



Route Evaluation Study

Mohawk Solar Facility – Preliminary Draft Report

May 16, 2019

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1 Introduction

Mohawk Solar LLC (“Mohawk Solar” or the “Applicant”), a wholly-owned subsidiary of Avangrid Renewables, LLC is preparing an Application under Article 10 of the Public Service Law to the New York State Board on Electric Generation Siting and the Environment (“Siting Board”) for its major electric generating facility (the “Facility”) proposal in Montgomery County, New York. This report has been prepared to satisfy relevant portions of the Preliminary Scoping Statement (PSS), specifically Section 2.25 Effect on Transportation and relevant portions of 1001.25 of the Article 10 Regulations.

1.1 Project Description

The proposed Mohawk Solar Facility is a utility-scale solar project located in Montgomery County NY. Project facilities will be located in two Towns: Canajoharie and Minden. The total size of the facility will be a maximum of 90.5 MW. The Facility Location and Facility Area Maps are found in Appendix A.

The proposed Facility consists of all activities necessary for the construction and operation of a utility-scale solar project, including the installation and operation of up to 1,000 acres of utility-scale solar arrays, together with associated collection lines, approximately 9.5 miles of access roads, one operation and maintenance (O&M) building approximately 2,500 - 3,000 sf in size, and one temporary construction staging/laydown area. The Facility will also include the construction of a collection sub-station. The collection sub-station will be located adjacent to the National Grid right of way off Clinton Road, which will be the point of interconnection (POI) sub-station. It is assumed that construction of the Facility will take approximately 12 months.

During construction, there will be temporary increases in truck traffic on area roadways served by the Facility. The purpose of this evaluation is to document the existing transportation conditions in the area and identify probable local travel routes, constraints, and proposed improvements if necessary. Also, this evaluation will contain any school bus routes along proposed haul roads, identification of emergency responders and the routes they will take to the Facility sites, roadway permit and road use agreement requirements, construction vehicle volumes/level of service, and airport impacts associated with the Facility.

1.2 Methodology

The study methodology was developed to address the relevant needs identified in the scoping document and the Article 10 Regulations. A field inventory, photo log, and visual assessment was conducted to evaluate possible travel routes. Sample roadway characteristics and conditions were documented. In addition, the Applicant has consulted with the Highway Superintendents in the host Towns of Minden and Canajoharie via phone and email. The Superintendents provided information on the type, thickness, widths, and restrictions of roads within their respective town. Such consultations will continue throughout the Article 10 process and prior to construction. Additional information in responses from Highway Superintendents have confirmed that there is no documented information of the conditions of town road culverts and all bridges on town roads are under the jurisdiction of the County. Research was conducted on transportation requirements, and a worst-case design vehicle was evaluated to identify possible roadway improvements that may be required.

2 Existing Traffic Conditions and Roadway Evaluation

2.1 Vehicle Types

During the Construction phase to build the facilities, there will be some temporary impacts to transportation routes that are needed to reach and travel within the Facility area. These impacts will result from the movement of vehicles involved in the Facility construction. These vehicles and their role in the Facility construction are described below.

The exact construction vehicles have not yet been determined, however, it is known that transportation of solar components and associated construction material involves numerous conventional vehicles. The AASHTO WB-67, a large single trailer (53 foot) semi-trailer, was used as the design vehicle. Other vehicles that are anticipated to be used include:

Construction Equipment and Materials

- Oversize/Overweight truck carrying transformer, TBD.
- Construction of Access Roads – Conventional 3 axle dump trucks carrying crushed stone and/or gravel.
- Concrete trucks for O&M building, sub-station foundations and transformer pads.
- Variety of conventional semi-trailers for delivery of panel arrays, sub-station, transmission line, and O&M facility components, machinery and materials.
- Construction staff and other incidental truck trips.

2.2 Existing Traffic Volume and Level of Service

Existing traffic volume data within the study area was obtained from the NYSDOT Traffic Data Viewer Website online and updated County and Local Road listings from the NYSDOT Highway Data Services Website. Most of the County roads and all the state roads had available traffic volume data. The data consists of some segments with total Annual Average Daily Traffic (AADT) and other segments showing AADT for both directions of travel. Most of the local Town roads do not have traffic volume data. Estimated volumes, based on the surrounding traffic counts, were added to these roadways. The existing traffic data was included in the analysis of the traffic capacity Level of Service (LOS) for the delivery/construction vehicle routes during the construction phase. See Appendix B for the Table of existing traffic volumes and vehicle count reports.

2.3 Accident Data

A FOIL request for accident data within the Facility area was sent to the NYSDOT Office in Albany, NY. Once the information was received, data was available for the three State Routes (5S, 10, and 163), six County Routes (64, 80, 85, 86, 87, and 97) and six local town roads that could be used as potential haul roads during the Facility construction. The existing accident data from the NYSDOT Accident Location Information System (ALIS) from July 2015 to July 2018 showed that within the study area the segment of State Route 10 had the most accidents; 43 for the three-year study period. County Routes 64 and 85 and 2 of the town roads had the least amount of accidents within the same study period. The accident data from the FOIL

request did not show any Safety Deficient Locations (SDL's) or Priority Investigation Locations (PIL) within the study area. Based on the existing accident data and Annual Average Design Traffic (AADT) for the roadway segments, the accident rates can be established and compared to the New York Statewide Average Rate which is 2.61 accidents/million vehicle miles (acc/mvm) for 2-lane Rural Arterials (segment and juncture accidents). Of the 17 roadway segments that were evaluated, six have accident rates that are below the statewide average, four of which did not have any recorded accidents during the three-year period. The remaining 11 segments have accident rates above the statewide average, mainly attributed to low AADT volumes with one or two accidents occurring during the time period. The segment of State Route 10 (Ames Road) within the Village of Canajoharie included the intersection at State Route 5S (Main Street) which significantly elevated the accident rate with 31 out of 40 recorded accidents occurring at the intersection. When the segment is evaluated with the intersection the rate is 3.22 accidents/MVM which is the highest accident rate within the study area that is not attributed to a very low AADT. When the intersection is evaluated independently the accident rate is 2.52 accidents /MEV which is also above the statewide average of 0.58. This intersection is the only area that raises any safety concerns within the project area and should be taken into consideration when scheduling deliveries and construction vehicles. See Appendix C for the Table of Existing Accident Data.

2.4 Existing Roadway Evaluation

A field evaluation was conducted during July 2018 on the potential delivery and construction vehicle haul routes to and within the Facility area. The condition of the roads was evaluated by visual inspection and rated with an excellent/good/fair/poor designation. The visual pavement condition ratings were based on the criteria from the NYSDOT 2016 Pavement Report, under the section "Pavement Condition Measures" on page 4. Roadside features, bridge and roadway horizontal/vertical restrictions, bridge/culvert locations, and possible restricted intersection radii locations were also included in the evaluation. The Special Hauling Permit will be the final determination of the route of any Oversized/Overweight to be taken during the facility's construction operations.

Generally, State Route 5S, 10, and 163 provide 12-16-foot lanes with shoulders that vary in width from 3 feet to 5 feet. The roadway terrain is considered rolling, with winding alignment. Currently, there is no load posting on these state highways, so it is assumed that these highways are adequate to handle the heavy loads. The Special Hauling Permit will be the final determination of the route to be taken during the facility's construction operations.

County Roads CR 80 and 86, have travel lanes that vary from 11 feet to 12 feet wide and shoulders that vary from 2 feet to 5 feet wide. The roadway terrain is considered mostly rolling with some roads having roadside hazards such as steep banks and ditches, some non-standard guide rail, trees close to the roadway, low tree branches, and low speed curves. Request for information (email and verbal) on the County roads, bridges and culverts were sent to the Montgomery County Department of Public Works Engineer. The County responded by providing information on posted bridges, posted roads, condition ratings for bridge and large culverts and other roadway information including traffic volumes, pavement thicknesses, widths, utilities, and construction history.

The various Town roads along the evaluation routes had roadway surfaces that were asphalt. The travel lane widths in a two-lane section ranged from 9 feet to 12 feet. The shoulder widths vary from 1 foot to 8 feet along these roads. The shoulder material may be asphalt, gravel or grass. The terrain for these roads is considered rolling. There are numerous roads with roadside

hazards similar to the County roads, along with low speed curves. Conversations with the Town Highway Superintendent have indicated that their paved Town highways have sufficient asphalt 6-8 inches over their sub base material.

State roads and County roads will be utilized as much as possible for construction traffic within the Facility area (unless there are any physical constraints that may limit the use of these roads), using Town roads as the last point of access to the solar locations. Based on the conditions of the Town roads, the most economical routes with the least impacts have been determined.

Concerns with the Haul Route through the Town of Canajoharie have been identified specifically the limited narrow roadway geometry along Route 10 between Erie Boulevard and Mohawk Street. In response additional Haul Route options have been evaluated to avoid this area. It was determined that due to a R-Posted Bridge in the town of Sharon, a secondary Haul Route from U.S. Highway 20 to Route 10 northbound is available for legal weight vehicles only.

See Section 3.1 Haul Route Recommendations for the preferred routes.

Below is a descriptive evaluation of each state, county or town road considered and/or projected to be used as a haul route, a construction vehicle route or that will provide Facility access. See Appendix F of the Transportation Study for the Table of Roadway Field Evaluation showing a condensed version of the field evaluation. See Appendix G of the Transportation Study for Roadway Rating Photos.

State Route 5S (E. Main Street) between I-90 exit 29 and West Main/Erie Boulevard is approximately 38 feet wide with 16 foot wide lanes and curbed gutters. Trucks will follow the posted truck route to Erie Boulevard. The posted speed is 30 MPH. The pavement is in good condition.

Erie Boulevard between State Route 5S (West Main St.) and State Route 10 (Ames Rd.) Erie Boulevard is a 28 to 54 foot wide roadway with parking on both sides of the street. The posted speed is 30 MPH. The pavement is in good condition.

State Route 10 (Ames Road) between Erie Boulevard and Cliff Street. This portion of State Route 10 is 38 feet wide and includes parking on both sides. The travel lanes are 10 feet wide and adjacent to parallel parking which makes it narrow for large vehicles to navigate. The posted speed is 30 MPH. The pavement is in good condition.

Cliff Street between State Route 10 (Rock Street) and Shaper Avenue. Cliff Street is a town road that has a moderate incline from State Route 10. The travel lanes are 10 to 11 feet wide without pavement markings. There are stone curbs at the edge of the pavement with a 3 foot snow storage and 3 foot wide sidewalk on each side. The speed limit is posted at 15 MPH and 30 MPH. Parking is restricted on the roadway. The pavement is in good condition.

Shaper Avenue between Cliff Street and Ridge Road. Shaper Avenue is a town road with travel lanes that are 9 to 10 feet wide with grass shoulders and without any pavement markings. The speed limit is posted at 30 MPH. Pavement is in good condition.

Ridge Avenue between Ridge Road and County Route 80 (Clinton Road). Ridge Avenue is a town road and has unmarked 9 to 10 foot wide lanes with grass shoulders. The speed limit is posted at 30 MPH. Pavement is in good condition.

County Route 80 (Clinton Road) between Ridge Road and Tanners Road. Clinton Road is a county highway with 11 foot wide travel lanes and stone and grass shoulders. The portion from Ridge Road to Seebers Lane crosses two culverts. There is no posted speed limit so it is assumed to be 55 MPH. Pavement is in good condition.

County Route 86 (Marshville Road) between State Route 163 (Cherry Valley Road) and Dygert Road. Marshville Road is a County highway that has 11 foot lanes and stone and grass shoulders that are approximately 3 feet wide. The speed limit is 55 MPH and pavement is in good condition.

Tanners Road between County Route 80 (Clinton Road) and State Route 163 (Cherry Valley Road). Tanners Road is a Town road with 8 to 9 foot unmarked lanes and 5 foot stone shoulders. The pavement is in fair condition.

State Route 10 (Ames Road) between Cliff Street and Marshville Road. This portion of State Route 10 is 22 feet wide, and the travel lanes are 11 feet wide with 5-foot-wide improved shoulders. The speed limit is posted at 55 MPH and the pavement is in good condition.

