DIVISION ST

Section P

No. Item

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*DELETE WHEN DONE: To Update Table of Contents Right Click on the index above and choose Update Field. If given a choice choose “Update Entire Table”.*

*DELETE WHEN DONE****:*** *Statements highlighted in yellow are guidelines or instructional in nature. Remove these notes before completing the spec. When appearing at the top left of a provision, it pertains to the paragraph immediately beneath the note, as well as any indented items following it.*

*DELETE WHEN DONE****:*** *Words highlighted in green are fields that may need to be modified or removed before completion of the spec, such as contact information, city names, sign numbers, or charts on the Plans.*

*For provisions containing the descriptor, “For Sign(s) [Type]-XX:”, this descriptor should only be used when the provision applies to specific sign numbers among that type on the Plans. Insert as necessary. Leave out the descriptor if the provision applies to all signs of that type on the Plans.*

I hereby certify that the Special Provisions for traffic sign construction (Division ST) contained in this proposal were prepared by me or under my direct supervision and that I am a duly licensed Professional Engineer under the laws of the State of Minnesota.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Engineer Name

Lic. No. XXXXX Date MM/DD/YY

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**DIVISION ST**

# (2104) REMOVING MISCELLANEOUS STRUCTURES

## DESCRIPTION

The Contractor shall remove and salvage miscellaneous structures according to 2104, “Removing Pavement and Miscellaneous Structures” and these Special Provisions.

## MATERIALS

The Contractor shall use materials according to 2104, “Removing Miscellaneous Structures” and the 2104, “Removing Miscellaneous Structures: Construction Requirements” section of these Special Provisions.

## CONSTRUCTION REQUIREMENTS

### Remove By Others

*Use for projects that include LOGO signs.*

Give at least 14 calendar days advance notice to the General Manager of Minnesota Logos to arrange removal of Logo signs designated on the Plans as “REMOVE BY OTHERS”.

Dave DeSutter

General Manager

Minnesota Logos

952-895-8079

[ddesutter@interstatelogos.com](mailto:ddesutter@interstatelogos.com)

### Remove Grout - Sign Footing

Remove all in place grout between the base plate and the sign footing, taking appropriate measures not to damage the in-place anchor bolts, nuts, washers and conduit.

### Remove Sign Lighting System

*Use for removing existing and installing new lighting on cantilever or sign bridge (safety cable and lighting specs are not included in masterspec document)*

For Sign(s) OH XX-XX:

Disconnect the power conductors at the source of power (SOP) and the switch. Tape both ends for reuse in the new sign lighting system. Resplice and waterproof any SOP power cable connections required to maintain roadway lighting according to 2545, “Electric Lighting Systems.”

Contact the Department for final acceptance of the source of power disconnection:

John Pedersen

Metro Traffic Lighting Operations

651-234-7849

Disconnect and remove the conductors between each sign lighting fixture, the switch, the sign base, and any fuse connectors in the sign base.

Disconnect and remove all conduit between the sign lighting fixtures, the switch, and the sign post’s conduit stub.

Remove the switch. If the switch is mounted on the sign post, obtain the Engineer’s approval before capping the opening in the sign post.

Dismantle the sign lighting fixtures and any ballasts from the sign structure.

Remove the feed point identification plate.

*Use for bridge mounted sign with conduit and SOP above*

For Sign(s) OH XX-XX:

Disconnect the power conductors at the source of power (SOP) and the switch. Tape both ends for reuse in the new sign lighting system. Resplice and waterproof any SOP power cable connections required to maintain roadway lighting according to 2545, “Electric Lighting Systems.”

Contact the Department for final acceptance of the source of power disconnection:

John Pedersen

Metro Traffic Lighting Operations

651-234-7849

Disconnect and remove conduit between the switch and the conduit stub in the bridge. Cut the power conductors extending out of the conduit stub so that 12 inches of each conductor extends out of the stub. Tape each power conductor, loop it, and insert back into the conduit stub. Cap the conduit stub.

Disconnect and remove the conductors between each sign lighting fixture and the switch.

Disconnect and remove all conduit between the sign lighting fixtures and the switch.

Remove the switch.

Dismantle the sign lighting fixtures and any ballasts from the sign structure.

Remove the feed point identification plate.

*Use for bridge mounted sign with junction box as SOP*

For Sign(s) OH XX-XX:

Disconnect the power conductors at the source of power (SOP) and the sign base. Tape both ends for reuse in the new sign lighting system. Resplice and waterproof any SOP power cable connections required to maintain roadway lighting according to 2545, “Electric Lighting Systems.”

Contact the Department for final acceptance of the source of power disconnection:

John Pedersen

Metro Traffic Lighting Operations

651-234-7849

Remove the power conductors between the source of power and the switch.

Disconnect and remove conduit between the switch and the conduit stub in the bridge. Cap the conduit stub.

Disconnect and remove the conductors between each sign lighting fixture and the switch.

Disconnect and remove all conduit between the sign lighting fixtures and the switch.

Remove the switch.

Dismantle the sign lighting fixtures and ballasts (if encountered) from the sign structure.

Remove the feed point identification plate.

*Use if pullbox or streetlight on mainline is the SOP (this is the old bridge mounted method)*

For Sign(s) OH XX-XX:

Disconnect the power conductors at the source of power (SOP) and at the switch. Resplice and waterproof any SOP power cable connections required to maintain roadway lighting according to 2545, “Electric Lighting Systems.”

Contact the Department for final acceptance of the source of power disconnection:

John Pedersen

Metro Traffic Lighting Operations

651-234-7849

Cut the power cable at the condulet, which is on top of the 2 inch rigid steel conduit and attached to the bridge pier; ensure that 12 inches of cable extends out of the condulet. Tape the cable end. Remove the power cable and cable straps between the condulet and the switch. Plug holes (from removed hangers in concrete) with epoxy grout.

Disconnect and remove the conductors between each sign lighting fixture and the switch.

Disconnect and remove all conduit between the sign lighting fixtures and the switch.

Remove the switch.

Dismantle the sign lighting fixtures and any ballasts from the sign structure.

Remove the feed point identification plate.

After removing the sign structure from the bridge,

Fill anchorage holes (within the concrete) with epoxy grout.

Plug holes (within the steel) with galvanized high strength steel bolts, washers and nuts.

