Appendix E

Glossary of Engineering Terms

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1. **Abutment:** *Part of a bridge substructure. Refers to the first and last supports of a bridge.*
2. **Anchor arm spans:** *Located at the outermost end, it counterbalances the arm of span extending in the opposite direction from a major point of support. Often attached to an abutment.*
3. **Approaches:** *Part of bridge or bridges leading up to the main span.*
4. **Arch:** *A structural form utilizing a semi-circular substructure.*
5. **Beam:** *A horizontal structure member supporting vertical loads by resisting bending.*
6. **Bent:** *Part of a bridge substructure. A single or multi-column frame commonly made of reinforced concrete or steel that supports a vertical load and is placed transverse to the length of a structure. Bents are commonly used to support beams and girders.*
7. **Bent cap:** *Refers to the horizontal element of a bent.*
8. **Bored tunnel:** *A tunnel constructed with a boring machine excavating and advancing automatically underground.*
9. **Bulb-tee girder:** *A type of precast concrete girder, where the cross section resembles a capital T with an extra "bulb" at the bottom of the stem.*
10. **Cable-stayed:** *A variation of suspension bridge in which the tension members extend from one or more towers at varying angles to carry the deck. Allowing much more freedom in design form, this type does not use cables draped over towers, nor the anchorages at each end, as in a traditional suspension bridge.*
11. **Cantilever arm:** *A structural member that projects beyond a supporting column or wall and is counterbalanced and/or supported at only one end.*
12. **Cast-in-place concrete girder:** *A concrete girder poured in the field in its final position.*
13. **Columns:** *Vertical supporting elements of a bridge.*
14. **Composite deck:** *A deck positively connected to the supporting beams or girders at regular intervals ensuring that the two behave as one, thereby increasing the overall carrying capacity.*
15. **Concrete box girder:** *A hollow concrete girder.*
16. **Concrete immersed tube tunnel:** *Tunnel made of pre-fabricated segments, sunk and connected at the bottom of a body of water.*
17. **Concrete segmental box girder**: *A concrete box girder built of small segments, bonded and pre-stressed together to form one long concrete box girder. Each segment can be either pre-cast or cast-in-place.*
18. **Deck:** *The portion of the superstructure in contact with vehicle tires.*
19. **Deck overlay:** *usually a thin application (in the order of 1 to 2") of new material across the deck of a bridge.*
20. **Functionally obsolete:** *A structure including substandard components, such as older railing or sidewalk and having a roadway geometry that does not meet today's standards. A functionally obsolete bridge may be structurally sufficient, but unable to handle its current volume of traffic.*
21. **Girder:** *A girder is a larger beam.*
22. **Main span:** *Refers to the longest span of a bridge structure (usually significantly longer than other spans). Also refers to the portion of the structure spanning the longest distance.*
23. **Overstressed:** *Stressed beyond acceptable range for a given material.*
24. **Piles:** *Long vertical steel or concrete elements drilled or driven deep into the ground to form part of a foundation. Piles are typically used in groups.*
25. **Pile Caps:** *A rectangular concrete element built on top of a group of piles. A column can be built above a pile cap.*
26. **Precast concrete girder:** *A concrete girder poured offsite, then transported to the construction site and lifted in place at a later time.*
27. **Seismically resistant:** *Characteristic of a structure designed to withstand earthquake loading.*
28. **Self-anchored suspension bridge:** *A suspension bridge where the main cables anchor in the superstructure itself instead of at the abutments.*

29. **Structurally deficient:** *A structure having a deck, superstructure, or substructure with a structural condition rating of 4 or less (poor or worse condition). This is a very low load rating and would require structural strengthening or bridge replacement.*
30. **Steel box girder:** *A hollow steel girder.*
31. **Steel casings:** *Steel pipe placed around another element for various applications.*
32. **Steel I-girder:** *A steel girder where the cross section resembles a capital I.*
33. **Steel plate girder:** *A steel girder built up with steel plates welded together.*
34. **Steel tied arch:** *Bridge built with a semicircular member over the deck, using the deck as a tie. This bridge usually involves cables connecting the deck to the arch.*
35. **Steel truss:** *Bridge built with steel truss members as main carrying elements.*
36. **Stringers:** *Secondary beams designed to support the deck.*
37. **Substructure:** *Any portion of a bridge structure below the superstructure, including abutments, columns, walls, and foundations that support the superstructure.*
38. **Superstructure:** *The portion of a bridge structure that carries the traffic load and transfers it to the substructure.*
39. **Suspension bridge***: A bridge that carries its deck with many tension members attached to main cables draped over tower piers and anchored at each abutment.*
40. **Sway bracing:** *Additional cross-members aimed at minimizing load-carrying member lateral sway, which could induce instability.*
41. **Tie-in:** *Location where approaches and main span meet.*
42. **Truss:** *A structural form that is used in the same way as a beam, but because it is made of a web-like assembly of smaller members, it can be made longer, deeper, and therefore, stronger than a* ***beam*** *or* ***girder*** *while being lighter than a beam of similar dimensions.*