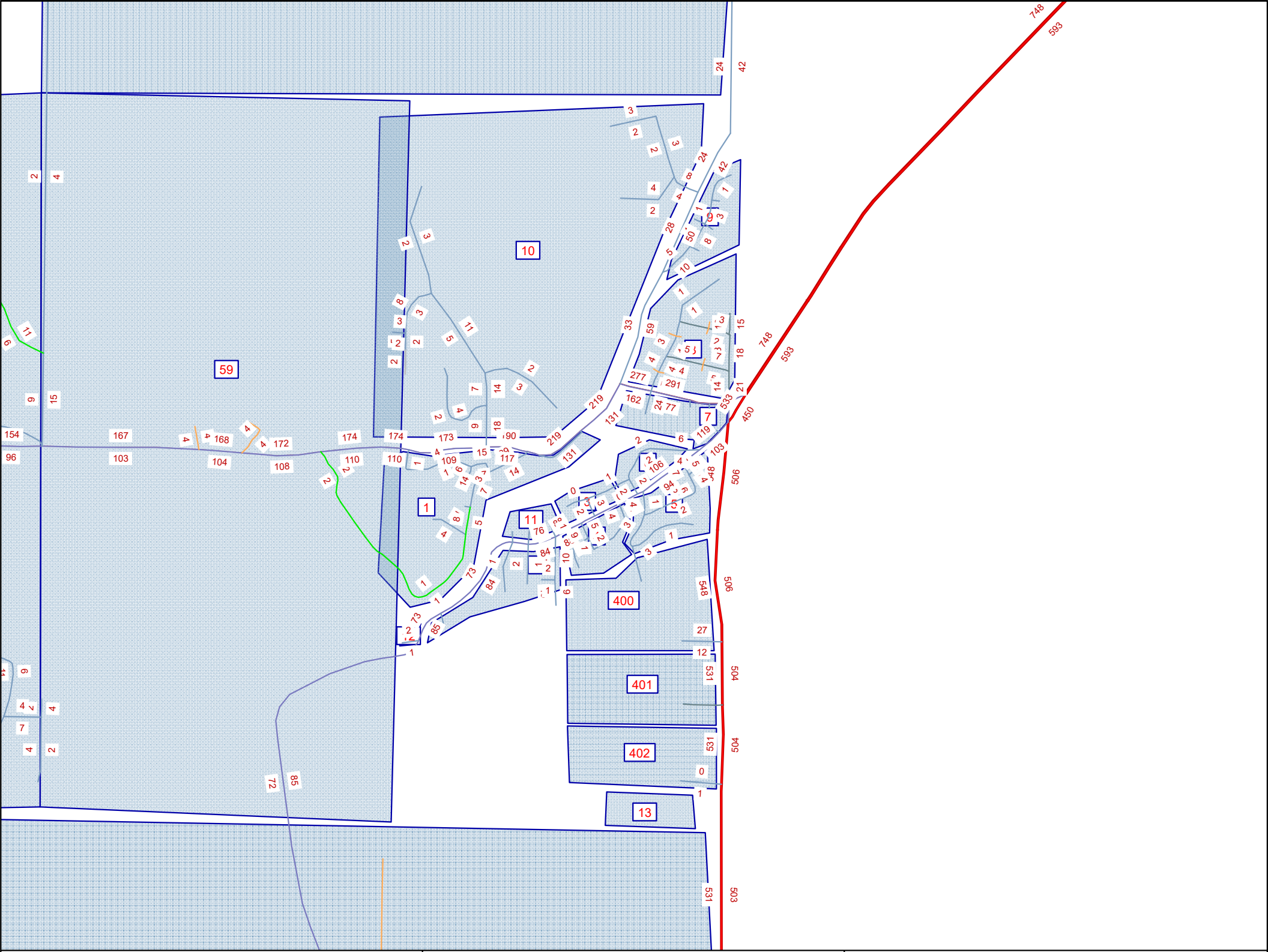
| 10 Year Sc 1 Opt 4 | Bragg Creek Future 10 Visum 3.ver | Created on: 13.01.2020 |

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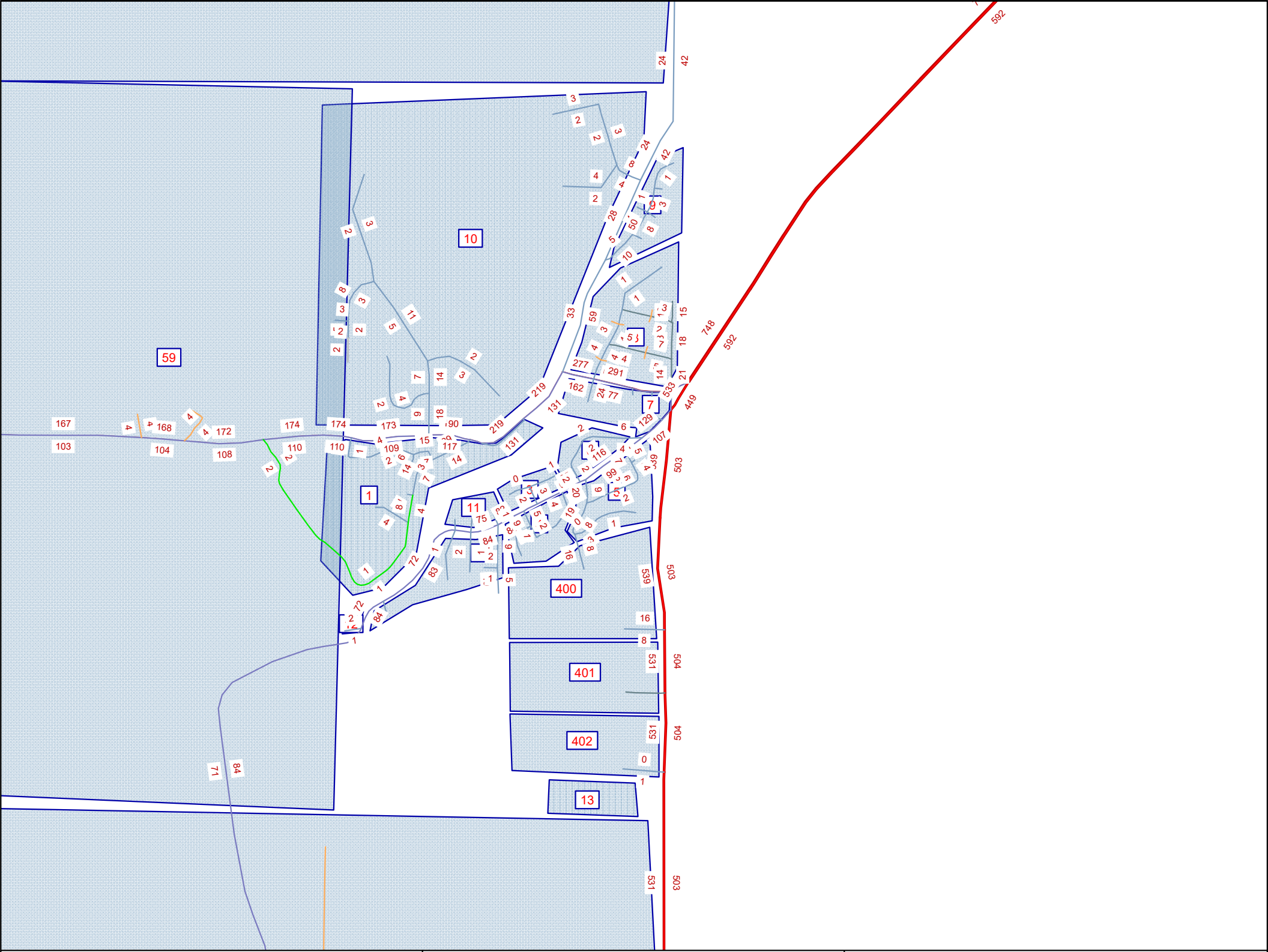
| 10 Year Sc 1 Opt 5 | Bragg Creek Future 10 Visum 4 Park Place.ver | Created on: 13.01.2020 |

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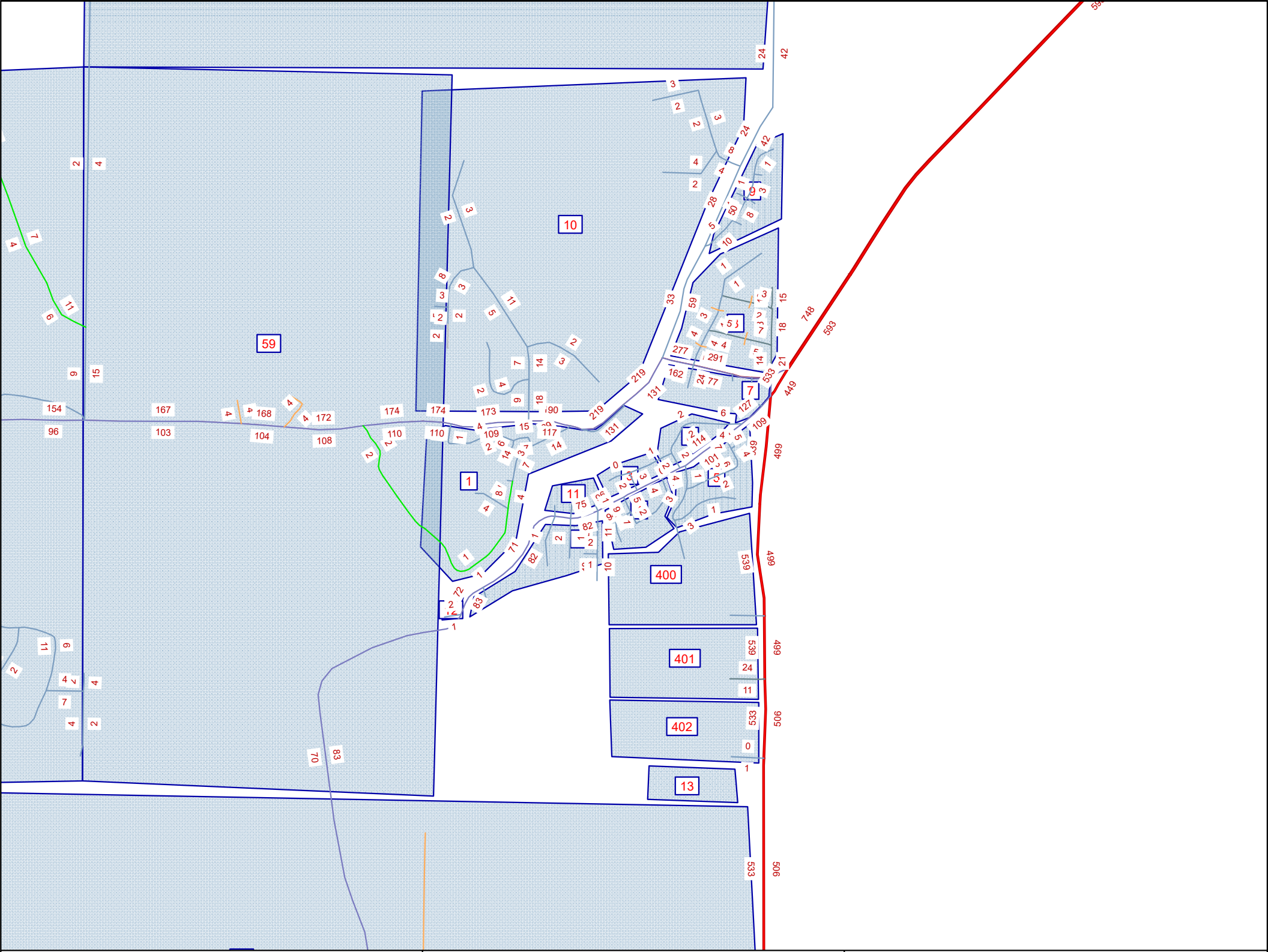
| 10 Year Sc 1 Opt 6 | Bragg Creek Future 10 Visum 4.ver | Created on: 13.01.2020 |

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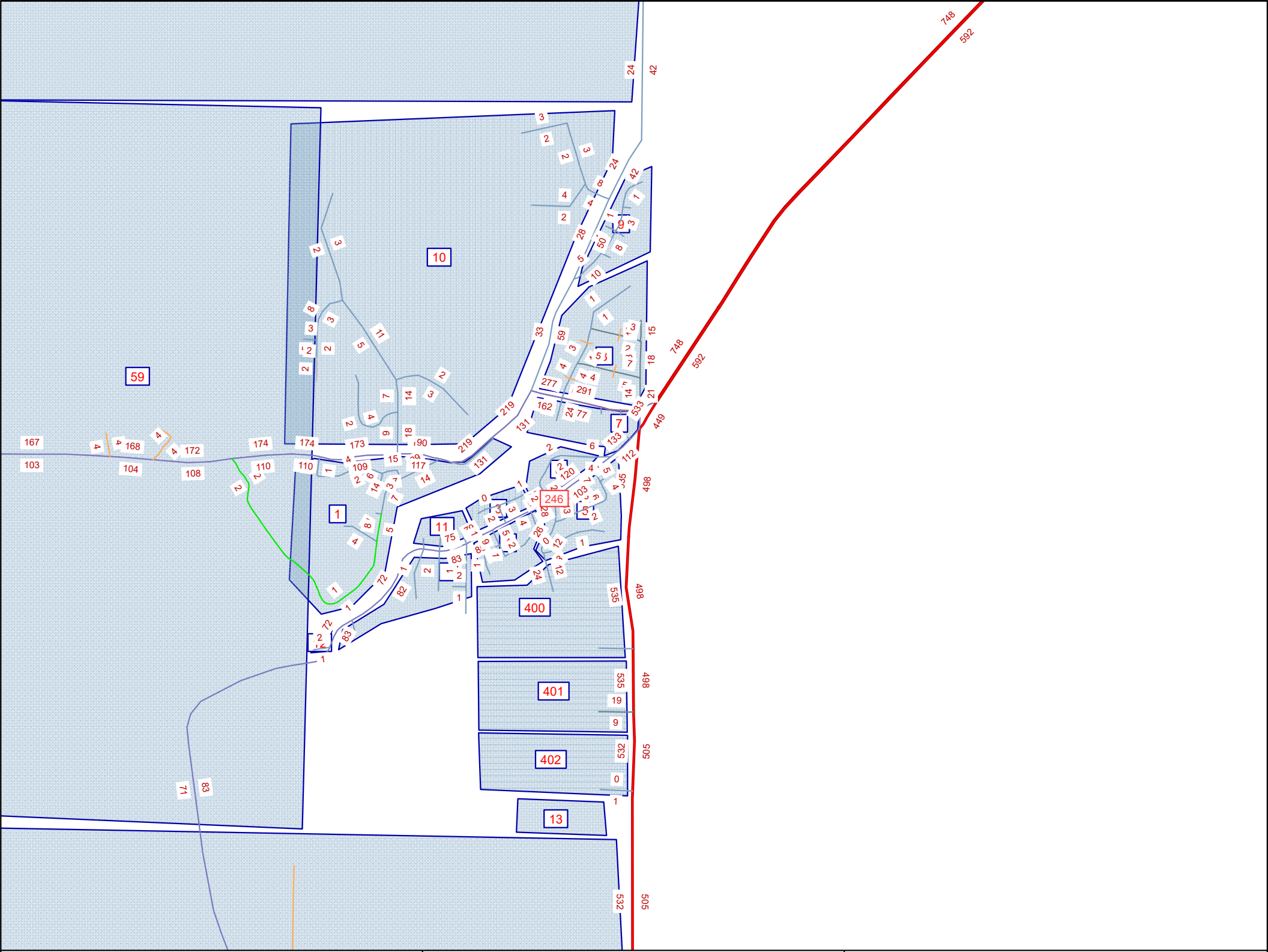
| 10 Year Sc 1 Opt 7 | Bragg Creek Future 10 Visum 5 Park Place.ver | Created on: 13.01.2020 |

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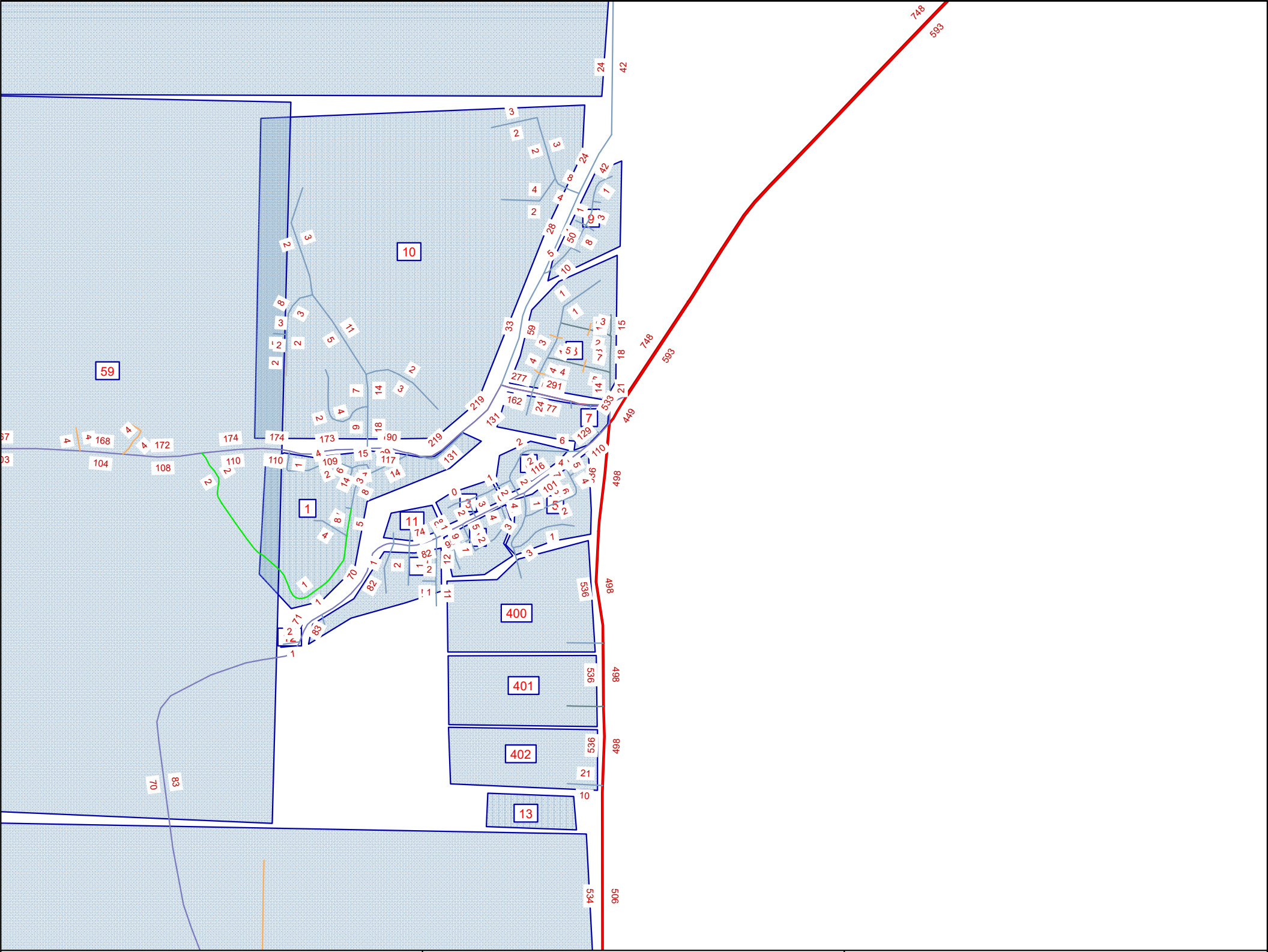
| 10 Year Sc 1 Opt 8 | Bragg Creek Future 10 Visum 5.ver | Created on: 13.01.2020 |

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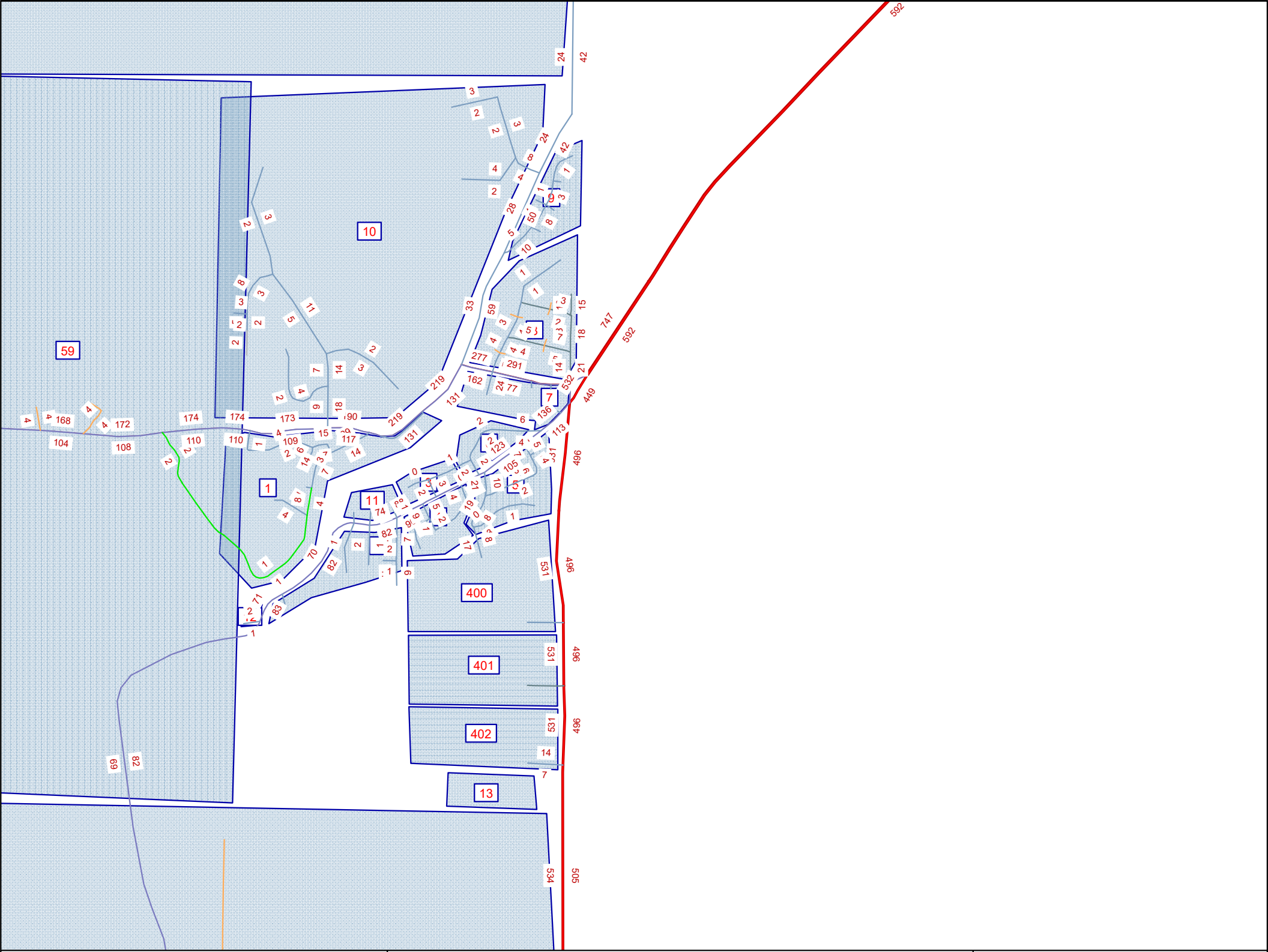
|---|---|---|
| 10 Year Sc 1 Opt 9 | Bragg Creek Future 10 Visum 6 Park Place.ver | Created on: 13.01.2020 |

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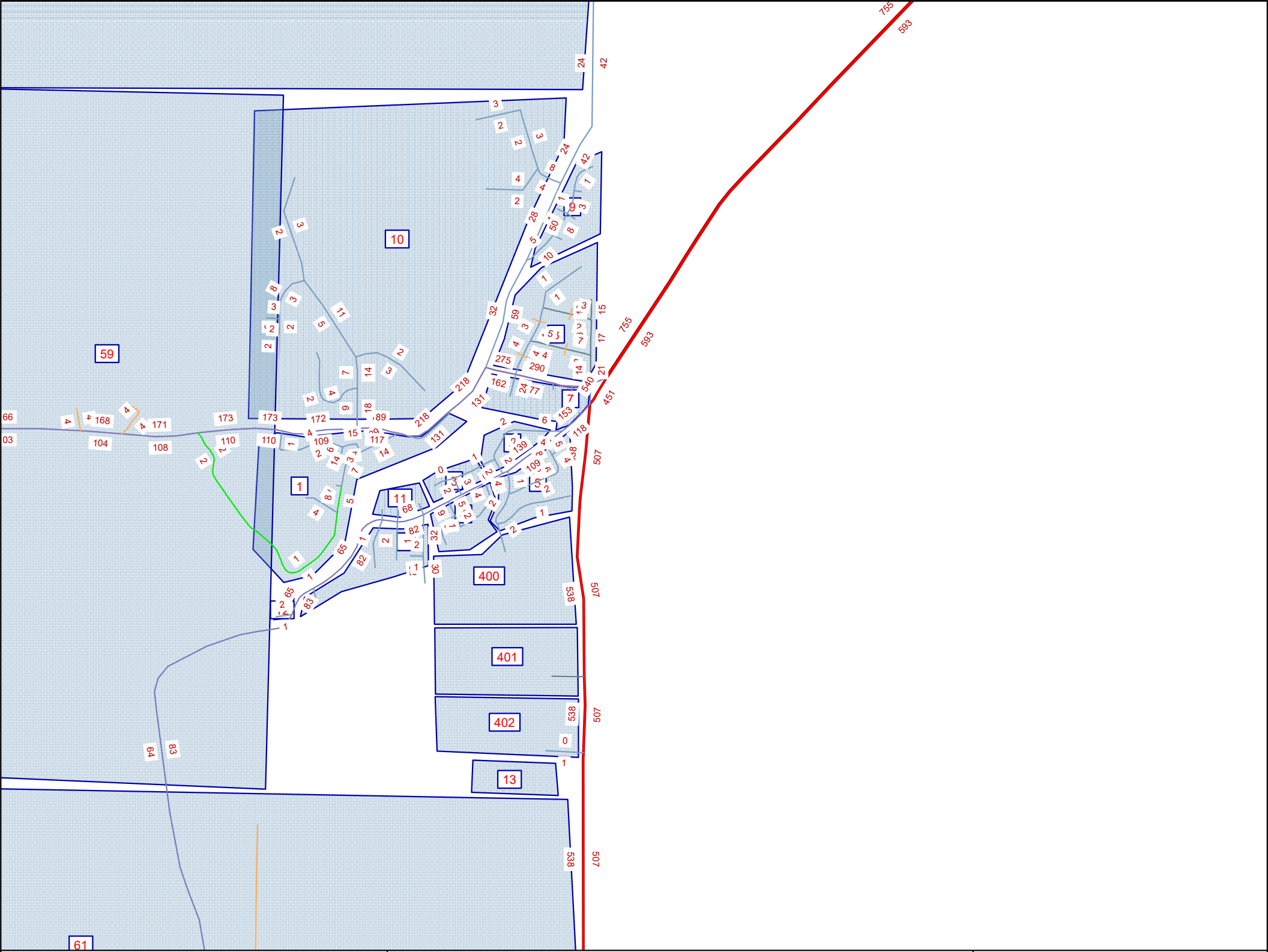
| 10 Year Sc 1 Opt 10 | Bragg Creek Future 10 Visum 6.ver | Created on: 13.01.2020 |

