This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: E2620 – 15 (Reapproved 2020)

Standard Classification for Program and Project Estimate Summaries[1]

This standard is issued under the fixed designation E2620; 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 classification establishes a classification of cost summaries for use when estimating program and project costs.

1.2 This classification can be applied to construction programs and projects that include one or more construction work projects.

1.3 This classification is not based on permanent physical elements of construction (as defined and classified in Classification E1557 for example); rather, the classification items are cost components common to most program and project estimates.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*[2]

E631 Terminology of Building Constructions

E833 Terminology of Building Economics

E1557 Classification for Building Elements and Related Sitework—UNIFORMAT II

E2083 Classification for Building Construction Field Requirements, and Office Overhead & Profit

E2168 Classification for Allowance, Contingency, and Reserve Sums in Building Construction Estimating

E2514 Practice for Presentation Format of Elemental Cost Estimates, Summaries, and Analyses

2.2 *Other Standard:*[3]

MasterFormat

3. Terminology

3.1 *Definitions:* For other definitions of general terms related to building construction used in this classification, refer to Terminology E631; and for general terms related to building economics, refer to Terminology E833.

3.1.1 *element, n—in construction planning, design, specification, estimating, and cost analysis*, a significant component part of the whole that performs a specific function, or functions, regardless of design, specification, or construction method.

3.1.1.1 *Discussion*—While through analysis, or by direct application, construction estimates categorized into elements (functional elements) with allocated costs, may be summarized in an **elemental cost summary** or **elemental cost analysis**; elements (functional elements) also provide a framework for consistent preliminary project description, outline, and performance specification, through all stages of planning, design, construction, and maintenance.

3.1.2 *elemental cost analysis, n—in construction planning, design, specification, estimating, and cost analysis*, a tabulation of cost categorized by **major group element**, **group element**, or **element**, or any combination thereof, to which a **parameter quantity**, or parameter quantities, has, or have, been applied to derive benchmark figures (rates, ratios, percentages, and so forth).

3.1.2.1 *Discussion*—Elemental cost analyses are valuable tools in planning, estimating, and controlling construction cost through all stages of planning and design. The benchmark figures are primarily derived from underlying estimate detail but can, in some circumstances, be used directly to approximate estimates for other projects.

3.1.3 *elemental cost summary, n—in construction planning, design, specification, estimating, and cost analysis*, a tabulation of cost categorized by **major group element**, **group element**, or **element**.

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

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[2] For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

[3] Available from the Construction Specifications Institute (CSI), 110 South Union Street, Suite 100, Alexandria VA 22314, http://www.csinet.org.

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3.1.4 *group element, n—in construction planning, design, specification, estimating, and cost analysis*, a significant component part of the whole that includes relevant **elements** which, as a group, perform specific function, or functions, regardless of design, specification or construction method.

3.1.5 *major group element, n—in construction planning, design, specification, estimating, and cost analysis*, a very significant component part of the whole that includes relevant **group elements** which, as a group, perform major specific function, or functions, regardless of design, specification or construction method.

3.1.6 *parameter quantity, n—in construction planning, design, specification, estimating, and cost analysis*, a measure of the amount (quantity) of work included within a **major group element**, **group element**, or **element**, or any combination thereof, which, using standardized metrics, ensures consistent **elemental cost analysis** preparation and comparison.

3.1.7 *UNIFORMAT II UII, n*—a hierarchical breakdown structure of construction work ordered by **elements**.

3.1.7.1 *Discussion*—Primarily designed for cost management (planning, control, and analysis) during the planning, budgeting, and design phases of construction, its hierarchical elemental breakdown structure is also used for qualitative–text rich–reports (preliminary project description, condition assessment, asset description), and other quantitative–text and numerical–purposes (value engineering, risk analysis, preliminary time schedule, building information modeling).

3.2 *Definitions of Terms Specific to This Standard:* Definitions for the terms *program*, *project*, and *construction* are legion. For the purposes of this classification, the following variations in the terms are used.

