

## REVIEW GUIDELINES FOR DESIGN OF BRIDGES WITH INTEGRAL ABUTMENTS

1. Types of bridges on which integral abutments are used.
  - A. Steel
  - B. Reinforced Concrete
  - C. Prestressed Concrete Beams
  - D. Post-tensioned
2. For jointless bridges with non integral or semi-integral abutments---What types of jointless bridges does the State have? What is the maximum length of jointless bridges?
3. What type of detail is used to accommodate superstructure movements? (ie: pinned connection, sliding backwall, etc...) How is this detail designed?
4. Criteria for limiting the length of integral abutment bridges or limiting stress in abutment piles for integral abutment bridges.
5. Criteria for limiting bridge skew of integral abutment bridges.
6. Pile type limitations.
7. Provisions for both pinned and fixed structural fixity assumptions for piles and superstructure. Provisions for intermediate fixity?
8. Analysis method. Beam element frame analysis program? Finite element program? Two or three dimensions? What analysis methods are used for the piles?
9. What loads are included in the frame analysis when using a FEA program.
10. How are pile bending stresses considered? Neglected? Limited?
11. Construction measures taken to reduce stresses? Are pile sleeves used?

12. Abutment backfill specifications and construction methods. What special provisions are made on integral abutment bridges? What provisions are made for drainage in the abutment area?
13. What kinds of details are used for the impact panel connection to the abutment?
14. H-pile orientation? On skewed bridges? What pile configuration (one row, two rows, etc...) and batter is allowed?
15. Details and criteria for achieving fixed connection between superstructure and piles.
16. Criteria for limiting design rotation of beam/pile connection?
17. Criteria for retrofitting existing expansion joints to integral connections?
18. Has design criteria been revised based on problems noted on in-service bridges?
19. Is an approach slab used? If so, how is it designed and is it positively attached to the abutment?