

Design Scene Part 2 – Plan Conventions

Chapter 16 Traffic

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Chapter 16 Traffic

Signing Pay Items

Pay items for signs mounted on square tube posts have been updated and consolidated. Templates, details, and sample plans utilizing the new pay items can be found on the [OTE signing website](#). A guide to the new sign pay items with tabulation examples and sample drawings is also available via the OTE signing website

Advance Warning Sign Spacing

The Advance Warning Sign Spacing for 0-30 mph has been reduced from 300 feet to 100 feet. This is more in line with the Federal MUTCD and accounts for more limited space in urban type jobs where the speed limit is 30 mph or less.

Centerline Markings

Use the double solid line pay items when paying for double solid centerlines. This applies to yellow centerlines in rural sections and white dividing lines on MnPASS lanes. For centerlines with a solid line on one side and a broken line on the other use the individual broken and solid line pay items.

2018 and 2020 Spec...2582.503 4" DOUBLE SOLID LINE – *material* by LIN FT

Interim Pavement Markings – Item 2580

This pay item should only be used for same day pavement markings to be placed on bituminous lifts and milled surfaces. Striping for detours or full striping of the project for suspensions should be paid for under pavement marking (2582) pay items, either as paint or removable preformed pavement markings.

Interim markings do not include edge lines and the length of the skip will be 5 ft. with a 45 ft. gap. Quantities must include centerline marking for each lift including any milled surfaces. For two lane, two way roads, quantities for the no passing zones need to be included. These quantities are kept on record in the District Traffic Offices. When being paid for by the linear foot, the plan needs to indicate how many lifts were estimated, the amount of solid yellow line, yellow broken line (skip) and white broken line (skip).

If the interim markings are being paid for by the lump sum this information is not included in the plan but will be in the ProjectWise restricted file folder.

The plan must include the standard plan sheet for interim pavement markings when either the linear foot or lump sum pay item is used.

One Direction Large Arrow

Type III barricades for merging tapers are no longer allowed to utilize the one direction large arrow sign (W1-6). When utilizing lane merges in temporary traffic control applications, use the "lane closed" sign (R11-2M). The details in the temporary traffic control handbook (3 days or less) and long term typical applications (greater than 3 days) have been updated to be consistent with current MUTCD interpretation.

When shifting a lane off the alignment (shifting tapers such as crossovers), the W1-6 sign should still be utilized.

Permanent Barricades

Permanent Barricades do not meet MASH16 requirements and are no longer available as a bid item for projects.

Pavement Messages

Pavement messages are now paid for by the square foot. Individual messages (placing and removing) should be listed in a tab. The following chart shows square areas for both removal of messages, which includes a larger area around the marking, and installation, which only includes the area of material installed. The most up-to-date chart can be found at this location (under Character areas, stop line, yield & crosshatch layouts):

[MnDOT Pavement Marking typical detail sheets](#)

The reason that the removal areas are larger than the placement areas is because the removal is a rectangular area. It is both easier for the contractor to grind out a rectangle than the shape of the message, and removed shapes may still be visible in wet conditions or at night when the contrast between the unground and ground portions of the roadway are higher.

Radius Corners on Signs

Currently, there is a standard note that is placed on the Sign Panel Layouts in the Signing Plan. It states: "Corners of the sign panels extending beyond the border shall not be trimmed."

The MNMUTCD allows for corners of sign panels to be trimmed. Please remove the above note from all future plans for small guide signs. Overhead sign panels and I-Beam sign panels may still have the note not to trim the corners.

It is important to note that by removing the note in the construction signing plan, it does not mean that all MnDOT signs are required to have the corners trimmed. It simply means that if these signs are manufactured with the corners trimmed MnDOT will accept them.

Sign Fonts and Route Markers for Guide Signs

Sign fonts for guide signs must be in the 2k font series. Route markers have also been updated in sign design software to reflect the updated sign panels in the 2020 sign and pavement marking guide. Contact the OTE signing group for information on installing and utilizing the new markers and fonts. When using the updated county route markers, the summary block below the panel may still indicate the old (2017) sign code. This will need to be updated in cad after the sign linework has been imported into the file.

