TAU-II®
Crash Cushion System

DESIGN GUIDE

“Advancing Safety Through Innovation”
INTRODUCTION

The TAU-II system has been tested to meet the rigorous requirements of NCHRP Report 350, Test Levels 2 and 3. The systems will be provided in lengths and capacities for both low speed and high speed applications.

The TAU-II system is fully redirective and non-gating, and is ideally suited for narrow hazards such as the ends of rigid barriers, tollbooths, utility poles and more. Ease of installation, numerous transition options, low maintenance requirements, and reusability of system components make the TAU-II system ideal for treating many roadside hazards.

Redirective, non-gating crash cushions are highway safety devices whose primary function is to improve the safety for occupants of errant vehicles that impact the end of rigid or semi-rigid barriers or fixed roadside hazards by absorbing the kinetic energy of impact or by allowing controlled redirection of the vehicle. These devices are designed to safely decelerate an errant vehicle to a safe stop or redirect an errant vehicle away from roadside or median hazards. These types of systems are typically applied to locations where head-on and angled impacts are likely to occur and it is desirable to have the majority of post impact trajectories on the impact side of the system.

Placement and use of the TAU-II system should be accomplished in accordance with the guidelines and recommendations set forth in the “AASHTO Roadside Design Guide,” FHWA memoranda and other state and local standards.

PREFACE

The Barrier Systems, Inc. (BSI), TAU-II crash cushion system incorporates the newest roadside safety materials and engineering processes.

As with any roadside safety device, the TAU-II system must be installed properly to insure proper performance. Thoroughly review and fully understand the installation instructions and product limitations before starting the installation. An instructional video is available from BSI to help explain the general installation requirements. Watch and fully understand the TAU-II Installation and Assembly Video before attempting to install this crash cushion. Do not start the installation without the proper plans and tools required for installation.

If you need additional information, or have questions about the TAU-II Crash Cushion, please call the BSI Customer Service Department at 888-800-3691 (U.S. toll free) or 707-374-6800.
IMPORTANT INFORMATION

The TAU-II crash cushion must be installed properly to maximize the systems ability to protect errant motorists that impact the system. Designers, installers and people that maintain the system should thoroughly understand the manufacturer’s instructions prior to performing the necessary work. Key information is provided in this Design Manual and important additional information is in the Installation Manual and Maintenance Instructions. If these documents are not available or if there are any questions regarding the proper placement, installation or maintenance of the TAU-II crash cushion, contact Barrier Systems, Inc., Customer Service toll free at 888-800-3691 (in the U.S.) or 707-374-6800.

SYSTEM OVERVIEW

The TAU-II system is designed and constructed to provide acceptable structural adequacy, minimal occupant risk and safe vehicle trajectory as set forth in NCHRP 350 for redirective, non-gating, crash cushions. The TAU-II system is designed to shield the ends of median barriers and other narrow fixed objects likely to be struck head-on, by absorbing and dissipating the kinetic energy of impacting vehicles. TAU-II utilizes disposable Energy Absorbing Cartridges (EACs) to absorb the kinetic energy of the impacting vehicle. The EACs are separated by diaphragms and held in place with a framework of three-beam corrugated steel rail panels that “telescope” rearward during head-on impacts. As the vehicle compresses the cushion, it exerts a force on the first bay containing an EAC. The diaphragms distribute the impact forces uniformly to all the remaining cartridges in each bay until the vehicle eventually stops. The depth of penetration is dependent upon both the original impact speed and the mass of the impacting vehicle. Only the Energy Absorbing Cartridges are expended after most head-on impacts. When hit at an angle along the side, the system is restrained laterally by guidance cables that run the length of the system, attaching to the bottoms of the diaphragms, and terminate at the anchors at each end of the system. The front and rear cable anchors are bolted to a foundation.

