highway maritime projects logistics

Arkwright Wind Farm

Transport Route Review

4/24/2015

There is much more to just hauling freight. It's securing the route, removing the obstacles and, literally, stopping traffic. We make it happen with in-house permitting, our very own escorts, and expert project managers who make it seem like no big deal.

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Purpose

To perform a detailed study of the Arkwright Wind Farm and outline a proposed route for the transportation of wind turbine components from Oswego, NY to the Arkwright wind site near Arkwright, NY.

The goal of our site and route reviews are to determine feasibility and risk points associated with transportation along identified routes or site locations. This determination is accomplished mostly through in person visual identification, but also by doing on-line research for state and local information. The below three key parts of the review are covered in most scopes of work:

1. **Route Survey** – Checking for 3 key areas of road transport are cornering, grade, and visual limitations on roads (i.e. Bridges, wires, trees, and other obstructions, etc.) Confirmation of a clear route (dimensionally) will be completed by an ATS representative. A visual inspection of bridges and culverts will be completed but will not be an engineered assessment unless otherwise determined.

2. **Equipment Study** – The site locations may require specific equipment (schnables, steerable trailers, etc.) in order to fit the suggested parameters within our proposal. If this is determined to be the case, the equipment plan will be provided within our report.

3. **Site Study** – The actual site must be surveyed to ensure adequate access to final delivery point(s). Elevation, turning radius, and general terrain must be physically inspected to insure proper equipment can be used to reach delivery point. If the site is undeveloped, ATS will work with the customer to provide proper grades, turning radius, and other items necessary for excavation. ATS will also need access and preferably accompanied by the customer on site to determine these needs.

Project Description

Customer	Vestas
Project Name	Arkwright
Project Location	Arkwright, KS
Contractor Name	TBD
Type of Turbine	Vestas V-110-2.0MW 80M or 95M
Quantity of Turbines	39
Receiving Hours	TBD
Project Deliveries Start Date	Q1 2016 (Proposed)

Overview

Arkwright Review

Prepared by …

For …

ATS has reviewed firsthand the Arkwright Wind Farm transport route.

On 3/30/15 through 4/14/15 and 4/9/15 through 4/14/15 William Richards from ATS reviewed the transport route to develop the proposed improvement options outlined in this document.

These improvements outlined in this document are based upon ATS equipment and transportation methods.

Arkwright Route Review		
Attendees	Company	Contact Information
William Richards	ATS	billri@atsinc.com

Transport Equipment

NOTE: Two tower lengths were proposed for this project, the V110 w/ 80M tower and the V110 w/ 95M tower. Information on both tower sizes is provided below. For the purpose of this review the 95M upper mid tower section transported on a double Schnable will be used for all turning radius improvement recommendations. This would be longest tower transport configuration and thereby the controlling component when determining improvements needed for turns and curves. The 54M Blade will be used for determining tip swing clearances.

V-110 2.0 80M

Component	Equipment Type	Typical Unloading
BASE	Double Schnable	Self-Unload
MID	Schnable Dolly	Crane(s)
TOP	Bolster Dolly	Crane(s)
NACELLE	13 Axle Low Boy	Crane(s)
BLADE	Blade Trailer	Crane(s)
HUB	Low Boy	Crane

V-110 2.0 95M

Component	Equipment Type	Typical Unloading
BASE	Double Schnable	Self-Unload
Lower MID	Double Schnable	Crane(s)
Upper MID	Double Schnable	Crane(s)
TOP	Bolster Dolly	Crane(s)
NACELLE	13 Axle Low Boy	Crane(s)
BLADE	Blade Trailer	Crane(s)
HUB	Low Boy	Crane

Typical Unloading: Ultimately, the contractor will determine specific size of unloading equipment.

