

### **2-2.16 Stage Construction, Traffic Handling, and Detour Construction Plans, Details and Quantities**

#### **General**

Stage construction and traffic handling plans shall be included in the set of project plans, if staging of the work or shifting and detouring of traffic, within the limits of the project, is needed and as permitted by the lane closure charts. Detour construction information shall be included in the set of project plans if detour construction is necessary for the staging of the work.

Stage construction, traffic handling and detour construction plans show the work area, sequence of operations, work to be performed (in relation to the shifting or detouring of traffic), materials to be used to construct detours, temporary widening, crossovers, etc. and the traveled way to be used for all movements of traffic during each construction sequence within the project limits.

Stage construction and traffic handling plans shall include, as applicable to the project, temporary drainage, temporary signing, temporary pavement delineation, temporary railing (Type K), temporary crash cushions and temporary lighting requirements. Modification of existing traffic signals or installation of temporary signals may be required for stage construction. This signal and lighting work may be shown on the electrical systems plan sheets provided a cross reference note is added to the stage construction or traffic handling plans stating that electrical system work is shown on the electrical systems plan sheets.

If utility installation or relocation work is to be performed by the project contractor, add a note to the stage construction plans in the stage sequence in which such work is to be performed. A typical note would read: "RELOCATE WATER LINE THIS STAGE, SEE UTILITY PLANS."

On extensive or complex projects, there may be too much information to clearly show both stage construction and traffic handling on the same plan sheets. When this occurs, separate plan sheets shall be prepared for stage construction and traffic handling, respectively.

If a temporary roadway detour is to be constructed and sufficient space does not allow the detour construction information to be shown on the stage construction and traffic handling plans, separate detour construction plans shall be prepared.

#### *Construction Area Signs*

Construction area signs, shown on the stage construction, traffic handling, and detour construction plans, are those temporary signs used for the direction of public traffic through the project limits during construction. Construction area signs used for stage construction, traffic handling, and detour construction shall be shown and summarized in the same manner as described in Section 2-2.14. A cross reference note shall be added to the respective plans regarding additional construction area signs shown on other plan sheets.

### Stage Construction Plans

The stage construction plans should contain sufficient information to construct those roadways in the stage sequence shown. It is not necessary to show profiles, superelevation diagrams and typical cross sections on the stage construction plan sheets if they are clearly shown elsewhere in the project plans.

The base mapping for the project is typically used as the background for these plans.

The first sheet of the stage construction plans should contain notes, legends, symbols, and a list of abbreviations. Do not include standard plan abbreviations or acronyms as part of the listed abbreviations.

Each stage shown on the stage construction plan shall show the sequence of construction by symbols (crosshatching, hatching, etc.) The symbology used shall be defined and included in a legend. The symbols used shall show the following:

- Work to be performed in the stage shown (solid lines not dropped out),
- Traffic direction, number of lanes and lane widths available in the stage shown,
- Existing roadbeds and those roadbeds constructed in previous stage(s), shown as dropped out (example: Stage 1 construction should be shown as existing on plan sheets for Stage 2 work since the work from the prior stage or sequence will have been completed).

Existing roads or detours that have been replaced by permanent construction in previous stages shall not be shown on subsequent stages.

If temporary railing (Type K) is used, a typical section may be required to show the lateral location of temporary (Type K) in relation to the work area and the edges of traveled way.

If only stage construction work is shown on the plan sheet, then each sheet of these plans shall be titled "STAGE CONSTRUCTION PLAN." The sheet identification code would be "SC" and the note included on them shall read: "APPROVED FOR STAGE CONSTRUCTION WORK ONLY."

If both stage construction work and traffic handling work is combined on the same plan sheet, then each sheet name should reflect both types of work involved. The combined sheet name would be "STAGE CONSTRUCTION AND TRAFFIC HANDLING PLAN." The sheet identification code would be "SC" and the note included on them shall read: "APPROVED FOR STAGE CONSTRUCTION AND TRAFFIC HANDLING WORK ONLY."

The stage number and sequence, if any, should be placed under the main sheet name.

### Stage Construction Details

The details shown on the stage construction detail sheet are unique to the specific project. These details may include typical cross sections, profiles, and superelevations for temporary roadway widening, temporary crossovers, etc. These details provide supplementary information that cannot be shown on the stage construction plan sheets because of the greater detailing required. An example of greater detailing would be the need for pavement elevations at transition areas. Details for temporary drainage features and other temporary construction features, as applicable to the project stage construction, should be shown on these detail sheets.

### Stage Construction Quantities

Items of work to construct temporary widening, crossovers, etc. and items of work for their subsequent removal shall be included in the project summary of quantities sheets for similar items of work used for roadway construction and identified by the stage number in which such work is to be performed. Items for temporary drainage work should be included with the project summary of drainage quantities sheets.

Earthwork quantities and pavement structure quantities for permanent roadway construction shall be summarized on the project summary of quantities sheets, as described in Section 2-2.19, "Summary of Quantities."

The summary of quantities for the temporary railing (Type K) and temporary crash cushions used for stage construction shall be shown in tabular format. Entries within the table should be referenced to an alignment line by stationing. This table should be included with the:

- Stage construction plans, if separate sheets are used for stage construction plans,
- Stage construction and traffic handling plans, if stage construction and traffic handling are combined on same plan sheets.

If additional quantities of temporary railing (Type K) and temporary crash cushions are shown on plan sheets other than the stage construction plans, add a note to the table such as: "SEE THE PROJECT SUMMARY OF QUANTITIES SHEETS FOR GRAND TOTALS FOR THE ITEMS OF TEMPORARY RAILING (TYPE K) AND TEMPORARY CRASH CUSHIONS."