### Remove Sign Panel Type A

Remove the sign panel and post clips.

### Remove Sign Panel Type C and Type D

Remove the sign panel and mounting hardware.

Use when the bridge-mounted sign structure is to be reused

Leave the bridge mounted sign structure in place for the later installation of a new sign panel.

### Remove Sign Panel Type OH

For Sign(s) OH XX-XX:

Remove the left sign panel and panel mounting posts.

*Use when existing panels are flat sheet aluminum.*

Remove the sign panel and sign bracket assembly(ies) which attach each sign panel to the sign support.

### Remove Sign Type A

Remove the concrete footings or H-pile footings completely.

### Remove Sign Type C and Type D

*Use for mast arm-mounted signs*

For each mast arm mounted sign, remove the bracketing and hardware which attaches each sign panel to the traffic signal mast arm.

*Use for light fixture-mounted signs*

For each sign mounted on a light fixture, remove the bracketing and hardware which attaches each sign panel to the light fixture.

*Use for bridge rail-mounted signs*

For each bridge rail mounted sign, remove the bridge rail mounted sign structure and mounting hardware. Fill anchorage holes in concrete with epoxy grout.

*Use for bridge-mounted signs*

For each bridge mounted sign, remove the sign panel, mounting hardware, and bridge mounted sign structure.

After removal of the sign structure,

Fill anchorage holes in concrete with epoxy grout.

Plug holes in steel with galvanized high strength steel bolts, washers, and nuts.

*Use for sign replacement projects.*

Schedule the work so that replacement signs are installed on the same work day that the in-place signs are removed.

### Remove Sign Type EA and EO

Remove and dispose of the sign panel, post clips, and flanged channel or S4 x 7.7 panel mounting posts.

### Remove Sign Type OH

Disconnect the power conductors at the source of power (SOP) and the sign base. Resplice and waterproof any SOP power cable connections required to maintain roadway lighting according to 2545, “Electric Lighting Systems.” Shut off the circuit breaker(s) in service cabinets.

Contact the Department for final acceptance of the source of power disconnection:

John Pedersen

Metro Traffic Lighting Operations

651-234-7849

*Use when the heavy hex nuts are to be salvaged from the pedestal. (Metro)*

Salvage as many heavy hex nuts as possible from the pedestal’s anchor rods.

Contact the Department for delivery instructions:

Pat O’Brien / Joe Podobinski

651-366-5820

Remove the concrete footing(s). Bury the end of the power cable and abandon it in place as directed by the Engineer.

### Remove Sign Type OH (Bridge Mounted)

Disconnect the power conductors at the source of power (SOP) and at the switch. Resplice and waterproof any SOP power cable connections required to maintain roadway lighting according to 2545, “Electric Lighting Systems.”

Contact the Department for final acceptance of the source of power disconnection:

John Pedersen

Metro Traffic Lighting Operations

651-234-7849

*Do not include if bridge is being removed.*

Cut the power cable at the condulet, which is on top of the 2 inch rigid steel conduit and attached to the bridge pier; ensure that 12 inches of cable extends out of the condulet. Tape the cable end. Remove the power cable and cable straps between the condulet and the switch. Plug holes (from removed hangers in concrete) with epoxy grout.

Disconnect and remove the conductors between each sign lighting fixture and the switch.

Disconnect and remove all conduit between the sign lighting fixtures and the switch.

Remove the switch.

Remove the feed point identification plate.

*Do not include if bridge is being removed or re-decked.*

After removing the sign structure from the bridge,

Fill anchorage holes (within the concrete) with epoxy grout.

Plug holes (within the steel) with galvanized high strength steel bolts, washers and nuts.

*Use for bridge redecking projects when fascia beams will remain inplace.*

Ensure that the fascia beam webs are not damaged during the removal of the sign structure(s).

*Use for bridge redecking projects when fascia beams will remain inplace and holes will not be reused.*

Fill the holes in the fascia beams with epoxy grout.

*Use for bridge redecking projects when fascia beams will remain inplace and holes will be reused.*

Leave open the holes in the fascia beams; they will be reused to mount new structures.

*Use if junction box is the SOP*

Disconnect the power conductors at the source of power (SOP) and at the switch. Resplice and waterproof any SOP power cable connections required to maintain roadway lighting according to 2545, “Electric Lighting Systems.”

*Do not include if bridge is being removed.*

Remove all conduit and power conductors between the source of power and the switch. Plug any holes in the junction box as directed by the Engineer. If the conduit is stubbed out of the bridge, cap the conduit end after removal of the power conductors.

Disconnect and remove the conductors between each sign lighting fixture and the switch.

Disconnect and remove all conduit between the sign lighting fixtures and the switch.

Remove the switch.

Remove the feed point identification plate.

### Remove Sign Type Special

Remove the entire street name sign structure, including any concrete footings.

### Contractor Responsibility for Salvaged Sign Panels

To be included for any salvage pay items.

Contractor to inform the Engineer of any damaged or missing in-place sign panels prior to salvaging.

If a sign panel is damaged, lost, or stolen after being salvaged, a new sign panel shall be fabricated according to 2564.2F “Traffic Signs and Devices: Signs and Markers,” and these Special Provisions, at no cost to the Department or City of \_\_\_\_, \_\_\_\_ County.

To deter theft, store sign panels in a secure area.

Contractor to prevent damage to the bracket assemblies, sign panels, and the sign sheeting materials at all times, including during storage. Methods to prevent damage during storage include but are not limited to:

Store sign panels so they are not laying on the ground.

Store sign panels so that the reflective surfaces do not come in contact with dirt, water, or grass.

Store sign panels so they are not covered with a tarp or plastic.

### Salvage Sign Panel Type A

Salvage the in-place sign panel and remove the post clips.

Leave the Type EA sign panels attached to the Type A sign panel while salvaging; both signs shall be reinstalled together as one unit under Item No. 2564.502 - Install Sign Panel Type A.

### Salvage Sign Panel Type C

Remove and dispose of the nuts, bolts and washers.

Salvaged sign panels will be reinstalled under Item No. 2564.502 - Install Sign Panel Type C.

### Salvage Sign Panel Type OH

Salvage the in place sign panel and remove the post clips.