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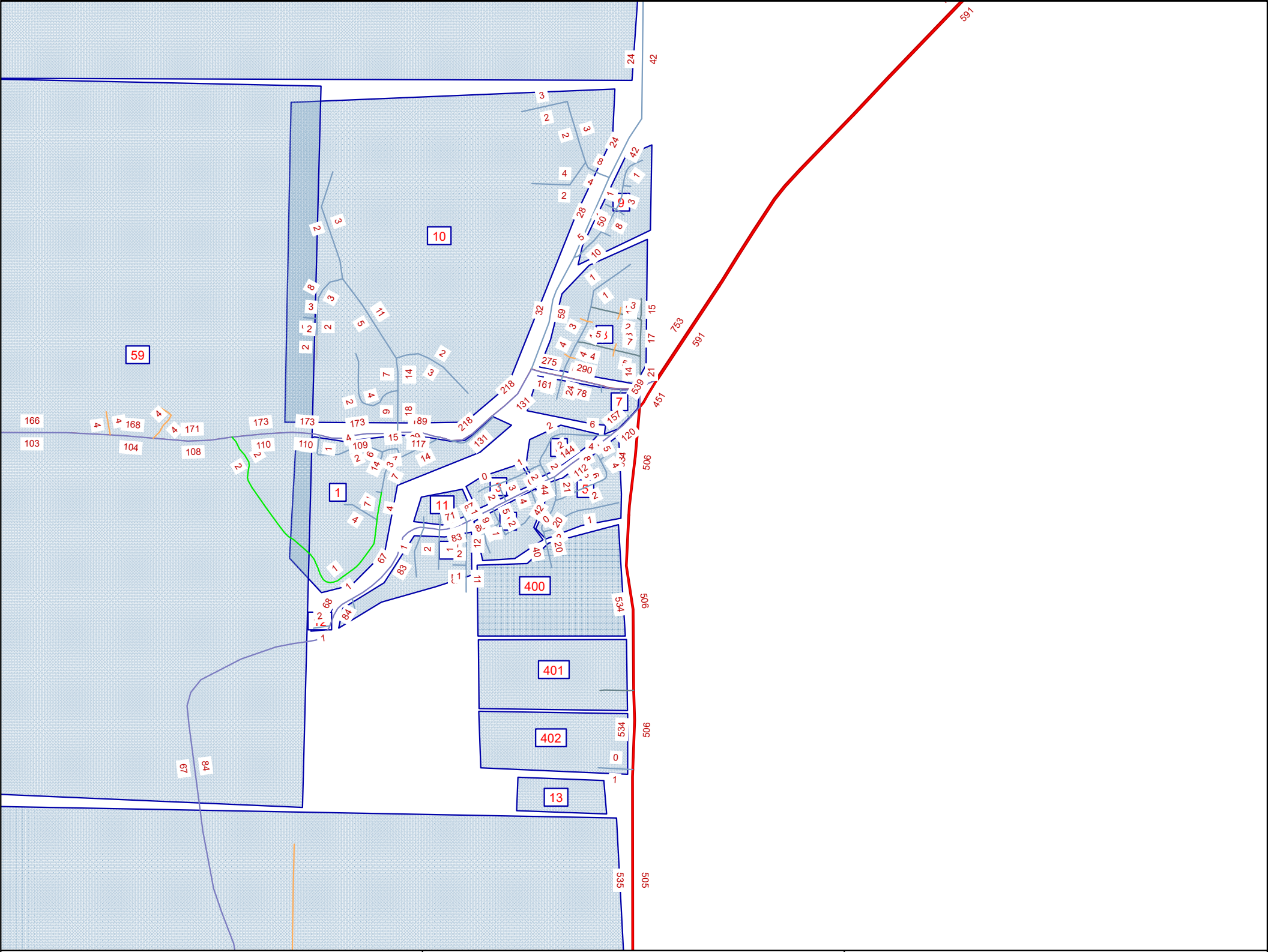
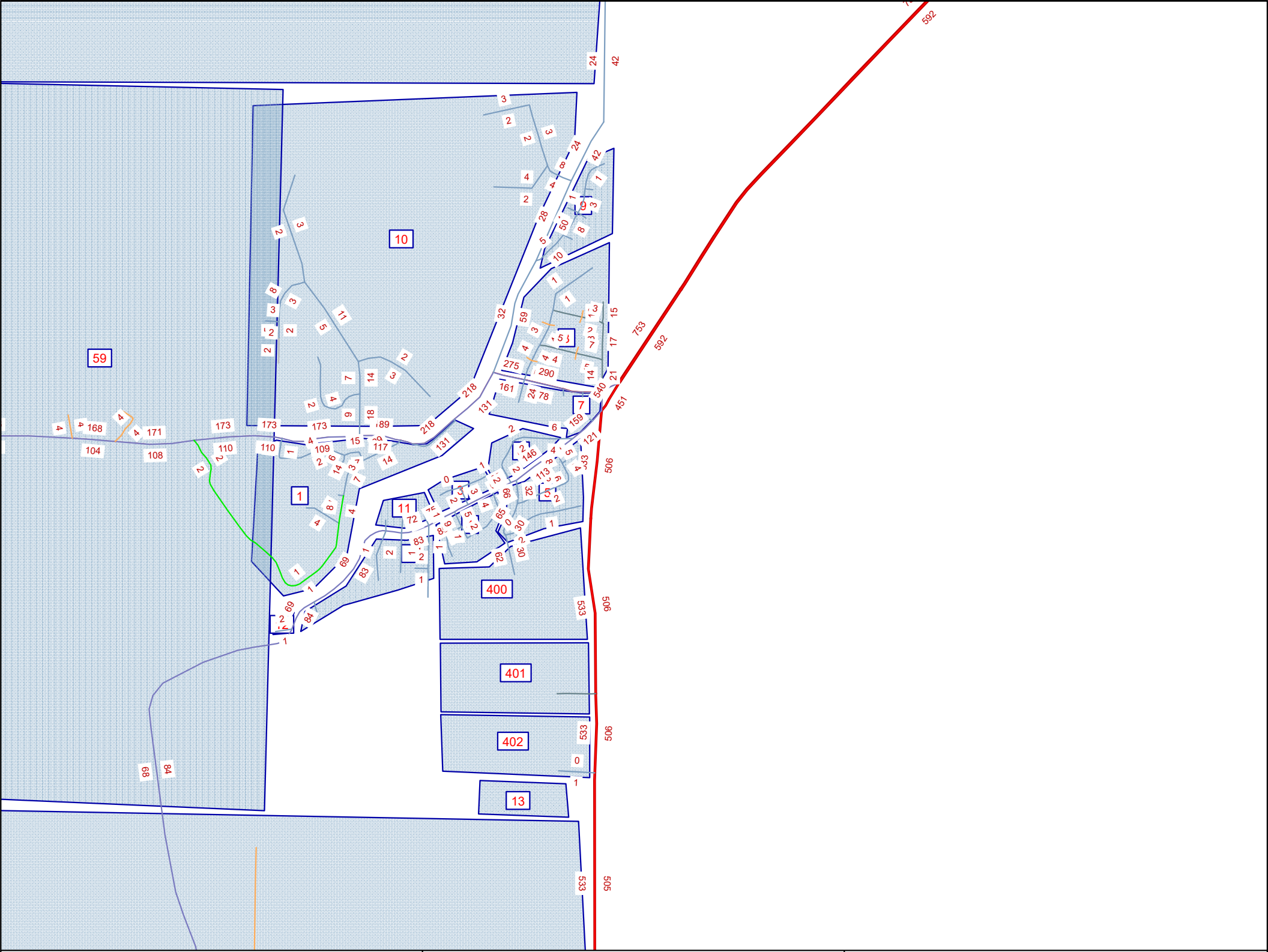
|---|---|---|
| 10 Year Sc 2 Opt 1 | Bragg Creek Future 10 Visum 1.ver | Created on: 13.01.2020 |




| | | |
|---|---|---|
| 10 Year Sc 2 Opt 2 | Bragg Creek Future 10 Visum 1+2.ver | Created on: 13.01.2020 |

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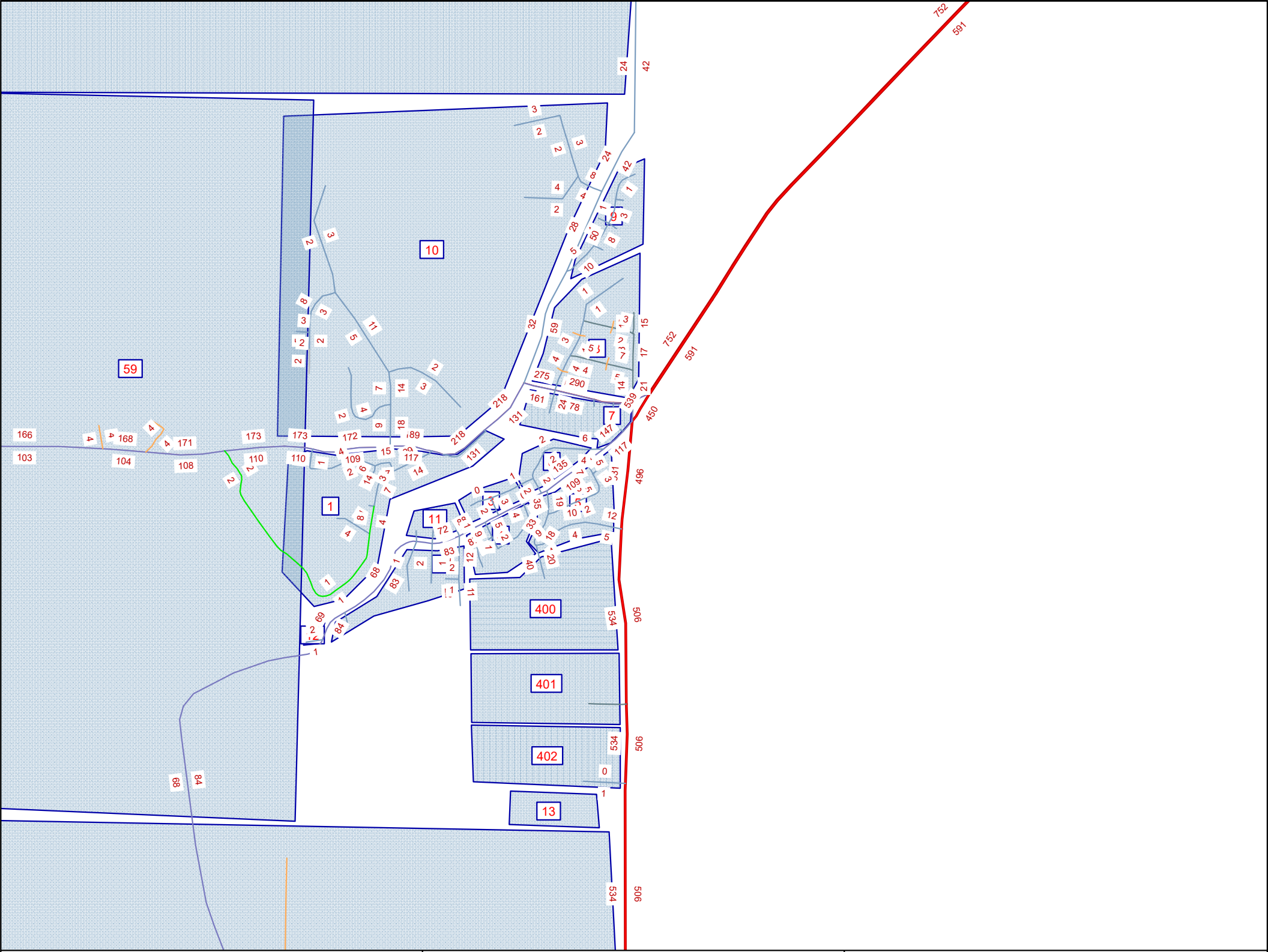
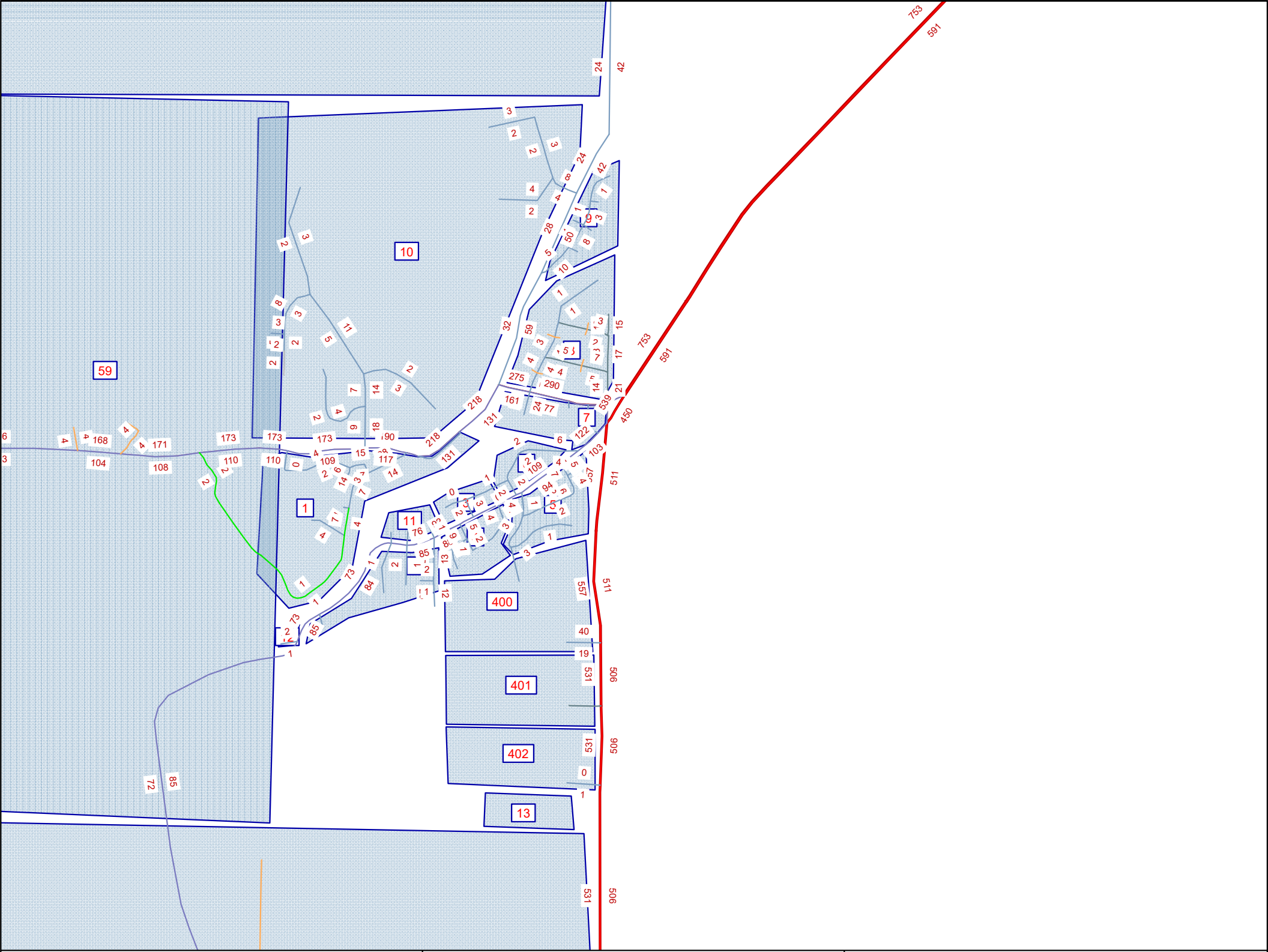
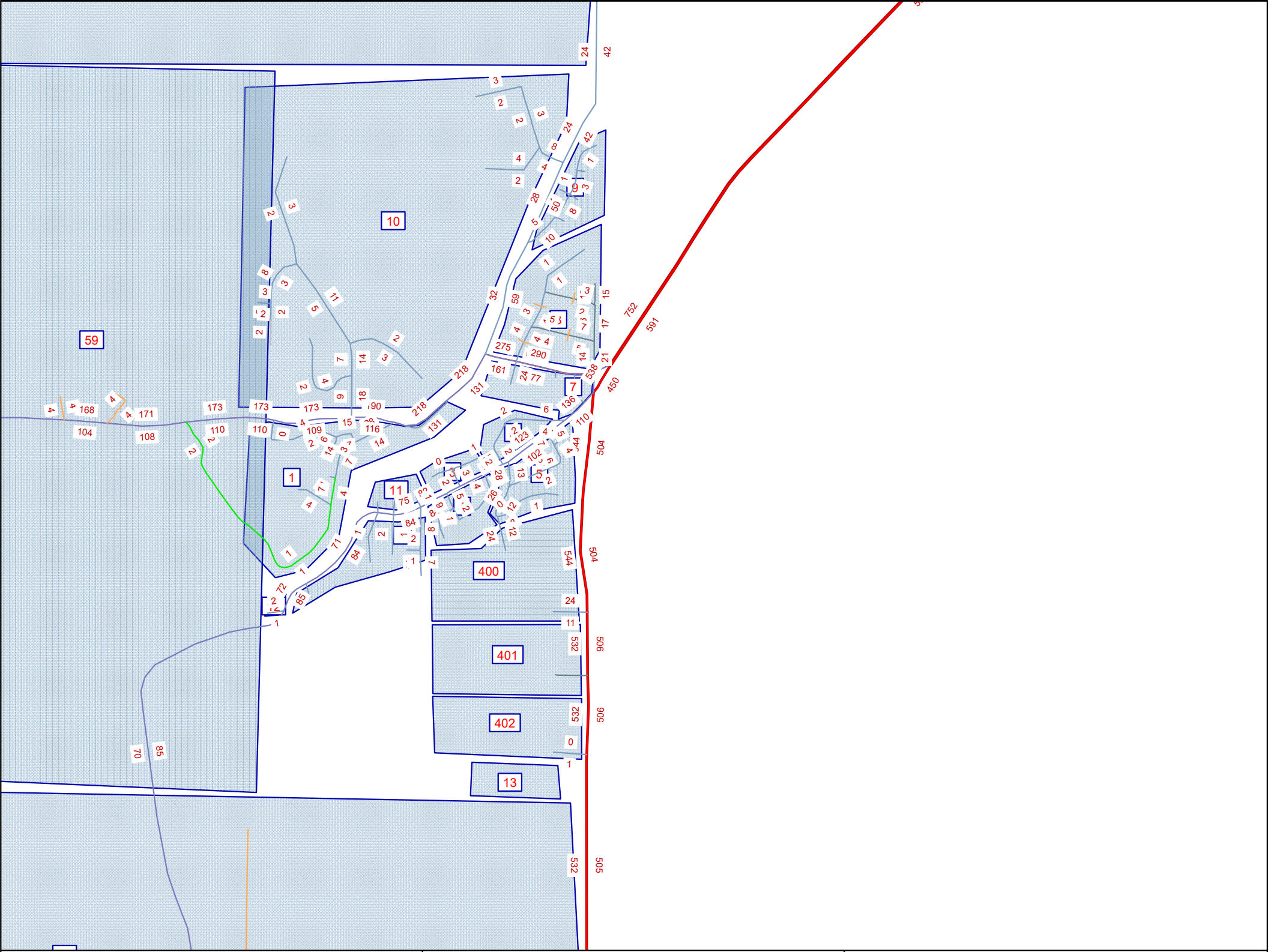
|---|---|---|
| 10 Year Sc 2 Opt 3 | Bragg Creek Future 10 Visum 2.ver | Created on: 13.01.2020 |



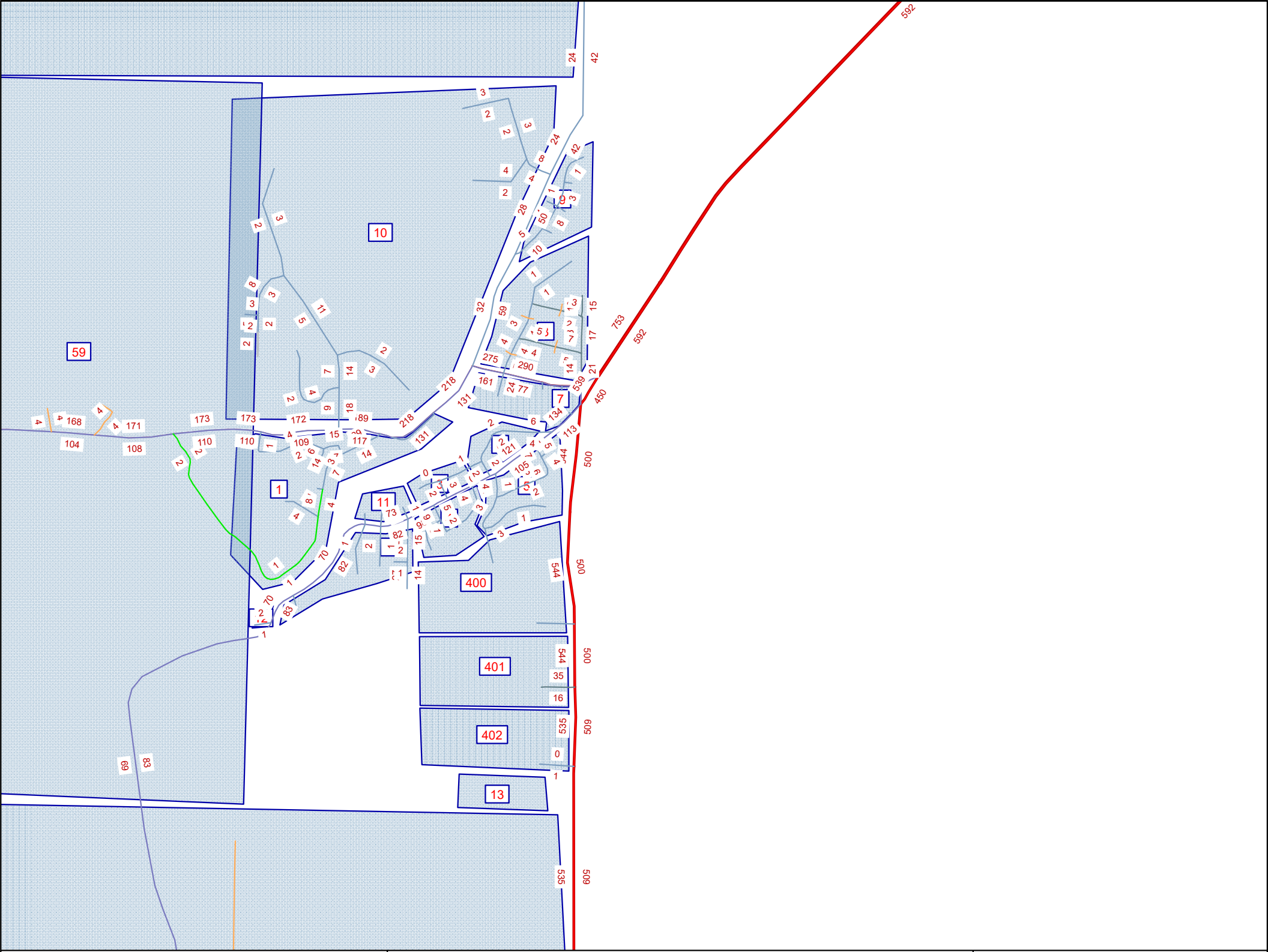

| | | |
|---|---|---|
| 10 Year Sc 2 Opt 4 | Bragg Creek Future 10 Visum 3.ver | Created on: 13.01.2020 |



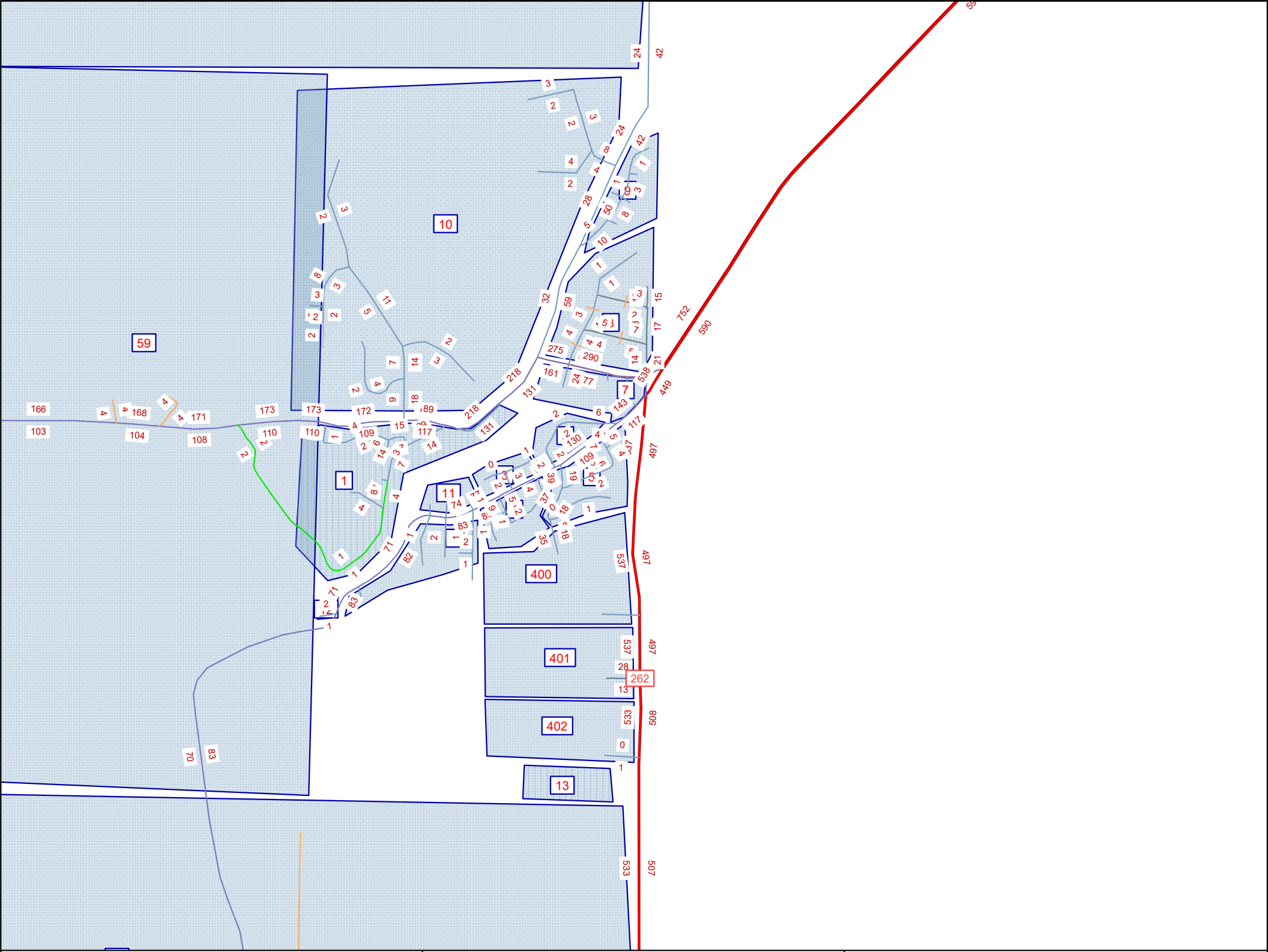

| | | |
|---|---|---|
| 10 Year Sc 2 Opt 5 | Bragg Creek Future 10 Visum 4 Park Place.ver | Created on: 13.01.2020 |