TAU-II CRASH CUSHION SYSTEM
ISOMETRIC DRAWING (TL-2)
Figure 1. Illustrated parts list

- Compact Backstop
- Compact Backstop with Asphalt Adapter
- PCB Backstop
- PCB Backstop with Asphalt Adapter
- Front Cable Anchor
- Front Cable Anchor with Asphalt Adapter
- Middle Support Diaphragm
- Compact Cable
- Cable Guide Assembly
- Sliding Panel
- End Panel
- Pipe Panel Mount
- Sliding Bolt Assembly
- Nose Piece
- Front Support and Legs
- Type "A" Energy Absorbing Cartridge
- Type "B" Energy Absorbing Cartridge
Design Considerations

The TAU-II system is a redirective, non-gating system that has been fully tested in conformance with NCHRP Report 350 and approved by the U. S. DOT Federal Highway Administration as well as several countries outside of the U.S. Redirective, non-gating crash cushions are frequently used at locations where it is desirable to have the majority of post impact vehicle trajectories on the impact side of the system. If it is desirable to maximize the post impact trajectories to the back side of the system, non-redirective crash cushions should be considered.

This section will address several of the other key issues that should be considered in deciding where and how to use the TAU-II crash cushion.

System Length and Width
The length and width of the TAU-II crash cushion is shown on the drawings in the Appendix.

System Capacity
The TAU-II crash cushion is available in several lengths to accommodate frontal impact velocities higher and lower than required in NCHRP Report 350. Appendix B (Page 15) contains a chart that shows the number of options available, the frontal impact speed capacity and the Type “A” and Type “B” EAC configurations.

Types of Backstop Structures
The TAU-II crash cushion can be installed with either a freestanding “Compact Backstop” or a “P.C.B. Backstop” that can be attached to properly reinforced concrete barrier. These two options are shown in Appendix A.

Foundation Options and Considerations
There are three foundation options that are described in Appendix A. The TAU-II system must be securely attached to the appropriate foundation in accordance with the Installation Manual and the drawings in Appendix A and E. Anchoring material options are listed in Appendix C.

The concrete foundation shown on the drawings must be a minimum of 6 inches (150 mm) thick, reinforced 28 Mpa (4000 psi) Portland Cement Concrete (PCC) or 8 inches (200 mm) non-reinforced 28 Mpa (4000 psi) Portland Cement Concrete (PCC).
psi) PCC. Asphalt foundations must be a minimum of 8 inches (200 mm) thick, AR-4000 Asphalt Concrete as described in Appendix A (Page 8). The foundation should be free of major cracks and other structures (expansion joints, drainage structures, etc.) that could interfere with the operation of the TAU-II system.

Cross slopes of up to 8% (5 degrees or 1:12 slope) can be accommodated with the standard hardware and with the instructions provided with the system. If there are cross slopes in excess of 8%, contact Barrier Systems, Inc., Customer Service to obtain engineering advice and assistance.

Transition Options

The TAU-II crash cushion was designed to be able to use standard AASHTO type transitions. Departments of transportation can apply their standard transition designs between the TAU-II system and adjacent longitudinal barrier systems. Several typical transition options are provided in Appendix D.

Special care should be taken to ensure that the type of transition system chosen properly addresses the direction of all vehicles that will be exposed to the system. If there is bi-directional traffic around the system, ensure that the transition properly shields the vehicles from the backstop structure of the TAU-II system.

Other Site Conditions and Considerations

There are numerous other conditions that should be taken into consideration when selecting and locating crash cushions. The majority of these are addressed in the “AASHTO Roadside Design Guide” and in memoranda from the Federal Highway Administration and state Departments of Transportation. These should always be taken into consideration when selecting and locating crash cushions.

A few of the typical considerations are as follows:

- All curbs, islands and elevated objects greater than 4 inches (100 mm) high that would be beneath, beside or less than 50 feet (15 m) in front of a TAU-II crash cushion should be removed prior to installation.
- Ensure that all drainage inlets or structures, junction boxes, expansion joints, sign supports, delineators or any other element that is close to the installation site of the TAU-II system, cannot interfere with the proper operation of the system.

