

# PROPRIETARY MATERIAL REQUEST

Date: July 5, 2022

To: David H. Boruff

- INDOT Highway Design Director
- INDOT Bridge Design Director
- INDOT Traffic Administration Manager, Traffic Engineering Division

From: Joe Bruno

Sr. Traffic Engineer, Signals & Markings

Proprietary Material Name: Lindsay Road Zipper System®

Lindsay Transportation Solutions Sales & Service, LLC

The Lindsay Road Zipper System® includes all of the components necessary for a complete installation, including: the QuickChange® Moveable Barrier Concrete Reactive Tension System, QMB-CRTS or QMB-CRTS-F (Fiber Series), a QuickChange® Moveable Barrier Concrete Reactive Tension System, QMB-CRTS Transition, a Lindsay Road Zipper Machine, and an optional RTS Guard.

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## Basis for Proprietary Material Request (select one)

- Certification No Suitable Equal Exists
- Certification, Essential for Synchronization
- Experimental/Research (*work plan required*)
- Public Interest Finding (PIF) (*suitable alternatives exist but are not the most cost-effective or in the public's best interest*)
- Programmatic Certification/Programmatic PIF (*work plan required*)

If programmatic, provide the length of time that the approval is effective:

May 1, 2022 – April 30, 2025

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## Justification

**1. Description of Need:** The Lindsay Road Zipper System® is needed as a means of maintaining traffic in two scenarios: [1] on high AADT roadways with unbalanced peak period vehicular traffic, and [2] on freeway pavement patching projects. The product may also be used to provide an additional lane for unbalanced traffic flow on a permanent basis.

Designers will have to submit a completed Moveable Barrier Justification Form, when specifying moveable barrier walls on a particular project. A copy of this Form is attached as Appendix A.

2. **Product History:** The Lindsay Road Zipper System<sup>®</sup> is a moveable barrier wall that provides positive protection and mitigates congesting during road or bridge work. The product was developed in the 1980's and INDOT's interest in this product has increased significantly in recent years.
3. **Product Availability:** The desired product is the only unanchored moveable barrier wall compliant with MASH TL-3 crash testing standards. An FHWA eligibility letter is attached as Appendix B.
4. **Product Cost:** The most recent unit price summaries from fiscal years 2021 and 2022 show an average unit price of \$185 per foot for a type 4 temporary traffic barrier (pay item 801-08403) and a total quantity statewide of 41,900 lft. The Lindsay Road Zipper System<sup>®</sup> may be more or less than this depending on the quantity and the timeframe the moveable barrier wall will be needed.
5. **Maintenance:** As a temporary traffic control device, maintenance for the Road Zipper Machine is the responsibility of the contractor and is included in the cost of the pay item.
6. **Product Alternatives:** Summary Table

	Road Zipper System <sup>®</sup>	Steel Barrier Wall	Tubular Markers	Drums
Moveable	Yes	No	Yes	Yes
Positive Protection	Yes	Yes	No	No
MASH TL-3 Compliant	Yes	Yes	Yes	Yes
Proprietary Item	Yes	Yes, Zoneguard <sup>®</sup> by Hill & Smith Highway Products	No	No

Work plan attached. (*Work plan required for experimental/research and programmatic requests*)

APPROVED:  Date: 7/05/2022

- INDOT Highway Design Director
- INDOT Bridge Design Director
- INDOT Traffic Administration Manager, Traffic Engineering Division

### **Work Plan for Movable Barrier Wall**

The performance of the movable barrier wall will be evaluated by INDOT's Traffic Administration Office and Work Zone Safety Section. The safety and mobility results for contracts with movable barrier wall will be compared to similar projects without movable barrier wall. A report will be prepared prior to renewing or extending the programmatic approval. The Traffic Administration Office will also check periodically to determine if another manufacturer is producing movable barrier wall that meets INDOT requirements.

**APPENDIX A**

*MOVABLE BARRIER – JUSTIFICATION FORM*

Location: \_\_\_\_\_

Des No: \_\_\_\_\_

Contract No: \_\_\_\_\_

A movable barrier is needed at the location(s) listed above for the following reason(s):

*Check all that apply*

- High AADT roadway with unbalanced peak periods where a temporary reversible lane would address or mitigate queuing in advance of the work zone (*attach hourly AADT data and IHCP summary*).
- For traffic control on freeway patching projects where a temporary reversible lane would protect workers during night-time or weekend pavement patching but also allow use of the lane during peak periods (*attach hourly AADT data and IHCP summary*).
- Other reason: \_\_\_\_\_  
*(please describe and attach supporting documentation)*
- High AADT roadway with unbalanced peak periods where a permanent reversible lane would address or mitigate delay and queuing (*attach hourly AADT data and operational analysis, e.g. from the Highway Capacity Manual*).