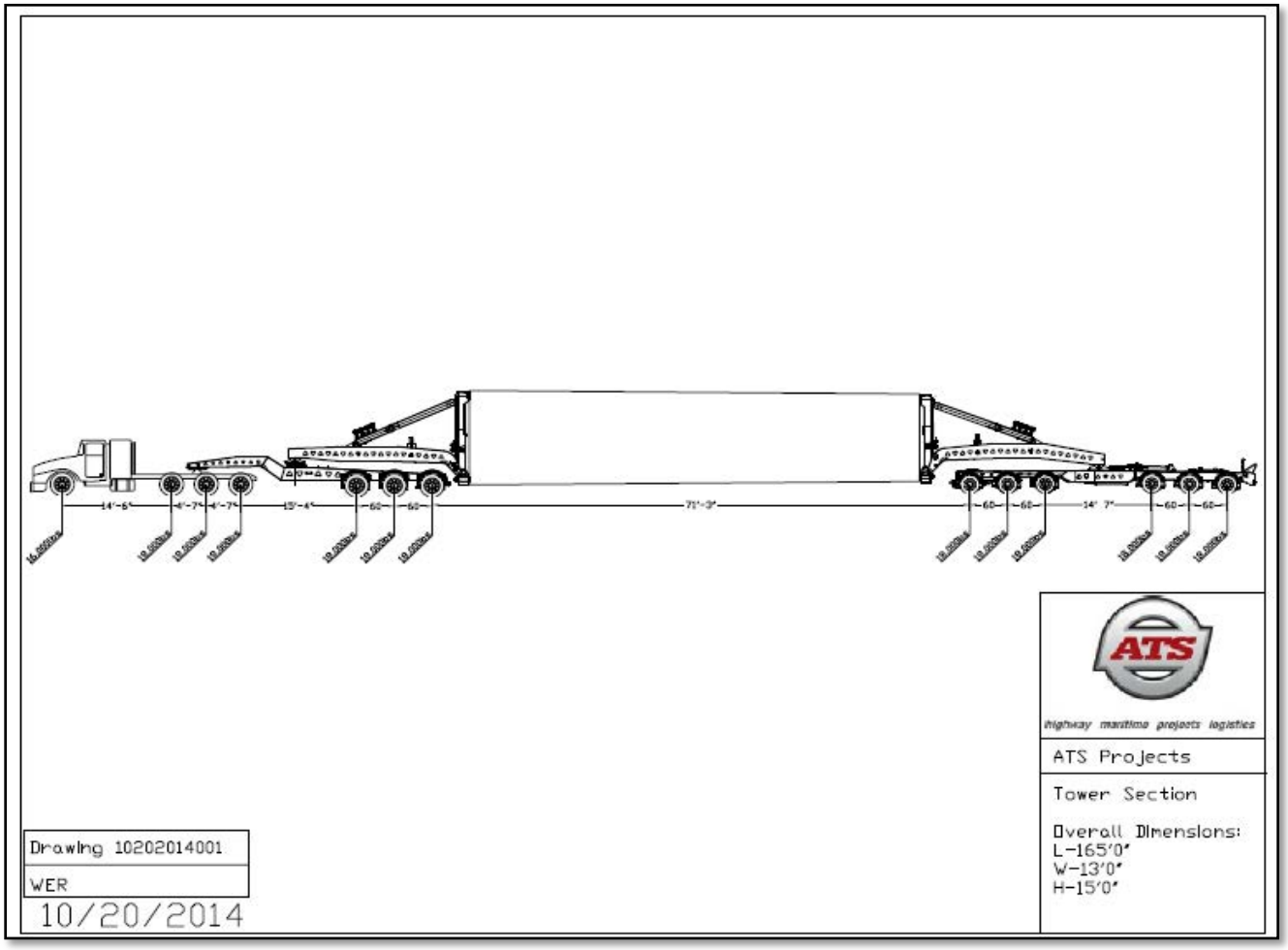


Figure 1- 80M Base

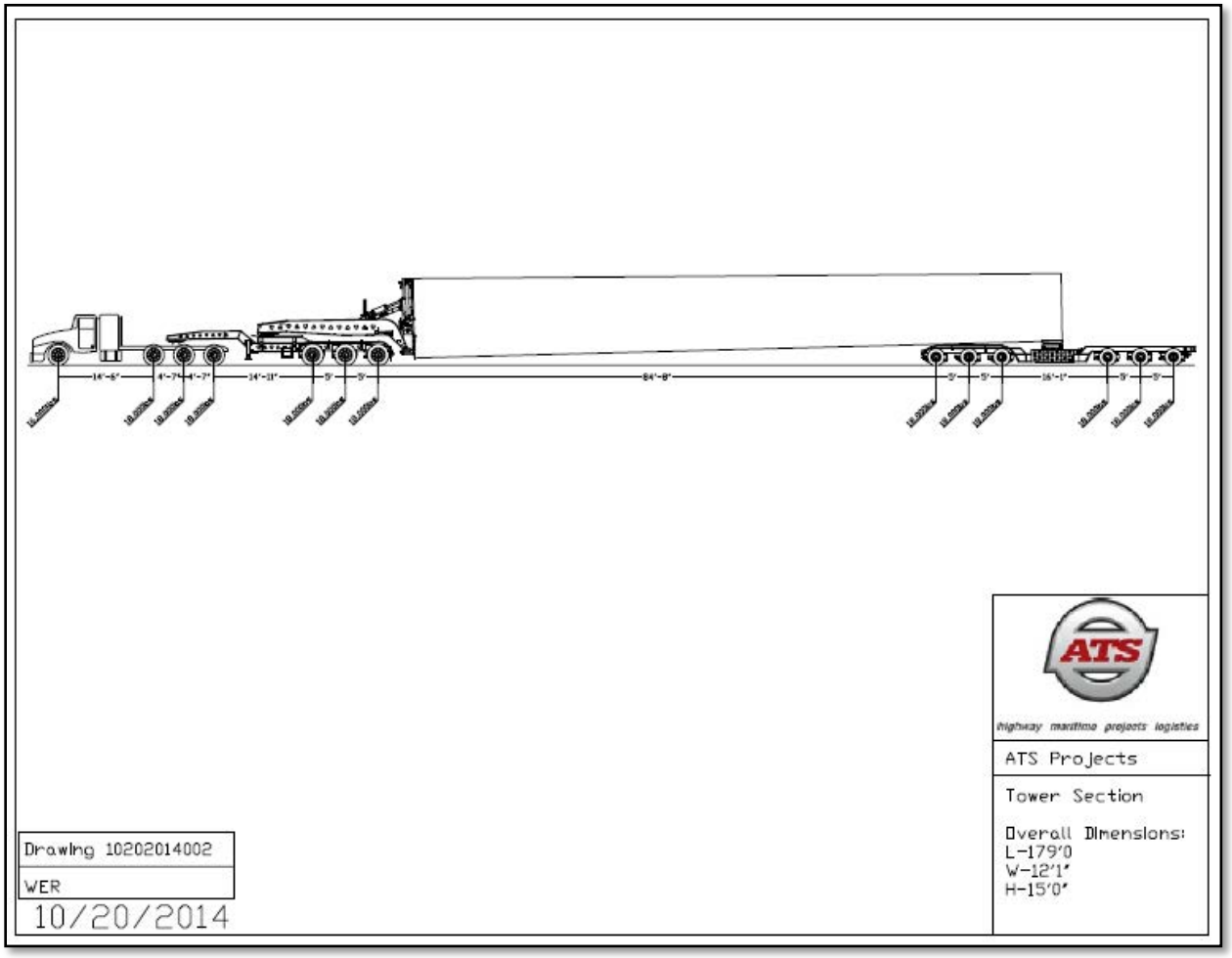


Figure 2 80M Mid

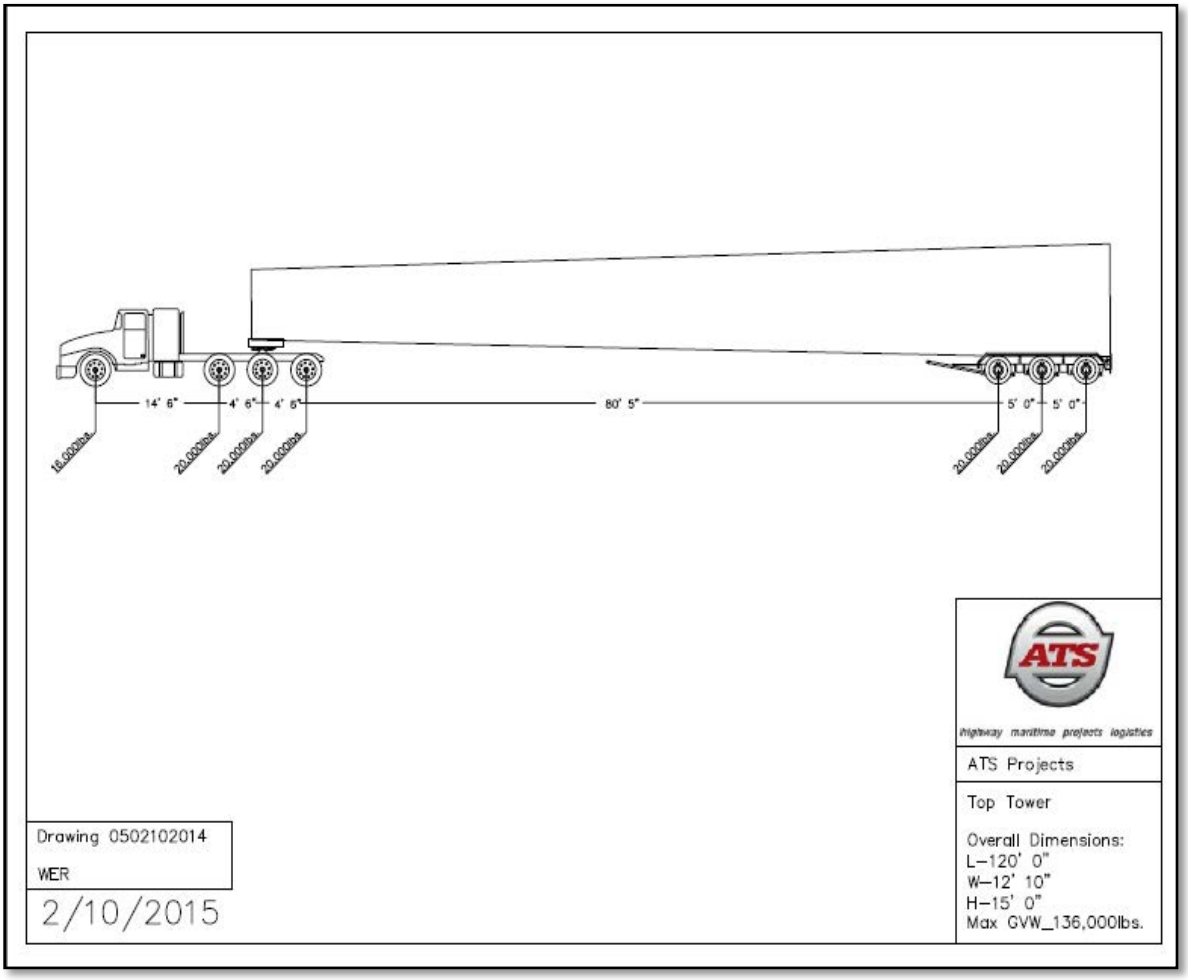


Figure 3 80M Top

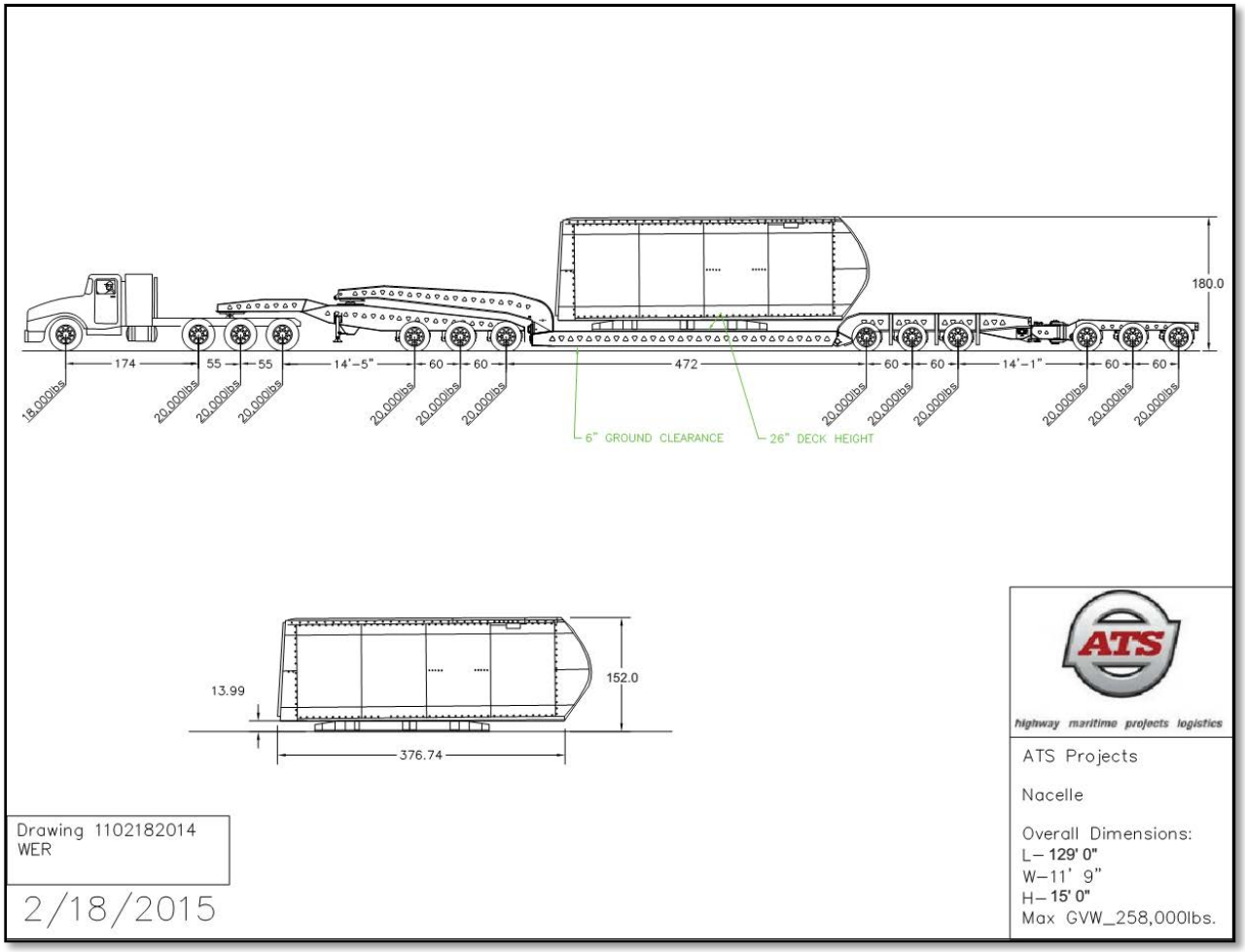


Figure 4- Nacelle

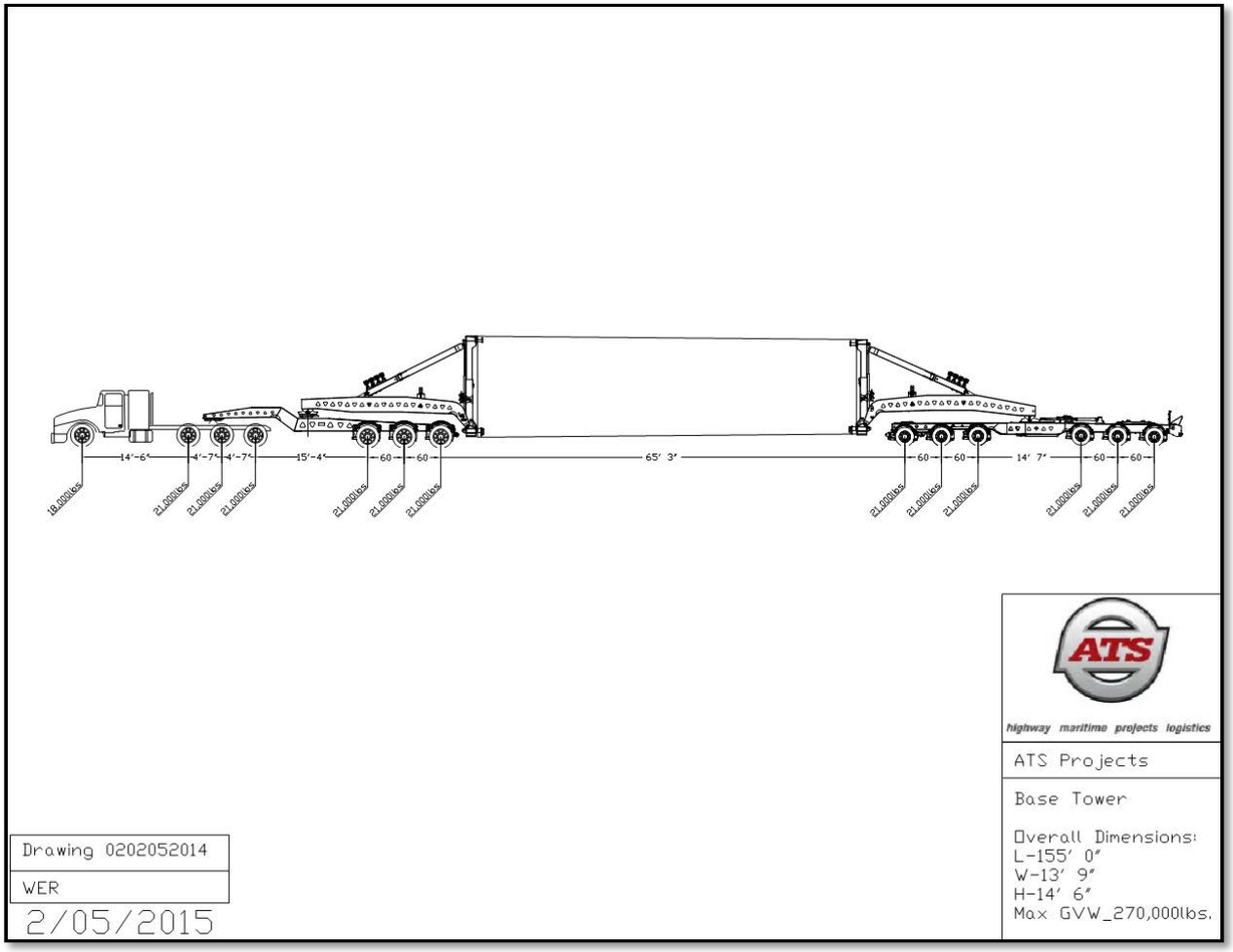


Figure 5- 95M Base

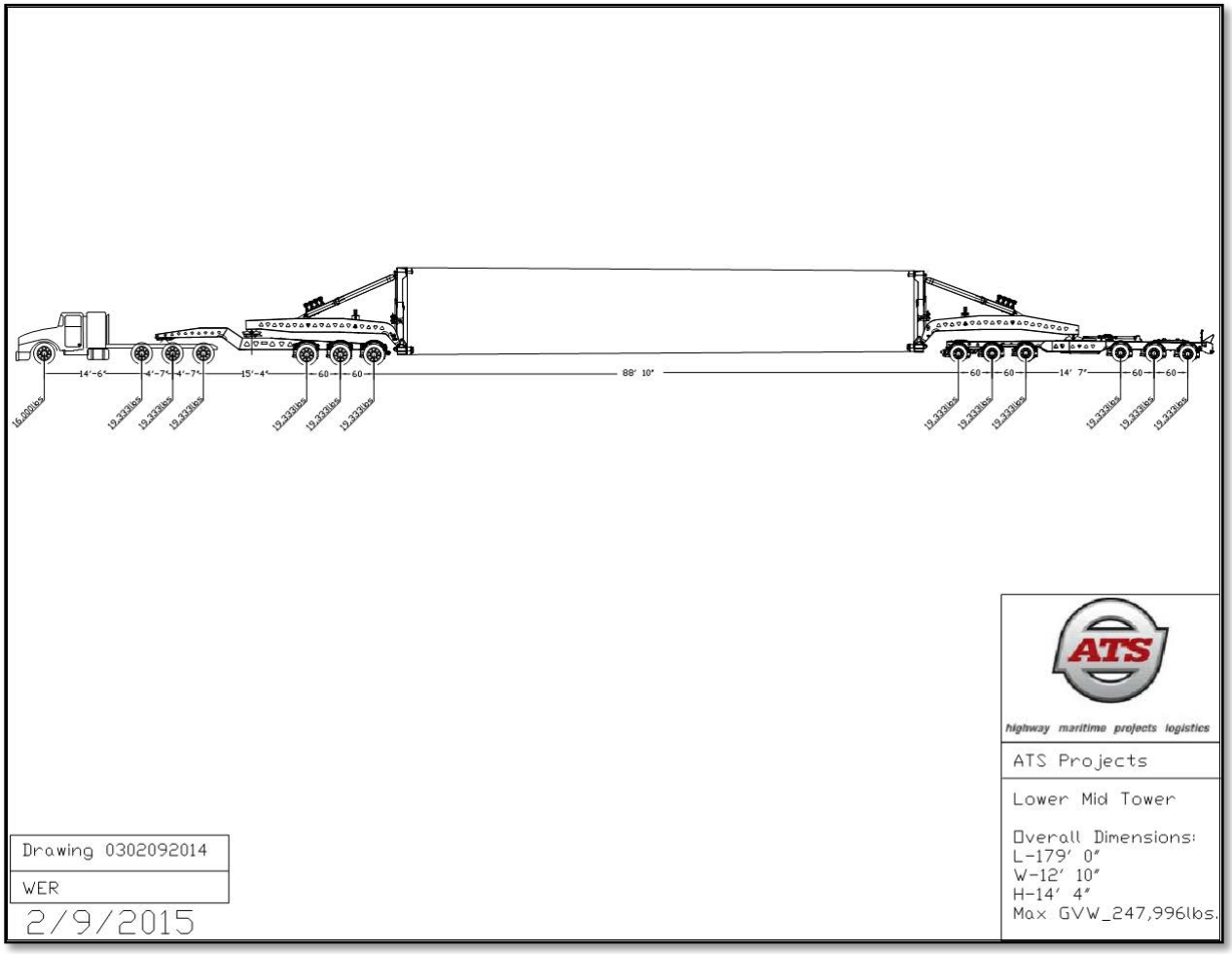


Figure 6- 95M Lower Mid

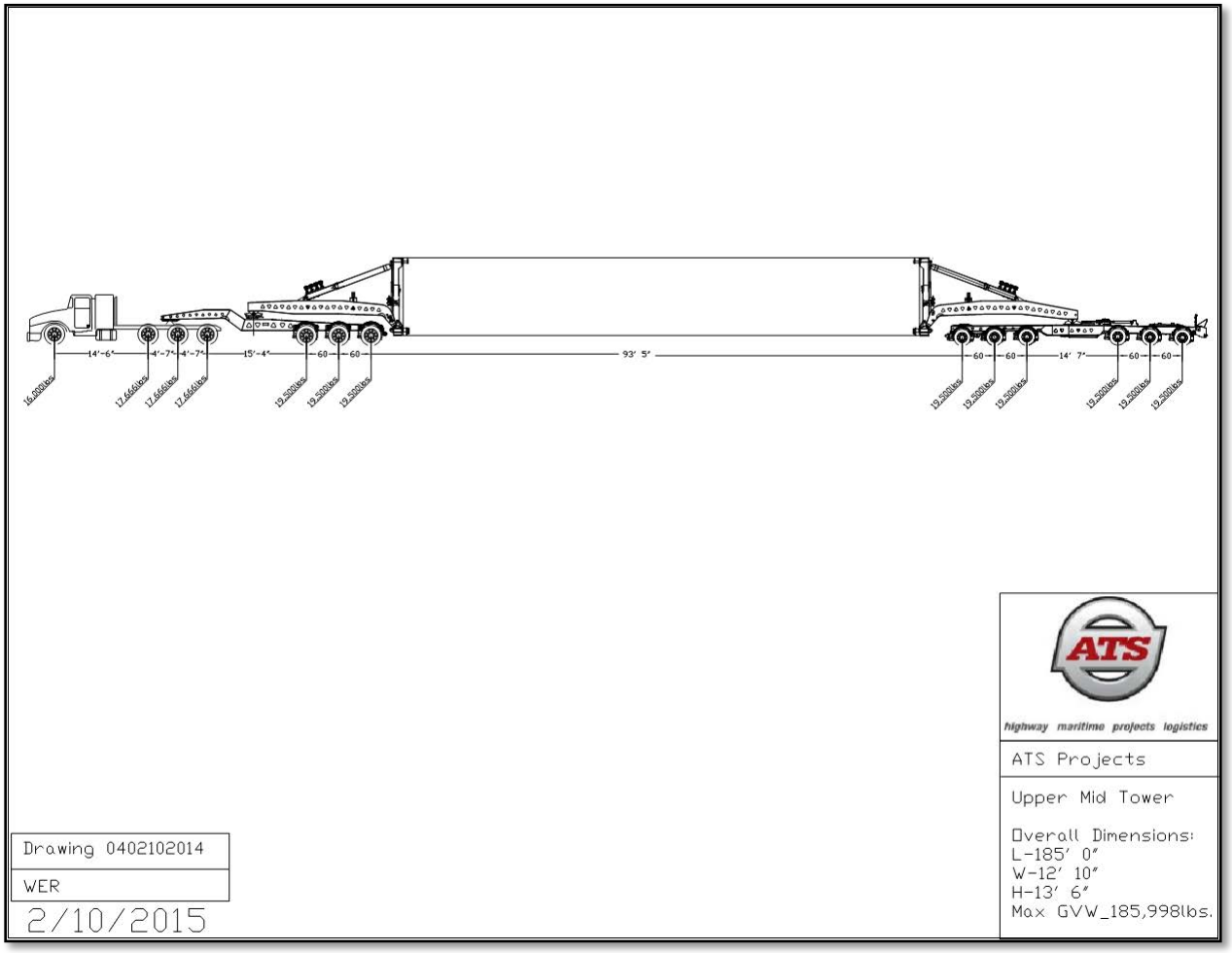


Figure 7- 95M Upper Mid

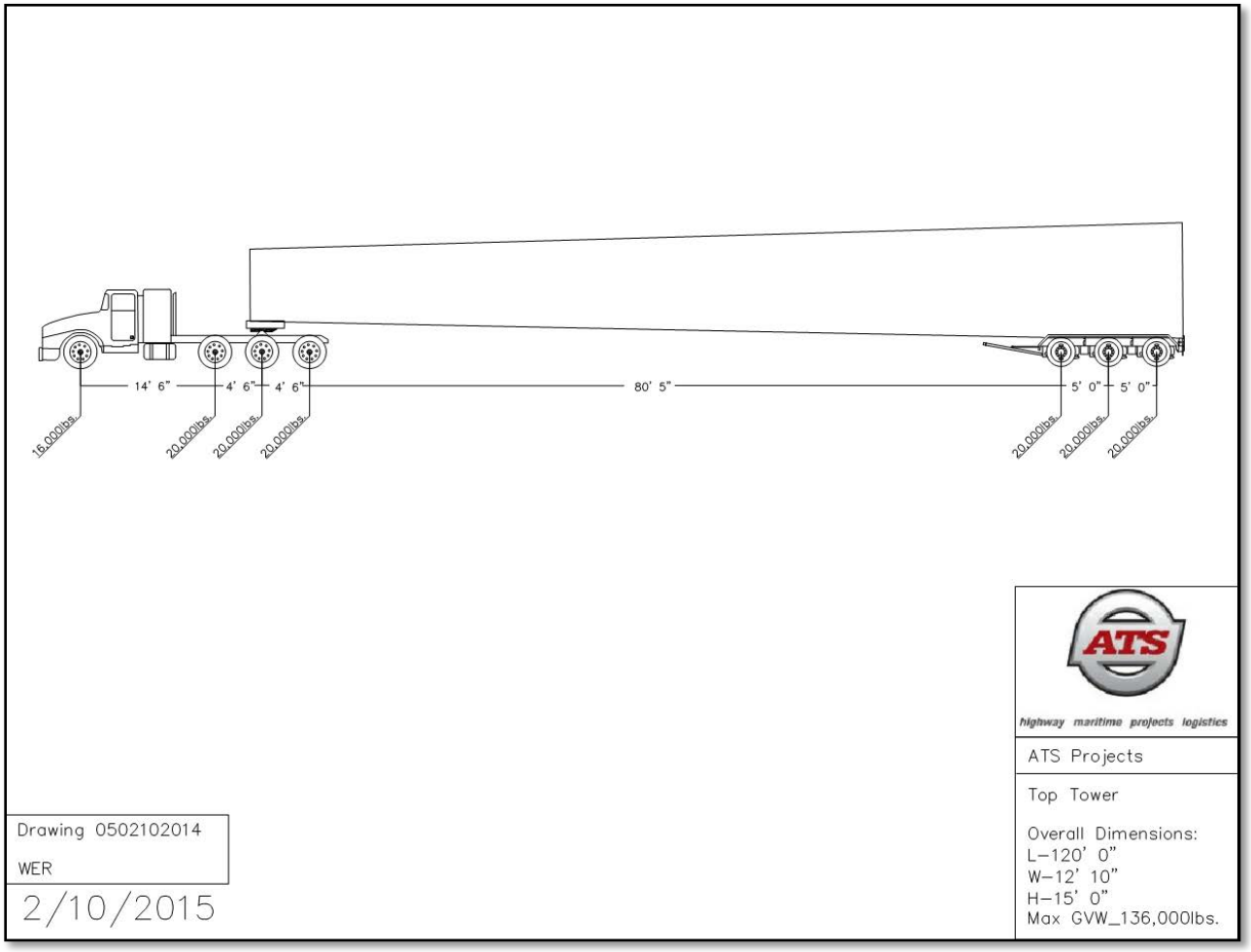


Figure 8- 95M Top

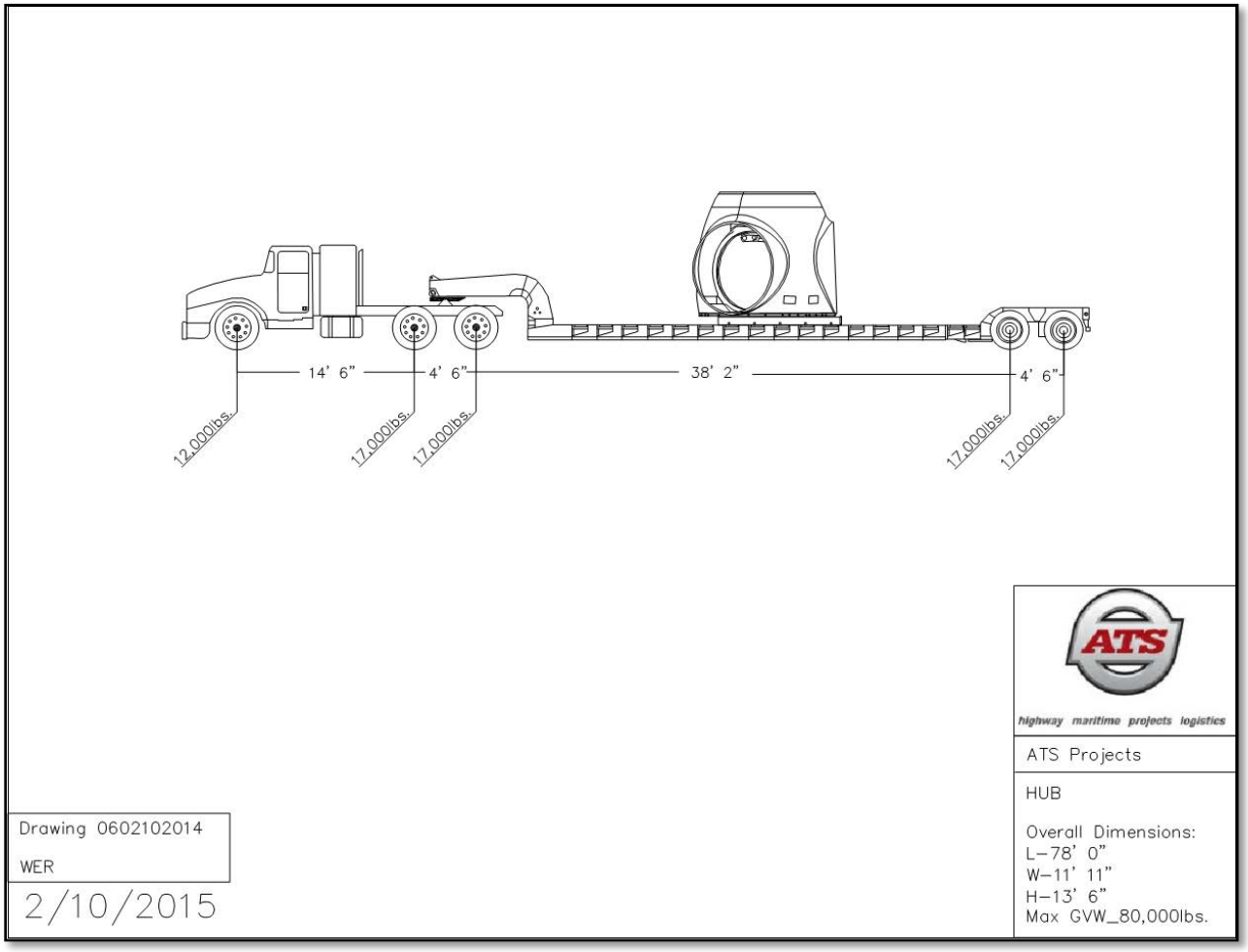