Limitations and Warnings

The TAU-II system has been rigorously tested and evaluated per the recommendations in the NCHRP Report 350 Guidelines for Test Level 2 (TL-2) and Test Level 3 (TL-3) terminals and crash cushions. The impact conditions recommended in NCHRP 350 are intended to address typical in-service collisions.

When the TAU-II system is properly installed and maintained, the system is capable of stopping or containing and redirecting impacting vehicles in a predictable and safe manner under the NCHRP 350 impact conditions of:

- Vehicles: Pickup (2000P) and small car (820C)
- Mass:    4409 lbs. (2000 kg) and 1808 lbs. (820 kg)
- Speed:   62 mph (100 km/hr)
- Angle:   20 degrees for pickup and 15 for small car

Vehicle impacts that vary from the NCHRP 350 impact conditions described for redirective non-gating, crash cushions may result in significantly different results than those experienced in testing. Vehicle impact characteristics different than or in excess of those encountered in NCHRP 350 testing (speed and angle) may result in system performance that may not meet the NCHRP 350 evaluation criteria.
APPENDIX A
Anchoring Foundation Options

There are three approved anchoring foundation configurations for the TAU-II system. The first method utilizes a solid concrete pad over the length of the system. The second utilizes concrete blocks at the Backstop and Front Cable Anchor locations. The third is asphalt (as specified in Appendix A, Page 8).

(Variations of these foundations may be reviewed and determinations made as to equivalence by the Project engineer.)

There are different foundation configurations depending on which backstop you are using (Compact or P.C.B.). Foundation options for both of the Backstop systems are shown in the following drawings.

Foundation Specifications .......... Page 8

Compact Backstop:

Foundation, PC concrete Pad or Roadway,
TAU-II with Compact Backstop
Drawing # B010819 ..................... Page 9

Foundation, PC concrete Anchor Blocks,
TAU-II with Compact Backstop
Drawing # B010714 ..................... Page 10

Foundation, Asphalt,
TAU-II with Compact Backstop
Drawing # B020410 ..................... Page 11

P.C.B. Backstop:

Foundation, PC Concrete Pad or Roadway,
TAU-II with P.C.B. Backstop
Drawing # B011044 ..................... Page 12

Foundation, PC Concrete Anchor Block,
TAU-II with P.C.B. Backstop
Drawing # B011045 ..................... Page 13

Foundation, Asphalt,
TAU-II with P.C.B. Backstop
Drawing # B020411 ..................... Page 14

For additional information regarding this product, please contact:

Barrier Systems, Inc.
Customer Support
180 River Road
Rio Vista, CA 94571

Toll Free (US) 888 800 3691
Phone 707 374 6800
Fax 707 374 6801
APPENDIX A: Foundation Specifications

The TAU-II Crash Cushion system has been designed to attach to concrete or asphalt foundations. Use the anchorage specified below depending on the foundation at the job site. Please see Appendix C for chemical anchoring specifications.

1. Concrete Pad
   - Foundation: Minimum 6 in. (150 mm) Reinforced PCC Pad or 8 in. (200 mm) Nonreinforced PCC Pad
   - Anchorage: 3/4 in. (20 mm) x 8 1/4 in. (210 mm) bolts 6 in. (150 mm) embedment

2. Asphalt over Subbase
   - Foundation: Minimum 6 in. (150 mm) AC over 6 in. (150 mm) Compacted DGA Subbase
   - Anchorage: 3/4 in. (20 mm) x 18 in. (460 mm) bolts 15 to 16 1/2 in. (380 to 420 mm) embedment

3. Asphalt Only
   - Foundation: Minimum 8 in. (200 mm) AC
   - Anchorage: 3/4 in. (20 mm) x 18 in. (460 mm) bolts 15 to 16 1/2 in. (380 to 420 mm) embedment

4. Asphalt over P.C. Concrete
   - Foundation: Minimum 3 in. (75 mm) AC over minimum 3 in. (75 mm) PCC
   - Anchorage: 3/4 in. (20 mm) x 18 in. (460 mm) bolts 15 to 16 1/2 in. (380 to 420 mm) embedment

SPECIFICATION SUMMARY

Portland Cement Concrete (PCC)

