



SHADOW IMPACT ANALYSIS

PROPOSED DEVELOPMENT

**28-60 Bronte Street North
Milton, Ontario**

KNYMH FILE # 16079

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October 30, 2018

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SHADOW IMPACT ANALYSIS

October 30, 2018

PROPOSED DEVELOPMENT

28-60 Bronte Street North
Milton, Ontario

1.0 PURPOSE:

The purpose of this report is to analyse the impact of a proposed development upon the adjacent properties, streets, and public spaces at the above noted location. We will discuss and comment upon the impact of the massing of the proposed development upon the adjacent properties using a computer generated model for analysis of the proposed buildings with a flat roof and a rooftop mechanical room which includes the rooftop building service equipment.

We have provided graphics along with a Site Plan and Satellite imagery of the surrounding area.

The property is located in Milton Ontario, on the Northwest corner of the intersection between Bronte Street North and Main Street West.

2.0 DESCRIPTION OF THE SITE AND NEIGHBOURING PROPERTIES:

The Subject Property: (Figure 2.1-1)

The subject property is a combination of 2 (two) lots. The lot at the intersection of Bronte Street North and Main Street West is currently occupied by a single storey commercial building. The existing building on 28 Bronte Street North will be removed as part of the scope in the proposed development. The subject lot area is 1.34 hectares.

The proposed development consists of two (2) buildings upon the subject lands. Building A is a 19 storey high-rise residential tower c/w 6 storey podium. Building B is a 21 storey high-rise residential tower c/w 6 storey podium.

The subject lands and neighboring parcels generally appear to be uniform in grade with the exception of the areas impacted by the rail line. The rail line is elevated with a buffer or berm that runs parallel to the tracks so that Main Street crosses underneath the rail. For the purpose of this analysis the proposed development and adjacent properties are represented at the same elevation.

Neighbouring properties include:

2.1) TO THE SOUTHWEST (1): The property abuts a raised railway line. Immediately across the rail line are single two (2) storey dwellings.

2.2) TO THE NORTH and NORTHEAST (2): The property abuts commercial space directly to the North (#104 Bronte Street N) and across the street Northeast (#97 Bronte Street N).

2.3) TO THE EAST (3): The property abuts Bronte Street North. Immediately across Bronte Street are three (3) commercial properties at the intersections of Mill, Victoria, and Main Streets; #3 Mill Street is an Art Gallery, #2 Victoria Street is an Office space, #2 Mill Street and #5 Main Street is an Automotive repair/Gas Station. There is one (1) residential property directly on Bronte Street at #5 Victoria Street. Further East of Bronte Street are single two (2) storey dwellings running in series along Victoria Street and Mill Street. This neighbourhood feature many mature deciduous trees that would actively shade these properties from spring through to fall seasons.

2.4) TO THE SOUTHEAST (4): The property abuts Main Street West, 2 storey commercial buildings occupy both the north and south sides of the street from Bronte Eastward.

October 26, 2018



3.0 METHOD OF ANALYSIS:

The method of analysis will be a discussion of the impact the development of the proposed two (2) Residential buildings has on the adjacent properties and the public realm. The summary is within Section 6.0.

The graphic analysis which we present within this report is developed using a computer generated modelling program in conjunction with satellite imagery and survey information with the following criteria specified in the impact guidelines developed by the town of Oakville [v.DE2017]:

Geographic Coordinates: 43.510269 N, 79.886280 W

Standard Time: UTC -5:00

Daylight Savings Time: UTC -4:00

Test Dates: April 21, June 21, September 21, and December 21

Test Times: Hourly intervals starting 1.5 hours after sunrise and ending 1.5 hours before sunset.

Date / Time	Sunrise	Sunrise (+1.5)	Sunset	Sunset (-1.5)
April 21 (UTC -4:00)	6:26 am	7:56 am	8:10 pm	6:40 pm
June 21 (UTC -4:00)	5:38 am	7:08 am	9:04 pm	7:34 pm
September 21 (UTC -4:00)	7:05 am	8:35 am	7:18 pm	5:58 pm
December 21 (UTC -5:00)	7:49 am	9:19 am	4:46 pm	3:16 pm

Impact Analysis (Residential Amenity): Adequate sunlight is available for residential amenity spaces to maximize their use. Shadow impacts should not exceed 2 (two) consecutive hourly test times after 12 pm on April 21, June 21, and September 21 (or where adjacent site is underdeveloped, on at least 60% of that site) as per Town of Oakville Shadow Impact Analysis Guidelines.

Impact Analysis (Public Space): Public sidewalks, plazas, parks, school yards and non-residential outdoor amenity area receive at least 5 hours of continuous sunlight on April 21, June 21, and September 21 as per Town of Oakville Shadow Impact Analysis Guidelines.

Impact Analysis (Winter Shade): Proposed development allows adequate sunlight on building faces and roofs for the possibility of using solar energy. Shadow impacts should not exceed 2 (two) consecutive hourly test times on December 21 as per Town of Oakville Shadow Impact Analysis Guidelines.

4.0 SHADOW IMPACT ANALYSIS OF THE PROPOSED DEVELOPMENT

4.1 WINTER SOLSTICE SHADOWS: (DECEMBER 21 • Figure 4.1-1 through 4.1-7)

The next section provides a summary of the Winter shadow effect of the subject property upon the surrounding area. This commentary will discuss the impact of the proposed two (2) Residential building's shadows upon properties at the north, and east side of the subject property. The impact is studied using hourly intervals starting 1.5 hours after sunrise and ending 1.5 hours before sunset. The start time for this period is observed at 9:19am and ends at 3:16pm.

It should be noted that Winter Shadows are the "longest" in terms of the shadow length due to a very low sun angle...but shadows are present for the shortest period of time (hours in the day) due to a very short days this time of year. The times for this period are under Eastern Standard Time (UTC -5:00).

4.1A Northwest Property Impact, December 21 (Figure 4.1-1 to 4.1-3)

At 9:30am the morning sun in winter rotates approximately 116-degrees from east to west in approximately 9-hours at this time of year. At this time the sun has an altitude angle of 12.77 degrees.

- Morning shadow falls upon the rail line and agricultural lands.

4.1B North Property Impact, December 21 (Figure 4.1-3 to 4.1-5)

At 12:00pm the noontime sun in winter is still relatively low (22.98-degrees) in the sky and is located directly south of the subject property.

- No impact to properties exceeding 2 (two) consecutive hourly test times.

4.1C East Property Impact, December 21 (Figure 4.1-5 to 4.1-7)

At 3:30pm the afternoon sun in winter is starting to descend and is 9.85 degrees above the horizon. At the winter solstice and just over an hour prior to sunset, this shallow angle is the largest shadow generating condition analyzed in this report.

Study Area (3) Impact

- The commercial property at #2 Victoria Street is impacted at the 1:16pm test period and continues to the end of the test period exceeding 2 (two) consecutive hourly test times.

October 26, 2018



DECEMBER 21, 9:19AM

UTC: (-05:00)

Latitude: 43.510269 N

Longitude: 79.886280 W



October 26, 2018



DECEMBER 21, 10:19AM

UTC: (-05:00)

Latitude: 43.510269 N

Longitude: 79.886280 W



October 26, 2018



DECEMBER 21, 11:19AM

UTC: (-05:00)

Latitude: 43.510269 N

Longitude: 79.886280 W



October 26, 2018



DECEMBER 21, 12:16PM

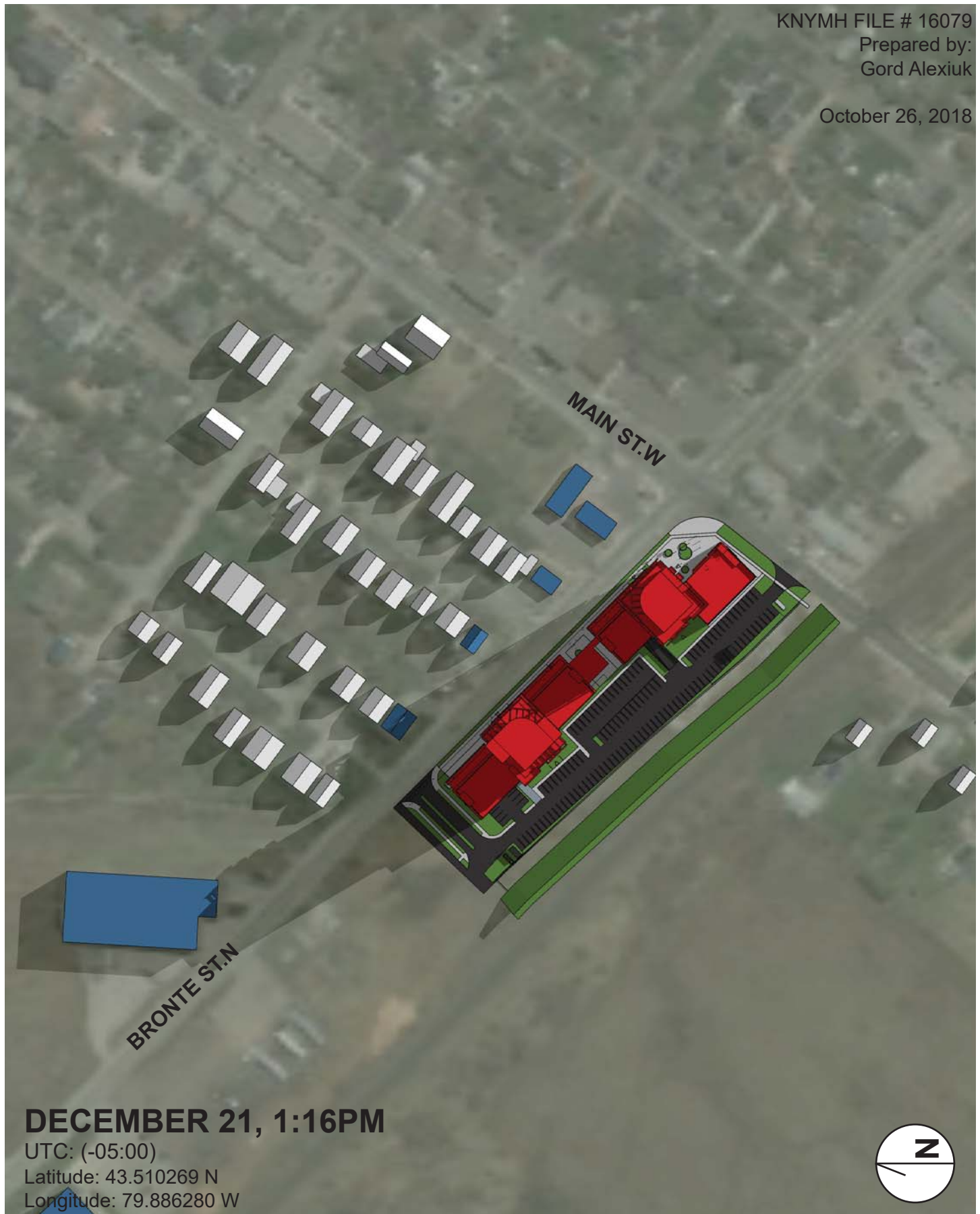
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Longitude: 79.886280 W



October 26, 2018



DECEMBER 21, 1:16PM

UTC: (-05:00)

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Longitude: 79.886280 W



October 26, 2018



DECEMBER 21, 2:16PM

UTC: (-05:00)

Latitude: 43.510269 N

Longitude: 79.886280 W



October 26, 2018



DECEMBER 21, 3:16PM

UTC: (-05:00)

Latitude: 43.510269 N

Longitude: 79.886280 W



4.2 SPRING & FALL EQUINOX SHADOWS: (SEPTEMBER 21 • Figure 4.2-1 to 4.2-11 • APRIL 21 Figure 4.2-12 to 4.2-23)

A summary of the Spring and Fall shadow effect of the subject property upon the surrounding area. This commentary will discuss the impact of the proposed two (2) Residential building's shadows upon properties at the north, east and southeast side of the subject property. The impact is studied using hourly intervals starting 1.5 hours after sunrise and ending 1.5 hours before sunset. The start time for this period is observed at 8:35am and ends at 5:58pm.

It should be noted that the Fall and Spring are the "moderate" in terms of the annual shadows. The times for this period are under Eastern Daylight Time. (UTC -4:00)

4.2A North and Northwest Property Impact, September 21 (Figure 4.2-1 to 4.2-6)

At 9:30am the morning sun in spring / fall rotates approximately 184-degrees from east to west in 12-hours. It is low in the sky rising to approximately 23-degrees at this time of day.

Study Area (1) Impact

- Shadow falls upon Agricultural and subject lands.
- No public sidewalk impact
- No impact to properties after 12:00pm

At 12:00pm the noontime sun in spring / fall is higher (45.38-degrees) in the sky and originates from near-south.

- Public sidewalk on subject land (West side of Bronte Street) almost 4 hours of continuous clear until 1:19pm, completely in shadow by 2pm, pedestrian sidewalk on East side of Bronte will experience partial shading at 1:50pm and will be impacted by the podium at 3:50pm with over 5 hours of sunlight.

Study Area (2) Impact

- No impact to properties exceeding 2 (two) consecutive hourly test times, shadow falls on subject lands

4.2B East and Southeast Property Impact, September 21 (Figure 4.2-7 to 4.2-11)

At 3:30pm the afternoon sun in spring / fall is past its peak. It is approximately 39.04-degrees above the horizon and the shadows are still short at this time of day.

Study Area (3) Impact

- The residential property at #8 Mill Street is impacted at the 3:58pm test period and continues to the end of the test period exceeding 2 (two) consecutive hourly test times.
- The residential property at #14 Mill Street is impacted at the 3:58pm test period and continues to the end of the test period exceeding 2 (two) consecutive hourly test times
- The residential property at #10 Victoria Street is impacted at the 3:58pm test period and continues to the end of the test period exceeding 2 (two) consecutive hourly test times
- The residential property at #14 Victoria Street is impacted at the 3:58pm test period and continues to the end of the test period exceeding 2 (two) consecutive hourly test times.

4.2C North and Northwest Property Impact, April 21 (Figure 4.2-12 to 4.2-17)

At 9:30am the morning sun in spring / fall rotates approximately 184-degrees from east to west in 12-hours. It is low in the sky rising to approximately 23-degrees at this time of day.

Study Area (1) Impact

- Shadow falls upon Agricultural and subject lands.
- No public sidewalk impact
- No impact to properties after 12:00pm

At 12:00pm the noontime sun in spring / fall is higher (45.38-degrees) in the sky and originates from near-south.