3.2.1 *construction, n*—a discrete undertaking, requiring concerted effort, that has a specified end product and is accomplished using finite resources.

3.2.2 *construction layer, n*—contains those activities and associated costs required to manage and deliver a constructed entity.

3.2.3 *program, n*—a specific collection, or group, of projects that is directed toward a common goal that may also serve as the basis for defining and planning those projects.

3.2.4 *program layer, n*—contains those activities and associated costs required to manage and deliver a collection, or group, of projects.

3.2.5 *project, n*—a discrete undertaking, requiring concerted effort, that has defined objectives, a defined life within specific start and end points, that is usually accomplished by using finite, or limited, resources.

3.2.6 *project layer, n*—contains those activities and associated costs required to manage and deliver a project.

4. Significance and Use

4.1 Program and project estimates are a necessary part of planning and implementing any program of work.

4.2 These estimates are used by persons involved in the planning and management of programs and projects. They are an essential part of establishing initial budgets and provide a framework for continuing updates permitting cost control through the life of a program and its various projects.

4.3 Users include owners, developers, facilities programmers, financial managers, company controllers, executives, program managers, project managers, and specialist cost planners including life cycle cost analysts.

4.4 They are also of use in risk management, and also provide a consistent list of major activity phases for use in program and project time schedules.

5. Basis of Classification

5.1 *Classification Criteria*—The selected classification of terms is based on the following criteria. The terms shall:

5.1.1 Be readily distinguishable one from the other,

5.1.2 Follow generic management hierarchical lines,

5.1.3 Allow a distinction between primary realms of responsibility, and

5.1.4 Be appropriate to many forms of construction.

5.2 *Primary Classification*—Based on the concept of layers that overlay and incorporate subordinate layers to build an overall estimated cost picture appropriate for those charged with responsibility for the successful delivery of that layer of the whole. A program may include all the phases envisaged in the program's Whole Life Cycle and will typically include more than one project. These projects may take place at several stages in several phases in a program's life cycle and may be concurrent or sequential, or both, in their delivery. A project will include at least one constructed entity but may include more, constructed concurrently or sequentially, or both.

5.2.1 *Program Layer*—This layer "wraps" around (overlays) and includes the project layer(s) necessary to complete the whole program. It details and summarizes cash expenditures from initial identification of need or opportunity through operation and maintenance to final closure and disposal.

5.2.2 *Project Layer*—This layer "wraps" around and includes the construction layer(s). It details and summarizes those cash expenditures appropriate and necessary to delivering the constructed entity from inception to completion.

5.2.3 *Construction Layer*—This layer details the specific construction deliverable, be it a building, installation, or other constructed entity.

6. Description of Program, Project, and Construction Layers

6.1 *The "Layer" Concept:*

6.1.1 Programs and projects are typically structured in a hierarchical scheme wherein each layer of management has specific functions or actions, in addition to control and oversight responsibilities for those actions taken by subordinate layers. The metaphor is that each superior layer "overlays" a subordinate layer. Removing each "layer" will uncover a more specific layer beneath. This classification outlines these layers from the "top-down" although from an estimating point of view it may often be the lower (subordinate) layer that "drives" the content and magnitude of the next layer up. Some organizations may well wish to view this hierarchy in a "bottom-up" manner which may be done without changing the layer concept. Appendix X1 uses this "bottom-up" approach.

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6.1.2 There will be several levels of detail within each layer. For example, Classification E1557 uses the term *level* to describe its hierarchy of increasing detail supporting each Major Group Element, Group Element, Element, and Sub-Element. To avoid confusion, and allow for clarity in discussion, this classification quite specifically avoids using the term *level* when distinguishing between the three identified layers.

6.1.3 The three layers represent three readily identifiable layers of responsibility that are applicable when managing a construction program or construction project.