Raised Pavement Markers Temporary

When including temporary raised pavement markers in the plan, show only one pay item. "Raised Pavement Markers Temporary" - and add footnote to the item indicating how many are one-way, two-way, and what color. We have a specification to attach to the proposal that only includes this pay item. (There is very little difference in cost for the different types).

Pavement Markings in Rumble Strips

Any Wet Reflective pavement marking needs to be recessed somehow. This is because the Wet Reflective markings utilize larger sized reflective media that will typically be scraped off in the winter months by plows – leading to little-to-no retroreflectivity after some snowplow operations. As a reminder, only liquid Wet Reflective pavement markings can be placed in a rumble.

Wet Reflective marking is placed in a sinusoidal rumble (which is installed fully below the pavement surface) or placed in a centerline area that is recessed by installing a chip seal only in the travel lanes, it is already recessed and does NOT need to be ground in further. Therefore, the pay item for these pavement markings should just be (WR) not Ground In (WR).

The rectangular corrugated rumble is made by grinding out corrugations every 7 inches out of the pavement, which leaves the space in between the corrugations alone. If a Wet Reflective pavement marking is placed on a rectangular corrugated rumble, then the reflective media between the rumbles will be scraped off. Therefore, it is recommended that these Wet Reflective pavement markings also be ground in...Ground In (WR).

Sign Structure Changes

All projects let after December 31, 2019 must include sign structures that meet MASH-16 crashworthy requirements. MnDOT's u-channel sign structure will not be crash tested and thus cannot be used in plans let after this date. MnDOT is monitoring which sign structures are being MASH-16 crash tested and will continue to evaluate which types will be allowed on MnDOT highways.

Starting January 1, 2020 MnDOT's sign structure design for all non-structural signs is a square tube sign structure. There are multiple square tube post sizes, gauges and bases that need to be identified for each sign structure based on the area of the sign panels. Refer to the [OTE Signing website](#) for templates for the new structures and for details for the structures to add to the plans.

A grace period for the use of the u-channel sign posts for temporary signage during construction is in place until December 31st, 2024 but u-channel sign posts must not include any knee braces. There is a standard note included in the temporary traffic control title sheet template highlighting this and this note should appear in the plan set. An updated detail published by OTE is available for these applications and should be included in the design when U-channel posts for temporary construction signing will be allowed by the district. Temporary signage should still be tabulated for square tube posts regardless of whether U-channels will be allowed as an option.

Situations may arise on certain projects where signage is being furnished and installed on county or city right of way who have not adopted square tube posts as their standard. In these situations, contact the OTE signing group for guidance on post selection and applicable details to include in the plan for legacy posts.

Signing and Pavement Marking Standard Plan Sheets

Many sign details and some pavement marking details have been converted into standard plan sheets in the 700 series available on the MnDOT standard plans website. Signing standard plans should be placed in the same location of the plan as other standard plans for roadway, drainage, erosion control, and so on.

The standard plan sheets for signing, as of the time of this writing, are undergoing updates more frequently than other standard plans. When selecting standard plan sheets, look through the OTE signing website charts of standard plans to see if an updated detail is an option. Select whether the standard plan or detail best fits the project and place in the appropriate place in the plan.

As of this writing, standard plan sheets must be included in the plan when applicable to the work. The requirement to include the standard plan sheets is under consideration to be altered to a similar process to standard plates, where a chart with the applicable revision is provided and no plan sheets included, but for the time being continue to include the standard plan sheets as sheets in the plan.

Alternate Pedestrian Route (APR)

Pedestrians need a clearly delineated and usable travel path to navigate through a work zone.

If the TTC zone affects the movement of pedestrians, adequate pedestrian access and walkways shall be provided. If the TTC zone affects an accessible and detectable pedestrian facility, the accessibility and detectability shall be maintained along the alternate pedestrian route. Alternate Pedestrian Route layouts are now standard plan sheets and are available on the standard plans website under 5-297.811 (2 sheet set). These sheets include an audible message device, which should be paid for under the audible message device pay item (2563.613 by the unit day) whenever practical.