RECOMMENDED:

APPROVED:

\_\_\_\_\_  
Name:  
Title:

\_\_\_\_\_  
Name:  
District Traffic Engineer

\_\_\_\_\_  
Date

*Copies To:*  
Area Engineer  
Director, Highway Engineering  
Senior Director, Engineering & Research (Research & Development)  
Supervisor, Work Zone Safety  
Manager, Traffic Administration

Appendix B



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

1200 New Jersey Ave., SE  
Washington, D.C. 20590

February 2, 2017

In Reply Refer To:  
HSST-1/B-277

Mr. Gerrit Dyke, P.E.  
Lindsay Transportation Solutions  
180 River Road  
Rio Vista, CA 94571

Dear Mr. Dyke:

This letter is in response to your December 20, 2016 request for the Federal Highway Administration (FHWA) to review a roadside safety device, hardware, or system for eligibility for reimbursement under the Federal-aid highway program. This FHWA letter of eligibility is assigned FHWA control number B-277 and is valid until a subsequent letter is issued by FHWA that expressly references this device.

**Decision**

The following devices are eligible, with details provided in the form which is attached as an integral part of this letter:

- QuickChange Moveable Barrier Concrete Reactive Tension System (QMB- CRTS)

**Scope of this Letter**

To be found eligible for Federal-aid funding, new roadside safety devices should meet the crash test and evaluation criteria contained in the American Association of State Highway and Transportation Officials' (AASHTO) Manual for Assessing Safety Hardware (MASH). However, the FHWA, the Department of Transportation, and the United States Government do not regulate the manufacture of roadside safety devices. Eligibility for reimbursement under the Federal-aid highway program does not establish approval, certification or endorsement of the device for any particular purpose or use.

This letter is not a determination by the FHWA, the Department of Transportation, or the United States Government that a vehicle crash involving the device will result in any particular outcome, nor is it a guarantee of the in-service performance of this device. Proper manufacturing, installation, and maintenance are required in order for this device to function as tested.

This finding of eligibility is limited to the crashworthiness of the system and does not cover other structural features, nor conformity with the Manual on Uniform Traffic Control Devices.

### **Eligibility for Reimbursement**

Based solely on a review of crash test results and certifications submitted by the manufacturer, and the crash test laboratory, FHWA agrees that the device described herein meets the crash test and evaluation criteria of the American Association of State Highway and Transportation Officials' (AASHTO) Manual for Assessing Safety Hardware (MASH). Therefore, the device is eligible for reimbursement under the Federal-aid highway program if installed under the range of tested conditions.

Name of system: QuickChange Moveable Barrier Concrete Reactive Tension System  
(QMB- CRTS)

Type of system: Longitudinal Barrier (unanchored)

Test Level: MASH Test Level 3 (TL3)

Testing conducted by: Texas A&M Transportation Institute (TamTI)

Date of request: December 20, 2016

Date initially acknowledged: December 21, 2016

Date of completed package: January 11, 2016

FHWA concurs with the recommendation of the accredited crash testing laboratory as stated within the attached form.

### **Full Description of the Eligible Device**

The device and supporting documentation, including reports of the crash tests or other testing done, videos of any crash testing, and/or drawings of the device, are described in the attached form.

### **Notice**

If a manufacturer makes any modification to any of their roadside safety hardware that has an existing eligibility letter from FHWA, the manufacturer must notify FHWA of such modification with a request for continued eligibility for reimbursement. The notice of all modifications to a device must be accompanied by:

- Significant modifications – For these modifications, crash test results must be submitted with accompanying documentation and videos.
- Non-signification modifications – For these modifications, a statement from the crash test laboratory on the potential effect of the modification on the ability of the device to meet the relevant crash test criteria.

FHWA's determination of continued eligibility for the modified hardware will be based on whether the modified hardware will continue to meet the relevant crash test criteria.

