Designation: E 2103 – 00

Standard Classification for Bridge Elements and Related Approach Work[1]

This standard is issued under the fixed designation E 2103; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This standard establishes a practice of classifying bridge elements and related approach work. Elements, as defined here, are major components common to most bridges. Elements usually perform a given function, regardless of the design specification, construction method, or materials used. The practice serves as a consistent reference for analysis, evaluation, cost estimating, and monitoring during the feasibility, planning and design stages of bridges. It also enhances reporting at all stages from feasibility and planning through the preparation of working documents, construction, maintenance, rehabilitation, and disposal.

1.2 This classification applies to bridges and related approach work. It excludes specialized structures such as signs and signals related to general highway use, but it does include bridge parapets, medians, drainage, and barriers needed to lessen vehicular impact.

1.3 This classification is similar to the E 1557, Standard Classification for Building Elements and Related Sitework - Uniformat II. However, it focuses exclusively on Bridges and Relocated Approach Work.

2. Referenced Documents

2.1 *ASTM Standards:*

E 1557 Standard Classification for Building Elements and Related Site Work – Uniformat II

3. Terminology

3.1 *Definitions*—For definitions of terms used in this practice, refer to Terminology E 833.

4. Significance and Use

4.1 This classification defines bridge elements that are major components of most bridges. The elemental clarification is the common thread linking activities and participants in a bridge project from initial planning through operations, maintenance, and disposal.

4.2 The users of this standard include federal, state, county and city officials, cost planners, estimators, schedulers, engineers, project/program managers, specification writers, operating and maintenance staff, manufacturers, and educators.

4.3 Use this practice when doing the following:

4.3.1 Estimating and controlling costs during planning, design, and construction. Use this standard to prepare budgets and to establish elemental cost plans before design begins. The project manager uses cost plans to control project cost, time, and quality, and to set design-to-cost targets.

4.3.2 Conducting value engineering workshops. Use this standard as a checklist to ensure that alternatives for all elements of significant cost in the bridge project are analyzed in the creativity phase of the job plan. Also, use the elemental cost data to expedite the development of cost models for bridge systems.

4.3.3 Developing initial project master schedules. Since projects are built element by element, this standard is an appropriate basis for preparing construction schedules at the start of the design process.

4.3.4 Structuring cost manuals and recording construction, operating, and maintenance costs in a computer database. Having a cost manual or computer database in an elemental format assists the preparation of an economic analysis early in the design stage and at a reasonable cost.

4.3.5 Structuring preliminary project descriptions during the conceptual design phase. This classification facilitates the description of the scope of the project in a clear, concise, and logical sequence for presentation to the client; it provides the basis for the preparation of more detailed elemental estimates during the early concept and preliminary design phases, and it enhances communication between designers and clients by providing a clear statement of the designer's intent.

5. Basis of Classification

5.1 The framework in Fig. 1 shows how bridge structures and related approaches fit with the rest of the built environment. This practice does not include general road features such as pavements, drainage structures, and noise walls.

5.2 *Criteria for the Classification*— The selected elements are grouped according to the following criteria:

5.2.1 The classification is applicable to any type of bridge.

5.2.2 The classification is consistent with that used in typical costing practices.

5.2.3 Each individual element has a significant impact on the cost, and it usually occurs frequently.

[1] This classification is under the jurisdiction of ASTM Committee E06 on Building Construction and is the direct responsibility of Subcommittee E06.81 on Building Economics.

Current edition approved July 10, 2000. Published Sept. 2000.

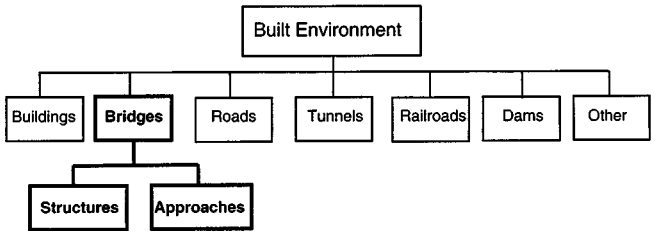

FIG. 1 Framework of the Built Environment

5.2.4 Only items that impact the choice and cost of the bridge elements are included. Other civil works in the transportation system are not included.

5.2.5 Table 1 represents the classification of bridge elements into three hierarchical levels: Level 1 - Major Group Elements, Level 2 - Group Elements and Level 3 - Individual Elements. The Major Groups are listed in the normal chronological order of construction.

6. Description of Project Elements

6.1 Bridge elements A, B, C and D are primary elements to bridge the gap between approach roadways. Element E includes secondary components which may or may not be needed and which vary from project to project. Element F includes incidental components, which the bridge must support.

6.2 The elements listed are generic. Sizes, types, materials, strength and connections are included in each generic element.

TABLE 1 Bridge Elements

Level 1 Major Group Elements	Level 2 Group Elements	Level 3 Individual Elements
A SITE WORK	A10 Utility Relocation	
	A20 Existing Structures Removal	
	A30 Excavation	
	A40 Cofferdam	A4010 Sheeting
		A4020 Seal Coat
		A4030 Dewatering
		A4040 Under Water Excavation
	A50 Embankment	
	A60 Traffic Maintenance	
	A70 Environmental Mitigation	
	A80 Demolition	A8010 Excavation
		A8020 Removal
B SUBSTRUCTURE	B10 Foundations	B1010 Spread Footings
		B1020 Piles
		B1030 Drilled Shafts, Cap Beams
	B20 Piers	B2010 Cap Beams
		B2020 Columns-single, Multiple
		B2030 Walls-Grade, Crash, Debris
		B2040 Slab Piers
	B30 Abutments	B3010 Sill Type
		B3020 Spill Through
		B3030 Retaining Wall Type
		B3040 Integral-Semi Integral
		B3050 Vaulted
C SUPERSTRUCTURE	C10 Railings	C1010 Traffic
		C1020 Pedestrian
		C1030 Bicycle
	C20 Decks	C2010 Slabs
		C2020 Sidewalks
		C2030 Medians
	C30 Beams	C3010 Stringers
		C3020 Floor Beams
		C3030 Transverse Beams
		C3040 Box Girders
	C40 Special Types	C4010 Tied Arch
		C4020 Suspension
		C4030 Cable Stayed
		C4040 Trusses
	C50 Bearings	C5010 Fixed
		C5020 Expansion
		C5030 Multi-Rotational
	C60 Movable Mechanism	
D APPROACH	D10 Wingwalls	
	D20 Retaining Walls	
	D30 Approach Slabs	
E PROTECTION	E10 Expansion Joints	E1010 Open
		E1020 Covered
		E1030 Filled
	E20 Waterproofing	
	E30 Topping/Overlay	
	E40 Drainage	E4010 Scuppers
		E4020 Piping
	E50 Slope Walls	
	E60 Approach Barriers	
	E70 Corrosion Control	E7010 Reinforcement Coating
		E7020 Concrete Admixtures
		E7030 Surface Coating
		E7040 Cathodic
	E80 Pier Protection Barriers	
F SERVICES	F10 Signals	
	F20 Signage	
	F30 Lighting	
	F40 Utilities	
	F50 Guard Tower	
	F60 Pavement Marking	