- Public sidewalk on subject land (West side of Bronte Street) will have 5 hours of continuous clear until partially shaded by towers at 1:25pm, impacted by the podium shadow at 2pm, pedestrian sidewalk on East side of Bronte will experience partial shading from towers begins at 2:05pm and will be impacted by the podium at 4:20pm with over 5 hours of sunlight.

Study Area (2) Impact

- No impact to properties exceeding 2 (two) consecutive hourly test times, shadow falls on subject lands

4.2D East and Southeast Property Impact, April 21 (Figure 4.2-17 to 4.2-23)

At 3:30pm the afternoon sun in spring / fall is past its peak. It is approximately 39.04-degrees above the horizon and the shadows are still short at this time of day.

Study Area (3) Impact

- The residential property at #11 Mill Street is impacted at the 4:40pm test period and continues to the end of the test period exceeding 2 (two) consecutive hourly test times.
- The residential property at #8 Mill Street is impacted at the 4:40pm test period and continues to the end of the test period exceeding 2 (two) consecutive hourly test times
- The residential property at #14 Mill Street is impacted at the 4:40pm test period and continues to the end of the test period exceeding 2 (two) consecutive hourly test times
- The residential property at #10 Victoria Street is impacted at the 4:40pm test period and continues to the end of the test period exceeding 2 (two) consecutive hourly test times
- The residential property at #14 Victoria Street is impacted at the 4:40pm test period and continues to the end of the test period exceeding 2 (two) consecutive hourly test times
- The residential property at #26 Victoria Street is impacted at the 4:40pm test period and continues to the end of the test period exceeding 2 (two) consecutive hourly test times

October 26, 2018



SEPTEMBER 21, 8:35AM

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Longitude: 79.886280 W



October 26, 2018



SEPTEMBER 21, 9:35AM

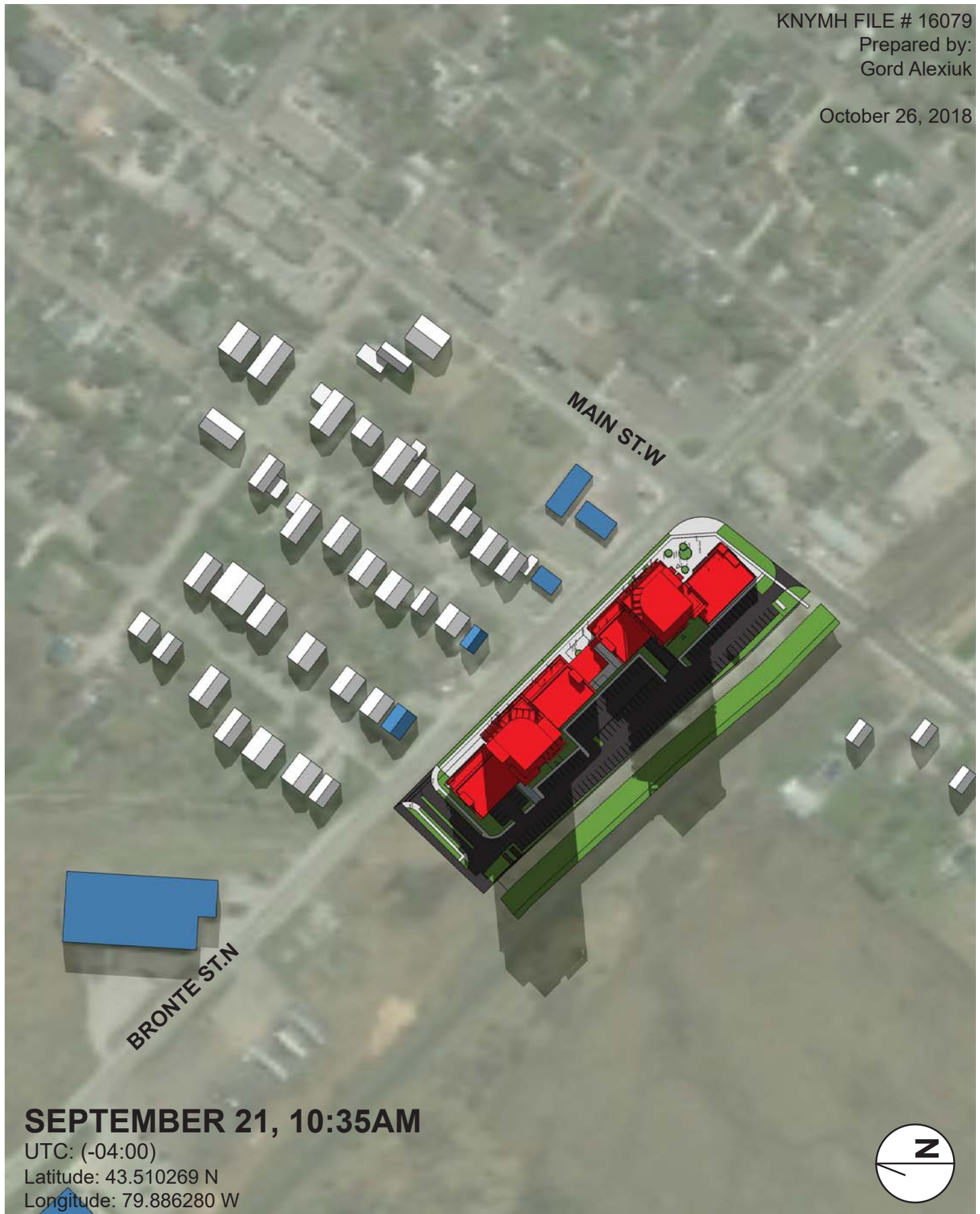
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October 26, 2018



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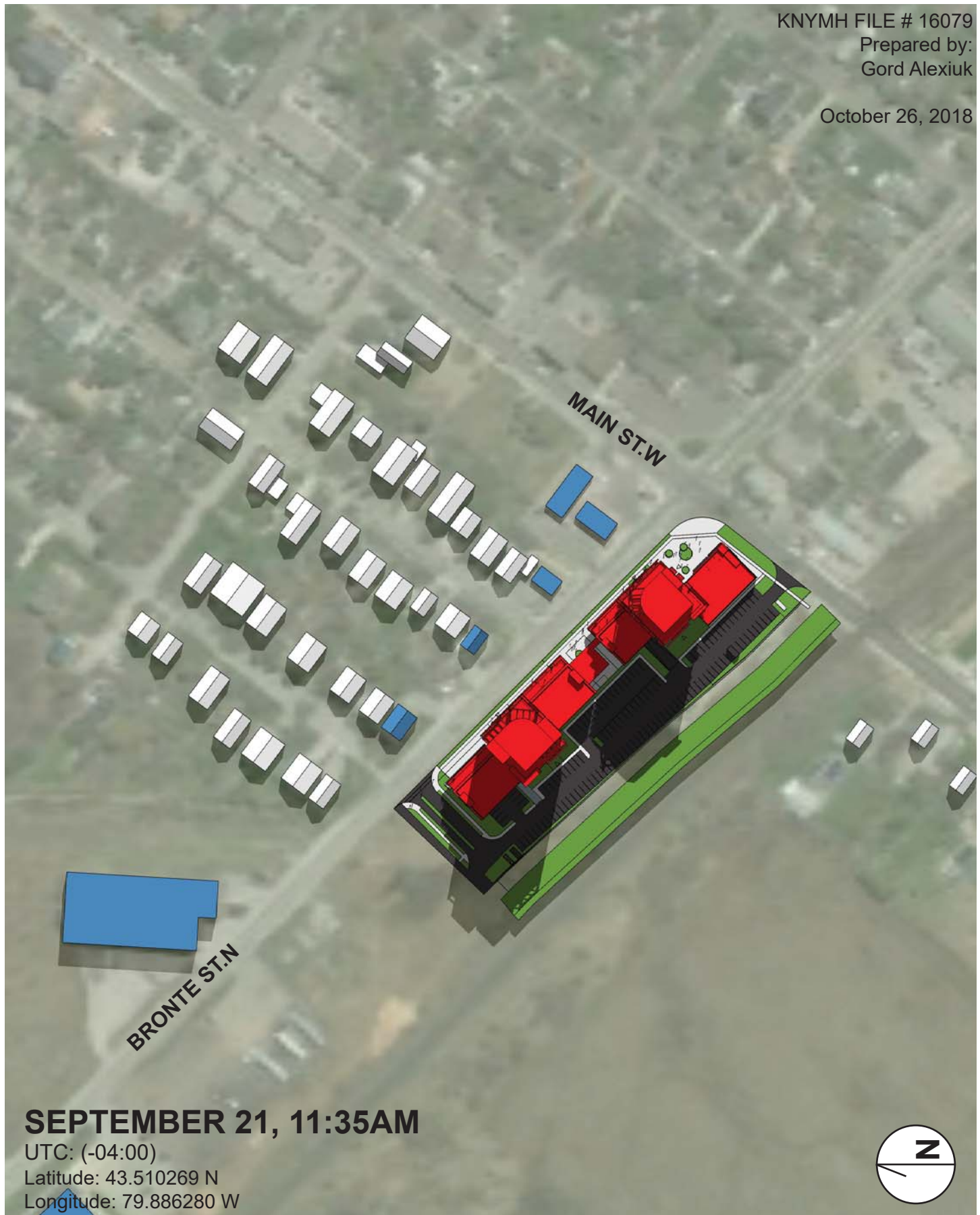
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October 26, 2018



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October 26, 2018



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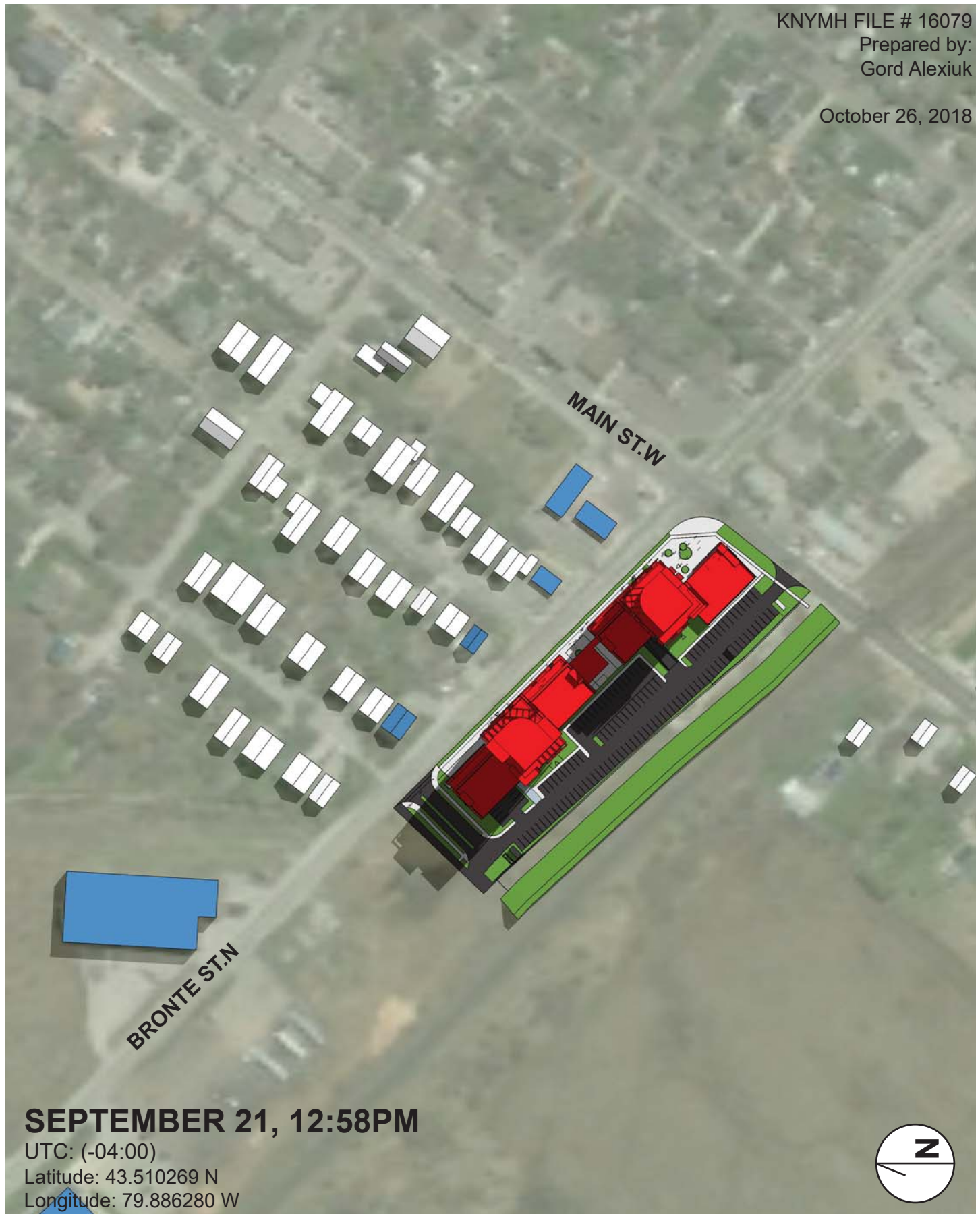
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October 26, 2018