Fredericks Road north of Marshville Road. Fredericks Road is a town road with 8 to 9 foot unmarked lanes and 3 to 5 foot grass and stone shoulders. The pavement is in fair condition.

Nestle Road between County Route 80 (Clinton Road) and State Route 163 (Cherry Valley Road). Nestle Road is a Town road that has 9 foot travel lanes and no pavement markings. There are 3 foot grass and stone shoulders. Pavement is in fair condition.

State Route 163 (Cherry Valley Road) between County Route 64 (Fisk Hill Road) and Tanners Road. Cherry Valley Road is a State route that has 11 foot wide travel lanes and 2 to 3 foot stone shoulders. The speed limit is not posted and is assumed to be 55 MPH. Pavement is in good condition.

2.5 Roadway and Intersection Restrictions

Existing roadway restrictions (height, width, weight) and deficient intersection radius locations were observed in the field and researched from NYSDOT resources during our initial review. Height restrictions such as vertical clearances under bridges as well as low utility wires along various local roads as described under the roadway evaluation will prevent or make it difficult for access by Overwidth/Overweight delivery vehicles. The route to the sub-station does not cross any load restricted bridges or culverts along the potential construction routes. This route will also will need to be re-evaluated during the Special Hauling Permit Application process. There are no weight restrictions along State and County roads, but the following local roads may have load postings that are determined by the Town Highway Superintendent at the time the road is needed as a haul route:

- Cliff Road

As there are not any anticipated oversized vehicles required for the Facility sites construction, a WB-67 was used as the design vehicle for the evaluation of intersection radius along the potential travel routes to the sites. There were not any deficient intersections identified along the proposed haul routes. See Appendix F for turning movement diagrams along the haul routes.

2.6 Load Restrictive Bridges and Culverts

Existing bridge posting data was taken from the R-Posted Bridge and Posted Bridge listing for Montgomery County dated June 25, 2018 at the NYSDOT Posted Bridges online website. There is one bridge within the Facility area, and is not posted (BIN: 1002830, Road: 5S 25031110, Feature Crossed: Canajoharie Creek). This bridge is located on the proposed Haul Route. If there are any changes to the construction routes in the future that direct traffic over other bridges, they will be checked for adequacy with respect to loading along with horizontal width and vertical height restrictions during the Special Hauling Permit Application process with the NYSDOT.

Also, there are numerous small and large culverts along the potential haul routes. These locations will be further analyzed during final engineering to determine if improvements are necessary prior to using the route for overweight delivery of the sub-station transformer. Any necessary improvements as well as restoration of damaged culverts will be addressed in the Road Use Agreements with the local municipalities.

A supplemental evaluation of potential Haul Routes was preformed that identified a secondary Haul Route. The secondary Haul Route identified is from Highway 20 to Route 10 northbound which crosses a number of bridges and culverts including one R-Posted Non-Wavered bridge in the Town of Sharon in Schoharie County (BIN 1007880, Road: 10 95021386, Feature Crossed: Brimstone Creek). This restricts this route to be used only by legal weight vehicles. No other information has been collected regarding this bridge.

2.7 School Bus Routes

Requests for information were sent to Canajoharie Central School District, Cherry Valley Central School District, and Fort Plain Central School District asking for identification of school bus routes, number of buses and pickup/drop off times along the possible haul roads needed for delivery trucks and construction vehicles. One out of three school districts have responded back with the requested school bus information. The information received has shown that there are currently 4 (four) buses covering this territory. Route 1 runs Rte 10 (Ames Rd) to Rte 163 and beyond. Route 2 runs Seebers Ln., Clinton Rd, Fredericks St, Marshville Rd. Route 3 runs Heiser, Fisk Hill Rd, Clinton Rd, Nestle Rd, Tanners Rd, Ridge Rd, Shaper Ave, Cliff St. Route 4 runs completely over this territory. Pick up times are 6 - 8 am. Drop off times are 2:30 to 4:30 pm.

2.8 Emergency Responder Information

A request for information was sent to local emergency responders identified within and around the Facility Area (i.e., Canajoharie Police, Fort Plain Police, Montgomery County Sheriff, New York State Police, Canajoharie Fire Department, South Minden Fire Department, Fort Plain Fire Department, and Mid County Volunteer Ambulance). This request contained a map showing the suggested emergency response routes to the proposed Facility and requested each local emergency responder verify the routes they would take to the Facility Site when responding to a possible emergency. As of April 8, 2019 no responses have been received. See Appendix E of the Route Evaluation Study for the maps depicting the potential emergency routes for all the local emergency responders.

During these consultations, the Applicant provided information to the local first responders regarding the Facility, the Article 10 process, and the Applicant's anticipated interactions with the local first responders during Facility construction and operation. The Applicant has developed a fire and emergency training and communication plan as part of this Article 10 process. A copy of the plan can be found in Appendix __. Based on consultations to date with the local first responders, there are no concerns with accessing the Facility Site. The Applicant will have employees on-site trained in responding to emergency situations

A map of all emergency service provider locations and routes will be posted in the Facility's collector substation and the O&M building and provided to the local emergency service providers.

2.1 Roadway Permits and Road Use Agreements

Special hauling permits are required when loads exceed legal dimensions or weights. The types of permits depend on the characteristics of the vehicle and its cargo, number of trips, distance traveled, and duration. The permit process can be completed online for Divisible and Non-Divisible Load Overweight Permits. The NYSDOT Website, <https://www.dot.ny.gov/nypermits> outlines the guidelines, types and fees for various special hauling permits. The applicant or other responsible party such as the Contractor or equipment supplier will need to set up an account to complete the permit process online. Additional information can also be found at www.NYPermits.org. Additionally, Highway Work Permits will be required from the respective municipalities for intersection and roadway improvements within the Public rights-of-ways.

Due to the excessive weight of the substation transformer, the following permits are anticipated:

- Special Hauling Permit (Non-Divisible Load)

In conjunction with this Application, the Applicant has consulted with the Highway Superintendent for the Towns of Minden and Canajoharie to identify all required town permits and to discuss each host Town's RUA. See Exhibits 31 and 32 for additional information.

Table 25-3. Roadway Agreement and Permit Table

Government Agency	Road Use Agreement	Highway Work Permit for Work Within Public ROW	Special Haul Permit for Oversized/Overweight Vehicles	Divisible Load Overweight Permit	Contact Information
Town of Canajoharie	X				Highway Superintendent Timothy Jones 518-673-5005
Town of Minden	X				Superintendent of Highways Joseph Hanifin 518-993-3351
Montgomery County	X	X	X		Director of Highways and Bridges Shawn Cotton 518-853-3814
NYSDOT		x	X	X	NYSDOT Transportation Region 2 Bridge Inspection, Design, Consultant Questions Brian Hoffmann 315-793-2429

A separate RUA will be executed between the Applicant and Montgomery County and each host Town to memorialize the rights and obligations for road use and repair during the Facility's construction phase. A sample RUA is included as Appendix ___ to the Application.

The use of private property adjacent to public roads will be permitted through a lease or easement agreement executed between the Applicant and landowner.

3 Haul Route Identification

3.1 Haul Route Recommendations

When evaluating viable transportation routes for delivery vehicles and construction vehicles going to the Facility sites, several items were considered. These items are:

- The roadway characteristics and condition
- The number of bridges and large culverts along a designated route
- The condition of the bridges and culverts that are along the route
- The number of intersections where turning movements will be made
- Roadways with minimal sharp curves and/or steep grades to avoid additional mitigation and/or safety issues
- Various potential restrictions such as narrow bridges/large culverts, low overhead clearances and impacts from small intersection radii affecting the turning movements.

Based on this assessment, the following are recommended routes to the various facility sites (see Appendix A for Haul Route Map):

Haul Route #1 – To North and West Facility Area, Arrays 1C, 1D, 1E Substation and O&M Buildings:

Construction vehicles will exit NY-90 at exit 29, turn right on East Main (Rt 5S) and follow the designated Truck Route to Erie Boulevard to turn right towards Church Street (NY 10). They will make another right to travel southbound on Church Street (NY 10). They will take Church Street (NY 10) to Cliff Street on the right. From Cliff Street they will make a left onto Shaper Ave and continue onto Ridge Road. Ridge Road turns into Clinton Road (Rt 80) there is access to arrays 1C, 1D, 1E, substation, and O&M buildings off Clinton after Heiser Rd. Other deliveries will continue on Clinton southbound. All Haul Route #1 deliveries will follow these directions until this point.

Haul Route #1A – To Arrays 1A, 2A, 2B, 2C, 2D, 2E, 2F, 2G, 2H, 3A, 3B, 3D and 3G:

Deliveries will make a right on Nestle Road and access arrays 1A, 2G, 2H and 3G from Nestle Road, deliveries to arrays 2A, 2B, 2C, 2D, 2E, and 2F will continue to Cherry Valley Road (NY 3) turning right to go north to Moyer Drive

Haul Route #1B – To Arrays 4A, 4B, 4C, 4D, 3C, 3E, 3F, 3H, 3I, and 3J:

The vehicles traveling to arrays 4A, 4B, 4C, 4D, 3C, 3E, 3F, 3H, 3J, and will follow Route #1 and continue on Clinton Road (Rt 80) to Marshville Road where they will turn right accessing the array entrances from Marshville Road.

Haul Route #1C – To Arrays :

The vehicles destined to arrays will follow the first portion of the above directions but continue on Clinton Road (Rt 80) past Marshville Road to Dygert Road and Tanners Road those delivering to arrays 3K and 3L will turn right onto Tanners Road. Deliveries to arrays 4E, 4F, and 4G will turn left to access the array entrances from Dygert Road.

Haul Route #2 – To the South East Facility Areas:

Construction vehicles will exit NY-90 at exit 29, turn right on East Main (Rt 5S) and follow the designated Truck Route to Erie Boulevard to turn right towards Church Street (NY 10). They will make another right to travel southbound on Church Street (NY 10). They will continue on Church Street (NY 10) to Ames Road (NY 10) southbound until making a right turn on to Marshville Road (CR 86). All Haul Route #2 deliveries will follow these directions until this point.

Haul Route #2A – To Arrays 4K and 4L:

The vehicles traveling to arrays 4K and 4L off Fredricks Road will follow the first portion of the above directions then will make a right on Fredricks Road and access array entrances on the left from Fredricks Road.

Haul Route #2B – To Arrays 4H and 4I:

Deliveries to arrays 4H and 4I off Marshville Road will continue on Marshville Road (Rt 86) westbound making a left turn into the array entrance.

In addition to above haul routes, a secondary Haul Route option has been identified that would allow legal weight vehicles to avoid traveling through the Town of Canajoharie, where lane width is limiting along a portion of Route 10. The secondary Haul Route accesses the arrays from U.S. Highway 20 and Route 10 northbound to Marshville Road (County Route 86). This route could provide an option for legal weight vehicles only and would not be an option for any overweight/oversize vehicles due to a R-Posted Bridge crossing in the Town of Sharron.

4 Facility Related Transportation Impact

4.1 Construction Vehicle Volumes

Construction equipment trips will include the following:

- 3-axle dump trucks with capacity of approximately 10 cubic yards (cy) per truck and an estimated gross weight of 50,000 pounds (lbs.), for access road construction. Approximately 19,334 cy are needed or approximately 1,933 truck deliveries.
- Concrete trucks for construction of sub-station and O&M building foundations and transformer pads with capacity of approximately 10 cy per truck and an estimated gross weight of 75,000 lbs. It is anticipated that there will be approximately 400 cy needed for the entire project or 40 concrete truck deliveries.
- Variety of conventional semi-trailers for delivery of solar panel arrays, sub-station components, O&M building, and interconnection facility material. The project currently plans for 326,349 solar panels to be used. Assuming a 52-foot flatbed truck (WB-67) is used, each delivery can carry approximately 750 panels per truck equaling approximately 435 truck trips for solar panels. It is estimated that the remaining construction material needed would add approximately 500 more truck trips of similar of smaller sized vehicles.
- Variety of conventional vehicles carrying contractor's equipment and tools, for construction or operation of the facility.
- During Facility construction, all trucks carrying water, fuels, or chemicals will utilize the identified haul routes.

