



Standard Classification for Building Elements and Related Sitework—UNIFORMAT II¹

This standard is issued under the fixed designation E 1557; 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 approval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This standard establishes a classification of building elements and related sitework. Elements, as defined here, are major components common to most buildings. Elements usually perform a given function, regardless of the design specification, construction method, or materials used. The classification serves as a consistent reference for analysis, evaluation, and monitoring during the feasibility, planning, and design stages of buildings. Using UNIFORMAT II ensures consistency in the economic evaluation of buildings projects over time and from project to project. It also enhances reporting at all stages in construction—from feasibility and planning through the preparation of working documents, construction, maintenance, rehabilitation, and disposal.

1.2 This classification applies to buildings and related site work. It excludes specialized process equipment related to a building's functional use but does include furnishings and equipment.

1.3 The Classification incorporates three hierarchical levels described as Levels 1, 2, and 3. Appendix X1 presents a more detailed suggested Level 4 classification of sub-elements.

1.4 UNIFORMAT II is an elemental format similar to the original UNIFORMAT² elemental classification. UNIFORMAT II differs from the original UNIFORMAT, however, in that it takes into consideration a broader range of building types and has been updated to categorize building elements as they are in current building practice.

2. Referenced Documents

2.1 ASTM Standards:

- E 833 Terminology of Building Economics³
- E 917 Practice for Measuring Life-Cycle Costs of Buildings and Building Systems³

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 The original UNIFORMAT classification was developed jointly by the General Services Administration (GSA) and the American Institute of Architects (AIA).

³ *Annual Book of ASTM Standards*, Vol 04.11.

- E 964 Practice for Measuring Benefit-to-Cost and Savings-to-Investment Ratios for Buildings and Building Systems³
- E 1057 Practice for Measuring Internal Rate of Return and Adjusted Internal Rate of Return for Investments in Buildings and Building Systems³
- E 1074 Practice for Measuring Net Benefits for Investments in Buildings and Building Systems³
- E 1121 Practice for Measuring Payback for Investments in Buildings and Building Systems³
- E 1185 Guide for Selecting Economic Methods for Evaluating Investments in Buildings and Building Systems³
- E 1369 Guide for Selecting Techniques for Treating Uncertainty and Risk in the Economic Evaluation of Buildings and Building Systems³
- E 1804 Practice for Performing and Reporting Cost Analysis during the Design Phase of a Building Project³
- E 2083 Standard Classification for Building Construction Field Requirements, Office Overhead Profit³

2.2 ASTM Adjuncts:

Discount Factor Tables, Adjunct to Practices E 917, E 964, E 1057, and E 1074⁴

Computer Program and User's Guide to Building Maintenance, Repair, and Replacement Database for Life-Cycle Cost Analysis, Adjunct to Practices E 917, E 964, E 1057, and E 1121⁵

3. Terminology

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

4. Significance and Use

4.1 This classification defines building elements as major components to most buildings. The classification is the common thread linking activities and participants in a building project from initial planning through operations, maintenance, and disposal.

⁴ Available from ASTM Headquarters. Order PCN 12-509179-10.

⁵ Available from ASTM Headquarters. Order PCN 12-509171-10 for the 3.5 in. disk. Order PCN 12-509172-10 for the 5.25 in. disk.

4.2 The users of UNIFORMAT II include owners, developers, facilities programmers, cost planners, estimators, schedulers, architects and engineers, specification writers, operating and maintenance staff, manufacturers, and educators.

4.3 Use this classification when doing the following:⁶

4.3.1 Structuring costs on an elemental basis for economic evaluations (Practices E 917, E 964, E 1057, E 1074, E 1121, E 1804 and *Computer Program and User's Guide to Building Maintenance, Repair, and Replacement Database for Life-Cycle Cost Analysis Adjunct*) early in the design process. Using UNIFORMAT II helps reduce the cost of early analysis and contributes to substantial design and operational savings before decisions have been made that limit options for potential savings.

4.3.2 Estimating and controlling costs during planning, design, and construction. Use UNIFORMAT II to prepare budgets and to establish elemental cost plans before design begins. The project manager uses these to control project cost, time, and quality, and to set design-to-cost targets. See Appendix X2 for an example of a UNIFORMAT II building elemental design cost estimate.

4.3.3 Conducting value engineering workshops. Use UNIFORMAT II as a checklist to ensure that alternatives for all elements of significant cost in the building 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 building systems.

