TYPICAL LOCATIONS OF THRIE BEAM AND W-BEAM CONNECTIONS TO BRIDGE

THRIE BEAM TRANSITION (MGS) MIDWEST GUARDRAIL SYSTEM

THRIE BEAM TRANSITION

W-BEAM TO 10-GAUGE ASYMMETRICAL

6'-3"

THRIE BEAM TRANSITION (MGS)

MGS BEAM GUARD (MGS)

12-GAUGE W-BEAM SECTION

TWO NESTED 12'-6"

THRIE BEAM SECTIONS

12-GAUGE THRIE BEAM SECTIONS

TWO WAY TRAFFIC

ONE WAY TRAFFIC

ELEVATION VIEW

PLAN VIEW

GENERAL NOTES

1. Bridge railing type does not require a terminal connector.
2. Optional curb and gutter or drainage feature see plan for information.
3. Steel or wood post is acceptable at post 1. See SDD14B42

BRIDGE RAILING TYPE "W" DOES NOT REQUIRE A TERMINAL CONNECTOR.

TRANSITION USES STEEL POSTS ONLY.

SEE STANDARD DETAIL DRAWING D 42 FOR MORE INFORMATION.

POST 2 THROUGH 17 USES STEEL POST ONLY

S.D.D. 14 B 45-58

MIDWEST GUARDRAIL SYSTEM

THRIE BEAM TRANSITION

STATE OF WISCONSIN

DEPARTMENT OF TRANSPORTATION

SEE OTHER DETAILS

OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.

POST 2 THROUGH 17 USES STEEL POST ONLY

IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2" AND OUTSIDE OF POST, SEE 14B42 FOR MORE DETAILS.
**Midwest Guardrail System (MGS)**

**General Notes**

1. Steel posts are W6x9 or W6x8.5. Bolt holes for post are on front and side of post.
2. When using steel posts and wood blockouts, install four 16D galvanized double head nails at the back corners of the block and bend the nails over the flange of the steel post.
3. Wood blockouts may be constructed of 2 wood blocks. See alternate wood block detail.
4. Steel or wood post 1 is acceptable at post 1. See SDD 14B42.

**Steel Posts 1-5**

- Top View
- Front View
- Side View

**Steel Posts 6-17**

- Top View
- Front View
- Side View

**Alternate Wood Blockout Detail**

**12'-6" Thrie Beam Section**

- Top View
- Front View
- Side View

**6'-3" Thrie Beam Section**

- Top View
- Front View
- Side View

**7'-3" Thrie Beam Section**

- Top View
- Front View
- Side View

**W-Beam to Thrie Beam Transition Section**

- Top View
- Front View
- Side View

**W-Beam Blockout Details**

- Top View
- Front View
- Side View
SHALL BE FILLED WITH A TREATED TIMBER BLOCKOUT. BLOCKOUT SIZE IS 1'-6" X 2'-0" X 3". THE RECESS FOR A W-BEAM CONNECTION, WHICH EXISTS ON SOME PARAPETS OF THIS TYPE, EXISTING BRIDGES TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS. THESE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSTION OF CONNECTIONS TO

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DATE
FHWA

SECTION E-E
FRONT VIEW
THRIE BEAM CONNECTION TO BRIDGE PARAPET WITH SQUARE ENDS

GENERAL NOTES

THREE ARE TYPICAL CONNECTION DETAILS. ADJUST THE POSITION OF CONNECTIONS TO FIT THE ACTUAL BRIDGE AND SITE DIMENSIONS.