14' 6"
4' 6"
38' 2"
4' 6"
12,000lbs.
17,000lbs.
17,000lbs.
17,000lbs.
17,000lbs.
highway maritime projects logistics
ATS Projects
HUB
Overall Dimensions:
L–78' 0"
W–11' 11"
H–13' 6"
Max GVW_80,000lbs.
Drawing 0602102014
WER
2/10/2015

Figure 9- Hub

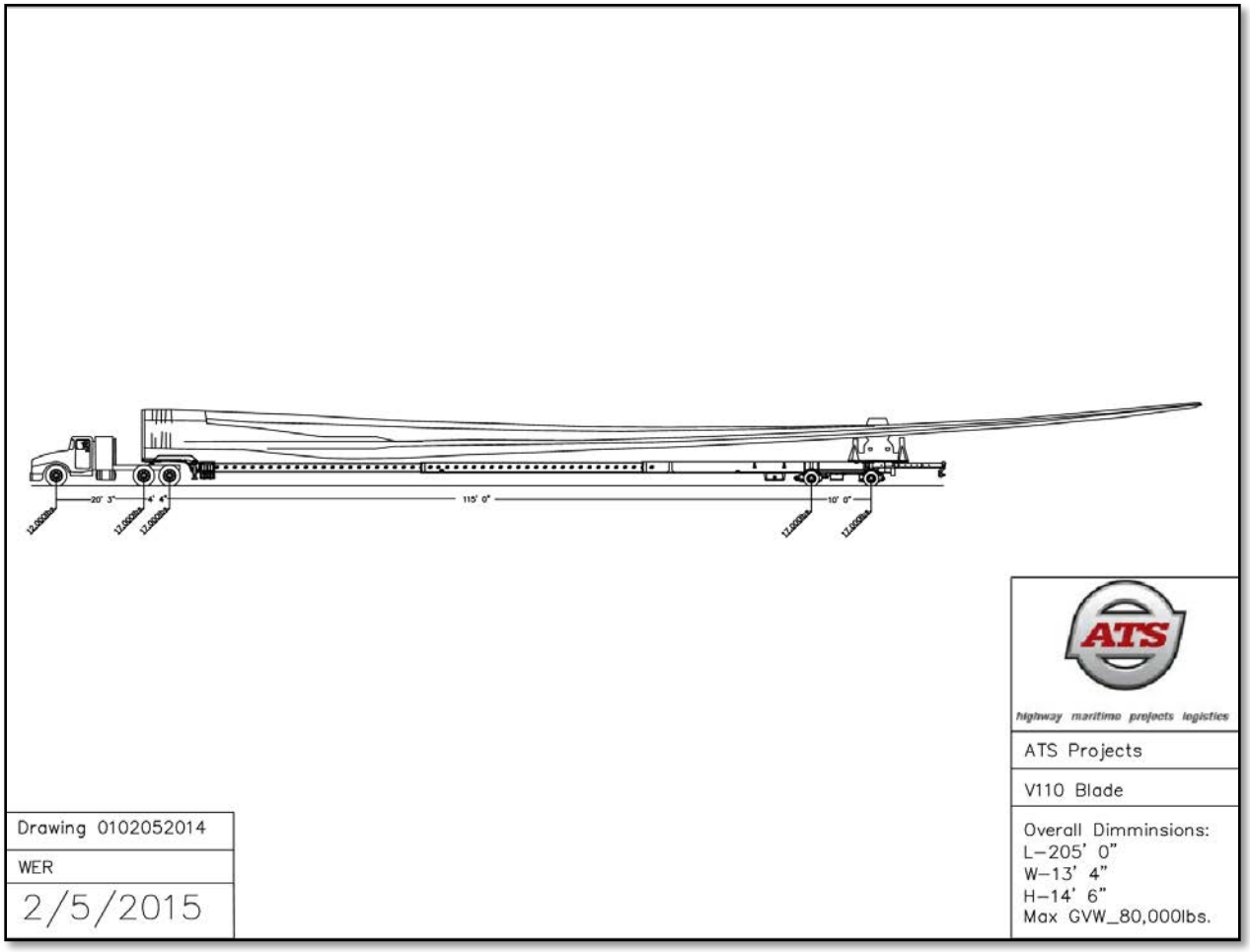


Figure 10 Blade

State Transport Permit Information

State	State Information
NY	www.dot.ny.gov/nypermits

NOTE: The Information below was obtained from the NY DOT website and provides basic information on the transport of oversize/ overweight loads through NY.