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

4.3.5 Performing risk analyses. Simulation is one technique (Practice E 1369) for developing probability distributions of building costs when evaluating the economic risk in undertaking a building project. Use individual elements and group elements in UNIFORMAT II for developing probability distributions of elemental costs. From these distributions, build up probability distributions of total project costs to establish acceptable project contingencies or to serve as inputs to an economic analysis. (See Practice E 1185 for guidance as to what economic method to use.)

4.3.6 Structuring cost manuals and recording construction, operating, and maintenance costs in a database. Having a manual or database in an elemental format helps you perform economic analysis early in the design stage and at reasonable cost.

4.3.7 Structuring preliminary project descriptions during the conceptual design phase. It facilitates the description of the scope of the project for the client in a clear, concise, and logical sequence; it provides the basis for the preparation of more detailed elemental estimates during the early concept and

preliminary design phases, and it enhances communications among designers and other building professionals by providing a clear statement of the designer's intent. See Appendix X3 for a sample preliminary project description (PPD) based on UNIFORMAT II.

4.3.8 Coding and referencing standard details in computer-aided design systems. This allows an architect, for example, to reference an exterior wall assembly according to UNIFORMAT II element designations and build up a database of standard details structured according to the classification.

4.4 UNIFORMAT II, as described in this classification, includes sitework normally related to buildings but does not apply to major civil works. It is also unsuitable for process applications or for preparing trade estimates.

5. Basis of Classification

5.1 What part of the built environment is included? The framework in Fig. 1 shows how buildings and related sitework fit in with the rest of the built environment. This classification describes exclusively the elements that make up the blocks shaded under the *building* block, that is, construction of buildings and related sitework. UNIFORMAT II does not treat other aspects of buildings or other features of the built environment, which are indicated by the non-shaded blocks.

NOTE 1—The other features of the built environment in Fig. 1 are listed for illustrative purposes and are not intended to be a comprehensive list of other features.

5.2 *Criteria for the Classification*— The selected classification, what items to include in it, and in which parts of the classification to include them are based on the following criteria:

5.2.1 The classification will be applicable to any building type, while at the same time allowing for details desirable for specialized buildings. The classification of building elements will be separate from the classification of building-related sitework. The classifications will be hierarchical to allow different levels of aggregation and summarization. And they will relate to other elemental classifications⁷ such as UNIFORMAT and the classification of the Canadian Institute of Quantity Surveyors.⁸

⁷ For more information on other elemental classifications, see Brian Bowen and Robert Charette, "Elemental Cost Classification Standard for Building Design," 1991 *AACE Transactions*, 1991.

⁸ Available from Canadian Institute of Quantity Surveyors, P.O. Box 124, Station R, Toronto, ON, Canada M4G 3Z3.

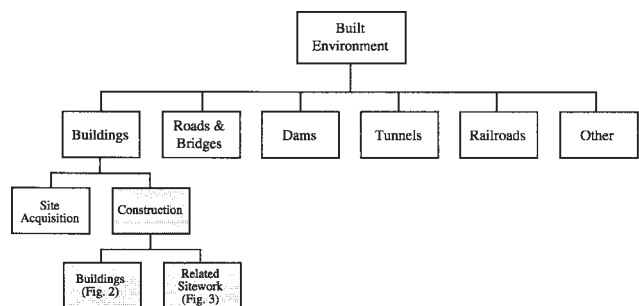


FIG. 1 Possible Framework of the Built Environment

⁶ For a more comprehensive discussion of the uses of UNIFORMAT II, see Bowen, Charette, and Marshall, *UNIFORMAT II—A Recommended Classification for Building Elements and Related Sitework*, National Institute of Standards and Technology Special Publication 841, Gaithersburg, MD, 1992, and Charette and Marshall, *UNIFORMAT II Elemental Classification for Building Specifications, Cost Estimating, and Cost Analysis*, National Institute of Standards and Technology NISTIR 6389, Gaithersburg, MD, 1999.

5.2.2 Items in the classification will have significant influence on cost and a high frequency of occurrence. Categories will be defined so as to provide a framework for cost control. The decision as to where among the classification elements to

include specific items is to rely on professional judgment as to where building professionals in current practice normally look for such items.