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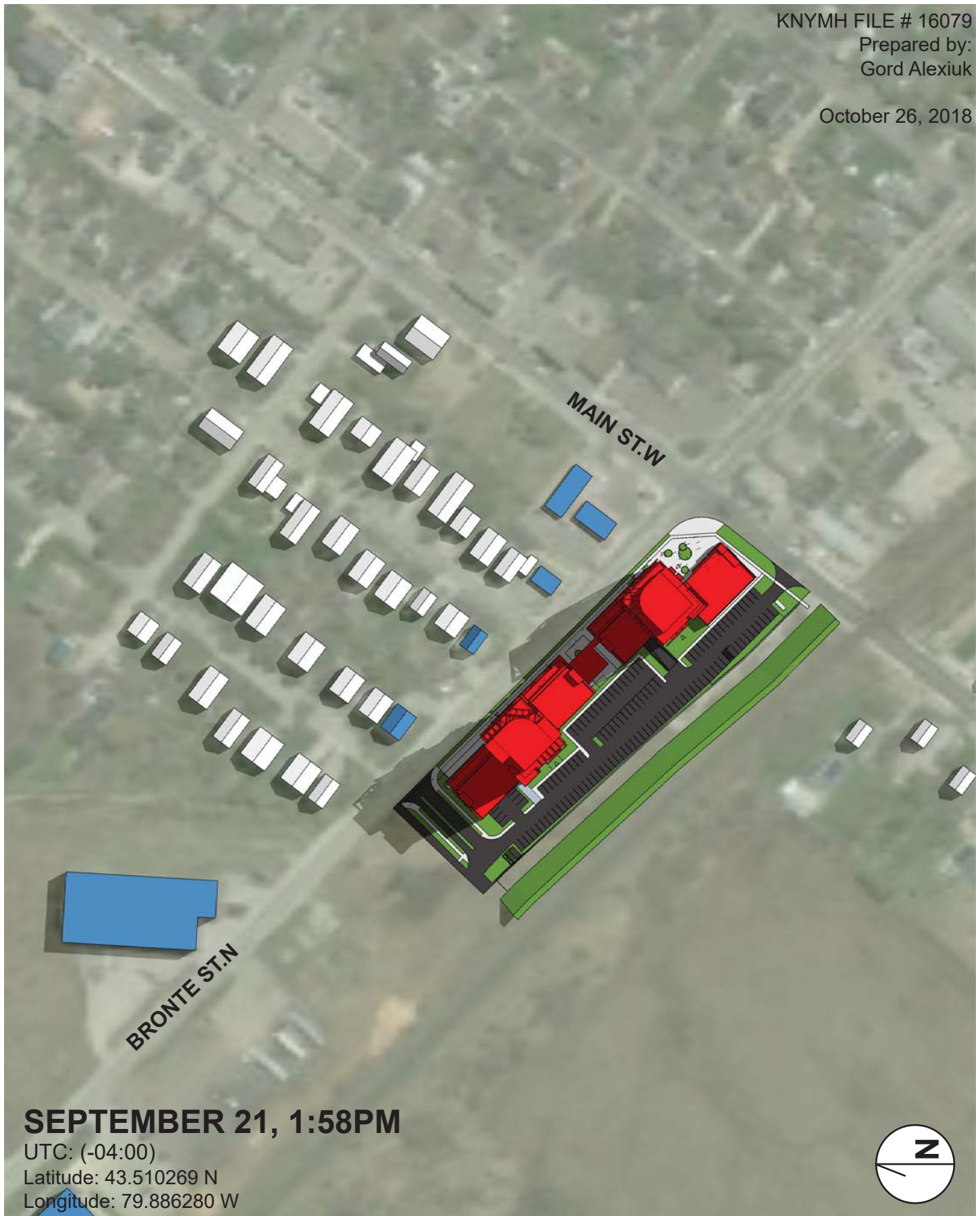
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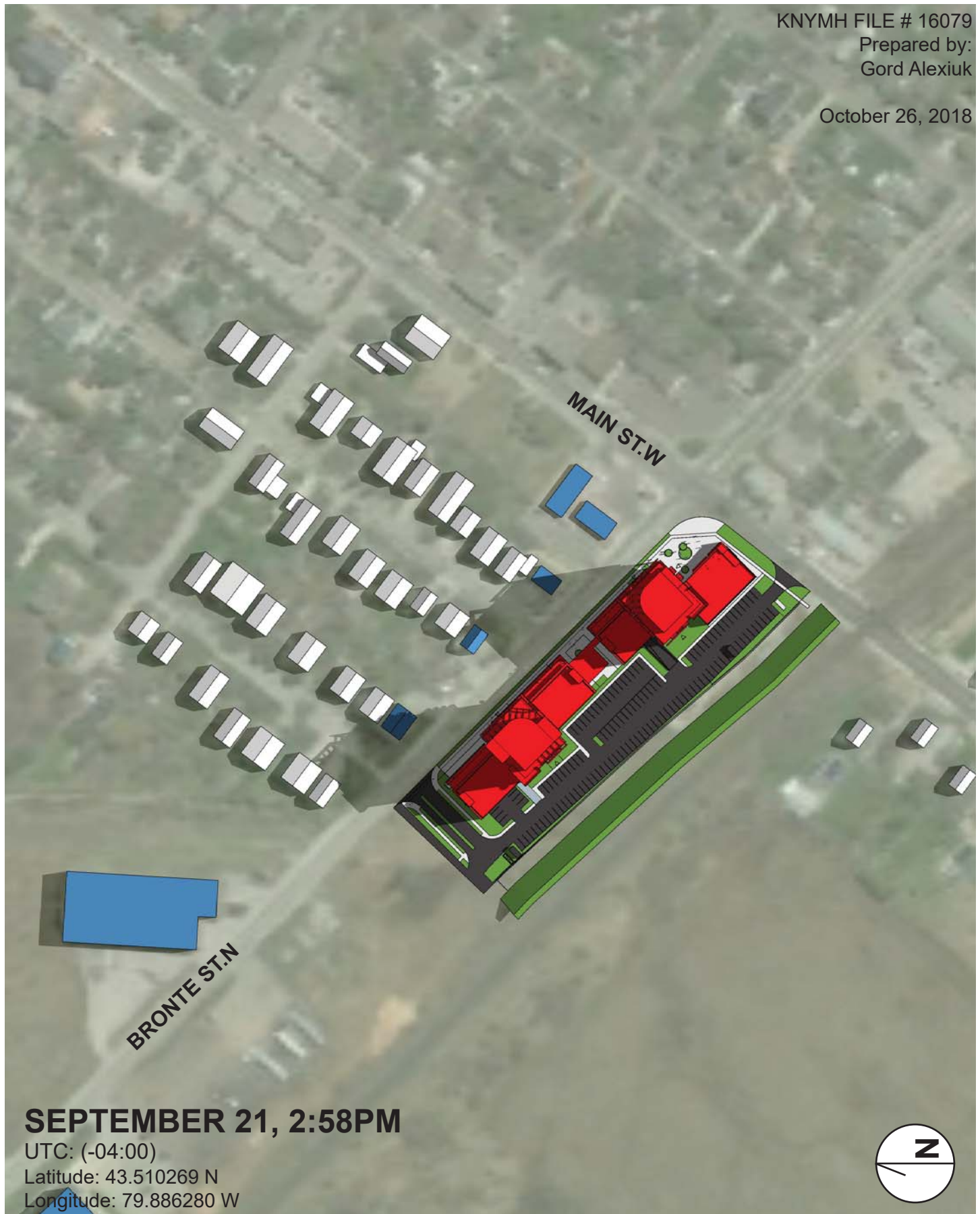
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October 26, 2018



October 26, 2018



SEPTEMBER 21, 2:58PM

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Latitude: 43.510269 N

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October 26, 2018



MAIN ST.W

BRONTE ST.N

SEPTEMBER 21, 3:58PM

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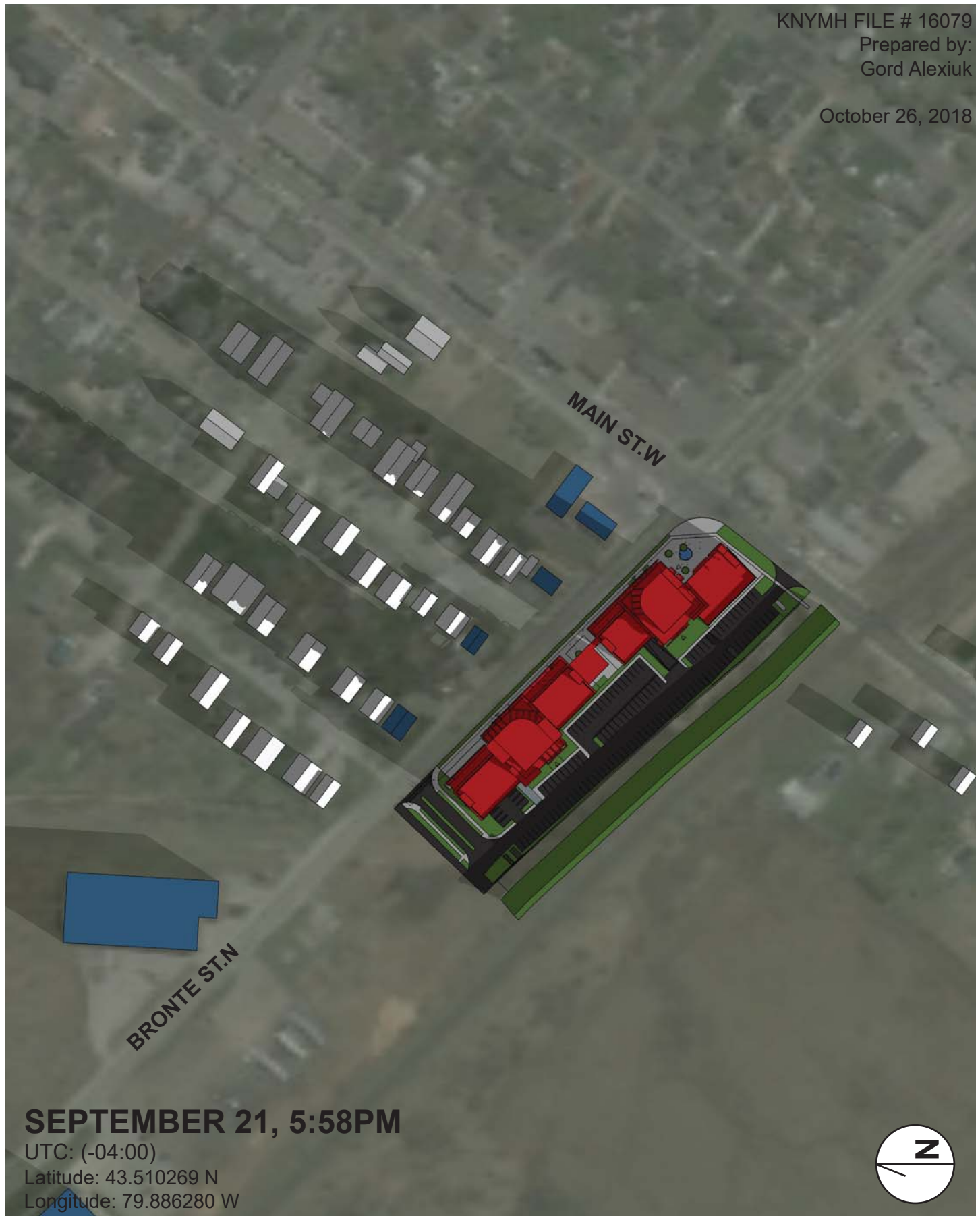
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October 26, 2018



October 26, 2018



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October 26, 2018



APRIL 21, 7:56AM

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Longitude: 79.886280 W

October 26, 2018



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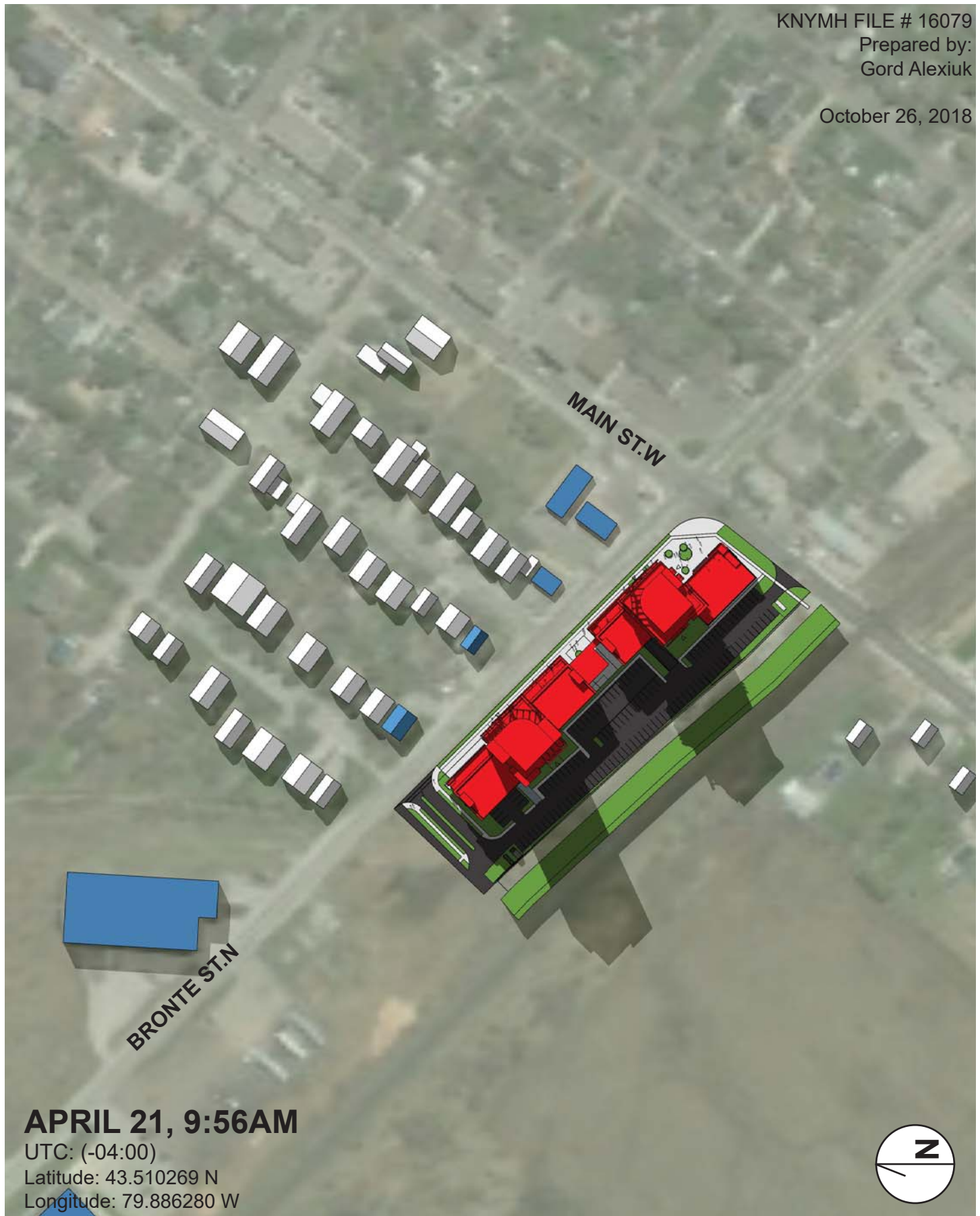
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October 26, 2018