1. TOLERANCE FOR TOP OF BEAM IS ± 1".
2. DRILLING HOLE(s) THROUGH THE PARAPET, NUTS, WASHERS AND THREADS CONNECTIVE ARE PENDING TO THE CONTRACT.
3. BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREAD LENGTH TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONNECTOR IS TO HOLD BEAM TO PLATE TVHROUGH LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THREAD LOCK NUT TO ALLOW BOLT TO REAM ITSELF INTO PLACE. INSTALL PLATE WASHERS ON BACKSIDE OF RIGID BARRIER, TRANSITION TO AN EXISTING RIGID BARRIER, THE GEAR FOR A W-BEAM CONNECTION, WHEN CUTS ON RIGID BARRIER OF THE THRIE BEAM STRUCTURE APPROACH LIMIT OF STEEL VARIOUS END OF ONE WAY BRIDGES (USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

DRILL HOLE LOCATION

MIDWEST GUARDRAIL SYSTEM
THRIE BEAM TRANSITION (MGS)
STATE OF WISCONSIN
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SECTION F-F
FRONT VIEW
W BEAM TRANSITION AND CONNECTION TO BRIDGE PARAPETS WITH SQUARE ENDS

(USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)

1. TOLERANCE FOR TOP OF BEAM IS ± 1".
2. DRILLING HOLE(s) THROUGH THE PARAPET, NUTS, WASHERS AND THREADS CONNECTIVE ARE PENDING TO THE CONTRACT.
3. BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREAD LENGTH TO ALLOW FOR A TIGHT CONNECTION BETWEEN RIGID BARRIER AND THRIE BEAM CONNECTION PLATE. CONNECTOR IS TO HOLD BEAM TO PLATE TVHROUGH LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THREAD LOCK NUT TO ALLOW BOLT TO REAM ITSELF INTO PLACE. INSTALL PLATE WASHERS ON BACKSIDE OF RIGID BARRIER, TRANSITION TO AN EXISTING RIGID BARRIER, THE GEAR FOR A W-BEAM CONNECTION, WHEN CUTS ON RIGID BARRIER OF THE THRIE BEAM STRUCTURE APPROACH LIMIT OF STEEL VARIOUS END OF ONE WAY BRIDGES (USE ONLY ON THE TRAFFIC EXIT END OF ONE WAY BRIDGES)
**General Notes**

There are typical connection details. Adjust the position of connections to fit the actual bridge and site dimensions.

- **Tolerances for Top of Beam:**
  - ±1/8 in.
- **Drilling Bolt Holes Through the Parapet:**
  - Drill 1 in. diameter holes and 4 in. deep holes for the through bolts. The holes should be sized to allow for a 1 in. diameter hex bolt and 1 in. diameter washer. The holes should be drilled perpendicular to the parapet.
- **Installation Instructions:**
  - Drill 1 in. diameter holes and 4 in. deep holes for the through bolts.
  - Install existing rigid barrier, transition to an existing rigid barrier, and install existing rigid barrier.

**Front View**

W Beam Connection to Vertical Face Parapets

(Use only on the traffic exit end of one way bridges)

**Section G-G**

- **W Beam Connector**
- **Washing Plate**
- **Backof of Rigid Barrier**

**Section H-H**

- **W Beam Connector**
- **Washing Plate**
- **Backof of Rigid Barrier**

**Midwest Guardrail System**

THRIE BEAM TRANSITION (MGS)

STATE OF WISCONSIN

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THRIE BEAM TRANSITION (MGS)

MIDWEST GUARDRAIL SYSTEM

2'-7" FRONT VIEW

3'-1"

4'-2"

5'-0"

CONNECTOR

W BEAM TERMINAL

W BEAM CONNECTION TO VERTICAL FACE PARAPET

NO. 17 POST STEEL

NO. 17 POST STEEL

S.D.D. 14 B 45-5e

S.D.D. 14 B 45-5e

[Diagram showing details of the connection and installation process, including bolt sizes, positions, and recommended practices for installing the THRIE BEAM TRANSITION.]
GENERAL NOTES

1. Optional curb and gutter or drainage feature see plan for information.

2. Tolerance for top of beam is ± 1/4".

3. Drilling bolt holes through the parapet. Bolts, nuts, washers and repairing damaged concrete are incidental to the contract.

4. Washers may be A325 or A449 bolts. Bolt length and threading length are to allow for a snug connection between the parapets and the beam connection. The connector plate is to field.