2015 Escort Requirement[1]

NY

§154-1.12 Escort and certified escort vehicle requirements.

The department may require the use of a certified or non-certified escort vehicle(s) in any permit if it determines that public safety so requires. Generally, a certified escort vehicle(s) provision will be included in permits where the vehicle is greater than 12 feet in width; 80 feet or more in length; 14 feet or more in height; with an overhang of 10 feet or more; or where subject to a permit speed restriction. Generally a non-certified escort vehicle(s) provision may be included in permits for self-propelled cranes where the vehicle is over 11 feet in width; 55 feet in length; over legal height; with an overhang of more than 15 feet; which cannot maintain a minimum speed of 45 miles per hour on Interstate highways of 30 miles per hour on other highways; or where subject to a speed restriction. A certified escort vehicle(s) requirement may be included in permits for self-propelled cranes when the vehicle significantly exceeds the above limits; where public safety so requires; or where it is likely that traffic control services will be required (i.e., where vehicle exceeds width of pavement by greater than two feet; vehicle overhang exceeds 50 feet; opposite direction traffic must be controlled to allow for crane movement; road closure is necessary due to highway geometry or similar situations, etc.).

New York State Police Requirements

All vehicles that exceed 200,000 lbs. in weight, 16'0" in width or 200'0" in length are to be inspected by New York State Police upon entry into New York State. New York State Police escorts are required if a vehicle (or vehicle load):

- is 200'0" in length or greater;
- must cross the center line of a bridge; or
- is required to cross bridges at 5 mph.

If a New York State Police escort is required, at least 48 hours notice must be provided in advance of travel.

Component	Civilian Escort	Police Escort
BASE	2	YES
MID(s)	2	YES
TOP	2	No
HUB	0	No
NACELLE	2	YES
BLADE	2	YES

[1] These are the typical, expected requirements. Actual requirements will be outlined in the transportation permit.

Transportation Permits

Permits have *NOT* been ordered from the State of NY.

Site Map- **Provided by customer**

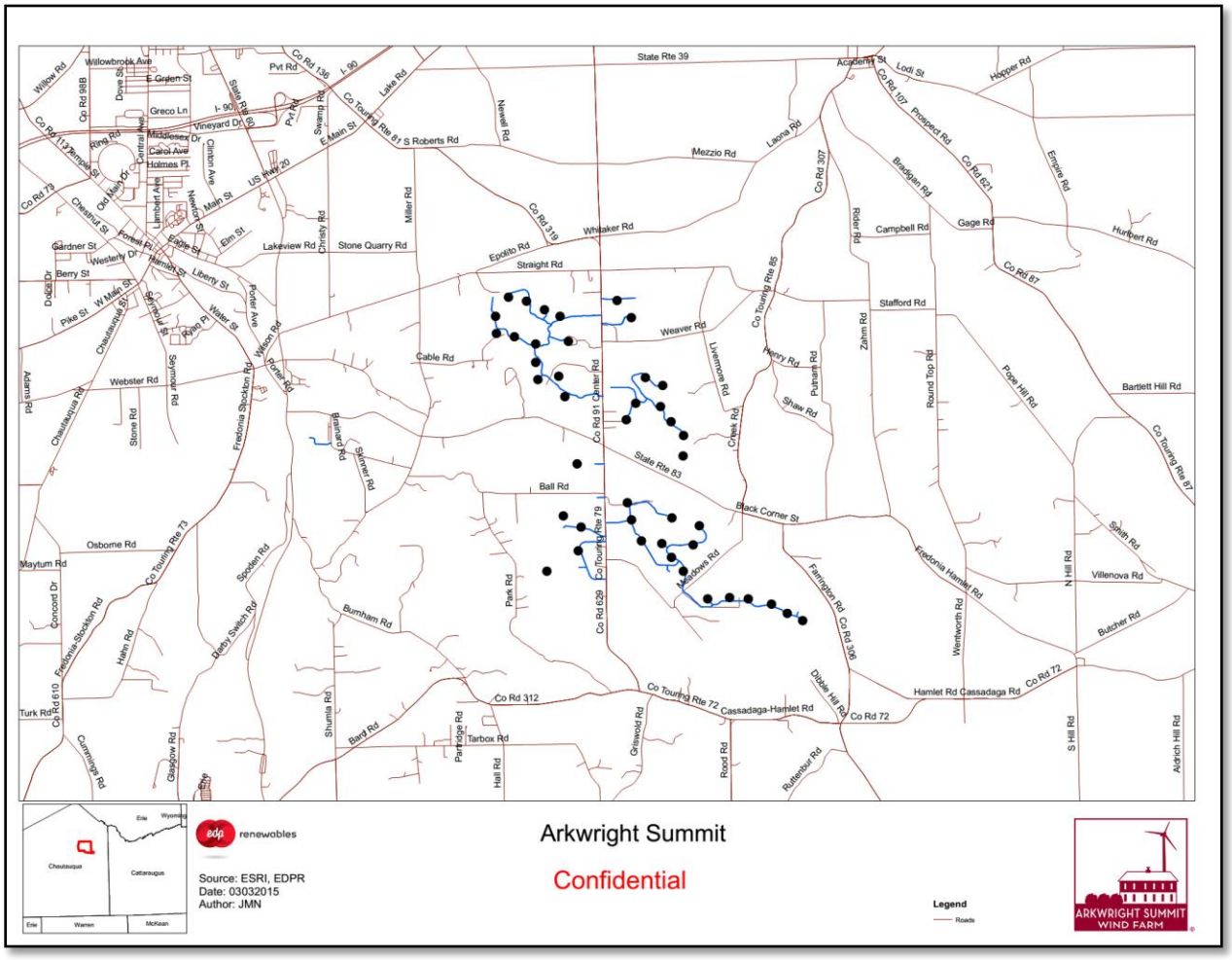


Figure 11- Site Map

Route Review Starting Point

Junction: Port of Oswego- E Schuyler St. Oswego, NY

NOTE: Only a generic origin was provided “Oswego, NY”. NO specific shipper address, port or rail siding information was given. ATS used the Port of Oswego as a starting point for the review.

Route of Travel Map

Figure 12- Route of Travel Map

Proposed Transport Route

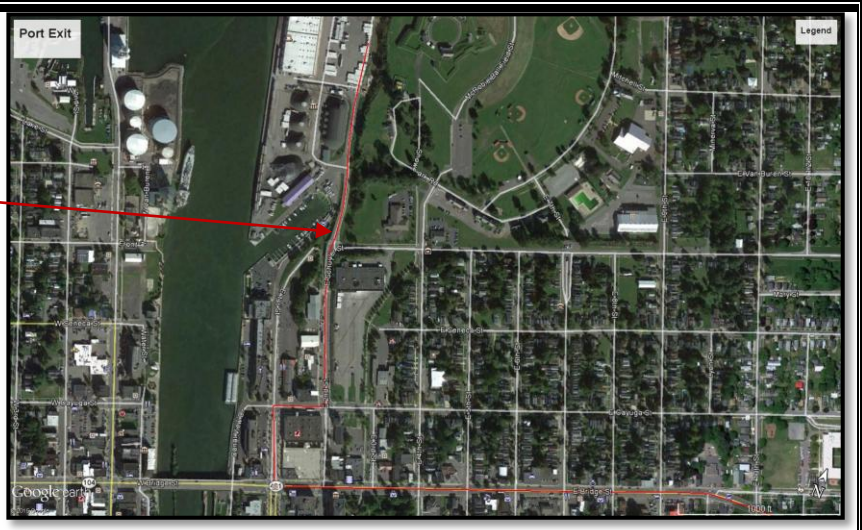
Route	Direction	Miles
E Schuyler St	South	.1
E 2nd St	South	.16
E Cayuga St.	West	.1
E 1st St	South	.1
Hwy-104	East	17.9
I-81	South	22.2
I-481	East/ South/ West	15.4
I-81	South	68.6
Hwy-17/ I-86	West	218.8
Hwy-60	North	24.3
Hwy-20	East	2.1
Hwy-39	East	2.0
CR-79/ Center Rd	South	4.8
Junction: Center Road & Ball Rd	End Point	TOTAL= 376.56

Transport Route Details

Port of Oswego Exit

No improvement needed

Transports will travel straight out of the port onto E Schuyler St.

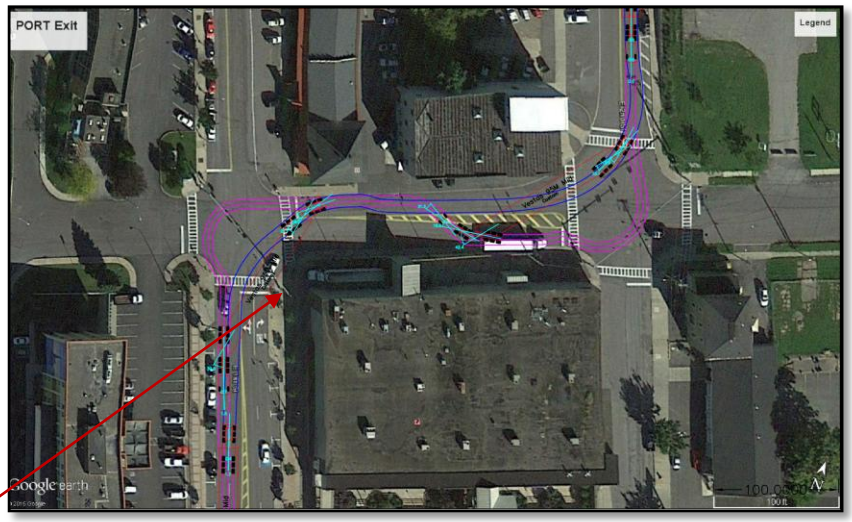


Junction: E 2nd St onto E Cayuga St AND E Cayuga St onto E 1st St

[Two turns back to back]

TOWER

Towers: The 80M tower has no issues making the turns however the 95M upper mid sections comes very close to the traffic signal pole on the inside of the corner. Insure selected equipment will be able to make the turn.

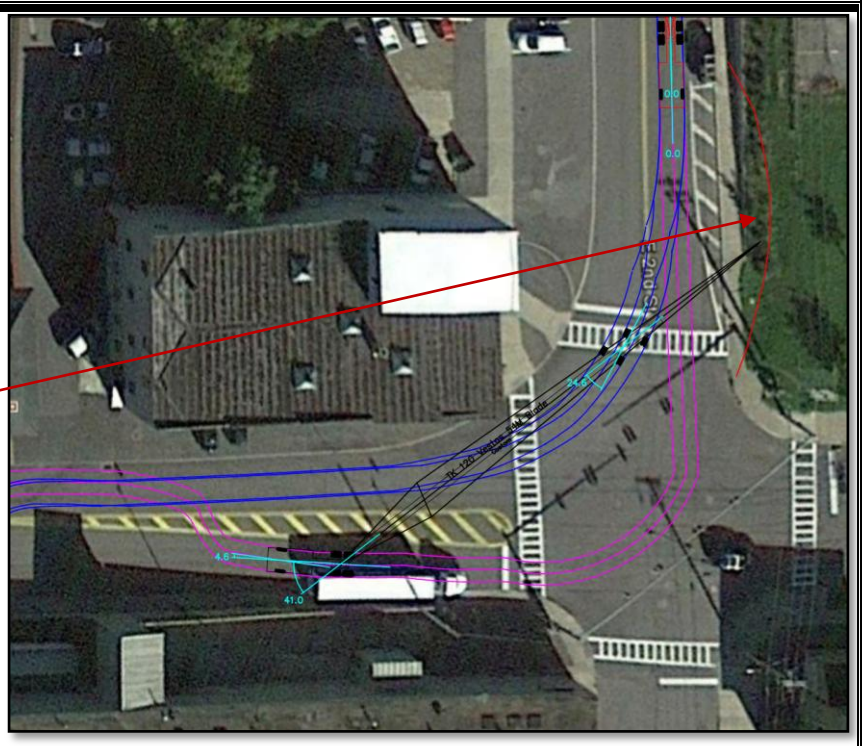


Junction: E 2nd St onto E Cayuga St AND E Cayuga St onto E 1st St (Continued)

BLADE

The first of the two turns [E 2nd St onto E Cayuga St] will need improvement for the blades.

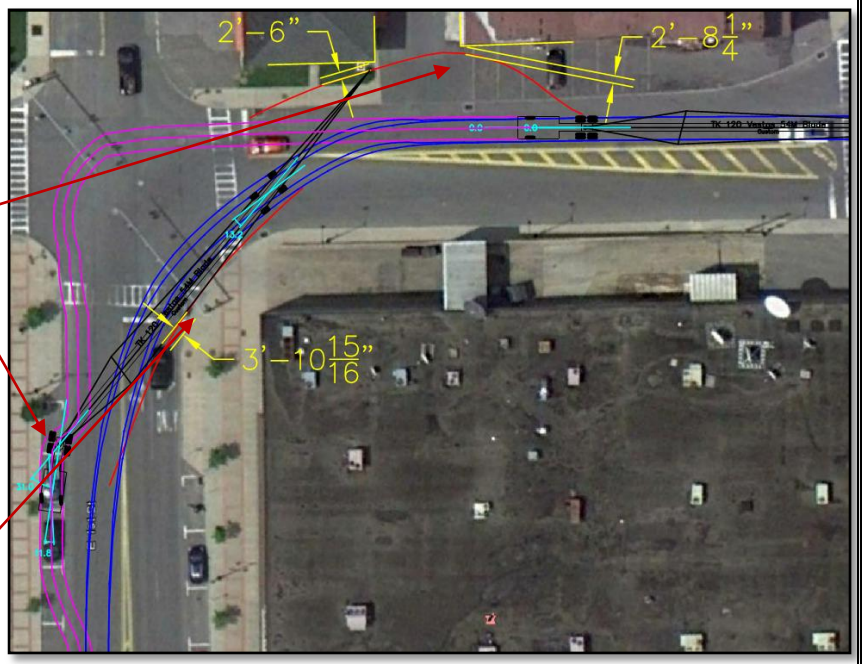
The tip swing area will need to be free of obstructions.



