Office of Highway Safety

Road Safety Audit Review

Town:	Highgate	**Date Reviewed:**	January 19 2016
Route:	VT 78 @ Machia Road	**Mile points:**	VT 78: 6.76

Location Map

Office of Highway Safety

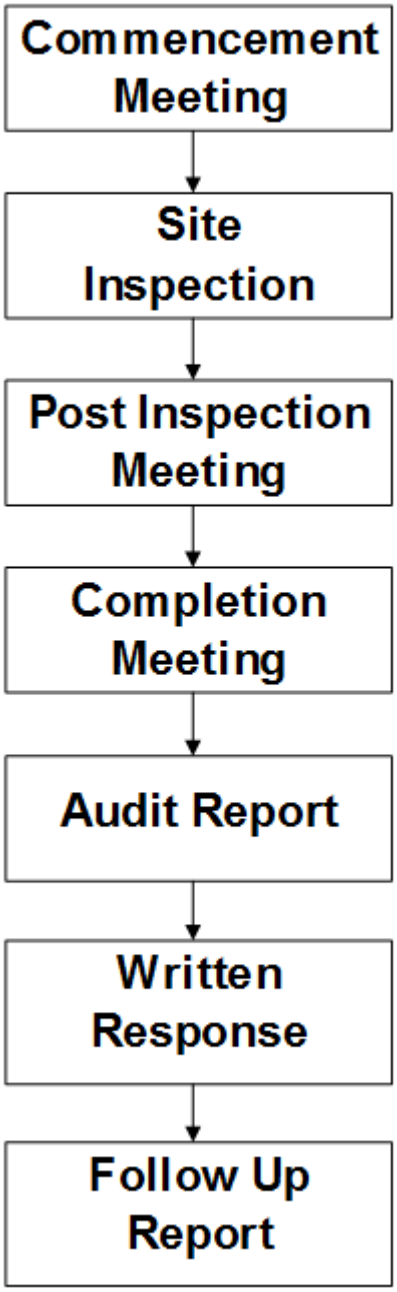
Road Safety Audit Review

RSAR Process

A ***Road Safety Audit Review*** (RSAR) is a formal examination of an existing road in which an independent, multi-discipline team (the Audit Team) reports on potential safety issues.

According to the Federal Highway Administration (FHWA), the purpose of a RSAR is to determine which elements of the road may present a safety concern, to what extent and under what circumstances as well as to identify opportunities to mitigate the identified safety concerns.

Figure 1 - Road Safety Audit Process



The RSAR process is composed of several steps as shown in Figure 1. The process starts with a ***Commencement Meeting*** during which the Audit Team reviews data and gathers community concerns. A ***Site Inspection*** is then performed by the Audit Team. The site visit involves the identification of safety deficiencies as seen in the field. The Audit Team will usually drive through the location of interest to "get a feel" for the area, traveling through each approach in the case of intersections. The team is to then drive at a slower speed to make observations. If needed, the team will also walk the location. Following the site inspection, the Audit Team holds a ***Post Inspection Meeting.*** It is during this meeting that the team members discuss their observations and identify safety issues. The team is to reach a consensus on the importance of each safety issue mentioned. Only those issues for which a consensus is reached are included in the RSAR findings. A RSAR report (Written Report) is prepared.

The ***Written Report*** identifies safety concerns and proposes guidance. These issues and solutions are presented in a tabular format associated to each Responsible Entity for ease of reporting. The ***Responsible Entities*** are any groups who own a roadway

feature or who are responsible for making an improvement or for initiating further studies. These could include for example, the VTrans design section, the local town, the local police or the local RPC.

Location

The location of this RSAR is the intersection of VT 78 and Machia Road in Highgate.

Purpose of the RSAR

This RSAR was conducted at the request of the Northwest Regional Planning Commission (NRPC) and of the Town of Highgate with the intent of having safety issues identified as they relate to the intersection of VT 78 and an upcoming town highway bridge program project for bridge number 25 on Machia Road (near the intersection of VT 78).

The RSAR herein has sought to identify potential safety hazards and physical features which may affect road user safety. However, it is possible that not every deficiency has been identified. It should further be recognized that the implementation of the guidance in this report may contribute to improve the level of safety of the facility reviewed but not necessarily remove all the risks.

RSAR Participants

Mario Dupigny-Giroux from the Office of Highway Safety, VTRANS, was the RSAR coordinator.

The other participants were:

Doug Bonneau,	Structures, VTRANS
Jim Cota,	District 8, VTRANS
John Filipek,	Office of Highway Safety, VTRANS
Tyler Guazzoni,	TSMO, VTRANS
Jonathan Harrington,	Pavement Design, VTRANS
Christopher Mooney,	Structures, VTRANS
David Peterson,	Structures, VTRANS
Taylor Sisson,	Traffic Design, VTRANS
Bethany Remmers,	Northwest Regional Planning Commission
Maren Hill,	Safe Routes to School

Andy King,	Highgate Public Works Director
Richard Noel,	Highgate Rep Trans Comm
Paulette Tatro,	Highgate Selectboard
Heidi Britch-Valenta,	Highgate Town Administrator
Maurice Lamothe,	Vermont State Police

Information Reviewed

Geometry

This is a three-way intersection with traffic being controlled by a stop sign on Machia Road.

This intersection is within a 10-degree curve.

Pine Plains Road is class IV road that intersects with Machia Road on the right hand side of Machia Road and in close proximity to the VT 78 intersection.

VT 78 has a 9 percent downgrade towards the intersection when traveling westbound.

Bridge number 25 is located within 200 feet of the intersection. There is a five-tons weight limit on this bridge.

Speed Limit

The posted speed limit is 30 mph on VT 78.

There are 15 mph advisory speed plaques below the advance curve signs in both directions on VT 78 approaching the intersection.

Traffic Volumes

The 2012 Average Annual Daily Traffic on VT 78 was 1700 vehicles per day.

Semitrailers of 73.5 feet in length are common on VT 78 and at this location.

It has been reported that a large number of pickup trucks that are pulling livestock trailers are making a right hand turn onto Machia Road.

Signs and Markings

Traveling eastbound on VT 78 approximately 490 feet from the intersection, there is a turn sign with a side road displayed on the sign supplemented by a 15 mph advisory plaque beneath the sign along with a Machia Road name plaque.

This is followed by a 10,000 pounds legal load limit sign with an arrow below it that is pointing to the right and a Machia Road name plaque above it.

The curve in this direction is delineated with two large arrows.

In the westbound direction, there is a 30 mph speed limit sign approximately 740 feet from the intersection followed by a 10,000 pounds legal load limit sign with an arrow below it that is pointing diagonally to the right and a Machia Road name plaque above it.

This is then followed by a curve sign with the side road depicting Machia Road supplemented with a street name plaque and a 15 mph advisory speed plaque.

The curve in this direction is delineated with one large arrow.

Approximately 3000 feet east of the intersection, at the beginning of the long downhill, there is an 11 percent hill sign that is facing westbound traffic.