Consideration should be made to separate pedestrian movements from work zones and motor vehicle traffic.

It is strongly encouraged to pay for this as...

2563.601 ALTERNATE PEDESTRIAN ROUTE by the LUMP SUM.

However, the ADA Office recommends making APR on mill and overlay projects incidental unless there are multiple curb line changes which require removal of large areas of pavement.

When APR is not practical pinch the staging timelines so that pedestrian facilities are interrupted for as little time as possible.

Traffic Control Tabulation

Traffic control items that are included in the lump sum should not be shown as quantities on the tabulation in the plan. This information will be supplied in a tabulated or listed format in a stand-alone document to the Cost Estimating Engineer and the Project Design Services Engineer in the Projectwise "EstimateRestricted" folder, at the time of project submittal.

Project cost estimates and the supporting documentation are nonpublic data from the time of final design until contract award. The Projectwise "EstimatesRestricted" folders and sub folders are "right protected" in order to limit access to this non-public data. Folders and sub folders may be requested through the MnDot IT Storefront.

Quantities paid for separately (not included in lump sum) should be tabulated in the plan.

Items such as, but not limited to...

- 2533 PORTABLE PRECAST CONCRETE BARRIER DES 8337 (As well as the anchored version)
- 2563 PORTABLE CONCRETE BARRIER DELINEATOR

- 2563 TEMPORARY IMPACT ATTENUATOR (Note test level on plan sheets or in traffic control tabulation)
- 2563 PORTABLE CHANGEABLE MESSAGE SIGN (There is a specification choice in how to pay for these – they can be included in the lump sum traffic control but the writeup must be included in Division S. The boilerplate has a measurement/payment section for various payment options)
- 2563 RAISED PAVEMENT MARKER TEMPORARY (Note on the plan the color, and specify one-way or two-way)
- 2563 SURFACE MOUNTED DELINEATOR
- 2582 TEMPORARY STRIPING
- 2563 AUDIBLE MESSAGE DEVICE
- 2563 ALTERNATE PEDESTRIAN ROUTE

The detour signing and detour striping pay items have been removed. This work should be included in the lump sum traffic control pay item.

“Install” versus “Furnish and Install” versus “Place”

When detailing plan notes, check to make sure that the instructions given on the plan sheets match the pay item. When using a furnish and install pay item, the plan notes should either say “furnish and install” or “place” rather than only stating “install”. Keeping this consistent from the SEQ to the plan sheets will eliminate confusion in the field on whether or not the item referred by a plan sheet note is to be supplied by an agency or salvaged from another location on the project, or is to be furnished by the contractor and installed.

Traffic Details

There are several different areas of details managed by the Office of Traffic Engineering. The most current version should always be used as the basis for the details in the plan.

Note that with the exception of cross-section sheets no unsigned plans are allowed in plans. For unaltered details, the signature on the sheet indicates the affirmation of the selection of the detail for the plan, and not that the designer was responsible for the design. If the detail is modified, the designer is indicating responsibility for the modifications indicated on the sheet.

Pavement Markings Typical Details

The Pavement Marking Typical Details have been created with the intent of reducing the number of plan sheets needed for the Pavement Marking Plan. They are also referenced by the MnDOT Traffic Engineering Manual to convey the MnDOT Traffic Engineering Organization’s (TEO) convention for pavement markings. Designers may make modifications to the Typical Details as long as the design is allowed by the Minnesota Manual on Uniform Traffic Control Devices; however, modifications to the TEO convention needs to be indicated on the typical and the Designer needs to sign off on the modification.

The PM Typical Details are to be placed onto the Pavement Marking Typical blank plan sheets and, if modified, the modified box in the typical detail needs to be filled out with both a date and initials. If a PM Typical Detail includes elements that are not used, cross out the elements not used. *Changes made to the typical detail allowed by the Designer Notes do not require the modified box to be filled out.* The plan sheet must be signed whether or not any modifications were made to the PM Typical Details.