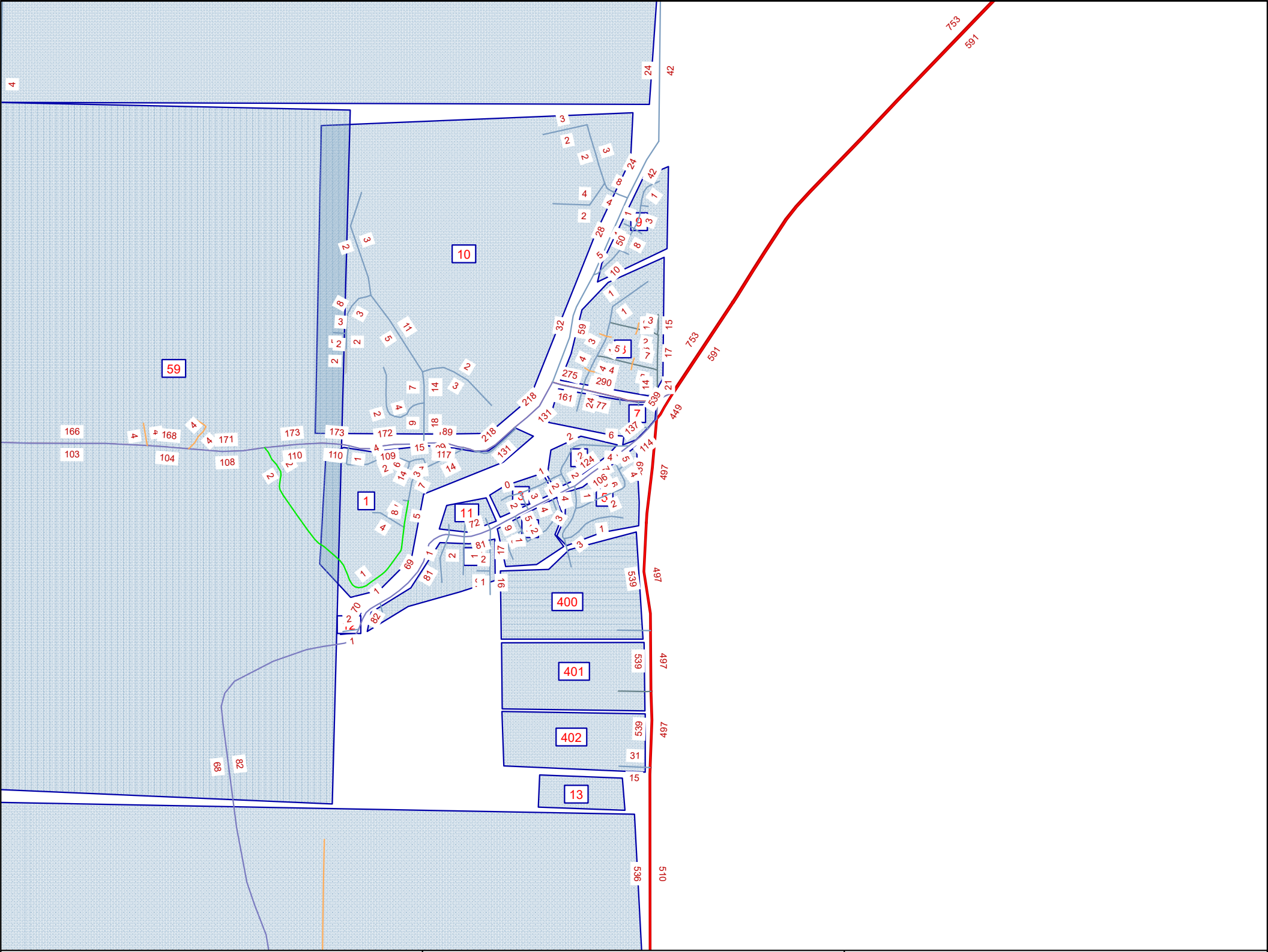

| | | |
|---|---|---|
| 10 Year Sc 2 Opt 6 | Bragg Creek Future 10 Visum 4.ver | Created on: 13.01.2020 |



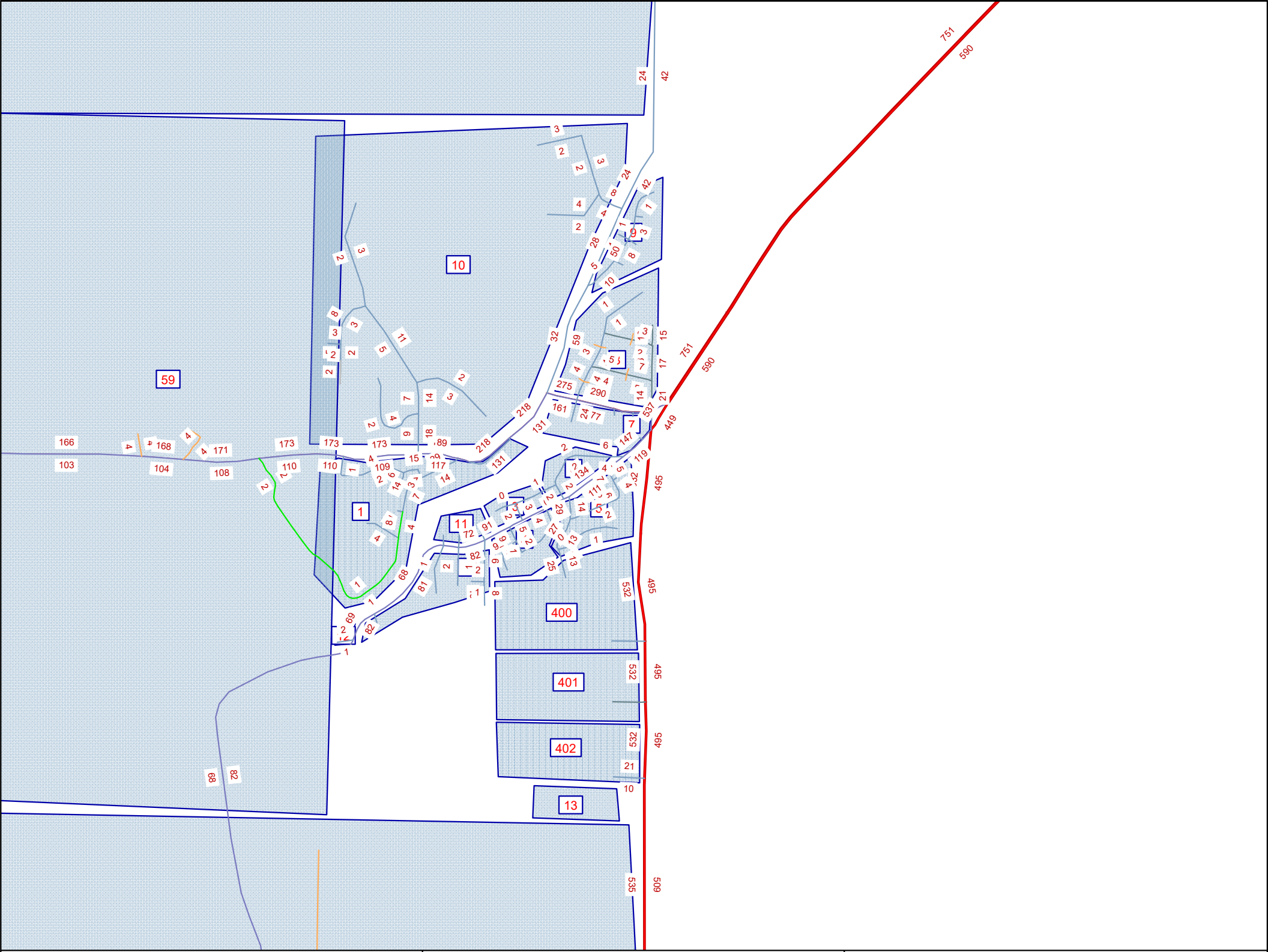

| | | |
|---|---|---|
| 10 Year Sc 2 Opt 7 | Bragg Creek Future 10 Visum 5 Park Place.ver | Created on: 13.01.2020 |




| | | |
|---|---|---|
| 10 Year Sc 2 Opt 8 | Bragg Creek Future 10 Visum 5.ver | Created on: 13.01.2020 |




| | | |
|---|---|---|
| 10 Year Sc 2 Opt 9 | Bragg Creek Future 10 Visum 6 Park Place.ver | Created on: 13.01.2020 |

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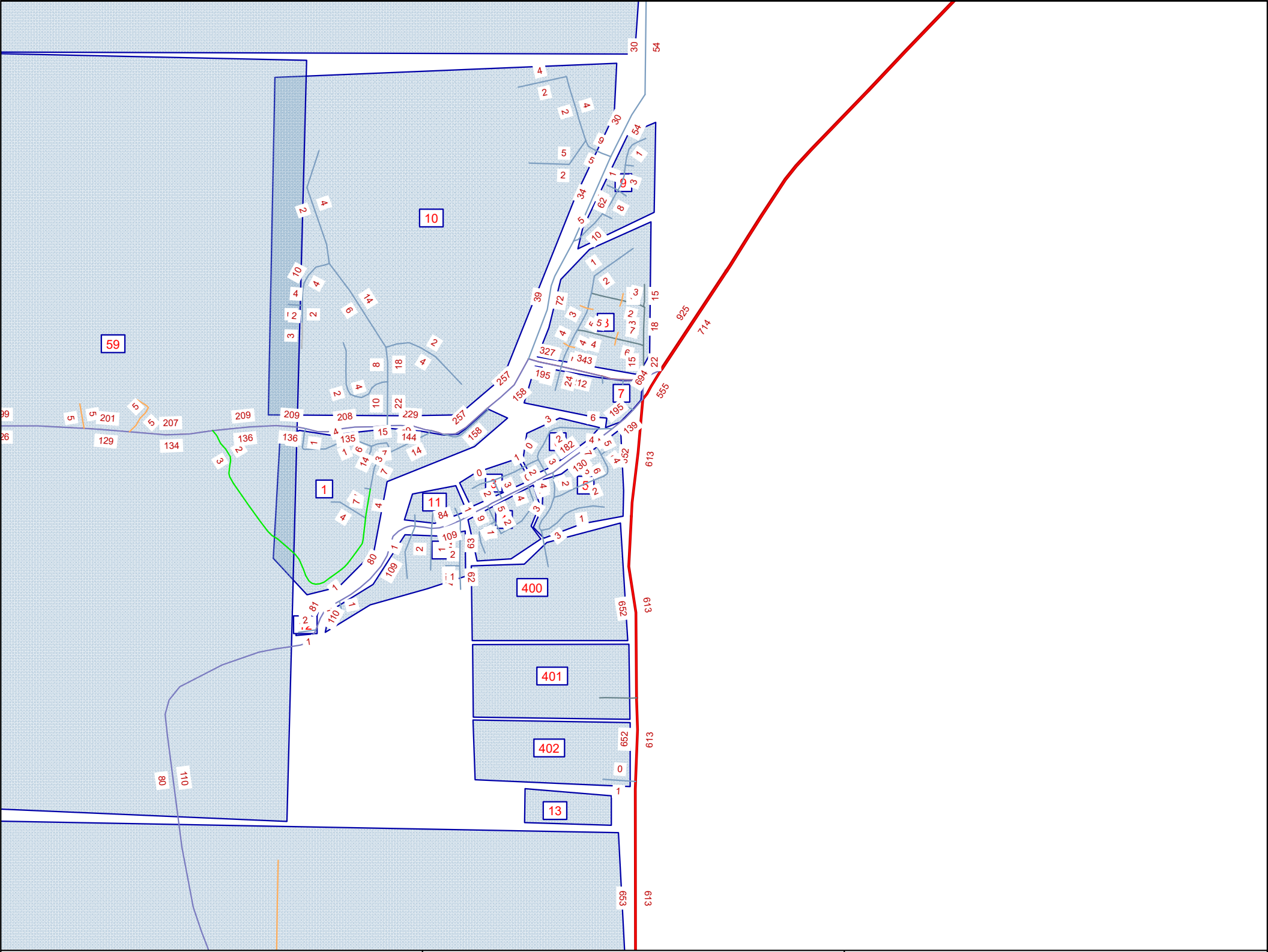
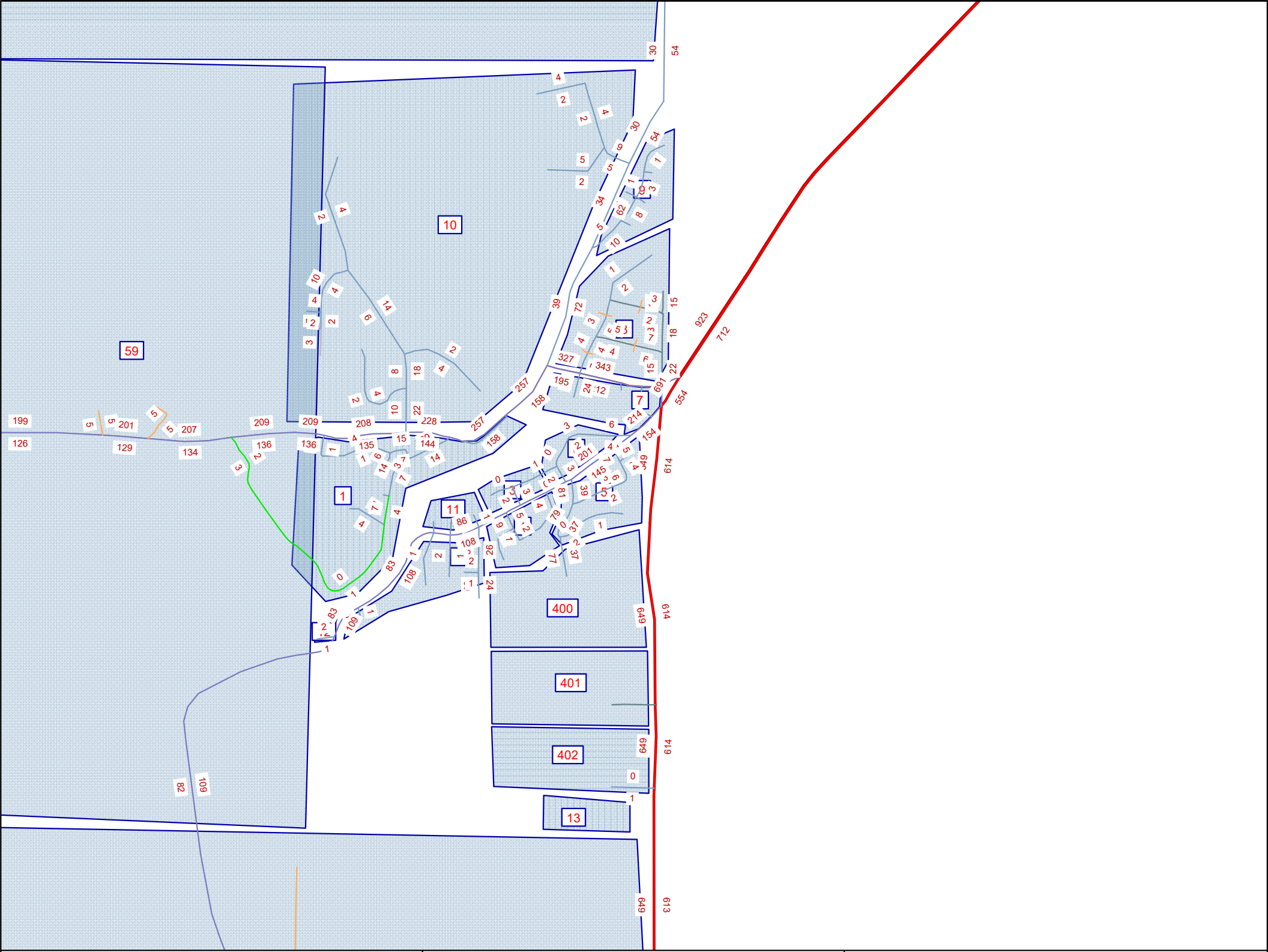
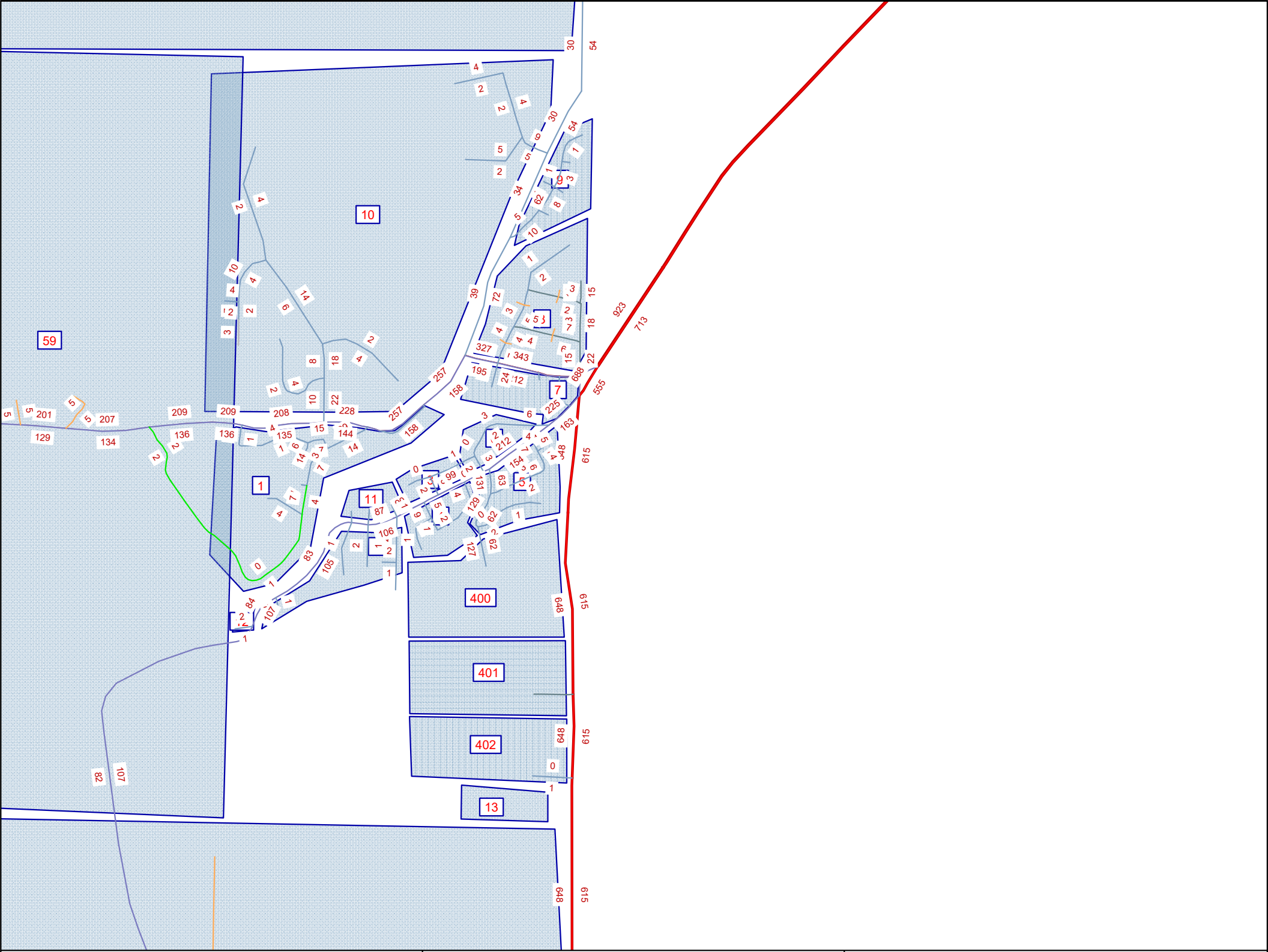
|---|---|---|
| 10 Year Sc 2 Opt 10 | Bragg Creek Future 10 Visum 6.ver | Created on: 13.01.2020 |




| | | |
|---|---|---|
| 20 Year Sc 1 Opt 1 | Bragg Creek Future 20 Visum 1.ver | Created on: 13.01.2020 |




| | | |
|---|---|---|
| 20 Year Sc 1 Opt 2 | Bragg Creek Future 20 Visum 1+2.ver | Created on: 13.01.2020 |


10
59
7
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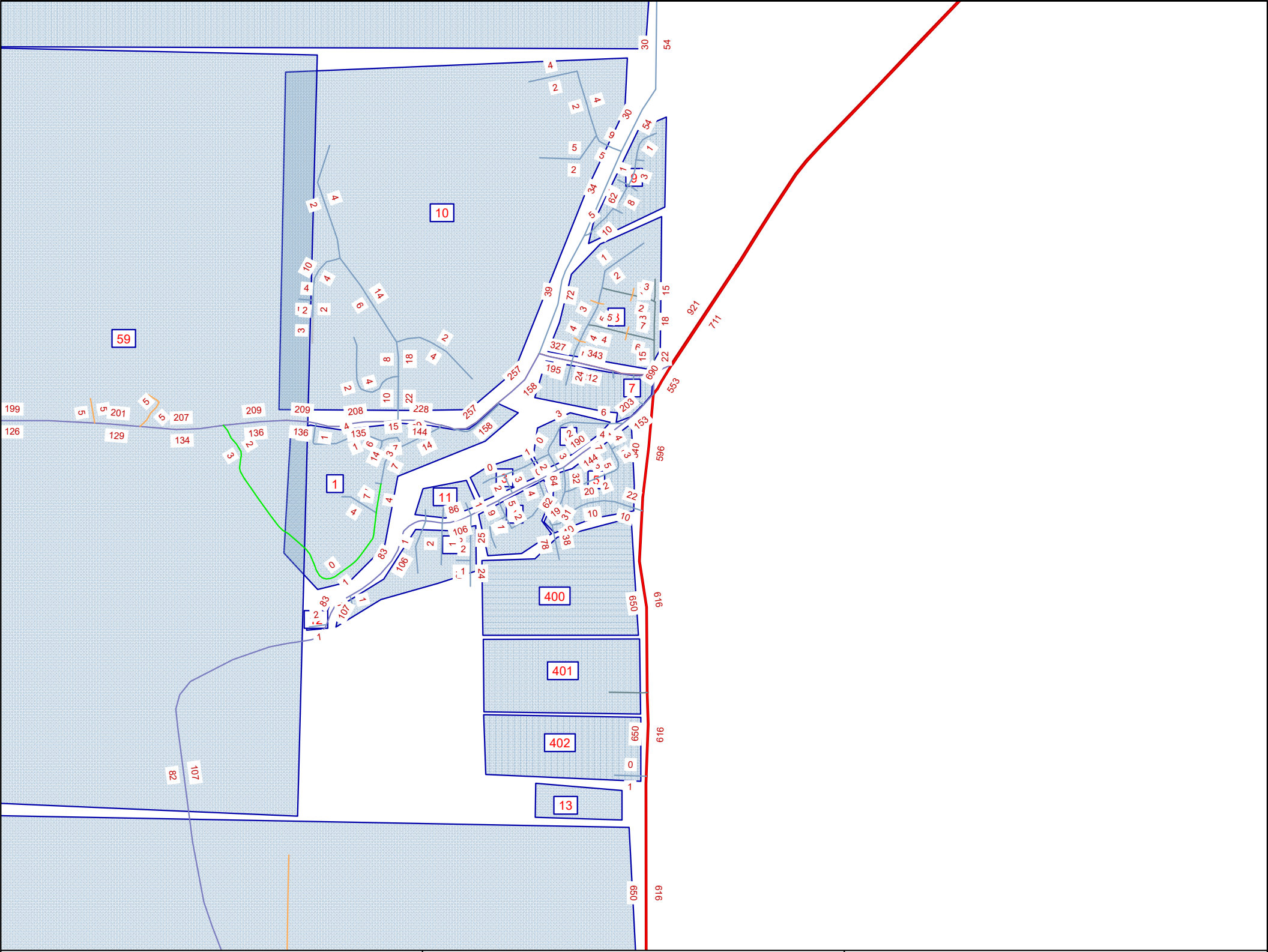
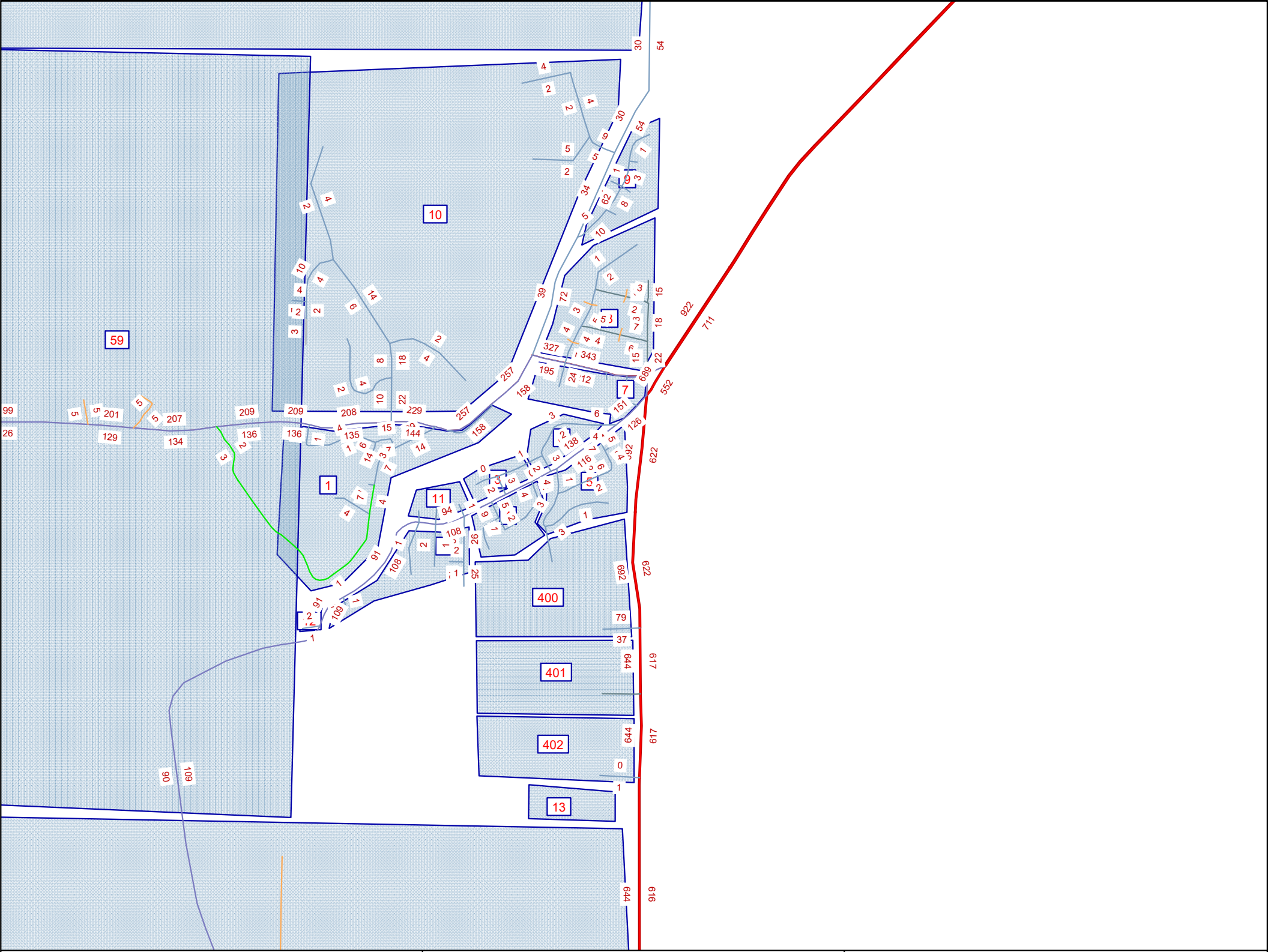
400
401
402
13




| | | |
|---|---|---|
| 20 Year Sc 1 Opt 4 | Bragg Creek Future 20 Visum 3.ver | Created on: 13.01.2020 |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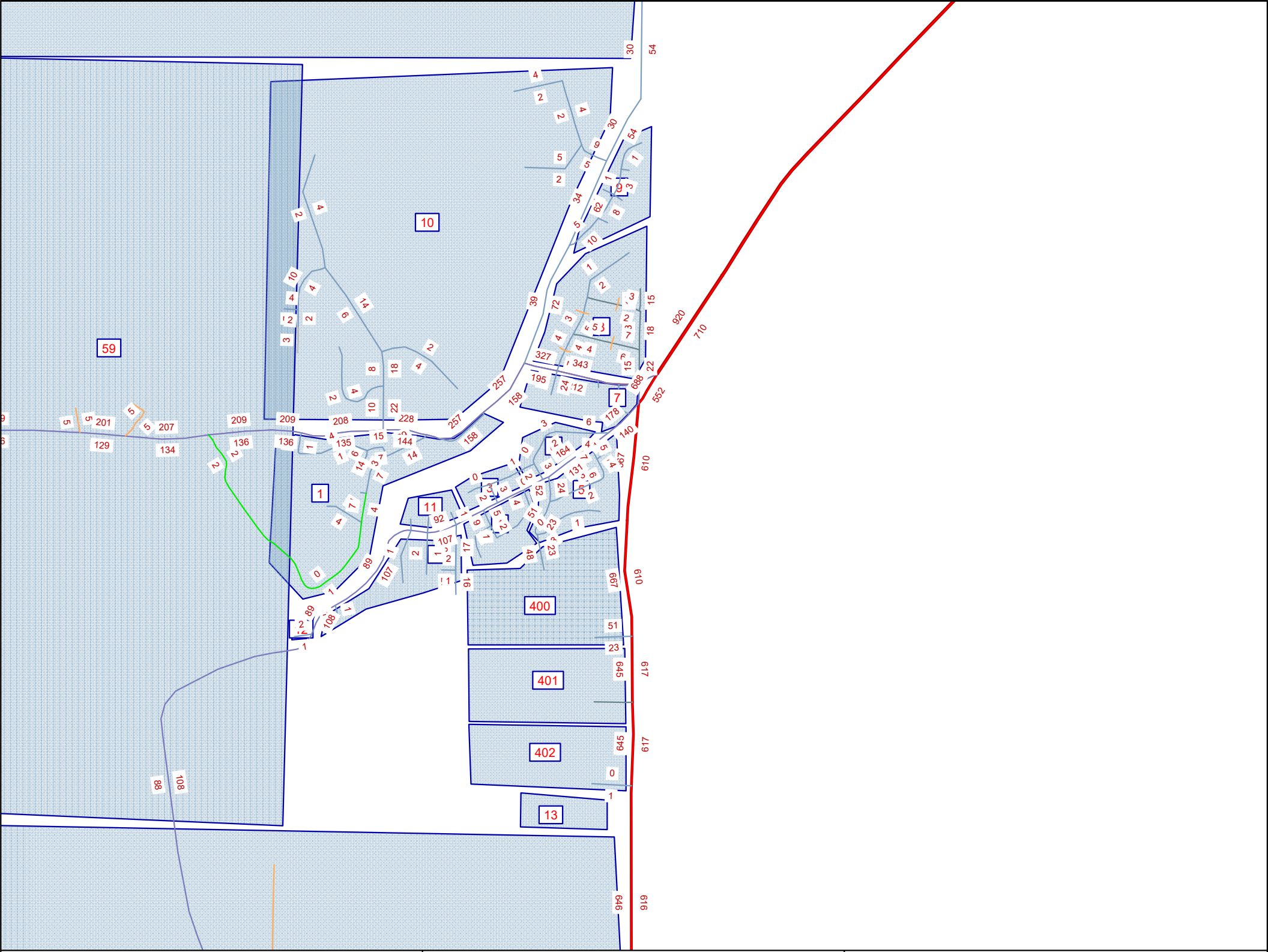