The second of the two turns [E Cayuga St onto E 1st St] will need improvement for the blades.

This is a very *HIGH RISK* turn.

Parking restrictions will need to be in place when blades depart port.



Even with parking restrictions the blade comes very close to the buildings north of E Cayuga St and the signal pole on the inside of the turn. The traffic signal pole should be relocated to allow blade transports to safely make the turn.

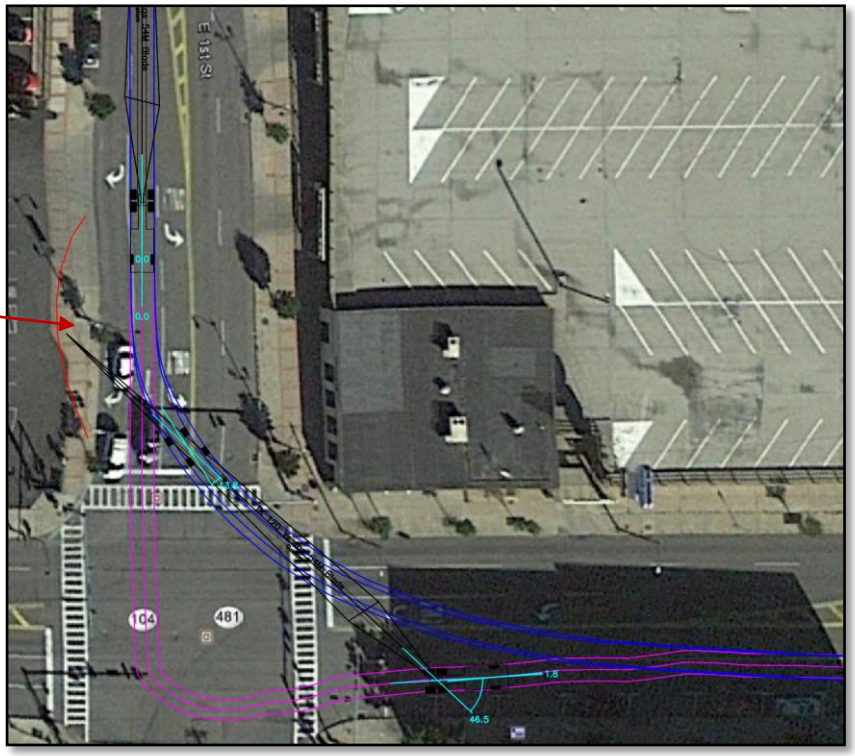
Junction: E 1st St onto Hwy-104

IMPROVEMENT NEEDED

TOWER

BLADE

All obstructions will need to be removed from the tip swing area



Junction: Hwy-104 & I-81

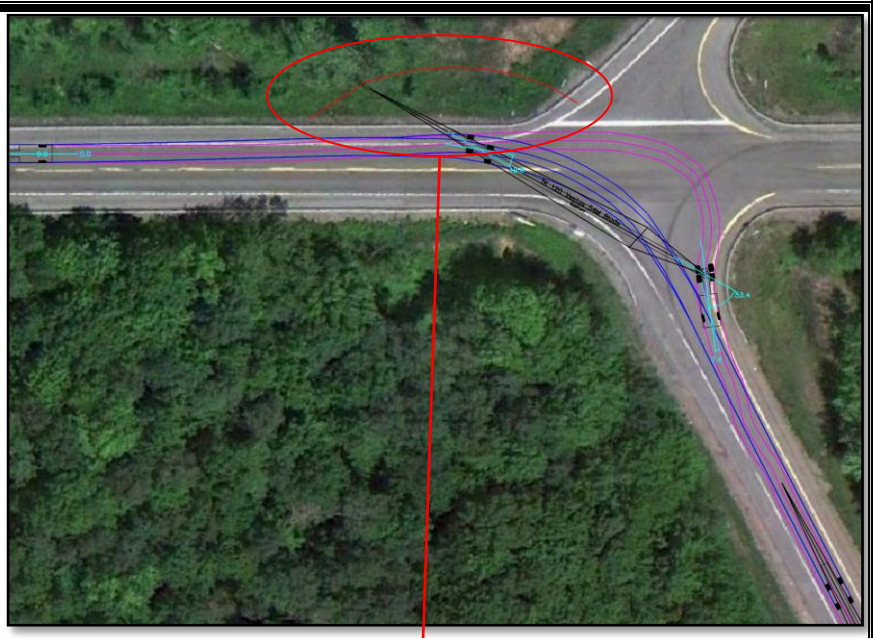
IMPROVEMENT NEEDED

95M- Top Tower manually steered.

Junction: Hwy-104 & I-81
(Continued)

54M- Blade

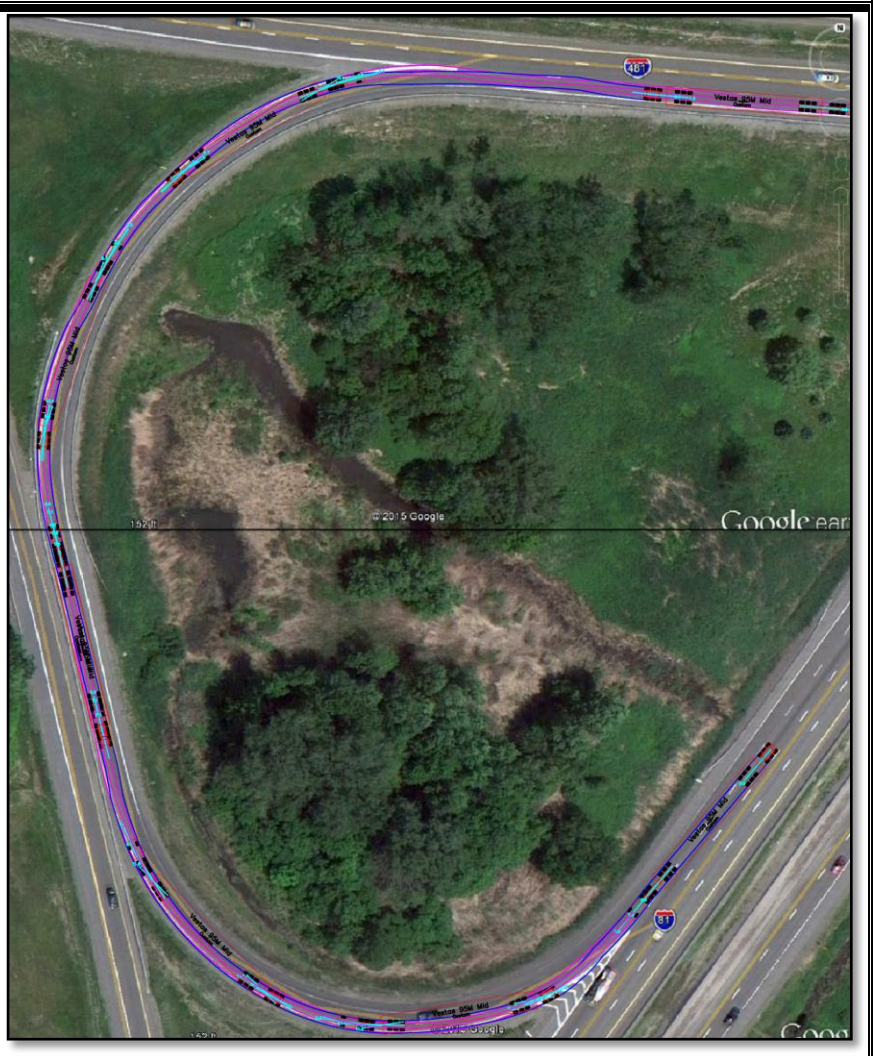
Obstructions will need to be removed from blade tip swing area. (To include signs, tree branches, etc.)



Junction: I-81 & I-481

95M-Upper Mid tower section.

The transport will need to manually steer the ramp in order to avoid the guard rails and delineators. This will require stopping on major interstates and walking the trailer around the ramp. This could cause major traffic congestion.



Delineators and guard rails

Junction: I-481 & I-81

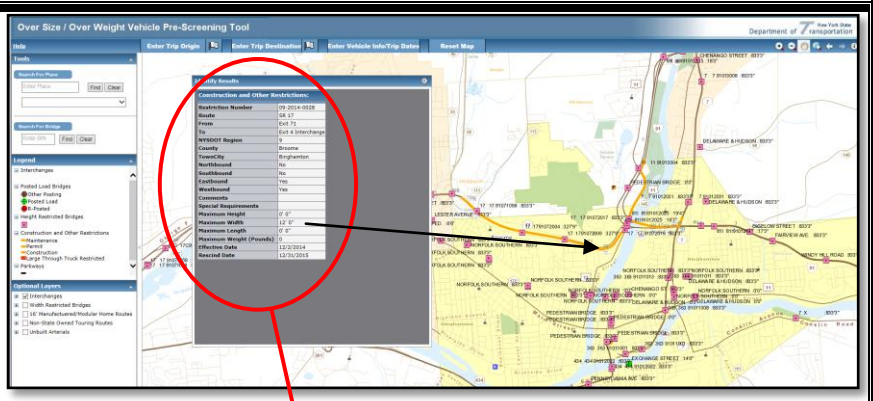
NO ISSUES

Junction: I-81 & Hwy-17

NOTE: At the time of the review this ramp was under major construction.

Junction: I-81 & Hwy-17
(Continued)

The construction currently has a 12’ width restriction and started 12/2/2014 with a rescind date of 12/31/15.



Identify Results

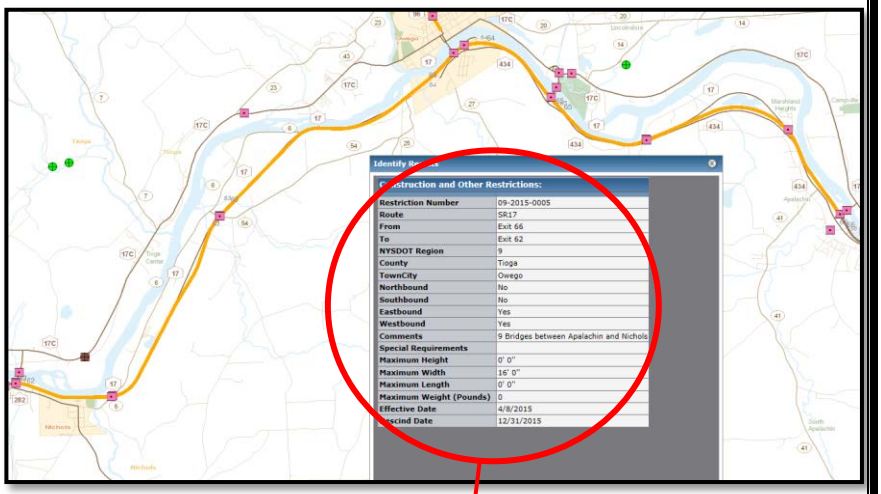
Construction and Other Restrictions:	
Restriction Number	09-2014-0028
Route	SR 17
From	Exit 71
To	Exit 4 Interchange
NYSDOT Region	9
County	Broome
TownCity	Binghamton
Northbound	No
Southbound	No
Eastbound	Yes
Westbound	Yes
Comments	
Special Requirements	
Maximum Height	0' 0"
Maximum Width	12' 0"
Maximum Length	0' 0"
Maximum Weight (Pounds)	0
Effective Date	12/2/2014
Rescind Date	12/31/2015

Hwy-17/ I-86 Construction Information

There were 4 additional construction areas along Hwy-17/ I-86

The following Hwy-17/ I-86 construction information was obtained using the NY DOT Website. https://www.dot.ny.gov/gisapps/osowscreen

Owego, NY
16’ width restriction
Starting 4/8/15 with a rescind date of 12/31/15



Identify Results

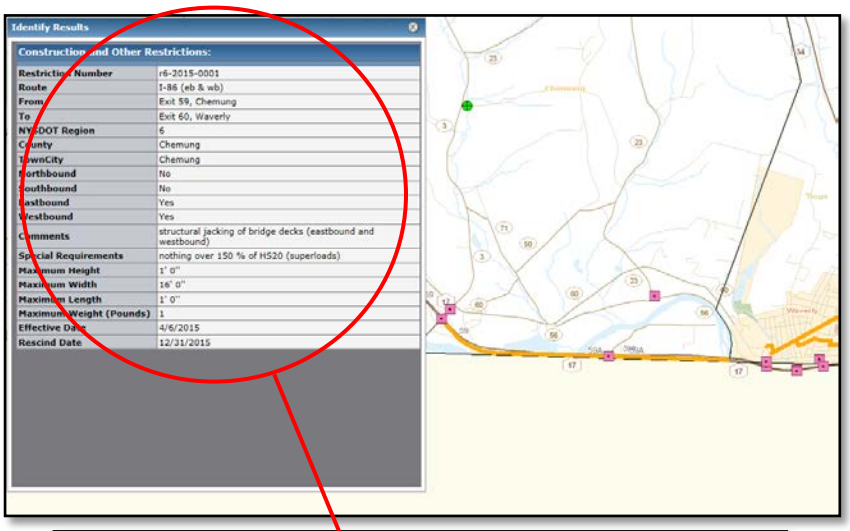
Construction and Other Restrictions:

Restriction Number	09-2015-0005
Route	SR17
From	Exit 66
To	Exit 62
NYSDOT Region	9
County	Tioga
TownCity	Owego
Northbound	No
Southbound	No
Eastbound	Yes
Westbound	Yes
Comments	9 Bridges between Apalachin and Nichols
Special Requirements	
Maximum Height	0' 0"
Maximum Width	16' 0"
Maximum Length	0' 0"
Maximum Weight (Pounds)	0
Effective Date	4/8/2015
Rescind Date	12/31/2015

Hwy-17/ I-86 Construction Information (Continued)

Chemung, NY
16’ width restriction and
no super-loads

Starting 4/6/15 with a rescind date of 12/31/15

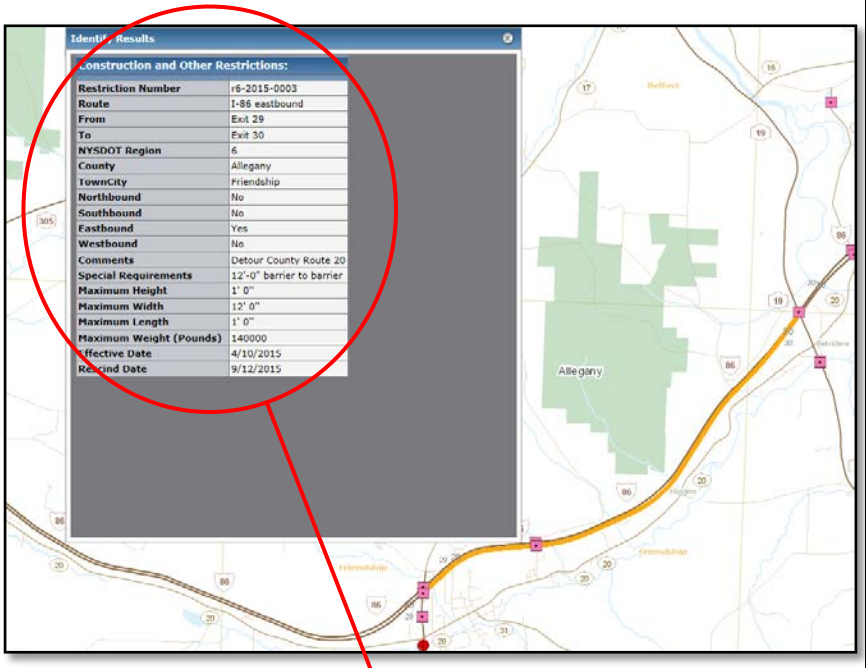


Identify Results

Construction and Other Restrictions:	
Restriction Number	r6-2015-0001
Route	I-86 (eb & wb)
From	Exit 59, Chemung
To	Exit 60, Waverly
NYSDOT Region	6
County	Chemung
TownCity	Chemung
Northbound	No
Southbound	No
Eastbound	Yes
Westbound	Yes
Comments	structural jacking of bridge decks (eastbound and westbound)
Special Requirements	nothing over 150 % of HS20 (superloads)
Maximum Height	1' 0"
Maximum Width	16' 0"
Maximum Length	1' 0"
Maximum Weight (Pounds)	1
Effective Date	4/6/2015
Rescind Date	12/31/2015

Hwy-17/ I-86 Construction Information (Continued)

Friendship, NY
12’ width restriction
Starting 4/10/15 with a rescind date of 9/12/15



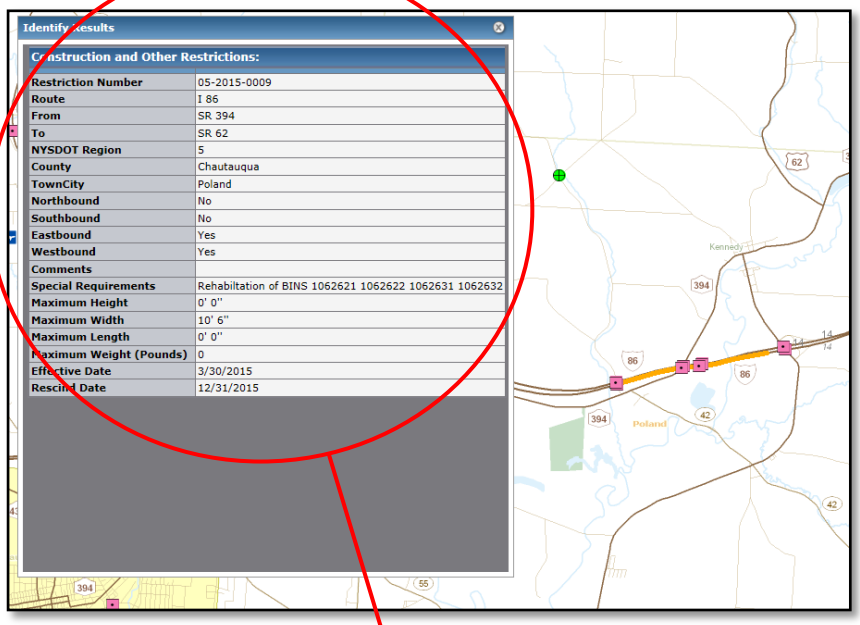
Identify Results

Construction and Other Restrictions:	
Restriction Number	r6-2015-0003
Route	I-86 eastbound
From	Exit 29
To	Exit 30
NYSDOT Region	6
County	Allegany
TownCity	Friendship
Northbound	No
Southbound	No
Eastbound	Yes
Westbound	No
Comments	Detour County Route 20
Special Requirements	12'-0" barrier to barrier
Maximum Height	1' 0"
Maximum Width	12' 0"
Maximum Length	1' 0"
Maximum Weight (Pounds)	140000
Effective Date	4/10/2015
Rescind Date	9/12/2015

Hwy-17/ I-86 Construction Information (Continued)

Poland, NY
10’6” width restriction
Starting 3/30/15 with a rescind date of 9/12/15

NOTE: Should any of the construction zones outlined above be delayed or any new construction started alternate route options may need to be found.



Identify Results

Construction and Other Restrictions:	
Restriction Number	05-2015-0009
Route	I 86
From	SR 394
To	SR 62
NYSDOT Region	5
County	Chautauqua
TownCity	Poland
Northbound	No
Southbound	No
Eastbound	Yes
Westbound	Yes
Comments	
Special Requirements	Rehabiltation of BINS 1062621 1062622 1062631 1062632
Maximum Height	0' 0"
Maximum Width	10' 6"
Maximum Length	0' 0"
Maximum Weight (Pounds)	0
Effective Date	3/30/2015
Rescind Date	12/31/2015

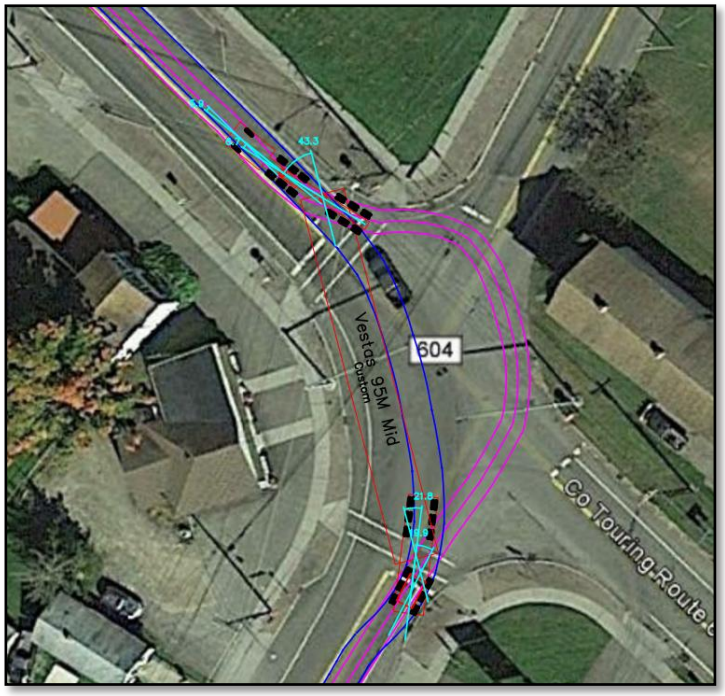
Junction: Hwy-17 & Hwy-60 No issue	 

Junction: Hwy-60 to Hwy-60

In the town of Gerry, NY the transports must turn left to stay on wy-60

IMPROVEMENT NEEDED

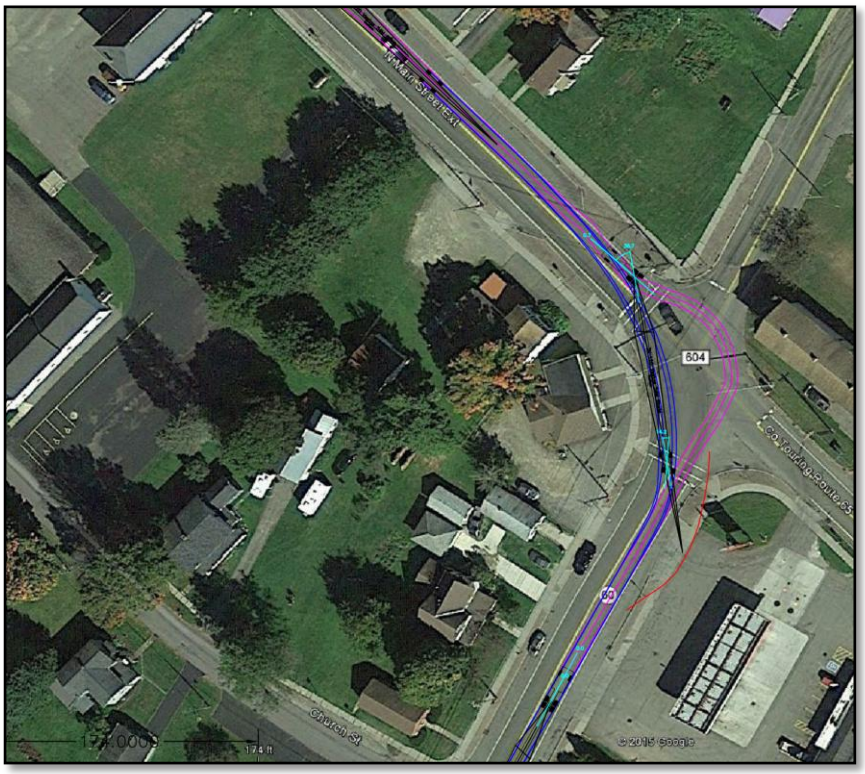
TOWER



Junction: Hwy-60 to Hwy-60 (Continued)

BLADE

Obstruction will need to be removed from the blade tip swing area.

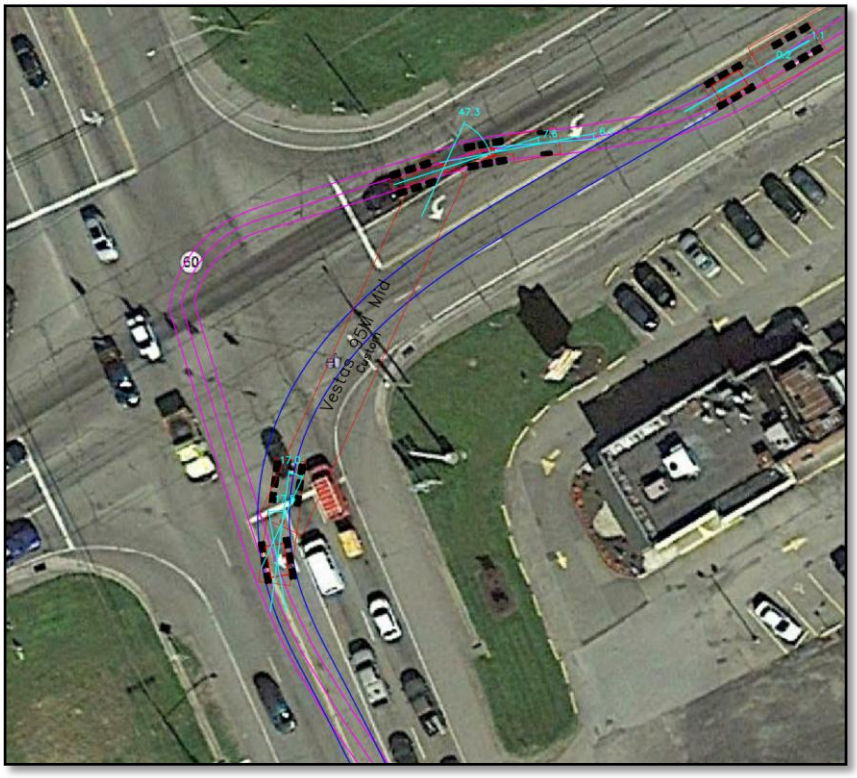


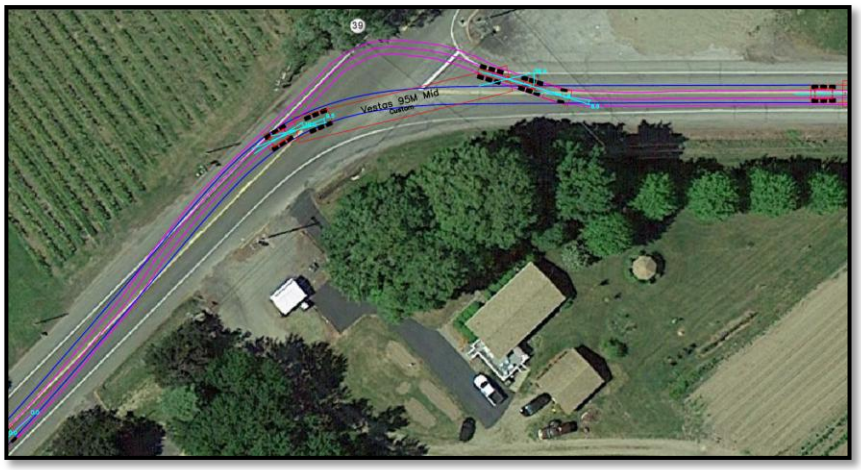
The stop sign will need to be easily removable to allow drivers to remove the sign, make the turn and replace the sign.