Temporary Traffic Control Long Term Typical Applications

The Traffic Control Long Term Typical Applications are meant to be a guidance about the MnDOT best practice for Traffic Control Plan designers. They are essentially upgraded from Field Manual Layouts (which are a standard to be used on all roads open to the public in the state of MN) for long term use (greater than 3 days). Designer notes are included on these applications to help guide the designer on common considerations for the type of traffic control. The details are not intended to be inserted into the plan – they are purely a guide to go by when designing the project-specific traffic control. If the designer does use all or portions of these applications, the sheet will need to be signed by the Engineer. The Engineer is responsible for all content on sheets using any content from the applications.

Long term traffic control typical applications are available on the [MnDOT Temporary Traffic Control Design Tools website](#) under the long term typical applications.

Signing Details

The Signing Details for projects follow a general style and format. The reference files are available in PDF and DGN for import into plan sheets on [OTE Signing Details](#) website.

The designer should be aware that when adding some of these typicals in the .DGN file it may look as though there is some overwriting occurring. It will self-correct when loaded into ProjectWise with MnDOT fonts. This will also self-correct when printed with MnDOT print cues so do not be concerned about it. For those outside of MnDOT projectwise, the fonts may need to be updated to work within your CAD environment.

Lighting Details

The Lighting Details have been created with the intent of specifically adding these sheets into plans. These details should be inserted into the plan when applicable to the work being done and need to be signed by the Engineer. If the Engineer modifies a detail, they should indicate with their initials and a date that it has been modified and highlight on the detail what was changed from the default.

Signal Details

The Signal Details have been created with the intent of specifically adding these sheets into plans. These details should be inserted into the plan when applicable to the work being done and need to be signed by the Engineer. If the Engineer modifies a detail, they should indicate with their initials and a date that it has been modified and highlight on the detail what was changed from the default.

TMS Details

The Traffic Management System Details have been created with the intent of specifically adding these sheets into plans. These sheets can be inserted into the plan. These plan sheets must be signed. The signature for the overall plan sheet indicates the selection of the details to be used and for any modifications made to the details.

Designer Notes

The Designer notes should be removed from the typicals prior to being placed in the plan. The designer notes and asterisk are on the “CAPT BLK” level. If they turn off that level all of that should disappear.

If revising the typical based on an option in the designer notes such as using a 6” marking instead of a 4” marking, a modification date and initial is not required. As this is allowed by MnDOT’s Traffic Engineering

Manual, this is not considered a modification and the revision can be made without following the modification guidelines below.

Modifying Typical

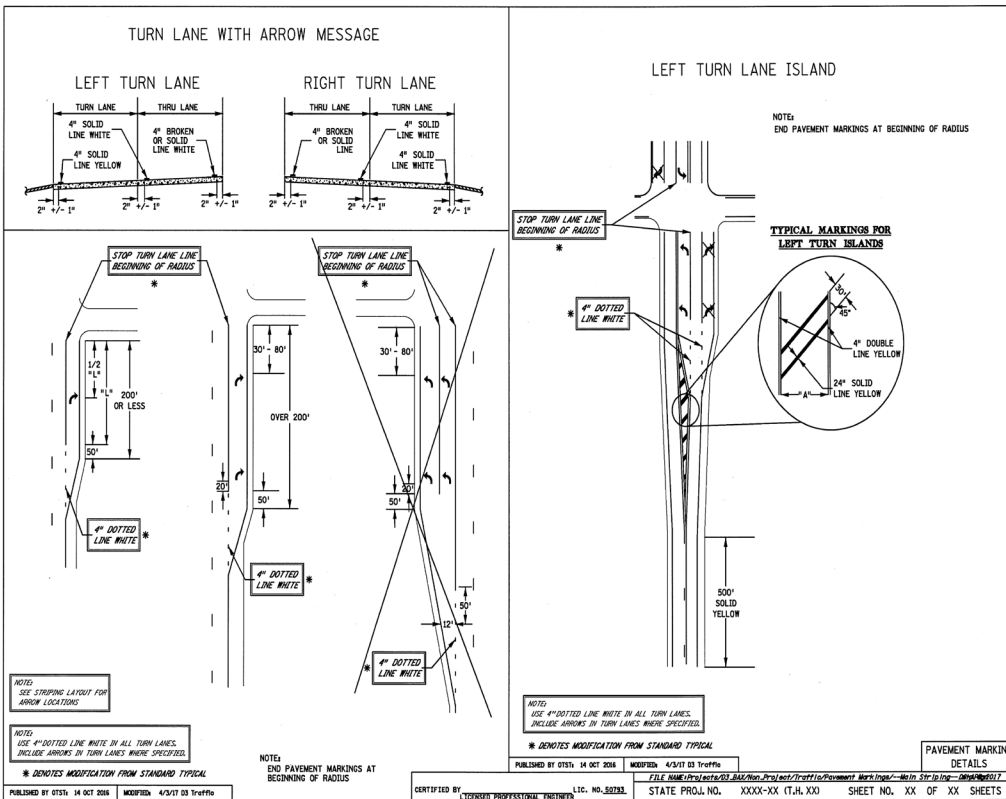
Most of the typicals are used in the plans as is, but on occasion there is a need to change or modify a typical. The designer can make changes if allowed by the Minnesota Manual on Uniform Traffic Control Devices. If a typical is modified in a way that is not proved in the designer notes, follow the process below. If a typical contains information not associated with your project, it is optional for designers to cross out the undesired details/information, do NOT delete the undesired details/information from the typical.