5.2.3 *Classification of Building Elements*—Fig. 2 presents

| Level 1 Major Group Elements | Level 2 Group Elements | Level 3 Individual Elements |
|--|-----------------------------------|---|
| A SUBSTRUCTURE | A10 Foundations | A1010 Standard Foundations A1020 Special Foundations A1030 Slab on Grade |
| | A20 Basement Construction | A2010 Basement Excavation A2020 Basement Walls |
| B SHELL | B10 Superstructure | B1010 Floor Construction B1020 Roof Construction |
| | B20 Exterior Enclosure | B2010 Exterior Walls B2020 Exterior Windows B2030 Exterior Doors |
| | B30 Roofing | B3010 Roof Coverings B3020 Roof Openings |
| C INTERIORS | C10 Interior Construction | C1010 Partitions C1020 Interior Doors C1030 Fittings |
| | C20 Stairs | C2010 Stair Construction C2020 Stair Finishes |
| | C30 Interior Finishes | C3010 Wall Finishes C3020 Floor Finishes C3030 Ceiling Finishes |
| D SERVICES | D10 Conveying | D1010 Elevators & Lifts D1020 Escalators & Moving Walks D1090 Other Conveying Systems |
| | D20 Plumbing | D2010 Plumbing Fixtures D2020 Domestic Water Distribution D2030 Sanitary Waste D2040 Rain Water Drainage D2090 Other Plumbing Systems |
| | D30 HVAC | D3010 Energy Supply D3020 Heat Generating Systems D3030 Cooling Generating Systems D3040 Distribution Systems D3050 Terminal & Package Units D3060 Controls and Instrumentation D3070 Systems Testing & Balancing D3090 Other HVAC Systems & Equipment |
| | D40 Fire Protection | D4010 Sprinklers D4020 Standpipes D4030 Fire Protection Specialties D4090 Other Fire Protection Systems |
| | D50 Electrical | D5010 Electrical Service & Distribution D5020 Lighting and Branch Wiring D5030 Communications & Security D5090 Other Electrical Systems |
| E EQUIPMENT & FURNISHINGS | E10 Equipment | E1010 Commercial Equipment E1020 Institutional Equipment E1030 Vehicular Equipment E1090 Other Equipment |
| | E20 Furnishings | E2010 Fixed Furnishings E2020 Movable Furnishings |
| F SPECIAL CONSTRUCTION & DEMOLITION | F10 Special Construction | F1010 Special Structures F1020 Integrated Construction F1030 Special Construction Systems F1040 Special Facilities F1050 Special Controls and Instrumentation |
| | F20 Selective Building Demolition | F2010 Building Elements Demolition F2020 Hazardous Components Abatement |

FIG. 2 UNIFORMAT II Classification of Building Elements with Alpha-Numeric Designations

the UNIFORMAT II classification of building elements. It comprises three hierarchical levels: Major Group Elements for Level 1, Group Elements for Level 2, and Individual Elements for Level 3. See Section 6 for detailed lists of specific items that are included and excluded under each individual element listed in the Level 3 category. A list of suggested level 4 building sub-elements is presented in Table X1.1.

5.2.4 *Classification of Building-Related Sitework*—Fig. 3 presents the UNIFORMAT II classification of building-related sitework. See Section 7 for detailed lists of specific items that are included and excluded under each individual element listed in the Level 3 category. A list of suggested Level 4 building-related sitework sub-elements is presented in Table X1.2.

5.2.4.1 UNIFORMAT II is not intended to classify elements of major civil works. Rather, it is provided for exclusive use in support of the construction of buildings. Buildings are usually constructed with roads, utilities, parking areas, and other nonbuilding features. The UNIFORMAT II classification of building-related sitework provides guidance so that planners do not have to resort to multiple elemental classifications for one project.

6. Description of Building Elements

6.1 The following lists show what items are included and excluded in the recommended classification at Level 3. Note that the listings of inclusions and exclusions are not intended to be an exhaustive listing. Rather, they provide a general outline of what to expect in that element consistent with the selection criteria outlined in 5.2. Exclusions are listed to help readers find items quickly. For example, an elemental format might show exterior load bearing walls under Exterior Walls or Superstructure. UNIFORMAT II puts them under Exterior Walls based on technical judgment and current practice. Putting under Superstructure a cross-reference to Exterior Walls directs the person who looks first under Superstructure to the appropriate element. Note that the table in Fig. 2 incorpo-

rates an alphanumeric designation for the classification: a single character letter code for Level 1 Major Group Elements, a three character alphanumeric code for Level 2 Group Elements, and a five character alphanumeric code for Level 3 Individual Elements.