Stone aggregate concrete mix, 4,000 psi (28 MPa) minimum compressive strength (sampling per ASTM C31-84 or ASTM C42-84a, testing per ASTM C39-84)

Asphalt Concrete (AC)

AR-4000 A.C. (per ASTM D3381 '83) .75"
Maximum, medium
(Type A or B) aggregate
Sieve Size  % Passing
1"   100
3/4"  95 - 100
3/8"  65 - 80
No. 4  49 - 54
No. 8  36 - 40
No. 30 18 - 21
No. 200 3 - 8

Compacted Subbase (DGA)

6 in. (150 mm) minimum depth, 95% compaction, class 2 aggregate
Sieve Size % Passing
3"   100
2 1/2" 90 - 100
No. 4 40 - 90
No. 200 0 - 25
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**NOTE:**

- THICKNESS OF WELD TO BE EQUAL TO THE THINNER OF 2 PIECES BEING JOINED, WELD TO BE ALL AROUND UNLESS OTHERWISE NOTED.

**INFO:**

- 4000 PSI [28 MPa] STONE AGGREGATE CONCRETE 145 LBS/CU.FT [2324 KG/CU.M].
- #5 [15MM] REBAR

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**APPENDIX A - Anchoring Pad Options**

**TAU-II Design Guide**

**Model:** B010819  **Rev:** A
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4000 PSI [28 MPa] REINFORCED P.C. CONCRETE
4000 PSI [28 MPa] STONE AGGREGATE
CONCRETE 145 LBS/CU.FT [2324 KG/CU.M].

4 IN [100 MM] MIN. NON-REINFORCED 4000 PSI [28 MPa] P.C. CONCRETE
OR
6 IN [150 MM] ASPHALTIC CONCRETE ABOVE
8 IN [200 MM] D.G.A. BASE.

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TAU-II Design Guide

APPENDIX A - Anchoring Pad Options
A SEE ECN 00331

SCALE: 1=20

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### Table A

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**Diagram Notes:**

1. **Asphalt Over Subbase:**
   - Minimum thickness indicated at 16 [407] min.
   - See Table A - MIN.

2. **Concrete Over Concrete:**
   - Minimum thickness indicated at 59 [151] min.

3. **Foundation Options:**
   - Refer to Table A for foundation options and specifications.

---

**Appendix A - Anchoring Pad Options**

**Model Drawing Number:** B0020410

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**Additional Notes:**

- Footings shall be compacted per AGC Class 2000, and the concrete mix shall be designed to meet the requirements of this specification.
- Items to be coordinated with civil engineer and contractor.
- See Table A - MIN. for specific details.

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**Software:** 2000L

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**Revised:** 1/10/01

**For inquiries, contact sales@wondersystems.com or visit our website at www.wondersystems.com**
NOTES:
1. THE CONCRETE REINFORCEMENT SHOWN IS RECOMMENDED TO ENSURE ADEQUATE BARRIER INTEGRITY FOR PROPER IMPACT PERFORMANCE. IT IS APPROPRIATE FOR SAFETY SHAPED BARRIER AND VERTICAL CONCRETE. VARIATIONS MAY BE REVIEWED AND DETERMINATIONS MADE AS TO EQUIVALENCE BY PROJECT ENGINEER.
2. MANUFACTURER RECOMMENDS TO REINFORCE A MINIMUM OF 96 IN [2438 MM] OF BARRIER.
3. MINIMUM 4000 PSI [28 MPa] P.C. CONCRETE MEDIAN BARRIER.
4. #4 [13MM] REBAR.
5. #5 [15MM] REBAR.