Pavement Conditions

Pavement conditions on VT 78 are rated as good by VTrans. This rating is based on 2015 data.

Past Projects

This portion of VT 78 was repaved in 2015 through project STP 2715(1).

As part of this project, the centerline was shifted along the curve by the Machia Road intersection based on truck movement observations to facilitate the maneuvering of trucks around the curve. Widening of the pavement in the inside of the curve was also done to help trucks around the curve. The swell on the left hand side of VT 78 east of Machia Road was also

redefined. The traffic signs were replaced with new ones and some were adjusted or added, for example, the westbound turn sign was moved closer and an additional eastbound large arrow was installed.

The Machia Road intersection was also realigned slightly and the actual stopping point was moved from being south of Pine Plains Road to being north of this road and directly at VT 78.

The final plan layout for this intersection is shown at the end of the report.

Future Projects

Project BO 1448(43) is for the replacement of Bridge number 25 on a new structure. One of the contemplated alignments is one that would bring Machia Road west of its current intersecting point with VT 78 to a new alignment through where house number 6756 is currently located (a preliminary alignment is provided at the end of this report). Another proposal is to connect with Machia Road as it currently exists.

Crash History

Crash history was reviewed at this intersection and near the curve for the twelve-year period covering the years 2003 to 2015. The crash summary listing is provided at the end of this report. A collision diagram was not produced since there was no documentation of recent crashes in the Web Crash System maintained by VTrans.

For the reporting period mentioned above, three crashes were reported to the Department of Motor Vehicles. Specifically, there was a single vehicle crash in September 2003, a left turn/broadside crash in August 2005 and an opposite direction sideswipe crash in December 2008.

In this last instance, a vehicle was traveling west on VT 78 down the hill trying to continue right. The vehicle was unable to make the turn due to the snow on the ground and hit the second vehicle that was traveling east.

Anecdotally, District 8 indicated that there were known crashes due to motorists traveling eastbound on Machia Road and entering VT 78, either without stopping or not being able to stop/failing to stop.

The Town mentioned that the owner of the house with the fence on the side opposite to Machia Road had come to the Town Office to mentioned that a truck had crossed over his lawn.

The Town also reported hearing of two other recent crashes (early January 2016) during which some vehicles ran off the road at this location. One of these recent instances involved a vehicle that knocked down an arrow sign.

Still anecdotally, some of the participants to the road safety audits witnessed, on the day of the audit (January 19 2016), a vehicle that was traveling eastbound and that drove into a snow bank as it missed negotiating the curve. The audit team learned of another crash that happened on that same day, but following the site visit by the audit team, in which a vehicle traveling westbound left the road and hit the porch of the yellow house that is located on the corner (There is a crash report available for this crash and it is summarized following the crash listing at the end of the report). The weather on the day of the audit was snowy and windy.

Local Concerns

The Town explained that the freeze/thaw cycle, due to the variation in temperatures, creates a dangerous situation when water runs down the steep hill on VT 78 and pools at the bottom of the hill to then freeze as the temperature goes down below freezing again. When this happens, the road becomes icy at the point in the road that requires a very sharp turn.

The Town also explained that there was a spring on the northbound side of VT 78 on one of the properties and that water from this spring was coming down the hill and pooling at the intersection.

Observations were reported via email, that many of the pickup trucks with livestock trailers that were making a right hand turn onto Machia Road were not able to see traffic coming from the bridge due to the house being in the way. In order to be able to complete their turn, the drivers

have to pull into the area in front of the house and inch forward until they can see around the house.

Identified Safety Concerns

This section lists the areas of safety concern identified by the audit team during the site inspection and from the analysis of available data. This section also reports the potential safety enhancement suggested by the audit team. The concerns are not listed in order of importance.

Concern: Sight Distance Issue When Making a Left Turn onto Machia Road

Westbound motorists who are continuing onto Machia Road and making a left turn have limited sight distance to the eastbound traffic on VT 78 that is coming from the right. This is due to the horizontal curve and the large trees on the property on the inside of the curve. It was determined that approximately 125 feet of sight distance was available compared to the

minimum 200 feet suggested by AASHTO for a travel speed of 30 mph. Note that this measurement was taken during winter and that the large tree did not contribute significantly to reducing the sight distance.

Safety Enhancements:

Ensure that the yellow centerline markings that define the intersection and specifically the opening through which motorists should enter Machia Road are visible. By properly stopping and entering the intersection at the centerline opening, motorists would be able to see oncoming eastbound VT 78 traffic better.

Relocate Machia Road on a new alignment that would go through the property at 6756 VT 78 as considered by project BO 1448(43). This would force motorists to make a left turn at about a 90 degree instead of shooting straight. The available sight distance for making the left turn onto Machia Road on a new alignment would be approximately 230-240 feet.

Concern: Visibility Issue for Long Vehicles that are Making a Right Hand Turn onto Machia Road.

Pickup trucks with livestock trailers need to be able to see oncoming traffic in advance in order to be making their turn. The house (# 6756) prevents the operators of these vehicles from seeing traffic coming off the bridge.

Safety Enhancements:

The removal of the house and associated relocation of Machia Road on a new alignment through the property as considered by project BO 1448(43) would resolve this condition.

Concern: Potential Issue with Motorists Failing to Stop at Machia Road When Entering VT 78.

District 8 has reported that failing to stop was an issue and that it had contributed to crashes.

Safety Enhancements:

Ensure that the stop bar and the STOP word markings are visible and refreshed on a yearly basis as needed.

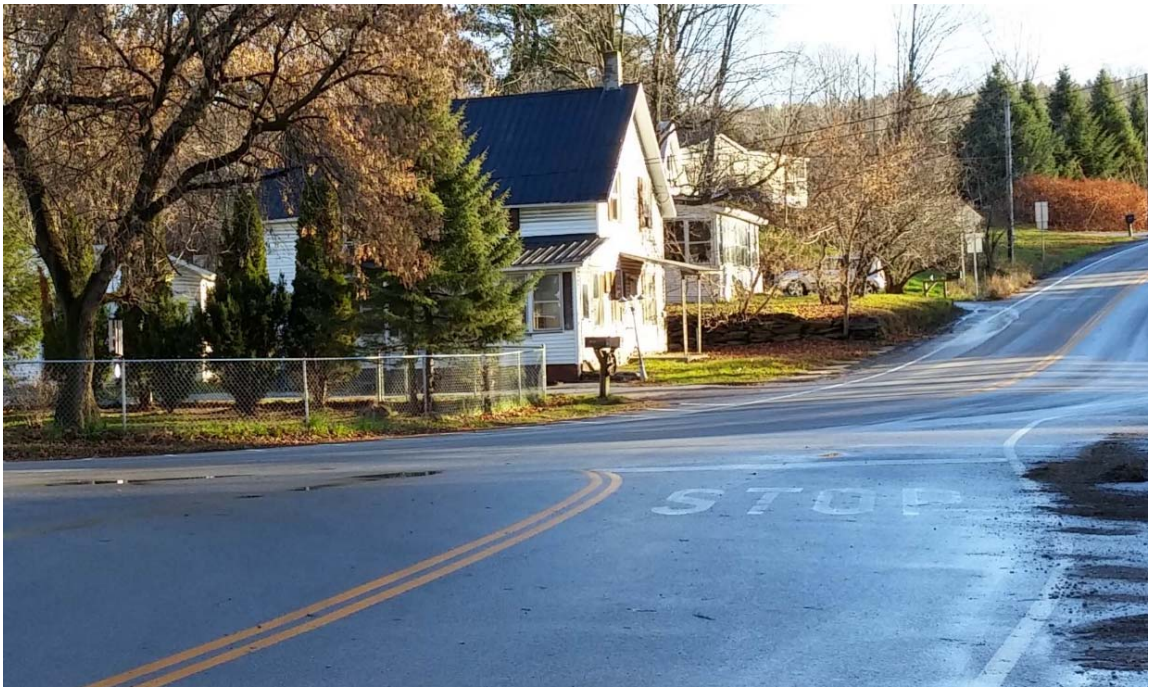
To make the reflectivity of the stop bar and STOP word markings and the other intersection markings last longer, consider milling the markings at the intersection.