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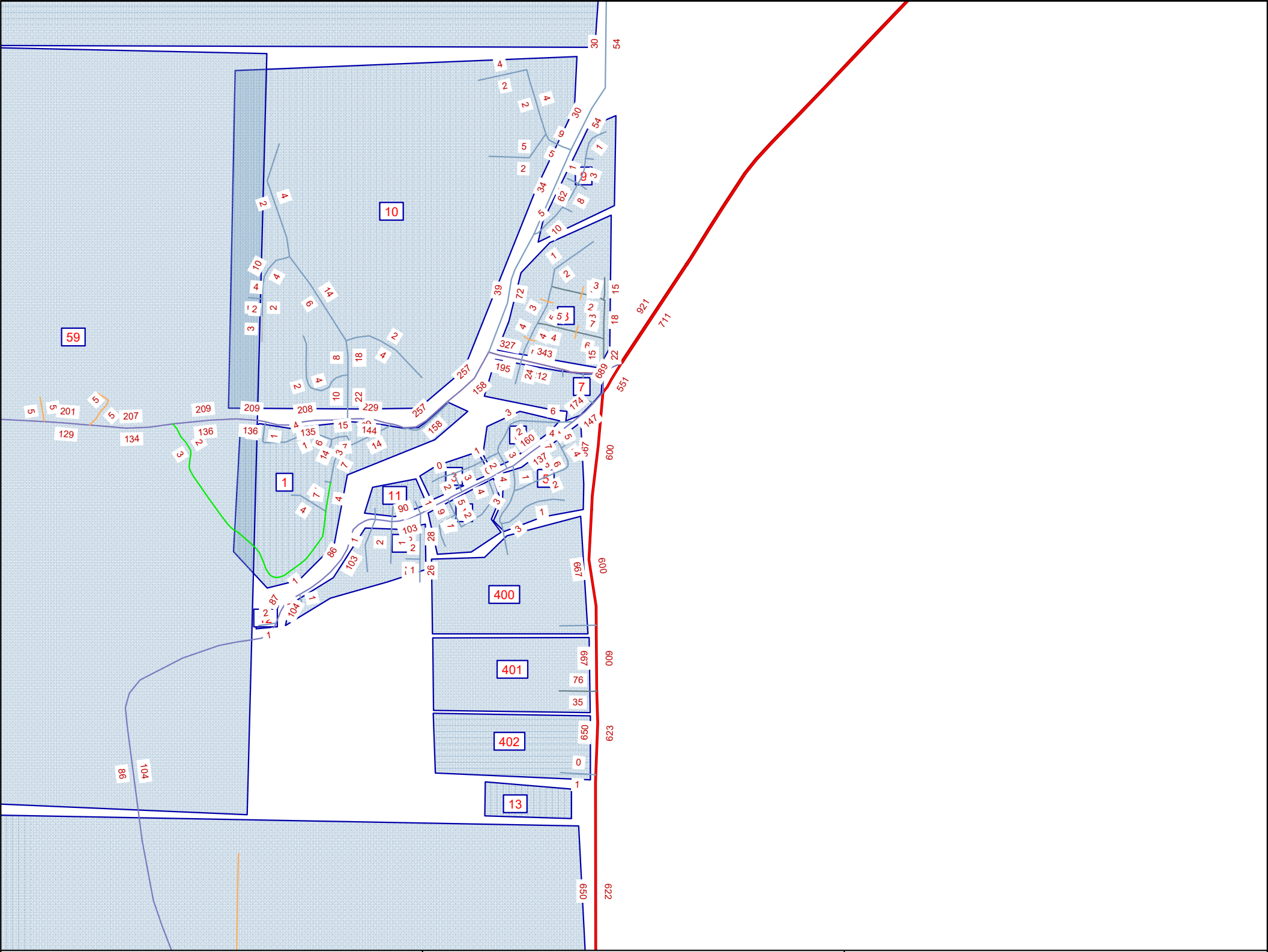
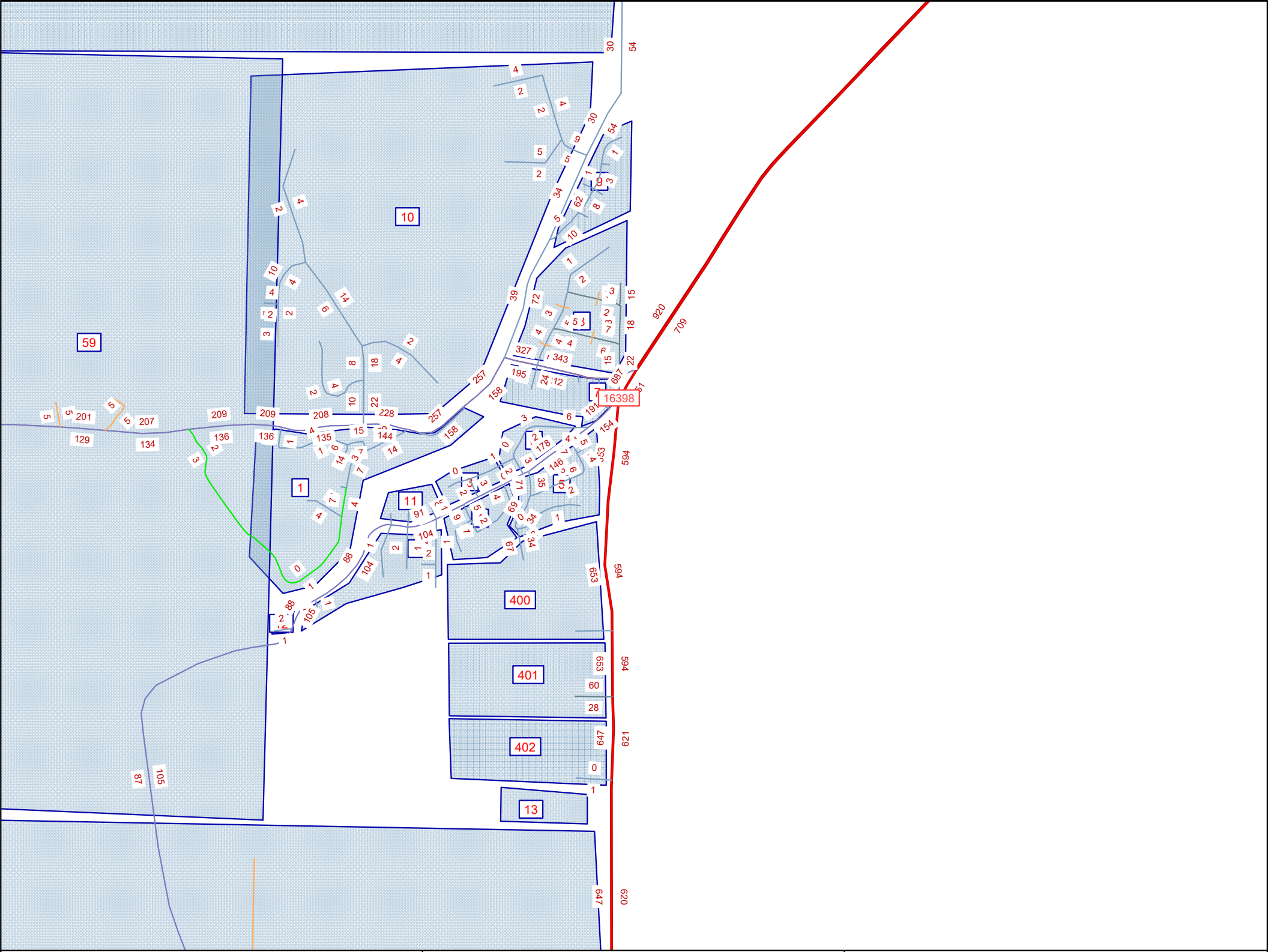
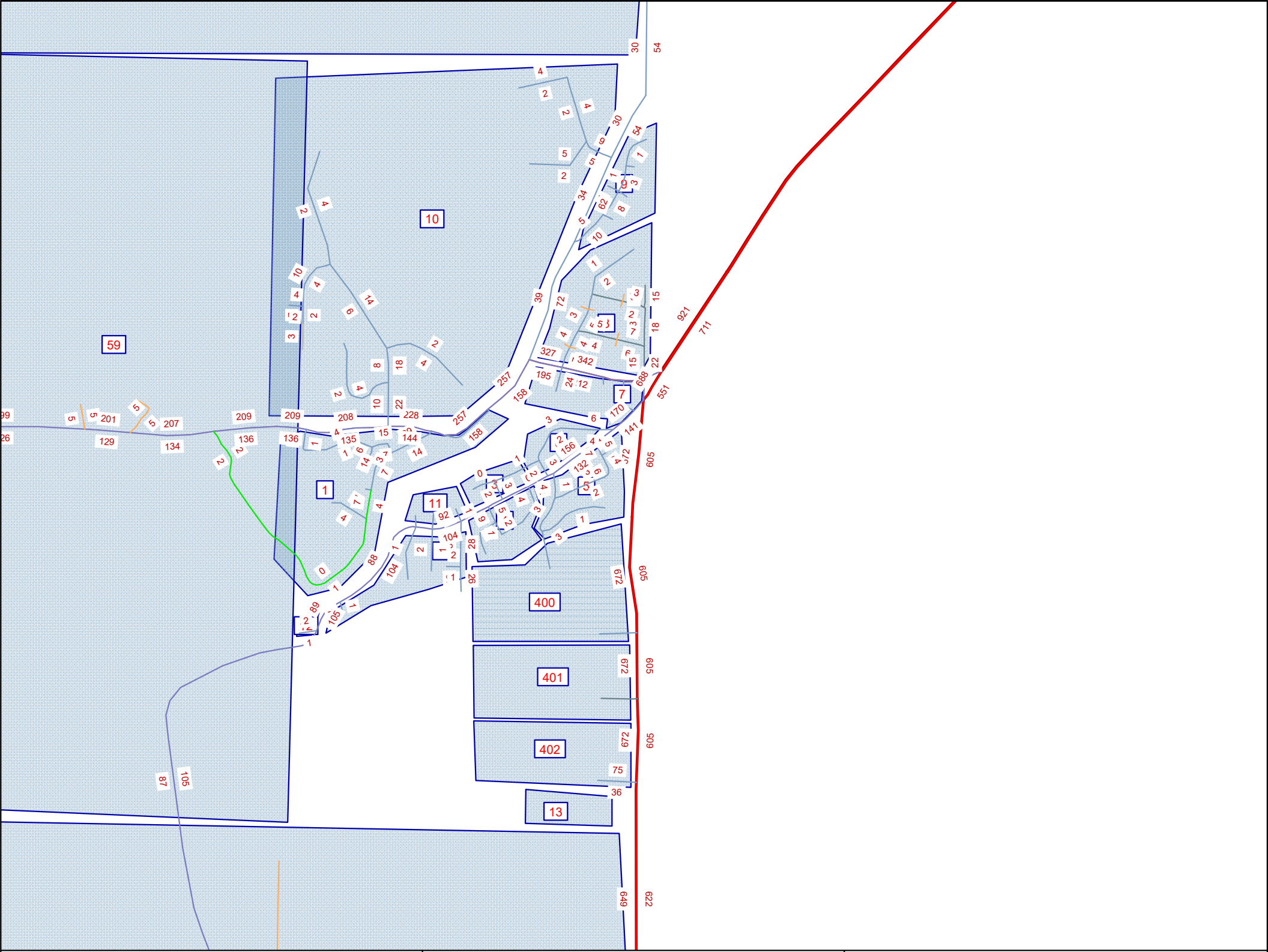
|---|---|---|
| 20 Year Sc 1 Opt 6 | Bragg Creek Future 20 Visum 4.ver | Created on: 13.01.2020 |



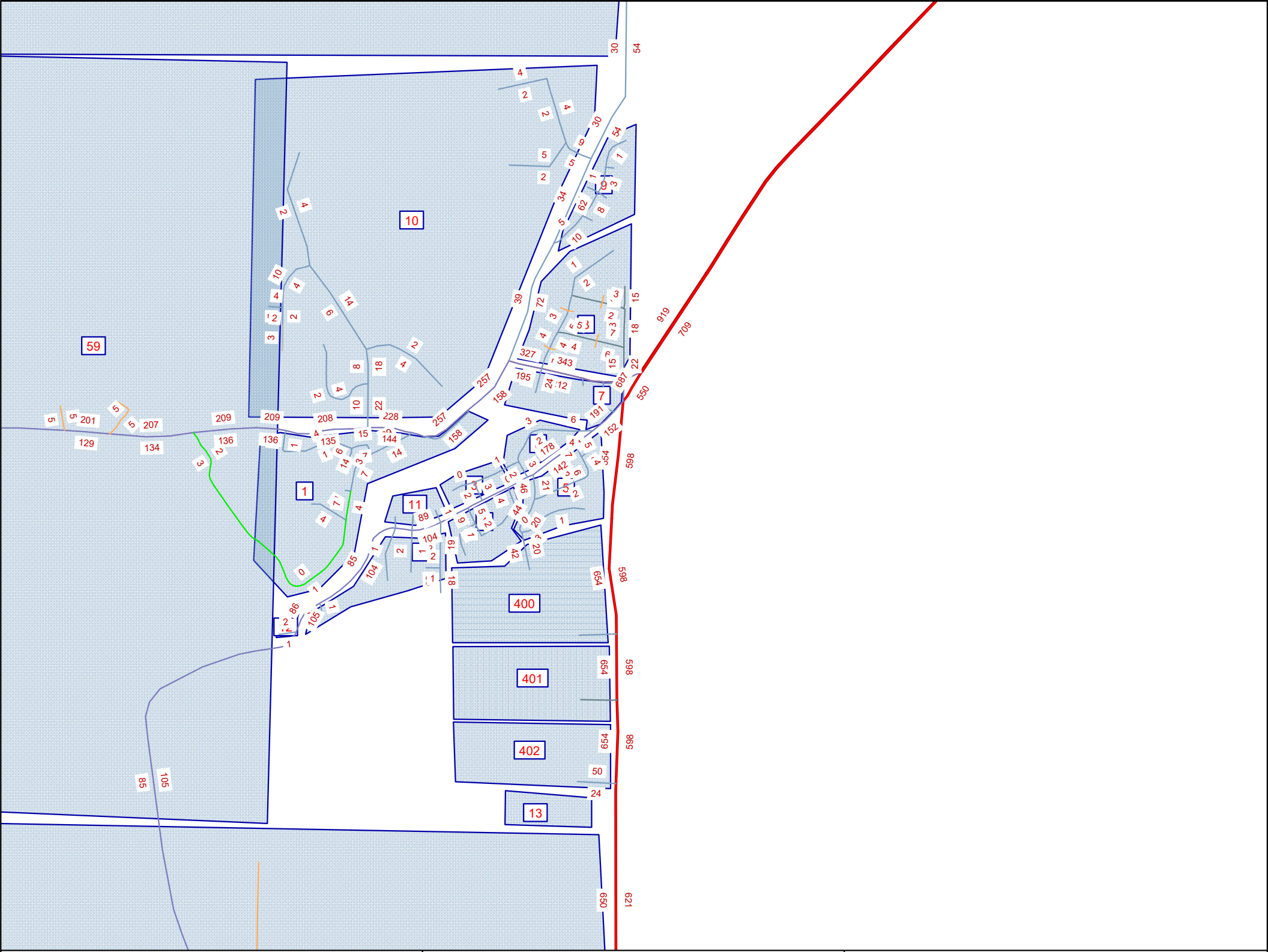

| | | |
|---|---|---|
| 20 Year Sc 1 Opt 7 | Bragg Creek Future 20 Visum 5 Park Place.ver | Created on: 13.01.2020 |



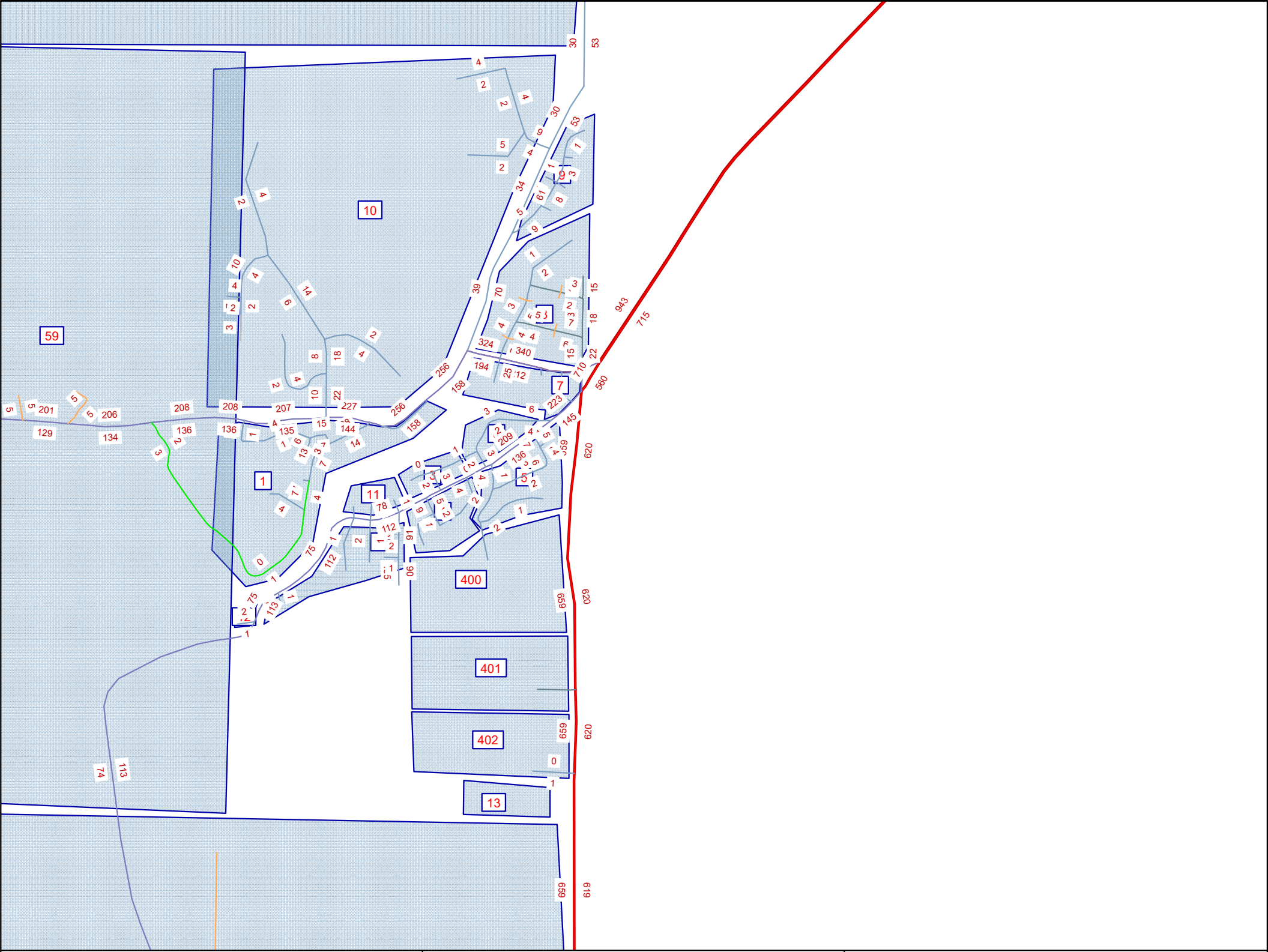

| | | |
|---|---|---|
| 20 Year Sc 2 Opt 8 | Bragg Creek Future 20 Visum 5.ver | Created on: 13.01.2020 |




| | | |
|---|---|---|
| 20 Year Sc 1 Opt 9 | Bragg Creek Future 20 Visum 6 Park Place.ver | Created on: 13.01.2020 |




| | | |
|---|---|---|
| 20 Year Sc 1 Opt 10 | Bragg Creek Future 20 Visum 6.ver | Created on: 13.01.2020 |

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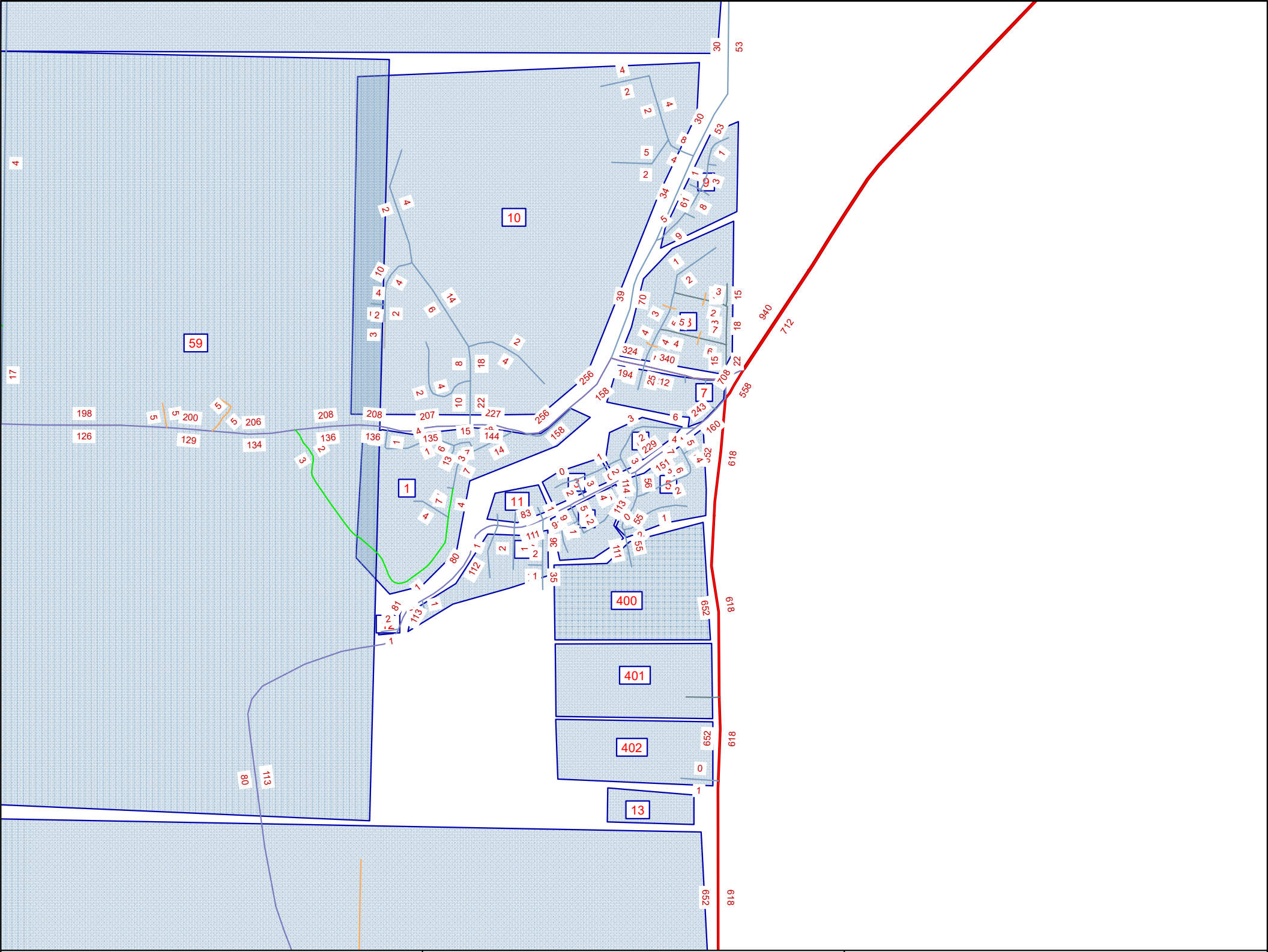
|---|---|---|
| 20 Year Sc 2 Opt 1 | Bragg Creek Future 20 Visum 1.ver | Created on: 13.01.2020 |

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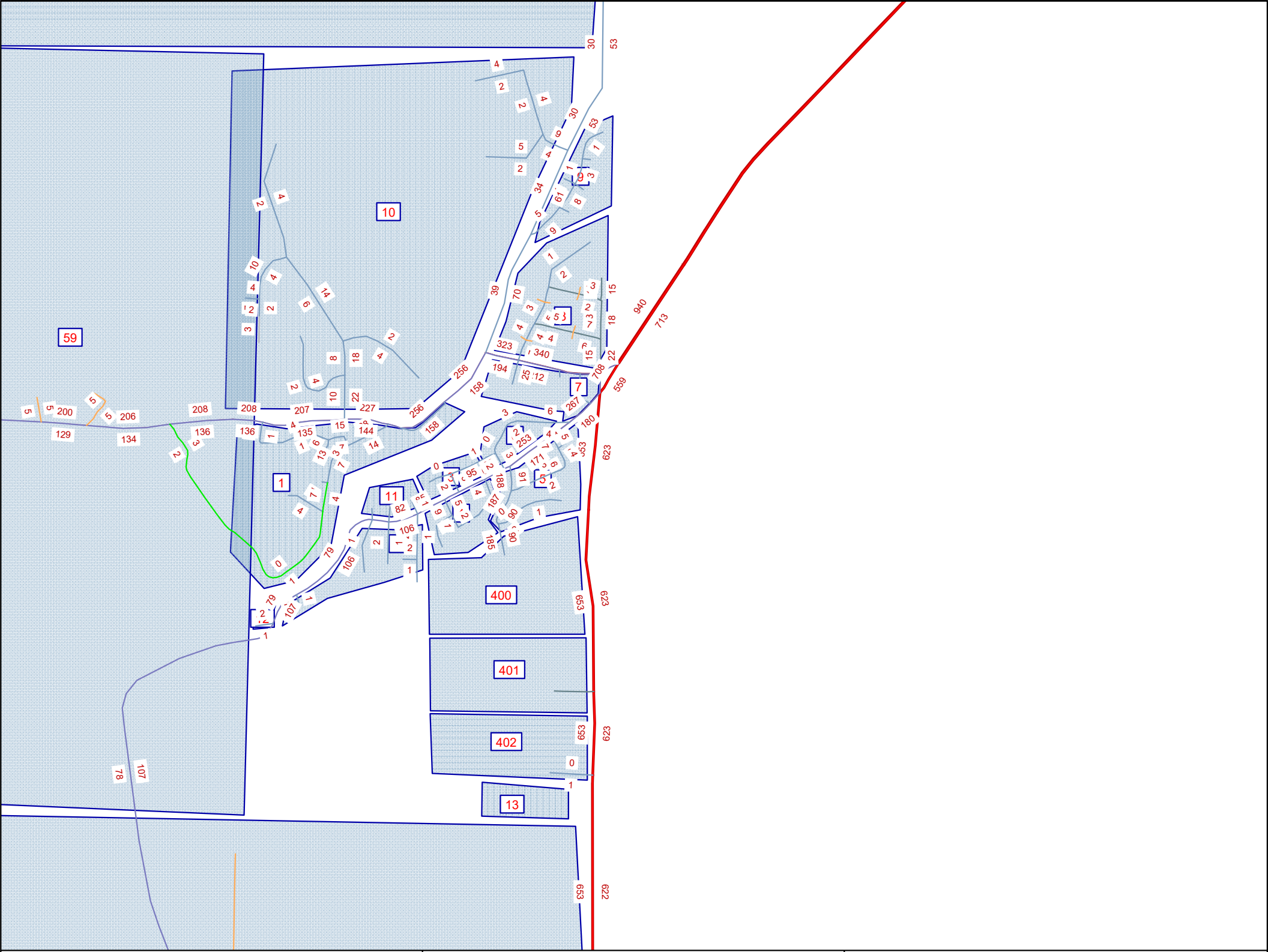
|---|---|---|
| 20 Year Sc 2 Opt 2 | Bragg Creek Future 20 Visum 1+2.ver | Created on: 13.01.2020 |