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SECTION A-A

APPENDIX A - Anchoring Pad Options
TAU-II Design Guide

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MODEL DRAWING NUMBER REV.
B011044 A
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2. MANUFACTURER RECOMMENDS TO REINFORCE A MINIMUM OF 96 IN [2438 MM] OF BARRIER.
3. MINIMUM 4000 PSI [28 MPa] P.C. CONCRETE MEDIAN BARRIER.
4. #4 [13MM] REBAR.
5. #5 [15MM] REBAR.
6. 4000 PSI [28 MPa] REINFORCED P.C. CONCRETE.

| TABLE "L" |
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| 6          | B011032    | 222       | 5639      |
| 7          | B011034    | 256       | 6502      |
| 8          | B010923    | 280 1/2   | 7370      |
| 9          | B011036    | 324 1/2   | 8242      |
| 10         | B011038    | 358 1/2   | 9106      |

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APPENDIX A - Anchoring Pad Options
TAU-II Design Guide

A SEE ECN 00331 3/25/2011

REV.  CHANGES  DATE BY  NEXT ASSY.  ITEM

SCALE: 1:30

Standard Tolerance

1/2" or 1/2 of 1/16

Dec. 1/16

1/32 or 1/32 of 1/16

Dec. 1/64

Dec. 0.000

TITLE: FOUNDATION, P.C. CONCRETE ANCHOR BLOCK, TAU-II WITH P.C.B. BACKSTOP

MODEL DRAWING NUMBER REV.
B011045 A
APPENDIX B  System Configurations

The TAU-II Crash Cushion System has been fully designed and tested to comply with the evaluation requirements of the National Cooperative Highway Research Program Report 350 (NCHRP 350) for Test Levels 2 (70 km/h) and 3 (100 km/h). The Test Level 2 system contains four energy absorbing bays and the Test Level 3 system contains eight energy absorbing bays.

It is sometimes desirable to have a crash cushion that has an energy absorbing capacity that is less than Test Level 2, between Test Level 2 and Test Level 3 or greater than Test Level 3. Therefore, the following table indicates the number of bays, and the energy absorbing cartridge configuration, that would be required to absorb the kinetic energy of a 2000 kg (4400 lb.) vehicle impacting the front of the TAU-II system, head-on and at the velocity indicated.

Roadside safety features, such as crash cushions, must be installed in accordance with the AASHTO Roadside Design Guide, state and local standards and in conformance with the manufacturer’s instructions. Instructions from the manufacturer are available by contacting Barrier Systems, Inc., Customer Service Department at 1-888-800-3691.

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<td>72</td>
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There are two types of Energy Absorbing Cartridges (EAC). Each EAC has a forward and rearward end. Type “B” EAC’s have a solid cylinder wall with (3) vent holes on the rearward end. Type “A” EAC’s have (8) 3” diameter holes around the circumference of the front half of the cylinder. When installing the EAC’s in a system it is important to ensure that they are placed according to manufacturer specification and in the configurations illustrated above.
APPENDIX C
Anchoring Material Options

The anchoring package supplied with the TAU-II system contains the necessary threaded rods and epoxy needed to install the system. (Fosroc Anchoritite Polyester Epoxy and galvanized or stainless steel threaded rods ¾” (20 mm) cut to length.) The epoxy has the following physical properties:

**Compressive Strength, ASTM C-109 (7 days):**
14,000 psi (97 MPa)

**Tensile Strength, ASTM C-307 (7 days):**
2,000 psi (14 MPa)

**Heat Distortion, Temperature, ASTM D-648:**
233°F (112°C)

**Coefficient of Linear Expansion:**
2.55 x 10⁻⁵/°C

The proper ratio of filler/hardener to resin is two parts of filler/hardener to one part resin by volume.

Anchor bolt holes should be drilled using air-flushed or water-flushed rotary percussive drilling equipment. If diamond core or non-percussive drills are used, the hole must be thoroughly scoured using a coarse wire flue brush.

Other anchoring materials can be used if they comply with the following specifications: epoxy should meet the ASTM C307 tensile strength of 2,000 psi (14 MPa) and compressive strength of 10,000 psi (70 MPa) per ASTM C109 or C579. The anchoring compound (epoxy) should provide a pull out strength of 20,000 lb. (9070 kg) minimum in 4,000 psi (28 MPa) concrete. Products such as HILTI HIT HY150 injection Adhesive Anchor or HVA Adhesive Anchoring System fit this criteria.