6.2 *Foundations (A 10)*:

6.2.1 *Standard Foundations (A 1010)*:

6.2.1.1 Includes:

- (a) Wall and column foundations,
- (b) Foundation walls up to level of top of slab on grade,
- (c) Pile caps,
- (d) Foundation excavation, backfill, and compaction,
- (e) Footings and bases,
- (f) Perimeter insulation,
- (g) Perimeter drainage, and
- (h) Anchor plates.
- (i) Dewatering

6.2.1.2 Excludes:

- (a) General excavation to reduce levels (see G 1030, Site Earthwork),
- (b) Excavation for basements (see A 2010, Basement Excavation),
- (c) Basement walls (see A 2020, Basement Walls), and
- (d) Under-slab drainage and insulation (see A 1030, Slab on Grade).

6.2.2 *Special Foundations (A 1020)*:

6.2.2.1 Includes:

- (a) Piling,
- (b) Caissons,
- (c) Underpinning,
- (d) Dewatering,
- (e) Raft foundations,
- (f) Any other special foundation conditions, and
- (g) Grade Beams

6.2.2.2 Excludes:

- (a) Pile caps (see A 1010, Standard Foundations), and

| Level 1 Major Group Elements | Level 2 Group Elements | Level 3 Individual Elements |
|---------------------------------|-------------------------------|---|
| G BUILDING SITEWORK | G10 Site Preparation | G1010 Site Clearing G1020 Site Demolition and Relocations G1030 Site Earthwork G1040 Hazardous Waste Remediation |
| | G20 Site Improvements | G2010 Roadways G2020 Parking Lots G2030 Pedestrian Paving G2040 Site Development G2050 Landscaping |
| | G30 Site Mechanical Utilities | G3010 Water Supply G3020 Sanitary Sewer G3030 Storm Sewer G3040 Heating Distribution G3050 Cooling Distribution G3060 Fuel Distribution G3090 Other Site Mechanical Utilities |
| | G40 Site Electrical Utilities | G4010 Electrical Distribution G4020 Site Lighting G4030 Site Communications & Security G4090 Other Site Electrical Utilities |
| | G90 Other Site Construction | G9010 Service and Pedestrian Tunnels G9090 Other Site Systems & Equipment |

FIG. 3 UNIFORMAT II Classification of Building Related Sitework with Alpha-Numeric Designations

(b) Rock excavation (unless associated with Special Foundations) (see A 1010, Standard Foundations and A 2010, Basement Excavation).

6.2.3 *Slab on Grade (A 1030):*

6.2.3.1 Includes:

- (a) Standard,
- (b) Structural,
- (c) Inclined slabs on grade,
- (d) Trenches,
- (e) Pits,
- (f) Bases,
- (g) Under-slab drainage, and
- (h) Under-slab insulation.

6.2.3.2 Excludes:

- (a) Applied floor finishes (see C 3020, Floor Finishes), and
- (b) Hardeners and sealers to the slab (see C 3020, Floor Finishes).

6.3 *Basement Construction (A 20):*

6.3.1 *Basement Excavation (A 2010):*

6.3.1.1 Includes:

- (a) Additional excavation required for construction of basement,
- (b) Backfill and compaction, and
- (c) Excavation support system.

6.3.1.2 Excludes:

- (a) General grading to reduce levels over site (see G 1030, Site Earthwork).

6.3.2 *Basement Walls (A 2020):*

6.3.2.1 Includes:

- (a) Basement wall construction,
- (b) Moisture protection, and
- (c) Basement wall construction below grade.

6.3.2.2 Excludes:

- (a) Walls above grade that enclose basements (see B 2010, Exterior Walls), and
- (b) Perimeter drainage (see A 1010, Standard Foundations).

6.4 *Superstructure (B 10):*

6.4.1 *Floor Construction (B 1010):*

6.4.1.1 Includes:

- (a) Floor structural frame,
- (b) Interior structural walls,
- (c) Floor slabs and decks,
- (d) Inclined and stepped floors,
- (e) Expansion and contraction joints,
- (f) Balcony construction,
- (g) Suspended ramps,
- (h) Exterior stairs and fire escapes, and
- (i) Other floor construction (for example, catwalks, space frames, etc.).

6.4.1.2 Excludes:

- (a) Exterior load bearing walls (see B 2010, Exterior Walls),
- (b) Applied and suspended ceiling and floor finishes (see C 3020, Floor Finishes and C 3030, Ceiling Finishes),
- (c) Stair construction (see C 2010, Stair Construction), and
- (d) Balcony walls and railings (see B 2010, Exterior Walls).

