

APPLICATION FORM

All applications must include the following information. Separate applications must be submitted for each eligible program. **Deadline: June 1, 2018.** Please include this application form with electronic entry. If you do not receive an email confirming receipt of your entry within 3 days of submission, please contact [Gage Harter](#).

PROGRAM INFORMATION

County: _____

Program Title: _____

Program Category: _____

CONTACT INFORMATION

Name: _____

Title: _____

Department: _____

Telephone: _____ Website: _____

Email: _____

SIGNATURE OF COUNTY ADMINISTRATOR OR DEPUTY/ASSISTANT COUNTY ADMINISTRATOR

Name: _____

Title: _____

Signature: _____

PROGRAM TITLE: WEIGHT RESTRICTED BRIDGE CROSSING PERMIT PROGRAM

CATEGORY: TRANSPORTATION

EXECUTIVE SUMMARY

In a collaborative, multi-agency effort, the Chesterfield County Department of Transportation (CDOT) successfully established a new, replicable, bridge testing process to allow all Emergency Response Vehicles (ERVs) to cross posted bridges during emergencies. The initial bridge tested using this process has a load posting of ten (10) tons which would only permit an ambulance to cross, not the Fire Department's heaviest vehicle an aerial ladder truck, rated at forty (40) tons. After successfully implementing the initial live-load test of the Mt. Hermon Road posted bridge, several other locations in Chesterfield County and other localities in the region were successfully tested and permitted for ERV crossings. This resulted in a significant improvement to the emergency response times for millions of dollars' worth of property and increased safety for those residents.

THE PROBLEM OR NEED FOR THE PROGRAM

Chesterfield County had tried for several years to go through the typical channels to allow ERVs to cross several key bridges throughout the county. The large geographic size of the county along with steady growth posed challenges with providing timely emergency response times. Continued growth, coupled with revised state bridge evaluation criteria, resulted in several bridges being posted with weight restrictions. This problem is common throughout Virginia and the country. However, to our knowledge, no public agency has performed load tests of bridge substructures. Therefore, all of the testing criteria and procedures were developed with little to no previous examples. The load a challenge for the

PROGRAM TITLE: WEIGHT RESTRICTED BRIDGE CROSSING PERMIT PROGRAM

county's Emergency Services to deliver acceptable response times. Many of their response times had become longer due to extended routes to avoid posted bridges in several growing areas of the county.

DESCRIPTION OF THE PROGRAM

The Weight Restricted Bridge Crossing Permit Program involved: 1) conducting analysis of the superstructure and the substructure to determine the appropriate ERV to test; 2) preparing and coordinating the load test; 3) performing the load test; 4) analysis of the test data, and 5) submittal of the test summary letter requesting the ERV crossing authorization permit.

To establish the appropriate ERV to use in the test, a licensed structural engineer conducted an initial visual condition assessment inspection and measurement of the bridge structure. Utilizing this information, the engineer performed a load rating of the bridge superstructure, as well as a global stability analysis of the substructure. This portion of the work determined what the test ERV will be for the selected bridge crossing.

Following the test ERV selection, minimum testing standards were established and the testing equipment selected: tiltmeters for rotation and conventional field survey equipment for abutment displacement. The positioning and duration of the test ERV was established.

In preparation for the actual load test, several tasks were planned. Traffic Control timeframes were coordinated and the test ERV was weighed. Also, developing the details of the testing personnel's communication and safety protocols were critical for establishing an efficient test, as well as minimizing traffic impacts to the general public.

During the actual load test, the testing procedures were executed and data collected. Post-processing analysis of the test data and creation of the crossing authorization request letter was complete, the

PROGRAM TITLE: WEIGHT RESTRICTED BRIDGE CROSSING PERMIT PROGRAM

package was submitted to the responsible State agency. This agency then conducted their review and issued the permit following their approval of the analysis.