Workers and employees in regular vehicles (pick up truck size or smaller) will not be limited to specific haul routes. Employees and workers accessing the site with heavy haul/construction equipment will follow specified haul routes. As identified earlier in this report a secondary Haul Route was identified for potential use for legal weight vehicles effectively limiting the impact of construction related vehicles on any one route.

Below is a table identifying the types and volumes of vehicles that are anticipated during construction. These trips will be spread over the length of the construction period, approximately 12 months, and distributed over the Facility Area to the various solar arrays. A more detailed schedule is to be developed with the contractor after detailed engineering is completed. The following is an assumed construction phasing sequence, construction vehicle volume generation assumptions, and schedule and table of estimated construction vehicle volumes for each primary haul route:

- Construction begins Q3 2020
- Site prep – earth moving equipment (Gravel Delivery) – 3 months
- Pier driving – 3-4 months (1-2 month overlap with start of next activity)
- Racking installation (Miscellaneous Delivery) – 3-4 months (1-2 month overlap with start of next activity)
- Panel installation (Panel Delivery)– 3-4 months (1-2 month overlap with start of next activity)
- Substation (Concrete and Overweight/Overwidth Delivery)– 3 month installation during Q2 2021
- Commissioning during Q3 2021

As presented in the following table (Table 4-1), an order-of-magnitude estimate of the total number of loaded truck trips associated with the Facility's construction is 2,462.

Table 4-1. Estimated Total Number of Loaded Truck Trips Required for Facility Construction

Component/Truck Type	Assumption	Trips
Gravel Truck	19,334 cy needed at 13 cy per truck delivery. *Routes may vary	1,487
Concrete Truck	400 cy needed for the entire project at 10 cy per concrete truck delivery	40
PV Panel Delivery Trucks	326,349 panels total, 750 panels per truck	435
Miscellaneous Deliveries	500 trips	500
Total		2,462

Note: trips represent a total number of entering and exiting (two way) project area heavy vehicles.

Existing traffic may experience short delays when construction vehicles are traveling to the Facility Area and on delivery route roadways. Ideally, deliveries would be limited to off peak hours to minimize delays when possible. Based on the estimated construction vehicle volumes there should be no noticeable delays to existing traffic. Maps of the access routes can be found in Appendix A of the Route Evaluation Study. Table 4-2 below identifies the vehicle routes/volumes for each phase of construction.

Table 4-2. Construction Vehicle Volumes

Construction Routes	Gravel (Cubic Yards)	Gravel Delivery Vehicle Volume	Concrete Mix (Cubic Yards)	Concrete Vehicle Volume	Number of Panels	Panel Delivery Vehicle Volume	Miscellaneous Delivery Vehicle Volume
Access Route #1	3867	298	200	20	65,270	87	100
Access Route #1A	7734	595	80	8	13,0540	174	200
Access Route #1B	2900	223	40	4	48,952	65	75
Access Route #1C	2900	223	40	4	48,952	65	75
Access Route #2A	967	74	20	2	16,317	22	25
Access Route #2B	967	74	20	2	16,317	22	25
Total	19,334	1,487	400	40	326,349	435	500

Existing roadways used for construction access routes that will temporarily experience this additional traffic could potentially have increased risk of vehicle accidents, due to the increase in traffic volumes. New traffic patterns and delays (new construction vehicle entrances on low volume roads, increased heavy truck traffic on these same roads, and delays at the intersections to allow oversized vehicle turning movements) are other factors that could affect safety. Potential routes that exhibited safety concerns (sharp curves, steep grades, restricted sight distance) were identified in this study and eliminated from consideration as viable routes where feasible. The remaining routes that are recommended for use are able to safely handle the passage of construction vehicles. Section 2.2 of this report summarized existing accident rates along these routes, which were used to predict the possible effect of additional traffic regarding safety. The highway with the greatest concentration and frequency of accidents is NYS Route 10, which is proposed to be utilized for all Access Routes. The historical data shows that 78% of the accidents were vehicle collisions at the intersection with NYS Route 5S, most of which were caused by driver inattention or disregarding traffic control devices. The other accidents along NYS 10 were due to animal action or hitting roadside fixed objects. None of these are factors that would apply to construction vehicles or could be otherwise avoided, so therefore the increase in traffic during construction of the proposed Facility should not exacerbate existing safety deficiencies.

To maintain the safety of all road users, there are preventative measures that can be implemented to reduce the potential risk of accidents during the construction phase of the Facility. Public notifications about the construction of the Facility is one measure that can be provided to warn drivers in advance what to expect when travelling within the construction area.

The overweight vehicle delivering the transformer will have certified escorts and/or police escorts when traveling to the construction sites. Daily construction trucks (concrete, gravel, equipment) typically have amber warning lights and/or construction warning signs attached to the back of the trucks conveying “CONSTRUCTION VEHICLE STAY 500 FEET BACK”, “CONSTRUCTION VEHICLE DO NOT FOLLOW”, or “SLOW MOVING VEHICLE” to alert motorists. Construction warning signs such as “CONSTRUCTION VEHICLES ENTERING” can be posted in advance of intersections with solar site access roads to provide awareness of the potential for construction vehicles entering and exiting these sites. When Overweight vehicles are traveling within the facility area and delivery route roadways, existing traffic may experience minor delays as escort vehicles and/or flag persons stop traffic to allow the safe passage of the Overweight vehicles. Additional construction signs such as “BE PREPARED TO STOP” and “FLAGGER AHEAD” can be placed in advance of these areas to provide advance warning to motorists.

Short term closures may be required for the delivery of the transformer, especially roads with narrow pavement or clearance obstructions. If a closure is necessary, an off-site detour (re-routing traffic around the closure) can be implemented during the road/intersection closure to minimize delay to motorists and reduce the potential risk of accidents. Additional construction signing would be placed along the detour route to guide motorists back to their original destination route. Additional measures can be placed in the contract documents as an Internal Traffic Control Plan for the project. These measures can include implementing a reduced speed limit for construction vehicles, establishing procedures for construction vehicles entering and exiting the work zone, placing time restrictions for construction vehicle travel, coordination with local municipalities and the traveling public on traffic pattern changes, and continued inspection along the access routes for any safety deficiencies during the construction phase.

4.2 Construction Route Level of Service

A capacity analysis was performed for the study area using Highway Capacity Software (HCS) by combining the existing condition traffic volumes and additional construction traffic volumes to estimate the construction route Level of Service during the construction phases. Level of Service (LOS) is a qualitative measure used to relate the quality of traffic service. LOS is used to analyze highways by categorizing traffic flow and assigning quality levels of traffic based on performance measure like speed, density, etc. North American Highway LOS standards, as described in the Highway Capacity Manual and the AASHTO Geometric Design of Highways and Streets use letter designations of A through F to describe levels of service, with A being the best and F being the worst.

It was assumed that all the Facility sites had the same start and completion date, worked 12 hour days, 6 days a week, 4 weeks per month for a duration of 12 months. The analysis showed that there was very little increase from the Existing Peak Hour Volume compared to the Future Construction Phase Peak Hour Volume. Along the proposed Haul Routes, it was determined that all roadway segments had a Level of Service A or B and would not change (existing and future during construction). As the existing traffic volumes are low, local traffic flow should not be significantly impacted by the normal construction traffic or during the panel delivery vehicles. As mentioned in the previous section, local traffic may experience minor delays due to slow moving construction vehicles and increased traffic related to the construction activities. To minimize any delays to local traffic during the construction phase, the Owner/Contractor will be required to coordinate with the State, County and local Municipalities to respond to any locations that may experience any traffic flow or capacity issues. See Appendix B for the Table of Level of Service.

4.3 Post Construction Needs

After construction, the Facility will employ approximately 3-4 full time employees, all of whom may drive separately to the Operation and Maintenance (O&M) building. Some of these personnel will need to visit each Facility Site location, as well as the collector sub-station and return to the O&M building. Panel arrays and the sub-station typically requires routine maintenance visits once every 3 months, but certain sites or other facility improvements may require periods of more frequent service visits, should a problem arise. Such service visits typically involve 1 to 2 pick-up trucks. The post-construction traffic will not have a significant impact on the Level of Service for the highway system, or require special transportation considerations, such as building new roads, so in conclusion, there are no long term impacts.

5 Public Transit and Airport Impact

5.1 Public Transportation and Airports

There are no mass transit systems within the Facility Area. Accordingly, mass transit systems are not anticipated to be affected by the construction and operation of the Facility and are not addressed in this Application

Using aeronautical charts, airport approach plates, airport 5010 forms, and other available sources, the Applicant identified nine airports and airstrips located in the vicinity of the Facility, as listed below.

- Canajoharie Airport, Canajoharie NY
- Hop House Airport, Canajoharie NY
- Russell Airport, Sprakers NY
- Boyles Landing Airport, Sharon Springs NY
- O'Riley Airport Fort Plain NY
- Nellis Airport Fort Plain NY
- Tomcat Airport, Fort Plain NY
- Hickory Acres Airport, Fort Plain NY

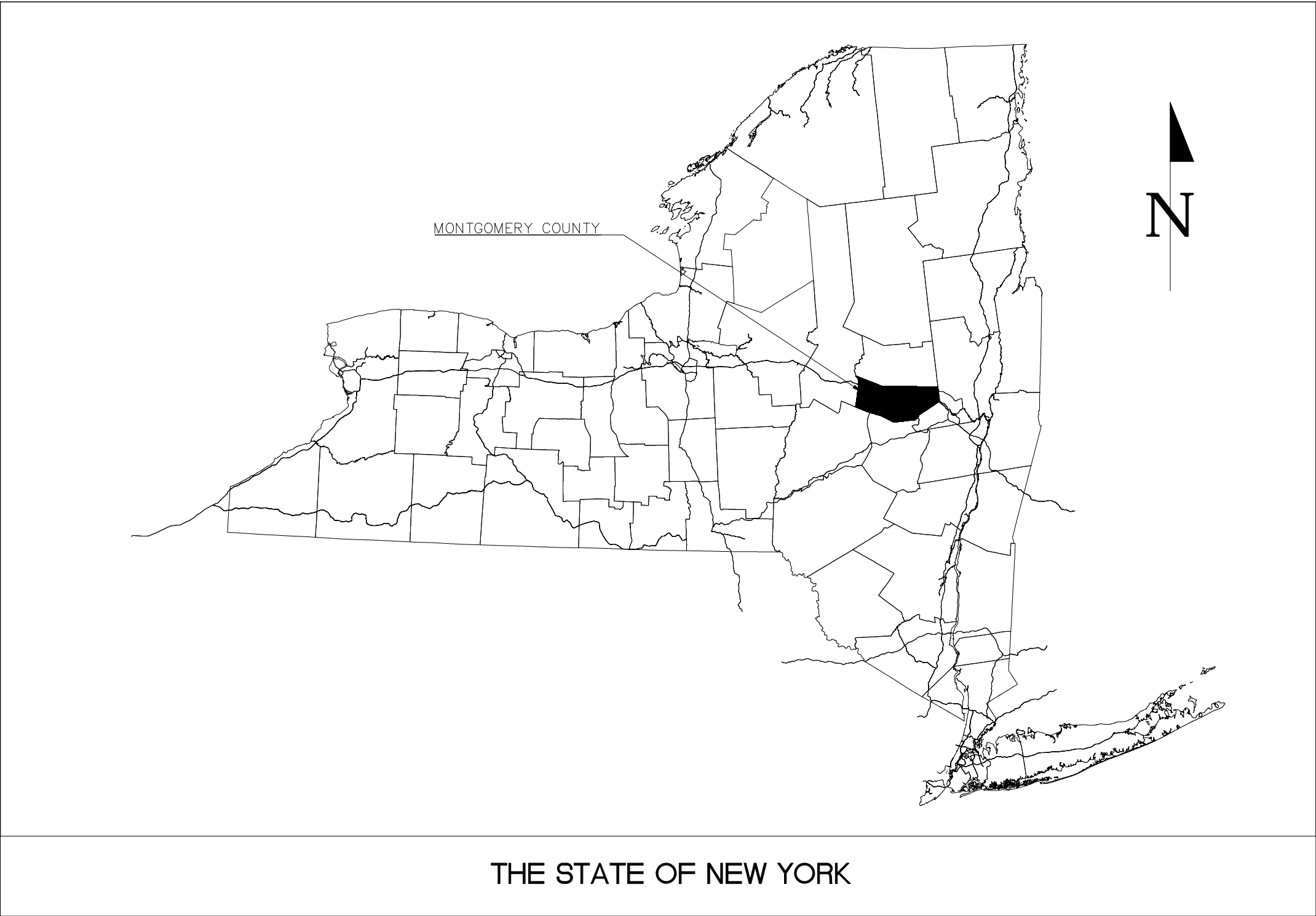
Neither the construction nor the operation of the Facility are anticipated to affect aviation. Therefore, consultations with the airports were not conducted and will not be addressed in this Application.