Any user or agency relying on this eligibility letter is expected to use the same designs, specifications, drawings, installation and maintenance instructions as those submitted for review.

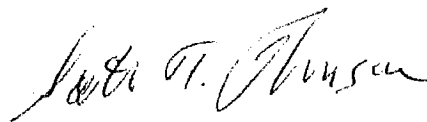
You are expected to certify to potential users that the hardware furnished has the same chemistry, mechanical properties, and geometry as that submitted for review, and that it will meet the test and evaluation criteria of the AASHTO MASH.

Issuance of this letter does not convey property rights of any sort or any exclusive privilege. This letter is based on the premise that information and reports submitted by you are accurate and correct. We reserve the right to modify or revoke this letter if: (1) there are any inaccuracies in the information submitted in support of your request for this letter, (2) the qualification testing was flawed, (3) in-service performance or other information reveals safety problems, (4) the system is significantly different from the version that was crash tested, or (5) any other information indicates that the letter was issued in error or otherwise does not reflect full and complete information about the crashworthiness of the system.

#### Standard Provisions

- To prevent misunderstanding by others, this letter of eligibility designated as FHWA control number B-277 shall not be reproduced except in full. This letter and the test documentation upon which it is based are public information. All such letters and documentation may be reviewed upon request.
- This letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented system for which the applicant is not the patent holder.
- If the subject device is a patented product it may be considered to be proprietary. If proprietary systems are specified by a highway agency for use on Federal-aid projects: (a) they must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the existing highway facilities or that no equally suitable alternative exists; or (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411.

Sincerely,



Scott T. Johnson  
Acting Director, Office of Safety  
Technologies  
Office of Safety

Enclosures

## Appendix B



U.S. Department  
of Transportation

Federal Highway  
Administration

March 18, 2019

1200 New Jersey Ave., SE  
Washington, D.C. 20590

In Reply Refer To:  
HSST-1/B-315

Mr. Gerrit Dyke, P.E.  
Lindsay Transportation Solutions  
180 River Road  
Rio Vista, CA 94571

Dear Mr. Dyke:

This letter is in response to your November 16, 2018 request for the Federal Highway Administration (FHWA) to review a roadside safety device, hardware, or system for eligibility for reimbursement under the Federal-aid highway program. This FHWA letter of eligibility is assigned FHWA control number B-315 and is valid until a subsequent letter is issued by FHWA that expressly references this device.

### **Decision**

The following devices are eligible, with details provided in the form which is attached as an integral part of this letter:

- QuickChange Moveable Barrier Concrete Reactive Tension System - Fiber Series (QMB-CRTS-F)

### **Scope of this Letter**

To be found eligible for Federal-aid funding, new roadside safety devices should meet the crash test and evaluation criteria contained in the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (MASH). However, the FHWA, the Department of Transportation, and the United States Government do not regulate the manufacture of roadside safety devices. Eligibility for reimbursement under the Federal-aid highway program does not establish approval, certification or endorsement of the device for any particular purpose or use.

This letter is not a determination by the FHWA, the Department of Transportation, or the United States Government that a vehicle crash involving the device will result in any particular outcome, nor is it a guarantee of the in-service performance of this device. Proper manufacturing, installation, and maintenance are required in order for this device to function as tested.

This finding of eligibility is limited to the crashworthiness of the system and does not cover other structural features, nor conformity with the Manual on Uniform Traffic Control Devices.



### **Eligibility for Reimbursement**

Based solely on a review of crash test results and certifications submitted by the manufacturer, and the crash test laboratory, FHWA agrees that the device described herein meets the crash test and evaluation criteria of the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (MASH). Therefore, the device is eligible for reimbursement under the Federal-aid highway program if installed under the range of tested conditions.

Name of system: QuickChange Moveable Barrier Concrete Reactive Tension System - Fiber Series (QMB- CRTS-F)  
Type of system: Longitudinal Barrier  
Test Level: MASH Test Level 3 (TL3)  
Testing conducted by: TamTI  
Date of request: December 10, 2018

FHWA concurs with the recommendation of the accredited crash testing laboratory as stated within the attached form for systems mounted on concrete only.

### **Full Description of the Eligible Device**

The device and supporting documentation, including reports of the crash tests or other testing done, videos of any crash testing, and/or drawings of the device, are described in the attached form.

### **Notice**

FHWA's determination of continued eligibility for the modified hardware will be based on whether the modified hardware will continue to meet the relevant crash test criteria.