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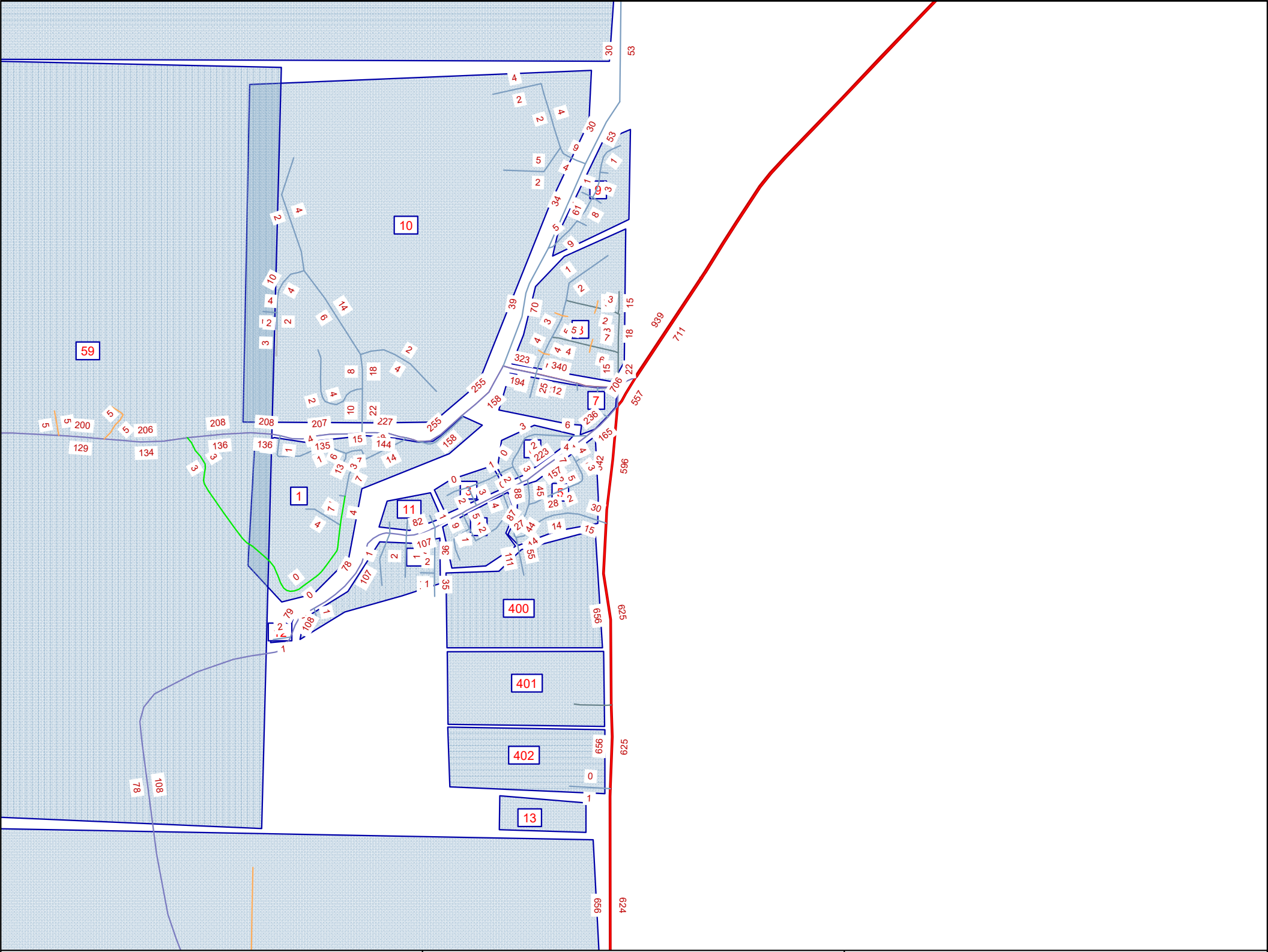
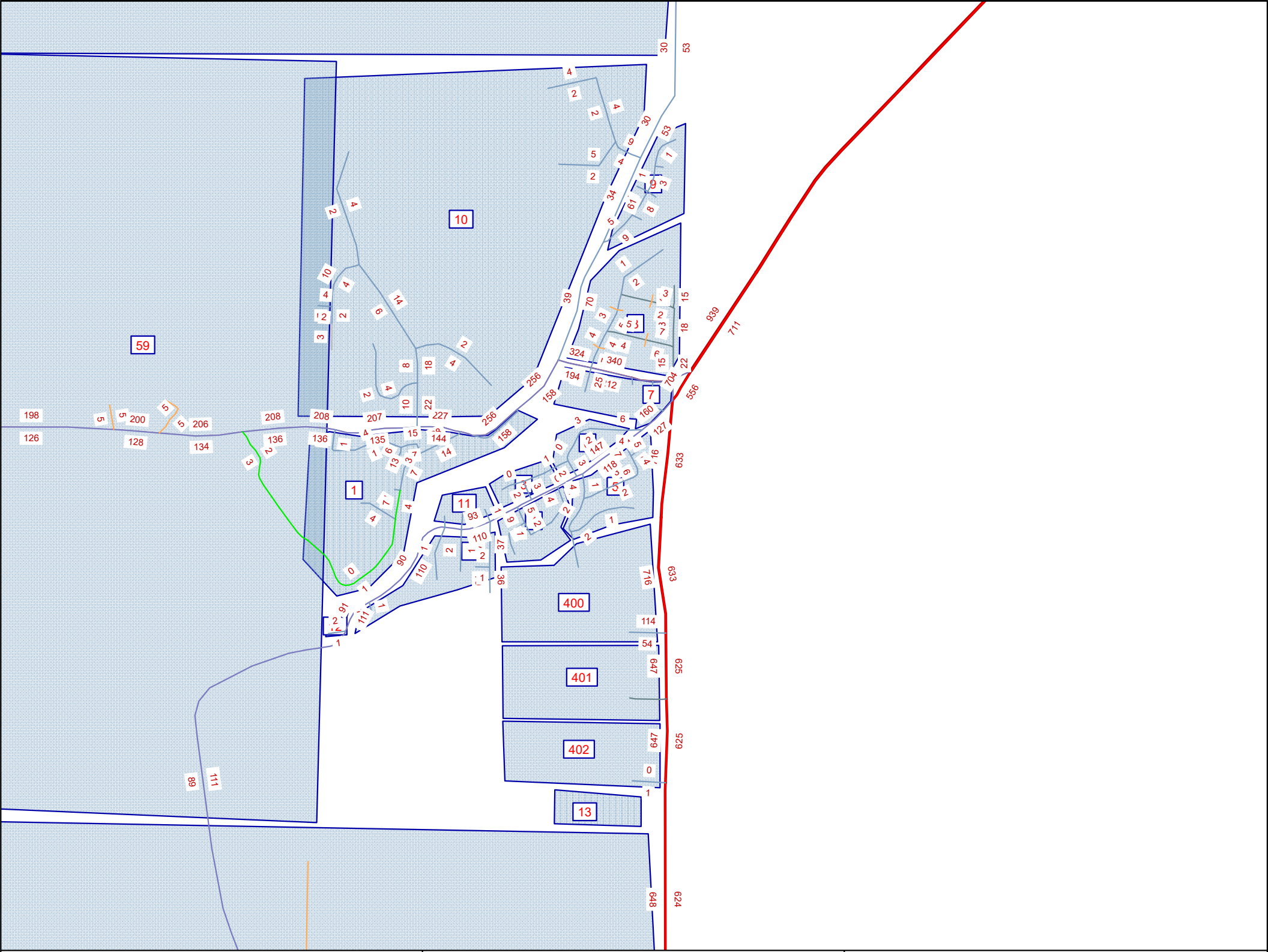
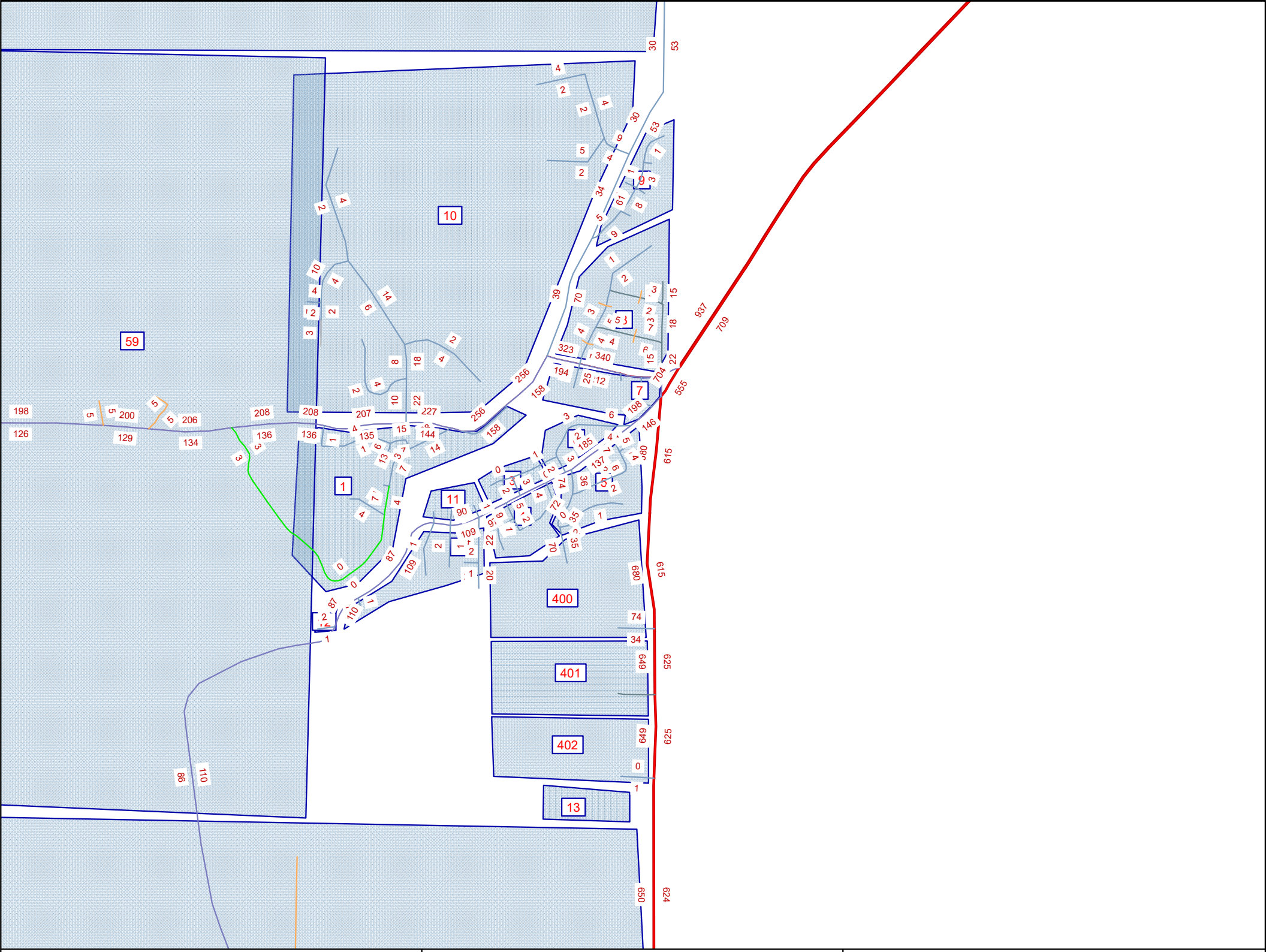
|---|---|---|
| 20 Year Sc 2 Opt 3 | Bragg Creek Future 20 Visum 2.ver | Created on: 13.01.2020 |




| | | |
|---|---|---|
| 20 Year Sc 2 Opt 4 | Bragg Creek Future 20 Visum 3.ver | Created on: 13.01.2020 |




| | | |
|---|---|---|
| 20 Year Sc 2 Opt 5 | Bragg Creek Future 20 Visum 4 Park Place.ver | Created on: 13.01.2020 |

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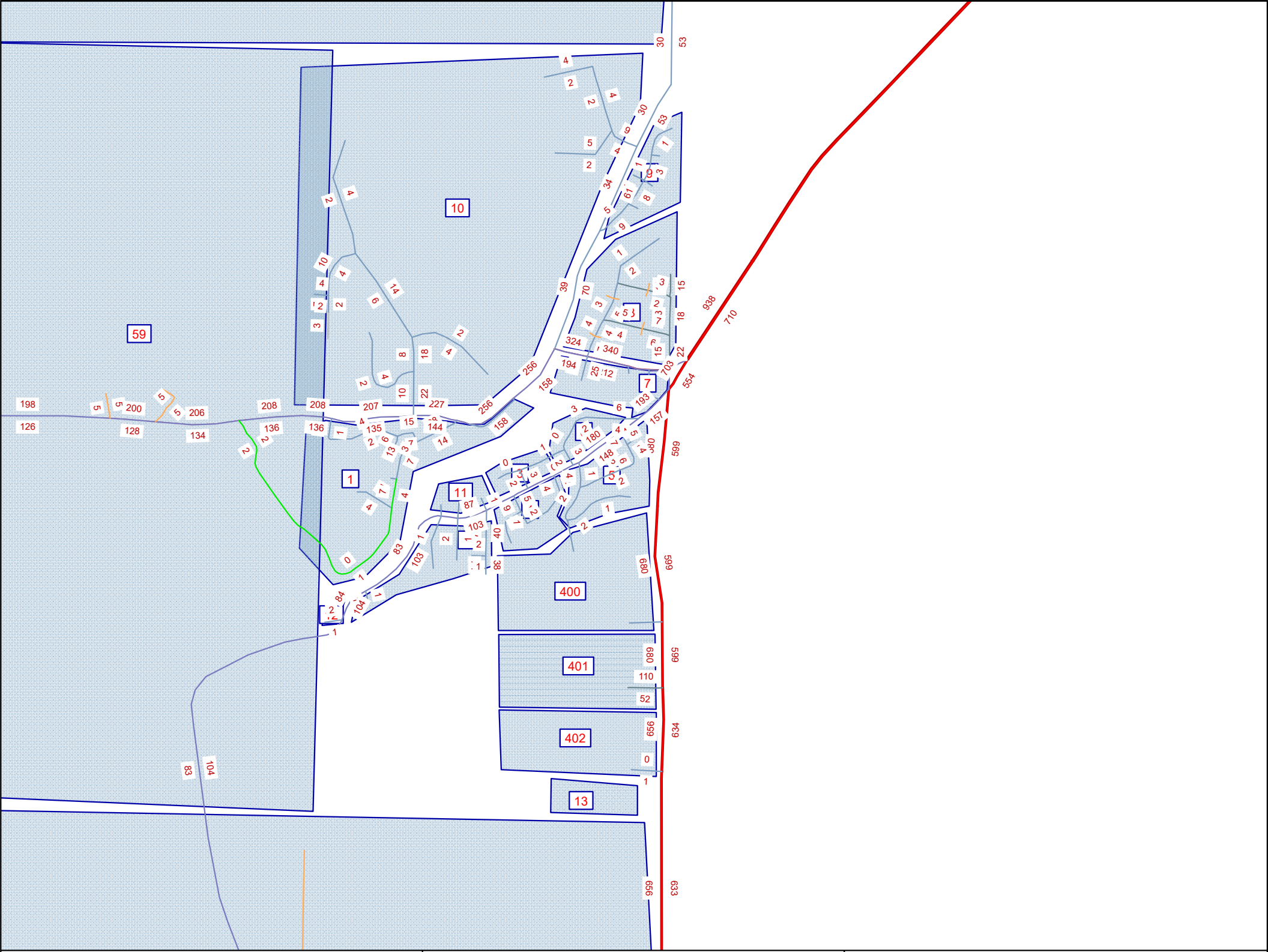
|---|---|---|
| 20 Year Sc 2 Opt 6 | Bragg Creek Future 20 Visum 4.ver | Created on: 13.01.2020 |

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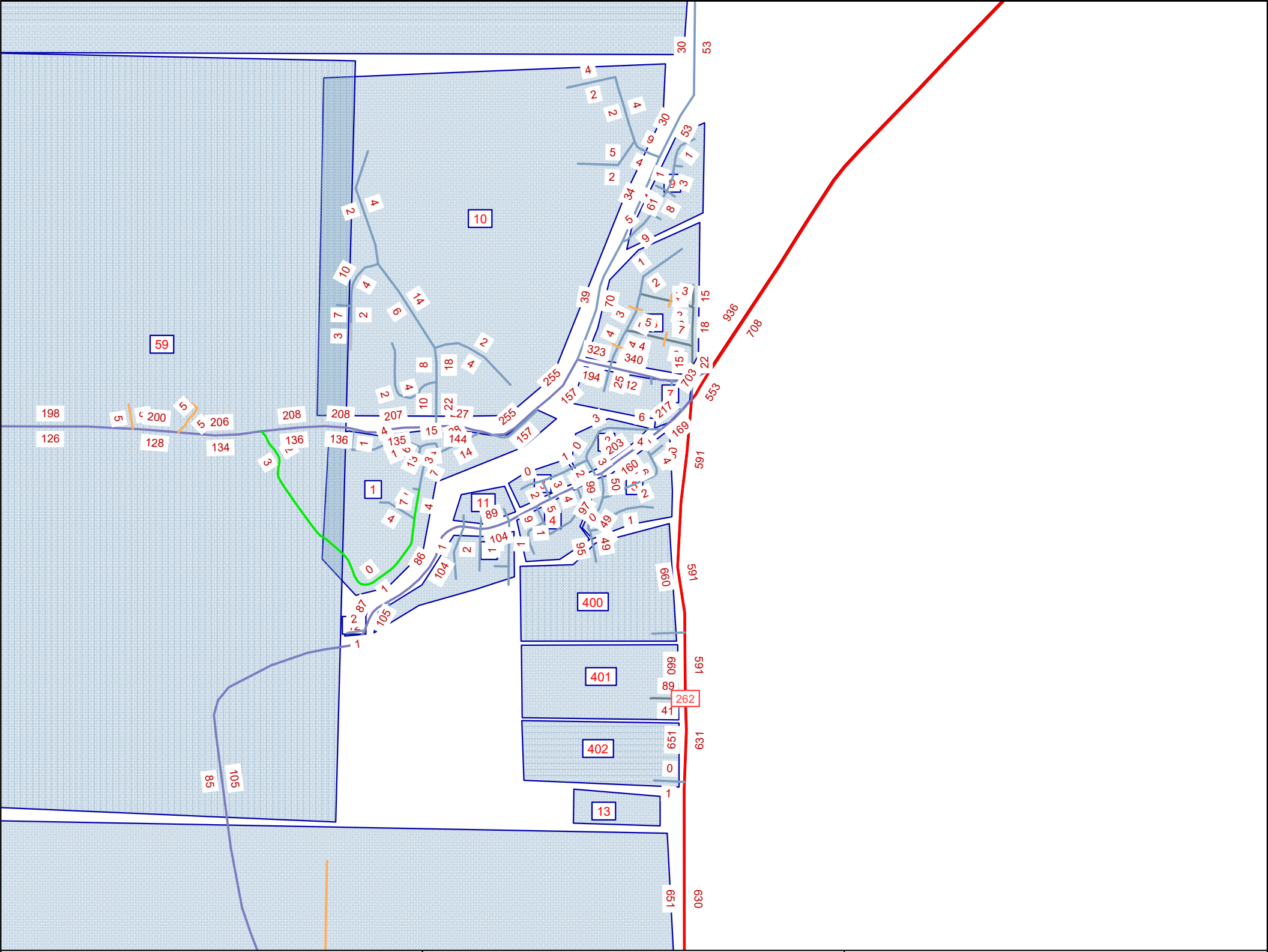
|---|---|---|
| 20 Year Sc 2 Opt 7 | Bragg Creek Future 20 Visum 5 Park Place.ver | Created on: 13.01.2020 |

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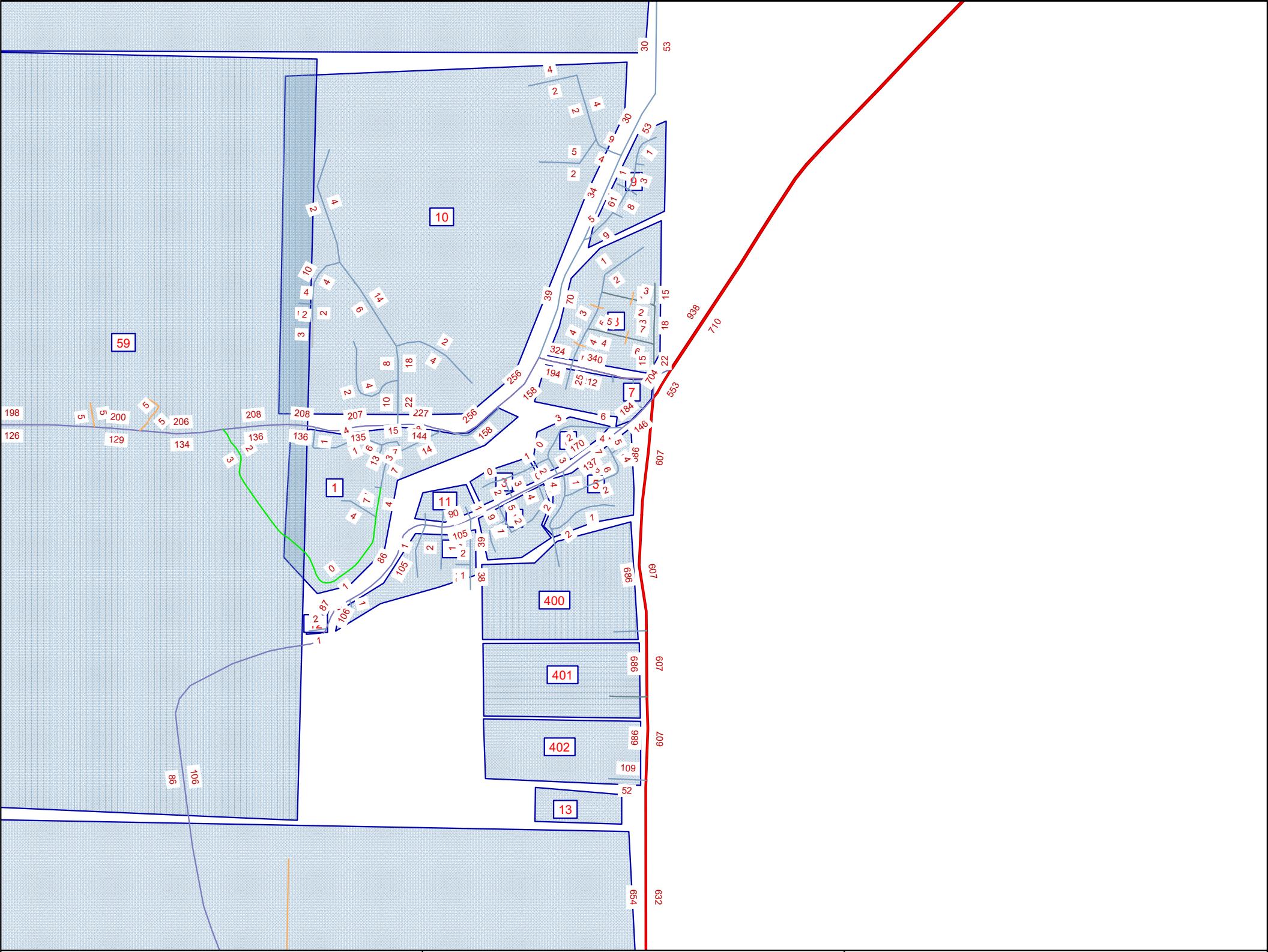
|---|---|---|
| 20 Year Sc 2 Opt 8 | Bragg Creek Future 20 Visum 5.ver | Created on: 13.01.2020 |