Appendices

A.	Location Map, Facility Map, Haul Route Map	2
B.	Traffic Volumes, Level of Service	3
C.	Existing Accident Data	4
D.	Bus Route Information	5
E.	Emergency Responder Route Maps	6
F.	Roadway Evaluation and Restriction Information	7
G.	Roadway Rating Photographs	8

A. Location Map, Facility Map, Haul Route Map

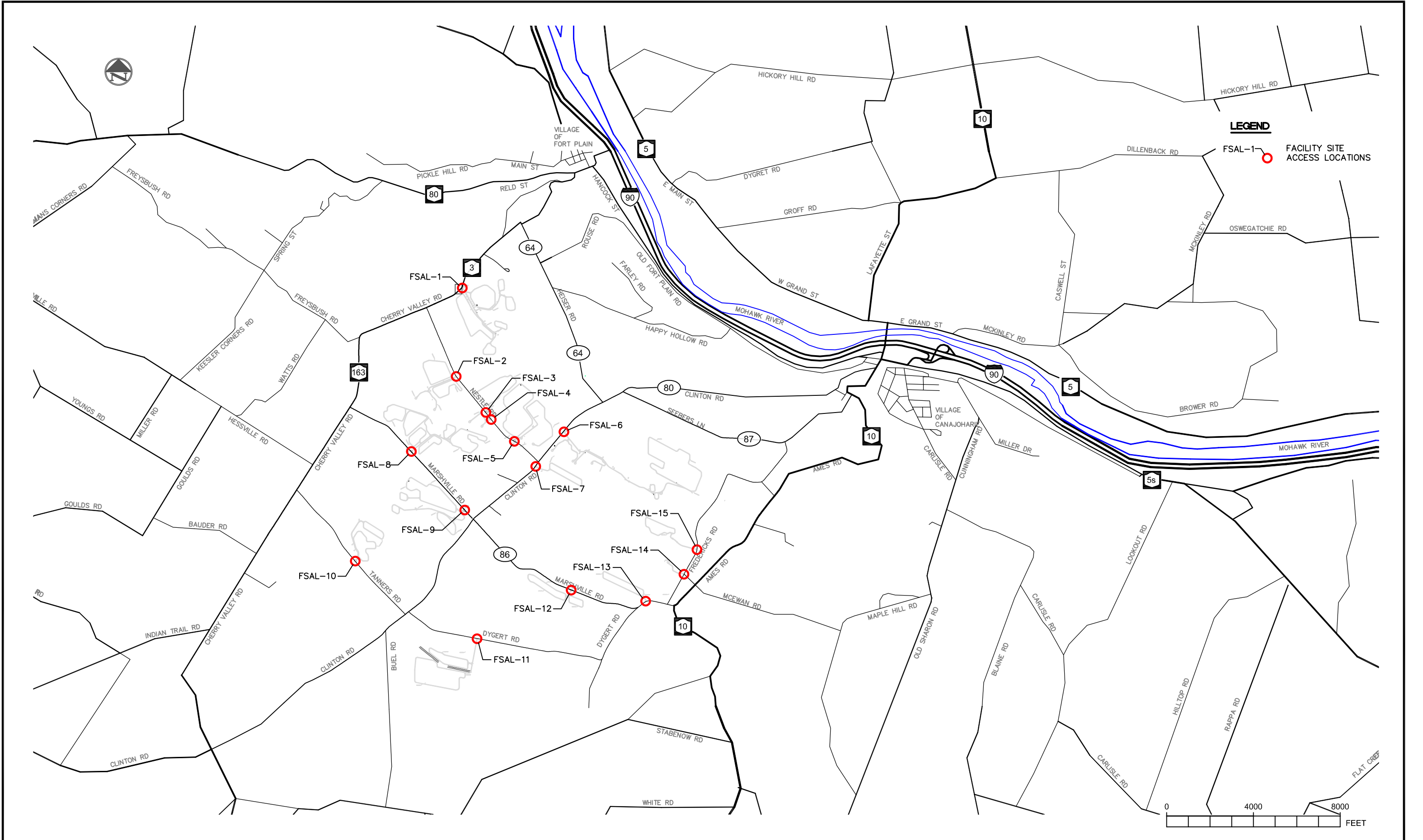
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CONCEPTUAL - NOT FOR CONSTRUCTION

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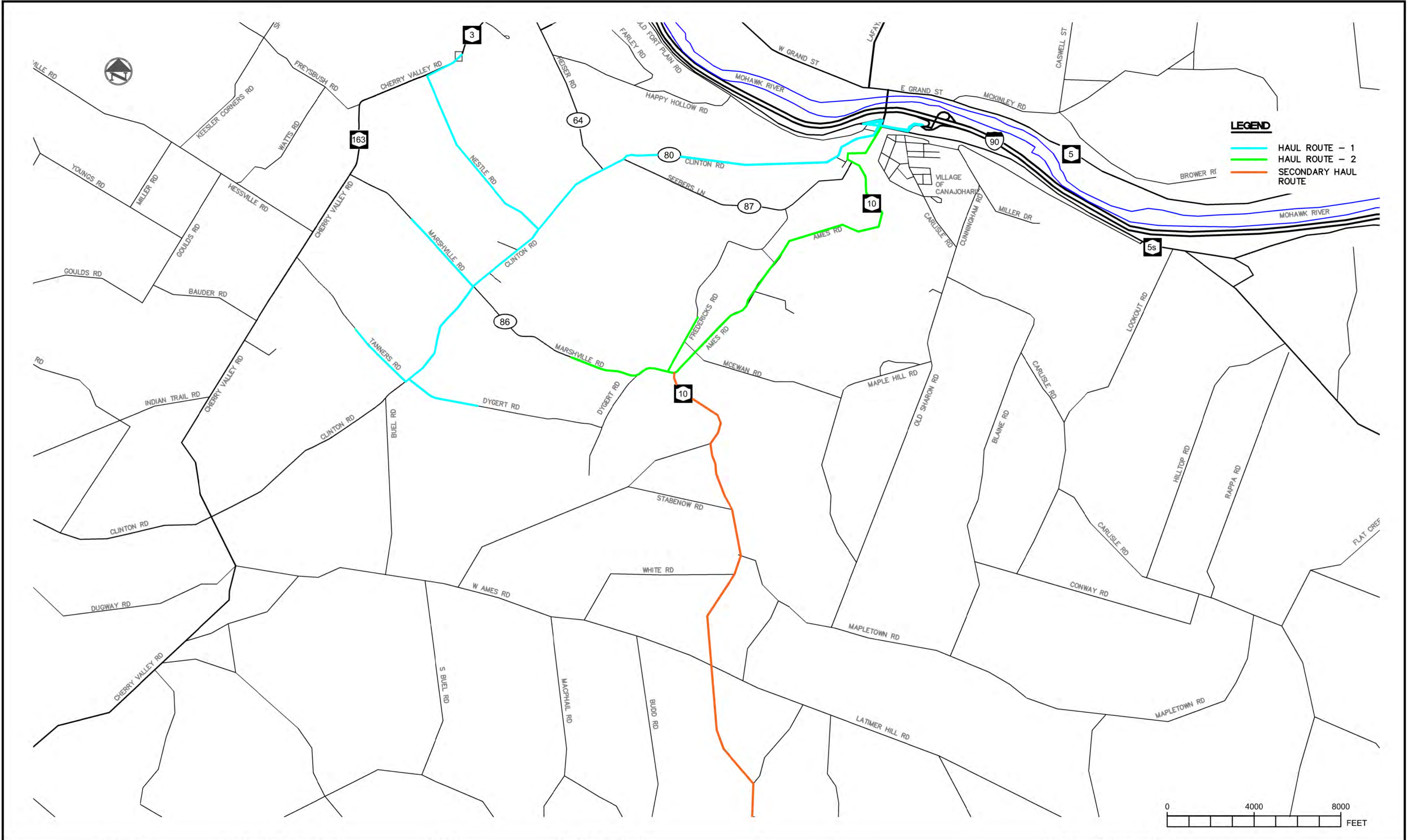




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MOHAWK SOLAR PROJECT		
FACILITY MAP		



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MOHAWK SOLAR PROJECT
HAUL ROUTES

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D. Bus Route Information

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Along Current (2018-19) Bus Route

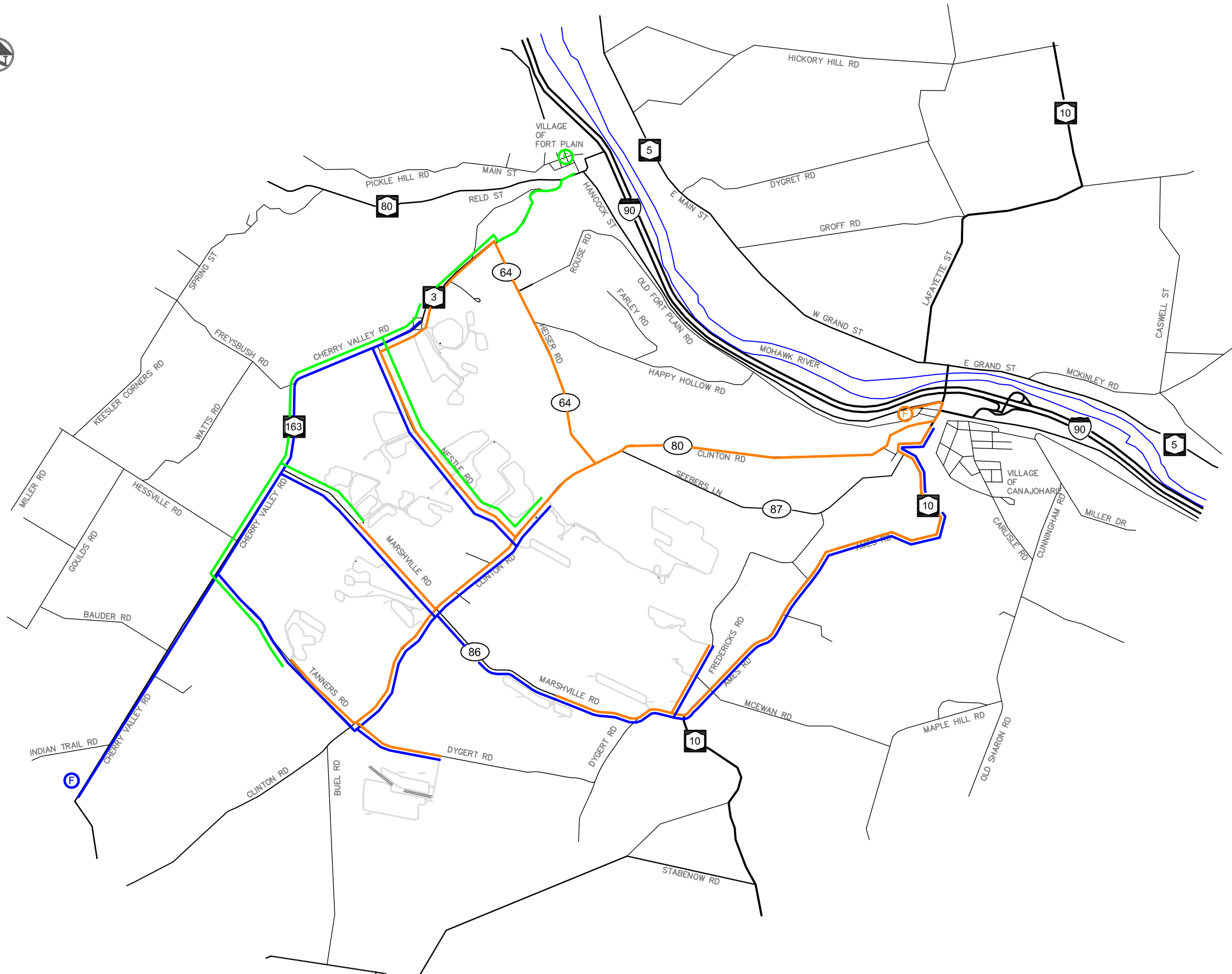
Construction Routes	Canajoharie Central School District	Cherry Valley Central School District	Fort Plain Central School District
Access Route #1	Yes	No Response	No Response
Access Route #1A	Yes	No Response	No Response
Access Route #1B	Yes	No Response	No Response
Access Route #1C	Yes	No Response	No Response
Access Route #2A	Yes	No Response	No Response
Access Route #2B	Yes	No Response	No Response

*School bus routes are subject to change based on student demand.