5. Bolt location and wording joined the round washer required between the nuts and the beam connector plate. Bolts that extend through the parapet and not the back face require a hardened round steel washer that is 1/2" thick and one plate washer. Repair any damaged concrete from bolt installation.

6. Tolerance for top of beam is ± 1/4".

7. Drilling bolt holes through the parapet. Bolts, nuts, washers and repairing damaged concrete are incidental to the contract.

FRONT VIEW

W BEAM CONNECTION TO PARAPETS WITH SLOPED ENDS

(USE ONLY AT TRAFFIC EXIT END OF ONE WAY BRIDGE)

THREE BEAM CONNECTION TO BRIDGE PARAPETS WITH SLOPED ENDS
GENERAL NOTES

1. TOLERANCE FOR TOP OF BEAM IS ±1/4".

2. DRILL HOLES THROUGH THE PAPRPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE RESIDENTIAL TO THE CONTRACT.

3. TOLERANCE FOR TOP OF BEAM IS ±1/4".

4. DRILL HOLES THROUGH THE PAPRPET, BOLTS, NUTS, WASHERS AND REPAIRING DAMAGED CONCRETE ARE RESIDENTIAL TO THE CONTRACT.

THREE BEAM TRANSITION (MGS)

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STATE OF WISCONSIN
APPROVED
DATE

UNIT SUPERVISOR
ROADWAY STANDARDS DEVELOPMENT
/S/ Rodney Taylor
07/2018
THRIE BEAM CONNECTION TO SINGLE SLOPE BARRIER

SINGLE SLOPE CONNECTION PLATE PLACEMENT

**GENERAL NOTES**
- Connector plate, drilling bolt holes through the barrier, bolts, nuts, washers and replacing damaged concrete are incidental to the contract.
- Optional curb and gutter or drainage feature see plan for information.
- Bolts may be A325 bolts or A449 bolts. Bolt length and threading length are to allow for a tight connection between barrier and THRIE beam connection plate. Connector plate is to be cleaned up to 1" in diameter and through length one round washer required between bolt head and the connector plate. Bolt, plate, may extend through the barrier, and out the back face require a hardened round steel washer that is 2" O.D. x 1/4" thick and one plain washer. Repair any damaged concrete from bolt installation.

OPTIONAL CURB AND GUTTER OR DRAINAGE FEATURE SEE PLAN FOR INFORMATION.

SINGLE SLOPE CONNECTION PLATE PLACEMENT

*Not to Scale*

**STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION**

**MIDWEST GUARDRAIL SYSTEM THRIE BEAM TRANSITION (MGS)**

**APPROVED**

7/2018

/S/ Rodney Taylor

UNIT SUPERVISOR

ROADWAY STANDARDS DEVELOPMENT
TOLERANCE FOR TOP OF BEAM IS +1".

BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREAD LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN THE BOLTED AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNEXION PLATE. ON BACKSIDE OF PARAPET ONE ROUND WASHER, AND NUT REQUIRED. BOLT THREAD IS TO EXTEND 1” BEYOND NUT.

GENERAL NOTES

1 TOLERANCE FOR TOP OF BEAM IS +1”.

2 BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREAD LENGTH ARE TO ALLOW FOR A TIGHT CONNECTION BETWEEN THE BOLTED AND THRIE BEAM CONNECTION PLATE. CONTRACTOR IS TO FIELD VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLT HEAD AND THRIE BEAM CONNEXION PLATE. ON BACKSIDE OF PARAPET ONE ROUND WASHER, AND NUT REQUIRED. BOLT THREAD IS TO EXTEND 1” BEYOND NUT.