Fill in the modified date and designer initial in the bottom corner of the typical.

Identify the changes made to the typicals.

Label the changes using Italicized text and add a note to the typical above the PUBLISHED DATE: *DENOTES MODIFICATION FROM STANDARD TYPICAL

Use the MicroStation custom line style StdsPlnMod to place a double line (thick/thin) box around the text to highlight/identify the modification(s). As an example:



Wet Reflective Markings

All permanent markings should be recessed to avoid damage by plows, and all recessed markings must be wet reflective as water will pool in the recess and if the marking is not wet reflective it will not be visible in low light, wet situations. There are non-recessed pay items for wet reflective markings that are to be used only when the

pavement marking will be recessed via other work occurring on the project (for example, in some rumble strip applications and when a chip seal omits the area where the pavement markings will be placed).

For Information Only Sheets

All plan sheets with the exception of cross section sheets must be signed in the plan. Commonly, informational sheets for signals and lighting layouts had been included for convenience in plan sets. These sheets were as-built sheets from previous projects or as-constructed sheets containing markups from the field. There are two options for these sheets currently. For unsigned versions of these sheets, specification 1205 is used to direct the reader to the communications website. If desired, the designer may place a note in the plan set informing the reader of the provision. If the Engineer desires for these sheets to be included in the plan document the sheets should be labeled as “as-built”, and the Engineer must sign the sheets.

Work Zone Speed Limits (Workers Present)

Work zone speed limits are contained within the Minnesota Statutes, Section 169.14 Subd. 5d. A thorough document outlining when and how to implement work zone speed limits for a project may be found here: [Work Zone Speed Limits 2023 \(PDF\)](#)

Portable Precast Concrete Barrier – Pinning versus Anchoring

When using portable precast concrete barrier, the designer may choose to specify that it shall be anchored to the surface it is placed on. Anchored concrete barrier will deflect less than non-anchored, but does require damaging the surface to be anchored. If using anchored concrete barrier, be sure to use the anchored pay item to capture the extra effort that anchoring concrete barrier requires for placement. Portable precast concrete barrier is always considered to be pinned, as there are pins connecting each piece of the barrier to one another. No special callout for pinning barrier needs to be made on the plan sheets. It is important to specify correctly between anchored and pinned, as stating pinned in contract documents when anchored is how the barrier is intended to be placed will result in the barrier not performing as expected in the field.

Road Closed (R11-2M) Signs

Road closed signs can be used only when the roadway is closed to all traffic. If any traffic is allowed within the closure area, even if it's for a residential driveway access, the R11-4 Road Closed to Through Traffic sign must be used.

Pavement Marking Color Chart

When developing the tabulations for permanent or temporary markings, include the lengths of different colors of the markings. The information can be in the main tabulations, in a supplemental chart, or done via notes.