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

### 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 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 S4x7.7 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.

### 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

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.”

### Salvage Delineator and Marker

Inform the Engineer of any damaged in-place delineators or markers prior to salvaging.

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

If the Contractor damages a delineator or marker,

Dispose of the damaged delineator or marker.

Fabricate a new delineator or marker 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.

Prevent damage to the 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.

Salvaged delineators will be reinstalled under Item No. 2564.602 - Install Delineator.

Salvaged markers will be reinstalled under Item No. 2564.602 - Install Marker.

### Salvage Sign Panel Type A

Inform the Engineer of any damaged in-place Type A or Type EA sign panels prior to salvaging.

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. 2564.536 - Install Sign Panel Type A.

### Salvage Sign Panel Type C

Inform the Engineer of any damaged in-place Type C sign panels prior to salvaging.

Remove and dispose of the nuts, bolts and washers.

If the Contractor damages a sign panel,

Dispose of the damaged sign panel.

Fabricate a new sign panel 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.

Prevent damage to the 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.

Salvaged sign panels will be reinstalled under Item No. 2564.536 - Install Sign Panel Type C.

### Salvage Sign Panel Type OH

Inform the Engineer of any damaged in-place Type OH or EO panels prior to salvaging.

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. 2564.536 - Install Sign Panel Type OH.

Prevent damage to the 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.

### Salvage Sign Panel Type Special

*Use if mounting above Type C sign on U-channel post (not permitted in MetroDistrict)*

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

*(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.

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.

Salvaged sign panels, bracket assemblies, and mounting hardware will be reinstalled under Item No. 2564.536 - Install Sign Panel Type Special.

### Salvage Sign Type A

Inform the Engineer of any damaged in-place Type A sign panels or posts prior to salvaging.

*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. 2564.537 - 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. 2564.537 - Install Sign Type A.

### Salvage Sign Type C and Type D

Inform the Engineer of any damaged in-place Type C or Type D sign panels prior to salvaging.

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

If the Contractor damages a sign panel,

Dispose of the damaged sign panel.

Fabricate a new sign panel according to 2564.2F, “Traffic Signs and Devices: Signs andMarkers,” and these Special Provisions, at no cost to the Department or City of \_\_, \_\_ County.

Prevent damage to the 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.

Salvaged Type C sign panels will be reinstalled under Item No. 2564.537 - Install Sign Type C.

Salvaged Type D sign panels will be reinstalled under Item No. 2564.537 - 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.*

Inform the Engineer of any damaged in-place EA/EO sign panels prior to salvaging.

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

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.

Salvaged Type EA signs will be reinstalled under Item No. 2564.537 - Install Sign Type EA.

Salvaged Type EO signs will be reinstalled under Item No. 2564.537 - 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

Inform the Engineer of any damaged in-place sign prior to salvaging.

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.

Prevent damage to the sign posts, 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.

Salvaged signs will be reinstalled under Item No. 2564.537 - Install Sign Type Special.

### Disposal of Lighting Devices

Deliver all mercury vapor lamps and ballasts that are NOT marked “NON-PCB” to one of the following companies:

Veolia ES Technical Solutions, L.L.C

2960 Yorkton Boulevard

Little Canada, MN 55117

952-736-3335

Green Lights Recycling, Inc

10040 Davenport Street NE

Blaine, MN 55449-4423

763-785-0456

<http://glrnow.com/contact-us/>

Provide written documentation to the Engineer that lamps and PCB ballasts 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:** |
| --- | --- | --- |
| 2104.501 | Remove Sign Walkway | Linear foot |
| 2104.509 | Remove Grout – Sign Footing | Each |
| 2104.509 | Remove Sign Lighting System | Each |
| 2104.509 | Remove Sign Panel Type \_ | Each |
| 2104.509 | Remove Sign Type \_ | Each |
| 2104.523 | Salvage Sign Panel Type \_ | Each |
| 2104.523 | Salvage Sign Type \_ | Each |
| 2104.523 | Salvage Delineator | Each |
| 2104.523 | Salvage Marker | 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.

# (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.

## MATERIALS

*METRO DISTRICT ONLY*

Fabricate all signs, markers, and delineators with material in accordance with 3352, “Signs, Delineators, and Markers” except as modified in these Special Provisions.

Fabricate all rigid permanent signs, markers, and delineators with materials from the [*MnDOT Approved/Qualified Products List*](http://www.dot.state.mn.us/products/signing/index.html).