Leave the Type EO sign panels attached to the Type OH sign panel while salvaging; both signs shall be reinstalled together as one unit under Item No. 2564.502 - Install Sign Panel Type OH.

### Salvage Sign Panel Type Special

*(note if there are two plates mounted back to back)*

Salvage the street name plates and bracket assembly.

Leave the sign panels attached to the bracket assembly.

Leave the mounting hardware attached to the flanged channel sign post(s).

If the Contractor damages a bracket assembly or street name plates,

Dispose of the damaged bracket assembly or damaged street name plate.

Fabricate new bracket assembly or street name plate according to City of \_\_,\_\_County specifications, 2564.2F, “Traffic Signs and Devices: Signs and Markers;” and these Special Provisions, at no cost to the Department or City of \_\_, \_\_ County.

Salvaged sign panels, bracket assemblies, and mounting hardware will be reinstalled under Item No. 2564.502 - Install Sign Panel Type Special.

### Salvage Sign Type A

*Use this provision if salvaging and later installing upon new footings.*

For Sign(s) A-XX, the Contractor shall:

Salvage the in place sign panel and sign posts.

Remove the post clips.

Remove the friction fuse and mounting hardware from each sign post.

Remove the concrete footings.

The sign panel and sign posts will be reinstalled under Item No. 2564.502 - Install Sign Type A.

*Use this provision if salvaging and later installing upon the same footings.*

For Sign(s) A-XX, the Contractor shall:

Unbolt the sign post from each base plate and remove the base plate bolts, nuts, and washers.

Remove the friction fuse and mounting hardware from each sign post.

Remove the lower sign post section (from the base plate to the post cut) of each sign post.

Remove the post clips and salvage the sign panel as well as the sign post sections behind the sign panel (from the post cut to the top of the sign panel).

The sign panel and sign post sections will be reinstalled under Item No. 2564.502 - Install Sign Type A.

### Salvage Sign Type C and Type D

Remove and dispose of the sign structure, nuts, bolts and washers.

Salvaged Type C sign panels will be reinstalled under Item No. 2564.502 - Install Sign Type C.

Salvaged Type D sign panels will be reinstalled under Item No. 2564.502 - Install Sign Type D.

### Salvage Sign Type EA and EO

*Use this provision only when modifying the panel height or repositioning the EA/EO sign on the A/OH panel.*

Remove and dispose of the post clips and flanged channel posts.

Salvaged Type EA signs will be reinstalled under Item No. 2564.502 - Install Sign Type EA.

Salvaged Type EO signs will be reinstalled under Item No. 2564.502 - Install Sign Type EO.

### Salvage Sign Type OH

*If the OH sign has lighting to be removed as part of the salvage, insert the appropriate language from the* [*2104: Construction Requirements: Remove Sign Lighting System*](#_Remove_Sign_Lighting) *section of this document.*

*If the OH sign has walkway to be removed as part of the salvage, insert the appropriate language from the* [*2104: Construction Requirements: Remove Sign Walkway*](#_Remove_Sign_Walkway) *section of this document.*

Pull the power cable out of the conduit in the footing prior to removal of the concrete footing. Tape the ends of the conductors.

Salvage the sign truss (including sign panels and panel mounting posts) and sign post from the concrete footing and store outside the clear zone on the job site as directed by the Engineer. The sign truss and sign post shall each be placed on sufficient cribbing (railroad ties, etc.) to keep them straight and clear of the ground. The sign truss and post will be installed under Install Sign Type OH.

Remove the concrete footing. Bury the end of the power cable and abandon in place as directed by the Engineer.

*Use for bridge mounted signs.*

Salvage the bridge mounted sign structures and sign panels.

Remove bolts, nuts, and the washers connecting to girder webs. Avoid damaging the in-place girder webs.

### Salvage Sign Type Special

Salvage the sign post with the bracket assembly and street name plates attached.

If the Contractor damages a sign post, bracket assembly, or street name plate,

Dispose of the damaged sign post, bracket assembly, or street name plate.

Fabricate a new sign post, bracket assembly, or street name plate according to City of \_\_,\_\_County specifications*,* 2564.2F, “Traffic Signs and Devices: Signs and Markers;” and these Special Provisions, at no cost to the Department or City of \_\_, \_\_ County.

Salvaged signs will be reinstalled under Item No. 2564.602 - Install Sign Type Special.

### Salvage Delineator and Marker

Remove and dispose of the sign structure, nuts, bolts and washers.

Salvaged delineators will be reinstalled under Item No. 2564.502 - Install Delineator.

Salvaged markers will be reinstalled under Item No. 2564.502 - Install Marker.

### Remove Sign Walkway

*Use for walkways on cantilevers or sign bridges without lighting systems.*

For Sign(s) OH XX-XX:

Remove the walkway and walkway supports.

Repair cut/damaged galvanized surfaces according to ASTM A780. Apply repair materials according to the manufacturer’s instructions.

After removal of the walkway from the sign truss:

Furnish high strength bolts, nuts, and washers according to 3391.2B, “Fasteners: High Strength Structural Steel Bolts” for each open hole in the sign truss.

Galvanize the high strength bolts, nuts, and washers according to 3392, “Galvanized Hardware.”

Install the high strength bolts, nuts, and washers in the open holes and tighten according to 2402.3G2c, “Steel Bridge Construction: Permanent Connections: Installation.”

*Use for walkways for signs on bridges without lighting systems.*

For Sign(s) OH XX-XX:

Cut each walkway support so that 2 inches of each support extend beyond the face of the sign panel.

Remove the walkway supports attached to the walkway.

Remove the feed point identification plate.

Repair cut/damaged galvanized surfaces according to ASTM A780. Apply repair materials according to the manufacturer’s instructions.

*Use for walkways with lighting systems on cantilevers or sign bridges.*

For Sign(s) OH XX-XX:

Disconnect the power cable at the source of power (SOP) and the sign base. Tape the ends of the power cable.

Resplice and waterproof any SOP power cable connections required to maintain roadway lighting according to 2545, “Electric Lighting Systems.”

If the SOP is a service cabinet,

Disconnect the power conductors from the circuit breaker(s).

Shut off the circuit breaker(s).