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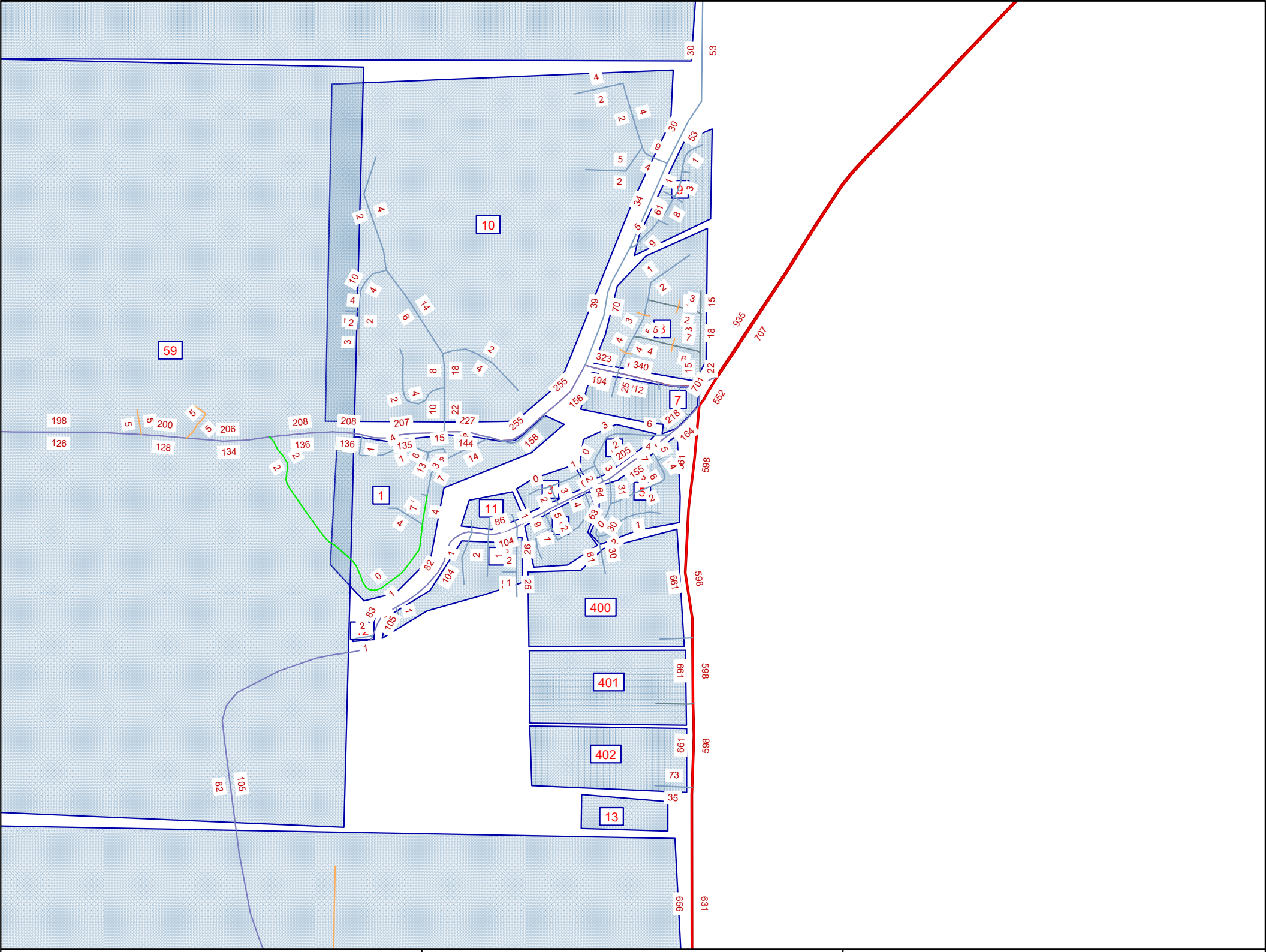
|---|---|---|
| 20 Year Sc 2 Opt 9 | Bragg Creek Future 20 Visum 6 Park Place.ver | Created on: 13.01.2020 |




| | | |
|---|---|---|
| 20 Year Sc 2 Opt 10 | Bragg Creek Future 20 Visum 6.ver | Created on: 13.01.2020 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 25 | 1 | 6 | 16 | 2 | 2 |
| Future Volume (Veh/h) | 25 | 1 | 6 | 16 | 2 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 27 | 1 | 7 | 17 | 2 | 2 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 28 | | 58 | 28 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 28 | | 58 | 28 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1585 | | 944 | 1048 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 28 | 24 | 4 |
| Volume Left | 0 | 7 | 2 |
| Volume Right | 1 | 0 | 2 |
| cSH | 1700 | 1585 | 993 |
| Volume to Capacity | 0.02 | 0.00 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.1 | 0.1 |
| Control Delay (s) | 0.0 | 2.1 | 8.6 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 2.1 | 8.6 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.5 | | |
| Intersection Capacity Utilization | 16.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 0 | 0 | 9 | 1 | 1 |
| Future Volume (Veh/h) | 10 | 0 | 0 | 9 | 1 | 1 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 11 | 0 | 0 | 10 | 1 | 1 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 11 | | 21 | 11 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 11 | | 21 | 11 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1608 | | 996 | 1070 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 11 | 10 | 2 |
| Volume Left | 0 | 0 | 1 |
| Volume Right | 0 | 0 | 1 |
| cSH | 1700 | 1608 | 1032 |
| Volume to Capacity | 0.01 | 0.00 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 0.0 | 0.0 | 8.5 |
| Lane LOS | | | A |
| Approach Delay (s) | 0.0 | 0.0 | 8.5 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.7 | | |
| Intersection Capacity Utilization | 13.3% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 18.2 |
| Intersection LOS | C |

| Movement | NBL | NBT | NBR | SBL | SBT | SBR | NEL | NET | NER | SWL | SWT | SWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 28 | 120 | 232 | 36 | 96 | 93 | 61 | 57 | 18 | 268 | 59 | 3 |
| Future Vol, veh/h | 28 | 120 | 232 | 36 | 96 | 93 | 61 | 57 | 18 | 268 | 59 | 3 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 5 | 5 | 5 | 3 | 3 | 3 | 3 | 3 | 3 | 5 | 5 | 5 |
| Mvmt Flow | 30 | 130 | 252 | 39 | 104 | 101 | 66 | 62 | 20 | 291 | 64 | 3 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | NB | SB | NE | SW |
|---|---|---|---|---|
| Opposing Approach | SB | NB | SW | NE |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | NE | SW | SB | NB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | SW | NE | NB | SB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 20.3 | 14.1 | 12.7 | 20.8 |
| HCM LOS | C | B | B | C |

| Lane | NELn1 | NBLn1 | SBLn1 | SWLn1 |
|---|---|---|---|---|
| Vol Left, % | 45% | 7% | 16% | 81% |
| Vol Thru, % | 42% | 32% | 43% | 18% |
| Vol Right, % | 13% | 61% | 41% | 1% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 136 | 380 | 225 | 330 |
| LT Vol | 61 | 28 | 36 | 268 |
| Through Vol | 57 | 120 | 96 | 59 |
| RT Vol | 18 | 232 | 93 | 3 |
| Lane Flow Rate | 148 | 413 | 245 | 359 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.283 | 0.674 | 0.429 | 0.648 |
| Departure Headway (Hd) | 6.881 | 5.878 | 6.317 | 6.502 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 520 | 611 | 567 | 552 |
| Service Time | 4.956 | 3.933 | 4.383 | 4.56 |
| HCM Lane V/C Ratio | 0.285 | 0.676 | 0.432 | 0.65 |
| HCM Control Delay | 12.7 | 20.3 | 14.1 | 20.8 |
| HCM Lane LOS | B | C | B | C |
| HCM 95th-tile Q | 1.2 | 5.1 | 2.1 | 4.6 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 51 | 1 | 8 | 32 | 2 | 4 |
| Future Volume (Veh/h) | 51 | 1 | 8 | 32 | 2 | 4 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 55 | 1 | 9 | 35 | 2 | 4 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 56 | | 108 | 56 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 56 | | 108 | 56 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 99 | | 100 | 100 |
| cM capacity (veh/h) | | | 1549 | | 884 | 1011 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 56 | 44 | 6 |
| Volume Left | 0 | 9 | 2 |
| Volume Right | 1 | 0 | 4 |
| cSH | 1700 | 1549 | 965 |
| Volume to Capacity | 0.03 | 0.01 | 0.01 |
| Queue Length 95th (m) | 0.0 | 0.1 | 0.2 |
| Control Delay (s) | 0.0 | 1.5 | 8.8 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 1.5 | 8.8 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.1 | | |
| Intersection Capacity Utilization | 18.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 37 | 0 | 1 | 31 | 2 | 2 |
| Future Volume (Veh/h) | 37 | 0 | 1 | 31 | 2 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 40 | 0 | 1 | 34 | 2 | 2 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 40 | | 76 | 40 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 40 | | 76 | 40 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1570 | | 927 | 1031 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 40 | 35 | 4 |
| Volume Left | 0 | 1 | 2 |
| Volume Right | 0 | 0 | 2 |
| cSH | 1700 | 1570 | 976 |
| Volume to Capacity | 0.02 | 0.00 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.1 |
| Control Delay (s) | 0.0 | 0.2 | 8.7 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 0.2 | 8.7 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.5 | |
| Intersection Capacity Utilization | | 13.3% | ICU Level of Service |
| Analysis Period (min) | | 15 | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 16.9 |
| Intersection LOS | C |

| Movement | NBL | NBT | NBR | SBL | SBT | SBR | NEL | NET | NER | SWL | SWT | SWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 13 | 98 | 238 | 19 | 140 | 55 | 97 | 89 | 45 | 225 | 49 | 0 |
| Future Vol, veh/h | 13 | 98 | 238 | 19 | 140 | 55 | 97 | 89 | 45 | 225 | 49 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 5 | 5 | 5 | 3 | 3 | 3 | 5 | 5 | 5 | 7 | 7 | 7 |
| Mvmt Flow | 14 | 107 | 259 | 21 | 152 | 60 | 105 | 97 | 49 | 245 | 53 | 0 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

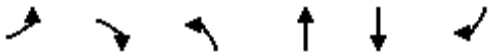
| Approach | NB | SB | NE | SW |
|---|---|---|---|---|
| Opposing Approach | SB | NB | SW | NE |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | NE | SW | SB | NB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | SW | NE | NB | SB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 18.7 | 14.3 | 15.3 | 17.9 |
| HCM LOS | C | B | C | C |

| Lane | NELn1 | NBLn1 | SBLn1 | SWLn1 |
|---|---|---|---|---|
| Vol Left, % | 42% | 4% | 9% | 82% |
| Vol Thru, % | 39% | 28% | 65% | 18% |
| Vol Right, % | 19% | 68% | 26% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 231 | 349 | 214 | 274 |
| LT Vol | 97 | 13 | 19 | 225 |
| Through Vol | 89 | 98 | 140 | 49 |
| RT Vol | 45 | 238 | 55 | 0 |
| Lane Flow Rate | 251 | 379 | 233 | 298 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.461 | 0.629 | 0.421 | 0.555 |
| Departure Headway (Hd) | 6.611 | 5.967 | 6.509 | 6.707 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 542 | 603 | 551 | 536 |
| Service Time | 4.686 | 4.031 | 4.584 | 4.777 |
| HCM Lane V/C Ratio | 0.463 | 0.629 | 0.423 | 0.556 |
| HCM Control Delay | 15.3 | 18.7 | 14.3 | 17.9 |
| HCM Lane LOS | C | C | B | C |
| HCM 95th-tile Q | 2.4 | 4.4 | 2.1 | 3.4 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 81 | 1 | 4 | 86 | 0 | 2 |
| Future Volume (Veh/h) | 81 | 1 | 4 | 86 | 0 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 88 | 1 | 4 | 93 | 0 | 2 |
| Pedestrians | 3 | | | | | |
| Lane Width (m) | 3.6 | | | | | |
| Walking Speed (m/s) | 1.2 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 89 | | 192 | 88 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 89 | | 192 | 88 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1506 | | 792 | 970 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 89 | 97 | 2 |
| Volume Left | 0 | 4 | 0 |
| Volume Right | 1 | 0 | 2 |
| cSH | 1700 | 1506 | 970 |
| Volume to Capacity | 0.05 | 0.00 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.1 | 0.0 |
| Control Delay (s) | 0.0 | 0.3 | 8.7 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 0.3 | 8.7 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 0.3 | |
| Intersection Capacity Utilization | | 17.8% | ICU Level of Service |
| Analysis Period (min) | | 15 | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 0 | 1 | 1 | 453 | 482 | 1 |
| Future Volume (Veh/h) | 0 | 1 | 1 | 453 | 482 | 1 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 0 | 1 | 1 | 492 | 524 | 1 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1018 | 524 | 525 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1018 | 524 | 525 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 100 | 100 | 100 | | | |
| cM capacity (veh/h) | 262 | 553 | 1042 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 1 | 493 | 525 |
| Volume Left | 0 | 1 | 0 |
| Volume Right | 1 | 0 | 1 |
| cSH | 553 | 1042 | 1700 |
| Volume to Capacity | 0.00 | 0.00 | 0.31 |
| Queue Length 95th (m) | 0.0 | 0.0 | 0.0 |
| Control Delay (s) | 11.5 | 0.0 | 0.0 |
| Lane LOS | B | A | |
| Approach Delay (s) | 11.5 | 0.0 | 0.0 |
| Approach LOS | B | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 35.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 33.1 |
| Intersection LOS | D |

| Movement | NBL | NBT | NBR | SBL | SBT | SBR | NEL | NET | NER | SWL | SWT | SWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 9 | 101 | 344 | 0 | 83 | 43 | 56 | 60 | 8 | 391 | 80 | 0 |
| Future Vol, veh/h | 9 | 101 | 344 | 0 | 83 | 43 | 56 | 60 | 8 | 391 | 80 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 10 | 110 | 374 | 0 | 90 | 47 | 61 | 65 | 9 | 425 | 87 | 0 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

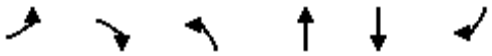
| Approach | NB | SB | NE | SW |
|---|---|---|---|---|
| Opposing Approach | SB | NB | SW | NE |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | NE | SW | SB | NB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | SW | NE | NB | SB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 31.1 | 12.9 | 13.2 | 45.6 |
| HCM LOS | D | B | B | E |

| Lane | NELn1 | NBLn1 | SBLn1 | SWLn1 |
|---|---|---|---|---|
| Vol Left, % | 45% | 2% | 0% | 83% |
| Vol Thru, % | 48% | 22% | 66% | 17% |
| Vol Right, % | 6% | 76% | 34% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 124 | 454 | 126 | 471 |
| LT Vol | 56 | 9 | 0 | 391 |
| Through Vol | 60 | 101 | 83 | 80 |
| RT Vol | 8 | 344 | 43 | 0 |
| Lane Flow Rate | 135 | 493 | 137 | 512 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.276 | 0.822 | 0.274 | 0.915 |
| Departure Headway (Hd) | 7.368 | 5.993 | 7.195 | 6.435 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 491 | 602 | 503 | 558 |
| Service Time | 5.378 | 4.07 | 5.195 | 4.519 |
| HCM Lane V/C Ratio | 0.275 | 0.819 | 0.272 | 0.918 |
| HCM Control Delay | 13.2 | 31.1 | 12.9 | 45.6 |
| HCM Lane LOS | B | D | B | E |
| HCM 95th-tile Q | 1.1 | 8.4 | 1.1 | 11.1 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 81 | 1 | 4 | 86 | 0 | 2 |
| Future Volume (Veh/h) | 81 | 1 | 4 | 86 | 0 | 2 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 88 | 1 | 4 | 93 | 0 | 2 |
| Pedestrians | 3 | | | | | |
| Lane Width (m) | 3.6 | | | | | |
| Walking Speed (m/s) | 1.2 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 89 | | 192 | 88 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 89 | | 192 | 88 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 100 | | 100 | 100 |
| cM capacity (veh/h) | | | 1506 | | 792 | 970 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 89 | 97 | 2 |
| Volume Left | 0 | 4 | 0 |
| Volume Right | 1 | 0 | 2 |
| cSH | 1700 | 1506 | 970 |
| Volume to Capacity | 0.05 | 0.00 | 0.00 |
| Queue Length 95th (m) | 0.0 | 0.1 | 0.0 |
| Control Delay (s) | 0.0 | 0.3 | 8.7 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 0.3 | 8.7 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 17.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 1 | 1 | 1 | 453 | 482 | 1 |
| Future Volume (Veh/h) | 1 | 1 | 1 | 453 | 482 | 1 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 1 | 1 | 1 | 492 | 524 | 1 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1018 | 524 | 525 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1018 | 524 | 525 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 100 | 100 | 100 | | | |
| cM capacity (veh/h) | 262 | 553 | 1042 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 2 | 493 | 525 |
| Volume Left | 1 | 1 | 0 |
| Volume Right | 1 | 0 | 1 |
| cSH | 356 | 1042 | 1700 |
| Volume to Capacity | 0.01 | 0.00 | 0.31 |
| Queue Length 95th (m) | 0.1 | 0.0 | 0.0 |
| Control Delay (s) | 15.2 | 0.0 | 0.0 |
| Lane LOS | C | A | |
| Approach Delay (s) | 15.2 | 0.0 | 0.0 |
| Approach LOS | C | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.0 | | |
| Intersection Capacity Utilization | 35.4% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 33.1 |
| Intersection LOS | D |

| Movement | NBL | NBT | NBR | SBL | SBT | SBR | NEL | NET | NER | SWL | SWT | SWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 9 | 101 | 344 | 0 | 83 | 43 | 56 | 60 | 8 | 391 | 80 | 0 |
| Future Vol, veh/h | 9 | 101 | 344 | 0 | 83 | 43 | 56 | 60 | 8 | 391 | 80 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 10 | 110 | 374 | 0 | 90 | 47 | 61 | 65 | 9 | 425 | 87 | 0 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

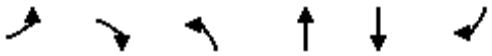
| Approach | NB | SB | NE | SW |
|---|---|---|---|---|
| Opposing Approach | SB | NB | SW | NE |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | NE | SW | SB | NB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | SW | NE | NB | SB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 31.1 | 12.9 | 13.2 | 45.6 |
| HCM LOS | D | B | B | E |

| Lane | NELn1 | NBLn1 | SBLn1 | SWLn1 |
|---|---|---|---|---|
| Vol Left, % | 45% | 2% | 0% | 83% |
| Vol Thru, % | 48% | 22% | 66% | 17% |
| Vol Right, % | 6% | 76% | 34% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 124 | 454 | 126 | 471 |
| LT Vol | 56 | 9 | 0 | 391 |
| Through Vol | 60 | 101 | 83 | 80 |
| RT Vol | 8 | 344 | 43 | 0 |
| Lane Flow Rate | 135 | 493 | 137 | 512 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.276 | 0.822 | 0.274 | 0.915 |
| Departure Headway (Hd) | 7.368 | 5.993 | 7.195 | 6.435 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 491 | 602 | 503 | 558 |
| Service Time | 5.378 | 4.07 | 5.195 | 4.519 |
| HCM Lane V/C Ratio | 0.275 | 0.819 | 0.272 | 0.918 |
| HCM Control Delay | 13.2 | 31.1 | 12.9 | 45.6 |
| HCM Lane LOS | B | D | B | E |
| HCM 95th-tile Q | 1.1 | 8.4 | 1.1 | 11.1 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 91 | 1 | 27 | 93 | 0 | 13 |
| Future Volume (Veh/h) | 91 | 1 | 27 | 93 | 0 | 13 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 99 | 1 | 29 | 101 | 0 | 14 |
| Pedestrians | 3 | | | | | |
| Lane Width (m) | 3.6 | | | | | |
| Walking Speed (m/s) | 1.2 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 100 | | 262 | 100 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 100 | | 262 | 100 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 98 | | 100 | 99 |
| cM capacity (veh/h) | | | 1493 | | 712 | 956 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 100 | 130 | 14 |
| Volume Left | 0 | 29 | 0 |
| Volume Right | 1 | 0 | 14 |
| cSH | 1700 | 1493 | 956 |
| Volume to Capacity | 0.06 | 0.02 | 0.01 |
| Queue Length 95th (m) | 0.0 | 0.5 | 0.4 |
| Control Delay (s) | 0.0 | 1.8 | 8.8 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 1.8 | 8.8 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.5 | | |
| Intersection Capacity Utilization | 23.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 4 | 5 | 11 | 494 | 527 | 8 |
| Future Volume (Veh/h) | 4 | 5 | 11 | 494 | 527 | 8 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 4 | 5 | 12 | 537 | 573 | 9 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1138 | 578 | 582 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1138 | 578 | 582 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 99 | 99 | | | |
| cM capacity (veh/h) | 220 | 516 | 992 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 9 | 549 | 582 |
| Volume Left | 4 | 12 | 0 |
| Volume Right | 5 | 0 | 9 |
| cSH | 323 | 992 | 1700 |
| Volume to Capacity | 0.03 | 0.01 | 0.34 |
| Queue Length 95th (m) | 0.7 | 0.3 | 0.0 |
| Control Delay (s) | 16.5 | 0.3 | 0.0 |
| Lane LOS | C | A | |
| Approach Delay (s) | 16.5 | 0.3 | 0.0 |
| Approach LOS | C | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 44.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 61.5 |
| Intersection LOS | F |

| Movement | NBL | NBT | NBR | SBL | SBT | SBR | NEL | NET | NER | SWL | SWT | SWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 9 | 109 | 380 | 0 | 92 | 49 | 63 | 69 | 8 | 434 | 99 | 0 |
| Future Vol, veh/h | 9 | 109 | 380 | 0 | 92 | 49 | 63 | 69 | 8 | 434 | 99 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 10 | 118 | 413 | 0 | 100 | 53 | 68 | 75 | 9 | 472 | 108 | 0 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

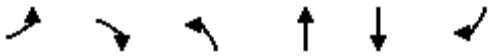
| Approach | NB | SB | NE | SW |
|---|---|---|---|---|
| Opposing Approach | SB | NB | SW | NE |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | NE | SW | SB | NB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | SW | NE | NB | SB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 49.3 | 14.7 | 15 | 97.4 |
| HCM LOS | E | B | B | F |

| Lane | NELn1 | NBLn1 | SBLn1 | SWLn1 |
|---|---|---|---|---|
| Vol Left, % | 45% | 2% | 0% | 81% |
| Vol Thru, % | 49% | 22% | 65% | 19% |
| Vol Right, % | 6% | 76% | 35% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 140 | 498 | 141 | 533 |
| LT Vol | 63 | 9 | 0 | 434 |
| Through Vol | 69 | 109 | 92 | 99 |
| RT Vol | 8 | 380 | 49 | 0 |
| Lane Flow Rate | 152 | 541 | 153 | 579 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.328 | 0.933 | 0.321 | 1.107 |
| Departure Headway (Hd) | 8.09 | 6.61 | 7.966 | 6.876 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 447 | 552 | 454 | 533 |
| Service Time | 6.09 | 4.61 | 5.966 | 4.9 |
| HCM Lane V/C Ratio | 0.34 | 0.98 | 0.337 | 1.086 |
| HCM Control Delay | 15 | 49.3 | 14.7 | 97.4 |
| HCM Lane LOS | B | E | B | F |
| HCM 95th-tile Q | 1.4 | 11.7 | 1.4 | 18.6 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 82 | 0 | 21 | 75 | 0 | 11 |
| Future Volume (Veh/h) | 82 | 0 | 21 | 75 | 0 | 11 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 89 | 0 | 23 | 82 | 0 | 12 |
| Pedestrians | 3 | | | | | |
| Lane Width (m) | 3.6 | | | | | |
| Walking Speed (m/s) | 1.2 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 89 | | 220 | 89 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 89 | | 220 | 89 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 98 | | 100 | 99 |
| cM capacity (veh/h) | | | 1506 | | 755 | 969 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 89 | 105 | 12 |
| Volume Left | 0 | 23 | 0 |
| Volume Right | 0 | 0 | 12 |
| cSH | 1700 | 1506 | 969 |
| Volume to Capacity | 0.05 | 0.02 | 0.01 |
| Queue Length 95th (m) | 0.0 | 0.4 | 0.3 |
| Control Delay (s) | 0.0 | 1.7 | 8.8 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 1.7 | 8.8 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.4 | | |
| Intersection Capacity Utilization | 21.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 6 | 12 | 494 | 527 | 12 |
| Future Volume (Veh/h) | 5 | 6 | 12 | 494 | 527 | 12 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 7 | 13 | 537 | 573 | 13 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1142 | 580 | 586 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1142 | 580 | 586 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 99 | 99 | | | |
| cM capacity (veh/h) | 219 | 515 | 989 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 12 | 550 | 586 |
| Volume Left | 5 | 13 | 0 |
| Volume Right | 7 | 0 | 13 |
| cSH | 329 | 989 | 1700 |
| Volume to Capacity | 0.04 | 0.01 | 0.34 |
| Queue Length 95th (m) | 0.9 | 0.3 | 0.0 |
| Control Delay (s) | 16.4 | 0.4 | 0.0 |
| Lane LOS | C | A | |
| Approach Delay (s) | 16.4 | 0.4 | 0.0 |
| Approach LOS | C | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.3 | | |
| Intersection Capacity Utilization | 45.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 61.2 |
| Intersection LOS | F |

| Movement | NBL | NBT | NBR | SBL | SBT | SBR | NEL | NET | NER | SWL | SWT | SWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 9 | 110 | 380 | 0 | 93 | 47 | 61 | 69 | 8 | 438 | 95 | 0 |
| Future Vol, veh/h | 9 | 110 | 380 | 0 | 93 | 47 | 61 | 69 | 8 | 438 | 95 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 10 | 120 | 413 | 0 | 101 | 51 | 66 | 75 | 9 | 476 | 103 | 0 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

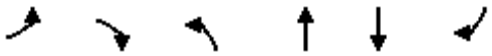
| Approach | NB | SB | NE | SW |
|---|---|---|---|---|
| Opposing Approach | SB | NB | SW | NE |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | NE | SW | SB | NB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | SW | NE | NB | SB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 49.3 | 14.6 | 14.9 | 96.6 |
| HCM LOS | E | B | B | F |

| Lane | NELn1 | NBLn1 | SBLn1 | SWLn1 |
|---|---|---|---|---|
| Vol Left, % | 44% | 2% | 0% | 82% |
| Vol Thru, % | 50% | 22% | 66% | 18% |
| Vol Right, % | 6% | 76% | 34% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 138 | 499 | 140 | 533 |
| LT Vol | 61 | 9 | 0 | 438 |
| Through Vol | 69 | 110 | 93 | 95 |
| RT Vol | 8 | 380 | 47 | 0 |
| Lane Flow Rate | 150 | 542 | 152 | 579 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.323 | 0.933 | 0.319 | 1.105 |
| Departure Headway (Hd) | 8.078 | 6.595 | 7.956 | 6.867 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 448 | 553 | 455 | 533 |
| Service Time | 6.078 | 4.595 | 5.956 | 4.89 |
| HCM Lane V/C Ratio | 0.335 | 0.98 | 0.334 | 1.086 |
| HCM Control Delay | 14.9 | 49.3 | 14.6 | 96.6 |
| HCM Lane LOS | B | E | B | F |
| HCM 95th-tile Q | 1.4 | 11.7 | 1.4 | 18.5 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 90 | 1 | 38 | 92 | 1 | 18 |
| Future Volume (Veh/h) | 90 | 1 | 38 | 92 | 1 | 18 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 98 | 1 | 41 | 100 | 1 | 20 |
| Pedestrians | 3 | | | | | |
| Lane Width (m) | 3.6 | | | | | |
| Walking Speed (m/s) | 1.2 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 99 | | 284 | 98 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 99 | | 284 | 98 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 97 | | 100 | 98 |
| cM capacity (veh/h) | | | 1494 | | 686 | 957 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 99 | 141 | 21 |
| Volume Left | 0 | 41 | 1 |
| Volume Right | 1 | 0 | 20 |
| cSH | 1700 | 1494 | 940 |
| Volume to Capacity | 0.06 | 0.03 | 0.02 |
| Queue Length 95th (m) | 0.0 | 0.7 | 0.5 |
| Control Delay (s) | 0.0 | 2.3 | 8.9 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 2.3 | 8.9 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 2.0 | |
| Intersection Capacity Utilization | | 23.6% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 5 | 7 | 16 | 492 | 525 | 12 |
| Future Volume (Veh/h) | 5 | 7 | 16 | 492 | 525 | 12 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 5 | 8 | 17 | 535 | 571 | 13 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1146 | 578 | 584 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1146 | 578 | 584 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 98 | 98 | 98 | | | |
| cM capacity (veh/h) | 216 | 516 | 991 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 13 | 552 | 584 |
| Volume Left | 5 | 17 | 0 |
| Volume Right | 8 | 0 | 13 |
| cSH | 337 | 991 | 1700 |
| Volume to Capacity | 0.04 | 0.02 | 0.34 |
| Queue Length 95th (m) | 1.0 | 0.4 | 0.0 |
| Control Delay (s) | 16.1 | 0.5 | 0.0 |
| Lane LOS | C | A | |
| Approach Delay (s) | 16.1 | 0.5 | 0.0 |
| Approach LOS | C | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.4 | | |
| Intersection Capacity Utilization | 48.8% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 65.3 |
| Intersection LOS | F |

| Movement | NBL | NBT | NBR | SBL | SBT | SBR | NEL | NET | NER | SWL | SWT | SWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 9 | 109 | 379 | 0 | 89 | 56 | 66 | 70 | 8 | 440 | 98 | 0 |
| Future Vol, veh/h | 9 | 109 | 379 | 0 | 89 | 56 | 66 | 70 | 8 | 440 | 98 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 10 | 118 | 412 | 0 | 97 | 61 | 72 | 76 | 9 | 478 | 107 | 0 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