To conduct the initial bridge crossing test, CDOT assembled and managed a team of consultants, state, and local agencies to demonstrate ERVs could cross the bridge structure safely. CDOT selected Johnson, Mirmiran & Thompson (JMT) as the engineering consultant to lead the testing team and provide analysis, along with surveyor Rice Associates, Inc. (RA). Supplemental real-time data collection of bridge beam tilt and rotation was provided by the Virginia Transportation Research Center (VTRC). The Virginia Department of Motor Vehicles (DMV) was included to provide on site axle weights of the test vehicle, an aerial ladder truck supplied from the County's Fire Department. Following the test, the Virginia Department of Transportation's District Structure and Bridge Division (VDOT-SB) reviewed the load test calculations, procedures and analysis report. VDOT-SB then recommended approval for VDOT's Chesterfield Residency to issue a renewable Land Use Permit for the ERV crossings for all the county's ERVs in the current fleet.

THE COST OF THE PROGRAM

During the development and implementation of the initial testing procedures, the costs were shared between VDOT, the state agency responsible for maintenance, and CDOT. Costs involved in the establishment of the program included development of the load test criteria and operational procedures of approximately \$10,000 in engineering consulting fees. Additional costs were incurred for each bridge tested.

The additional total cost involved for the bridge crossing load test was approximately \$30,000 per bridge. The following summarizes the components and costs that made up the total cost:

PROGRAM TITLE: WEIGHT RESTRICTED BRIDGE CROSSING PERMIT PROGRAM

1. Load rating and stability analysis of bridge structures: \$11,000
2. Modifying load test operational procedures for individual bridge testing site: \$ 2,000
3. Actual load test: \$15,000
 - a. Testing Coordination: \$ 1,500
 - b. Traditional Field Survey: \$ 3,500
 - c. Bridge Rotation measurements: \$10,000
 - d. Test ERV, ERV weighing and traffic control provided by state and local agencies at no project cost;
4. Load testing summary letter and bridge crossing permit request letter: \$2,000

THE RESULTS/SUCCESS OF THE PROGRAM

Chesterfield County's first bridge crossing load test was successful and resulted in VDOT's Chesterfield Residency issuing a Land Use Permit for allowing all Emergency Response Vehicles in the county's fleet to cross the Mt. Hermon Road bridge over Swift Creek when responding to emergency requests.

Following the issuing of the permit for this bridge crossing, response times were estimated to be improved by 90 seconds. This improved emergency response service to properties assessed at over \$6.5 million including 16 residential parcels.

PROGRAM TITLE: WEIGHT RESTRICTED BRIDGE CROSSING PERMIT PROGRAM

WORTHINESS OF AWARD

Through the implementation of a strong team of consultants, state and local agencies, CDOT made it a goal to address the needs of the citizens by addressing the state bridge evaluation criteria while improving the quality of life to protect life, safety, and welfare by improving response times. This goal was reach by the willingness of VDOT's Richmond District Structure and Bridge Division's District Bridge Engineer to support innovative testing procedures and our engineering consultant's, JMT, dedication to pulling together a great bridge load testing team. Now more property is protected by significantly faster response times for a moderate cost. In addition, a repeatable testing process was established for surrounding localities to both preserve the integrity of their aging bridge infrastructure and provide acceptable emergency response times to their residents and property owners.

SUPPLEMENTAL MATERIALS

- A. Bridge Load Testing Photo,
- B. Crossing Authorization Request Letter for Mt. Hermon Road Crossing,
- C. Land Use Permit issued for Mt. Hermon Road Crossing.





September 20, 2017

Mr. Nathan Mathis, PE
Chesterfield County
Transportation Department
9800 Government Center Parkway
Chesterfield, VA 23832

RE: Crossing Authorization for
Route 606 (Mt. Hermon Road) over Swift Creek
VA Structure No. – 6006
Federal Structure No. – 05243
Chesterfield County, VA
JMT Project No. 14-1272-004

Dear Mr. Mathis:

Chesterfield County (County) requested permission from the Virginia Department of Transportation (VDOT) for various County emergency response vehicles to cross over seven (7) posted bridges located on secondary roads in Chesterfield County. With this letter, Johnson, Mirmiran & Thompson, Inc. (JMT) is pleased to submit to Chesterfield County the Crossing Authorization for the first bridge on Route 606 (Mt. Hermon Road) over Swift Creek.