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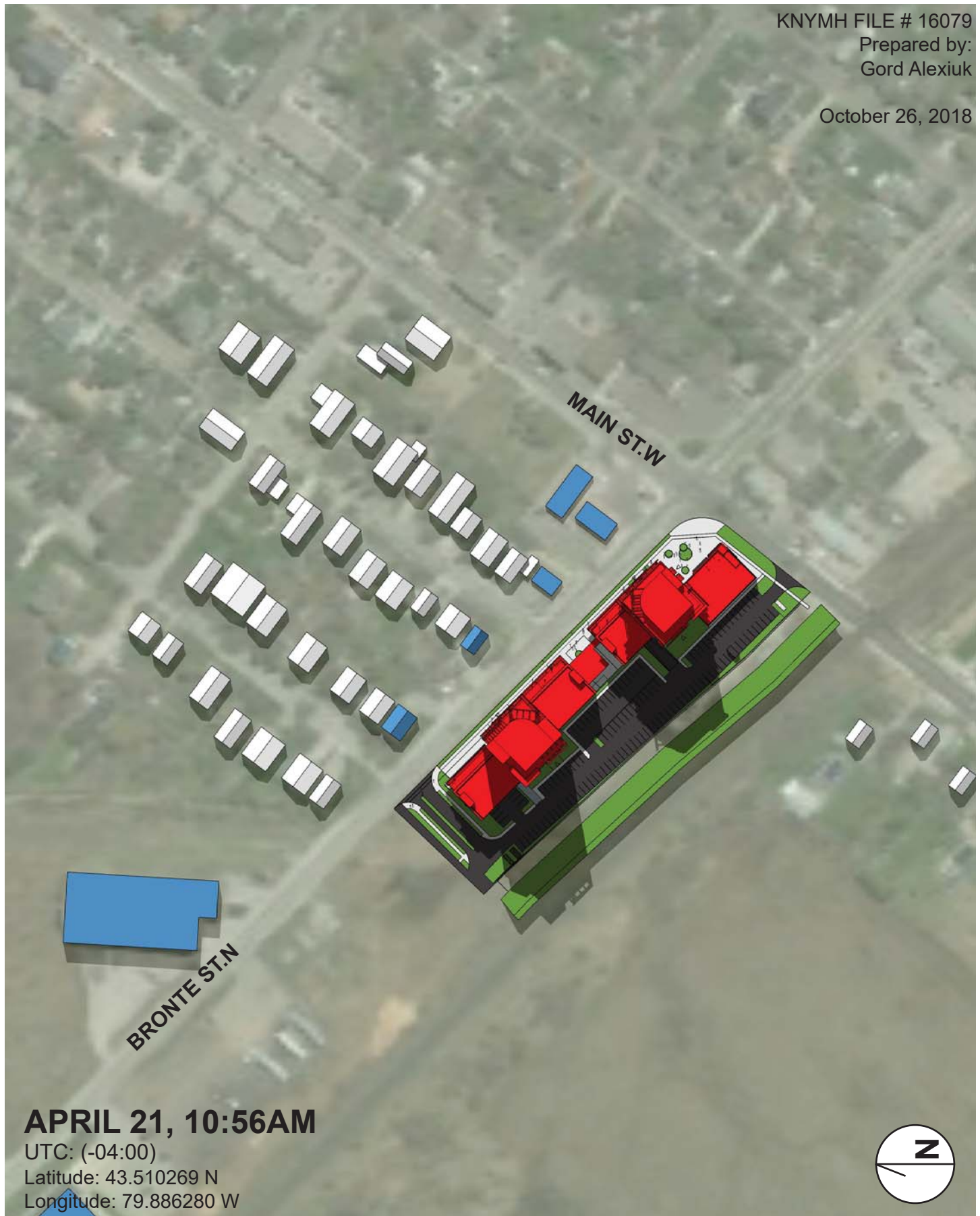
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October 26, 2018



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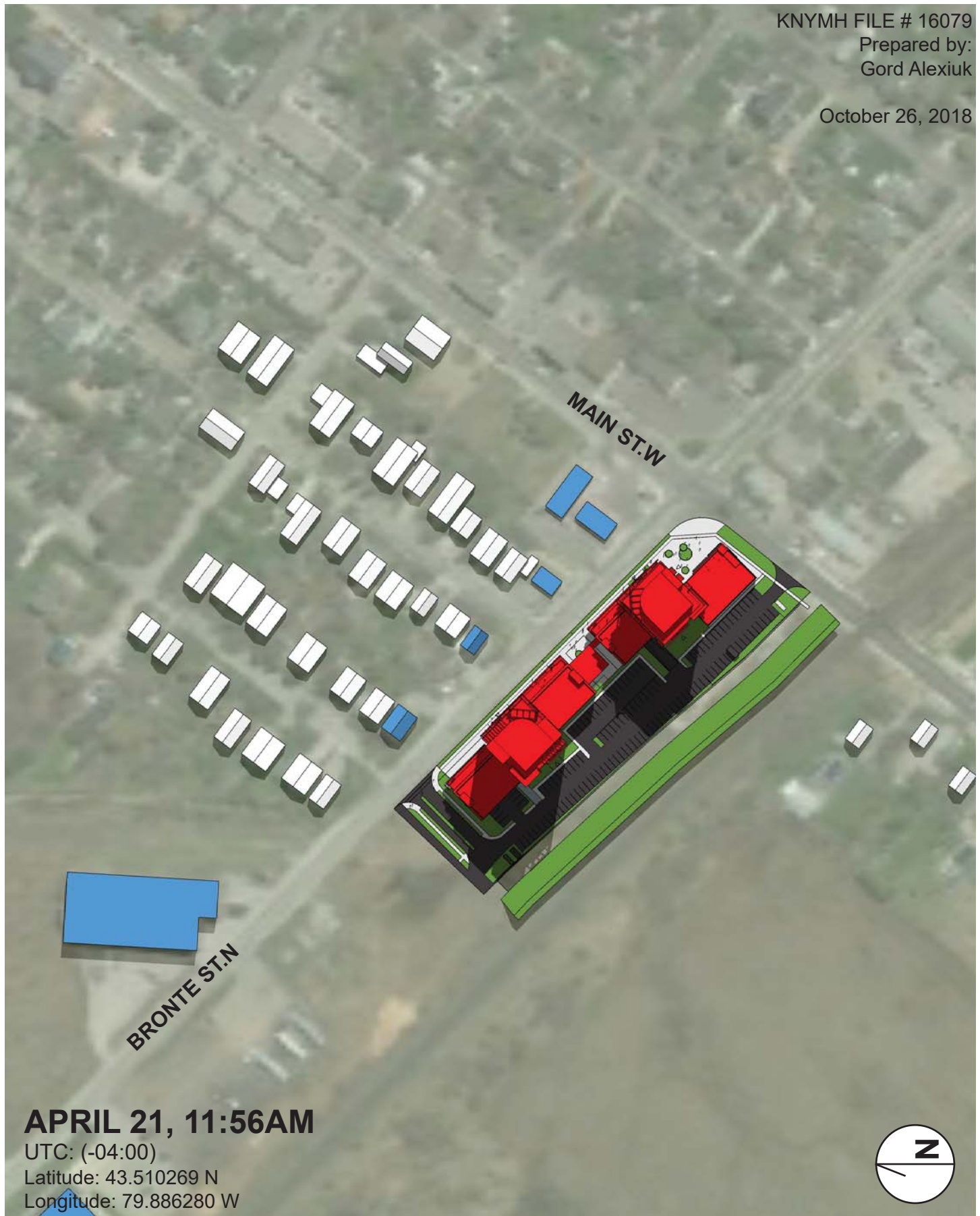
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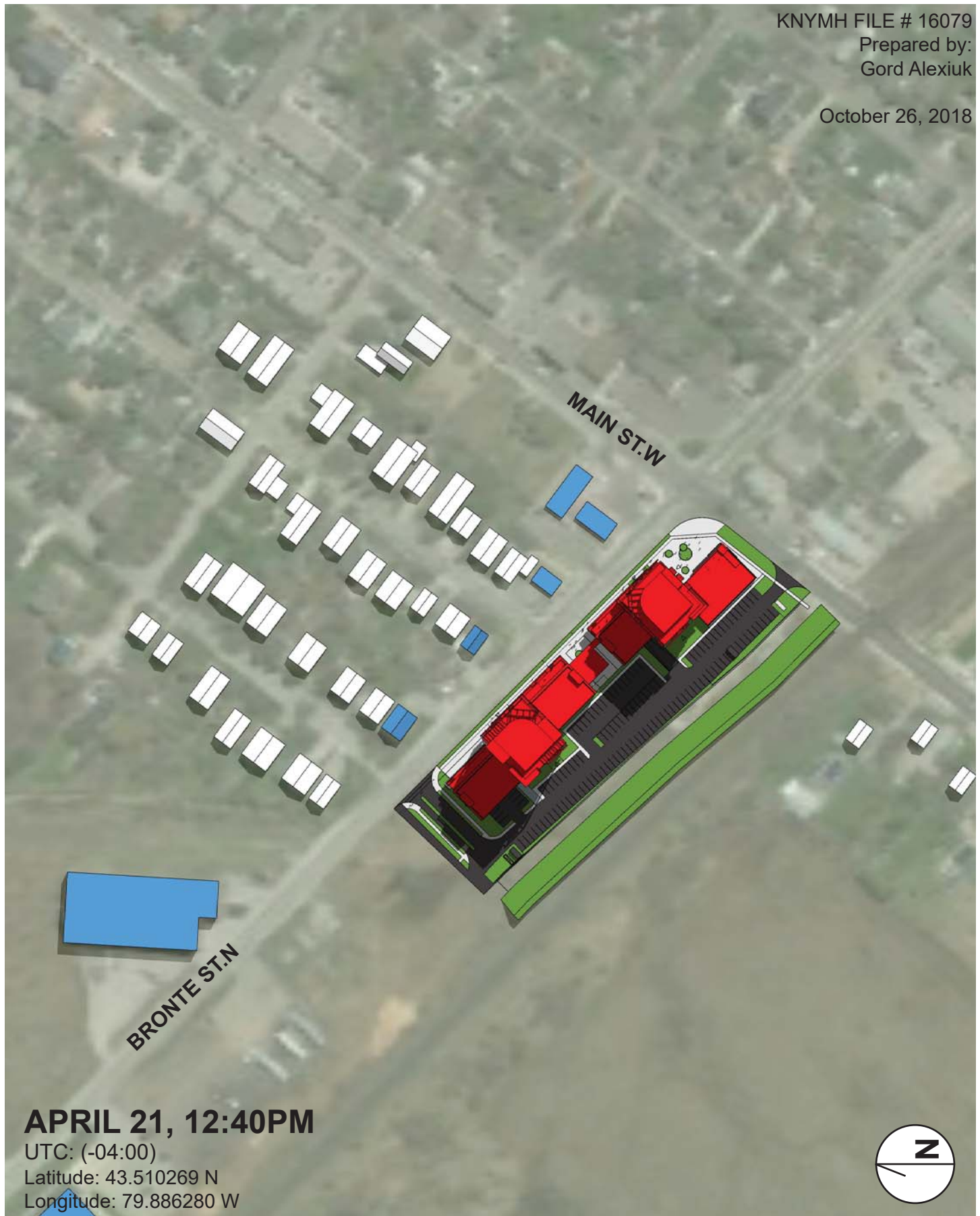
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October 26, 2018