6.1.4 Each layer might also be likened to a "container" wherein specific functions and actions are contained and controlled. Some of the functions and actions may become more specific management applications in each succeeding (lower) layer, although others will not. They will be specific to their layer and may also contain several levels of detail.

6.1.5 Fig. 1 provides a graphic representation of this layer hierarchy.

6.1.6 A business program may not be defined as precisely as a construction program or project in that, while it has a defined start and a specified objective, its end date may be a long way ahead or even unknown. Consequently the business objective is likely to mature and evolve as changing needs and the business environment dictate. A business program may require that more than one construction program and many projects be implemented and these can occur at several stages during a business programs lifetime. Business programs typically include four major phases of activity:

6.1.6.1 Planning and Definition Phase,

6.1.6.2 Implementation Phase,

6.1.6.3 Operation and Maintenance Phase, and

6.1.6.4 Disposal and Deactivation Phase.

6.1.7 Projects are unique, are temporary, and are implemented to fulfil/meet a specific goal. Projects have an identified objective, a specific beginning, and a defined end. A project may include more than one constructed entity, and these may be constructed sequentially, concurrently, or in a combination of these two modes. Projects involving construction typically include two major phases of activity:

6.1.7.1 Design Phase, and

6.1.7.2 Construction Phase.

6.1.8 Construction refers to the physical erection of each constructed entity, be it a building, a bridge, or one of the many different construction forms extant in the built environment.

7. Program Layer

7.1 The program layer, in its entirety, is an all-encompassing, over-arching layer that typically includes all phases of the Program.

7.2 For the purposes of this classification, a program estimate will only include those program costs specific to the implementation of a planned construction program and so will exclude those other costs and activities that are a necessary part of an overall business program.

7.3 Fig. 2 provides a generic view of the typical cost centers included within construction programs within the four primary phases of any business program.