ELEVATION OF DETAIL AT NY3 END POST
THRIE BEAM RAIL ATTACHMENT

ELEVATION OF DETAIL AT NY4 END POST
THRIE BEAM RAIL ATTACHMENT
GENERAL NOTES

1. TOLERANCE FOR TOP OF BEAM IS 2.16".

2. BOLTS MAY BE A325 BOLTS OR A449 BOLTS. BOLT LENGTH AND THREADING LENGTH ARE TO ALLOW FOR A
   TIGHT CONNECTION BETWEEN THE WEB AND THE BEAM CONNECTOR PLATE. CONTRACTOR IS TO FIELD
   VERIFY BOLT LENGTH AND THREAD LENGTH. ONE ROUND WASHER REQUIRED BETWEEN BOLTS AND THEIR
   BEAM CONNECTOR PLATE. ON BACKSIDE OF PARAPET ONE ROUND WASHER AND NUT REQUIRED. BOLT THREAD
   EXTEND 1/4" BEYOND NUT.

THREE BEAM TRANSITION (MGS)

STATE OF WISCONSIN
DEPARTMENT OF TRANSPORTATION

APPROVED:

ROADWAY STANDARDS DEVELOPMENT

DATE: 7/2018

{Signature} Rodney Taylor
Midwest Guardrail System (MGS) Thrie Beam Transition

References:

- Standard Spec 614
- FDM 11-45-30
- AASHTO Roadside Design Guide
- Midwest Roadside Safety Facility (MwRSF) Report No. TRP-03-047-95
- MwRSF Report No. TRP-03-167-07
- MwRSF Report No. TRP-03-210-10
- MwRST Report No. TRP-03-291-14

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Other SDDs associated with this drawing:

- SDD8D1    Concrete Curb, Concrete Curb and Gutter and Ties
- SDD14B28  Mow Strip Detail
- SDD14B42  Midwest Guardrail System (Required)
- SDD14B44  Midwest Guardrail System Terminal (MGS)
- SDD14B45  Midwest Guardrail System Transitions (MGS)
- SDD14B47  Midwest Guardrail System Type 2 terminal (MGS)

Design Notes:

Midwest Guardrail System Thrie Beam Transition (MGS transition) is a specially designed transition to rigid barrier for the MGS system. MGS transition is required when connecting MGS to rigid barriers (roadway concrete barrier, bridge parapets).

Provide working width for MGS transition. Document in Design Study Report (DSR) when working width cannot be provided. Thrie beam transition working width is the same as standard MGS.

Modifications shown on SDD allow for the MGS transition to have TBT, and TBTT curb installed. Flow line of curb is to line up with front face of block. Install TBT or TBTT curb when MGS transition is connecting to concrete bridge parapets, older New Jersey shaped barrier (SDD 14B11 or SDD 14B22).
Single Slope Thrie Beam Anchorages (SDD 14B33) do not require TBT or TBTT curb for operation of the thrie beam transition. However, TBT or TBTT curb and gutter can be installed to control water. M, W, F, NY3, NY4, should not have curb and gutter installed by them.
The 12.5 feet of MGS beam guard at half post spacing beyond the asymmetrical transition piece is required for all installations.
Do not flare MGS thrie beam transition. Install 25 feet of MGS beam guard tangent to the MGS thrie beam transition. The 25 feet of additional tangent MGS may include the 12.5 feet of half post spacing MGS beam guard shown on sheet A. After the 25 feet of tangent MGS beam guard, the MGS beam guard may be flared. No additional beam guard is needed when an EAT is flared.
Use this SDD for temporary thrie beam installations.
Individual construction detail drawings are required (See FDM 11-45-3.1.4). Review drainage and grading near MGS transitions to rigid barrier. Installing MGS transition with missing posts, improper embedment, or improper grading behind post may cause system not to function as intended. Review FDM 11-45-30.3.5 for more information.
MGS transition may use grading and shaping item.
See SDD 14B42 for additional guidance.
Sheets H and I are required when connecting to a single slop thrie beam anchorage (SDD 14B33).
If installing a thrie beam transition on to an existing NY3 or NY4 parapet that does not have the additional hardware for attaching the thrie beam (see Bridge Standard Detail 30.28), provide special provisions and detail drawings to have contractor install hardware.

Contact Person:
Erik Emerson (608) 266-2842