The "Hwy-60" sign will need to be relocated.

Junction: Hwy-60 to Hwy-20

No issues



Junction: Hwy-20 to Hwy-39 No issue	 

Junction: Hwy-39 to CR-79/ Center Rd

IMPROVEMENT NEEDED

TOWER

Clear obstructions from component swing area

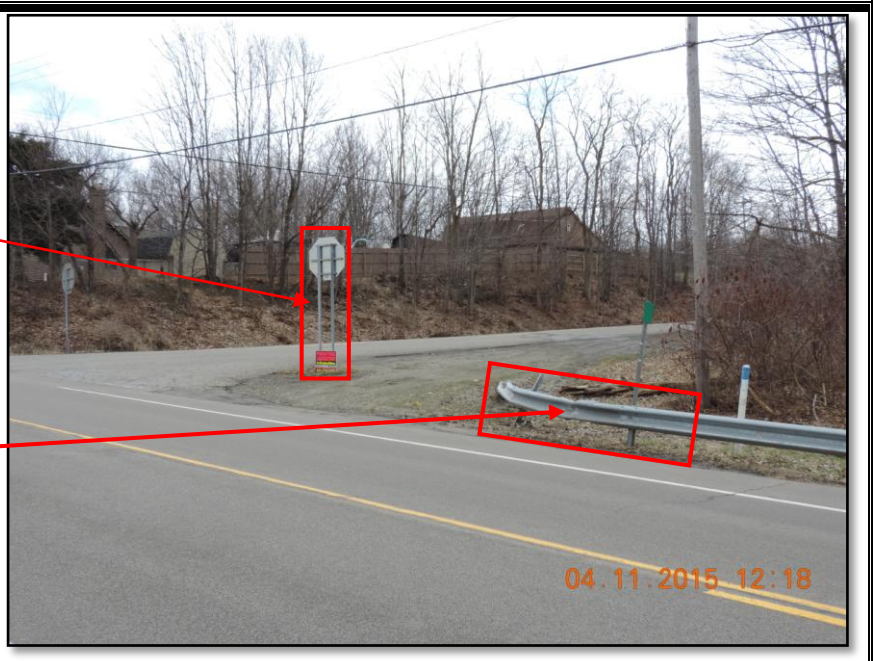
and

Fill and compact wheel track area.

Junction: Hwy-39 to CR-79/ Center Rd (Continued)

Stop Sign will need to be made removable to allow drivers to easily remove the sign, make the turn and replace the sign.

The guardrail will need to be removed to allow for component swing and wheel track.

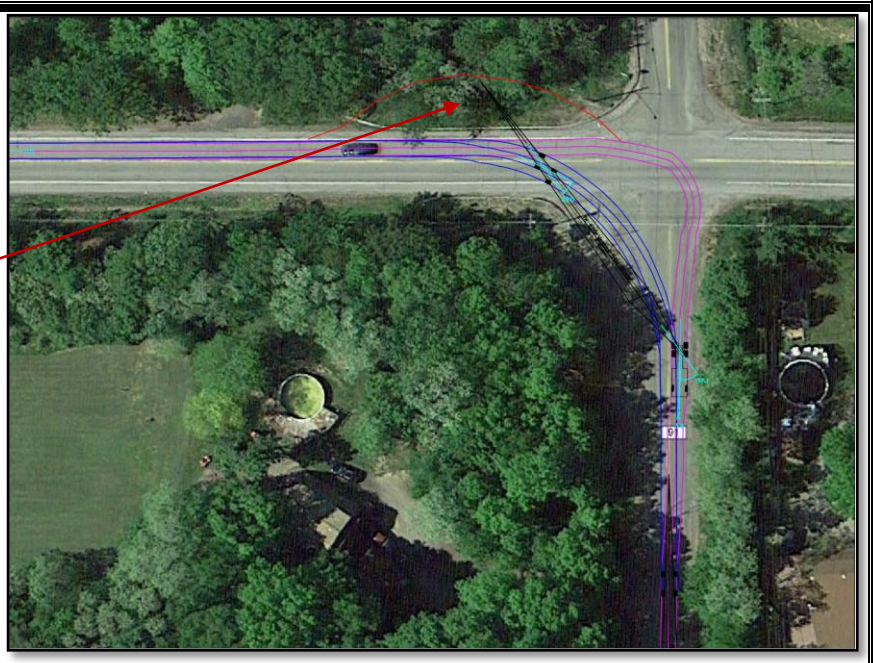


Fill and compact to allow for wheel track.

Junction: Hwy-39 to CR-79/ Center Rd (Continued)

BLADE

All obstructions will need to be removed from the blade tip swing area.



CR-79/ Center Rd.

CR-79/ Center Rd is a narrow two lane road with no shoulders and no passing areas. Traffic control will be critical to safe transport.

NOTE: Between Hwy-39 and the site area CR-79 is a steady up grade ranging between 1 and 10.4 percent.

Part of CR-79 is load posted. The county should be contacted to confirm access.

CR-79/ Center Rd.
(Continued)

Junction CR-79/ Center Rd. & Hwy-83

IMPROVEMRNT NEEDED

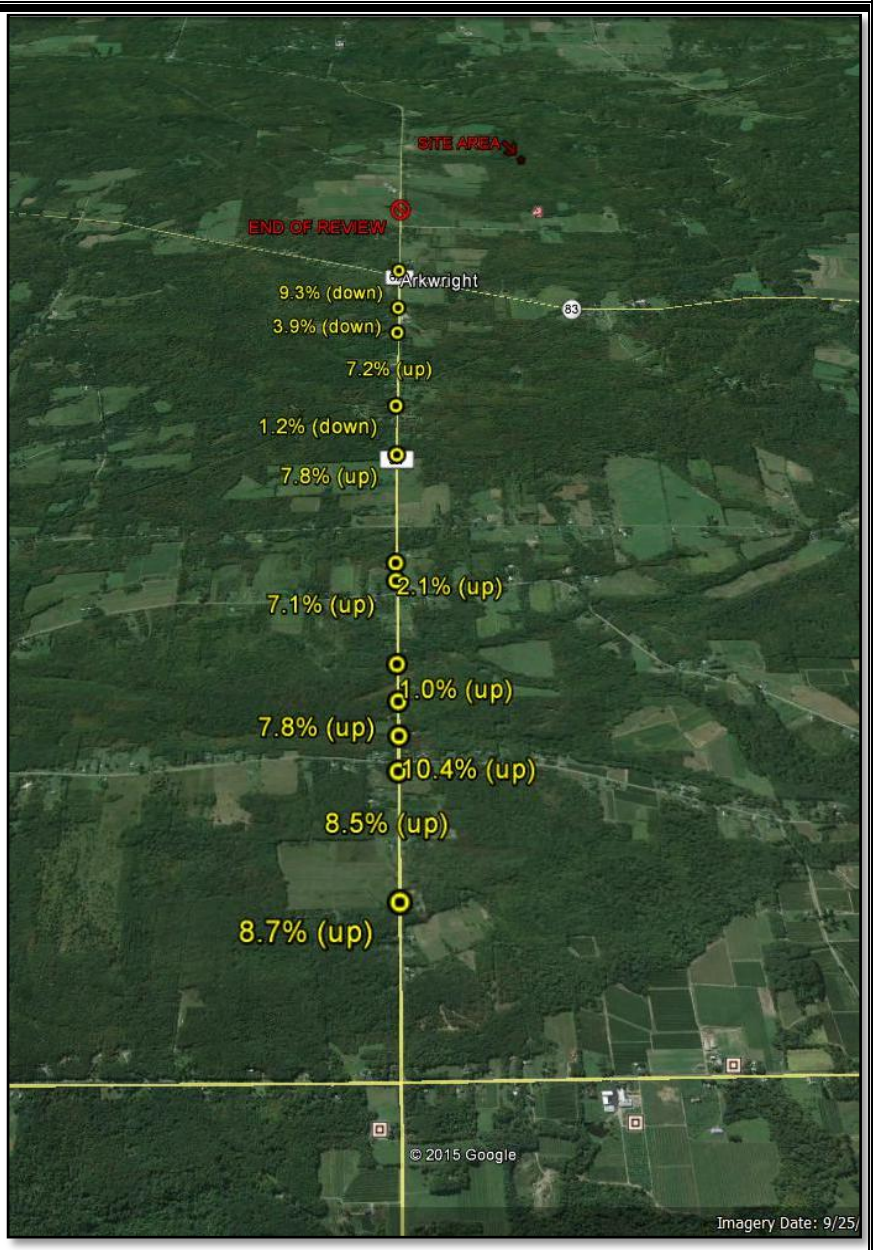
HUMP

The hump in the intersection will need to be reduced. Fill could be added before and after the intersection to prevent the loads with minimal ground clearance (Nacelle, Hub, etc.) from becoming high centered.

CR-79/ Center Rd.
(Continued)

GRADE MAP:

Map shows readings taken at random locations along the route between Hwy-39 and Ball Rd.



Transport Route

The proposed transport route was physically reviewed and checked using the NY DOT website for dimensional clearance.

The route was checked for the following dimensions. All loads for both tower sizes fall in the below combined dimensions.

205 L
14 W
15 H

Optional Rail Siding

During the review additional rail sidings were examined based on proximity to the site as well as the amount of improvement needed to use the siding.

NOTE: This option will need to be verified by the railroad(s) to insure adequate clearances to safely rail components to this location.

An optional rail siding was identified during the review in the town of Dunkirk, NY. Dunkirk is approximately 10 miles north of the site. The siding appears to be a CSX yard with additional property to the southwest that is privately owned. The siding is approximately 4.4ac and would require some improvement, clean up, tree clearing, etc. The additional property could add up to an additional 10ac for a total of 14.4ac. An access point between the two properties would need to be constructed and some minor improvement would be necessary.

NOTE: Property owners and the railroad were *NOT* contacted during this review.

Figure 13 Dunkirk Rail Siding Option

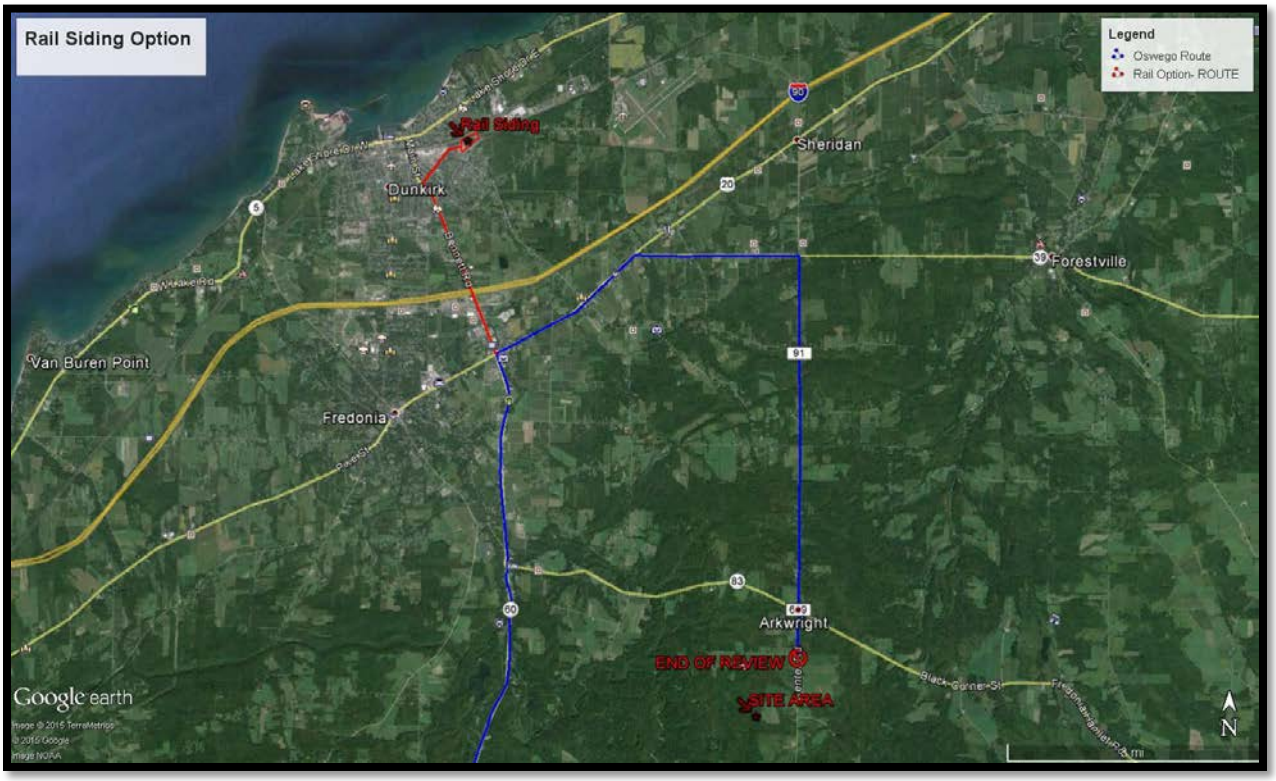
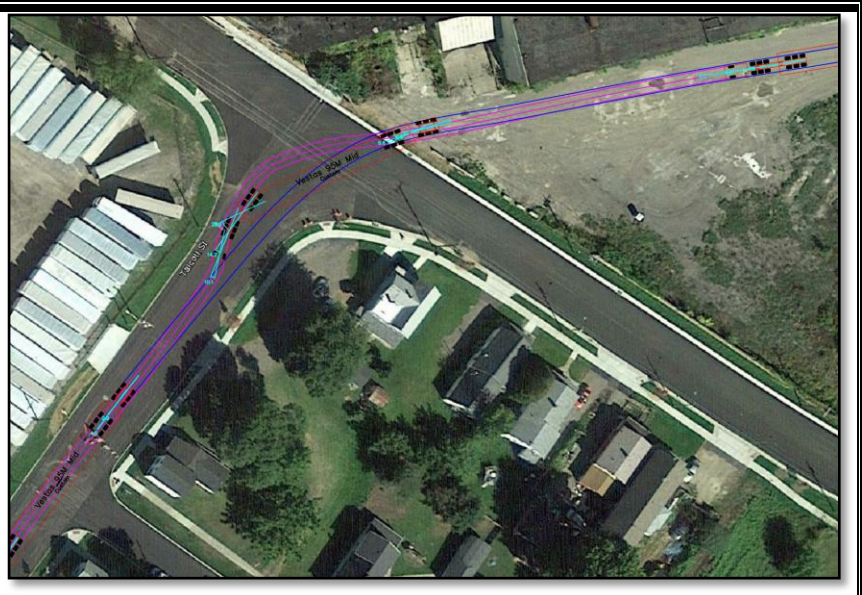
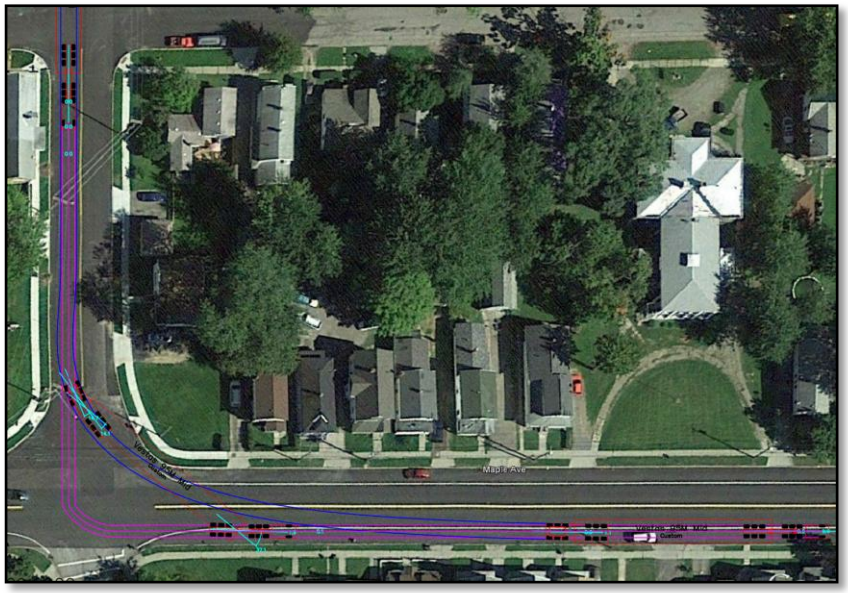