7.4 A brief description of the typical activities that may be expected in each primary phase follows.

7.5 *Plan and Define:*

7.5.1 *Intent:*

7.5.1.1 To define an investment opportunity, a need, or a problem.

7.5.1.2 To define a solution in technical terms, financial terms, and goals.

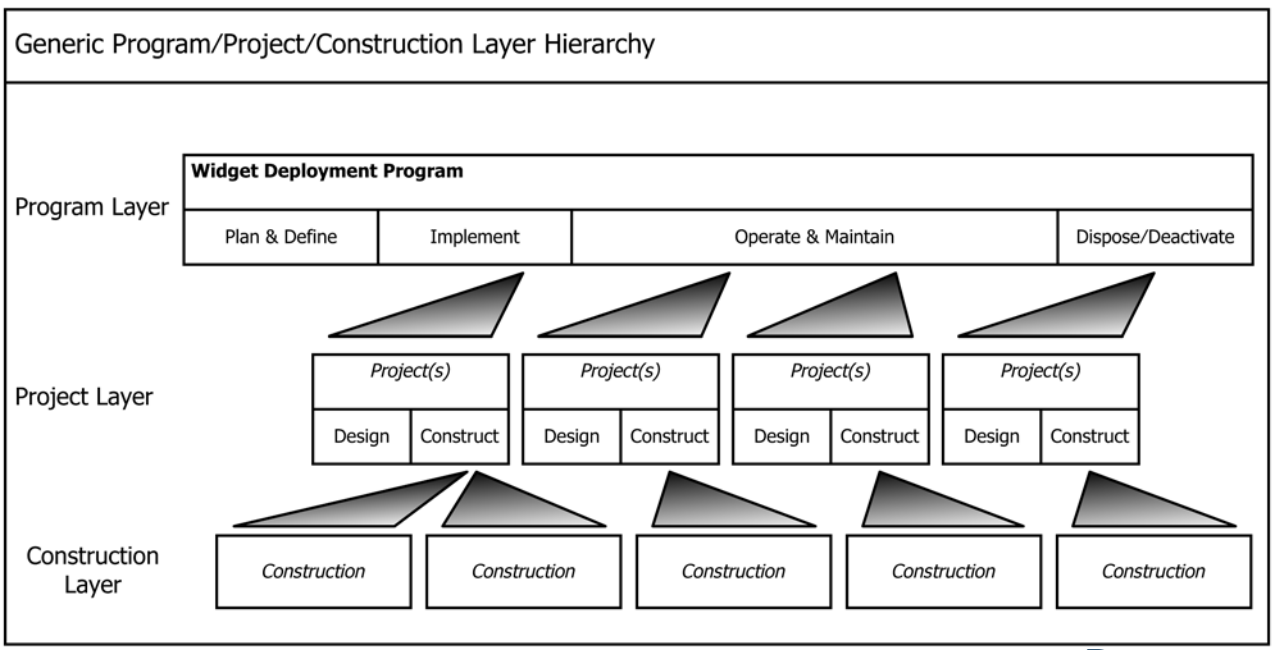

FIG. 1 Generic Layer Hierarchy

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GENERIC PROGRAM COST SUMMARY LAYER

Cost Centres	Plan & Define	Implement	Operate & Maintain	Dispose Deactivate
Program Management				
Staff	<$>	<$>	<$>	<$>
Accommodation	<$>	<$>	<$>	<$>
Disbursements	<$>	<$>	<$>	<$>
Capital Expenditure				
Real Property				
Purchase		<$>		
Sale				<$>
Lease		<$>	<$>	
Improvements		<$>		<$>
Capital Project(s)				
see Project Layer(s)		<$>	<$>	<$>
Equipment				
Purchase		<$>		
Cyclical Replacement			<$>	
Disposal				<$>
Furnishings				
Purchase		<$>		
Cyclical Replacement			<$>	
Disposal				<$>
Signage and Wayfinding		<$>		
Financing				
Interim		<$>		
Permanent		<$>	<$>	
Fees and Disbursements				
Appraisal		<$>		<$>
Real Estate		<$>		<$>
Legal		<$>		<$>
Consultants				
Surveying		<$>	<$>	
Planning		<$>	<$>	
Geotechnical		<$>	<$>	
Asset Management			<$>	
Project Brief/Programming		<$>	<$>	
Commissioning		<$>	<$>	
Other		<$>	<$>	<$>
Disbursements		<$>	<$>	<$>
Facility Management				
Staff				
Management		<$>	<$>	
Tenant Services			<$>	
Accomodation			<$>	
Supplies			<$>	
Operation and Maintenance				
Operation				
Utilities			<$>	
Taxes			<$>	
Insurances			<$>	
Cleaning			<$>	
Other			<$>	
Maintenance				
Ad-Hoc/Emergency			<$>	
Preventive			<$>	
Grounds and Landscaping			<$>	
Parts and Supplies			<$>	
Other			<$>	
Cyclical Renewal				
Project(s)				
see Project Layer(s)			<$>	
Signage and Wayfinding			<$>	
Management Reserve				
Major Scope Change		<$>	<$>	
Discretionary Project(s)		<$>	<$>	
Other		<$>	<$>	

FIG. 2 Program Layer

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7.5.1.3 A successful corporate entity will always be searching for improvement, either in product delivery or product availability, as a means to maximizing profit (often by cost reduction), or the identification of new investment opportunities. This ongoing activity entails some cost and research.

7.5.2 *Activities:*

7.5.2.1 Identify Opportunity.

7.5.2.2 Define Objective.

7.5.2.3 Analyze and Decide.

7.5.2.4 Seek Approvals.

7.5.3 *Participants:*

7.5.3.1 Program Manager.

7.5.3.2 Property Managers.

7.5.3.3 Real Estate Analysts.

7.5.3.4 Investment and Financial Specialists/Analysts.

7.5.3.5 Technical Specialists/Analysts.

7.5.4 *Key Product:*

7.5.4.1 Program Description.

7.5.5 *Critical Decisions:*

7.5.5.1 A firm decision to proceed with a new program.

7.5.5.2 Appointment of Program Manager(s) and support team(s).

7.5.5.3 Constraints—financial, time, and quality.

7.6 *Implement:*

7.6.1 *Purpose:*

7.6.1.1 To design and construct the identified needs in accordance with the Program Description and within the bounds of the identified constraints.