**Buses run 6-8am and 2:30-4:30pm durring school year

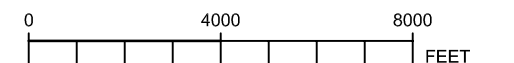
E. Emergency Responder Route Maps

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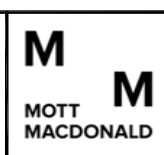


LEGEND

- Ⓡ CANAJOHARIE FIRE DEPARTMENT
- RESPONSE ROUTE
- Ⓡ SOUTH MINDEN FIRE DEPARTMENT
- RESPONSE ROUTE
- Ⓡ FORT PLAIN FIRE DEPARTMENT
- RESPONSE ROUTE



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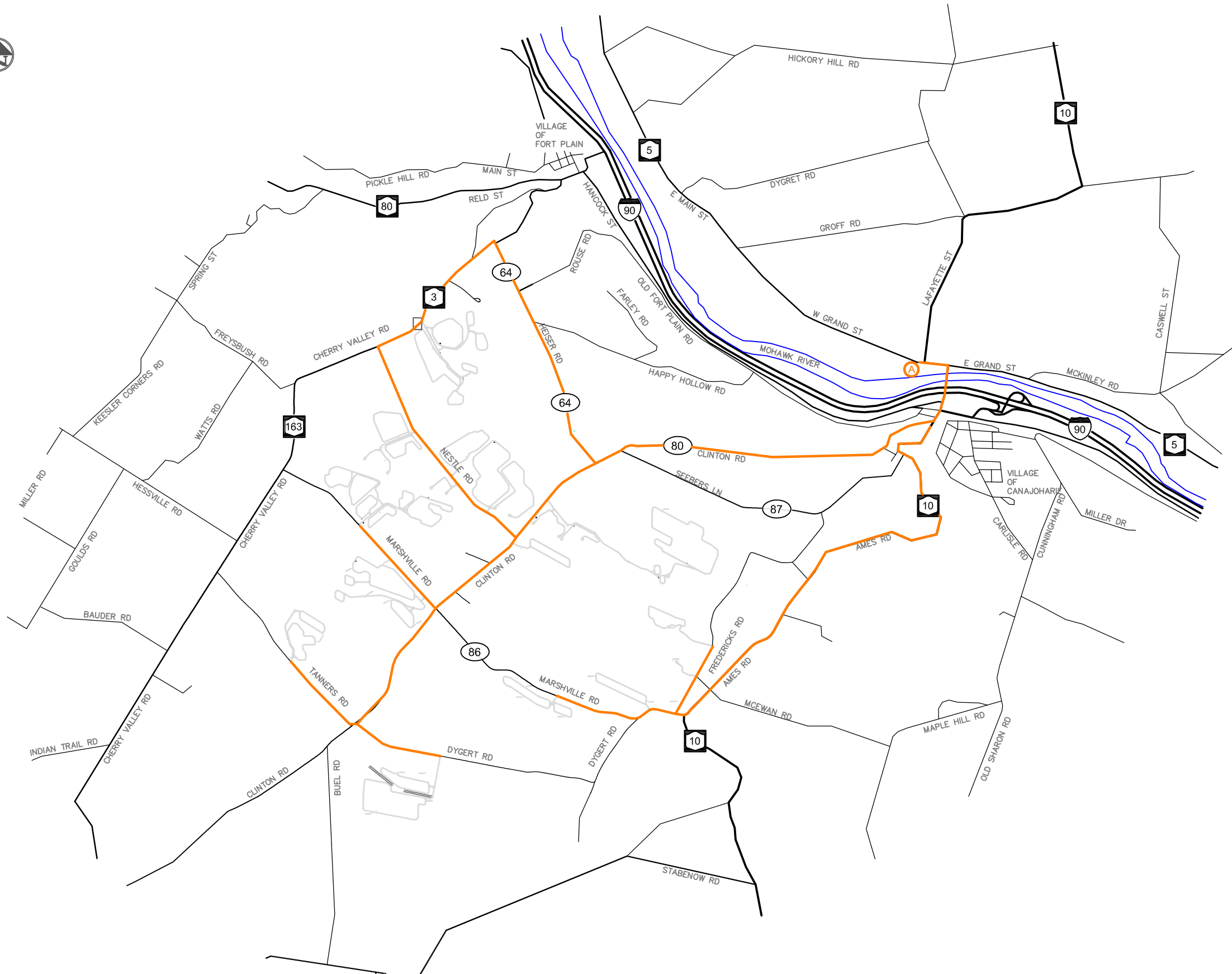
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MOHAWK SOLAR PROJECT
FIRE DEPARTMENT EMERGENCY
RESPONSE ROUTES



SCALE: 1" = 4000'

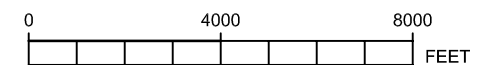
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LEGEND

-  MID COUNTY VOLUNTEER AMBULANCE
-  RESPONSE ROUTE



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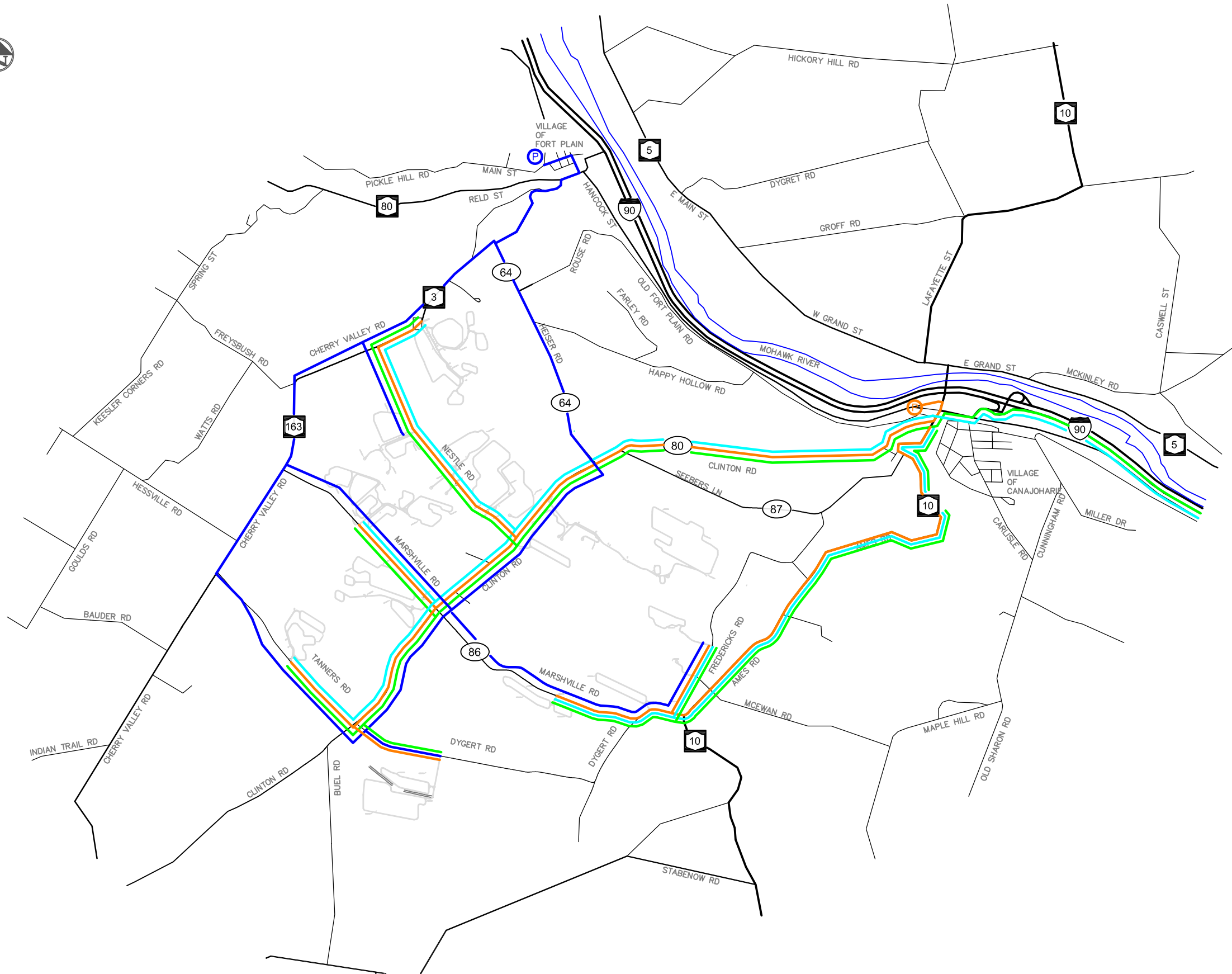


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MOHAWK SOLAR PROJECT
AMBULANCE EMERGENCY
RESPONSE ROUTES

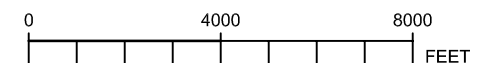
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SHEET 2 OF 3 REV **A**



LEGEND

-  CANAJOHARIE POLICE DEPARTMENT
-  RESPONSE ROUTE
-  FORT PLAIN POLICE DEPARTMENT
-  RESPONSE ROUTE
-  NY STATE POLICE (FULTONVILLE NY)
-  RESPONSE ROUTE
-  MONTGOMERY COUNTY SHERIFF DEPARTMENT
-  RESPONSE ROUTE



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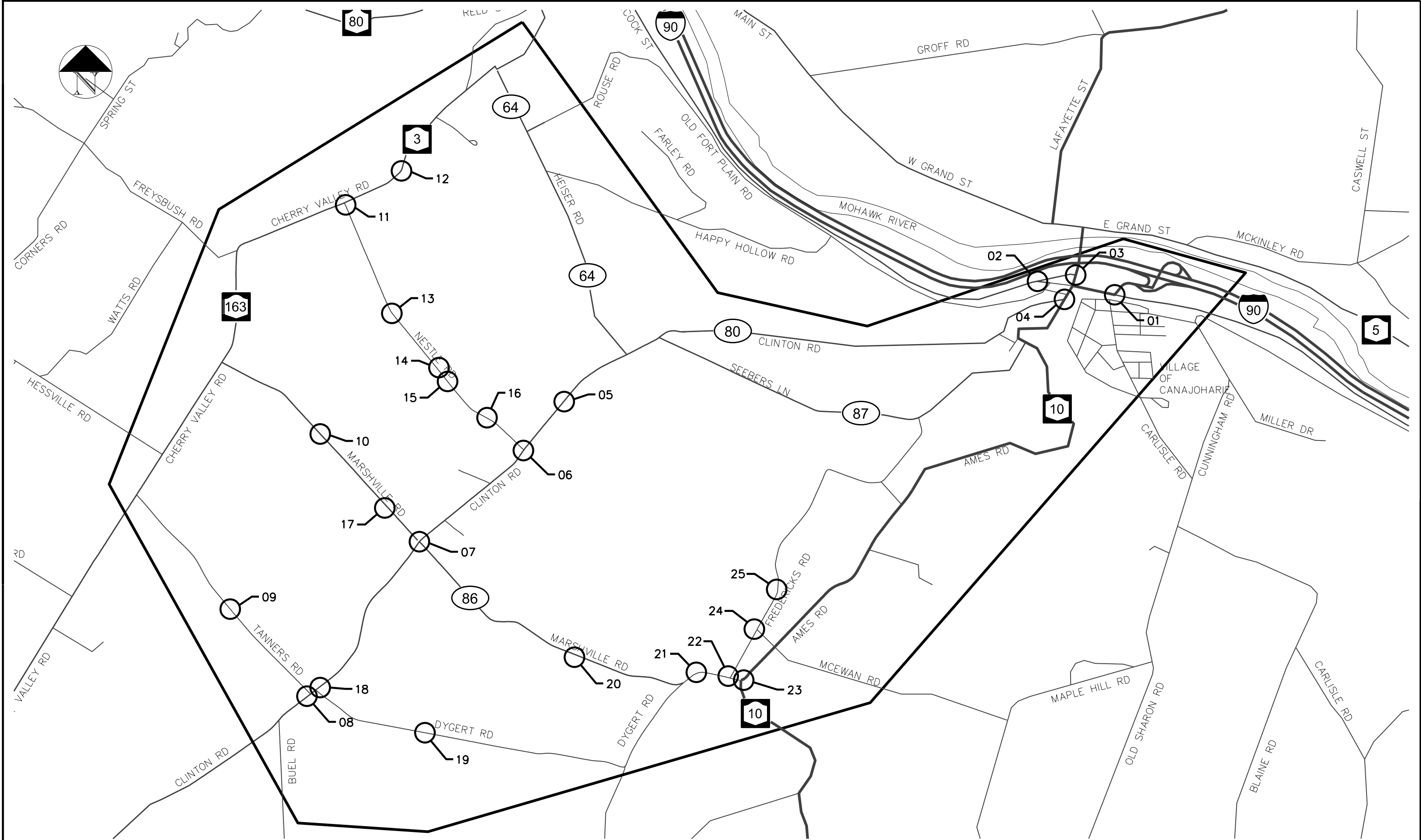
MOHAWK SOLAR PROJECT
POLICE DEPARTMENT EMERGENCY
RESPONSE ROUTES