Provide sign face material meeting the performance requirements of 3352.2.A.2.b, “Sign Sheeting Type IV” for rigid permanent signs, markers, and delineators described in Table 2564.2-ST1 and on the Plans:

| **Table 2564.2-ST1: MnDOT Metro District Sign Sheeting Type IV Requirements** |
| --- |
| **Category** | **Item** | **Condition(s)** |
| (1) | Sign Panels Type C | All Sign Panels Type C with the exception of: * R1-1 STOP, R1-2 YIELD, R1-3P ALL WAY, R5-1 DO NOT ENTER signs,
* W-Series (warning) signs,
* S-Series (school) signs,
* Mast arm-mounted signs, and
* Bridge-mounted signs.

Provide sign face material meeting the requirements of 3352.2.A.2.f, “Sign Sheeting Type XI for the exceptions listed in Category (1).  |
| (2) | Sign Panels Type D | Ground-mounted signs |
| (3) | Sign Panels Type Overlay | Type Overlays which are attached to signs described in Categories (1) and (2) |
| (4) | Delineator Type X3-1 | All |
| (5) | Delineator Type X4-6 | White background color |
| (6) | Delineator Type X4-8 | All |
| (7) | Infiltration Area Marker X3-6a | All |

 Provide non-fluorescent reflective sheeting for the yellow background color portions for:

* Sign Panels Type A, Type EA, Type EO, Type OH,
* Sign Panel Overlay Type A, Type EA, Type EO, and Type OH,
	+ Sign Panel Type Overlays attached to Type A, Type EA, Type EO and Type OH sign panels,
* Overhead-mounted Type D sign panels,
	+ Sign Panel Type Overlays attached to overhead-mounted Type C and Type D sign panels, and
* X3-6A Infiltration Area Markers.

## CONSTRUCTION REQUIREMENTS

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

The following replaces the fourth paragraph of 2564.3A:

Sign locations and sign structure posts lengths indicated on the Plans are approximate. Locate and stake final sign and delineator locations and obtain approval of locations by the Engineer. Determine the final post lengths for Type C signs, Type D signs and delineators in accordance with offsets, mounting heights and clearances detailed on the Plans and field verification of the proposed or inplace slopes. Determine the final post lengths for Type A and Type OH sign in accordance with the offsets, mounting heights and clearances detailed on the Plans and by field verification of the proposed or inplace slopes. Provide shop drawings for Type A and Type OH signs in accordance with 2564.3, “Construction Requirements, Structural Steel.”

### 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.*

### Fabrication & 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 Type A, C, and D sign panels according to 2564.3H.2, “Traffic Signs and Devices: Construction Requirements: Sign Panels: Fabrication and Warning Stickers.”

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

Jeff Streeter *(Metro)-(for other districts, use maintenance area sign supervisor*)

651-366-5191

*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

### Infiltration Area Marker

Furnish and install a new 3 lb/ft. flanged channel post at the location approved by the Engineer. Attach the furnished sign panel to the flanged channel post with new mounting hardware at the mounting height detailed on the Plans.

### Install Delineator and Marker

*Use this provision when installing salvaged delineators and/or markers*

For each salvaged delineator or marker being installed,

Furnish and install a new 3 lb/ft. flanged channel post at the location approved by the Engineer.

Attach the salvaged delineator or marker to the flanged channel post with new mounting hardware at the mounting height detailed on the Plans.

Install delineators under Item No. 2564.602 - Install Delineator.

Install markers under Item No. 2564.602 - Install Marker.

### Install Sign Panel Type A

For each Item No. 2564.536 – 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. 2564.535 - 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*.* 2564.535 - Sign Panel Overlay Type A.

Install the sign panel upon the modified sign posts.

### Install Sign Panel Type EA and EO

The following item is modified from 2564.3L, “Traffic Signs and Devices: Construction Requirements: Install Sign Panel Type” with the following: (2) Install Type EA and Type EO sign panels with new flanged channel or S4x7.7 panel mounting posts and post clips;”

### Install Sign Panel Type OH

For each Item No. 2564.536 – 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. 2564.535 – Sign Panel Overlay Type OH.

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

### Install Sign Panel Type Special

*Use this provision when mounting salvaged street name signs above Type C signs on U-channel posts.*

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

Mount the bottom of the bracket assembly a minimum of six inches above the Type C sign panel.