7.6.1.2 To design and construct the required facilities in accordance with the approved program decision. To put the requirement into action.

7.6.2 *Activities:*

7.6.2.1 *Locate Finance,* both Interim and Permanent.

7.6.2.2 *Real Property Acquisition,* which may include:

(1) Purchase.

(2) Lease.

(3) Improvements.

(a) Planning:

Survey.

Rezoning/Development.

Geotechnical Testing.

(b) Fees:

Appraisal.

Real Estate.

Legal.

(c) Site Improvement:

Primary Site Services.

Site Preparation:

Abatement.

Demolition.

7.6.2.3 *Develop:*

(1) Project Brief.

(2) Project (see Project Layer).

(3) Commission.

(4) Equipment:

(a) Installation:

Moving/Transportation.

Storage.

(b) Furnishings:

Installation:

Moving/Transportation.

Storage.

7.6.3 *Participants:*

7.6.3.1 Project Management Team.

7.6.3.2 Program Manager.

7.6.3.3 Consultants.

7.6.3.4 Contractors.

7.6.3.5 Suppliers.

7.6.4 *Documents:*

7.6.4.1 Specifications, Working Drawings, and Contract Documents.

7.6.4.2 Commissioning and Maintenance Manuals.

7.6.4.3 As-Built drawings and specifications.

7.6.5 *Key Product and Critical Decisions:*

7.6.5.1 Constructed facility(ies) that meet the approved criteria of cost, quality, and time.

7.6.5.2 Acceptance of Design.

7.6.5.3 Acceptance of Building.

7.6.5.4 Compliance with Brief and Constraints.

7.7 *Operate and Maintain:*

7.7.1 *Purpose:*

7.7.1.1 To operate the facility(ies) for the life of the program.

7.7.1.2 To maintain the facility(ies) for efficient operation and in accordance with all applicable codes and regulations.

7.7.1.3 To operate and maintain the constructed entity(ies), included within the program, to ensure safe and efficient utilization.

7.7.2 *Activities:*

7.7.2.1 Operation.

7.7.2.2 Ad-Hoc Maintenance.

7.7.2.3 Alteration/Improvement:

(1) Project Brief.

(2) Project (see Project Layer).

(3) Commission.

7.7.2.4 Cyclical Renewal—Facility:

(1) Project Brief.

(2) Project (see Project Layer).

(3) Commission.

7.7.2.5 Cyclical Renewal—Equipment.

7.7.2.6 Cyclical Renewal—Furnishings.

7.7.2.7 Operate building systems.

7.7.2.8 Preventative maintenance, ongoing, and daily inspection.

7.7.2.9 Replacement of failing or failed components.

7.7.2.10 Testing.

7.7.2.11 Maintain a watching brief to identify opportunities for improvement in efficiency and performance.

7.7.2.12 Prepare Project Brief for all changes.

7.7.2.13 Once in place, the facilities require operation and maintenance for their continued safe and economic program life. This continuing process includes updating and upgrading components and systems, regular maintenance, and planned replacement of time-expired components. As in the Planning and Definition Program Phase, a continuing process of evaluation and identification of improved products and procedures

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needs to be implemented, the results of which may cause additional project work or a decision to close the facility. This latter decision will prompt entry into the next program phase.