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SHEET 3 OF 3 REV **A**

F. Roadway Evaluation and Restriction Information

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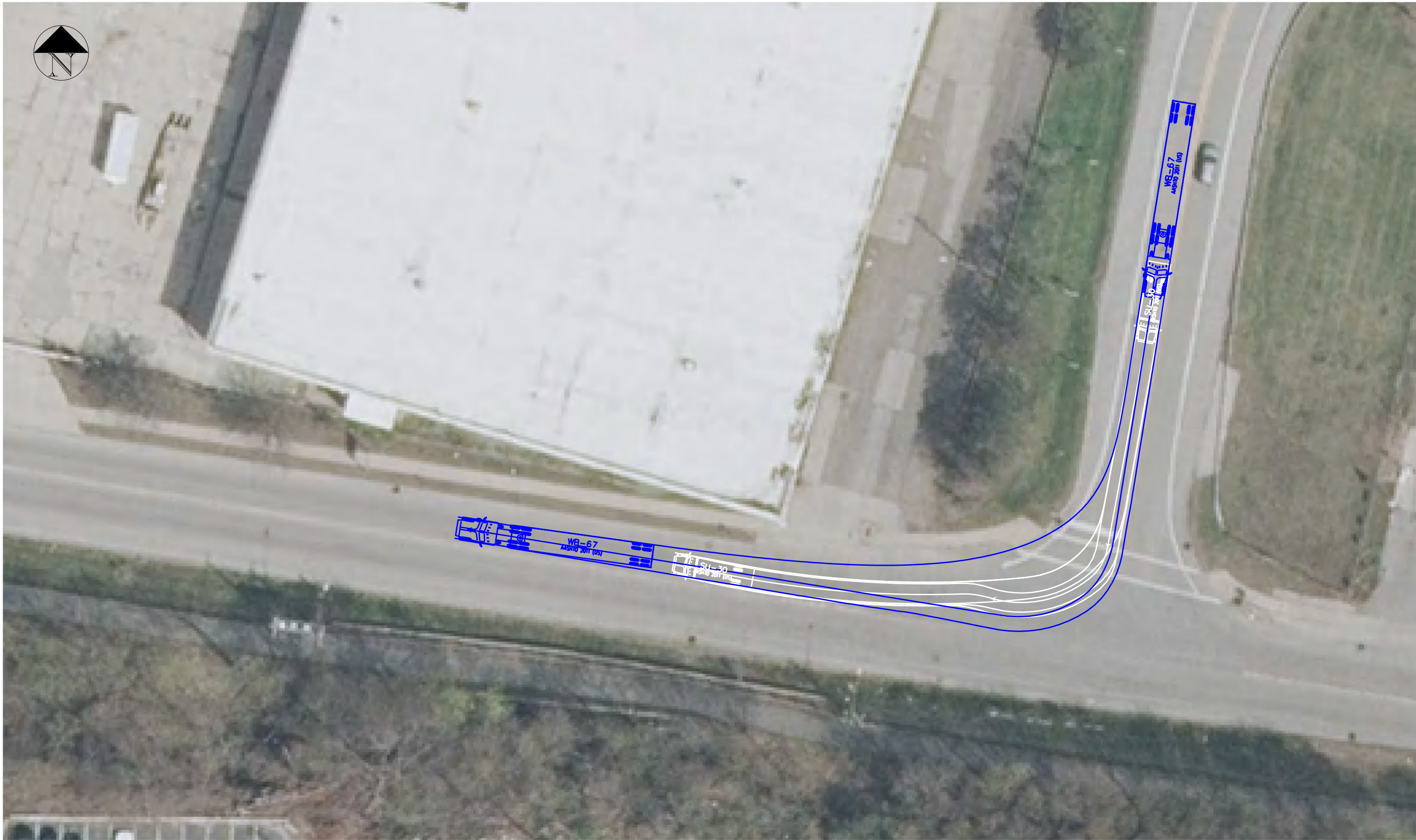


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TURNING MOVEMENT KEY PLAN

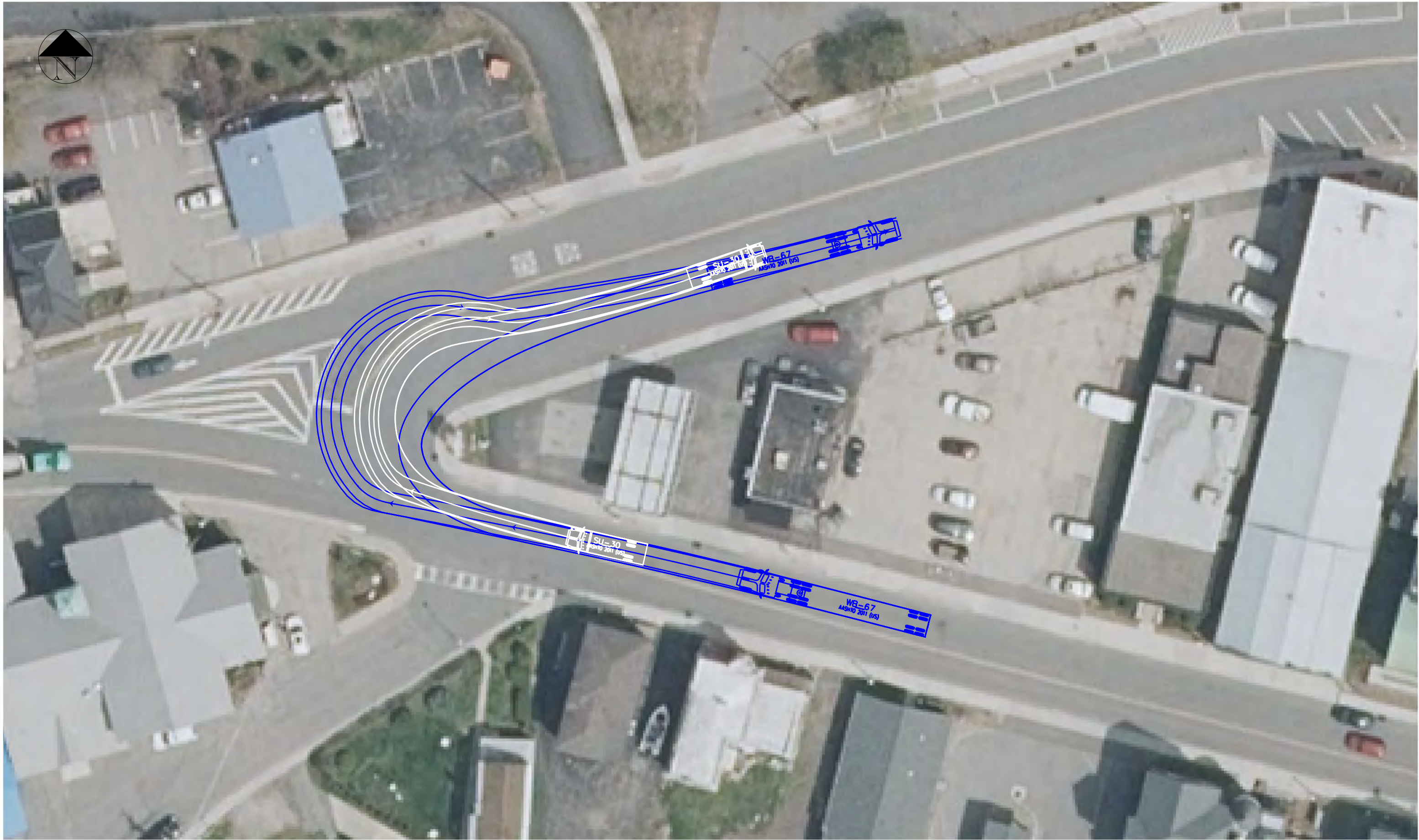


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TURNING MOVEMENT 01			
AASHTO WB-67 VEHICLE			
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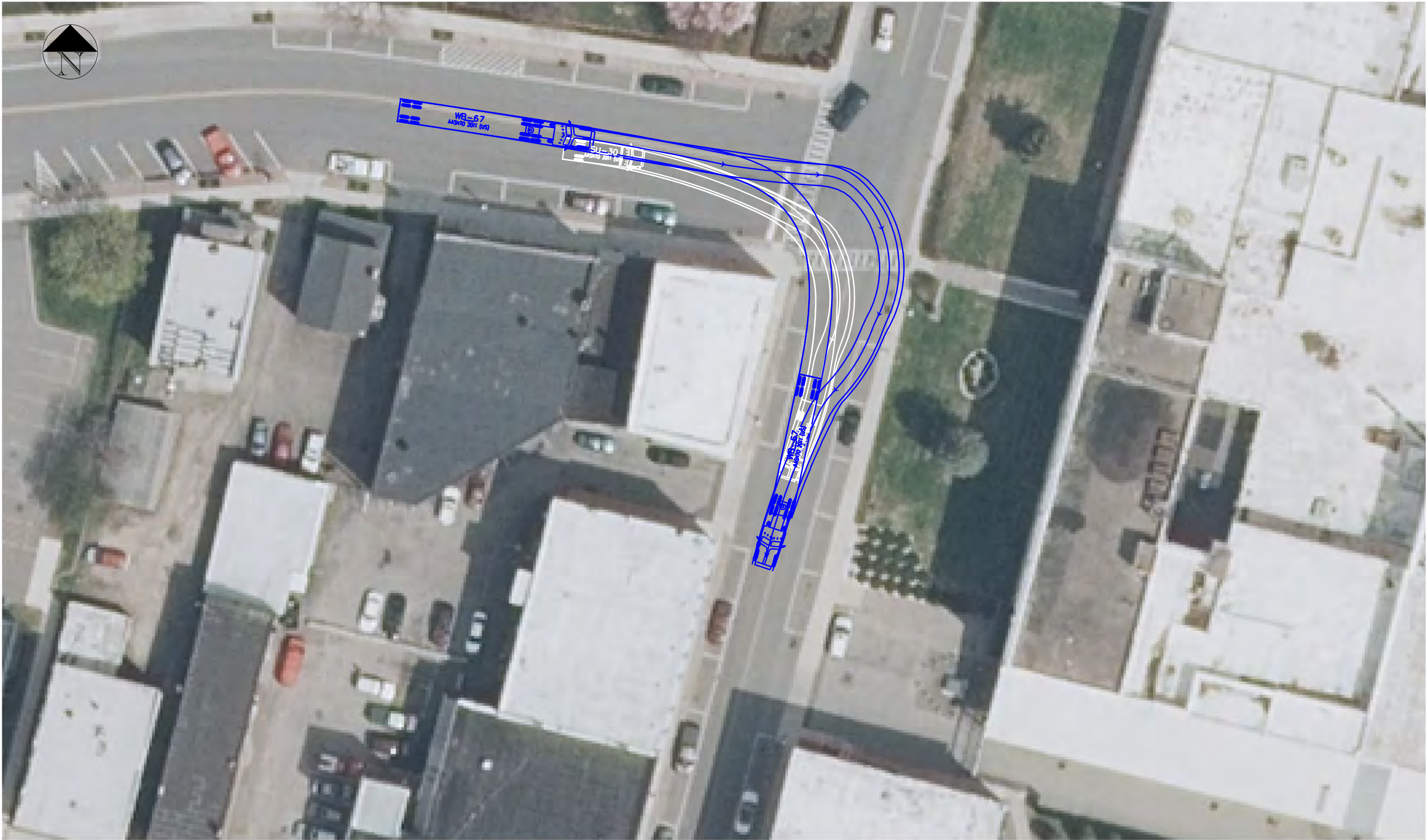