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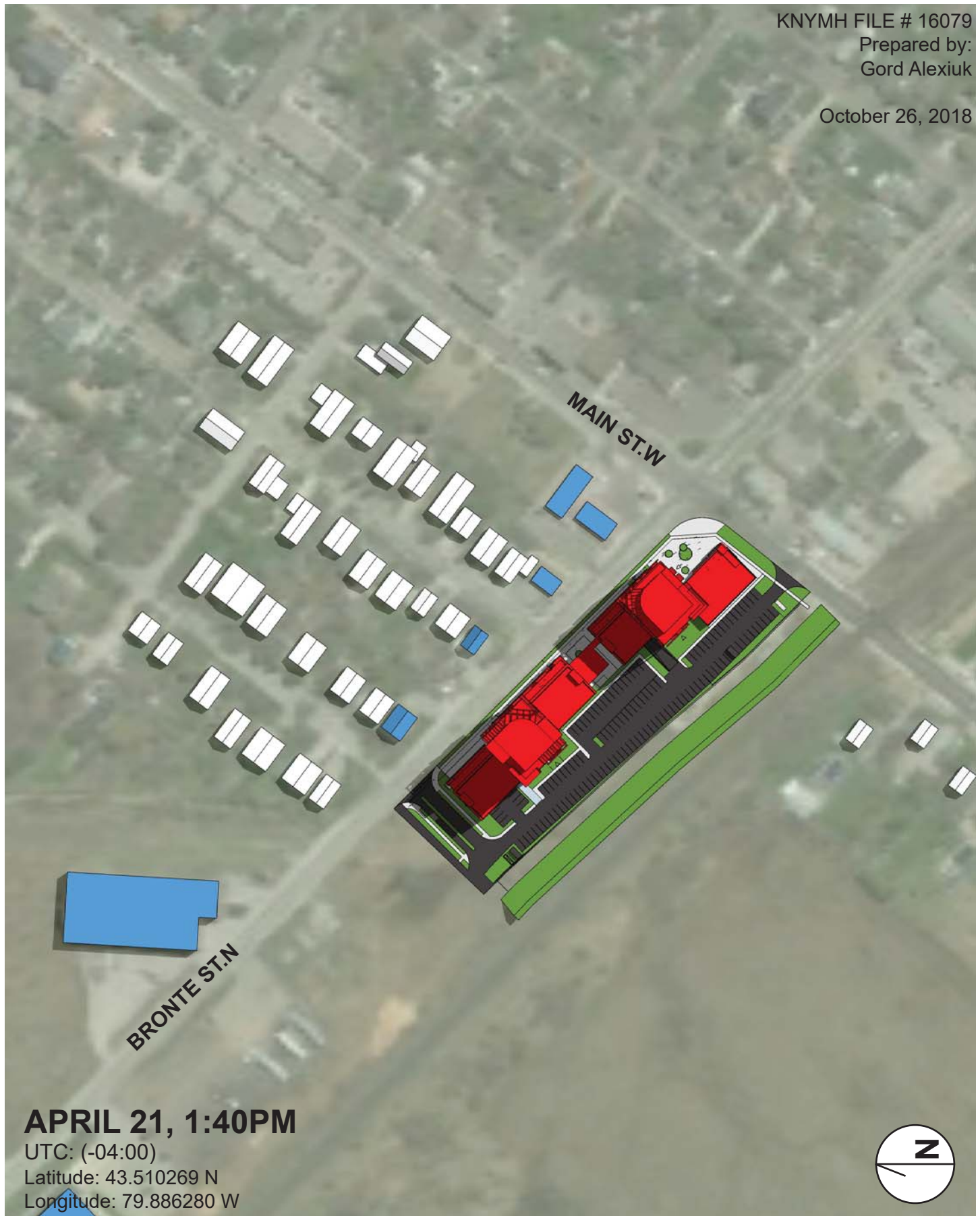
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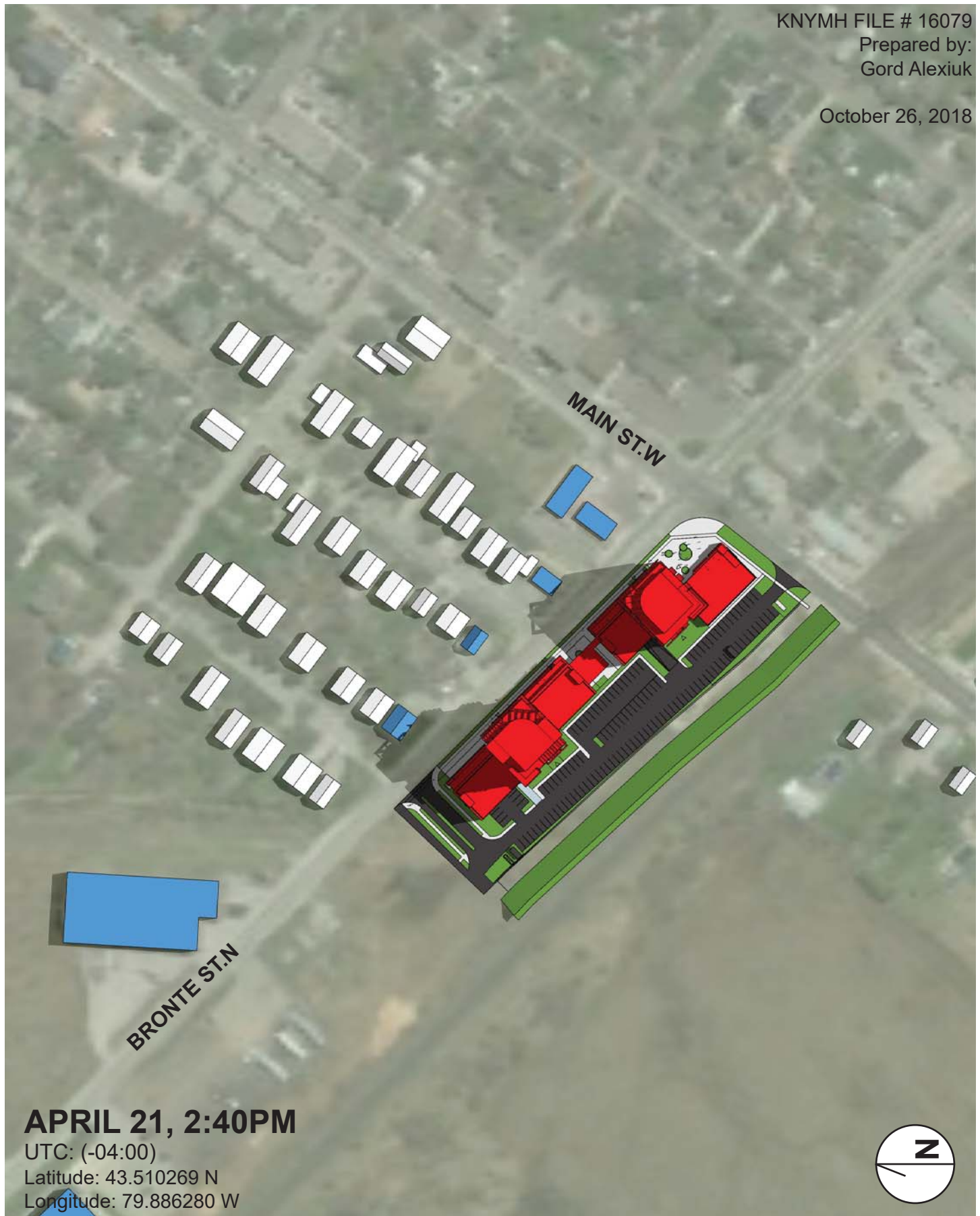
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October 26, 2018



October 26, 2018



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October 26, 2018



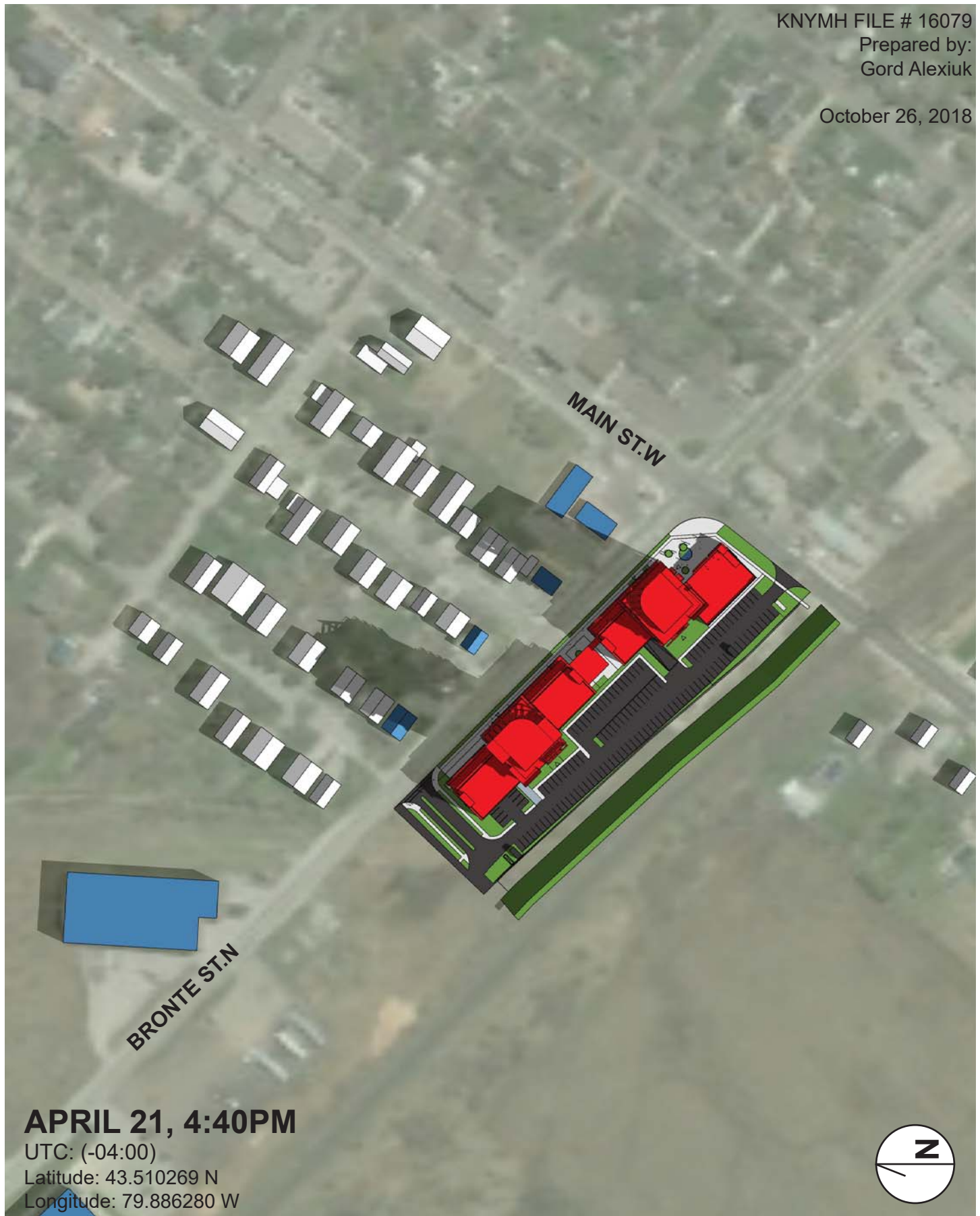
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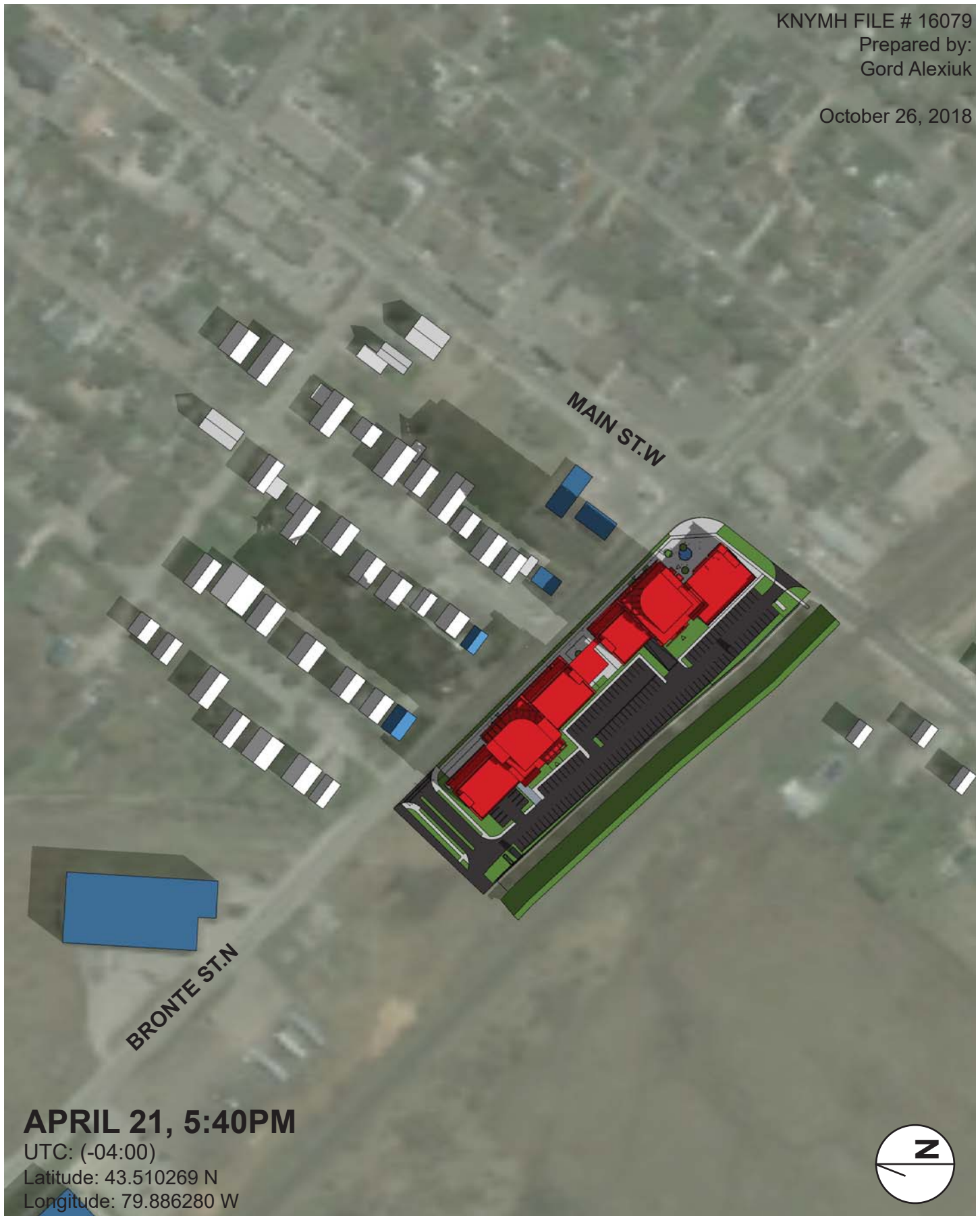
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Longitude: 79.886280 W

October 26, 2018



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October 26, 2018



APRIL 21, 6:40PM

UTC: (-04:00)

Latitude: 43.510269 N

Longitude: 79.886280 W



4.3 SUMMER SOLSTICE SHADOWS: (JUNE 21 • Figure 4.3-1 to Figure 4.3-14)

A summary of the Summer Shadow effect of the subject property upon the surrounding area. This commentary will discuss the impact of the proposed two (2) Residential building's shadows upon properties at the north, west, east and southeast side of the subject property. The impact is studied using hourly intervals starting 1.5 hours after sunrise and ending 1.5 hours before sunset. The start time for this period is observed at 7:08am and ends at 7:34pm.

At this day the solar altitude is at a maximum; Shadows are minor and stay short, falling mostly upon the development site. The times for this period are under Eastern Daylight Time. (UTC -4:00)

4.3A North and Northwest Property Impact, June 21 (Figure 4.3-1 to 4.3-9)

At 9:30am the morning sun is rising and already at 38.91 degrees at this time. The sun will rotate almost 250 degrees in the sky on this day over fifteen and a half hours.

Study Area (1) Impact

- No public sidewalk impact
- No impact to properties after 12:00pm

At 12:00pm the noontime sun in summer is reaching its peak in the sky (67-degrees) originating from the south at this time.

- Public sidewalk on subject land (West side of Bronte Street) and pedestrian sidewalk on East side of Bronte will experience more than 5 (five) hours of continuous sunlight.

Study Area (2) Impact

- No impact to properties exceeding 2 (two) consecutive hourly test times, shadow falls on subject lands

4.3B East and Southeast Property Impact, June 21 (Figure 4.3-9 to 4.3-14)

At 3:30pm the afternoon sun in summer has begun descending and is still at about 56.8 degrees altitude. The sun appears to be shining from the southwest.