The mechanical expansion anchors provided with the P.C.B. anchoring package can be replaced with any corrosion resistant mechanical or chemical anchor that provides a shear capacity of at least 30,000 lb. (13607 KG) and a tensile capacity of at least 20,000 lb. (9070 KG), in 4,000 psi (28MPa) concrete. Appropriate sized threaded rod and specified epoxy can also be substituted.

For additional information regarding this product, please contact:

Barrier Systems, Inc.
Customer Service
180 River Road
Rio Vista, CA 94571

U.S. Toll Free (888) 800-3691
Phone: (707) 374-6800
Fax: (707) 374-6801
APPENDIX D  Transitions

There are a variety of transition options available for the TAU-II system. The system was designed to be compatible with a variety of generic transitions already available to the industry.

Placement and installation of the TAU-II system and transitions must be accomplished in accordance with the guidelines and recommendations set forth in the “AASHTO Roadside Design Guide,” FHWA memoranda and other state and local standards.

There are different transition configurations depending on which backstop you are using (Compact or P.C.B.). Transition options for either of the Backstop systems are shown in the following drawings.

With P.C.B. Backstop:

To Vertical Concrete:
TAU-II with PCB Backstop
Transition to Vertical Concrete
Drawing # B010727  ......................... Page 18

To Safety Shape PCB:
TAU-II with PCB Backstop
Transition to Safety Shape P.C.B.
Drawing # B010809  ......................... Page 19

With Compact Backstop:

To Safety Shape PCB:
TAU-II with Compact Backstop
Transition to Safety Shape P.C.B.
Drawing # B010725  ......................... Page 20

To Safety Shape PCB – One Side:
TAU-II with Compact Backstop
Transition to Safety Shape P.C.B., One Side
Drawing # B010811  ......................... Page 21

To Safety Shape PCB – Offset:
TAU-II with Compact Backstop
Transition to Safety Shape P.C.B., Offset
Drawing # B010726  ......................... Page 22

To Concrete End Shoe:
TAU-II with Compact Backstop
Transition to Concrete End Shoe
Drawing # B010806  ......................... Page 23

To Thrie Beam Guardrail:
TAU-II with Compact Backstop
Transition to Thrie Beam Guardrail
Drawing # B010724  ......................... Page 24

To W Beam Guardrail:
TAU-II with Compact Backstop
Transition to W-Beam
Drawing # B010728  ......................... Page 25

For additional information regarding this product, please contact:

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180 River Road
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NOTES:
1.) REINFORCEMENT OF VERTICAL CONCRETE BARRIER END MAY BE NEEDED. REFER TO BSI SPECIFICATION B011044 OR B011045 FOR FOUNDATION REQUIREMENTS.
2.) SUPPORT SPACING AND BLOCKOUTS SHOWN ARE IN ACCORDANCE WITH NEVADA DOT SPECIFICATION R-8.4.3.
3.) 4-SPACE THRIE BEAM GUARDRAIL PER AASHTO HARDWARE SPECIFICATION RTM01b.
4.) THREE BEAM BRIDGE SHOE PER AASHTO HARDWARE SPECIFICATION RTE01b.
5.) RECTANGULAR GUARDRAIL WASHER PER AASHTO HARDWARE SPECIFICATION FW0203.
6.) TAII SYSTEM TO BE INSTALLED PER MANUFACTURER INSTRUCTIONS.
7.) OVERLAP THRIE BEAM OR BRIDGE SHOE ACCORDING TO DIRECTION OF TRAFFIC. UNDERLYING PART SHOULD BE DOWNSTREAM OF TRAFFIC.
1. REINFORCEMENT OF SAFETY SHAPED BARRIER END MAY BE NEEDED. REFER TO BSI SPECIFICATION B011044 OR B011045 FOR FOUNDATION REQUIREMENTS.

2. SUPPORT SPACING AND BLOCKOUTS SHOWN ARE IN ACCORDANCE WITH NEVADA DOT SPECIFICATION R-8.4.3.

3. 4-SPACE THRIE BEAM GUARDRAIL PER AASHTO HARDWARE SPECIFICATION RTM01b.