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AASHTO WB-67 VEHICLE			
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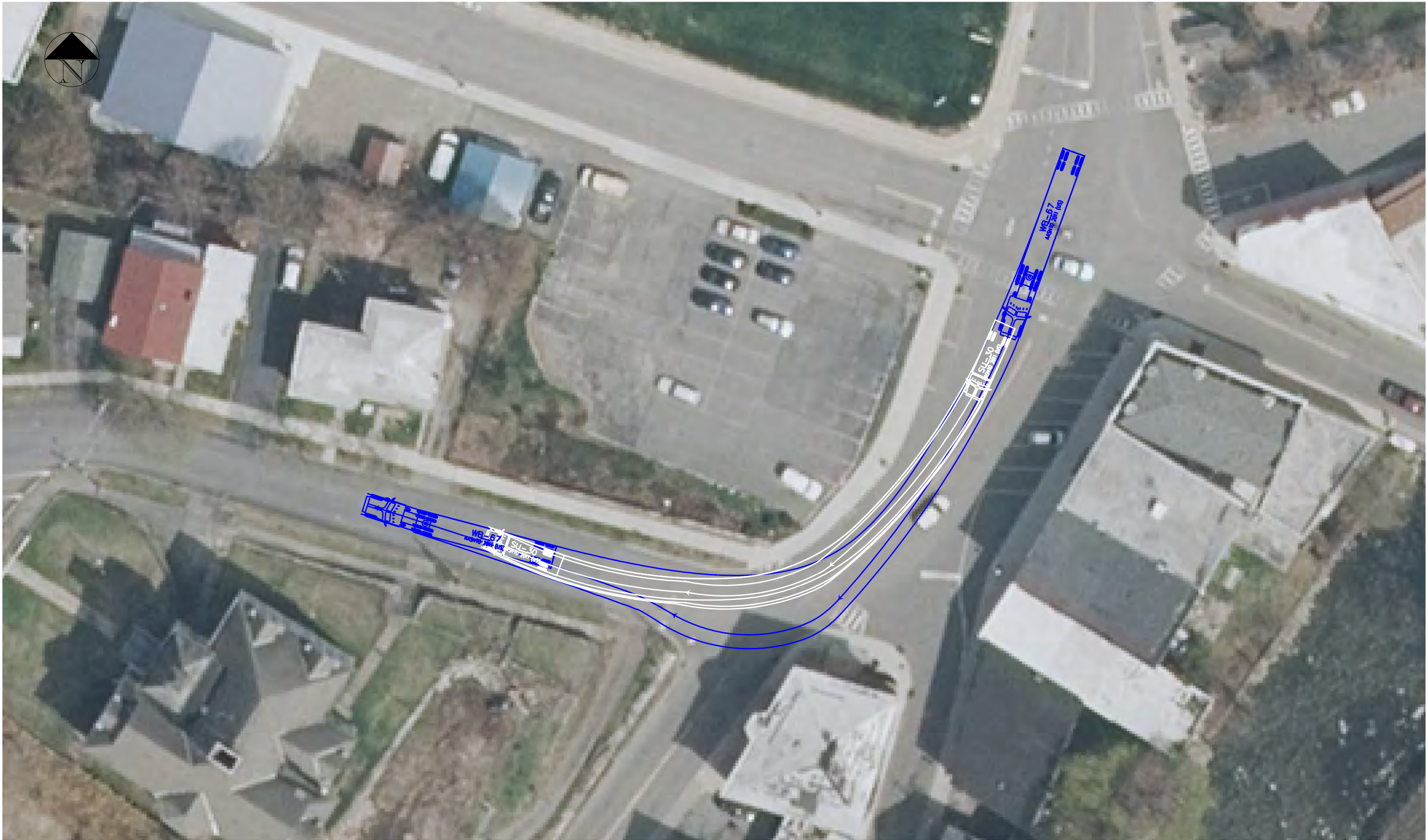


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TURNING MOVEMENT 03					
AASHTO WB-67 VEHICLE					
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AASHTO WB-67 VEHICLE			
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TURNING MOVEMENT 05			
AASHTO WB-67 VEHICLE			
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TURNING MOVEMENT 06			
AASHTO WB-67 VEHICLE			
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TURNING MOVEMENT 07			
AASHTO WB-67 VEHICLE			
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TURNING MOVEMENT 08			
AASHTO WB-67 VEHICLE			
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TURNING MOVEMENT 09			
AASHTO WB-67 VEHICLE			
SCALE: N.T.S.	DWG.NO.	SHEET	REV



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TURNING MOVEMENT 10			
AASHTO WB-67 VEHICLE			
SCALE: N.T.S.	DWG.NO.	SHEET	REV



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TURNING MOVEMENT 11			
AASHTO WB-67 VEHICLE			
SCALE: N.T.S.	DWG. NO.	SHEET	REV



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TURNING MOVEMENT 12 CUSTOM EMERGENCY FIRE VEHICLE			
SCALE: N.T.S.	DWG. NO.	SHEET	REV



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TURNING MOVEMENT 13 CUSTOM EMERGENCY FIRE VEHICLE			
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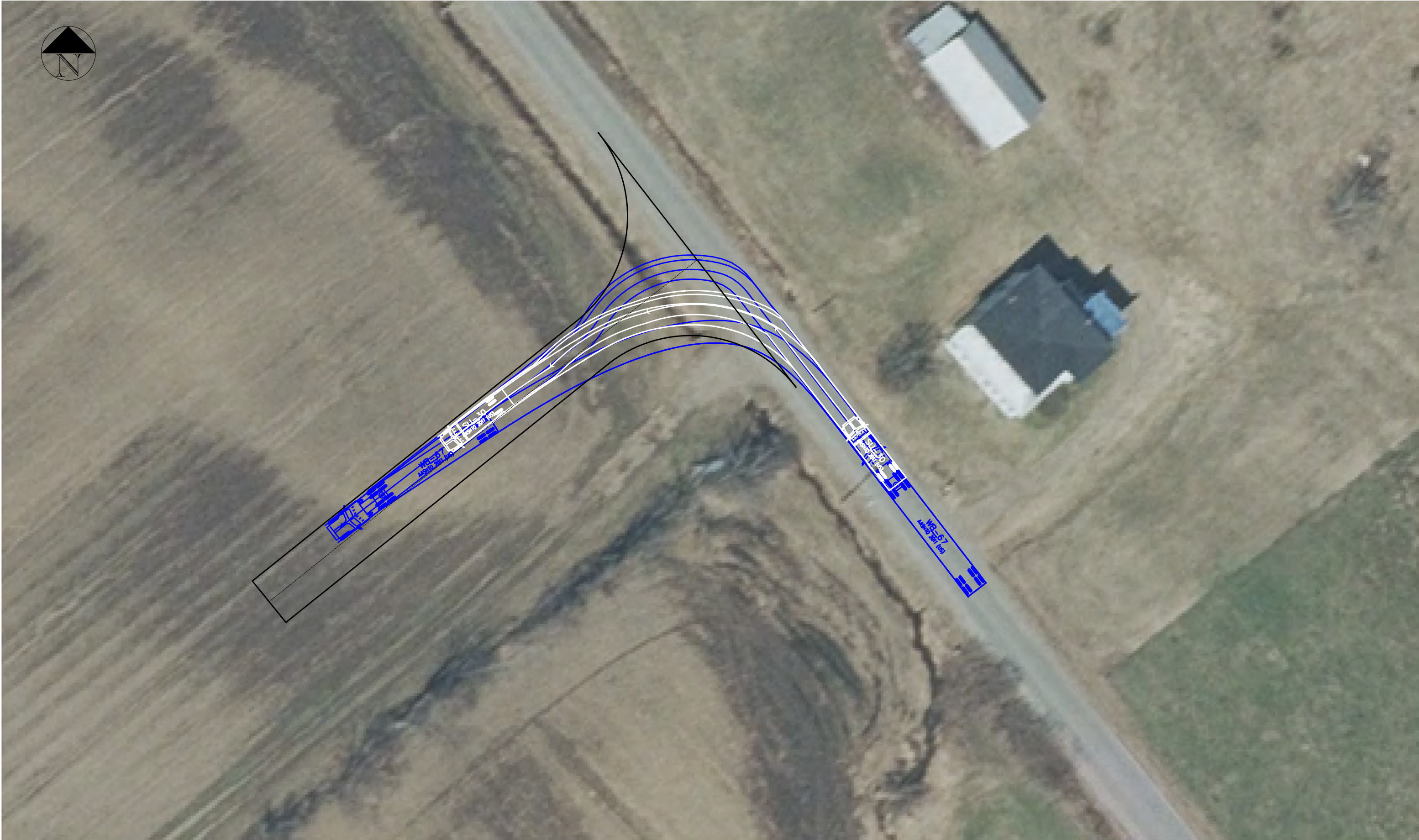


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TURNING MOVEMENT 14			
CUSTOM EMERGENCY FIRE VEHICLE			
SCALE: N.T.S.	DWG.NO.	SHEET	REV