Construction area signs shall be summarized as described in Section 2-2.14. With the exception of construction area signs, traffic handling items of work shall be summarized as provided in "Traffic Handling Quantities" of this section.

### Traffic Handling Plans

Traffic handling plans show how traffic is to be routed through the construction zone. These plans are unique for each project. The plans show long-term closures of lanes and ramps, detouring of traffic by signing, and the number of traffic lanes available for public traffic. Stage construction may require lateral shifting of traffic in relation to the normal path of travel, including shifting traffic by use of median crossovers. Lateral shifting of traffic may also involve the dropping of a traffic lane. Lateral shifting of traffic from its normal path of travel typically requires restriping of roadbeds.

A traffic handling plan is generally required for each stage of construction.

The base mapping for the project is typically used as the background for these plans. Existing information is to be dropped out.

The plan sheets for routing traffic through or away from the construction zone shall show all required temporary construction signing.

The first sheet of the traffic handling plans should contain notes, legends, symbols, and a list of abbreviations. Do not include standard plan abbreviations or acronyms as part of the listed abbreviations.

Traffic handling plans should not be confused with traffic control system standard plans ("T" series). Traffic control system plans show lane closures or ramp closures for short periods of time. The traffic control systems shown in the standard plans are usually installed and removed on a daily basis. Payment for the traffic control systems shown in the standard plans, including temporary signs used, is included in the lump sum bid item for traffic control system.

The components of the traffic handling plans generally consist of such items as:

- Channelizers,
- Portable delineators,
- Barricades,
- Temporary changeable message signs,
- Construction area signs,
- Flashing yellow beacons,
- Temporary striping (edgelines, centerlines, lane lines, etc.),
- Temporary pavement markings,
- Temporary pavement markers, etc.

Temporary pavement delineation, if required on the project, should be included in the traffic handling plan sheets, if separate plan sheets are used for traffic handling, otherwise

temporary pavement delineation would be included on the combination sheet for both stage construction and traffic handling.

Temporary pavement delineation shall be identified by a legend such as placement of a "T" designation in front of the standard plan traffic line detail number or by the use of the standard plan traffic line detail number enclosed in a distinct symbol, which is only used for temporary delineation.

If only traffic handling work is shown on the plan sheet, then each sheet of these plans shall be titled "TRAFFIC HANDLING PLAN." The sheet identification code would be "TH" and the note included on them shall read: "APPROVED FOR TRAFFIC HANDLING WORK ONLY."

### Traffic Handling Details

The details shown on the traffic handling detail sheet are unique to the specific project. These details provide supplementary information that cannot be shown on the traffic handling plan sheets because of insufficient availability of space. These details could be for special construction area signs, temporary traffic striping, etc.

### Traffic Handling Quantities

The components of the traffic handling plans are typically paid for as separate bid items.

The summary of quantities for the temporary items such as, traffic stripe, pavement markings, pavement markers, delineators, channelizers, and object markers shall be shown in tabular format. Entries within the table should be referenced to an alignment line by stationing. This table should be included with either of the following sheets depending on the type of sheets used:

- Traffic handling plan sheets, if separate sheets are used for traffic handling plans,
- Stage construction and traffic handling plan sheets, if stage construction and traffic handling are combined on the same plan sheets.

If additional quantities of temporary items for traffic handling are shown on plan sheets other than the traffic handling plans, add a cross reference note regarding additional quantities on other plan sheets.

Where the temporary items for traffic handling can be shown in a table on one plan sheet, quantity totals for each bid item column shall appear at the bottom of the table. Where more than one sheet is necessary to show the temporary items, the totals for each item shall appear at the bottom of the table on each individual sheet. The totals for the items shall be identified as "SHEET TOTALS." Sheet totals for each item shall appear on the last sheet of this summary. Sheet totals shall be totaled and shown as "GRAND TOTAL" or "TOTAL."

Construction area signs shall be summarized as described in Section 2-2.14.

### Detour Construction Plans

The detour construction plans shall contain sufficient alignment, profiles, superelevation diagrams, and typical cross sections to construct temporary roadways in the stage sequence shown. These plans typically show traffic direction, number of lanes available, temporary pavement delineation, channelizers, construction area signs, and if applicable, barricades, temporary railing (Type K), temporary crash cushions and other items necessary to maintain traffic through the constructed detours. If the traffic handling items used for maintaining traffic on the constructed detours are not shown on the detour construction plans, they shall be shown on the traffic handling plan sheets.

The base mapping for the project is typically used as the background for the detour construction plans.

Details applicable to construction and removal of detours shall be shown on the detour construction plans, if separate detour construction plan sheets are included in the set of project plans.

Each sheet of the detour construction plans, shall have this note included on them: "APPROVED FOR DETOUR CONSTRUCTION WORK ONLY."

### Detour Construction Quantities

Items of work to construct detours and items of work for their subsequent removal shall be shown in a separate table. Subtotals of the roadway construction items from this table shall be included in the project summary of quantities for similar items of work and identified as those used to construct the specific detour.

Temporary railing (Type K) and temporary crash cushions used with the detours shall be summarized in the same manner as that described in "Stage Construction Plans" of this section.

Construction area sign shall be summarized as described in Section 2-2.14.

With the exception of construction area signs, the traffic handling items used on the constructed detours shall be summarized in the same manner as described in "Traffic Handling Quantities" of this section. This summary should be included with the detour construction plans, but may be included with the traffic handling quantity summary and identified as those used to construct the specific detour.