6.4.2 *Roof Construction (B 1020):*

6.4.2.1 Includes:

- (a) Roof structural frame,
- (b) Structural interior walls supporting roof,
- (c) Roof decks, slabs and sheathing,
- (d) Canopies, and
- (e) Other roof construction.

6.4.2.2 Excludes:

- (a) Roof coverings (see B 3010, Roof Coverings),
- (b) Skylights and roof openings (see B 3020, Roof Openings), and
- (c) Stair construction (see C 2010, Stair Construction).

6.5 *Exterior Enclosure (B 20):*

6.5.1 *Exterior Walls (B 2010):*

6.5.1.1 Includes:

- (a) Exterior wall construction with facing materials, exterior applied finishes, back-up construction, framing, sheathing, wallboard, parapets, insulation, and vapor retarders,
- (b) Exterior load-bearing wall construction,
- (c) Exterior louvers and screens,
- (d) Exterior sun control devices,
- (e) Balcony walls and railings, and
- (f) Exterior soffits.

6.5.1.2 Excludes:

- (a) Applied finishes to interior faces of exterior walls (see C 3010, Wall Finishes),
- (b) Columns and beams in exterior walls (see B 10, Superstructure),
- (c) Venetian blinds (see E 20, Furnishings),
- (d) Other interior sun control devices (see E 20, Furnishings),
- (e) Roof eaves and eaves soffits (see B 3010, Roof Coverings), and
- (f) Glazed curtain walls (see B 2020, Exterior Windows).

6.5.2 *Exterior Windows (B 2020):*

6.5.2.1 Includes:

- (a) Windows,
- (b) Storefronts,
- (c) Curtain walls,
- (d) Exterior painting of windows, and
- (e) Wall opening elements such as lintels, sills, flashings, etc.

6.5.2.2 Excludes:

- (a) Window treatments (see E 20, Furnishings).

6.5.3 *Exterior Doors (B 2030):*

6.5.3.1 Includes:

- (a) Personnel doors,
- (b) Revolving doors,
- (c) Overhead doors, and
- (d) Other doors (for example, hanger doors, blast-resistant doors, etc.).

6.6 *Roofing (B 30):*

6.6.1 *Roof Coverings (B 3010):*

6.6.1.1 Includes:

- (a) Roofing membranes, shingles and tiles,
- (b) Traffic coatings,
- (c) Waterproof membranes below paving,
- (d) Expansion joints,