- The residential property at #11 Mill Street is impacted at the 4:40pm test period and continues to the end of the test period exceeding 2 (two) consecutive hourly test times
- The residential property at #17 Mill Street is impacted at the 4:40pm test period and continues to the end of the test period exceeding 2 (two) consecutive hourly test times
- The residential property at #21 Mill Street is impacted at the 4:40pm test period and continues to the end of the test period exceeding 2 (two) consecutive hourly test times

October 26, 2018



JUNE 21, 7:08AM

UTC: (-04:00)

Latitude: 43.510269 N

Longitude: 79.886280 W



October 26, 2018



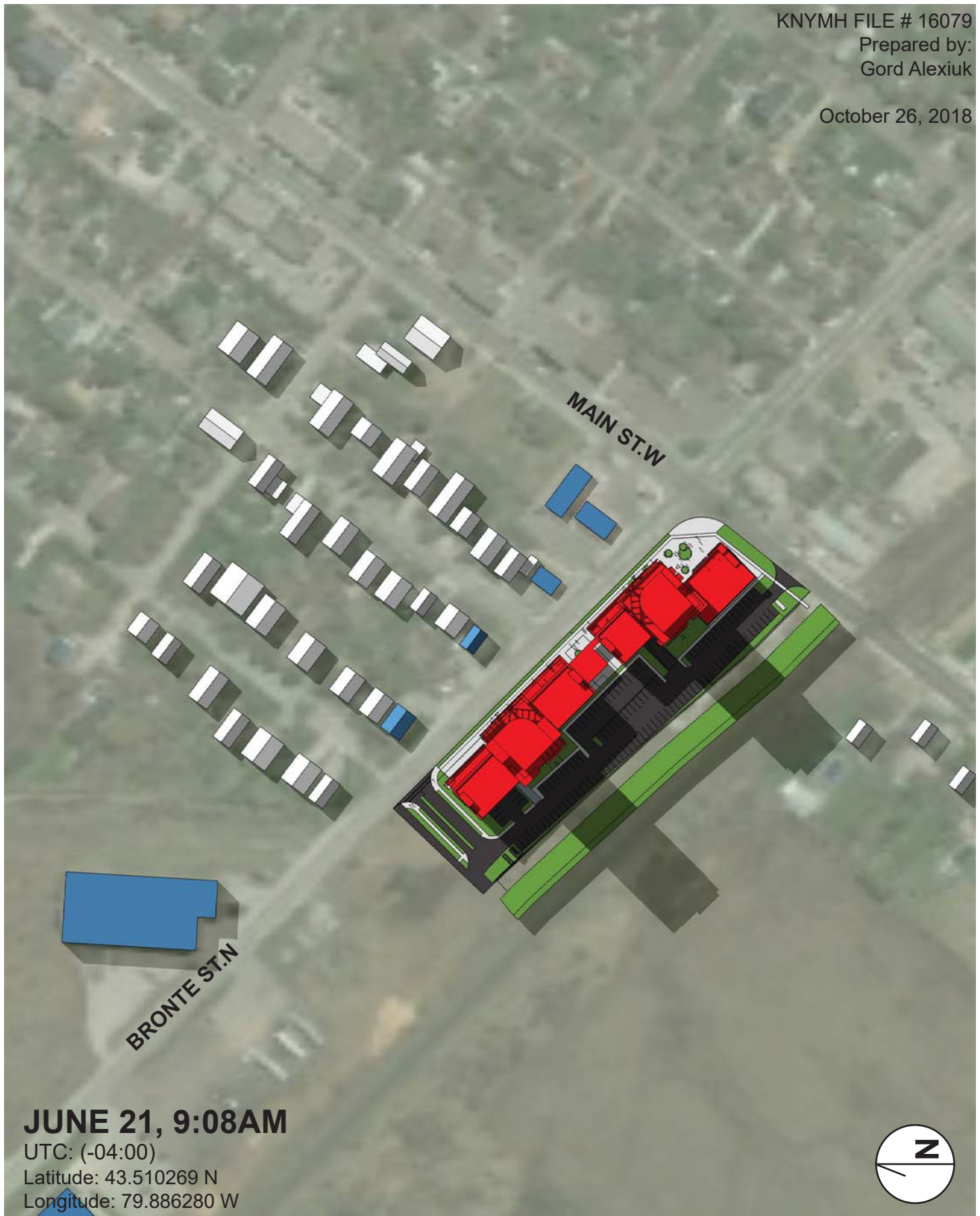
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October 26, 2018



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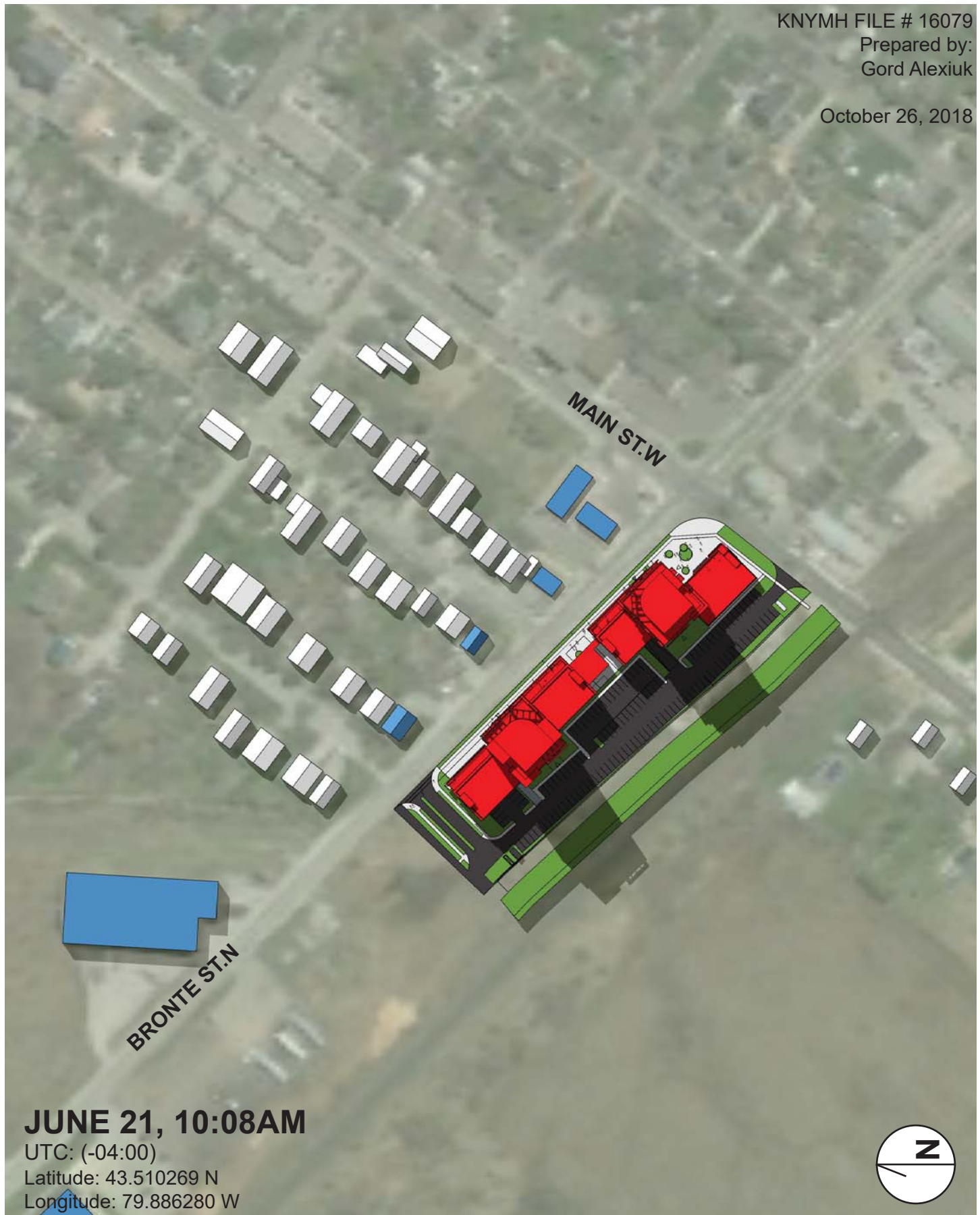
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October 26, 2018



JUNE 21, 10:08AM

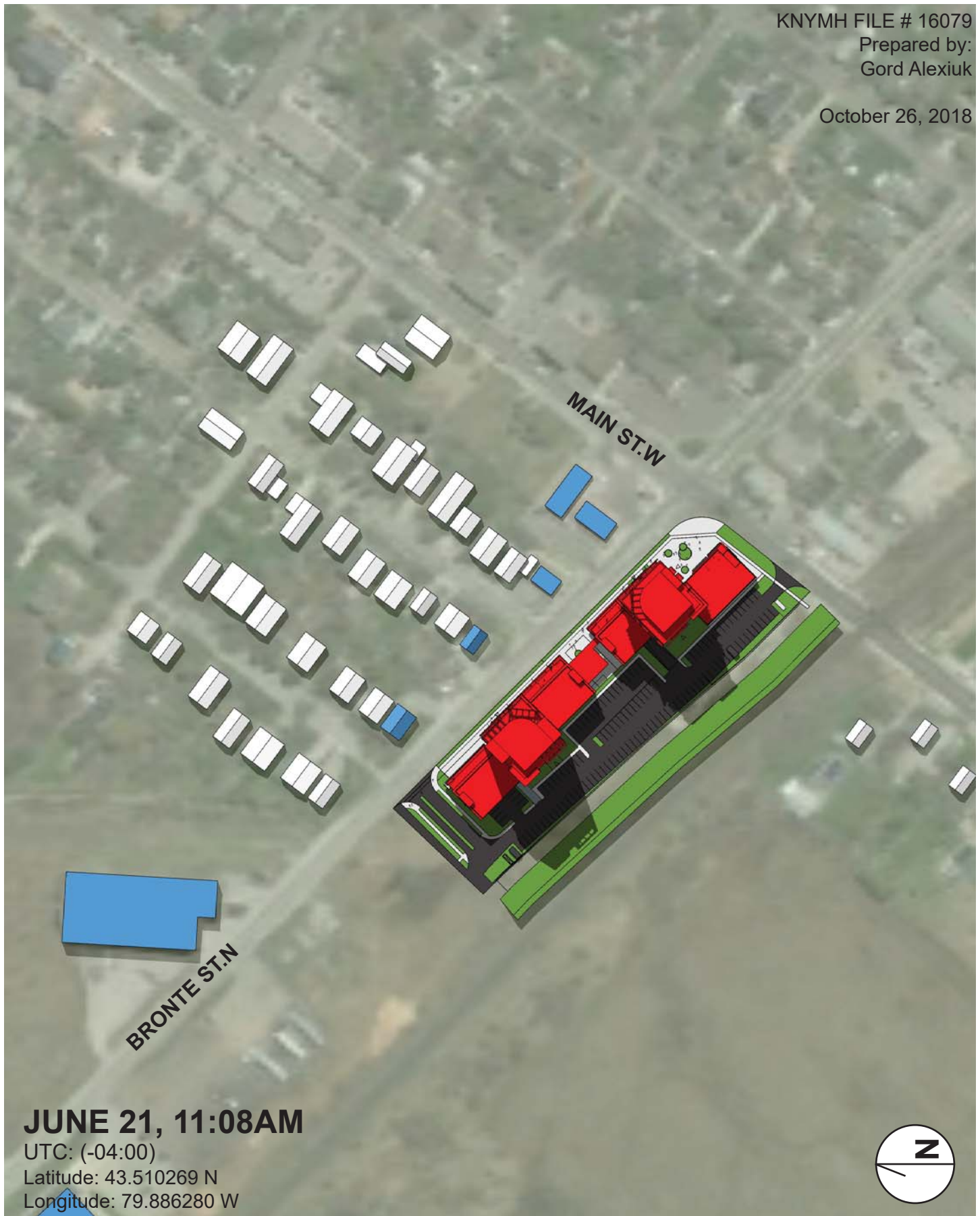
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October 26, 2018