### 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

*Use this provision when installing Type C or Type D signs in areas of high winds such as Districts 1, 2, 4, 7, and 8*

Install signs with 3/8” stainless steel bolts and zinc-plated nylon insert lock nuts on the L-Bracket assembly when a knee brace is used.

*Use this provision when installing Type C or Type D signs in areas of high winds in District 8*

Install signs with zinc 9/16” head nylon insert lock nuts placed on all structural hardware. Use driven stub posts of at least 8 feet long and embedded a minimum of 54 inches. Use flanged channel posts with a 3/8 in diameter holes punched on 3 inch centers for all stringers and lateral braces.

### 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. 2564.531 – Sign Panels Type EA and Item No. 2564.531 – 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. 2564.537– Install Sign Type EA and Item No. 2564.537 – 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. 2564.535 – Sign Panel Overlay Type EA and Item No. 2564.535 – 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.

### 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.

### Overhead Sign Identification Plate

*Use this provision when installing new OH ID plates on existing OH sign structures*

For each new Overhead Sign Identification Plate (X5-1) being installed,

Remove the existing plate (if present) and install the new plate on the sign post according to 2564.3P, “Traffic Signs and Devices: Construction Requirements: Overhead Sign Identification Plate.”

### Post-Award Data

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

SignCAD Millennium (Program Version 8.61) 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

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.

### 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 2564.3.X, “Traffic Signs and Devices: Construction Requirements: Safety Cable.”

### Sign Panel Overlay Type \_

*For Districts 1, 2, 3, 4, 6, 7, 8 use the following provisions:*

The provisions of 2564.3K, “Construction Requirements: Sign Panel Overlay Type\_” are modified as follows:

Use retroreflective sheeting sign face material in accordance with 3352.2.A.2.f, “Sign Sheeting Type XI,” except for the following:

(1) For a yellow background on sign panel overlays, use retroreflective sheeting as specified by 3352.2.A.2.f, “Sign Sheeting Type XI,” FL fluorescent yellow, and

(2) For a brown background, use white retroreflective sheeting as specified by 3352.2.A.2.f, “Sign Sheeting Type XI.”

Use sign legend material as specified by 3352.2.A.2.f, “Sign Sheeting Type XI” for the sign face material on each sign panel, except for the following:

(1) Use brown (1179), electronic Cuttable (EC) film produced by the same manufacturer that fabricates the retroreflective sheeting specified by 3352.2.A.2.f, “Sign Sheeting Type XI,” for sign legend material on sign panel overlays with brown sheeting; and

(2) If brown EC film for sign panel overlays requires splicing, make splices vertical and butt spliced and spaced so splices do not occur through letters or arrows.

*For METRO Districts use the following provisions:*

The provisions of 2564.3K, “Construction Requirements: Sign Panel Overlay Type\_” are modified as follows:

Use retroreflective sheeting sign face material in accordance with 3352.2.A.2.f, “Sign Sheeting Type XI,” except for the following:

(1) For a yellow background on sign panel overlays, use retroreflective sheeting as specified by 3352.2.A.2.f, “Sign Sheeting Type XI,” non-fluorescent yellow, and

(2) For a brown background, use white retroreflective sheeting as specified by 3352.2.A.2.f, “Sign Sheeting Type XI.”

Use sign legend material as specified by 3352.2.A.2.f, “Sign Sheeting Type XI” for the sign face material on each sign panel, except for the following:

(1) Use brown (1179), electronic Cuttable (EC) film produced by the same manufacturer that fabricates the retroreflective sheeting specified by 3352.2.A.2.f, “Sign Sheeting Type XI,” for sign legend material on sign panel overlays with brown sheeting; and

(2) If brown EC film for sign panel overlays requires splicing, make splices vertical and butt spliced and spaced so splices do not occur through letters or arrows.

*Use this provision to remove existing sign panel overlays from the extruded panels*

In addition to the work described in 2564.3K, “Traffic Signs and Devices: Construction Requirements: Sign Panel Overlay Type\_,”

Remove in-place sign panel overlays before attaching the new overlays to the panel.

*Use this provision to add graffiti film to sign panel overlay Type OH*

For Sign Panel Overlays Type OH indicated in Chart XX of the Plan and for Sign Panels Type Overlay to be attached to these panels,

Apply the graffiti film to the panels in the shop and according to the manufacturer’s specifications.

Apply graffiti film to the entire Sign Panel Overlay Type OH panel.

Apply graffiti film to the Sign Panels Type Overlay.