Any user or agency relying on this eligibility letter is expected to use the same designs, specifications, drawings, installation and maintenance instructions as those submitted for review.

You are expected to certify to potential users that the hardware furnished has the same chemistry, mechanical properties, and geometry as that submitted for review, and that it will meet the test and evaluation criteria of the MASH.

Issuance of this letter does not convey property rights of any sort or any exclusive privilege. This letter is based on the premise that information and reports submitted by you are accurate and correct. We reserve the right to modify or revoke this letter if: (1) there are any inaccuracies in the information submitted in support of your request for this letter, (2) the qualification testing was flawed, (3) in-service performance or other information reveals safety problems, (4) the system is significantly different from the version that was crash tested, or (5) any other information indicates that the letter was issued in error or otherwise does not reflect full and complete information about the crashworthiness of the system.

### **Standard Provisions**

- To prevent misunderstanding by others, this letter of eligibility designated as FHWA control number B-315 shall not be reproduced except in full. This letter and the test documentation upon which it is based are public information. All such letters and documentation may be

reviewed upon request.

- This letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented system for which the applicant is not the patent holder.
- If the subject device is a patented product it may be considered to be proprietary. If proprietary systems are specified by a highway agency for use on Federal-aid projects: (a) they must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the existing highway facilities or that no equally suitable alternative exists; or (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411.

Sincerely yours,

A handwritten signature in cursive script that reads "Michael S. Griffith".

Michael S. Griffith  
Director, Office of Safety Technologies  
Office of Safety

Enclosures

Appendix B



U.S. Department  
of Transportation

Federal Highway  
Administration

SEP 17 2018

1200 New Jersey Ave., SE  
Washington, D.C. 20590

In Reply Refer To:  
HSST-1/B-309

Mr. Gerrit Dyke, P.E.  
Lindsay Transportation Solutions  
180 River Road  
Rio Vista, CA 94571

Dear Mr. Dyke:

This letter is in response to your August 3, 2018 request for the Federal Highway Administration (FHWA) to review a roadside safety device, hardware, or system for eligibility for reimbursement under the Federal-aid highway program. This FHWA letter of eligibility is assigned FHWA control number B-309 and is valid until a subsequent letter is issued by FHWA that expressly references this device.

**Decision**

The following devices are eligible, with details provided in the form which is attached as an integral part of this letter:

- QuickChange Moveable Barrier Concrete Reactive Tension System (QMB-CRTS) Transition

**Scope of this Letter**

To be found eligible for Federal-aid funding, new roadside safety devices should meet the crash test and evaluation criteria contained in the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (MASH). However, the FHWA, the Department of Transportation, and the United States Government do not regulate the manufacture of roadside safety devices. Eligibility for reimbursement under the Federal-aid highway program does not establish approval, certification or endorsement of the device for any particular purpose or use.

This letter is not a determination by the FHWA, the Department of Transportation, or the United States Government that a vehicle crash involving the device will result in any particular outcome, nor is it a guarantee of the in-service performance of this device. Proper manufacturing, installation, and maintenance are required in order for this device to function as tested.

This finding of eligibility is limited to the crashworthiness of the system and does not cover other structural features, nor conformity with the Manual on Uniform Traffic Control Devices.

### **Eligibility for Reimbursement**

Based solely on a review of crash test results and certifications submitted by the manufacturer, and the crash test laboratory, FHWA agrees that the device described herein meets the crash test and evaluation criteria of the American Association of State Highway and Transportation Officials' Manual for Assessing Safety Hardware (MASH). Therefore, the device is eligible for reimbursement under the Federal-aid highway program if installed under the range of tested conditions.

Name of system: QuickChange Moveable Barrier Concrete Reactive Tension System  
(QMB-CRTS) Transition

Type of system: Longitudinal Barrier Transition

Test Level: MASH Test Level 3 (TL3)

Testing conducted by: Safe Technologies, Inc.

Date of request: August 3, 2018

FHWA concurs with the recommendation of the accredited crash testing laboratory as stated within the attached form.

### **Full Description of the Eligible Device**

The device and supporting documentation, including reports of the crash tests or other testing done, videos of any crash testing, and/or drawings of the device, are described in the attached form.

### **Notice**

FHWA's determination of continued eligibility for the modified hardware will be based on whether the modified hardware will continue to meet the relevant crash test criteria.