Contact the Department for final acceptance of the source of power disconnection:

John Pedersen

Metro Traffic Lighting Operations

651-234-7849

Or

Mike Posch

Greater MN

320-248-3179

Disconnect and remove the conductors between the sign lighting fixtures and the switch, as well as between the switch and the sign base. Remove fuse connectors encountered in the sign base.

Disconnect and remove conduit between the switch and the conduit stub on the sign post. Cap the conduit stub.

If the switch is not attached to the sign post,

Disconnect and remove the conduit between the sign lighting fixtures and the switch.

Remove the switch.

If the switch is attached to the sign post,

Cap the opening in the sign post to the satisfaction of the Engineer.

Dismantle the sign lighting fixtures and any ballasts from the sign structure.

Remove the walkway, walkway supports, and the feed point identification plate.

Repair cut/damaged galvanized surfaces according to ASTM A780. Apply repair materials according to the manufacturer’s instructions.

After removal of the walkway from the sign truss:

Furnish high strength bolts, nuts, and washers according to 3391.2B, “Fasteners: High Strength Structural Steel Bolts” for each open hole in the sign truss.

Galvanize the high strength bolts, nuts, and washers according to 3392, “Galvanized Hardware.”

Install the high strength bolts, nuts, and washers in the open holes and tighten according to 2402.3G2c, “Steel Bridge Construction: Permanent Connections: Installation.”

### Disposal of Lighting Devices

Contractor to deliver all mercury vapor lamps (Fluorescent, high intensity discharge, etc.) and ballasts and capacitors that are NOT marked “NON-PCB” to one of the following companies:

Veolia ES Technical Solutions, LLC

3220 101st Avenue

Blaine, MN 55449

763-786-3660

Clean Harbors Environmental Services, Inc.

211 Holiday Avenue

Cannon Falls, MN 55009

800-444-4244

Green Lights Recycling, Inc.

10040 Davenport Street NE

Blaine, MN 55449-4327

800-208-8340

Provide written documentation to the Engineer that lamps and PCB ballasts and capacitors were delivered to a listed disposal company.

The Contractor shall pay any costs incurred by the disposal company for proper disposal of lamps and PCB ballasts.

Dispose of lighting fixture housings and all other components according to 2104, “Removing Pavement and Miscellaneous Structures.”

## METHOD OF MEASUREMENT & BASIS OF PAYMENT

The Engineer will measure each item according to the Contract and the 2104, “Removing Miscellaneous Structures: Construction Requirements” section of these Special Provisions.

The Department will include all work described in the Contract and the 2104, “Removing Miscellaneous Structures: Construction Requirements” section of these Special Provisions as part of the contract unit price per unit of measure.

The Department will pay for traffic signs and devices on the basis of the following schedule:

*Include only pay items that contain work specified in the special provisions.*

| **Item No.:** | **Item:** | **Unit:** |
| --- | --- | --- |
| 2104.502 | Remove Grout – Sign Footing | Each |
| 2104.502 | Remove Sign Lighting System | Each |
| 2104.502 | Remove Sign Panel Type \_ | Each |
| 2104.502 | Remove Sign Type \_ | Each |
| 2104.502 | Salvage Sign Panel Type \_ | Each |
| 2104.502 | Salvage Sign Type \_ | Each |
| 2104.502 | Salvage Delineator | Each |
| 2104.502 | Salvage Marker | Each |
| 2104.503 | Remove Sign Walkway | Linear foot |

The Department’s payment for each item shall be compensation in full for all work, material, and costs involved in performing the work specified on the Plans and these Special Provisions.

# (2564) TRAFFIC SIGNS AND DEVICES

## DESCRIPTION

The Contractor shall furnish and install traffic signs in accordance with 2564, “Traffic Signs and Devices,” except as modified in these Special Provisions.

## CONSTRUCTION REQUIREMENTS

The provisions of 2564.3A, “Construction Requirements: General” are modified and supplemented as follows:

The following replaces the second paragraph of 2564.3A:

Sign locations and sign structure posts lengths indicated in the Contract are approximate. Locate and stake final sign and delineator/marker locations. Obtain approval of locations by the Engineer. Determine the final post lengths for signs and delineator/markers in accordance with the offsets, mounting heights, and clearances detailed in the Contract and field verification of the proposed or in-place ground slopes. Obtain approval of the final required post lengths for I-Beam, Monotube, and Overhead Signs prior to starting fabrication of the posts. Provide shop drawings for I-Beam, Monotube, and Overhead signs in accordance with 2471.3C, “Shop Drawings.”

The provisions of 2564.3A.1, “Sign Fabrication” are modified and supplemented as follows:

The following replaces the second paragraph of 2564.3A.1:

Use sheet aluminum for Sign Panels.

### As-Built Signing Data

***DO NOT INCLUDE*** *provisions in DIV ST to collect sign data for inventory management purposes. Use the Pay Item 2011.601 AS BUILT and follow the directions within DIV S to cover sign inventory management.*

### Warning Stickers

*Use this provision if new sign panels or sign panel overlays are being installed for Type A, Type C and Type D signs (almost all projects)*

Install Department-provided warning stickers on new sign panels according to 2564.3, “Construction Requirements.”

Give 30 days advance notice to the Department prior to picking up the Department-provided warning stickers:

Chris Dochniak *(Metro)-(for other districts, use maintenance area sign supervisor*)

651-755-0316

James Smidt *(for D6 use)*

507-286-7618

*If the project involves Type A signs:*

For Type A signs and sign panel overlays on Type A signs,

Affix the warning sticker to each Type A sign panel in the lower right corner of the back of the sign panel, directly above the fabrication sticker.

### Field Spotting of Signs

*Use this provision when installing signs where location and orientation is critical (i.e. roundabouts, RCUTs, DDI)*

Give the Engineer 14 calendar days advance notice prior to installing signs inside or within 50 feet of roundabouts.