Rivet the Sign Panels Type Overlay to the Sign Panel Overlay Type OH panel according to 2564.3H, “Traffic Signs and Devices: Construction Requirements: Sign Panels”, paragraph 1.

### Sign Panels Type C and D

*Use this provision when installing Type C or D sign panels in areas of high winds such as Districts 1, 2, 4, 7, and 8*

Install signs with 3/8” stainless steel bolts and zinc-plated nylon insert lock nuts on the L-Bracket assembly when a knee brace is used.

### 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.

### Sign Panels Type Special

*Use this provision if mounting new street name sign above Type C signs on U-channel posts.*

Furnish and install street name plates, bracket assemblies, mounting hardware, and sign posts as detailed on the Plans.

The Engineer will determine the location of each sign post in the field.

### Sign Replacement Projects

*Use this provision on sign replacement projects*

The provisions of 2564.3V, “Traffic Signs and Devices: Construction Requirements: Scheduling of Work” are supplemented as follows:

For signs not detailed in 2564.3V, “Traffic Signs and Devices: Construction Requirements: Scheduling of Work”:

Schedule the work so that replacement Type C and Type D signs are installed the same work day that the in-place signs are removed.

### Structural Steel

The provisions of 2564.3E, “Traffic Signs and Devices: Construction Requirements: Structural Steel” are replaced as follows:

Manufacture and fabricate structural steel in accordance with 2471, “Structural Metals,” and the additional requirements and limitations specified in this subsection (2564.3.E).

Provide shop drawings for overhead sign structures and for Type A sign structures in accordance with 2471.3.B, “Shop Detail Drawings.”

Assemble the truss sections and posts in the shop before galvanizing. Check truss sections and posts for straightness, alignment and dimensions and correct any variations. Correct warpage from galvanizing before installing structural steel.

Ensure main chord angles for overhead sign structures that are at least ½ in [13 mm] thick, meet a Charpy V‑notch impact strength requirement of 15 ft•lb [20 N•m] at 40 °F [5 °C].

Drill or mechanically cut overhead sign post base plate anchor rod holes.

Install overhead sign structures according to the following steps:

1. Verify that the position of the anchor rods and the hole pattern on the baseplate match the plan sheet as detailed in the Plans.
2. Verify that the leveling nuts can be turned onto the anchor rods well past the final elevation of the bottom of the leveling nut and backed off by one worker using an ordinary wrench without a cheater bar.
3. At the time of installation, clean the anchor rods and nuts, removing any rust with a steel brush.
4. Just before installation, lubricate the entire contact surface of the anchor rods and leveling nuts, using Bridge Grease (Bostik Never-Seez Mariner’s Choice) or approved alternative.
5. Place the leveling nuts on the anchor rods.
6. Place leveling nut washers on top of the leveling nuts.
7. Install the post on top of the footings with a crane.
8. Plumb the post and level the baseplate as detailed in the Plans.
9. Determine if beveled washers are necessary. Beveled washers are necessary under the leveling or top nut if any face of the base plate has a slope greater than 1:20 and/or any nut could not be brought into firm contact with the base plate. If any beveled washer is required, the installation crew should disassemble the joint as necessary, add the beveled washer(s) and retighten (in a star pattern) the top and leveling nuts.
10. Install the top nut washers on the anchor rods.
11. Lubricate the threads and bearing surfaces of the top nuts with the same product used in Step 4.
12. Install the top nuts on the anchor rods and snug tighten in a star pattern. Tighten the leveling nuts to the snug-tight condition in a star pattern.
13. Mark the reference position of the bolt, top nut, and baseplate with a permanent marker. See Figure 2564-1 below for proper match marking. Top nuts should be turned in increments (at least two full tightening cycles, in a star pattern) to achieve the appropriate nut rotation listed in Table 2564-1 below. After tightening, verify the nut rotation as shown in Figure 2564-2 below.

Figure 2564-1

Proper Match Marking



|  |
| --- |
| Table 2564-1 |
| Nut Rotation for Turn-of-Nut Pretensioning |
|   | Nut Rotation from Snug Tight Condition |
| Anchor Rod Diameter | F1554 Grade 36 |   |
| F1554 Grades 55 and 105 |
| A615 and A706 Grade 60 |
|   |
| Less than 1.5" | 1/6 Turn | 1/3 Turn |
| Greater than 1.5" | 1/12 Turn | 1/6 Turn |

Figure 2564-2

Proper before and after markings of Turn-of-Nut tightening of 1/6 turn (60 degrees).