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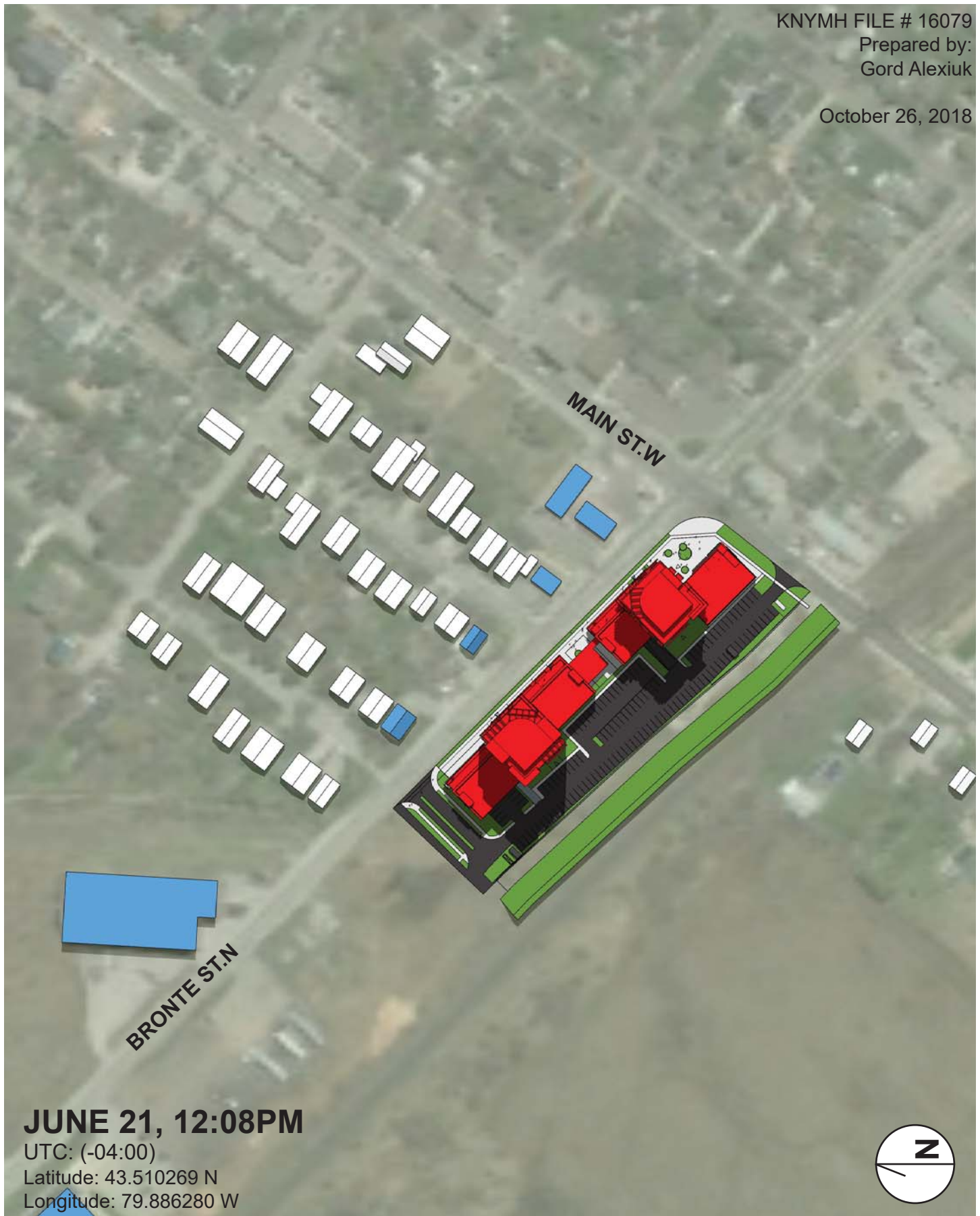
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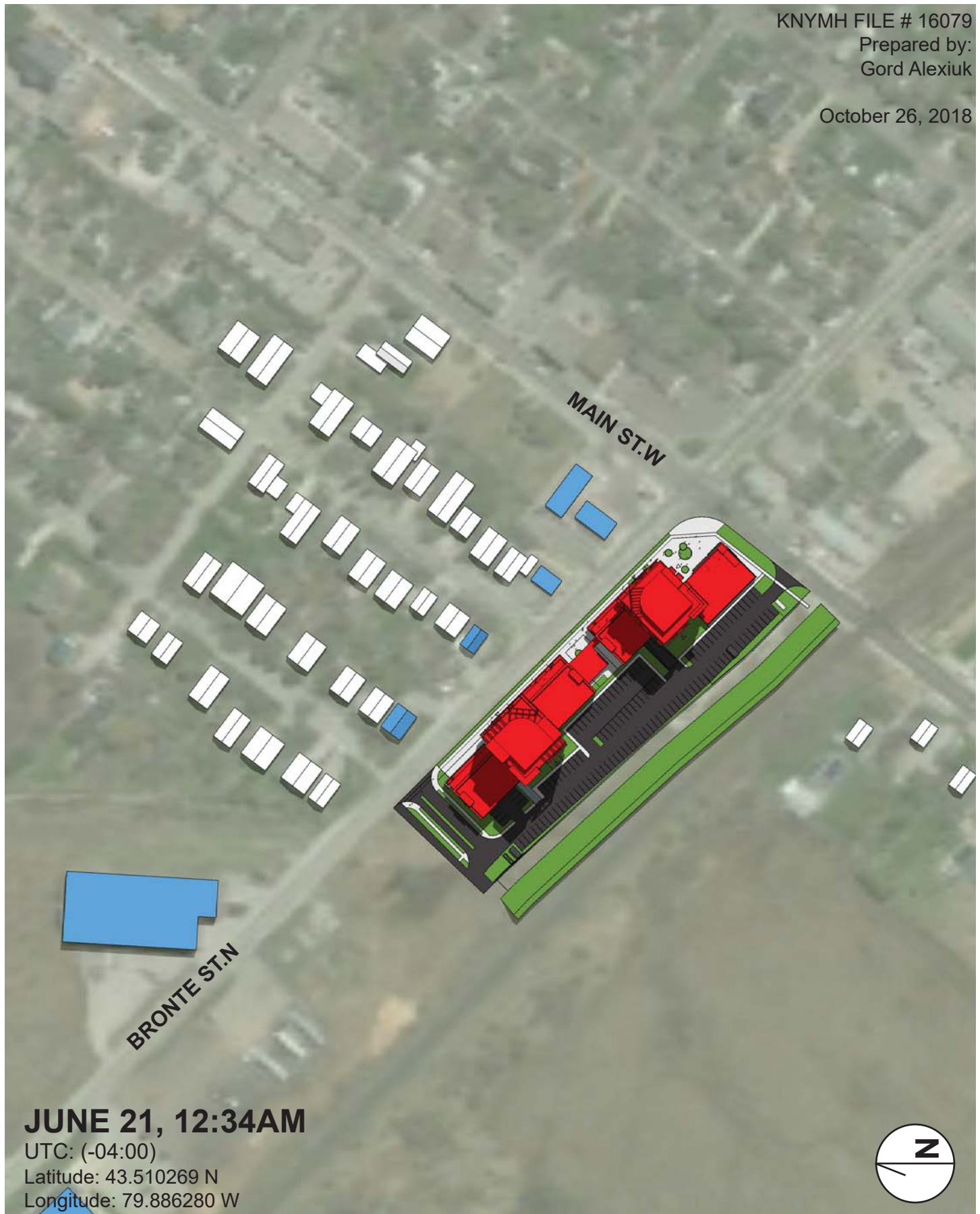
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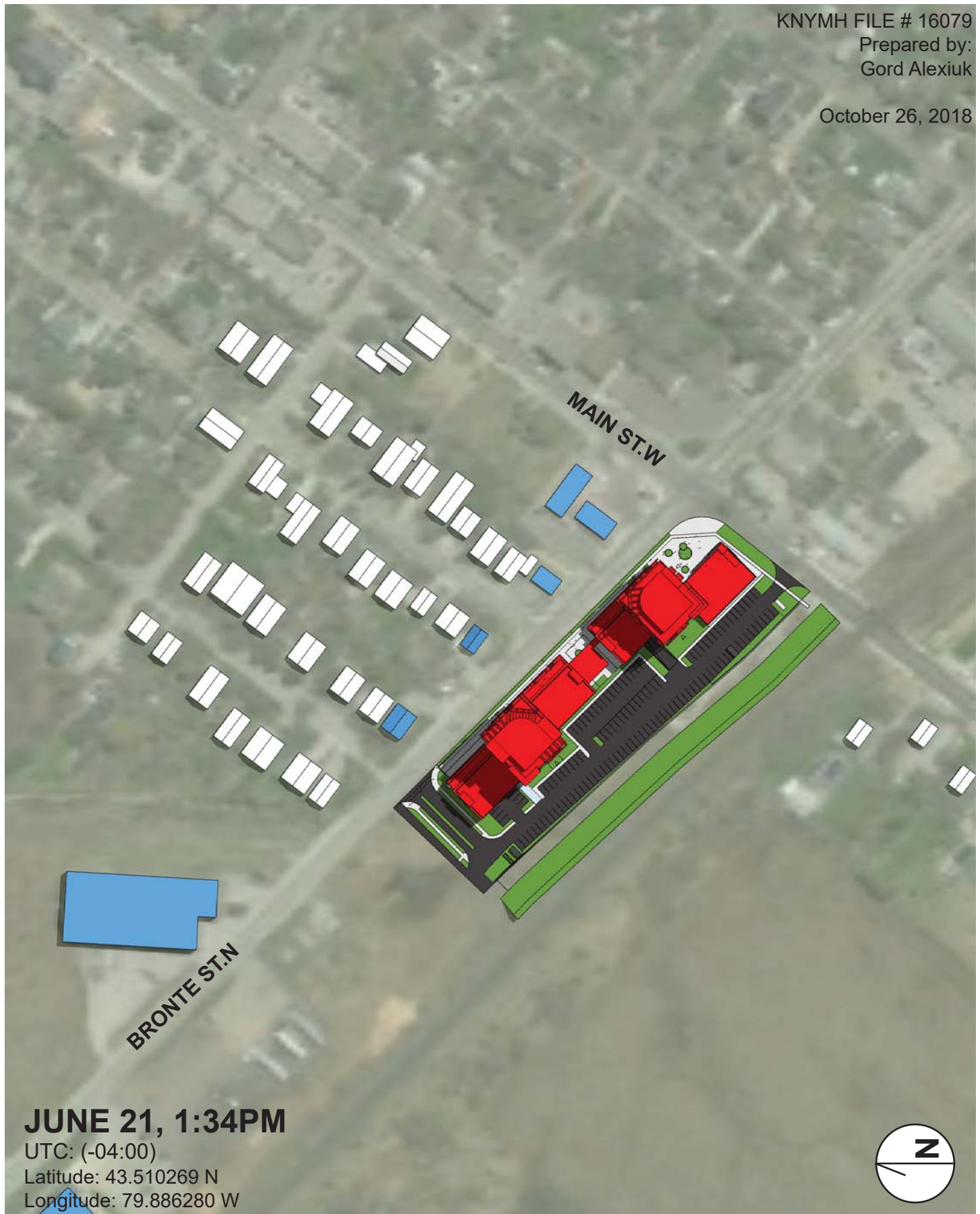
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October 26, 2018



October 26, 2018



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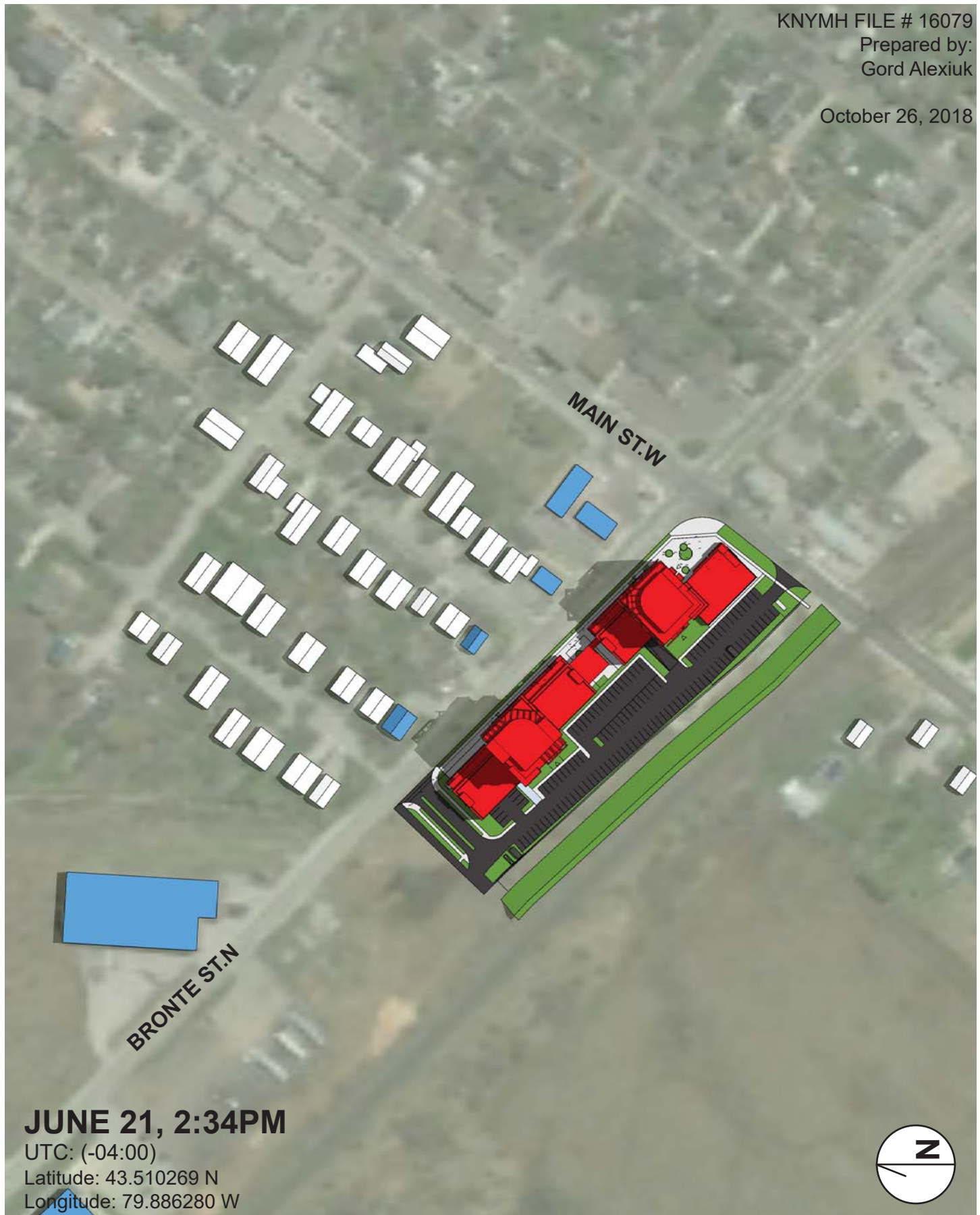
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October 26, 2018



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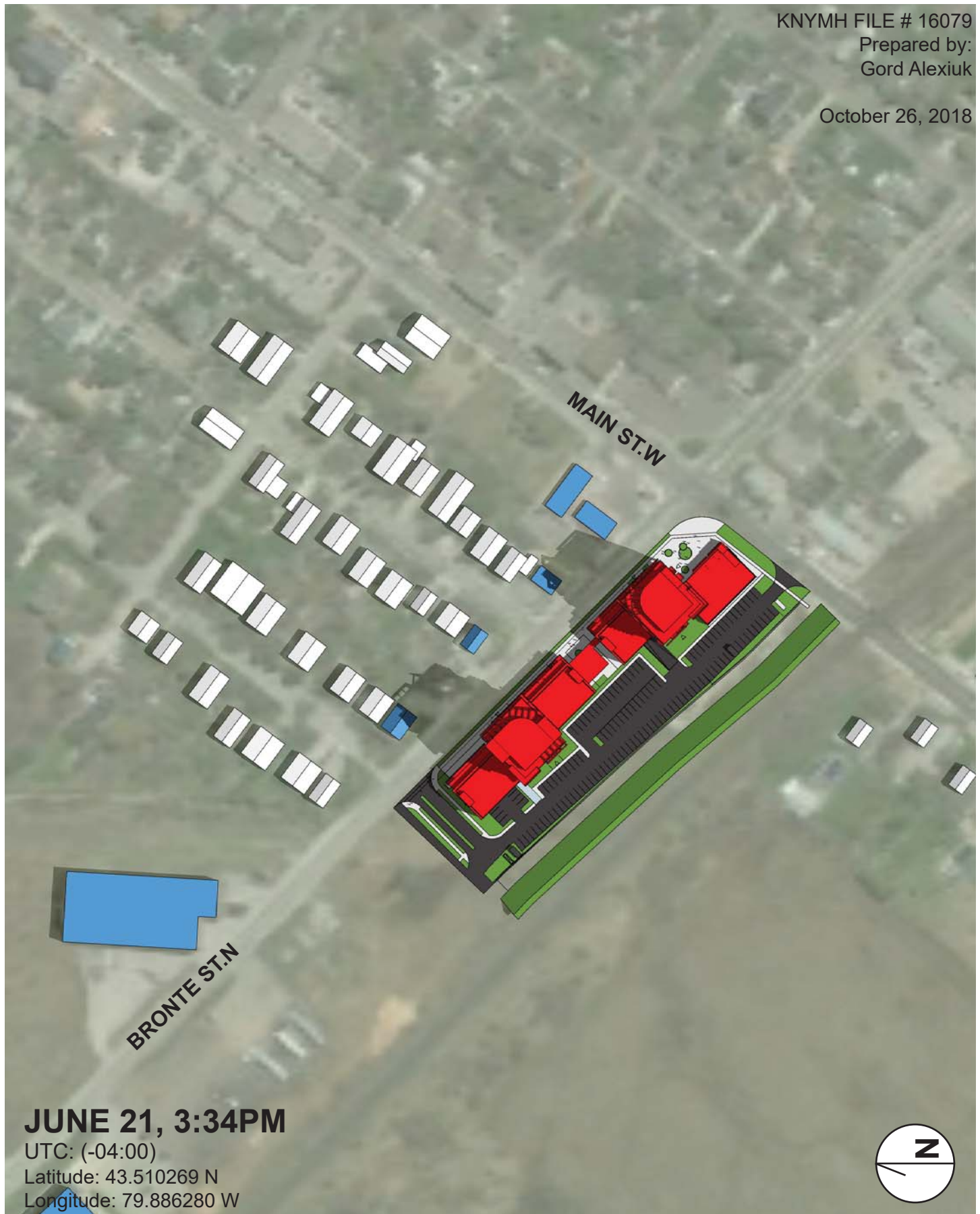
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October 26, 2018