The Engineer will contact the District Traffic Office, which will provide personnel to field spot the installation location and orientation of the signs:

Contact Name

Title

Phone Number

[Email@state.mn.us](mailto:Email@state.mn.us)

### Post-Award Data

*Use this provision if requested by the District Traffic Office*

SignCAD panel layout files for panel layouts shown on the Plans are available electronically upon project award. To request these files, please contact:

Contact Name

Title

Phone Number

[Email@state.mn.us](mailto:Email@state.mn.us)

### MnDOT believes the electronic data it will provide is accurate, but MnDOT provides no guarantee or warranty, express or implied, concerning the accuracy of the data and the Contractor shall not act in reliance on the data without verifying the data against the contract documents. The documents originally provided with the Contract remain the basis of the Contract, and the electronic data that will be provided at the Request of the Contractor is provided only for the convenience of the Contractor. Therefore, if use of this data causes an error, omission, unacceptable work, or work not in conformance with the contract documents, then any costs to the Contractor to make corrections as a result of this error will not be considered "extra work", and the Contractor will not be entitled to an adjustment of contract time.

### Sign Replacement Projects

*Use this provision on sign replacement projects*

The provisions of 2564.3A.3, “Scheduling of Work” are supplemented as follows:

For signs not detailed in 2564.3A.3, “Scheduling of Work”:

Schedule the work so that replacement signs are installed the same workday that the in-place signs are removed.

### Safety Cable

Use this provision to add cable to overhead structures with walkway

Furnish and install brackets, aircraft cable, and all necessary hardware required to assemble and attach a safety cable, according to 2564.3Y, “Traffic Signs and Devices: Construction Requirements: Safety Cable.”

### New Posts Installed

Use this provision in all of Districts 1 and 2 and in all counties north of and including for District 3 (Kanabec, Mille Lacs, Morrison, Todd) for District 4 (Douglas, Grant, Traverse).

Install base posts to a minimum depth of 60 inches.

### Install Sign Panel Type A

For each Item No. 2564.502 – Install Sign Panel Type A on the Plans,

Furnish and install new post clips. Torque the post clips according to Item (3) in 2564.3L, “Traffic Signs and Devices: Construction Requirements: Install Sign Panel Type.”

*Use when installing a salvaged sign panel on new posts*

For Sign Panel(s) A-XX,

Attach salvaged Sign Panel A-YY on the new sign posts designated on the Plans.

*Use this provision when modifying a sign panel and reinstalling it upon the existing posts*

For Sign Panel(s) A-XX,

Furnish and install OR Remove extruded panel sections to obtain the sign panel height specified on the Plans.

Leave the new extruded panel sections without sign face material; they will be overlaid under Item No. 2564.518 - Sign Panel Overlay Type A.

Install the sign panel upon the existing sign posts.

*Use this provision when modifying a sign panel and modifying existing posts*

For Sign Panel(s) A-XX,

Furnish and install OR Remove extruded panel sections to obtain the sign panel height as specified on the Plans.

Leave the new extruded panel sections without sign face material; they will be overlaid under Item No*.* 2564.518 - Sign Panel Overlay Type A.

Install the sign panel upon the modified sign posts.

### Install Sign Panel Type C and Type D

Sign panel punching codes, stringer details, and panel joint details have been updated to correspond with new square tube post standards and crashworthy requirements.

Field Punch salvaged sign panels as needed based on the new Punching Codes and Stringer Detail file found on MnDOT’s Standard Signs and Markings Manual (2020) website:

<http://www.dot.state.mn.us/trafficeng/publ/signsmanual/index.html>

Aluminum stringers shall be extruded aluminum made with 6061-T6 Alloy.  The stringer shape shall be a channel with the legs folded back upon themselves to form an enlarged area for mounting to the post.  The stringer shall be two inches wide with a milled surface that the sign will be mounted upon.  The stringer shall have 3/8 inch holes provided at one inch intervals on center.  The legs of the stringer shall be 7/8 inch long to the folded portion.  The nominal thickness of the stringer shall be 1/8 inch.

### Install Sign Panel Type OH

For each Item No. 2564.502 – Install Sign Panel Type OH on the Plans,

Furnish and install new post clips. Torque the post clips according to Item (3) in 2564.3L, “Traffic Signs and Devices: Construction Requirements: Install Sign Panel Type.”

*Use this provision when modifying an overhead sign panel*

For Sign Panel(s) OH XX-XX,

Furnish and install OR Remove extruded panel sections to obtain the sign panel height as specified on the Plans.

*Use if furnishing and installing new sections*

Leave the new extruded panel sections without sign face material; they will be overlaid under Item No. 2564.518 – Sign Panel Overlay Type OH.

Modify the in-place panel mounting posts as detailed on the Plans.

### Install Sign Panel Type Special

Attach the salvaged street name plate, attached bracket assembly, and new mounting hardware to the square tube sign post as directed by the Engineer.

### Install Sign Type A

*Use this provision when installing a new panel and post on existing concrete footings*

For Sign(s) A-XX,

Attach new sign posts to the stub posts on the in-place concrete footings in accordance with Sheet No. Y of the Plan.

### Install Sign Type C and D

Sign panel punching codes, stringer details, and panel joint details have been updated to correspond with new square tube post standards and crashworthy requirements.

Field Punch salvaged sign panels as needed based on the new Punching Codes and Stringer Detail file found on MnDOT’s Standard Signs and Markings Manual (2020) website:

<http://www.dot.state.mn.us/trafficeng/publ/signsmanual/index.html>

Aluminum stringers shall be extruded aluminum made with 6061-T6 Alloy.  The stringer shape shall be a channel with the legs folded back upon themselves to form an enlarged area for mounting to the post.  The stringer shall be two inches wide with a milled surface that the sign will be mounted upon.  The stringer shall have 3/8 inch holes provided at one inch intervals on center.  The legs of the stringer shall be 7/8 inch long to the folded portion.  The nominal thickness of the stringer shall be 1/8 inch.

### Install Sign Type EA and EO

*Use this provision when converting 24” EA/EO panels to 30”*

For each salvaged Sign Type EA and Sign Type EO being installed,

Furnish and install new extruded panel sections as detailed on the Plans; they will be furnished and installed under Item No. 2564.518 – Sign Panels Type EA and Item No. 2564.518 – Sign Panels Type EO.

Install by attaching Type EA panels to Type A sign panels and Type EO panels to Type OH sign panels with new flanged channel or S4x7.7 panel mounting posts and new post clips. Install the panels under Item No. 2564.502– Install Sign Type EA and Item No. 2564.502 – Install Sign Type EO.

Torque the post clips according to Item (3) in 2564.3L, “Traffic Signs and Devices: Construction Requirements: Install Sign Panel Type.”