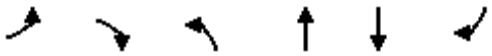
| Approach | NB | SB | NE | SW |
|---|---|---|---|---|
| Opposing Approach | SB | NB | SW | NE |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | NE | SW | SB | NB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | SW | NE | NB | SB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 53.2 | 15 | 15.3 | 103.5 |
| HCM LOS | F | B | C | F |

| Lane | NELn1 | NBLn1 | SBLn1 | SWLn1 |
|---|---|---|---|---|
| Vol Left, % | 46% | 2% | 0% | 82% |
| Vol Thru, % | 49% | 22% | 61% | 18% |
| Vol Right, % | 6% | 76% | 39% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 144 | 497 | 145 | 538 |
| LT Vol | 66 | 9 | 0 | 440 |
| Through Vol | 70 | 109 | 89 | 98 |
| RT Vol | 8 | 379 | 56 | 0 |
| Lane Flow Rate | 157 | 540 | 158 | 585 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.339 | 0.951 | 0.331 | 1.124 |
| Departure Headway (Hd) | 8.195 | 6.68 | 8.045 | 6.917 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 441 | 546 | 449 | 526 |
| Service Time | 6.195 | 4.68 | 6.045 | 4.973 |
| HCM Lane V/C Ratio | 0.356 | 0.989 | 0.352 | 1.112 |
| HCM Control Delay | 15.3 | 53.2 | 15 | 103.5 |
| HCM Lane LOS | C | F | B | F |
| HCM 95th-tile Q | 1.5 | 12.3 | 1.4 | 19.3 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 82 | 0 | 29 | 73 | 0 | 15 |
| Future Volume (Veh/h) | 82 | 0 | 29 | 73 | 0 | 15 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 89 | 0 | 32 | 79 | 0 | 16 |
| Pedestrians | 3 | | | | | |
| Lane Width (m) | 3.6 | | | | | |
| Walking Speed (m/s) | 1.2 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 89 | | 235 | 89 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 89 | | 235 | 89 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 98 | | 100 | 98 |
| cM capacity (veh/h) | | | 1506 | | 735 | 969 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 89 | 111 | 16 |
| Volume Left | 0 | 32 | 0 |
| Volume Right | 0 | 0 | 16 |
| cSH | 1700 | 1506 | 969 |
| Volume to Capacity | 0.05 | 0.02 | 0.02 |
| Queue Length 95th (m) | 0.0 | 0.5 | 0.4 |
| Control Delay (s) | 0.0 | 2.3 | 8.8 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 2.3 | 8.8 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.8 | | |
| Intersection Capacity Utilization | 22.1% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 8 | 8 | 18 | 492 | 526 | 18 |
| Future Volume (Veh/h) | 8 | 8 | 18 | 492 | 526 | 18 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 9 | 9 | 20 | 535 | 572 | 20 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1157 | 582 | 592 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1157 | 582 | 592 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 96 | 98 | 98 | | | |
| cM capacity (veh/h) | 213 | 513 | 984 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 18 | 555 | 592 |
| Volume Left | 9 | 20 | 0 |
| Volume Right | 9 | 0 | 20 |
| cSH | 301 | 984 | 1700 |
| Volume to Capacity | 0.06 | 0.02 | 0.35 |
| Queue Length 95th (m) | 1.5 | 0.5 | 0.0 |
| Control Delay (s) | 17.7 | 0.6 | 0.0 |
| Lane LOS | C | A | |
| Approach Delay (s) | 17.7 | 0.6 | 0.0 |
| Approach LOS | C | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 0.5 | | |
| Intersection Capacity Utilization | 50.5% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 64.4 |
| Intersection LOS | F |

| Movement | NBL | NBT | NBR | SBL | SBT | SBR | NEL | NET | NER | SWL | SWT | SWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 9 | 113 | 377 | 0 | 96 | 48 | 60 | 72 | 8 | 440 | 99 | 0 |
| Future Vol, veh/h | 9 | 113 | 377 | 0 | 96 | 48 | 60 | 72 | 8 | 440 | 99 | 0 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 10 | 123 | 410 | 0 | 104 | 52 | 65 | 78 | 9 | 478 | 108 | 0 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

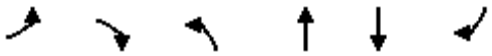
| Approach | NB | SB | NE | SW |
|---|---|---|---|---|
| Opposing Approach | SB | NB | SW | NE |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | NE | SW | SB | NB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | SW | NE | NB | SB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 50.6 | 14.9 | 15.1 | 103.3 |
| HCM LOS | F | B | C | F |

| Lane | NELn1 | NBLn1 | SBLn1 | SWLn1 |
|---|---|---|---|---|
| Vol Left, % | 43% | 2% | 0% | 82% |
| Vol Thru, % | 51% | 23% | 67% | 18% |
| Vol Right, % | 6% | 76% | 33% | 0% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 140 | 499 | 144 | 539 |
| LT Vol | 60 | 9 | 0 | 440 |
| Through Vol | 72 | 113 | 96 | 99 |
| RT Vol | 8 | 377 | 48 | 0 |
| Lane Flow Rate | 152 | 542 | 157 | 586 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.329 | 0.938 | 0.329 | 1.124 |
| Departure Headway (Hd) | 8.149 | 6.664 | 8.028 | 6.904 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 444 | 548 | 451 | 527 |
| Service Time | 6.149 | 4.664 | 6.028 | 4.926 |
| HCM Lane V/C Ratio | 0.342 | 0.989 | 0.348 | 1.112 |
| HCM Control Delay | 15.1 | 50.6 | 14.9 | 103.3 |
| HCM Lane LOS | C | F | B | F |
| HCM 95th-tile Q | 1.4 | 11.8 | 1.4 | 19.4 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 111 | 2 | 69 | 108 | 1 | 34 |
| Future Volume (Veh/h) | 111 | 2 | 69 | 108 | 1 | 34 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 121 | 2 | 75 | 117 | 1 | 37 |
| Pedestrians | 3 | | | | | |
| Lane Width (m) | 3.6 | | | | | |
| Walking Speed (m/s) | 1.2 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 123 | | 392 | 122 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 123 | | 392 | 122 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 95 | | 100 | 96 |
| cM capacity (veh/h) | | | 1464 | | 579 | 929 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 123 | 192 | 38 |
| Volume Left | 0 | 75 | 1 |
| Volume Right | 2 | 0 | 37 |
| cSH | 1700 | 1464 | 915 |
| Volume to Capacity | 0.07 | 0.05 | 0.04 |
| Queue Length 95th (m) | 0.0 | 1.3 | 1.0 |
| Control Delay (s) | 0.0 | 3.2 | 9.1 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 3.2 | 9.1 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 2.7 | |
| Intersection Capacity Utilization | | 26.2% | ICU Level of Service |
| Analysis Period (min) | | 15 | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 10 | 17 | 37 | 584 | 629 | 24 |
| Future Volume (Veh/h) | 10 | 17 | 37 | 584 | 629 | 24 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 11 | 18 | 40 | 635 | 684 | 26 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1412 | 697 | 710 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1412 | 697 | 710 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 92 | 96 | 96 | | | |
| cM capacity (veh/h) | 145 | 441 | 889 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 29 | 675 | 710 |
| Volume Left | 11 | 40 | 0 |
| Volume Right | 18 | 0 | 26 |
| cSH | 249 | 889 | 1700 |
| Volume to Capacity | 0.12 | 0.04 | 0.42 |
| Queue Length 95th (m) | 3.1 | 1.1 | 0.0 |
| Control Delay (s) | 21.4 | 1.2 | 0.0 |
| Lane LOS | C | A | |
| Approach Delay (s) | 21.4 | 1.2 | 0.0 |
| Approach LOS | C | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.0 | | |
| Intersection Capacity Utilization | 71.1% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 156 |
| Intersection LOS | F |

| Movement | NBL | NBT | NBR | SBL | SBT | SBR | NEL | NET | NER | SWL | SWT | SWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 9 | 121 | 460 | 0 | 100 | 71 | 82 | 91 | 8 | 537 | 136 | 15 |
| Future Vol, veh/h | 9 | 121 | 460 | 0 | 100 | 71 | 82 | 91 | 8 | 537 | 136 | 15 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 10 | 132 | 500 | 0 | 109 | 77 | 89 | 99 | 9 | 584 | 148 | 16 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

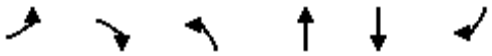
| Approach | NB | SB | NE | SW |
|---|---|---|---|---|
| Opposing Approach | SB | NB | SW | NE |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | NE | SW | SB | NB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | SW | NE | NB | SB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 123.7 | 19.2 | 20.2 | 253.5 |
| HCM LOS | F | C | C | F |

| Lane | NELn1 | NBLn1 | SBLn1 | SWLn1 |
|---|---|---|---|---|
| Vol Left, % | 45% | 2% | 0% | 78% |
| Vol Thru, % | 50% | 21% | 58% | 20% |
| Vol Right, % | 4% | 78% | 42% | 2% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 181 | 590 | 171 | 688 |
| LT Vol | 82 | 9 | 0 | 537 |
| Through Vol | 91 | 121 | 100 | 136 |
| RT Vol | 8 | 460 | 71 | 15 |
| Lane Flow Rate | 197 | 641 | 186 | 748 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.443 | 1.171 | 0.407 | 1.492 |
| Departure Headway (Hd) | 9.718 | 7.729 | 9.715 | 7.723 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 374 | 475 | 374 | 479 |
| Service Time | 7.718 | 5.729 | 7.715 | 5.723 |
| HCM Lane V/C Ratio | 0.527 | 1.349 | 0.497 | 1.562 |
| HCM Control Delay | 20.2 | 123.7 | 19.2 | 253.5 |
| HCM Lane LOS | C | F | C | F |
| HCM 95th-tile Q | 2.2 | 20.1 | 1.9 | 35.9 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 103 | 0 | 53 | 90 | 0 | 28 |
| Future Volume (Veh/h) | 103 | 0 | 53 | 90 | 0 | 28 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 112 | 0 | 58 | 98 | 0 | 30 |
| Pedestrians | 3 | | | | | |
| Lane Width (m) | 3.6 | | | | | |
| Walking Speed (m/s) | 1.2 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 112 | | 329 | 112 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 112 | | 329 | 112 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 96 | | 100 | 97 |
| cM capacity (veh/h) | | | 1478 | | 638 | 941 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 112 | 156 | 30 |
| Volume Left | 0 | 58 | 0 |
| Volume Right | 0 | 0 | 30 |
| cSH | 1700 | 1478 | 941 |
| Volume to Capacity | 0.07 | 0.04 | 0.03 |
| Queue Length 95th (m) | 0.0 | 1.0 | 0.8 |
| Control Delay (s) | 0.0 | 3.0 | 9.0 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 3.0 | 9.0 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 2.5 | |
| Intersection Capacity Utilization | | 24.3% | ICU Level of Service |
| Analysis Period (min) | | 15 | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 16 | 19 | 39 | 584 | 630 | 37 |
| Future Volume (Veh/h) | 16 | 19 | 39 | 584 | 630 | 37 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 17 | 21 | 42 | 635 | 685 | 40 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1424 | 705 | 725 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1424 | 705 | 725 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 88 | 95 | 95 | | | |
| cM capacity (veh/h) | 142 | 436 | 878 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 38 | 677 | 725 |
| Volume Left | 17 | 42 | 0 |
| Volume Right | 21 | 0 | 40 |
| cSH | 227 | 878 | 1700 |
| Volume to Capacity | 0.17 | 0.05 | 0.43 |
| Queue Length 95th (m) | 4.7 | 1.2 | 0.0 |
| Control Delay (s) | 24.0 | 1.2 | 0.0 |
| Lane LOS | C | A | |
| Approach Delay (s) | 24.0 | 1.2 | 0.0 |
| Approach LOS | C | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.2 | | |
| Intersection Capacity Utilization | 72.7% | ICU Level of Service | C |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 156.4 |
| Intersection LOS | F |

| Movement | NBL | NBT | NBR | SBL | SBT | SBR | NEL | NET | NER | SWL | SWT | SWR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 9 | 133 | 457 | 0 | 100 | 71 | 68 | 94 | 8 | 542 | 132 | 14 |
| Future Vol, veh/h | 9 | 133 | 457 | 0 | 100 | 71 | 68 | 94 | 8 | 542 | 132 | 14 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 10 | 145 | 497 | 0 | 109 | 77 | 74 | 102 | 9 | 589 | 143 | 15 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

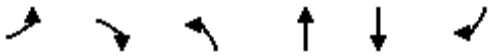
| Approach | NB | SB | NE | SW |
|---|---|---|---|---|
| Opposing Approach | SB | NB | SW | NE |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | NE | SW | SB | NB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | SW | NE | NB | SB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 127.5 | 19 | 19.4 | 249.5 |
| HCM LOS | F | C | C | F |

| Lane | NELn1 | NBLn1 | SBLn1 | SWLn1 |
|---|---|---|---|---|
| Vol Left, % | 40% | 2% | 0% | 79% |
| Vol Thru, % | 55% | 22% | 58% | 19% |
| Vol Right, % | 5% | 76% | 42% | 2% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 170 | 599 | 171 | 688 |
| LT Vol | 68 | 9 | 0 | 542 |
| Through Vol | 94 | 133 | 100 | 132 |
| RT Vol | 8 | 457 | 71 | 14 |
| Lane Flow Rate | 185 | 651 | 186 | 748 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 0.415 | 1.182 | 0.404 | 1.483 |
| Departure Headway (Hd) | 9.708 | 7.667 | 9.629 | 7.687 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 373 | 482 | 377 | 479 |
| Service Time | 7.708 | 5.667 | 7.629 | 5.687 |
| HCM Lane V/C Ratio | 0.496 | 1.351 | 0.493 | 1.562 |
| HCM Control Delay | 19.4 | 127.5 | 19 | 249.5 |
| HCM Lane LOS | C | F | C | F |
| HCM 95th-tile Q | 2 | 20.7 | 1.9 | 35.6 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 111 | 2 | 97 | 106 | 1 | 49 |
| Future Volume (Veh/h) | 111 | 2 | 97 | 106 | 1 | 49 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 121 | 2 | 105 | 115 | 1 | 53 |
| Pedestrians | 3 | | | | | |
| Lane Width (m) | 3.6 | | | | | |
| Walking Speed (m/s) | 1.2 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 123 | | 450 | 122 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 123 | | 450 | 122 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 93 | | 100 | 94 |
| cM capacity (veh/h) | | | 1464 | | 525 | 929 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 123 | 220 | 54 |
| Volume Left | 0 | 105 | 1 |
| Volume Right | 2 | 0 | 53 |
| cSH | 1700 | 1464 | 916 |
| Volume to Capacity | 0.07 | 0.07 | 0.06 |
| Queue Length 95th (m) | 0.0 | 1.9 | 1.5 |
| Control Delay (s) | 0.0 | 4.0 | 9.2 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 4.0 | 9.2 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 3.4 | | |
| Intersection Capacity Utilization | 27.6% | ICU Level of Service | A |
| Analysis Period (min) | 15 | | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 15 | 26 | 54 | 577 | 625 | 35 |
| Future Volume (Veh/h) | 15 | 26 | 54 | 577 | 625 | 35 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 16 | 28 | 59 | 627 | 679 | 38 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1443 | 698 | 717 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1443 | 698 | 717 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 88 | 94 | 93 | | | |
| cM capacity (veh/h) | 136 | 440 | 884 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 44 | 686 | 717 |
| Volume Left | 16 | 59 | 0 |
| Volume Right | 28 | 0 | 38 |
| cSH | 243 | 884 | 1700 |
| Volume to Capacity | 0.18 | 0.07 | 0.42 |
| Queue Length 95th (m) | 5.2 | 1.7 | 0.0 |
| Control Delay (s) | 23.1 | 1.7 | 0.0 |
| Lane LOS | C | A | |
| Approach Delay (s) | 23.1 | 1.7 | 0.0 |
| Approach LOS | C | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.5 | | |
| Intersection Capacity Utilization | 81.7% | ICU Level of Service | D |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 167.9 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | ↕ | | | ↕ | | | ↕ | | | ↕ | |
| Traffic Vol, veh/h | 76 | 103 | 8 | 535 | 157 | 11 | 9 | 132 | 450 | 0 | 118 | 63 |
| Future Vol, veh/h | 76 | 103 | 8 | 535 | 157 | 11 | 9 | 132 | 450 | 0 | 118 | 63 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 83 | 112 | 9 | 582 | 171 | 12 | 10 | 143 | 489 | 0 | 128 | 68 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

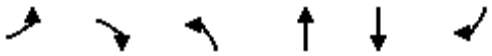
| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 21.2 | 275.4 | 131.7 | 20.5 |
| HCM LOS | C | F | F | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 2% | 41% | 76% | 0% |
| Vol Thru, % | 22% | 55% | 22% | 65% |
| Vol Right, % | 76% | 4% | 2% | 35% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 591 | 187 | 703 | 181 |
| LT Vol | 9 | 76 | 535 | 0 |
| Through Vol | 132 | 103 | 157 | 118 |
| RT Vol | 450 | 8 | 11 | 63 |
| Lane Flow Rate | 642 | 203 | 764 | 197 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.19 | 0.462 | 1.542 | 0.436 |
| Departure Headway (Hd) | 7.941 | 9.967 | 7.854 | 9.995 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 463 | 364 | 466 | 364 |
| Service Time | 5.941 | 7.967 | 5.854 | 7.995 |
| HCM Lane V/C Ratio | 1.387 | 0.558 | 1.639 | 0.541 |
| HCM Control Delay | 131.7 | 21.2 | 275.4 | 20.5 |
| HCM Lane LOS | F | C | F | C |
| HCM 95th-tile Q | 20.6 | 2.3 | 38 | 2.1 |

| Movement | EBT | EBR | WBL | WBT | NBL | NBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 103 | 0 | 77 | 87 | 0 | 40 |
| Future Volume (Veh/h) | 103 | 0 | 77 | 87 | 0 | 40 |
| Sign Control | Free | | | Free | Stop | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 112 | 0 | 84 | 95 | 0 | 43 |
| Pedestrians | 3 | | | | | |
| Lane Width (m) | 3.6 | | | | | |
| Walking Speed (m/s) | 1.2 | | | | | |
| Percent Blockage | 0 | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | None | | | None | | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | | | 112 | | 378 | 112 |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | | | 112 | | 378 | 112 |
| tC, single (s) | | | 4.1 | | 6.4 | 6.2 |
| tC, 2 stage (s) | | | | | | |
| tF (s) | | | 2.2 | | 3.5 | 3.3 |
| p0 queue free % | | | 94 | | 100 | 95 |
| cM capacity (veh/h) | | | 1478 | | 587 | 941 |

| Direction, Lane # | EB 1 | WB 1 | NB 1 |
|---|---|---|---|
| Volume Total | 112 | 179 | 43 |
| Volume Left | 0 | 84 | 0 |
| Volume Right | 0 | 0 | 43 |
| cSH | 1700 | 1478 | 941 |
| Volume to Capacity | 0.07 | 0.06 | 0.05 |
| Queue Length 95th (m) | 0.0 | 1.4 | 1.1 |
| Control Delay (s) | 0.0 | 3.8 | 9.0 |
| Lane LOS | | A | A |
| Approach Delay (s) | 0.0 | 3.8 | 9.0 |
| Approach LOS | | | A |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | | 3.2 | |
| Intersection Capacity Utilization | | 25.5% | ICU Level of Service A |
| Analysis Period (min) | | 15 | |



| Movement | EBL | EBR | NBL | NBT | SBT | SBR |
|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | |
| Traffic Volume (veh/h) | 23 | 29 | 58 | 576 | 627 | 53 |
| Future Volume (Veh/h) | 23 | 29 | 58 | 576 | 627 | 53 |
| Sign Control | Stop | | | Free | Free | |
| Grade | 0% | | | 0% | 0% | |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Hourly flow rate (vph) | 25 | 32 | 63 | 626 | 682 | 58 |
| Pedestrians | | | | | | |
| Lane Width (m) | | | | | | |
| Walking Speed (m/s) | | | | | | |
| Percent Blockage | | | | | | |
| Right turn flare (veh) | | | | | | |
| Median type | | | | None | None | |
| Median storage veh) | | | | | | |
| Upstream signal (m) | | | | | | |
| pX, platoon unblocked | | | | | | |
| vC, conflicting volume | 1463 | 711 | 740 | | | |
| vC1, stage 1 conf vol | | | | | | |
| vC2, stage 2 conf vol | | | | | | |
| vCu, unblocked vol | 1463 | 711 | 740 | | | |
| tC, single (s) | 6.4 | 6.2 | 4.1 | | | |
| tC, 2 stage (s) | | | | | | |
| tF (s) | 3.5 | 3.3 | 2.2 | | | |
| p0 queue free % | 81 | 93 | 93 | | | |
| cM capacity (veh/h) | 131 | 433 | 867 | | | |

| Direction, Lane # | EB 1 | NB 1 | SB 1 |
|---|---|---|---|
| Volume Total | 57 | 689 | 740 |
| Volume Left | 25 | 63 | 0 |
| Volume Right | 32 | 0 | 58 |
| cSH | 216 | 867 | 1700 |
| Volume to Capacity | 0.26 | 0.07 | 0.44 |
| Queue Length 95th (m) | 8.2 | 1.9 | 0.0 |
| Control Delay (s) | 27.6 | 1.9 | 0.0 |
| Lane LOS | D | A | |
| Approach Delay (s) | 27.6 | 1.9 | 0.0 |
| Approach LOS | D | | |

| Intersection Summary | | | |
|---|---|---|---|
| Average Delay | 1.9 | | |
| Intersection Capacity Utilization | 83.1% | ICU Level of Service | E |
| Analysis Period (min) | 15 | | |

| Intersection | |
|---|---|
| Intersection Delay, s/veh | 168.4 |
| Intersection LOS | F |

| Movement | EBL | EBT | EBR | WBL | WBT | WBR | NBL | NBT | NBR | SBL | SBT | SBR |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Lane Configurations | | | | | | | | | | | | |
| Traffic Vol, veh/h | 68 | 102 | 8 | 546 | 148 | 10 | 9 | 138 | 453 | 0 | 126 | 51 |
| Future Vol, veh/h | 68 | 102 | 8 | 546 | 148 | 10 | 9 | 138 | 453 | 0 | 126 | 51 |
| Peak Hour Factor | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 | 0.92 |
| Heavy Vehicles, % | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| Mvmt Flow | 74 | 111 | 9 | 593 | 161 | 11 | 10 | 150 | 492 | 0 | 137 | 55 |
| Number of Lanes | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 | 0 | 1 | 0 |

| Approach | EB | WB | NB | SB |
|---|---|---|---|---|
| Opposing Approach | WB | EB | SB | NB |
| Opposing Lanes | 1 | 1 | 1 | 1 |
| Conflicting Approach Left | SB | NB | EB | WB |
| Conflicting Lanes Left | 1 | 1 | 1 | 1 |
| Conflicting Approach Right | NB | SB | WB | EB |
| Conflicting Lanes Right | 1 | 1 | 1 | 1 |
| HCM Control Delay | 20.4 | 271.8 | 134.7 | 20.1 |
| HCM LOS | C | F | F | C |

| Lane | NBLn1 | EBLn1 | WBLn1 | SBLn1 |
|---|---|---|---|---|
| Vol Left, % | 1% | 38% | 78% | 0% |
| Vol Thru, % | 23% | 57% | 21% | 71% |
| Vol Right, % | 76% | 4% | 1% | 29% |
| Sign Control | Stop | Stop | Stop | Stop |
| Traffic Vol by Lane | 600 | 178 | 704 | 177 |
| LT Vol | 9 | 68 | 546 | 0 |
| Through Vol | 138 | 102 | 148 | 126 |
| RT Vol | 453 | 8 | 10 | 51 |
| Lane Flow Rate | 652 | 193 | 765 | 192 |
| Geometry Grp | 1 | 1 | 1 | 1 |
| Degree of Util (X) | 1.199 | 0.438 | 1.534 | 0.425 |
| Departure Headway (Hd) | 7.862 | 9.932 | 7.807 | 9.956 |
| Convergence, Y/N | Yes | Yes | Yes | Yes |
| Cap | 470 | 366 | 474 | 364 |
| Service Time | 5.862 | 7.932 | 5.807 | 7.956 |
| HCM Lane V/C Ratio | 1.387 | 0.527 | 1.614 | 0.527 |
| HCM Control Delay | 134.7 | 20.4 | 271.8 | 20.1 |
| HCM Lane LOS | F | C | F | C |
| HCM 95th-tile Q | 21.1 | 2.2 | 37.8 | 2.1 |

# MOVEMENT SUMMARY

## Site: 101 [5 Yr Hwy 22/White Ave (Park Place Access)]

New Site
Site Category: (None)
Roundabout

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
| South: RoadName | | | | | | | | | | | | |
| 3 | L2 | 10 | 3.0 | 0.421 | 7.4 | LOS A | 2.6 | 20.4 | 0.40 | 0.24 | 0.40 | 55.0 |
| 8 | T1 | 110 | 3.0 | 0.421 | 7.4 | LOS A | 2.6 | 20.4 | 0.40 | 0.24 | 0.40 | 54.9 |
| 18 | R2 | 374 | 3.0 | 0.421 | 7.4 | LOS A | 2.6 | 20.4 | 0.40 | 0.24 | 0.40 | 53.4 |
| Approach | | 493 | 3.0 | 0.421 | 7.4 | LOS A | 2.6 | 20.4 | 0.40 | 0.24 | 0.40 | 53.7 |
| East: RoadName | | | | | | | | | | | | |
| 1 | L2 | 425 | 3.0 | 0.463 | 8.3 | LOS A | 2.9 | 22.7 | 0.49 | 0.34 | 0.49 | 51.1 |
| 6 | T1 | 87 | 3.0 | 0.463 | 8.3 | LOS A | 2.9 | 22.7 | 0.49 | 0.34 | 0.49 | 51.1 |
| 16 | R2 | 1 | 3.0 | 0.463 | 8.3 | LOS A | 2.9 | 22.7 | 0.49 | 0.34 | 0.49 | 49.8 |
| Approach | | 513 | 3.0 | 0.463 | 8.3 | LOS A | 2.9 | 22.7 | 0.49 | 0.34 | 0.49 | 51.1 |
| North: RoadName | | | | | | | | | | | | |
| 7 | L2 | 1 | 3.0 | 0.178 | 6.5 | LOS A | 0.7 | 5.8 | 0.57 | 0.53 | 0.57 | 55.8 |
| 4 | T1 | 90 | 3.0 | 0.178 | 6.5 | LOS A | 0.7 | 5.8 | 0.57 | 0.53 | 0.57 | 55.8 |
| 14 | R2 | 47 | 3.0 | 0.178 | 6.5 | LOS A | 0.7 | 5.8 | 0.57 | 0.53 | 0.57 | 54.2 |
| Approach | | 138 | 3.0 | 0.178 | 6.5 | LOS A | 0.7 | 5.8 | 0.57 | 0.53 | 0.57 | 55.2 |
| West: RoadName | | | | | | | | | | | | |
| 5 | L2 | 61 | 3.0 | 0.173 | 6.5 | LOS A | 0.7 | 5.6 | 0.57 | 0.52 | 0.57 | 54.0 |
| 2 | T1 | 65 | 3.0 | 0.173 | 6.5 | LOS A | 0.7 | 5.6 | 0.57 | 0.52 | 0.57 | 53.9 |
| 12 | R2 | 9 | 3.0 | 0.173 | 6.5 | LOS A | 0.7 | 5.6 | 0.57 | 0.52 | 0.57 | 52.5 |
| Approach | | 135 | 3.0 | 0.173 | 6.5 | LOS A | 0.7 | 5.6 | 0.57 | 0.52 | 0.57 | 53.8 |
| All Vehicles | | 1279 | 3.0 | 0.463 | 7.6 | LOS A | 2.9 | 22.7 | 0.47 | 0.34 | 0.47 | 52.8 |

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [5 Yr Hwy 22/White Ave]

New Site
Site Category: (None)
Roundabout

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
| South: RoadName | | | | | | | | | | | | |
| 3 | L2 | 10 | 3.0 | 0.421 | 7.4 | LOS A | 2.6 | 20.4 | 0.40 | 0.24 | 0.40 | 55.0 |
| 8 | T1 | 110 | 3.0 | 0.421 | 7.4 | LOS A | 2.6 | 20.4 | 0.40 | 0.24 | 0.40 | 54.9 |
| 18 | R2 | 374 | 3.0 | 0.421 | 7.4 | LOS A | 2.6 | 20.4 | 0.40 | 0.24 | 0.40 | 53.4 |
| Approach | | 493 | 3.0 | 0.421 | 7.4 | LOS A | 2.6 | 20.4 | 0.40 | 0.24 | 0.40 | 53.7 |
| East: RoadName | | | | | | | | | | | | |
| 1 | L2 | 425 | 3.0 | 0.463 | 8.3 | LOS A | 2.9 | 22.7 | 0.49 | 0.34 | 0.49 | 51.1 |
| 6 | T1 | 87 | 3.0 | 0.463 | 8.3 | LOS A | 2.9 | 22.7 | 0.49 | 0.34 | 0.49 | 51.1 |
| 16 | R2 | 1 | 3.0 | 0.463 | 8.3 | LOS A | 2.9 | 22.7 | 0.49 | 0.34 | 0.49 | 49.8 |
| Approach | | 513 | 3.0 | 0.463 | 8.3 | LOS A | 2.9 | 22.7 | 0.49 | 0.34 | 0.49 | 51.1 |
| North: RoadName | | | | | | | | | | | | |
| 7 | L2 | 1 | 3.0 | 0.178 | 6.5 | LOS A | 0.7 | 5.8 | 0.57 | 0.53 | 0.57 | 55.8 |
| 4 | T1 | 90 | 3.0 | 0.178 | 6.5 | LOS A | 0.7 | 5.8 | 0.57 | 0.53 | 0.57 | 55.8 |
| 14 | R2 | 47 | 3.0 | 0.178 | 6.5 | LOS A | 0.7 | 5.8 | 0.57 | 0.53 | 0.57 | 54.2 |
| Approach | | 138 | 3.0 | 0.178 | 6.5 | LOS A | 0.7 | 5.8 | 0.57 | 0.53 | 0.57 | 55.2 |
| West: RoadName | | | | | | | | | | | | |
| 5 | L2 | 61 | 3.0 | 0.173 | 6.5 | LOS A | 0.7 | 5.6 | 0.57 | 0.52 | 0.57 | 54.0 |
| 2 | T1 | 65 | 3.0 | 0.173 | 6.5 | LOS A | 0.7 | 5.6 | 0.57 | 0.52 | 0.57 | 53.9 |
| 12 | R2 | 9 | 3.0 | 0.173 | 6.5 | LOS A | 0.7 | 5.6 | 0.57 | 0.52 | 0.57 | 52.5 |
| Approach | | 135 | 3.0 | 0.173 | 6.5 | LOS A | 0.7 | 5.6 | 0.57 | 0.52 | 0.57 | 53.8 |
| All Vehicles | | 1279 | 3.0 | 0.463 | 7.6 | LOS A | 2.9 | 22.7 | 0.47 | 0.34 | 0.47 | 52.8 |