Any user or agency relying on this eligibility letter is expected to use the same designs, specifications, drawings, installation and maintenance instructions as those submitted for review.

You are expected to certify to potential users that the hardware furnished has the same chemistry, mechanical properties, and geometry as that submitted for review, and that it will meet the test and evaluation criteria of the MASH.

Issuance of this letter does not convey property rights of any sort or any exclusive privilege. This letter is based on the premise that information and reports submitted by you are accurate and correct. We reserve the right to modify or revoke this letter if: (1) there are any inaccuracies in the information submitted in support of your request for this letter, (2) the qualification testing was flawed, (3) in-service performance or other information reveals safety problems, (4) the system is significantly different from the version that was crash tested, or (5) any other information indicates that the letter was issued in error or otherwise does not reflect full and complete information about the crashworthiness of the system.

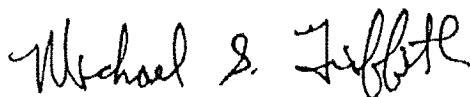
### **Standard Provisions**

- To prevent misunderstanding by others, this letter of eligibility designated as FHWA control number B-309 shall not be reproduced except in full. This letter and the test documentation upon which it is based are public information. All such letters and documentation may be

reviewed upon request.

- This letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented system for which the applicant is not the patent holder.
- If the subject device is a patented product it may be considered to be proprietary. If proprietary systems are specified by a highway agency for use on Federal-aid projects: (a) they must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the existing highway facilities or that no equally suitable alternative exists; or (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411.

Sincerely yours,

A handwritten signature in black ink that reads "Michael S. Griffith". The signature is written in a cursive style with a large, stylized "M" and "G".

Michael S. Griffith  
Director, Office of Safety Technologies  
Office of Safety

Enclosures

Appendix B



U.S. Department  
of Transportation  
**Federal Highway  
Administration**

1200 New Jersey Ave., SE  
Washington, D.C. 20590

February 9, 2018

In Reply Refer To:  
HSST-1/B-299

Mr. Gerrit A. Dyke, P.E.  
Lindsay Transportation Solutions, Inc.  
180 River Road  
Rio Vista, CA 95471

Dear Mr. Dyke:

This letter is in response to your December 6, 2017 request for the Federal Highway Administration (FHWA) to review a roadside safety device, hardware, or system for eligibility for reimbursement under the Federal-aid highway program. This FHWA letter of eligibility is assigned FHWA control number B-299 and is valid until a subsequent letter is issued by FHWA that expressly references this device.

**Decision**

The following device is eligible within the length-of-need, with details provided in the form which is attached as an integral part of this letter:

- RTS Guard

**Scope of this Letter**

To be found eligible for Federal-aid funding, new roadside safety devices should meet the crash test and evaluation criteria contained in the American Association of State Highway and Transportation Officials' (AASHTO) Manual for Assessing Safety Hardware (MASH). However, the FHWA, the Department of Transportation, and the United States Government do not regulate the manufacture of roadside safety devices. Eligibility for reimbursement under the Federal-aid highway program does not establish approval, certification or endorsement of the device for any particular purpose or use.

This letter is not a determination by the FHWA, the Department of Transportation, or the United States Government that a vehicle crash involving the device will result in any particular outcome, nor is it a guarantee of the in-service performance of this device. Proper manufacturing, installation, and maintenance are required in order for this device to function as tested.

This finding of eligibility is limited to the crashworthiness of the system and does not cover other structural features, nor conformity with the Manual on Uniform Traffic Control Devices.

### **Eligibility for Reimbursement**

Based solely on a review of crash test results and certifications submitted by the manufacturer, and the crash test laboratory, FHWA agrees that the device described herein meets the crash test and evaluation criteria of the AASHTO's MASH. Therefore, the device is eligible for reimbursement under the Federal-aid highway program if installed under the range of tested conditions.

Name of system: RTS Guard  
Type of system: Longitudinal Barrier  
Test Level: MASH Test Level 3 (TL3)  
Testing conducted by: Safe Technologies, Inc.  
Date of request: December 6, 2017  
Date initially acknowledged: December 6, 2017

FHWA concurs with the recommendation of the accredited crash testing laboratory on the attached form.

### **Full Description of the Eligible Device**

The device and supporting documentation, including reports of the crash tests or other testing done, videos of any crash testing, and/or drawings of the device, are described in the attached form.