If the issue is determined to be significant, install a flashing beacon above the stop sign or LEDs around the stop sign.

Realign Machia Road on a new alignment that forces motorists to slow down before approaching and entering VT 78 as considered by project BO 1448(43).

Concern: Issue with Water Pooling at the Intersection.

Water has been reported to be pooling at the intersection from different sources. In general, from water shading off driveways but specifically from a spring on a property on the north side of VT 78 (on the hill side approach to the intersection). During the freezing months, water turns into ice and creates slippery conditions at the horizontal curve.



Safety Enhancements:

Could VTrans Structures investigate the issue with the spring and consider alternative improvements as part of project BO 1448(43)?

If the water pooling issue cannot be physically resolved, to reduce the incidences of motorists leaving the road when the road surface is icy, could a dynamic ice warning system using advance signs that would have some form of flashing mechanism with the message ICING MAY OCCUR WHEN FLASHING be considered as of part project BO 1448(43)? *Detection of icy conditions would be achieved with a non-intrusive road surface sensor capable of detecting ice on the road surface. The system could have the capabilities of being monitored remotely by the district using a web-based application.*

Concern: Issue with Vehicles Leaving the Road at the Horizontal Curve.

While there are very few crashes reported to the Department of Motor Vehicles, vehicles leaving the road due to the horizontal curve has been anecdotally recorded. Some of these incidents are due to the water/ice issue discussed previously.

Safety Enhancements:

Install a distance plaque below the hill sign at mile point 7.32 (Next ½ mile).

Upgrade the large arrow signs to fluorescent yellow sheeting.

Make the turn sign at mile point 6.81 dynamic and flash when a vehicle is approaching at a speed above a certain selected speed (beacon or LEDs around the sign).

Summary of Safety Enhancements

The safety concerns and potential actions that were identified in the previous sections are further summarized in the next table. These potential enhancements will be presented to the various responsible parties for further consideration.

Potential Safety Enhancements Summary Table

Safety Concern	Safety Enhancement	Responsibility	Safety Payoff	Time Frame	Cost
Sight Distance Issue When Making a Left Turn onto Machia Road	Ensure that the yellow centerline markings are visible	VTrans (OPS)	Low	Annually	Low
	To make the reflectivity of the yellow centerline markings last longer, consider milling the markings at the intersection.	VTrans (Structures - via project BO 1448(43))	Low	Mid	Med
	Relocate Machia Road on a new alignment that would go through the property at 6756 VT 78 as considered by project BO 1448(43)	VTrans (Structures)	High	Mid	High
Visibility Issue for Long Vehicles that are Making a Right Hand Turn onto Machia Road	The removal of the house and associated relocation of Machia Road on a new alignment through the property as considered by project BO 1448(43) would resolve this condition	VTrans (Structures)	Med	Mid	High
Potential Issue with Motorists Failing to Stop at Machia Road When Entering VT 78	Ensure that the stop bar and the STOP word markings are visible and refreshed on a yearly basis as needed	Town of Highgate	Low	Annually	Low
	To make the reflectivity of the stop bar and STOP word markings and the other intersection markings last longer, consider milling the markings at the intersection.	VTrans (Structures - via project BO 1448(43))	Low	Mid	Med
	Under current conditions, if the issue is determined to be significant, install a flashing beacon above the stop sign or LEDs around the stop sign	VTrans (TSMO)	High (41% reduction right angle)	Short	Low
	Realign Machia Road on a new alignment that forces motorists to slow down before approaching and entering VT 78 as considered by project BO 1448(43)	VTrans (Structures)	High	Mid	High

Potential Safety Enhancements Summary Table

Issue with Water Pooling at the Intersection *(& icy slippery conditions at the horizontal curve)*	Could VTrans Structures investigate the issue with the spring and consider drainage improvements as part of project BO 1448(43)?	VTrans (Structures - via project BO 1448(43))	Med	Mid	Med
	If no physical changes can be done as part of BO 1448(43), could a dynamic ice warning system with icy conditions detected using a non-intrusive road surface sensor be considered?	VTrans (Structures - via project BO 1448(43))	Med (18% reduction)	Short/Mid	Med (est $15000 for project.)
Issue with Vehicles Leaving the Road at the Horizontal Curve	Install a distance plaque below the hill sign at mile point 7.32 (Next ½ mile)	VTrans (TSMO)	Low	Short	Low
	Upgrade the large arrow signs to fluorescent yellow sheeting	VTrans (TSMO)	Med (18% reduction)	Short	Low
	Make the turn sign at mile point 6.81 dynamic and flash when a vehicle is approaching at a speed above a certain selected speed.	VTrans (TSMO)	Low/Med	Short/Mid	Low ($6500)

Vermont Agency of Transportation

General Yearly Summaries - Crash Listing: State Highways and All Federal Aid Highway Systems