4. THRIE BEAM BRIDGE SHOE PER AASHTO HARDWARE SPECIFICATION RTE01b.

5. RECTANGULAR GUARDRAIL WASHER PER AASHTO HARDWARE SPECIFICATION FWRO3.

6. TAU-II SYSTEM TO BE INSTALLED PER MANUFACTURER INSTRUCTIONS.

7. OVERLAP THRIE BEAM OR BRIDGE SHOE ACCORDING TO DIRECTION OF TRAFFIC. UNDERLYING PART SHOULD BE DOWNSTREAM OF TRAFFIC.
NOTES:
1.) REINFORCEMENT OF SAFETY SHAPED BARRIER END MAY BE NEEDED. REFER TO BSI SPECIFICATION B010714 OR B010819 FOR FOUNDATION REQUIREMENTS.
2.) SUPPORT SPACING AND BLOCKOUTS SHOWN ARE IN ACCORDANCE WITH NEVADA DOT SPECIFICATION R-8.4.3.
3.) 4-SPACE THRE BEAM GUARDRAIL PER AASHTO HARDWARE SPECIFICATION RTM016.
4.) THRE BEAM BRIDGE SHOE PER AASHTO HARDWARE SPECIFICATION RTE016.
5.) RECTANGULAR GUARDRAIL WASHER PER AASHTO HARDWARE SPECIFICATION FWR03.
6.) TAU-II SYSTEM TO BE INSTALLED PER MANUFACTURER INSTRUCTIONS.
7.) OVERLAP THRE BEAM OR BRIDGE SHOE ACCORDING TO DIRECTION OF TRAFFIC. UNDERLYING PART SHOULD BE DOWNSTREAM OF TRAFFIC.
NOTES:
1.) REINFORCEMENT OF SAFETY SHAPED BARRIER END MAY BE NEEDED. REFER TO BSI SPECIFICATION B010714 OR B010819 FOR FOUNDATION REQUIREMENTS.
2.) SUPPORT SPACING AND BLOCKOUTS SHOWN ARE IN ACCORDANCE WITH NEVADA DOT SPECIFICATION R-8.4.3.
3.) 4-SPACE THREE BEAM GUARDRAIL PER AASHTO HARDWARE SPECIFICATION RTM01b.
4.) THREE BEAM BRIDGE SHOE PER AASHTO HARDWARE SPECIFICATION RTE01b.
5.) RECTANGULAR GUARDRAIL WASHER PER AASHTO HARDWARE SPECIFICATION FWR03.
6.) TAU-II SYSTEM TO BE INSTALLED PER MANUFACTURER INSTRUCTIONS.
7.) OVERLAP THREE BEAM OR BRIDGE SHOE ACCORDING TO DIRECTION OF TRAFFIC, UNDERLYING PART SHOULD BE DOWNSTREAM OF TRAFFIC AS SHOWN.
NOTES:
1.) REINFORCEMENT OF SAFETY SHAPED BARRIER END MAY BE NEEDED. REFER TO BSI SPECIFICATION B010714 OR B010819 FOR FOUNDATION REQUIREMENTS.
2.) SUPPORT SPACING AND BLOCKOUTS SHOWN ARE IN ACCORDANCE WITH NEVADA DOT SPECIFICATION R-8.4.3.
3.) 4-SPACE THRE BEAM GUARDRAIL PER AASHTO HARDWARE SPECIFICATION RTM01b.
4.) THRE BEAM BRIDGE SHOE PER AASHTO HARDWARE SPECIFICATION RTE01b.
5.) RECTANGULAR GUARDRAIL WASHER PER AASHTO HARDWARE SPECIFICATION FWR03.
6.) TAU-II SYSTEM TO BE INSTALLED PER MANUFACTURER INSTRUCTIONS.
7.) OVERLAP THRE BEAM OR BRIDGE SHOE ACCORDING TO DIRECTION OF TRAFFIC. UNDERLYING PART SHOULD BE DOWNSTREAM OF TRAFFIC AS SHOWN.