7.7.3 *Participants:*

7.7.3.1 Facility Management.

7.7.3.2 User Councils and Tenant Groups.

7.7.3.3 Project Team for changes.

7.7.4 *Documents:*

7.7.4.1 Maintenance Plan.

7.7.4.2 Cyclical Renewal Plan.

7.7.4.3 Drawings and Specifications for major work based upon a Project Brief.

7.7.5 *Product:*

7.7.5.1 Functioning and operating facility.

7.7.5.2 Documentation for all changes made.

7.7.6 *Critical Decisions:*

7.7.6.1 Failure to meet agreed standards of performance.

7.7.6.2 Revise systems or facility for greater efficiency/economy or changing needs.

7.8 *Dispose/Deactivate:*

7.8.1 *Purpose:*

7.8.1.1 To safely deactivate or dispose, or both, of facility(ies) at end of program.

7.8.1.2 To efficiently deactivate a facility and dispose of the physical assets where deemed necessary.

7.8.2 *Activities:*

7.8.2.1 Sale/Disposal.

7.8.2.2 Salvage—Demolish:

(1) Project Brief.

(2) Project (see Project Layer).

7.8.2.3 Salvage—Mothball:

(1) Project Brief.

(2) Project (see Project Layer).

7.8.3 *Participants:*

7.8.3.1 Program Manager.

7.8.3.2 Project Management Team.

7.8.3.3 Consultants.

7.8.3.4 Contractors.

7.8.4 *Documents:*

7.8.4.1 Decision documentation and Project Brief.

7.8.5 *Key Product and Critical Decisions:*

7.8.5.1 Decision to dispose or retain.

7.9 *Reserve:*

7.9.1 The term Management Reserve is a common one, but evidence is not so common that management of organizations consciously and routinely address the concept. Reference to Reserves is made in Classification E2168. Whether a reserve takes the form of cash set aside (encumbered) or a listing of other planned expenditures that can be forgone, should the need arise, is clearly a management choice.

8. Project Layer

8.1 A Project Manager's main responsibility is to oversee, manage and coordinate the actions of the many individuals, consultants, contractors and suppliers needed to complete a project. The Project Manager's goal is to complete the project assignment on time and on budget while meeting the prescribed quality and scope expectations of the Program Manager.

8.2 Every project is unique. The project layer is a complete module that can be inserted into any construction program, when needed, and is not exclusive to the business program implementation phase.

8.3 Many practitioners and organizations will be familiar with the project layer although they may be unfamiliar with the overarching Program Layer (business or construction, or both).

8.4 A construction project typically includes two main phases, one of design and the other of construction. These two phases contain several discrete, sequential, phases, the successful completion of which will help ensure an efficiently delivered project.

8.5 Fig. 3 provides a generic view of the typical cost centers included within the primary phases of any project.

8.6 A brief description of the typical activities that may be expected in each primary phase follows.

8.7 *Design:*

8.7.1 *Purpose:*

8.7.1.1 To provide a considered design solution that meets client requirements in all areas of cost, time, and quality.

8.7.1.2 To develop documentation for the agreed design solution, in a form that will permit obtaining competitive construction quotations.

8.7.2 *Activities:*

8.7.2.1 Appoint Consultants.

8.7.2.2 Design:

(1) Schematic Design.

(2) Design Development.

8.7.2.3 Document:

(1) Construction Documents.

(2) Contract Documents.

8.7.3 *Participants:*

8.7.3.1 Project Manager.

8.7.3.2 Program Manager.

8.7.3.3 Consultants.

8.7.4 *Documents:*

8.7.4.1 Schematic Design Drawings.

8.7.4.2 Design Development Drawings and Outline Specifications.

8.7.4.3 Construction Drawings and Specifications.

8.7.4.4 Contract Documents.

8.7.5 *Key Product:*

8.7.5.1 Contract Documents Package.

8.7.6 *Critical Decisions:*

8.7.6.1 That the design meets Project and Program budget and requirements.

8.8 *Construct:*

8.8.1 *Contract:*

8.8.1.1 *Purpose:*

(1) To obtain competitive quotations for the construction works.

(2) To appoint the selected construction contractor(s).

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