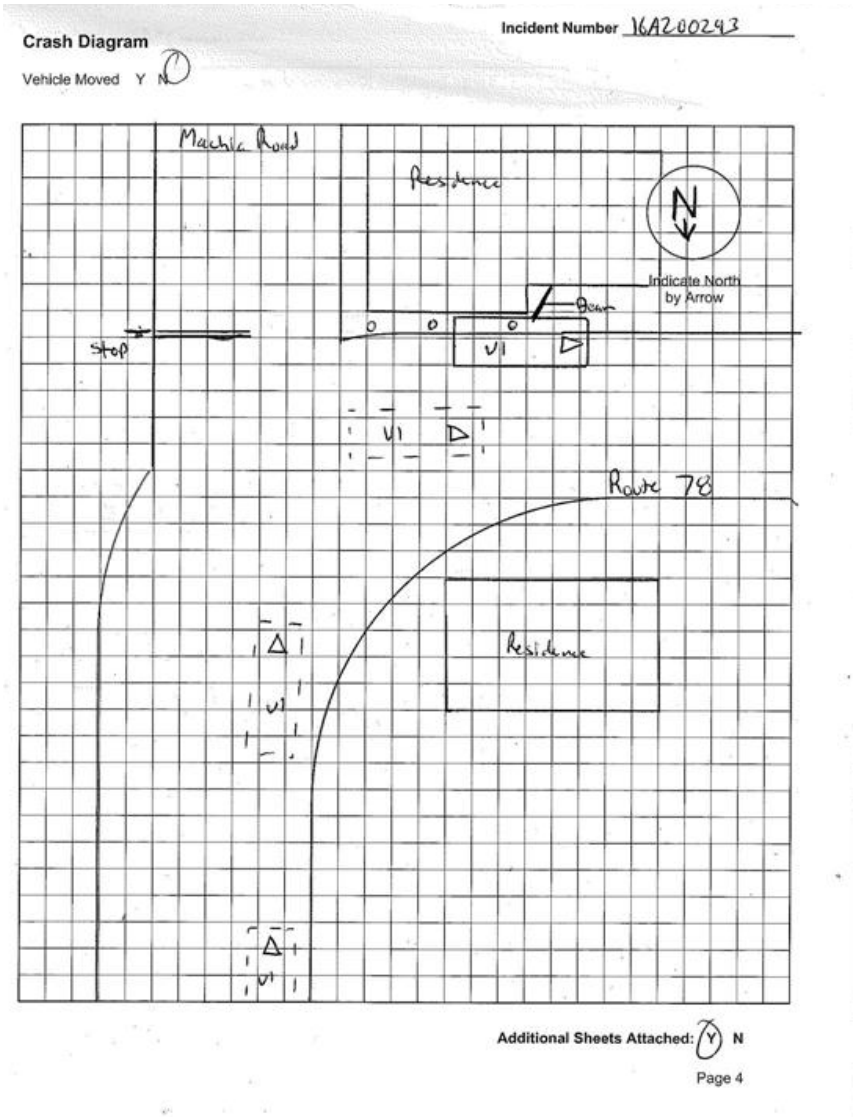
From 01/01/03 To 01/20/16 General Yearly Summaries Information

*	Reporting Agency/ Number	Town	Mile Marker	Date MM/DD/YY	Time	Weather	Contributing Circumstances	Direction Of Collision	Number Of Injuries	Number Of Fatalities	Number Of Untimely Deaths	Direction	Road Group
Route: VT-78 Continued ...													
	VTVSP0700/09A20 0186	Highgate	5.61	01/12/2009	07:48	Clear	Driving too fast for conditions, Failure to keep in proper lane	Single Vehicle Crash	0	0	0	E	SH
	0612/12805-07	Highgate	5.65	10/07/2007	00:10	Rain	Driving too fast for conditions	Single Vehicle Crash	1	0	0	E	SH
	0612/3955-06	Highgate	5.66	03/03/2006	16:20	Snow	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway etc	Single Vehicle Crash	0	0	0	E	SH
	0613/9614-04	Highgate	5.7	07/23/2004	09:31	Rain	Driving too fast for conditions, No improper driving	Same Direction Sideswipe	0	0	0		SH
	0613/7113-03	Highgate	5.71	05/07/2003	07:45	Rain	Driving too fast for conditions, Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner, No improper driving	Head On	2	0	0		SH
	VTVSP0700/09A20 4332	Highgate	5.72	09/17/2009	03:21	Clear	Driving too fast for conditions, Failure to keep in proper lane	Single Vehicle Crash	0	1	0	E	SH
	0612/11363-05	Highgate	5.76	08/14/2005	18:33	Rain	Driving too fast for conditions, Distracted	Single Vehicle Crash	0	0	0	E	SH
	0612/3481-05	Highgate	6.03	02/18/2005	19:50	Snow	No improper driving	Single Vehicle Crash	0	0	0	W	SH
	VTVSP0700/10A20 5493	Highgate	6.15	12/08/2010	01:52	Snow	Visibility obstructed	Single Vehicle Crash	0	0	0	W	SH
	VTVSP0700/11A20 3357	Highgate	6.35	07/25/2011	02:12	Clear	Fatigued, asleep	Single Vehicle Crash	0	0	0	E	SH
	0609/12455-04	Highgate	6.47	09/25/2004	17:22	Rain	No improper driving, Driving too fast for conditions, Failure to keep in proper lane	Same Direction Sideswipe	0	0	0		SH
	0613/33-04	Highgate	6.55	06/12/2004	12:35	Clear	Failure to keep in proper lane, No improper driving	Head On	0	1	0		SH
	0613/12182-05	Highgate	6.55	08/14/2005	12:56	Cloudy	Failure to keep in proper lane	Head On	0	0	0		SH
	0612/16684-06	Highgate	6.55	12/18/2006	12:59	Cloudy	Unknown	Single Vehicle Crash	1	0	0	E	SH
	0613/9658-04	Highgate	6.57	06/20/2004	07:19	Clear	Inattention	Single Vehicle Crash	0	0	0	W	SH
	VT0060000/15FRC 005793	Highgate	6.59	11/07/2015	23:14	Cloudy	Driving too fast for conditions	Single Vehicle Crash	0	0	0	N	SH
	0613/10612-03	Highgate	6.77	09/07/2003	12:36	Clear	Driving too fast for conditions	Single Vehicle Crash	0	0	0	W	SH
	0613/10899-05	Highgate	6.77	08/06/2005	13:48	Clear	Other improper action, No improper driving	Left Turn and Thru, Broadside v<--	1	0	0	E	SH
	VTVSP0700/08A20 673	Highgate	6.77	12/23/2008	18:28	Snow	Failure to keep in proper lane, Driving too fast for conditions	Opp Direction Sideswipe	0	0	0	E	SH
	0613/13937-04	Highgate	6.82	10/11/2004	08:43	Cloudy	Driving too fast for conditions, Failure to keep in proper lane	Single Vehicle Crash	0	0	0	W	SH
	0613/1992-03	Highgate	6.86	01/11/2003	08:52	Cloudy	Driving too fast for conditions	Single Vehicle Crash	2	0	0	W	SH
	0613/7355-06	Highgate	6.86	06/08/2006	08:23	Rain	No improper driving	Single Vehicle Crash	0	0	0		SH
	0613/753-03	Highgate	6.87	01/24/2003	20:45	Clear	Driving too fast for conditions	Single Vehicle Crash	0	0	0	W	SH
	0612/10228-05	Highgate	6.89	07/03/2005	22:00	Clear	Wrong side or wrong way, Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway etc	Other - Explain in Narrative	0	0	0		SH
	0613/14281-03	Highgate	7.11	11/21/2003	11:41	Clear	Distracted, No improper driving	Rear End	0	0	0		SH
	VTVSP0700/10A20 1019	Highgate	7.14	03/16/2010	08:06	Clear	Followed too closely, Driving too fast for conditions	Rear End	0	0	0	E	SH
	VTVSP0700/10A20 0465	Highgate	7.24	02/02/2010	08:04	Cloudy	Driving too fast for conditions, Failure to keep in proper lane	Single Vehicle Crash	0	0	0	W	SH
	0613/2407-03	Highgate	7.27	02/02/2003	15:22	Snow	Driving too fast for conditions	Single Vehicle Crash	0	0	0	W	SH
	0613/8349-03	Highgate	7.27	06/09/2003	16:01	Rain	Driving too fast for conditions	Single Vehicle Crash	1	0	0	E	SH
	0613/13126-04	Highgate	7.27	10/04/2004	19:37	Rain	Driving too fast for conditions	Single Vehicle Crash	0	0	0	W	SH
	0805/13321-06	Highgate	7.27	10/14/2006	21:34	Fog, Smog, Smoke	Driving too fast for conditions	Single Vehicle Crash	1	0	0	W	SH
	VTVSP0700/10A20 3285	Highgate	7.27	08/02/2010	15:21	Rain	Driving too fast for conditions, Failure to keep in proper lane	Single Vehicle Crash	0	0	0		SH
	VT0060000/13FRC 0258	Highgate	7.72	02/21/2013	23:20	Snow	Swerving or avoiding due to wind, slippery surface, vehicle, object, non-motorist in roadway etc	Single Vehicle Crash	0	0	0	E	SH
	0613/15096-04	Highgate	UNK	09/03/2004	00:25	Cloudy	Made an improper turn, Under the influence of medication/drugs/alcohol	Same Direction Sideswipe	1	0	0		SH