JUNE 21, 3:34PM

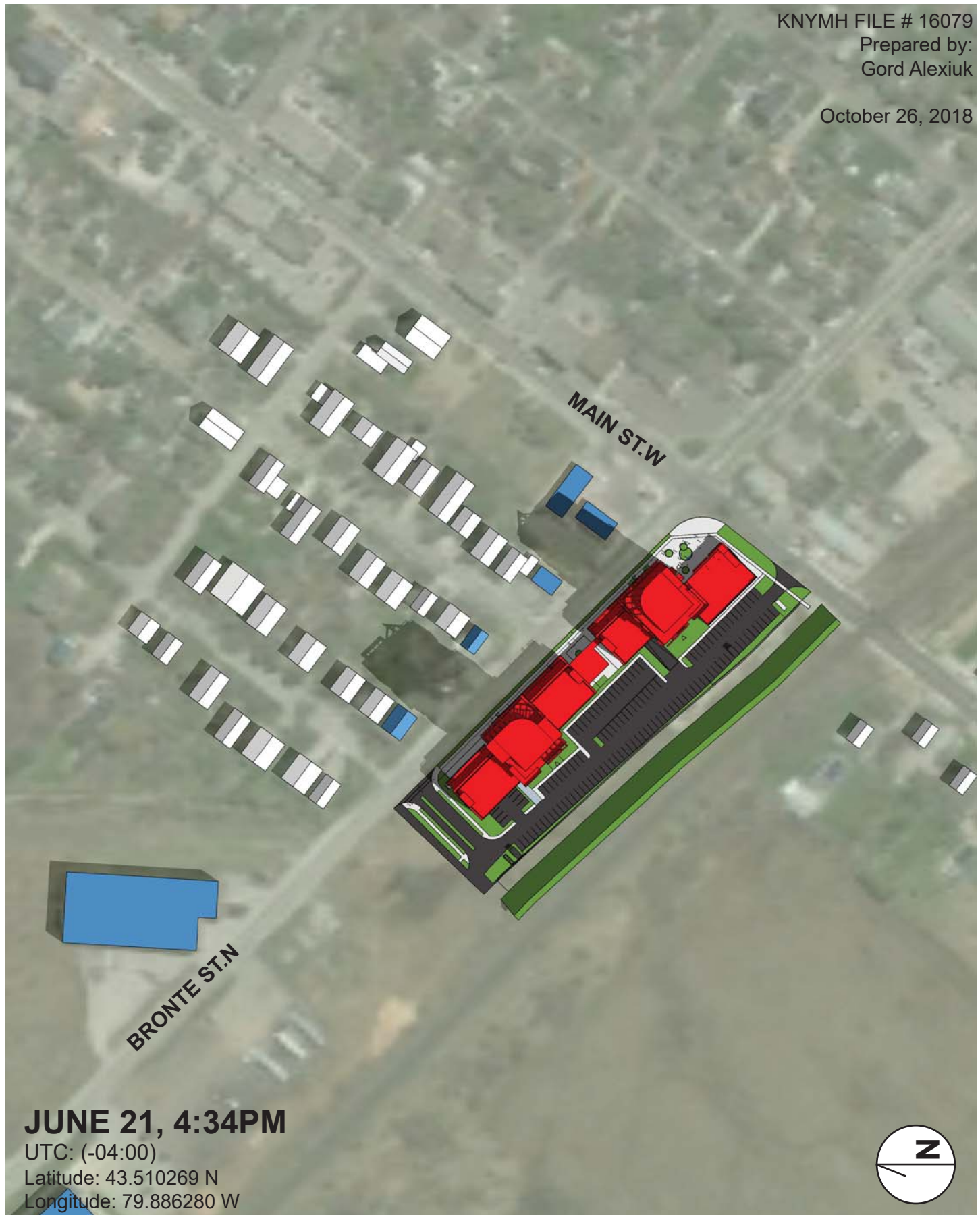
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October 26, 2018



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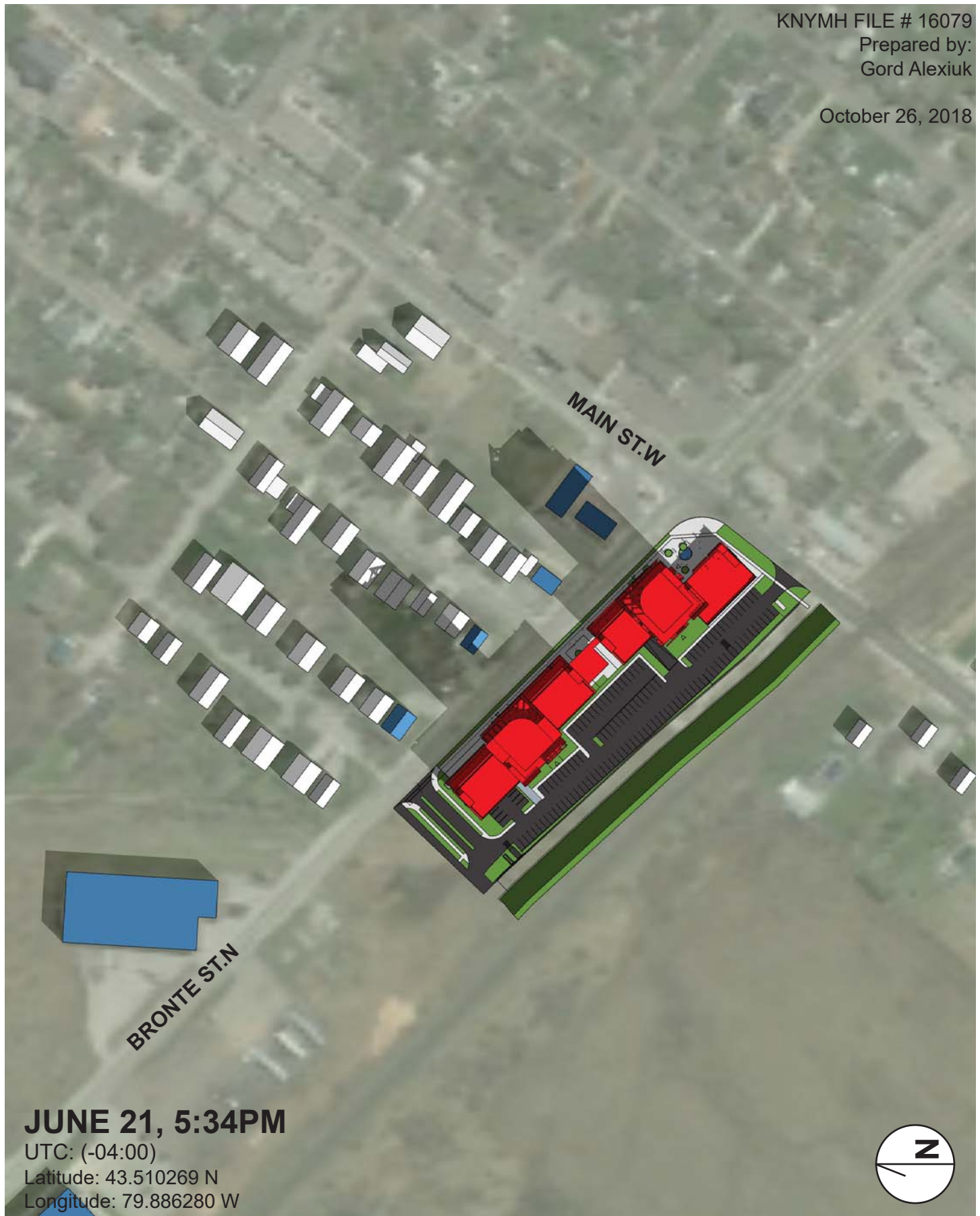
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Longitude: 79.886280 W



October 26, 2018



October 26, 2018



JUNE 21, 6:34PM

UTC: (-04:00)

Latitude: 43.510269 N

Longitude: 79.886280 W



October 26, 2018



5.0 GENERAL OBSERVATIONS: REGARDING THE PROPOSED DEVELOPMENT

5.1 The Winter (December 21) shadow impact on building faces or roofs for the possibility of using solar energy.

- There are no residential dwellings impacted during the winter period for a duration of greater than 2 (two) consecutive hourly test times.
- Commercial space located at #2 Victoria was impacted during the winter period for a duration of greater than 2 (two) consecutive hourly test times.

5.2 The shadow impact on public sidewalks, plazas, parks, school yards and non-residential outdoor amenity areas on April 21, June 21, and September 21:

- Fall (Sept 21) impact analysis indicates that the public sidewalk on the East side of Bronte will experience over five (5) hours of continuous sunlight. The public sidewalk on the West side of Bronte (on the subject land) will experience four (4) hours of direct sunlight and experience partial shading for just over forty (40) minutes afterward.
- Summer (June 21) impact analysis indicates that both the East and West public sidewalk will experience over five (5) hours of continuous sunlight.
- Spring (April 21) impact analysis indicates that both the East and West public sidewalk will experience over five (5) hours of continuous sunlight.

5.3 The shadow impact on residential amenity spaces on April 21, June 21, and September 21:

- Fall (Sept 21) shadow impacts exceed 2 (two) consecutive hourly test times after 12 pm on four (4) residential properties. The study shows that the impact is upon the following lots; Mill Street #8, & #14, Victoria #10, & #14. During this period the impact is isolated to the tower forms not the podium of building 'A or 'B'. Neighbouring properties impact one another at 4:30pm.
- Summer (June 21) shadow impacts exceed 2 (two) consecutive hourly test times after 12 pm on three (3) residential properties. The study shows that the impact is upon the following lots; Mill Street #11, #17, & #21. During this period the impact is isolated to the tower forms not the podium of building 'A or 'B'. Neighbouring properties impact one another at 5:45pm
- Spring (April 21) shadow impacts exceed 2 (two) consecutive hourly test times after 12 pm on six (6) residential properties. The study shows that the impact is upon the following lots; Mill Street #8, #11 & #14, Victoria #10, #14, & #26. During this period the impact is isolated to the tower forms not the podium of building 'A or 'B'. Neighbouring properties impact one another at 4:30pm
- The majority of the residential properties impacted feature mature deciduous trees lining both sides of each lot.

6.0 SUMMARY OBSERVATIONS: REGARDING IMPACT OF DEVELOPMENT UPON THE SURROUNDING AREA

The Winter (December 21) shadow on building faces or roofs for the possibility of using solar energy does not impact residential properties but does impact one (1) commercial spaces of two (2) or more consecutive hours.

The shadow impact on public sidewalks, plazas, parks, school yards and non-residential outdoor amenity areas on April 21, June 21, and September 21. The shadow analysis demonstrates during the summer (June 21) and spring (April 21) test period that public sidewalks and parks receive at least five (5) hours of continuous sunlight per day, as per the Town of Oakville guidelines. During the fall (September 21) test period the public sidewalk on the East side of Bronte will experience five (5) hours of continuous sunlight per day, as per the Town of Oakville guidelines. The sidewalk on the West side of Bronte located on the subject land will receive just over four (4) hours falling short by a marginal amount.

The shadow impact on residential amenity spaces on April 21, June 21, and September 21. The spring (April 21) test period indicates an impact on six (6) properties to the East of the subject land exceeding two (2) 2 (two) consecutive hourly test times. The summer (June 21) test period indicates an impact on three (3) properties to the East of the subject land exceeding two (2) 2 (two) consecutive hourly test times. One (1) of the three (3) properties is impacted by the spring (April 21) test period. The fall (September 21) period indicates an impact on four (4) properties to the East of the subject land exceeding two (2) 2 (two) consecutive hourly test times. None of the four (4) properties is impacted by the summer (June 21) test period. The shadow impact on these properties is isolated to the narrow high-rise tower forms.

The Residential amenity spaces shown to be exceeding the criteria set in this analysis during the April 21, June 21, and September 21 test periods all are also impacted by mature plantings and neighbouring buildings in excess of two (2) consecutive hourly test times.

The proposed high-rise development is considerate to the guidelines set for shadow impact analysis by the town of Oakville on nearby residential developments and presents the ideal building typology for this site. The design of proposed development ensures that sunlight is maximized to the neighbouring residential properties using a high-rise tower building type. This building typology produces narrow shadows that move quickly across the terrain. The design goal of the proposed development is to ensure sensitivity to view corridors through the subject land to the Escarpment for the community. Based upon the analysis we suggest that the proposed design will not have a significant negative effect on this neighbourhood.

In our opinion this development is compatible with the area and does not have a significant effect on the existing neighbourhood in general.

Sincerely,
KNYMH Inc.
Gord Alexiuk