During project development, VDOT stated that in order to grant permission to cross a posted bridge with an emergency response vehicle heavier than the posting, the County would need to satisfy the requirements described in their Structure and Bridge Instructional and Informational Memorandum for “Crossing of Emergency Response Vehicles over Posted Bridges or Culverts” (IIM-S&B-75). One of the requirements in this IIM is to perform a load rating of each bridge as described in VDOT’s Structure and Bridge Instructional and Information Memorandum for “Load Rating and Posting of Structures (Bridges and Culverts)” (IIM-S&B-86). JMT was tasked by the County to perform a load rating for the various configurations and types of emergency response vehicles operated within the County. In addition to the load rating, the Crossing Authorization contains multiple requirements which are listed below.

Crossing Authorization requirements:

- Vehicle Identification Number (VIN) of the emergency response vehicle (ERV).
[See Attachment A for Chesterfield County’s fleet of ERV’s.](#)

- Copy of vehicle registration.
[Doug Cabbage, the Assistant District Bridge Engineer for the Richmond District, directed JMT on May 16, 2017, that the provided fleet information in Attachment A is sufficient in lieu of individual registrations.](#)
- Load Rating Calculations for each posted structure that is requested in the application to be crossed by the ERV.
 - The load rating calculations must be performed and signed and sealed by a licensed professional engineer in the Commonwealth of Virginia.
[See Attachment B for superstructure Load Rating calculations that are signed and sealed by Kurt W. Zebley, PE. In addition, see Attachment C for a description of the abutment load test results performed on April 20, 2017.](#)
 - The load rating calculations must be performed in accordance with the American Association of State Highway Transportation Officials' (AASHTO's) "Manual for Bridge Evaluation" (MBE) and the latest applicable guidelines and requirements that are established by the National Bridge Inspection Standards, and the Virginia Department of Transportation (VDOT). The load rating shall conform to the original load design method, i.e. Working Stress, Load Factor Design, etc.
[Load Rating calculations were performed in accordance with AASHTO, VDOT, and MBE guidelines and requirements. A Load and Resistance Factor Rating was performed for this bridge. See Attachment B for additional assumptions.](#)
 - A Crossing Authorization Summary Sheet for each load rated structure showing the load carrying capacity, posted capacity, and the authorized capacity in tonnage for the posted structure that is proposed to be crossed by the ERV.
[See next page for the Crossing Authorization Summary sheet. Note that the Crossing Authorization Summary sheet only lists axle weights for the heaviest vehicle in the County's ERV fleet. However, the Crossing Authorization would apply to the County's entire fleet of ERV.](#)
 - Endorsement statement by the Professional Engineer to allow the ERV to cross the Posted structure.
[See next page for the endorsement statement.](#)

Respectfully,

JOHNSON, MIRMIRAN & THOMPSON, INC.



Kurt W. Zebley, PE
Senior Associate

Cc: Trip Phaup, PE, Vice President
Ginny England, PE, Senior Associate
Jesse Smith, PE, Chesterfield County
Barbara K. Smith, PE, Chesterfield County

CROSSING AUTHORIZATION SUMMARY SHEET

NAME OF APPLICANT Chesterfield County

EMERGENCY RESPONSE VEHICLE CONFIGURATION

Empty Vehicle Weight (lbs) 79,960 Gross Vehicle Weight (lbs) 80,000 *

AXLE NUMBER	SPACING (feet)	EMPTY WEIGHT AXLE LOAD (lbs)	GROSS WEIGHT AXLE LOAD (lbs)
Axle 1	<u>0.0</u>	<u>22,800</u>	<u>22,800</u>
Axle 2	<u>20.25</u>	<u>28,620</u>	<u>29,000</u>
Axle 3	<u>4.33</u>	<u>28,540</u>	<u>29,000</u>
Axle 4			
Axle 5			
Axle 6			
Axle 7	* Heaviest vehicle in County's ERV fleet listed. Crossing Authorization is requested for all ERV's in County's fleet.		

LOCATION OF STRUCTURE

County Chesterfield County
Route Rte 606 (Mt. Hermon Road)
Feature Crossed Swift Creek
Structure Number 6006-05243

Load Carrying Capacity (Virginia Legal Vehicle) 70 Tons
Posted Capacity (Virginia Legal Vehicle) 10 Tons
Authorized Capacity (Emergency Response Vehicle) 40 Tons

ENDORSEMENT STATEMENT

I have reviewed all data submitted to me by the applicant and the Virginia Department of Transportation and have taken into account all items that will affect the ability of the stated structure to carry the indicated Emergency Response Vehicle. The indicated Emergency Response Vehicle can safely cross the indicated structure.