### **Notice**

This eligibility letter is issued for the subject device as tested. Modifications made to the device are not covered by this letter. Any modifications to this device should be submitted to the user (i.e., state DOT) as per their requirements.

You are expected to supply potential users with sufficient information on design, installation and maintenance requirements to ensure proper performance.

You are expected to certify to potential users that the hardware furnished has the same chemistry, mechanical properties, and geometry as that submitted for review, and that it will meet the test and evaluation criteria of AASHTO's MASH.

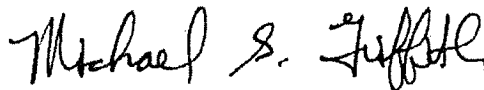
Issuance of this letter does not convey property rights of any sort or any exclusive privilege. This letter is based on the premise that information and reports submitted by you are accurate and correct. We reserve the right to modify or revoke this letter if: (1) there are any inaccuracies in the information submitted in support of your request for this letter, (2) the qualification testing was flawed, (3) in-service performance or other information reveals safety problems, (4) the system is significantly different from the version that was crash tested, or (5) any other information indicates that the letter was issued in error or otherwise does not reflect full and

complete information about the crashworthiness of the system.

**Standard Provisions**

- To prevent misunderstanding by others, this letter of eligibility designated as FHWA control number B-299 shall not be reproduced except in full. This letter and the test documentation upon which it is based are public information. All such letters and documentation may be reviewed upon request.
- This letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented system for which the applicant is not the patent holder.
- If the subject device is a patented product it may be considered to be proprietary. If proprietary systems are specified by a highway agency for use on Federal-aid projects: (a) they must be supplied through competitive bidding with equally suitable unpatented items; (b) the highway agency must certify that they are essential for synchronization with the existing highway facilities or that no equally suitable alternative exists; or (c) they must be used for research or for a distinctive type of construction on relatively short sections of road for experimental purposes. Our regulations concerning proprietary products are contained in Title 23, Code of Federal Regulations, Section 635.411.

Sincerely,



Michael S. Griffith  
Director, Office of Safety Technologies  
Office of Safety

Enclosures



# THE ROAD ZIPPER SYSTEM®

FOR CONSTRUCTION APPLICATIONS



### IMPROVES SAFETY

Workers and motorists have the security of high-level positive barrier separation at all times.

### REDUCES CONGESTION

The Road Zipper reconfigures the road in real time to open the maximum number of lanes for peak traffic periods.

### SPEEDS CONSTRUCTION

By combining or eliminating stages due to the larger work space, contractors can save months or even entire construction seasons.

### CREATES EFFICIENCIES

Dedicated haul lanes create safer, more efficient deliveries and material staging.

### BETTER QUALITY REPAIRS

More work zone space allows contractors to use larger, more efficient equipment, resulting in better quality repairs that last years longer.

### RAPID STAGE CHANGES

The Zipper changes the road layout in minutes. It can take days to reposition miles of temporary concrete barrier.

## ROAD WIDENING OR SHOULDER / MEDIAN REPAIR

### H-1 FREEWAY, HAWAII: ROAD WIDENING

When working in the shoulder or median, the Road Zipper allows the contractor to expand the work zone during off-peak traffic hours by taking one or more lanes from traffic. More work zone space can be used for dedicated haul lanes or allow for larger, more efficient equipment. These options help the contractor combine stages and accelerate construction for early job completion with better quality repairs.



More room to work during off-peak



More lanes for traffic during peak

An extra lane is returned to motorists prior to the peak traffic period - Honolulu, HI

### EDGE OF ROAD CROSS SECTIONS



Peak Traffic Condition



Off Peak Traffic Condition

The Road Zipper System® is designed to create a flexible, positive traffic barrier between opposing lanes of traffic, or between motorists and construction work zones. The system uses a wall of interlocked 1-meter barriers that can be lifted and repositioned by a transfer machine to create additional work zone space for construction crews, and to