Overlay the Type EA and Type EO panels under Item No. 2564.518 – Sign Panel Overlay Type EA and Item No. 2564.518 – Sign Panel Overlay Type EO.

### Install Sign Type OH

*Use this provision when installing a salvaged OH sign structure on a new footing*

For Sign(s) OH XX-XX,

Install the salvaged sign on the new concrete footing detailed on the Plans.

### Overhead Sign Identification Plate

The provisions of 2564.3I, “Overhead Sign Identification Plate” is modified as follows:

The following replaces the fourth paragraph of 2564.3I:

For bridge-mounted, Type OH signs without sign lighting, install the plate on a three wall base and riser post in accordance with 3402, “Square Tubular Sign Posts.” Install the plate and post as close to the bridge as possible and behind the guardrail. If no guardrail is in place, install the plate and post at least 12 ft outside the edge of shoulder or face of curb. Install the plate so the bottom is 6 ft above the edge of pavement.

### Delineator Type Special (Linear Delineation Panels)

*Use this provision if using Linear Delineation Panels (Waffle Sheeting) – Very Rare.*

This work shall consist of furnishing and installing linear delineation panels upon median barriers and guardrail in accordance with the provisions of MnDOT 2564, the details shown in the Plans, and the following:

Provide linear delineation panels of sizes and colors identified in Tabulation X on Sheet No. XX of the Plan.

Only use linear delineation panels listed on MnDOT’s Approved/Qualified Products List under “Signing: Delineation Devices.”

Remove any inplace linear delineation panels that conflict with the installation of new linear delineation panels shown in the Plan.

*Modify the following as necessary to identify mounting requirements and/or panel spacing (if not identified in Plan).*

For concrete barrier mounted linear delineation panels:

Place each of the linear delineation panels along the concrete barrier, spaced (edge-to-edge) at the distance apart specified in the Plans.

Vertically space the linear delineation panels 2” below the top edge of concrete barrier to the top edge of the panel.

Prior to installing the linear delineation panels, prepare and clean the concrete surface per

the manufacturer’s detail. Attach the linear delineation panels to concrete barrier surface

with anchor bolts AND adhesive caulk per the manufacturer’s detail.

For guardrail mounted linear delineation panels:

Place each of the linear delineation system panels along the inside vertical surface of the guardrail

trough, spaced (center-to-center) at the distance apart specified in the Plans. Center each panel horizontally between guardrail post bolt heads.

The Contractor may adjust the spacing of panels if the specified panel distance and placement conflicts with guardrail post bolt heads. If spacing is adjusted, the Contractor shall ensure approximately uniform spacing between the panels.

Prior to installing the linear delineation panels, prepare and clean the guardrail surface per

the manufacturer’s detail. Attach the linear delineation system panels to the guardrail surface with

adhesive tape per the manufacturer’s detail.

### Infiltration Area Marker

The provisions of 2564.3O, “Infiltration Area Marker” are modified as follows:

Furnish and install a new three wall base and riser post at the location approved by the Engineer. Attach the furnished sign panel to the flanged channel post with new mounting hardware at a 4 foot mounting height, measured from the highest point of the ground surface below the sign panel to the bottom of the sign panel.

### Concrete Footings (Type OH Shaft)

*Coordinate placement of the project’s foundation report on the MnDOT Foundations Reports website with Rich Lamb at (651) 366-5595 or* [*rich.lamb@state.mn.us*](mailto:rich.lamb@state.mn.us)

Obtain and review the soils information and foundation recommendation(s) found within the S.P. XXXX-XXX foundations report located on the MnDOT Foundations Unit’s *Foundations Reports* website:

<http://www.dot.state.mn.us/materials/borings.html>

### Post-Installed Adhesive Anchorage

*Use this provision when installing Type C or D sign to concrete structures*

This section is applicable for any post-installed adhesive anchorage used to facilitate installation of signs to in-place concrete structures.

Except when part of a proprietary anchorage assembly, ensure threaded rods and bolts meet the requirements of 3385, "Anchor Rods," and 3391," Fasteners," respectively.

1. Post-Installed Adhesive Anchorages

Adhesive anchorage installers must hold current ACI Adhesive Anchor Installer Certification credentials. Installers are required to check depth, diameter and condition of the drilled hole, clean the hole, and install the anchorage per the Manufacturer’s Printed Installation Instructions (MPII). Record the name(s) of all certified installers on the *RECORD OF CONTRACTOR/INSTALLER ACI CERTIFICATION* form available on the MnDOT Bridges and Structures website under "Bridge Construction; Construction forms and tools".

Furnish only one of the systems listed on the Department’s "Approved/Qualified Products List for Bridge Products, Concrete Adhesive Anchorages for Structural Applications". Verify that the adhesive has an uncracked characteristic bond strength as specified in the plan. Install all anchors as specified by the MPII. Install in sound concrete to a depth equal to the minimum depth specified in the plan or as specified by the manufacturer, whichever is greater.

Meet the following conditions prior to installation and testing:

* Concrete is greater than 14 days old;
* Concrete surface is free of water prior to drilling;
* The hole is dry, as defined below; and
* Any additional requirements listed in the Manufacturer’s Printed Installation Instructions.

A dry hole is defined as: *a hole with no water present within the hole*. If the hole is filled with water, partially filled with water, or water entered the hole during drilling, blow out the water using compressed air and allow a minimum of 24 hours dry-out time before cleaning the hole and installing the anchorage.

**It is essential that the adhesive material completely fill the hole in the concrete for proper anchorage performance.** Ensure that the hole is completely filled to the top of the concrete surface in which the anchorage is installed. Do not permit the adhesive to overtop the concrete surface in a way that will interfere with the placement of the elements.

1. Testing of Post-Installed Anchorages

Perform all testing by an independent third party testing agency. Testing agent must have current ACI Adhesive Anchor Inspector Certification credentials.

Verify the anchor strength and installation procedures by proof testing anchorages in accordance with this specification. Perform all testing in accordance with ASTM E488, *Standard Test Methods for Strength of Anchors in Concrete Elements*. Set up the tension testing device such that no portion of the device bears on the concrete surface within a distance equal to one and a half times the anchorage embedment depth. Test anchorages to not less than the required proof load as provided in the plan (if no anchor proof load is provided in the plan, contact the Engineer). Failure criteria of an anchorage test are defined in ASTM E488.