Figure 14 Dunkirk Rail Siding Route Map

Proposed Transport Route

Route	Direction	Miles
W Talcott St.	Southwest	.32
Hwy-60	South	2.3
Hwy-20	East	2.1
Hwy-39	East	2.0
CR-79/ Center Rd	South	4.8
Junction: Center Road & Ball Rd	End Point	TOTAL= 9.52

Optional Rail Siding Routes

<u>Rail Siding Exit (using private property)</u> Exiting the siding through the private property onto W Talcott St. No issue <u>Junction: W Talcott St & Hwy-60</u> TOWER	 

Junction: W Talcott St & Hwy-60

BLADE

Blade tip swing area will need to be clear of obstructions.

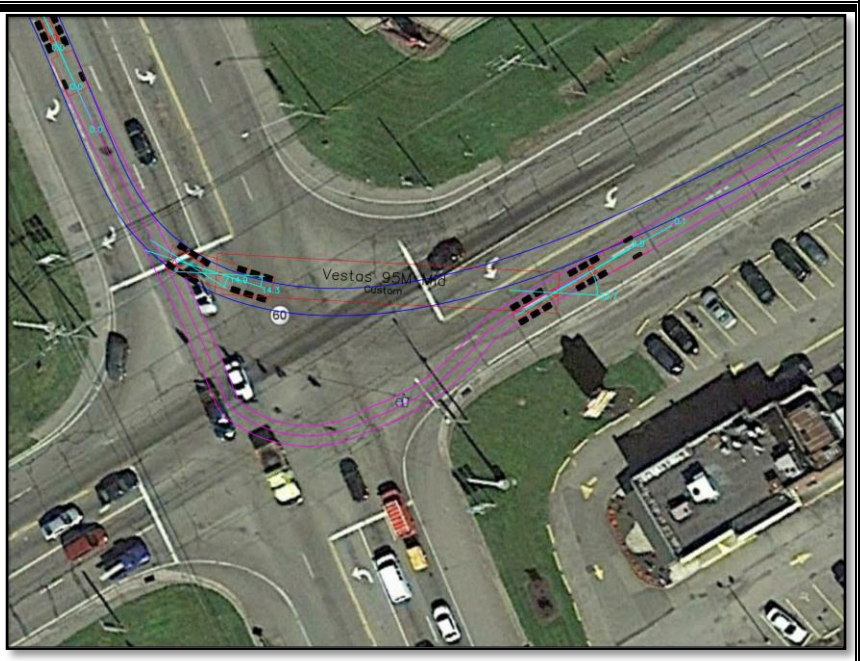
Junction: Hwy-60 & Hey-20

No issues

NOTE: From the intersection of Hwy-60 AND Hwy-20 the route is the same as route from Oswego, NY

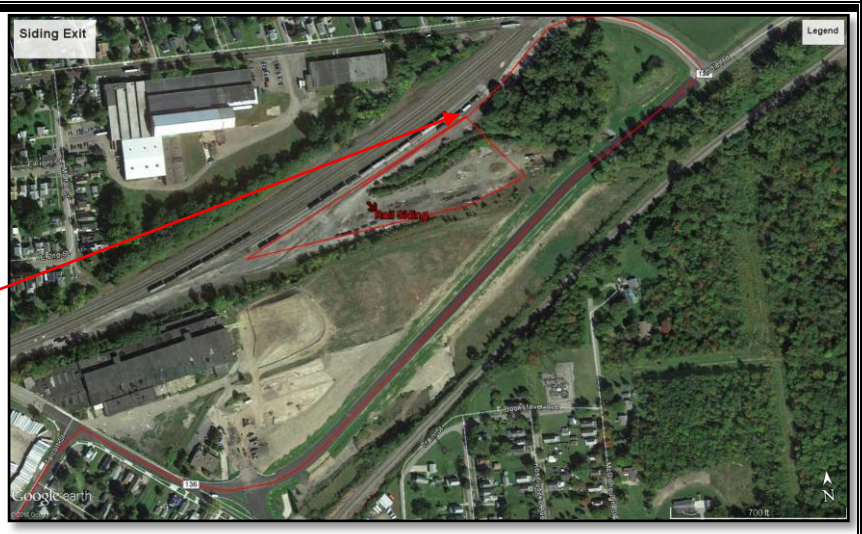
NOTE: This route would require approval from local authorities for transport on local roads, from the siding to Hwy-60

NOTE: The rail clearances into the siding have *NOT* been checked or confirmed by any railroad.



Rail Siding Exit (NOT using private property)

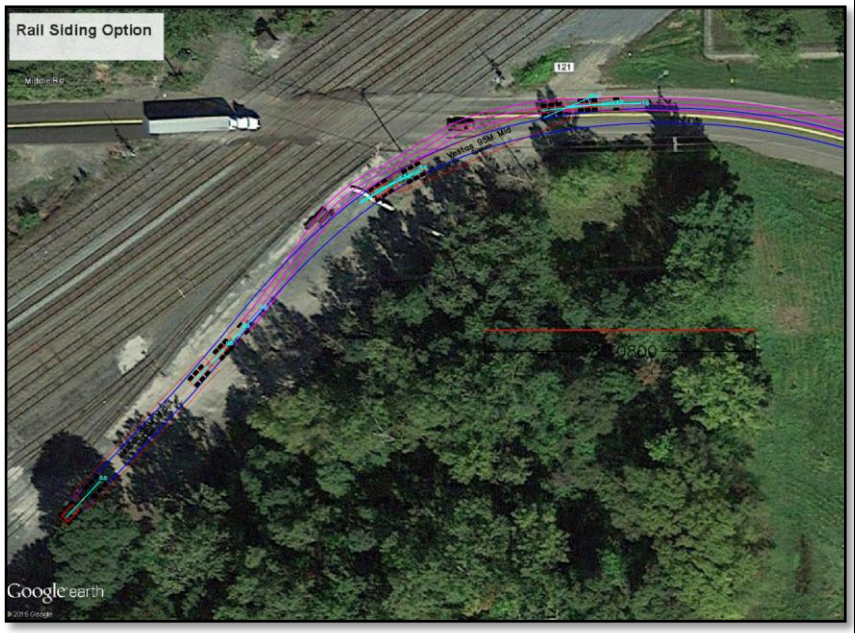
Exiting the rail siding without using the private property- Transports could exit the siding at the northeast corner of the siding onto CR-121/ Middle Rd.



Siding Exit

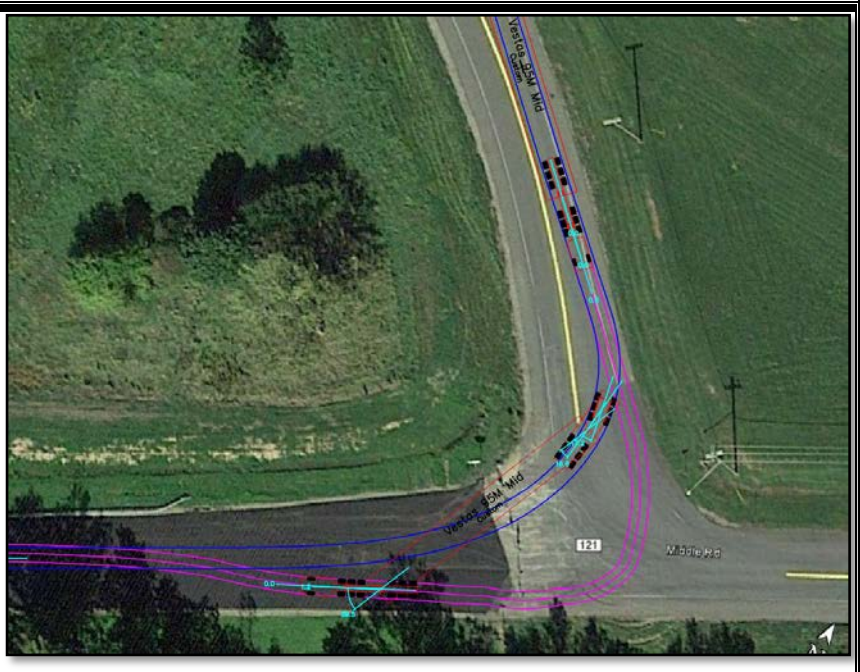
IMPROVEMENT NEEDED

Some minor improvement to the radius and some cleanup would be required.



Junction: CR-121 & ROAD

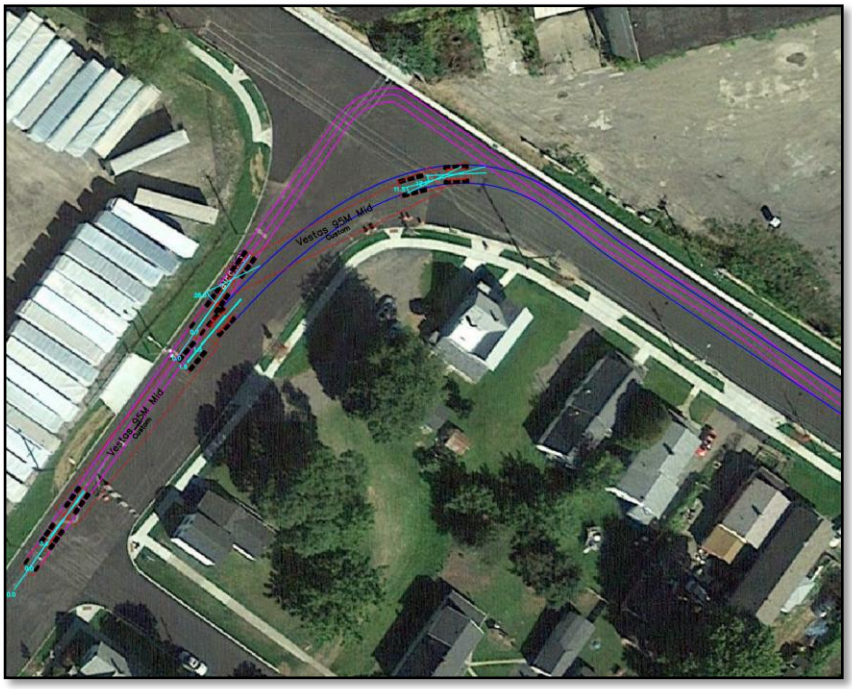
No issues



Junction: ROAD & E Talcott St.

No issues

NOTE: From this point same as route above.



Comments

1. Transport permits have not been ordered.
2. Transport equipment listed in this document are a typical representation of the equipment that will be used, the exact equipment has not been selected yet.
3. This review was conducted using all information available at the time.
4. The turn improvement drawings/ overlays were created using scaled Google Earth images. They will give a very good representation of what is needed. When the exact tower and transport equipment is selected the drawings/ overlays should be reevaluated.
5. There is considerable construction going on in New York, it is recommended that closer to deliveries the route be reevaluated to insure nothing has changed.
6. State and local roads within the site area consist of many narrow roads with many rolling hills. The roads will need a lot of improvements to insure safe delivery of components.