**Crash occurred prior to the last Highway Improvement Project. This data should not be used in a crash analysis. UNK indicates the Mile Marker is Unknown.*

16A20093

On 01/19/16, at approximately 1234 hours, a single vehicle crash without injuries at the intersection of Route 78 and Machia Road. Vehicle 1 was still in contact with the residence at this intersection. This is a tan building with red shutters directly at the intersection of Route 78 and Machia Road. Op 1 stated that while traveling west on Route 78, coming down the Highgate Hill, she was braking due to the excessive snow and ice that was built up on the roadway surface. The operator stated that she was traveling very slow, approximately 20 mph, and began to slide on the ice. While sliding down the hill, her vehicle turned sideways and slowly slide into the side of the building. The officer observed the roadway to be very icy and snow covered. When the vehicle collided with the building, it also collided with a support beam for the porch above where the vehicle came to rest.



REHAB. Dis, CBs OR MHs, CLASS I OR II
SEE SHEET 13

TEMPORARY 4 INCH WHITE LINE, PAINT
DURABLE 4 INCH WHITE LINE (OPTION BID ITEM)
(ALL LINES WILL INCLUDE EDGE LINE BREAKS AND RADII FOR SIDE ROADS)
STA. 355+00 TO 360+00, SOLID LT & RT
STA. 357+18, SOLID RT (EDGELINES, MACHIA ROAD, TH-4)

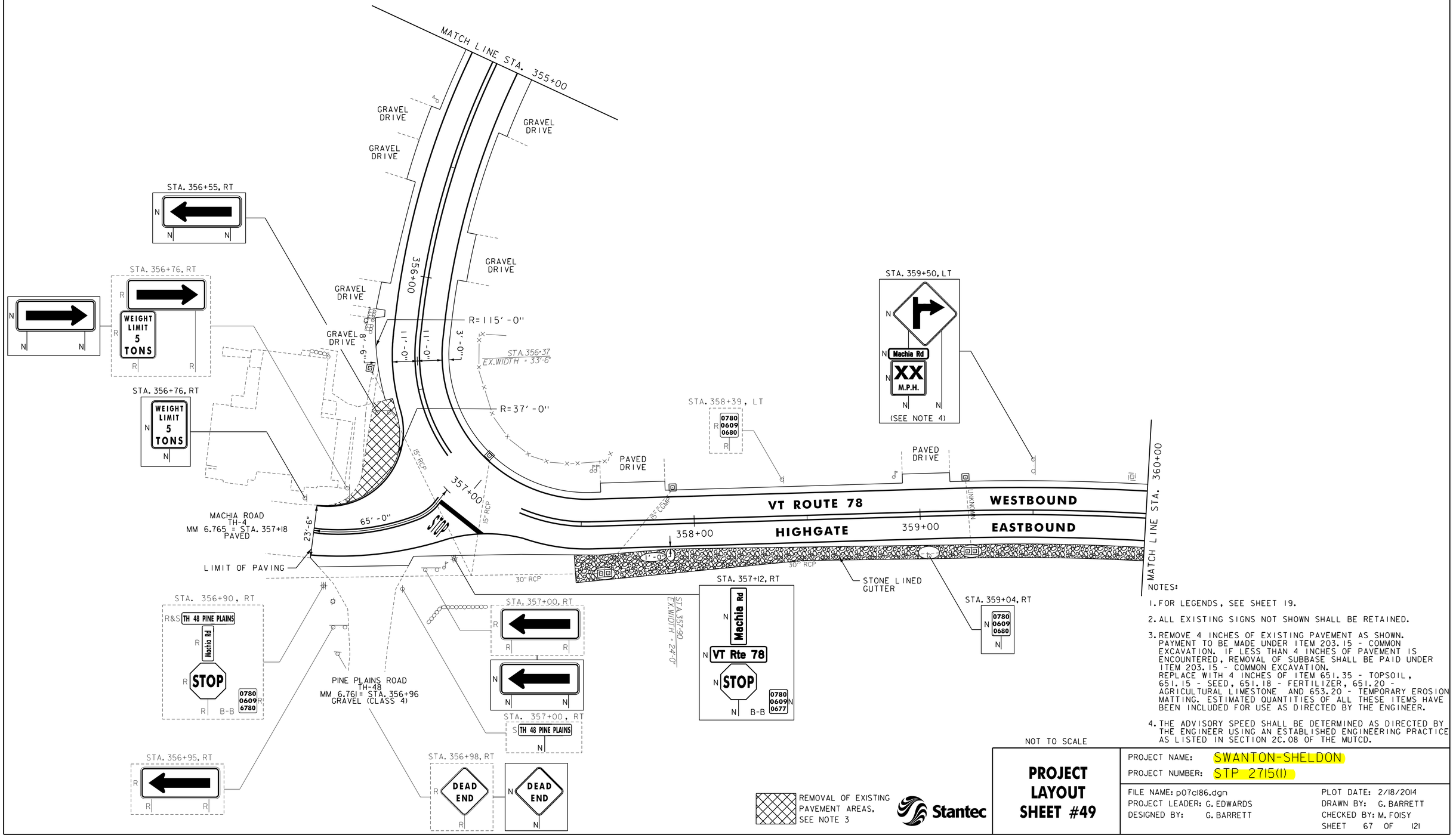
TEMPORARY 4 INCH YELLOW LINE, PAINT
DURABLE 4 INCH YELLOW LINE (OPTION BID ITEM)
(ALL LINES WILL INCLUDE ℄ BREAKS FOR SIDE ROADS)
STA. 355+00 TO 360+00, SOLID LT & RT
STA. 357+18, DOUBLE SOLID RT (MACHIA ROAD, TH-4)