Ensure that nothing interferes with the testing apparatus during the proof test. Do not perform any caulk prior to testing.

Verify the anchor strength and installation procedure by demonstrating the anchorage system at the first site of field installation. One passing demonstration is required to be able to move to the remaining production anchorage installations. Include a proof test in each demonstration installation. Failure of a proof test will require a modification of installation procedures or use of a different anchorage system and an additional demonstration of the modified or substituted system. Demonstration anchorages may be used as production anchorages. The Contractor assumes all liability for repairs that may need to be performed as a result of a failed test. Record all demonstration results on the *PRE-PRODUCTION ANCHORAGES QUALIFICATION TEST REPORT* available on the [www.dot.state.mn.us/bridge/construction.html](http://www.dot.state.mn.us/bridge/construction.html) under "Construction forms and tools," and furnish the original of the completed form to the Engineer.

Notify the Engineer immediately after any failure. Provide a non-conformance anchorage replacement plan, to be accepted by the Engineer. Once accepted by the Engineer:

* Remove all anchorages that fail the field test without damage to the surrounding concrete;
* Redrill holes to remove adhesive bonding material;
* Install replacement anchorages in accordance with the MPII; and,
* Test anchors using the method listed above.

Perform replacement of failed anchorages to the satisfaction of the Engineer and at no cost to the Department.

Payment for all costs associated with furnishing, testing, and installing the anchorages are included with the sign installation.

### Sign Panels Type C and D

For ground mounted signs,

Sign panel punching codes, stringer details, and panel joint details have been updated to correspond with new square tube post standards and crashworthy requirements.

Field Punch salvaged sign panels as needed based on the new Punching Codes and Stringer Detail file found on MnDOT’s Standard Signs and Markings Manual (2020) website:

<http://www.dot.state.mn.us/trafficeng/publ/signsmanual/index.html>

Aluminum stringers shall be extruded aluminum made with 6061-T6 Alloy.  The stringer shape shall be a channel with the legs folded back upon themselves to form an enlarged area for mounting to the post.  The stringer shall be two inches wide with a milled surface that the sign will be mounted upon.  The stringer shall have 3/8 inch holes provided at one inch intervals on center.  The legs of the stringer shall be 7/8 inch long to the folded portion.  The nominal thickness of the stringer shall be 1/8 inch.

*Use this provision when installing street name Type D Signs on bridge structures*

For street name Type D signs on bridge mounted structures,

Furnish sign with either steel stringer and attachment angles or an aluminum z-bar as shown in the plans.

Attach each new sign support structure to the in-place concrete structure with new mounting hardware and post-installed anchors as detailed on the Plans and as described in these Special Provisions.

Installation of bridge mounted structures for street name signs includes all costs associated with providing, installing and testing the mounting structure, including the post-installed adhesive anchorages.

*Use this provision when installing minor guide sign Type D Signs on bridge structures*

For minor guide sign Type D signs on bridge mounted structures,

Furnish sign with the steel stringers, mounting posts, and connection brackets as shown in the plans.

Attach each new sign support structure to the in-place concrete structure with new mounting hardware and post-installed anchors as detailed on the Plans and as described in these Special Provisions.

Installation of bridge mounted structures for minor guide signs includes all costs associated with providing, installing and testing the sign panel and mounting structure, including the post-installed adhesive anchorages.

Use this provision when installing Type C or Type D signs on Concrete Rail Mounted Sign Support structures

For signs on concrete rail mounted structures,

Attach each new sign support structure to the in-place concrete barrier with new mounting hardware and post-installed anchors as detailed on the Plans and as described in these Special Provisions.

Installation of signs on an individual Concrete Rail Mounted Sign Support includes the cost of the sign panel(s) including mounting hardware and all costs associated with providing, installing and testing the mounting structure, including the post-installed adhesive anchorages and bearing pads.

### Sign Panels Type OH

Use this provision when installing flat sheet aluminum panels on OH sign supports

For Sign Panel(s) OH XX-XX,

Furnish and attach new sign bracket assemblies to the sign support.

Attach each new panel to the new sign bracket assemblies with new mounting hardware as detailed on the Plans.

### Sign Panels Type Overlay

*Use this provision when including an organization’s official logo/pictograph and attaching them to the panel with rivets .*

*(pictograph = government agency; logo = private organization)*

For Sign(s)/Sign Panel(s) A/D/OH-XX,

Use the official name of logo here for the logo/pictograph design on the sign panel.

*If design requirements are publicly available:*

Access the logo/pictograph's graphic design standards on the following website:

Insert website here

*If design requirements are NOT publicly available:*

Contact Company Name to obtain the logo/pictograph’s graphic design standards:

Contact Name

Company Name

Telephone and/or email

Fabricate the sign panel(s) with the logo/pictograph at the size and location shown on Sheet No(s). XX on the Plans.

Attach the logo/pictograph to the sign panel according to 2564.3H, “Traffic Signs and Devices: Construction Requirements: Sign Panels”, paragraph 1.

### Reposition Sign Panel Type OH

For Sign Panel(s) OH XX-XX,

Inform the Engineer of any damaged in-place OH sign panels prior to repositioning.

Reposition the panel mounting posts add detail here as necessary; vertically, horizontally, etc. on the truss in accordance with the include elements present in the plan here; overhead details, cross-section(s), etc. in the Plans.

Prevent damage to the bracket assemblies, aluminum sign panels, and the sign sheeting materials at all times, including during storage.

Methods to prevent damage during storage include but are not limited to:

Store sign panels so that they are NOT lying on the ground.

Store sign panels so that reflective surfaces do NOT come in contact with dirt, water, or grass.

Store sign panels so that they are NOT covered with plastic or a tarp.

*Include the following if desired for the project*

Schedule the work so that the sign panel is repositioned on the same work day.

### Install Sign Type Special

Install each salvaged Sign Type Special:

At the location approved by the Engineer

At the same embedment depth as the salvaged sign.

### Delineator/Marker Panel

Provide delineator/marker sign panel as required by the contract.

Attach the sign panel with new mounting hardware required by the contract.

Affix a Department-provided warning sticker to the backside of each marker sign panel directly above the fabrication sticker. Warning stickers are available at the Department's Transportation District Office specified in the Contract. Provide thirty calendar days advance notice before picking up the stickers.