- (e) Vapor retarders,⁹
 - (f) Roof and deck insulation,
 - (g) Roof fill,
 - (h) Flashings and trim,
 - (i) Gutters and downspouts, and
 - (j) Eaves and eaves soffits.
- 6.6.1.2 Excludes:
- (a) Roof openings (see B 3020, Roof Openings),
 - (b) Roof drains (see D 2040, Rain Water Drainage), and
 - (c) Parapets (see B 2010, Exterior Walls).
- 6.6.2 *Roof Openings (B 3020)*:
- 6.6.2.1 Includes:
- (a) Skylights,
 - (b) Area glazing,
 - (c) Roof hatches,
 - (d) Gravity roof ventilators, and
 - (e) Smoke vents.
- 6.6.2.2 Excludes:
- (a) Powered and ducted ventilators (see D 3040, Distribution Systems).
- 6.7 *Interior Construction (C 10)*:
- 6.7.1 *Partitions (C 1010)*:
- 6.7.1.1 Includes:
- (a) Fixed partitions,
 - (b) Demountable partitions,
 - (c) Retractable and movable partitions,
 - (d) Operable partitions,
 - (e) Interior balustrades and screens, and
 - (f) Interior window and storefronts.
- 6.7.1.2 Excludes:
- (a) Stair balustrades (see C 2010, Stair Construction),
 - (b) Interior load bearing and shear walls (see B 10, Superstructure), and
 - (c) Applied wall finishes (see C 3010, Wall Finishes).
- 6.7.2 *Interior Doors (C 1020)*:
- 6.7.2.1 Includes:
- (a) Standard swinging doors,
 - (b) Glazed doors,
 - (c) Sliding and folding doors,
 - (d) Fire doors,
 - (e) Other doors,
 - (f) Door frames,
 - (g) Door hardware,
 - (h) Door opening elements,
 - (i) Door painting and staining, and
 - (j) Hatches and access doors.
- 6.7.2.2 Excludes:
- (a) Vault doors (see E 10, Equipment), and
 - (b) Operable partitions (see C 1010, Partitions).
- 6.7.3 *Fittings (C 1030)*:
- 6.7.3.1 Includes:
- (a) Chalk and tack boards,
 - (b) Identifying devices,
 - (c) Lockers,
 - (d) Toilet and bath accessories,
 - (e) Storage shelving,
 - (f) Handrails and ornamental metals,
 - (g) Fabricated toilet partitions,
 - (h) Fabricated compartments and cubicles, and
 - (i) Closet specialties.
- 6.7.3.2 Excludes:
- (a) Equipment (see E 10, Equipment),
 - (b) Furniture (see E 20, Furnishings),
 - (c) Special construction (see F 10, Special Construction),
 - (d) Fire extinguishers (see D 4030, Fire Protection Specialities), and
 - (e) Manufactured case work (see E 20, Furnishings).
- 6.8 *Stairs (C 20)*:
- 6.8.1 *Stair Construction (C 2010)*:
- 6.8.1.1 Includes:
- (a) Stair treads, risers and landings, and
 - (b) handrails and balustrades.
- 6.8.1.2 Excludes:
- (a) Steps in structural slabs (see B 1010, Floor Construction).
- 6.8.2 *Stair Finishes (C 2020)*:
- 6.8.2.1 Includes:
- (a) Finishes to treads, risers, landings, and soffits, and
 - (b) Finishes to handrails and balustrades.
- 6.9 *Interior Finishes (C 30)*:
- 6.9.1 *Wall Finishes (C 3010)*:
- 6.9.1.1 Includes:
- (a) Concrete wall finishes,
 - (b) Wall plastering,
 - (c) Wallboard,
 - (d) Tile and terrazzo,
 - (e) Painting,
 - (f) Wallcoverings,
 - (g) Acoustic wall treatment, and
 - (h) Other coatings and finishings.
- 6.9.1.2 Excludes:
- (a) Wallboard integral to interior walls and partitions (see C 1010, Partitions, B 2010 Exterior Walls).
- 6.9.2 *Floor Finishes (C 3020)*:
- 6.9.2.1 Includes:
- (a) Floor toppings and traffic membranes,
 - (b) Hardeners and sealers,
 - (c) Tile, terrazzo, wood, and resilient flooring,
 - (d) Carpeting,
 - (e) Masonry and stone flooring,
 - (f) Other flooring (for example, conductive, armored),
 - (g) Painting and staining, and
 - (h) Access pedestal flooring.
- 6.9.2.2 Excludes:
- (a) Stair finishes (see C 2020, Stair Finishes).
- 6.9.3 *Ceiling Finishes (C 3030)*:
- 6.9.3.1 Includes:
- (a) Exposed concrete finishes,
 - (b) Plaster ceiling finishes,
 - (c) Wallboard ceiling finishes,
 - (d) Acoustic ceiling tiles and panels,
 - (e) Painting and staining,
 - (f) Metal strip ceilings,
 - (g) Other ceilings, and

⁹ A vapor retarder was formerly referred to as a vapor barrier.