TEMPORARY 24 INCH STOP BAR, PAINT
DURABLE 24 INCH STOP BAR (OPTION BID ITEM)
STA. 357+18, (MACHIA ROAD, TH-4)

TEMPORARY TEMPORARY LETTER OR SYMBOL, PAINT
DURABLE LETTER OR SYMBOL (OPTION BID ITEM)
STA. 357+18, (MACHIA ROAD, TH-4)

REMOVING SIGNS
AS SHOWN - 10

ERECTING SALVAGED SIGNS
AS SHOWN - 1



NOTES:

1. FOR LEGENDS, SEE SHEET 19.
2. ALL EXISTING SIGNS NOT SHOWN SHALL BE RETAINED.
3. REMOVE 4 INCHES OF EXISTING PAVEMENT AS SHOWN. PAYMENT TO BE MADE UNDER ITEM 203.15 - COMMON EXCAVATION. IF LESS THAN 4 INCHES OF PAVEMENT IS ENCOUNTERED, REMOVAL OF SUBBASE SHALL BE PAID UNDER ITEM 203.15 - COMMON EXCAVATION. REPLACE WITH 4 INCHES OF ITEM 651.35 - TOPSOIL, 651.15 - SEED, 651.18 - FERTILIZER, 651.20 - AGRICULTURAL LIMESTONE AND 653.20 - TEMPORARY EROSION MATTING. ESTIMATED QUANTITIES OF ALL THESE ITEMS HAVE BEEN INCLUDED FOR USE AS DIRECTED BY THE ENGINEER.
4. THE ADVISORY SPEED SHALL BE DETERMINED AS DIRECTED BY THE ENGINEER USING AN ESTABLISHED ENGINEERING PRACTICE AS LISTED IN SECTION 2C.08 OF THE MUTCD.

REMOVAL OF EXISTING PAVEMENT AREAS, SEE NOTE 3

NOT TO SCALE

PROJECT LAYOUT SHEET #49

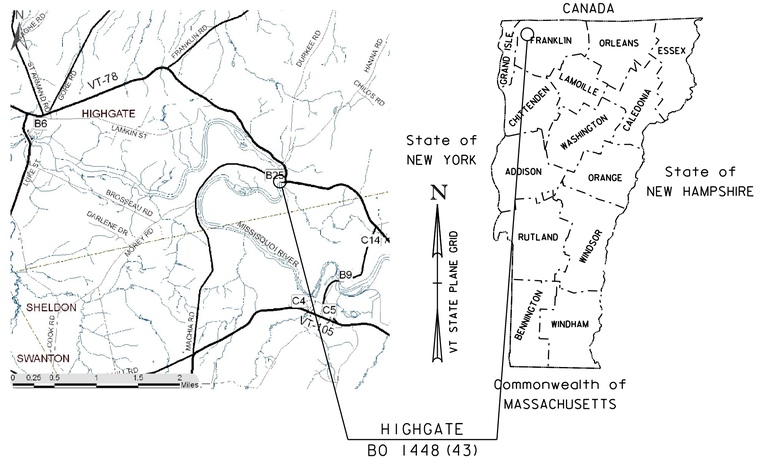
PROJECT NAME: SWANTON-SHELDON
PROJECT NUMBER: STP 2715(1)

FILE NAME: p07cl86.dgn
PROJECT LEADER: G. EDWARDS
DESIGNED BY: G. BARRETT
PLOT DATE: 2/18/2014
DRAWN BY: G. BARRETT
CHECKED BY: M. FOISY
SHEET 67 OF 121

REVIEWER NOTES

1. THE TOWN WILL BE RESPONSIBLE FOR SELECTING, SIGNING, AND MAINTAINING ANY DETOUR ROUTES USED DURING CONSTRUCTION.
2. UTILITIES WILL BE RELOCATED PRIOR TO THE START OF CONSTRUCTION.
3. ADDITIONAL TEMPORARY AND PERMANENT ROW WILL BE NEEDED FOR THIS PROJECT.
4. IT IS ANTICIPATED THAT A CAUSEWAY WILL NEED TO BE CONSTRUCTED IN THE RIVER STARTING AT THE SOUTHWEST CORNER OF THE BRIDGE AND EXTENDING SLIGHTLY EAST OF THE EXISTING PIER.
5. A SIMPLIFIED PAVEMENT DESIGN HAS BEEN DONE FOR THIS PROJECT.

STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
BRIDGE PROJECT

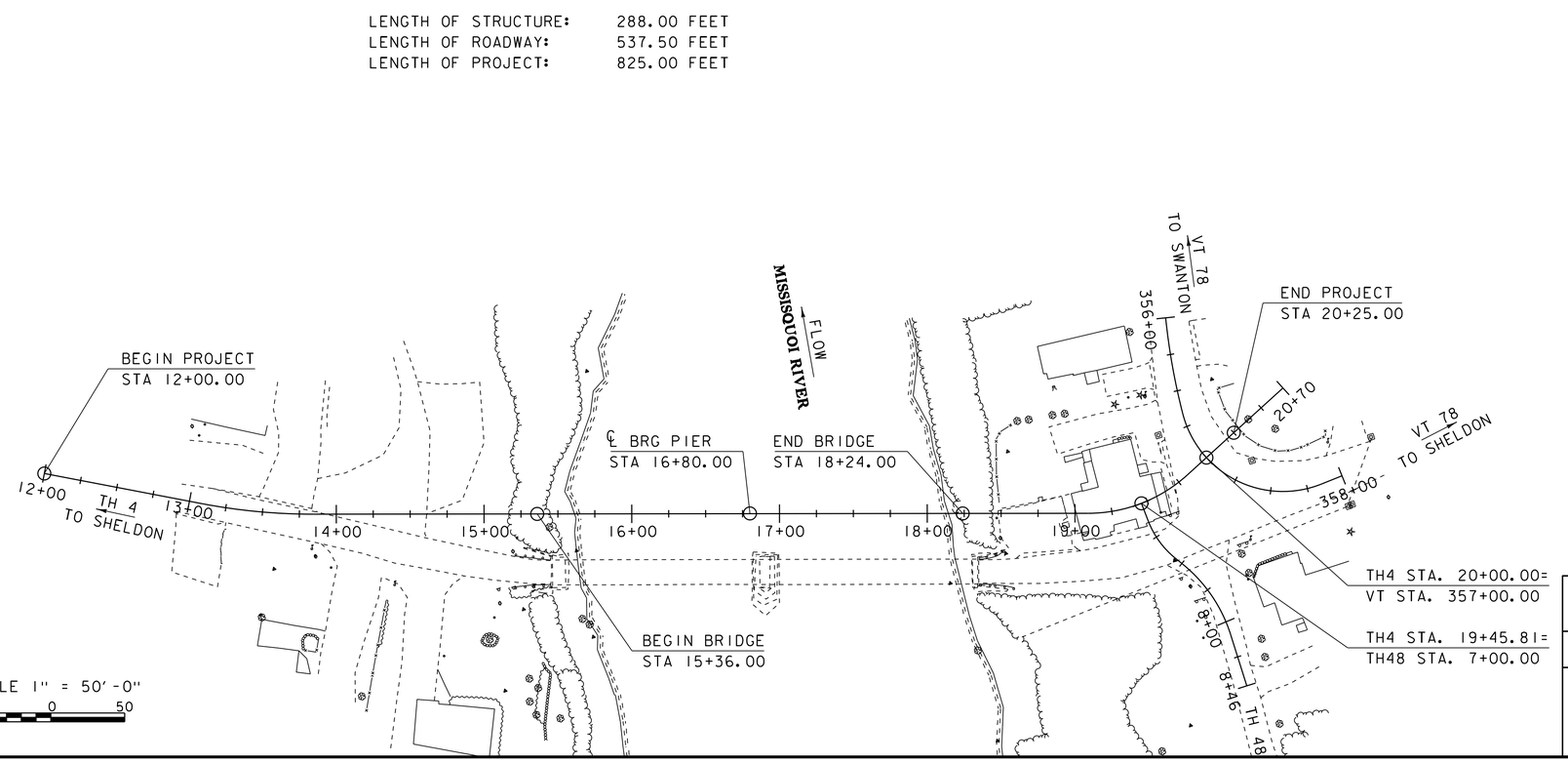
VILLAGE OF HIGHGATE
COUNTY OF FRANKLIN

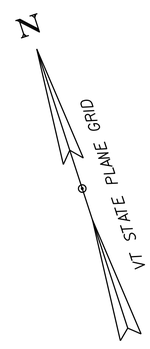
ROUTE NO : TOWN HIGHWAY 4. CLASS 2 LOCAL TOWN ROAD BRIDGE NO : 25

PROJECT LOCATION: 200 FEET WEST OF THE INTERSECTION OF TH 4 (MACHIA ROAD) AND VT ROUTE 78

PROJECT DESCRIPTION: REMOVAL OF EXISTING STRUCTURE AND REPLACEMENT WITH A NEW STRUCTURE. INCLUDING APPROACH WORK ON TOWN HIGHWAY 4

LENGTH OF STRUCTURE:	288.00 FEET
LENGTH OF ROADWAY:	537.50 FEET
LENGTH OF PROJECT:	825.00 FEET





SCALE 1" = 50'-0"
50 0 50

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2011, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JULY 20, 2011 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

QUALITY ASSURANCE PROGRAM : LEVEL 2	
SURVEYED BY :	L. ORVIS
SURVEYED DATE :	05/29/2013
DATUM	
VERTICAL	NAVD88
HORIZONTAL	NAD 83 (2007)

DIRECTOR OF PROJECT DELIVERY

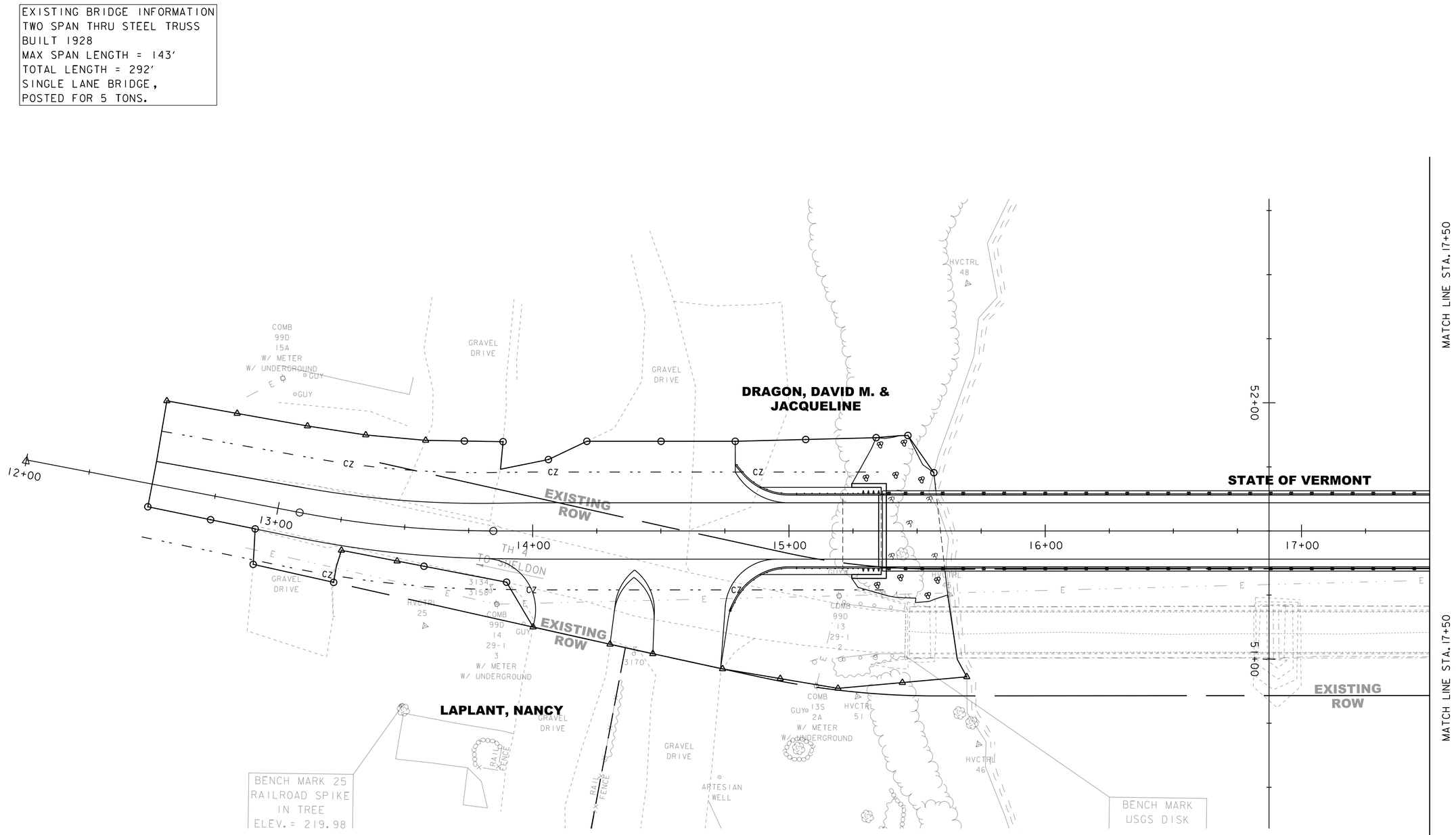
APPROVED _____ DATE _____

PROJECT MANAGER : D. BONNEAU P.E.

PROJECT NAME : HIGHGATE
PROJECT NUMBER : BO 1448(43)

SHEET 1 OF 14 SHEETS

EXISTING BRIDGE INFORMATION
TWO SPAN THRU STEEL TRUSS
BUILT 1928
MAX SPAN LENGTH = 143'
TOTAL LENGTH = 292'
SINGLE LANE BRIDGE,
POSTED FOR 5 TONS.