1. Use a torque wrench to verify that post tightening verification torque values listed in Table 2564-2 will not additionally rotate the top nut.
2. Release the load from the crane.
3. Use a torque wrench to re-verify that post tightening verification torque values listed in Table 2564-2 will not additionally rotate the top nut. If it does, the tightening procedure may not have been followed. The inability to achieve this torque should be interpreted to indicate that the threads have stripped or other fastener problems have occurred and must be reported to the Engineer.
4. Repeat Step 16 between 48 to 96 hours after the original tightening.

|  |
| --- |
| Table 2564-2 |
| Post Tightening Verification Torque (105 ksi rods) |
| Anchor Rod Diameter | Torque |
| 2.00 in. (51 mm) | 1250 ft-lb |
| 2.25 in. (57 mm) | 1400 ft-lb |
| 2.50 in. (64 mm) | 1575 ft-lb |
| 2.75 in. (70 mm) | 1700 ft-lb |
| 3.00 in. (76 mm) | 1900 ft-lb |

Unless otherwise required by the contract, provide and install galvanized structural steel posts (H‑Pile) as footings for Type A signs in accordance with 2452, “Piling,” 2471, “Structural Metals,” and the following:

(1) Construct footings as required by the contract;

(2) The Department will allow use of a 14 ft [4.3 m] H‑Pile post instead of welding a 2 ft [0.6 m] stub post to the12 ft [3.7 m] H‑Pile;

(3) Obtain a bearing capacity from 12 ton [107 kN] to 14 ton [125 kN] for each H‑Pile in accordance with 2452, “Piling;”

(4) Splice additional length of H‑Pile in accordance with 2452, “Piling,” and drive to the bearing capacity required in 2452.3.C, “Equipment for Driving,” if the driven length of H‑Pile specified in the contract fails to reach bearing capacity;

(5) Repair damage to galvanized surfaces in accordance with 2471, “Structural Metals,” before back filling.

## 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 [square meter] 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 the special provisions. For METRO projects, also include pay items which will have sign panels fabricated with sign sheeting Type IV.*

| **Item No.:** | **Item:** | **Unit:** |
| --- | --- | --- |
| 2013.603 | Safety Cable | Linear foot |
| 2564.522 | Structural Steel - \_\_ | Pound |
| 2564.531 | Sign Panels Type \_ | Square foot |
| 2564.535 | Sign Panel Overlay Type \_ | Square foot |
| 2564.536 | Install Sign Panel Type \_ | Each |
| 2564.537 | Install Sign Type \_ | Each |
| 2564.539 | Overhead Sign Identification Plate | Each |
| 2564.550 | Delineator Type \_ | Each |
| 2564.551 | Reference Location Sign | Each |
| 2564.552 | Object Marker Type\_ | Each |
| 2564.553 | Bridge Number Marker X4-12A | Each |
| 2564.602 | Infiltration Area Marker X3-6A | Each |
| 2564.602 | Install Delineator | Each |
| 2564.602 | Install Marker | 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

## SCOPE

The Contractor shall fabricate traffic signs, delineators, and markers consisting of sign panels 3352, “Signs, Delineators and Markers” and these Special Provisions.

## REQUIREMENTS

The Contractor shall use materials according to 3352, “Signs, Delineators and Markers” and these Special Provisions.

*METRO DISTRICT ONLY:*

* + 1. **Sign Sheeting Type IV**

The provisions of 3352.2.A.2.b, “Signs, Delineators, and Markers: Requirements: Sign Sheeting Type IV” are modified as follows:

Provide Sign Sheeting Type IV for highway signing, markers, and delineators. Provide white and fluorescent orange Sign Sheeting Type IV for reboundable plastic drums and weighted channelizers. Additionally, test to ensure the impact resistance of the material at 32 °F [0 °C].

The provisions of 3352.2.A.3, “Signs, Delineators, and Markers: Requirements: Warranty Requirements” are supplemented as follows:

| **Table 3352-3Minimum Retroreflectivity Values** |
| --- |
| **Sign SheetingType** | **Warranty Period, *years*** | **MinimumAllowableRetroreflection** | **Total Daytime LuminanceFactor Minimum** |
| Type IV Signs,  Delineators, and Markers | 1 - 7 | 80% | --- |
| Type IV Signs,  Delineators, and Markers | 8 - 10 | 70% | --- |

## SAMPLING AND TESTING — (BLANK)