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [10 Yr Sc 1 Hwy 22/White Ave (Park Place Access)]

New Site
Site Category: (None)
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: RoadName | | | | | | | | | | | | |
| 3 | L2 | 10 | 3.0 | 0.470 | 8.2 | LOS A | 3.1 | 24.1 | 0.45 | 0.28 | 0.45 | 54.3 |
| 8 | T1 | 120 | 3.0 | 0.470 | 8.2 | LOS A | 3.1 | 24.1 | 0.45 | 0.28 | 0.45 | 54.3 |
| 18 | R2 | 413 | 3.0 | 0.470 | 8.2 | LOS A | 3.1 | 24.1 | 0.45 | 0.28 | 0.45 | 52.8 |
| Approach | | 542 | 3.0 | 0.470 | 8.2 | LOS A | 3.1 | 24.1 | 0.45 | 0.28 | 0.45 | 53.1 |
| East: RoadName | | | | | | | | | | | | |
| 1 | L2 | 476 | 3.0 | 0.532 | 9.6 | LOS A | 3.6 | 28.3 | 0.56 | 0.40 | 0.56 | 50.2 |
| 6 | T1 | 103 | 3.0 | 0.532 | 9.6 | LOS A | 3.6 | 28.3 | 0.56 | 0.40 | 0.56 | 50.2 |
| 16 | R2 | 1 | 3.0 | 0.532 | 9.6 | LOS A | 3.6 | 28.3 | 0.56 | 0.40 | 0.56 | 49.0 |
| Approach | | 580 | 3.0 | 0.532 | 9.6 | LOS A | 3.6 | 28.3 | 0.56 | 0.40 | 0.56 | 50.2 |
| North: RoadName | | | | | | | | | | | | |
| 7 | L2 | 1 | 3.0 | 0.212 | 7.4 | LOS A | 0.9 | 6.9 | 0.61 | 0.60 | 0.61 | 55.1 |
| 4 | T1 | 101 | 3.0 | 0.212 | 7.4 | LOS A | 0.9 | 6.9 | 0.61 | 0.60 | 0.61 | 55.1 |
| 14 | R2 | 51 | 3.0 | 0.212 | 7.4 | LOS A | 0.9 | 6.9 | 0.61 | 0.60 | 0.61 | 53.5 |
| Approach | | 153 | 3.0 | 0.212 | 7.4 | LOS A | 0.9 | 6.9 | 0.61 | 0.60 | 0.61 | 54.5 |
| West: RoadName | | | | | | | | | | | | |
| 5 | L2 | 66 | 3.0 | 0.206 | 7.2 | LOS A | 0.9 | 6.7 | 0.60 | 0.59 | 0.60 | 53.4 |
| 2 | T1 | 75 | 3.0 | 0.206 | 7.2 | LOS A | 0.9 | 6.7 | 0.60 | 0.59 | 0.60 | 53.4 |
| 12 | R2 | 9 | 3.0 | 0.206 | 7.2 | LOS A | 0.9 | 6.7 | 0.60 | 0.59 | 0.60 | 51.9 |
| Approach | | 150 | 3.0 | 0.206 | 7.2 | LOS A | 0.9 | 6.7 | 0.60 | 0.59 | 0.60 | 53.3 |
| All Vehicles | | 1426 | 3.0 | 0.532 | 8.6 | LOS A | 3.6 | 28.3 | 0.52 | 0.40 | 0.52 | 52.0 |

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [10 Yr Sc 1 Hwy 22/White Ave]

New Site
Site Category: (None)
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: RoadName | | | | | | | | | | | | |
| 3 | L2 | 10 | 3.0 | 0.470 | 8.2 | LOS A | 3.1 | 24.0 | 0.45 | 0.29 | 0.45 | 54.3 |
| 8 | T1 | 118 | 3.0 | 0.470 | 8.2 | LOS A | 3.1 | 24.0 | 0.45 | 0.29 | 0.45 | 54.3 |
| 18 | R2 | 413 | 3.0 | 0.470 | 8.2 | LOS A | 3.1 | 24.0 | 0.45 | 0.29 | 0.45 | 52.7 |
| Approach | | 541 | 3.0 | 0.470 | 8.2 | LOS A | 3.1 | 24.0 | 0.45 | 0.29 | 0.45 | 53.1 |
| East: RoadName | | | | | | | | | | | | |
| 1 | L2 | 472 | 3.0 | 0.533 | 9.7 | LOS A | 3.6 | 28.3 | 0.56 | 0.41 | 0.56 | 50.3 |
| 6 | T1 | 108 | 3.0 | 0.533 | 9.7 | LOS A | 3.6 | 28.3 | 0.56 | 0.41 | 0.56 | 50.2 |
| 16 | R2 | 1 | 3.0 | 0.533 | 9.7 | LOS A | 3.6 | 28.3 | 0.56 | 0.41 | 0.56 | 49.0 |
| Approach | | 580 | 3.0 | 0.533 | 9.7 | LOS A | 3.6 | 28.3 | 0.56 | 0.41 | 0.56 | 50.2 |
| North: RoadName | | | | | | | | | | | | |
| 7 | L2 | 1 | 3.0 | 0.214 | 7.4 | LOS A | 0.9 | 7.0 | 0.61 | 0.60 | 0.61 | 55.1 |
| 4 | T1 | 100 | 3.0 | 0.214 | 7.4 | LOS A | 0.9 | 7.0 | 0.61 | 0.60 | 0.61 | 55.1 |
| 14 | R2 | 53 | 3.0 | 0.214 | 7.4 | LOS A | 0.9 | 7.0 | 0.61 | 0.60 | 0.61 | 53.5 |
| Approach | | 154 | 3.0 | 0.214 | 7.4 | LOS A | 0.9 | 7.0 | 0.61 | 0.60 | 0.61 | 54.5 |
| West: RoadName | | | | | | | | | | | | |
| 5 | L2 | 68 | 3.0 | 0.207 | 7.2 | LOS A | 0.9 | 6.7 | 0.60 | 0.58 | 0.60 | 53.4 |
| 2 | T1 | 75 | 3.0 | 0.207 | 7.2 | LOS A | 0.9 | 6.7 | 0.60 | 0.58 | 0.60 | 53.3 |
| 12 | R2 | 9 | 3.0 | 0.207 | 7.2 | LOS A | 0.9 | 6.7 | 0.60 | 0.58 | 0.60 | 51.9 |
| Approach | | 152 | 3.0 | 0.207 | 7.2 | LOS A | 0.9 | 6.7 | 0.60 | 0.58 | 0.60 | 53.3 |
| All Vehicles | | 1428 | 3.0 | 0.533 | 8.6 | LOS A | 3.6 | 28.3 | 0.53 | 0.40 | 0.53 | 52.0 |

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [10 Yr Sc 2 Hwy 22/White Ave (Park Place Access)]

New Site
Site Category: (None)
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: RoadName | | | | | | | | | | | | |
| 3 | L2 | 10 | 3.0 | 0.471 | 8.2 | LOS A | 3.1 | 24.1 | 0.45 | 0.29 | 0.45 | 54.3 |
| 8 | T1 | 123 | 3.0 | 0.471 | 8.2 | LOS A | 3.1 | 24.1 | 0.45 | 0.29 | 0.45 | 54.2 |
| 18 | R2 | 410 | 3.0 | 0.471 | 8.2 | LOS A | 3.1 | 24.1 | 0.45 | 0.29 | 0.45 | 52.7 |
| Approach | | 542 | 3.0 | 0.471 | 8.2 | LOS A | 3.1 | 24.1 | 0.45 | 0.29 | 0.45 | 53.1 |
| East: RoadName | | | | | | | | | | | | |
| 1 | L2 | 478 | 3.0 | 0.539 | 9.8 | LOS A | 3.7 | 28.9 | 0.56 | 0.41 | 0.56 | 50.2 |
| 6 | T1 | 108 | 3.0 | 0.539 | 9.8 | LOS A | 3.7 | 28.9 | 0.56 | 0.41 | 0.56 | 50.1 |
| 16 | R2 | 1 | 3.0 | 0.539 | 9.8 | LOS A | 3.7 | 28.9 | 0.56 | 0.41 | 0.56 | 48.9 |
| Approach | | 587 | 3.0 | 0.539 | 9.8 | LOS A | 3.7 | 28.9 | 0.56 | 0.41 | 0.56 | 50.2 |
| North: RoadName | | | | | | | | | | | | |
| 7 | L2 | 1 | 3.0 | 0.220 | 7.5 | LOS A | 0.9 | 7.2 | 0.61 | 0.61 | 0.61 | 55.0 |
| 4 | T1 | 104 | 3.0 | 0.220 | 7.5 | LOS A | 0.9 | 7.2 | 0.61 | 0.61 | 0.61 | 55.0 |
| 14 | R2 | 52 | 3.0 | 0.220 | 7.5 | LOS A | 0.9 | 7.2 | 0.61 | 0.61 | 0.61 | 53.4 |
| Approach | | 158 | 3.0 | 0.220 | 7.5 | LOS A | 0.9 | 7.2 | 0.61 | 0.61 | 0.61 | 54.4 |
| West: RoadName | | | | | | | | | | | | |
| 5 | L2 | 65 | 3.0 | 0.210 | 7.3 | LOS A | 0.9 | 6.8 | 0.61 | 0.59 | 0.61 | 53.4 |
| 2 | T1 | 78 | 3.0 | 0.210 | 7.3 | LOS A | 0.9 | 6.8 | 0.61 | 0.59 | 0.61 | 53.3 |
| 12 | R2 | 9 | 3.0 | 0.210 | 7.3 | LOS A | 0.9 | 6.8 | 0.61 | 0.59 | 0.61 | 51.9 |
| Approach | | 152 | 3.0 | 0.210 | 7.3 | LOS A | 0.9 | 6.8 | 0.61 | 0.59 | 0.61 | 53.3 |
| All Vehicles | | 1439 | 3.0 | 0.539 | 8.7 | LOS A | 3.7 | 28.9 | 0.53 | 0.41 | 0.53 | 52.0 |

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [10 Yr Sc 2 Hwy 22/White Ave]

New Site
Site Category: (None)
Roundabout

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
| South: RoadName | | | | | | | | | | | | |
| 3 | L2 | 10 | 3.0 | 0.584 | 10.7 | LOS B | 4.3 | 33.6 | 0.59 | 0.43 | 0.59 | 52.4 |
| 8 | T1 | 132 | 3.0 | 0.584 | 10.7 | LOS B | 4.3 | 33.6 | 0.59 | 0.43 | 0.59 | 52.4 |
| 18 | R2 | 500 | 3.0 | 0.584 | 10.7 | LOS B | 4.3 | 33.6 | 0.59 | 0.43 | 0.59 | 51.0 |
| Approach | | 641 | 3.0 | 0.584 | 10.7 | LOS B | 4.3 | 33.6 | 0.59 | 0.43 | 0.59 | 51.3 |
| East: RoadName | | | | | | | | | | | | |
| 1 | L2 | 584 | 3.0 | 0.711 | 14.9 | LOS B | 11.7 | 91.2 | 0.77 | 0.82 | 1.19 | 47.1 |
| 6 | T1 | 148 | 3.0 | 0.711 | 14.9 | LOS B | 11.7 | 91.2 | 0.77 | 0.82 | 1.19 | 47.1 |
| 16 | R2 | 16 | 3.0 | 0.711 | 14.9 | LOS B | 11.7 | 91.2 | 0.77 | 0.82 | 1.19 | 46.0 |
| Approach | | 748 | 3.0 | 0.711 | 14.9 | LOS B | 11.7 | 91.2 | 0.77 | 0.82 | 1.19 | 47.1 |
| North: RoadName | | | | | | | | | | | | |
| 7 | L2 | 1 | 3.0 | 0.304 | 9.9 | LOS A | 1.3 | 10.0 | 0.68 | 0.69 | 0.70 | 53.1 |
| 4 | T1 | 109 | 3.0 | 0.304 | 9.9 | LOS A | 1.3 | 10.0 | 0.68 | 0.69 | 0.70 | 53.1 |
| 14 | R2 | 77 | 3.0 | 0.304 | 9.9 | LOS A | 1.3 | 10.0 | 0.68 | 0.69 | 0.70 | 51.6 |
| Approach | | 187 | 3.0 | 0.304 | 9.9 | LOS A | 1.3 | 10.0 | 0.68 | 0.69 | 0.70 | 52.5 |
| West: RoadName | | | | | | | | | | | | |
| 5 | L2 | 89 | 3.0 | 0.304 | 9.5 | LOS A | 1.3 | 10.1 | 0.67 | 0.67 | 0.67 | 51.7 |
| 2 | T1 | 99 | 3.0 | 0.304 | 9.5 | LOS A | 1.3 | 10.1 | 0.67 | 0.67 | 0.67 | 51.7 |
| 12 | R2 | 9 | 3.0 | 0.304 | 9.5 | LOS A | 1.3 | 10.1 | 0.67 | 0.67 | 0.67 | 50.3 |
| Approach | | 197 | 3.0 | 0.304 | 9.5 | LOS A | 1.3 | 10.1 | 0.67 | 0.67 | 0.67 | 51.6 |
| All Vehicles | | 1773 | 3.0 | 0.711 | 12.3 | LOS B | 11.7 | 91.2 | 0.68 | 0.65 | 0.86 | 49.5 |

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [20 Yr Sc 1 Hwy 22/White Ave (Park Place Access)]

New Site
Site Category: (None)
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: RoadName | | | | | | | | | | | | |
| 3 | L2 | 10 | 3.0 | 0.585 | 10.6 | LOS B | 4.4 | 34.2 | 0.58 | 0.41 | 0.58 | 52.5 |
| 8 | T1 | 145 | 3.0 | 0.585 | 10.6 | LOS B | 4.4 | 34.2 | 0.58 | 0.41 | 0.58 | 52.4 |
| 18 | R2 | 497 | 3.0 | 0.585 | 10.6 | LOS B | 4.4 | 34.2 | 0.58 | 0.41 | 0.58 | 51.0 |
| Approach | | 651 | 3.0 | 0.585 | 10.6 | LOS B | 4.4 | 34.2 | 0.58 | 0.41 | 0.58 | 51.3 |
| East: RoadName | | | | | | | | | | | | |
| 1 | L2 | 589 | 3.0 | 0.709 | 14.8 | LOS B | 11.6 | 90.3 | 0.76 | 0.81 | 1.17 | 47.1 |
| 6 | T1 | 143 | 3.0 | 0.709 | 14.8 | LOS B | 11.6 | 90.3 | 0.76 | 0.81 | 1.17 | 47.1 |
| 16 | R2 | 15 | 3.0 | 0.709 | 14.8 | LOS B | 11.6 | 90.3 | 0.76 | 0.81 | 1.17 | 46.0 |
| Approach | | 748 | 3.0 | 0.709 | 14.8 | LOS B | 11.6 | 90.3 | 0.76 | 0.81 | 1.17 | 47.1 |
| North: RoadName | | | | | | | | | | | | |
| 7 | L2 | 1 | 3.0 | 0.304 | 9.9 | LOS A | 1.3 | 10.0 | 0.68 | 0.69 | 0.70 | 53.1 |
| 4 | T1 | 109 | 3.0 | 0.304 | 9.9 | LOS A | 1.3 | 10.0 | 0.68 | 0.69 | 0.70 | 53.1 |
| 14 | R2 | 77 | 3.0 | 0.304 | 9.9 | LOS A | 1.3 | 10.0 | 0.68 | 0.69 | 0.70 | 51.6 |
| Approach | | 187 | 3.0 | 0.304 | 9.9 | LOS A | 1.3 | 10.0 | 0.68 | 0.69 | 0.70 | 52.5 |
| West: RoadName | | | | | | | | | | | | |
| 5 | L2 | 74 | 3.0 | 0.287 | 9.3 | LOS A | 1.2 | 9.4 | 0.67 | 0.67 | 0.67 | 52.1 |
| 2 | T1 | 102 | 3.0 | 0.287 | 9.3 | LOS A | 1.2 | 9.4 | 0.67 | 0.67 | 0.67 | 52.0 |
| 12 | R2 | 9 | 3.0 | 0.287 | 9.3 | LOS A | 1.2 | 9.4 | 0.67 | 0.67 | 0.67 | 50.7 |
| Approach | | 185 | 3.0 | 0.287 | 9.3 | LOS A | 1.2 | 9.4 | 0.67 | 0.67 | 0.67 | 52.0 |
| All Vehicles | | 1771 | 3.0 | 0.709 | 12.2 | LOS B | 11.6 | 90.3 | 0.68 | 0.63 | 0.85 | 49.6 |

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [20 Yr Sc 1 Hwy 22/White Ave]

New Site
Site Category: (None)
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: RoadName | | | | | | | | | | | | |
| 3 | L2 | 10 | 3.0 | 0.584 | 10.7 | LOS B | 4.3 | 33.6 | 0.59 | 0.43 | 0.59 | 52.4 |
| 8 | T1 | 132 | 3.0 | 0.584 | 10.7 | LOS B | 4.3 | 33.6 | 0.59 | 0.43 | 0.59 | 52.4 |
| 18 | R2 | 500 | 3.0 | 0.584 | 10.7 | LOS B | 4.3 | 33.6 | 0.59 | 0.43 | 0.59 | 51.0 |
| Approach | | 641 | 3.0 | 0.584 | 10.7 | LOS B | 4.3 | 33.6 | 0.59 | 0.43 | 0.59 | 51.3 |
| East: RoadName | | | | | | | | | | | | |
| 1 | L2 | 584 | 3.0 | 0.711 | 14.9 | LOS B | 11.7 | 91.2 | 0.77 | 0.82 | 1.19 | 47.1 |
| 6 | T1 | 148 | 3.0 | 0.711 | 14.9 | LOS B | 11.7 | 91.2 | 0.77 | 0.82 | 1.19 | 47.1 |
| 16 | R2 | 16 | 3.0 | 0.711 | 14.9 | LOS B | 11.7 | 91.2 | 0.77 | 0.82 | 1.19 | 46.0 |
| Approach | | 748 | 3.0 | 0.711 | 14.9 | LOS B | 11.7 | 91.2 | 0.77 | 0.82 | 1.19 | 47.1 |
| North: RoadName | | | | | | | | | | | | |
| 7 | L2 | 1 | 3.0 | 0.304 | 9.9 | LOS A | 1.3 | 10.0 | 0.68 | 0.69 | 0.70 | 53.1 |
| 4 | T1 | 109 | 3.0 | 0.304 | 9.9 | LOS A | 1.3 | 10.0 | 0.68 | 0.69 | 0.70 | 53.1 |
| 14 | R2 | 77 | 3.0 | 0.304 | 9.9 | LOS A | 1.3 | 10.0 | 0.68 | 0.69 | 0.70 | 51.6 |
| Approach | | 187 | 3.0 | 0.304 | 9.9 | LOS A | 1.3 | 10.0 | 0.68 | 0.69 | 0.70 | 52.5 |
| West: RoadName | | | | | | | | | | | | |
| 5 | L2 | 89 | 3.0 | 0.304 | 9.5 | LOS A | 1.3 | 10.1 | 0.67 | 0.67 | 0.67 | 51.7 |
| 2 | T1 | 99 | 3.0 | 0.304 | 9.5 | LOS A | 1.3 | 10.1 | 0.67 | 0.67 | 0.67 | 51.7 |
| 12 | R2 | 9 | 3.0 | 0.304 | 9.5 | LOS A | 1.3 | 10.1 | 0.67 | 0.67 | 0.67 | 50.3 |
| Approach | | 197 | 3.0 | 0.304 | 9.5 | LOS A | 1.3 | 10.1 | 0.67 | 0.67 | 0.67 | 51.6 |
| All Vehicles | | 1773 | 3.0 | 0.711 | 12.3 | LOS B | 11.7 | 91.2 | 0.68 | 0.65 | 0.86 | 49.5 |

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [20 Yr Sc 2 Hwy 22/White Ave (Park Place Access)]

New Site
Site Category: (None)
Roundabout

**Movement Performance - Vehicles**

| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| South: RoadName | | | | | | | | | | | | |
| 3 | L2 | 10 | 3.0 | 0.592 | 10.8 | LOS B | 4.4 | 34.6 | 0.59 | 0.43 | 0.59 | 52.3 |
| 8 | T1 | 150 | 3.0 | 0.592 | 10.8 | LOS B | 4.4 | 34.6 | 0.59 | 0.43 | 0.59 | 52.3 |
| 18 | R2 | 492 | 3.0 | 0.592 | 10.8 | LOS B | 4.4 | 34.6 | 0.59 | 0.43 | 0.59 | 50.9 |
| Approach | | 652 | 3.0 | 0.592 | 10.8 | LOS B | 4.4 | 34.6 | 0.59 | 0.43 | 0.59 | 51.2 |
| East: RoadName | | | | | | | | | | | | |
| 1 | L2 | 593 | 3.0 | 0.730 | 15.8 | LOS C | 13.1 | 102.2 | 0.79 | 0.88 | 1.29 | 46.6 |
| 6 | T1 | 161 | 3.0 | 0.730 | 15.8 | LOS C | 13.1 | 102.2 | 0.79 | 0.88 | 1.29 | 46.6 |
| 16 | R2 | 11 | 3.0 | 0.730 | 15.8 | LOS C | 13.1 | 102.2 | 0.79 | 0.88 | 1.29 | 45.5 |
| Approach | | 765 | 3.0 | 0.730 | 15.8 | LOS C | 13.1 | 102.2 | 0.79 | 0.88 | 1.29 | 46.6 |
| North: RoadName | | | | | | | | | | | | |
| 7 | L2 | 1 | 3.0 | 0.322 | 10.4 | LOS B | 1.4 | 11.0 | 0.69 | 0.71 | 0.76 | 52.8 |
| 4 | T1 | 137 | 3.0 | 0.322 | 10.4 | LOS B | 1.4 | 11.0 | 0.69 | 0.71 | 0.76 | 52.7 |
| 14 | R2 | 55 | 3.0 | 0.322 | 10.4 | LOS B | 1.4 | 11.0 | 0.69 | 0.71 | 0.76 | 51.3 |
| Approach | | 193 | 3.0 | 0.322 | 10.4 | LOS B | 1.4 | 11.0 | 0.69 | 0.71 | 0.76 | 52.3 |
| West: RoadName | | | | | | | | | | | | |
| 5 | L2 | 74 | 3.0 | 0.311 | 10.0 | LOS A | 1.3 | 10.4 | 0.68 | 0.69 | 0.71 | 51.7 |
| 2 | T1 | 111 | 3.0 | 0.311 | 10.0 | LOS A | 1.3 | 10.4 | 0.68 | 0.69 | 0.71 | 51.6 |
| 12 | R2 | 9 | 3.0 | 0.311 | 10.0 | LOS A | 1.3 | 10.4 | 0.68 | 0.69 | 0.71 | 50.3 |
| Approach | | 193 | 3.0 | 0.311 | 10.0 | LOS A | 1.3 | 10.4 | 0.68 | 0.69 | 0.71 | 51.6 |
| All Vehicles | | 1804 | 3.0 | 0.730 | 12.8 | LOS B | 13.1 | 102.2 | 0.70 | 0.68 | 0.92 | 49.3 |

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.

# MOVEMENT SUMMARY

## Site: 101 [20 Yr Sc 2 Hwy 22/White Ave]

New Site
Site Category: (None)
Roundabout

| Movement Performance - Vehicles | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mov ID | Turn | Demand Flows Total veh/h | HV % | Deg. Satn v/c | Average Delay sec | Level of Service | 95% Back of Queue Vehicles veh | Distance m | Prop. Queued | Effective Stop Rate | Aver. No. Cycles | Average Speed km/h |
| South: RoadName | | | | | | | | | | | | |
| 3 | L2 | 10 | 3.0 | 0.589 | 10.9 | LOS B | 4.4 | 33.9 | 0.60 | 0.44 | 0.60 | 52.3 |
| 8 | T1 | 143 | 3.0 | 0.589 | 10.9 | LOS B | 4.4 | 33.9 | 0.60 | 0.44 | 0.60 | 52.2 |
| 18 | R2 | 489 | 3.0 | 0.589 | 10.9 | LOS B | 4.4 | 33.9 | 0.60 | 0.44 | 0.60 | 50.8 |
| Approach | | 642 | 3.0 | 0.589 | 10.9 | LOS B | 4.4 | 33.9 | 0.60 | 0.44 | 0.60 | 51.2 |
| East: RoadName | | | | | | | | | | | | |
| 1 | L2 | 582 | 3.0 | 0.731 | 15.8 | LOS C | 13.1 | 102.5 | 0.79 | 0.88 | 1.30 | 46.7 |
| 6 | T1 | 171 | 3.0 | 0.731 | 15.8 | LOS C | 13.1 | 102.5 | 0.79 | 0.88 | 1.30 | 46.6 |
| 16 | R2 | 12 | 3.0 | 0.731 | 15.8 | LOS C | 13.1 | 102.5 | 0.79 | 0.88 | 1.30 | 45.5 |
| Approach | | 764 | 3.0 | 0.731 | 15.8 | LOS C | 13.1 | 102.5 | 0.79 | 0.88 | 1.30 | 46.6 |
| North: RoadName | | | | | | | | | | | | |
| 7 | L2 | 1 | 3.0 | 0.329 | 10.5 | LOS B | 1.5 | 11.4 | 0.69 | 0.72 | 0.77 | 52.7 |
| 4 | T1 | 128 | 3.0 | 0.329 | 10.5 | LOS B | 1.5 | 11.4 | 0.69 | 0.72 | 0.77 | 52.6 |
| 14 | R2 | 68 | 3.0 | 0.329 | 10.5 | LOS B | 1.5 | 11.4 | 0.69 | 0.72 | 0.77 | 51.2 |
| Approach | | 198 | 3.0 | 0.329 | 10.5 | LOS B | 1.5 | 11.4 | 0.69 | 0.72 | 0.77 | 52.1 |
| West: RoadName | | | | | | | | | | | | |
| 5 | L2 | 83 | 3.0 | 0.320 | 9.9 | LOS A | 1.4 | 10.9 | 0.68 | 0.69 | 0.72 | 51.6 |
| 2 | T1 | 112 | 3.0 | 0.320 | 9.9 | LOS A | 1.4 | 10.9 | 0.68 | 0.69 | 0.72 | 51.5 |
| 12 | R2 | 9 | 3.0 | 0.320 | 9.9 | LOS A | 1.4 | 10.9 | 0.68 | 0.69 | 0.72 | 50.2 |
| Approach | | 203 | 3.0 | 0.320 | 9.9 | LOS A | 1.4 | 10.9 | 0.68 | 0.69 | 0.72 | 51.5 |
| All Vehicles | | 1808 | 3.0 | 0.731 | 12.8 | LOS B | 13.1 | 102.5 | 0.70 | 0.69 | 0.93 | 49.2 |

Site Level of Service (LOS) Method: Delay & v/c (HCM 6). Site LOS Method is specified in the Parameter Settings dialog (Site tab).
Roundabout LOS Method: Same as Sign Control.
Vehicle movement LOS values are based on average delay and v/c ratio (degree of saturation) per movement.
LOS F will result if v/c > 1 irrespective of movement delay value (does not apply for approaches and intersection).
Intersection and Approach LOS values are based on average delay for all movements (v/c not used as specified in HCM 6).
Roundabout Capacity Model: US HCM 6.
HCM Delay Formula option is used. Control Delay does not include Geometric Delay since Exclude Geometric Delay option applies.
Gap-Acceptance Capacity: Traditional M1.
HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.