PAVED DRIVEWAY APRON
(BITUMINOUS CONCRETE PAVEMENT)
12+92 RT - 13+25 RT
14+00 RT - 14+40 RT
15+50 RT - 14+75 RT

GRAVEL DRIVEWAY
12+50.00 LT - 14+25.00 LT

REMOVAL AND DISPOSAL OF GUARDRAIL
15+20 RT - 15+45 RT
15+20 RT - 15+45 RT

BOX BEAM END SECTION, TYPE I
14+75 LT
14+75 RT

BOX BEAM GUARDRAIL
14+75 LT - 15+05 LT
14+75 RT - 15+05 RT

GUARDRAIL APPROACH SECTION,
GALVANIZED 3 RAIL BOX BEAM
15+05 LT - 15+37 LT
15+05 RT - 15+37 RT

BRIDGE RAILING,
GALVANIZED 3 RAIL BOX BEAM
15+37 LT -17+50 LT
15+37 RT -17+50 RT

REMOVING SIGNS
15+10 RT
15+20 RT
15+35 RT

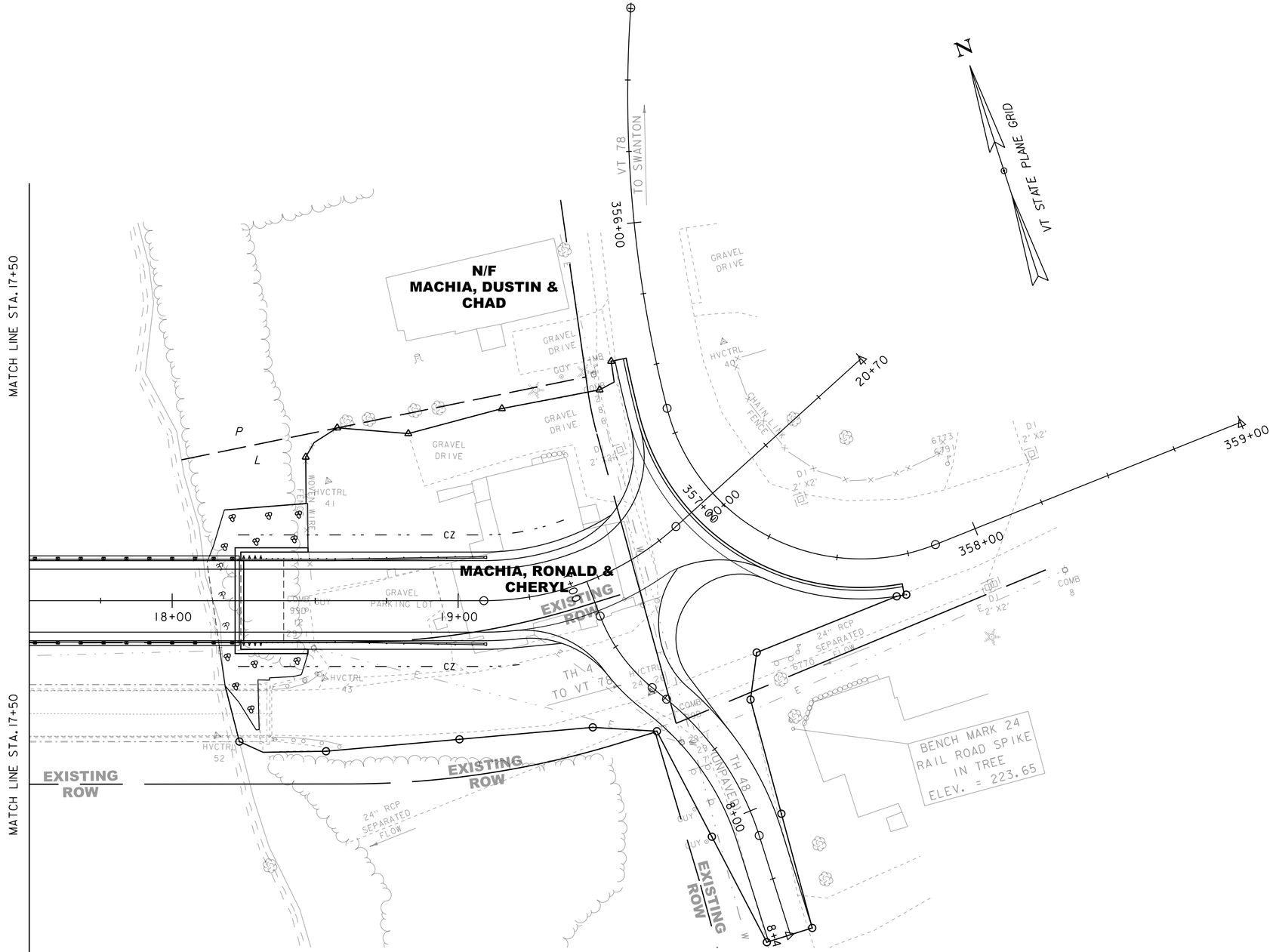
REMOVE & RESET MAILBOX
13+83 RT (2)
14+40 RT

SCALE 1" = 20'-0"
20 0 20

PROJECT NAME: HIGHGATE
PROJECT NUMBER: BO 1448 (43)

FILE NAME: s98j378bdr.dgn
PROJECT LEADER: D. BONNEAU
DESIGNED BY: D. PETERSON
LAYOUT SHEET 1

PLOT DATE: 07-JAN-2016
DRAWN BY: C. MOONEY
CHECKED BY: D. PETERSON
SHEET 4 OF 14



MATCH LINE STA. 17+50

GUARDRAIL APPROACH SECTION,
GALVANIZED 3 RAIL BOX BEAM
18+23 LT - 18+57 LT
18+23 RT - 18+57 RT

BOX BEAM GUARDRAIL
18+57 LT - 18+96 LT
18+57 RT - 18+96 RT

BOX BEAM, MTS
18+96 LT - 19+10 LT
18+96 RT - 19+10 RT

BRIDGE RAILING,
GALVANIZED 3 RAIL BOX BEAM
15+37 LT -17+50 LT
15+37 RT -17+50 RT

REMOVING SIGNS
18+46 RT
18+51RT
19+55 RT (4)
19+80 RT

REMOVE & RESET MAILBOX
19+80 RT

REMOVAL AND DISPOSAL OF GUARDRAIL
18+34 RT - 18+60 RT
18+34 RT - 18+60 RT

SCALE 1" = 20'-0"
20 0 20

PROJECT NAME: HIGHGATE
PROJECT NUMBER: BO 1448 (43)

FILE NAME: s98j378bdr.dgn
PROJECT LEADER: D. BONNEAU
DESIGNED BY: D. PETERSON
LAYOUT SHEET 2

PLOT DATE: 07-JAN-2016
DRAWN BY: C. MOONEY
CHECKED BY: D. PETERSON
SHEET 5 OF 14