APPENDIX D - Transitions
TAU-II Design Guide
NOTES:
1.) REINFORCEMENT OF VERTICAL CONCRETE END
SHOE MAY BE NEEDED. REFER TO BSI
SPECIFICATION B010714 OR B010819 FOR
FOUNDATION REQUIREMENTS.
2.) THRE BEAM BRIDGE SHOE PER AASHTO
HARDWARE SPECIFICATION RTE01b.
3.) RECTANGULAR GUARDRAIL WASHER PER AASHTO
HARDWARE SPECIFICATION FWRO3.
4.) TAU-II SYSTEM TO BE INSTALLED PER
MANUFACTURER INSTRUCTIONS.
5.) END PANEL MUST OVERLAP BRIDGE SHOE TO
INSURE PROPER FUNCTION OF TAU-II SYSTEM.
TAU-II WITH COMPACT BACKSTOP

1. TAU-II SYSTEM TO BE INSTALLED PER MANUFACTURER INSTRUCTIONS. REFER TO BSI SPECIFICATION B010714 OR B010819 FOR FOUNDATION REQUIREMENTS.

2. SUPPORT SPACING AND POSTS SHOWN ARE IN ACCORDANCE WITH ASHTE SPECIFICATION STB06 AND NEVADA DOT SPECIFICATION R-8.4.3.

3. 4-SPACE THRIE BEAM GUARDRAIL PER ASHTE HARDWARE SPECIFICATION RTM01b. ADDITIONAL HOLES ARE REQUIRED AT 18" [470] SPACING.

4. RECTANGULAR GUARDRAIL WASHER PER ASHTE HARDWARE SPECIFICATION FWR03.

5. OVERLAP THRIE BEAM PANELS ACCORDING TO DIRECTION OF TRAFFIC. UNDERLYING PART SHOULD BE DOWNSTREAM OF TRAFFIC.

6. TWO (2) 4-SPACED THRIE BEAM GUARDRAIL (RTM04b) PANELS—ONE SET INSIDE THE OTHER FOR BI-DIRECTIONAL TRAFFIC CONDITIONS. ONLY NEEDED ON SIDE WHERE TAU-II SYSTEM IS DOWNSTREAM OF TRANSITION.

NOTE:
THINNESS OF WELD TO BE EQUAL TO THE THINNER OF 2 PIECES BEING JOINED. WELD TO BE ALL AROUND UNLESS OTHERWISE NOTED.

APPENDIX D - Transitions TAU-II Design Guide
APPENDIX E  Installation Drawings

There are a variety of system configurations available for the TAU-II system.

Placement and installation of the TAU-II system and transitions must be accomplished in accordance with the guidelines and recommendations set forth in the “AASHTO Roadside Design Guide,” FHWA memoranda and other state and local standards.

The following drawings show the TAU-II system installation specifications

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Phone 707 374 6800
Fax    707 374 6801

With P.C.B. Backstop:

Installation, PC concrete Pad or Roadway, TAU-II with P.C.B. Backstop
Drawing # B011132  …………………………  Page 27

Installation, Asphalt, TAU-II with P.C.B. Backstop
Drawing # B020413  …………………………  Page 28

With Compact Backstop:

Installation, PC concrete Pad or Roadway, TAU-II with Compact Backstop
Drawing # B011131  …………………………  Page 29

Installation, Asphalt, TAU-II with Compact Backstop
Drawing # B020412  …………………………  Page 30

Design Dimensions:

Design Dimensions, TAU-II
Drawing # A020305  …………………………  Page 31
NOTES:
1. FOUNDATION PER BSI SPECIFICATION B011044 OR B011045 OR EQUIVALENT.
2. POSITION FRONT CABLE ANCHOR'S OFFSET LUGS TOWARD BACKSTOP, REVERSE IF MORE THREAD IS NEEDED TO REACH SPECIFIED CABLE TENSIONING TORQUE.
3. USE CAULKING GUN TO FILL HORIZONTAL HOLES.