

Type II Safety End Treatment Guide for Reinforced Concrete Pipe, Corrugated Metal Pipe, and Thermoplastic Pipe Culverts

Reinforced Concrete Pipe (RCP)

When using Type II SET with reinforced concrete pipe (RCP), there are four options:

- RCP mitered to the proper slope without riprap aprons
- RCP mitered to the proper slope with riprap aprons
- Precast SET units without riprap aprons
- Precast SET units with riprap aprons

The TxDOT Standard Specifications for Construction and Maintenance of Highways Streets, and Bridges allows the Contractor the option to choose mitered RCP or precast SET units. If the designer wishes to limit the Contractor's options, this needs to be clearly communicated on the plans. It is also up to the designer to specify when riprap aprons are necessary if precast SETs are used.

Option 1: Allow the Contractor to use either mitered or precast units without riprap aprons. (This is a "standard" installation which is covered by the SET standards and Item 467.)

Action:

- No additional General Notes are required.
- Include the following standards in the plans:
 - For cross drainage structures: SETP-CD, PSET-SC, and PSET-RC
 - For parallel drainage structures: SETP-PD, PSET-SP, and PSET-RP

Option 2: Allow the Contractor to use either mitered pipe or precast units with riprap aprons.

Action:

- Include the following in the General Notes: "For all Type II SETs, provide riprap aprons as shown on the plans."
- Include the following standards in the plans:
 - For cross drainage structures: SETP-CD, PSET-SC, and PSET-RC
 - For parallel drainage structures: SETP-PD, PSET-SP, and PSET-RP
 - PSET-RR

Option 3: Allow only precast units without riprap aprons.

Action:

- Include the following in the General Notes: "Provide precast Type II SETs. Riprap aprons will not be required."
- Include the following standards in the plans:
 - For cross drainage structures: PSET-SC and PSET-RC
 - For parallel drainage structures: PSET-SP and PSET-RP

Option 4: Allow only precast units with riprap aprons.

Action:

- Include the following in the General Notes: “Provide precast Type II SETs and riprap aprons as shown on the plans.”
- Include the following standards in the plans:
 - For cross drainage structures: PSET-SC and PSET-RC
 - For parallel drainage structures: PSET-SP and PSET-RP
 - PSET-RR

Corrugated Metal Pipe (CMP)

When using Type II SET with reinforced concrete pipe (RCP) there are four options:

- CMP mitered to the proper slope without riprap aprons
- CMP mitered to the proper slope with riprap aprons
- Prefabricated metal end sections or precast SET units without riprap aprons
- Prefabricated metal end sections or precast SET units with riprap aprons

The TxDOT Standard Specifications for Construction and Maintenance of Highways Streets, and Bridges allows the Contractor the option to choose mitered CMP, prefabricated metal end, or precast SET units. If the designer wishes to limit the Contractor’s options, this needs to be clearly communicated on the plans. It is also up to the designer to specify when riprap aprons are necessary if prefabricated metal end sections or precast SETs are used.

Option 1: Allow the Contractor to use CMP mitered to the proper slope, prefabricated metal end sections, or precast units without riprap aprons. (This is a “standard” installation which is covered by the SET standards and Item 467.)

Action:

- No additional General Notes are required.
- Include the following standards in the plans:
 - For cross drainage structures: GS-ES-CD, SETP-CD, PSET-SC, and PSET-RC
 - For parallel drainage structures: GS-ES-PD, SETP-PD, PSET-SP, and PSET-RP

Option 2: Allow the Contractor to use CMP mitered pipe to the proper slope, prefabricated metal end sections, or precast units with riprap aprons.

Action:

- Include the following in the General Notes: “For all Type II SETs, provide riprap aprons as shown on the plans.”
- Include the following standards in the plans:
 - For cross drainage structures: GS-ES-CD, SETP-CD, PSET-SC, and PSET-RC
 - For parallel drainage structures: GS-ES-PD, SETP-PD, PSET-SP, and PSET-RP
 - PSET-RR

Option 3: Allow only prefabricated metal end sections or precast units without riprap aprons.

Action:

- Include the following in the General Notes: “Provide precast Type II SETs. Riprap aprons will not be required.”
- Include the following standards in the plans:
 - For cross drainage structures: GS-ES-CD, PSET-SC, and PSET-RC
 - For parallel drainage structures: GS-ES-PD, PSET-SP, and PSET-RP

Option 4: Allow only prefabricated metal end sections or precast units with riprap aprons.

Action:

- Include the following in the General Notes: “Provide precast Type II SETs and riprap aprons as shown on the plans.”
- Include the following standards in the plans:
 - For cross drainage structures: GS-ES-CD, PSET-SC, and PSET-RC
 - For parallel drainage structures: GS-ES-PD, PSET-SP, and PSET-RP
 - PSET-RR

Thermoplastic Pipe (TP)

When using Type II SET with thermoplastic pipe there are two options:

- Precast SET units with riprap aprons
- Precast SET units without riprap aprons

Option 1: Allow only precast units without riprap aprons.

Action:

- Include the following in the General Notes: “Provide precast Type II SETs. Riprap aprons will not be required.”
- Include the following standards in the plans:
 - For cross drainage structures: PSET-SC
 - For parallel drainage structures: PSET-SP

Option 2: Allow only precast units with riprap aprons.

Action:

- Include the following in the General Notes: “Provide precast Type II SETs and riprap aprons as shown on the plans.”
- Include the following standards in the plans:
 - For cross drainage structures: PSET-SC
 - For parallel drainage structures: PSET-SP
 - PSET-RR