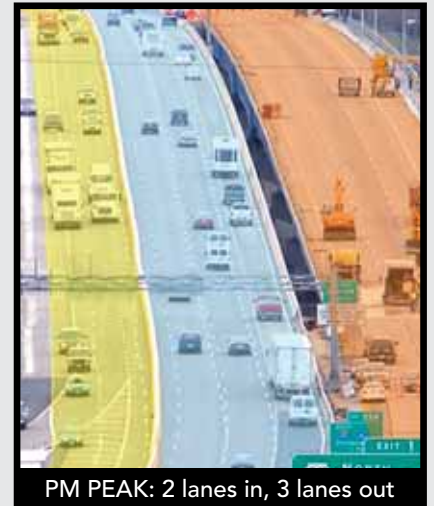
provide more lanes to the peak traffic direction to mitigate congestion. For widening work and shoulder / median repair, the Road Zipper allows the contractor to increase the size of the work zone during off-peak traffic hours to create dedicated haul lanes and use larger, more efficient equipment to combine or eliminate stages and significantly acceler-

ate the construction process. For partial width construction with traffic switches, the Road Zipper reduces congestion by enabling more lanes to be open during peak hour traffic. The barrier is moved several times per day to reconfigure the roadway in real time, maximizing the number of lanes available for peak traffic.

**PARTIAL WIDTH CONSTRUCTION WITH TRAFFIC SWITCH**

**ST. CROIX RIVER BRIDGE, WISCONSIN: PARTIAL WIDTH CONSTRUCTION**

During partial width construction, the Road Zipper helps keep more lanes open in the peak traffic direction at all times by reconfiguring the road in real time as a “moveable median” with no disruption to live traffic. This significantly reduces traffic queues and user delay costs, and it saves hundreds of thousands, or even millions of dollars in temporary asphalt widening to meet minimum traffic flow requirements.



Award winning I-94 St. Croix Bridge construction project – Wisconsin, USA

**TRAFFIC SWITCH CROSS SECTIONS**



AM Peak Traffic



PM Peak Traffic



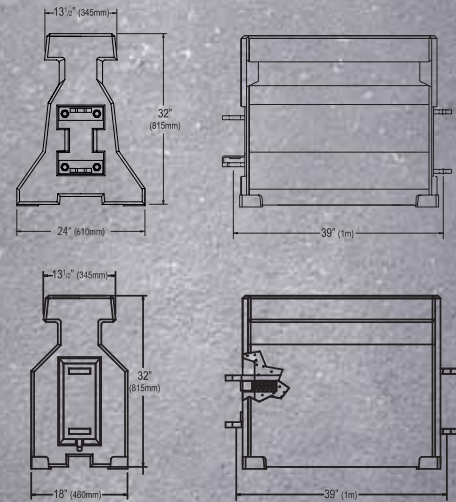
**PHYSICAL SPECIFICATIONS**

**24" QuickChange® Moveable Barrier**

Heavily reinforced concrete barriers have similar deflection and superior vehicle stability when compared to standard Temporary Concrete Barrier. Tested and Approved to NCHRP Report 350, Test Level 3 (100 km/h)  
 Maximum Deflection at TL-3: 52 in. (1.3m)  
 Mass of Each Barrier Element: Approximately 1425 lbs (646 kg)

**18" Reactive Tension Moveable Barrier**

Heavily reinforced concrete barriers have superior deflection and vehicle stability when compared to standard Temporary Concrete Barrier.  
 Permanent deflection:  
 NCHRP 350 TL-3: 24 in. (610mm), MASH TL-3: 39 in. (990mm)  
 Mass of Each Barrier Element: Approximately 1500 lbs (680 kg)



<b>BARRIER TRANSFER MACHINE</b>			
Transfer Speed	5 mph (7km/h)	Max. Single Transfer	18 ft (5.5m)
Roading Speed	20 mph (32km/h)	Transfer Time	1 mile in 12 minutes

**Devore, CA I-15**

Type: Pavement Reconstruction  
 Contractor: Coffman Specialties  
 Project Length: 2 miles

- Project completion accelerated from 8 months to 6 weeks<sup>1</sup>
- Construction savings of more than \$6M
- Traffic queues and user delay costs minimized



<sup>1</sup> CalTrans, CA4PRS

**Salt Lake City, UT SR 171**

Type: Arterial Widening  
 Contractor: Granite Construction  
 Project Length: 1.7 miles

- Project completed 7 months ahead of schedule
- Moveable barrier benefits estimated at \$1.7M to \$2.4M
- B/C ratio of 10:1 "if all benefits are considered"<sup>2</sup>



<sup>2</sup> T.Y. Lin International, Evaluation of Moveable Barrier in Construction Work Zones

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