The Engineer will measure delineator/marker panel as a complete unit, including new mounting hardware and new sign panel.

### Delineator/Marker Sign

Provide delineator/marker sign panel as required by the contract.

Provide and install the square tubular sign post and attach the sign panel with new mounting hardware required by the contract.

Affix a Department-provided warning sticker to the backside of each marker sign panel directly above the fabrication sticker. Warning stickers are available at the Department's Transportation District Office specified in the Contract. Provide thirty calendar days advance notice before picking up the stickers.

The Engineer will measure delineator/marker sign as a complete unit, including new post, new mounting hardware, and new sign panel.

## METHOD OF MEASUREMENT AND BASIS OF PAYMENT

The Engineer will measure each item according to the Contract and the 2564, “Traffic Signs and Devices: Construction Requirements” section of these Special Provisions.

The Department will include all work described in the Contract and the 2564, “Traffic Signs and Devices: Construction Requirements” section of these Special Provisions as part of the contract unit price per unit of measure.

The contract square foot prices for Sign Panels Type EA and Type EO includes the cost of providing and installing the flanged channel or S4x7.7 panel mounting posts.

The Department will pay for traffic signs and devices on the basis of the following schedule:

*Include only pay items that contain work specified in these special provisions.*

| **Item No.:** | **Item:** | **Unit:** |
| --- | --- | --- |
| 2013.603 | Safety Cable | Linear foot |
| 2564.502 | Install Sign Panel Type \_ | Each |
| 2564.502 | Install Sign Type \_ | Each |
| 2564.502 | Overhead Sign Identification Plate | Each |
| 2564.502 | Delineator Type Special | Each |
| 2564.502 | Infiltration Area Marker X3-6A | Each |
| 2564.507 | Concrete Footings (Type OH Shaft) | Cubic Yard |
| 2564.508 | Structural Steel-\_ | Pound |
| 2564.518 | Sign Panels Type \_ | Square foot |
| 2564.518 | Sign Panel Overlay Type \_ | Square foot |
| 2564.602 | Delineator/Marker Panel | Each |
| 2564.602 | Delineator/Marker Sign | Each |
| 2564.602 | Reposition Sign Panel Type OH | Each |
| 2564.602 | Install Sign Type Special | Each |

The Department’s payment for each item shall be compensation in full for all work, material, and costs involved in performing the work specified on the Plans and these Special Provisions.

# (3352) SIGNS, DELINEATORS, AND MARKERS

## DESCRIPTION

The Contractor shall furnish signs, delineators, and markers in accordance with 3352, “Signs, Delineators, and Markers,” except as modified in these Special Provisions.

The provisions of 3352.2A.1 “Sheet Aluminum” are modified and supplemented as follows:

The following table replaces Table 3352.2-1

|  |  |
| --- | --- |
| Table 3352.2-1  Sheet Aluminum Thickness | |
| Length of Longest Side | Thickness |
| < 18 | 0.063 + 0.004 |
| >18 - 30 | 0.080 + 0.005 |
| >30 | 0.100 + 0.005 |
| Overlays | 0.063 + 0.004 |
| X4-3 and X4-3a | 0.040 + 0.005 |

### Aluminum Stringers

Add under section 3352.2:

A.8 Aluminum Stringers

Use extruded aluminum alloy 6061-T6 with mill finished surface for stringers used to mount sign panels to square tube posts. The stringer shall have 3/8 inch holes provided at one inch intervals on center.  The nominal thickness of the stringer shall be 1/8 inch.

### Stainless Steel Clamp

Add under section3352.2:

A.9 Stainless Steel Clamps

To clamp stringers to square tube posts use 11 gauge Type 304, #2B finished stainless steel with 3/8"-16 x 2" carriage bolt & serrated flange nut.

### Wraparound Delineators

Add under section 3352.2:

A.10 Wraparound Delineators

Use either cylinder or angular style.

For the cylinder style use either 0.040 or 0.080 inch thick sheet aluminum bent into a cylindrical shape of 6 inches diameter. Height is 9 inches. Use either sign sheeting type V, VIII, or XI.

For the angular style use 4 inches wide by 9 inch height by 0.040 inches thick sheet aluminum. Bend the aluminum sheet 90 degrees along the long axis. Use either sign sheeting type V or VIII.

### Stainless Steel bolts

Add under section 3352.2:

A.7.c Stainless Steel Bolts

Use stainless steel bolts as specified in 3391.2E, “Fasteners: Requirements: Stainless Steel Bolts,” with zinc coated steel nylon insert lock nuts. When used to attach sign panels place a stainless steel washer and nylon washer on the sign sheeting surface.

### Galvanized Steel Screw Anchor Bolts

Add under section 3352.2:

A.7.d Galvanized Steel Screw Anchor Bolts

Use galvanized screw anchor bolts as specified in plans. Galvanize screw ancho bolts in accordance with 3392, “Galvanized Hardware.”

# (3402) SQUARE TUBULAR SIGN POSTS

## DESCRIPTION

The Contractor shall furnish square tubular sign posts in accordance with 3402, “Square Tubular Sign Posts,” except as modified in these Special Provisions.

The provisions of 3402.2C “Weight” are modified and supplemented as follows:

The following replaces the entire section:

Use posts required by the contract and in accordance with Table 3402.2-1.

|  |  |  |
| --- | --- | --- |
| Table 3402.2-1  Properties | | |
| Size | USS Gauge | Weight |
| 1-3/4 inches by 1-3/4 inches | 14 | 1.71 pounds/foot |
| 1-1/2 inches by 1-1/2 inches | 12 | 1.7 pounds/foot |
| 1-3/4 inches by 1-3/4 inches | 12 | 2.06 pounds/foot |
| 2 inches by 2 inches | 12 | 2.42 pounds/foot |
| 2-1/4 inches by 2-1/4 inches | 12 | 2.77 pounds/foot |
| 2-1/2 inches by 2-1/2 inches | 12 | 3.14 pounds/foot |
| 2-3/16 inches by 2-3/16inches | 10 | 3.43 pounds/foot |
| 2-1/2 inches by 2-1/2 inches | 10 | 4.01 pounds/foot |

The post weight shall be within 7 percent of the weight shown for the specified post size and gauge.