

13. Concrete Encasement, Arches and Cradles.

a. Concrete Encasement.

- 1) Concrete encasement for gravity sewer pipelines to upgrade the pipe bedding.
 - a) Proposed gravity sewers. The use of concrete encasement for the purpose of upgrading the bedding to increase the load carrying capacity of the pipe is not permitted. The appropriate class and type of pipe shall be used in conjunction with the standard bedding for the pipe as indicated in the Specifications and Standard Details.
 - b) Existing gravity sewers. Concrete encasement is acceptable within the limitations noted in Part Three, Section 12 (Related Analysis and Design) to increase the bedding factor to allow the pipe to withstand higher loading. Submit computations and details for review. The method of analysis of an existing sewer for a proposed increase in soil cover or live loading to be in accordance with Part Three, Section 11 (Loading Analysis of Existing Pipelines).
- 2) Water and Sewer Pressure Pipelines. Concrete encasement is not permitted for use on any water and sewer pressure pipelines.
- 3) The allowable sewer pipeline materials that can be used with concrete encasement include: reinforced and unreinforced concrete pipe, cast iron soil pipe, vitrified clay pipe and asbestos cement pipe, see Standard Detail M/9.0 for details.
- 4) For requirements for concrete encasement of gravity sewer pipelines for protection of water pipelines against contamination, see Part Three, Section 3 (Pipeline Crossings and Clearances).
- 5) Concrete encasement of sewer pipelines in special cases not covered above will be considered on a case by case basis.
- 6) Encasement of pipelines at stream crossings is not permitted.

b. Concrete Arches.

- 1) Proposed gravity sewer pipelines. The use of concrete arches over proposed gravity sewers for the purpose of upgrading the bedding to increase the load carrying capacity of the pipe is not permitted. Design the sewer pipeline with the appropriate class and type of pipe in conjunction with the standard bedding for the pipe as indicated in the Specifications and Standard Details.
- 2) Existing gravity sewer pipelines. Concrete arches may be used as an alternative on existing gravity sewer pipelines for the purpose of upgrading the bedding factor to increase the load carrying capacity. A concrete arch may be suitable when it is preferable not to dig under an existing gravity sewer pipe to avoid disturbing the pipe. The method of analyzing the existing sewer for a proposed increase in soil cover or live loading is to be in accordance with Part Three, Section 12 (Related Analysis and Design). Submit computations and details for approval.
- 3) Water and Sewer Pressure Pipelines. Concrete arches are not permitted for use on any water and sewer pressure pipelines.



c. Concrete Cradles.

- 1) Existing water pipelines. Under special circumstances, only when approved and installed under strict guidelines, concrete cradles can be used to upgrade the bedding under existing water pipelines to increase the load carrying capacity. Submit computations and design details.
- 2) Existing sewer pipelines. Under special circumstances, only when approved and installed under strict guidelines, concrete cradles can be used to upgrade the bedding under existing force mains or pressure sewers to increase the load carrying capacity. Submit computations and design details.
- 3) For example, a special circumstance for consideration might include a short length of large diameter existing pipeline which will be overloaded by proposed work, and relocation or replacement of the section of pipe may be cost prohibitive.