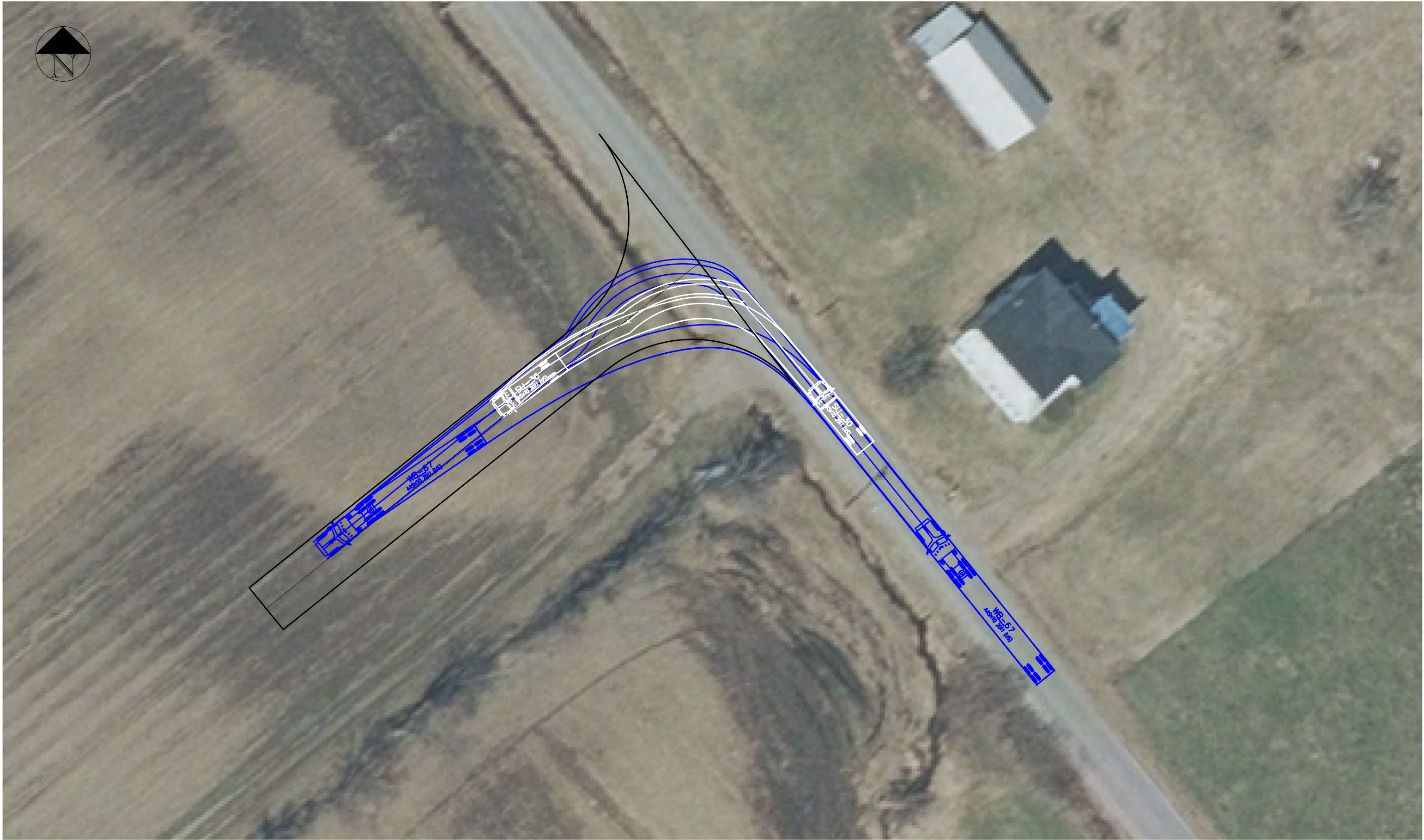


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TURNING MOVEMENT 15 CUSTOM EMERGENCY FIRE VEHICLE			
SCALE: N.T.S.	DWG.NO.	SHEET	REV



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TURNING MOVEMENT 16 CUSTOM EMERGENCY FIRE VEHICLE			
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ENGINEERING RECORD		<div style="text-align: center;"> <h1>TURNING MOVEMENT 17</h1> <h2>CUSTOM EMERGENCY FIRE VEHICLE</h2> </div>			
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TURNING MOVEMENT 18
AASHTO WB-67 VEHICLE

SCALE: N.T.S.	DWG.NO.	SHEET	REV
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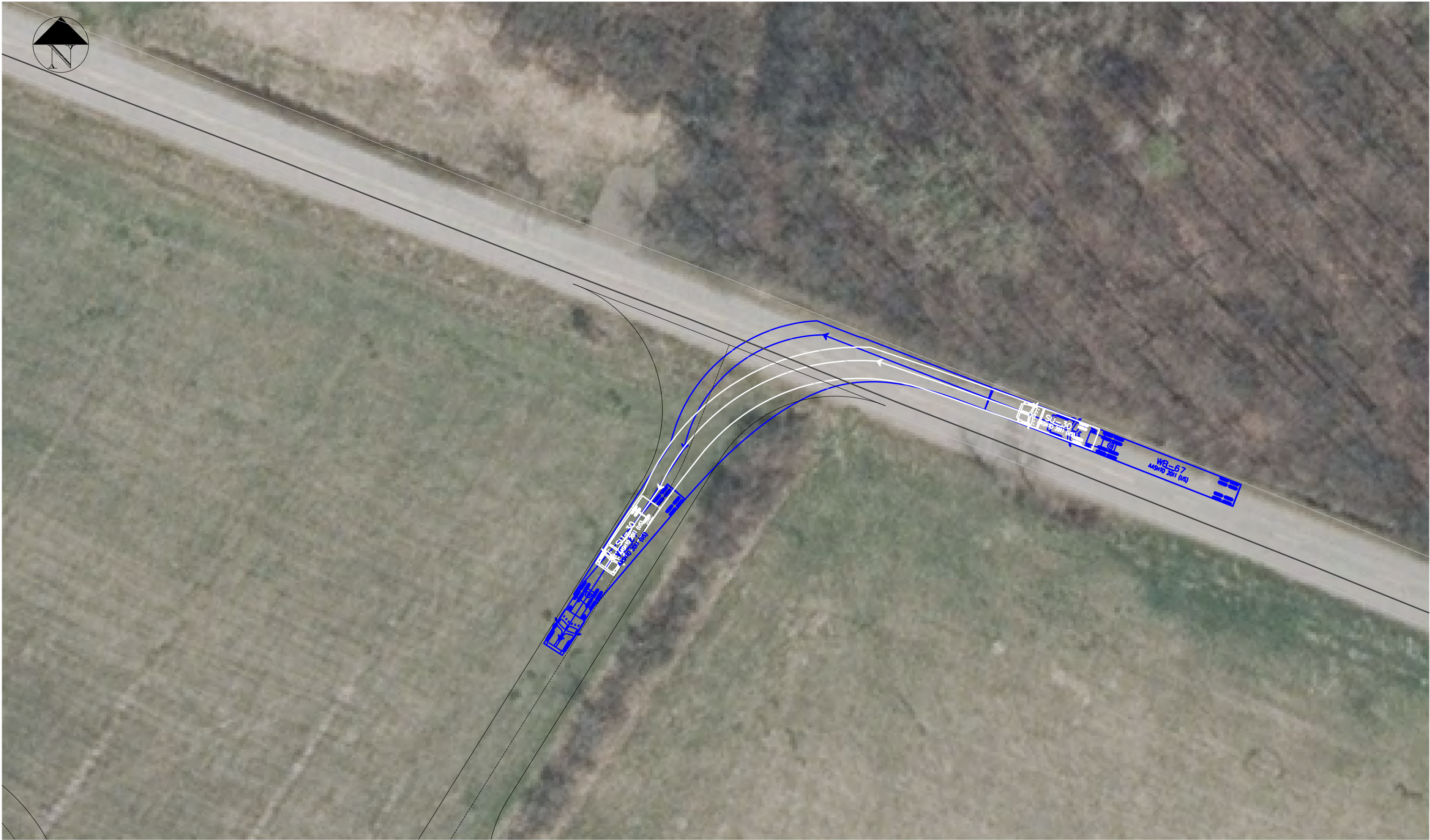
NO.	REVISIONS	DATE	BY	CHK	APR	NO.	REVISIONS	DATE	BY	CHK	APR

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TURNING MOVEMENT 19
AASHTO WB-67 VEHICLE

SCALE: N.T.S.	DWG.NO.	SHEET	REV
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NO.	REVISIONS	DATE	BY	CHK	APR	NO.	REVISIONS	DATE	BY	CHK	APR

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TURNING MOVEMENT 20				AASHTO WB-67 VEHICLE		
SCALE: N.T.S.	DWG.NO.	SHEET	REV			



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TURNING MOVEMENT 21
AASHTO WB-67 VEHICLE



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TURNING MOVEMENT 22
AASHTO WB-67 VEHICLE



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TURNING MOVEMENT 23
AASHTO WB-67 VEHICLE



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TURNING MOVEMENT 24
AASHTO WB-67 VEHICLE



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TURNING MOVEMENT 25
AASHTO WB-67 VEHICLE

SCALE: N.T.S.	DWG.NO.	SHEET	REV
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G. Roadway Rating Photographs

DRAFT

Roadway Condition Photos

Project: Mohawk Solar – Route Evaluation Study

Our reference: 400940

Your reference: Case No. 17-F0182

Prepared by: J. Sowinski

Date: 12/14/2018

Approved by:

Checked by:

Subject: Appendix G - Roadway Condition Photos

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This document contains confidential information and proprietary intellectual property. It should not be shown to other parties without consent from us and from the party which commissioned it.



I-90 Exit 29 at East Main St. looking south



East Main St. looking east between Exit 20 and Church St.



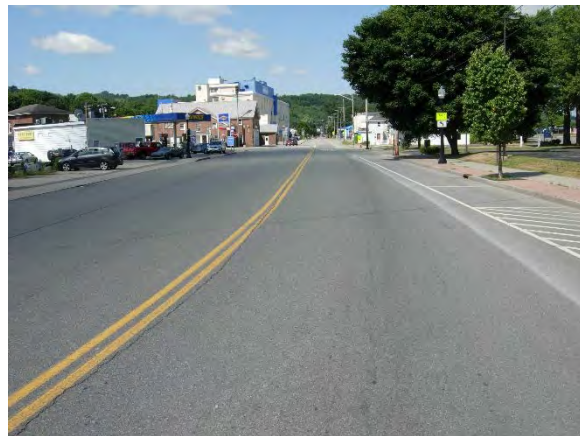
East Main St. looking west between Exit 20 and Church St.



Bridge over Canajoharie Creek on East Main St.



Church St. looking south at Main St.



Erie St. looking west



Erie St. looking east



West Main St. looking east



West Main St. looking east



Erie St. looking east at Church St.



Church St. looking south at Erie St.



Church St. looking south at Mohawk St.



Clinton Rd looking north at Ridge Rd



Cherry Valley Rd looking south



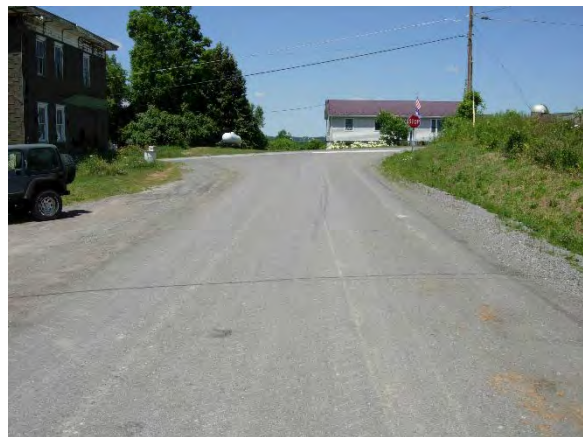
Clinton Rd. looking south at Seebers Ln.



Clinton Rd. looking north at Seebers Ln.



Nestle Rd. looking east at Cherry Valley Rd.



Nestle Rd. looking west at Cherry Valley Rd.



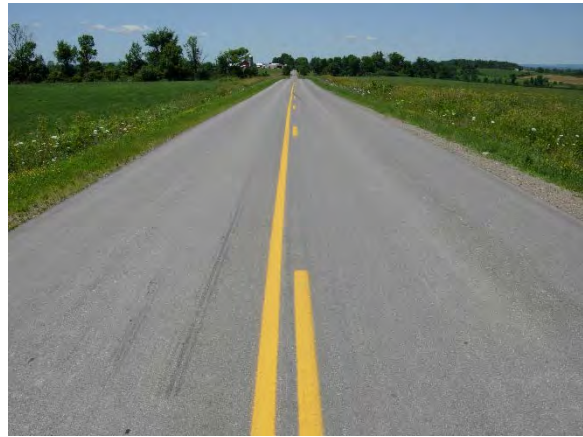
Nestle Rd. looking east at Clinton Rd.



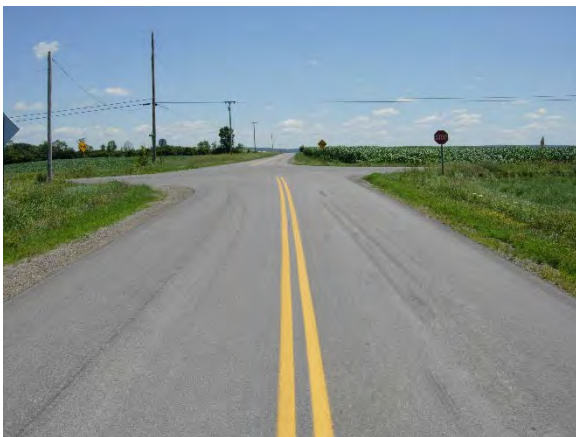
Nestle Rd. looking west at Clinton Rd.



Clinton Rd. looking north at Nestle Rd



Marshville Rd. looking west at Clinton Rd.



Marshville Rd looking east at Clinton Rd



Tanners Rd looking east at Cherry Valley Rd



Fredricks Rd looking south



Rt 10 Ames Rd looking south



Rt 10 Ames Rd looking north



Dygett Rd looking south