Signature of the Professional
Engineer who completed the
attached calculations

Date 9/20/2017

Please attach all calculations

Attachment A: Specifications for Emergency Vehicles Operated in Chesterfield County
Attachment B: Load Rating Calculations
Attachment C: Load Test Results for Emergency Vehicles

The below is to be filled out by a representative of the Virginia Department of Transportation.

Approved _____ Comments: _____

Denied _____

District Structure and Bridge Engineer _____

Date _____

Commonwealth Of Virginia

Department Of Transportation

Land Use Permit



Permit No 426-51242

Status APPROVED

This permit only grants permission to use whatever rights the Commonwealth Transportation Board and the Department of Transportation have in the right of way and no more, and it is the obligation of the permittee to secure any other releases or permission that may be needed in order to perform the work.

Effective Date Oct 12, 2017

Expiration Date Oct 12, 2018

Reinstatement Date

Permittee Information		Your Job# Rt 606 - Mount Hermon Road - Bridge #6006-05243 over Swift Creek - ERV	Surety & Account Receivable Information
Owner & Address	County of Chesterfield P.O. Box 40 Chesterfield VA 23832	Agent JMT Engineering Richmond District 9201 Arboretum Parkway Suite 310 Richmond VA 23236	Name Surety Account Surety Type Amount Obligation Amount 0.00 Surety Holder CUSTOMER
Contact	Nate Mathis	Contact	Trip Phaup
Phone#	804-768-7386	Phone#	804-267-1246
Fax#	804-745-8516	Fax#	804-323-0596
24 Hr#	804-638-9104	24 Hr#	804-551-3232

AUTHORIZATION: In compliance with your application, permission is hereby given insofar as the Commonwealth Transportation Board has the right, power, and authority under sections 33.2 - 210,33.2 - 240,33.2 - 241 of the Code of Virginia as amended, to grant by Special Agreement and/or by Land Use Permit for you to perform the work and or activity(s) described below:

Location

County/City/Town	Chesterfield County	Highway Route(s)	606 - Mount Hermon Road
From Route Number	606	From Route Name	County Line Road
To Route Number	604	To Route Name	Genito Road

Work Description


Code of Va. Sec. 46.2-1130 allows emergency response vehicles to cross over posted bridges or culverts under Permit. Permit valid for 12 months. Renewal required every 12 months or upon a change in condition. Renewal process does not require locality to reapply to access the structure for the purpose of performing condition assessment and evaluation. The locality shall submit updated calculations to the Residency for review and approval (IIM-S&B-75 Sec. 8). If posted capacity reduced during term of ERV 12 month period the Permit Manager shall contact the locality and inform them of the nullification of the Permit and to request resubmittal for renewal along with updated calculations. The permitting agency or entity shall not be held liable for any damage or injury caused as a result of an emergency response vehicle crossing a bridge or culvert while responding to or returning from an emergency call under the conditions specified in the overweight permit pursuant to this section.

Fee Description	Fee
Fee Waived	\$0.00

Applicant has compiled with VA Code Section 56-265.15 Affidavit is attached.

TERMS: Applicable as stated in the VDOT Land Use Permit Regulations (current edition) and/or as per approved plans, and/or regulatory instructions, including but not limited to the LUP-SPG and/or agreement(s) attached hereto.

COMMONWEALTH TRANSPORTATION BOARD

By: 
Ryan McGrath

Oct 12, 2017

- C** Call before you dig
- A** Allow the required time for marking
- R** Respect and protect the marks/flags
- E** Excavate carefully



Call Miss Utility
811

FINAL INSPECTION & SURETY REQUIREMENTS: Upon completion of the work or activity(s) authorized under this Land Use Permit, the permittee shall contact the following office in writing or by electronic communication to request final inspection and release of the surety obligation for this permit.

Chesterfield Residency
3301 Speaks Drive
Midlothian, VA VA 23112

Permit No.426-51242

VDOT's Web Site: www.vdot.virginia.gov

Permittee Copy

Commonwealth Of Virginia

Department Of Transportation

Land Use Permit



Permit No	426-51242
Status	APPROVED

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Permittee Information		Your Job# Rt 606 - Mount Hermon Road - Bridge #6006-05243 over Swift Creek - ERV		Surety & Account Receivable Information
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Agent Copy