- (h) All suspended systems.
 - 6.9.3.2 Excludes:
 - (a) Finishes to stair soffits (see C 2020, Stair Finishes), and
 - (b) Finishes to exterior soffits (see B 2010, Exterior Walls).
 - 6.10 *Conveying (D 10)*:
 - 6.10.1 *Elevators and Lifts (D 1010)*:
 - 6.10.1.1 Includes:
 - (a) Passenger elevators,
 - (b) Freight elevators,
 - (c) People lifts, and
 - (d) Wheel chair lifts.
 - 6.10.1.2 Excludes:
 - (a) Elevator pits (see A 1030, Slab on Grade).
 - 6.10.2 *Escalators and Moving Walks (D 1020)*:
 - 6.10.2.1 Includes:
 - (a) Escalators,
 - (b) Moving walks.
 - 6.10.3 *Other Conveying Systems (D 1090)*:
 - 6.10.3.1 Includes:
 - (a) Hoist and cranes,
 - (b) Conveyors,
 - (c) Dumbwaiters,
 - (d) Pneumatic tube systems,
 - (e) Linen, trash, and mail chutes, and
 - (f) Turntables.
 - (g) operable scaffolding
 - (h) transportation systems (for example, baggage handling and aircraft loading systems).
 - 6.11 *Plumbing (D 20)*:
 - 6.11.1 *Plumbing Fixtures (D 2010)*:
 - 6.11.1.1 Includes:
 - (a) Water closets,
 - (b) Urinals,
 - (c) Lavatories,
 - (d) Sinks,
 - (e) Showers,
 - (f) Bathtubs,
 - (g) Drinking fountains, and
 - (h) Bidets.
 - 6.11.1.2 Excludes:
 - (a) Domestic hot water heaters (see D 2020, Domestic Water Distribution).
 - (b) Hose bibbs (see D 2020, Domestic Water Distribution), and
 - (c) Other equipment (see D 2090, Other Plumbing Systems).
 - 6.11.2 *Domestic Water Distribution (D 2020)*:
 - 6.11.2.1 Includes:
 - (a) Pipes and fittings,
 - (b) Valves, hydrants, and hose bibbs,
 - (c) Water heaters,
 - (d) Domestic water supply equipment, and
 - (e) Insulation.
 - 6.11.2.2 Excludes:
 - (a) Plumbing fixtures (see D 2010, Plumbing Fixtures).
 - 6.11.3 *Sanitary Waste (D 2030)*:
 - 6.11.3.1 Includes:
 - (a) Waste pipe and fittings,
 - (b) Vent pipe and fittings,
 - (c) Floor drains,
 - (d) Sanitary waste equipment, and
 - (e) Insulation.
 - 6.11.4 *Rain Water Drainage (D 2040)*:
 - 6.11.4.1 Includes:
 - (a) Pipe and fittings,
 - (b) Roof drains, and
 - (c) Insulation.
 - 6.11.4.2 Excludes:
 - (a) Gutters and downspouts (see B 3010, Roof Coverings).
 - 6.11.5 *Other Plumbing Systems (D 2090)*:
 - 6.11.5.1 Includes:
 - (a) Other piping systems,
 - (b) Gas distribution,
 - (c) Acid waste systems,
 - (d) Pool equipment, and
 - (e) Fountain piping systems and devices.
- 6.12 *HVAC (D 30)*:
 - 6.12.1 *Energy Supply (D 3010)*:
 - 6.12.1.1 Includes:
 - (a) Oil, gas, and coal supply,
 - (b) Steam, hot and chilled water supply,
 - (c) Solar energy supply, and
 - (d) Wind energy supply.
 - 6.12.1.2 Excludes:
 - (a) Electrical energy supply systems (see D 5090, Other Electrical Systems, and D 5010, Electrical Service and Distribution).
 - 6.12.2 *Heat Generating Systems (D 3020)*:
 - 6.12.2.1 Includes:
 - (a) Boilers, including electric,
 - (b) Piping and fittings adjacent to boilers,
 - (c) Primary pumps,
 - (d) Auxiliary equipment, and
 - (e) Equipment and piping insulation.
 - 6.12.2.2 Excludes:
 - (a) Electric space unit heaters and baseboard, fuel fired unit heaters, furnaces (see D 3050, Terminal and Package Units).
 - (b) Controls and instrumentation (see D 3060, Controls and Instrumentation).
 - 6.12.3 *Cooling Generating Systems (D 3030)*:
 - 6.12.3.1 Includes:
 - (a) Chillers,
 - (b) Cooling towers and evaporative coolers,
 - (c) Condensing units,
 - (d) Piping and fittings,
 - (e) Primary pumps,
 - (f) Direct expansion systems, and
 - (g) Equipment and piping insulation.
 - 6.12.3.2 Excludes:
 - (a) Secondary chilled water pumps (see D 3040, Distribution Systems),
 - (b) Distribution piping (see D 3040, Distribution Systems), and
 - (c) Controls and instrumentation (see D 3060, Controls and Instrumentation).
 - 6.12.4 *Distribution Systems (D 3040)*:

6.12.4.1 Includes:

- (a) Supply and return air systems, including air handling units with coils (electric included), filters, ductwork, and associated devices such as VAV boxes, duct heaters, induction units and grilles,
- (b) Ventilation and exhaust systems,
- (c) Steam, hot water, glycol, and chilled water distribution,
- (d) Associated terminal devices including convectors, fan-coil units, and induction units, water and steam unit heaters,
- (e) Heat recovery equipment,
- (f) Auxiliary equipment such as secondary pumps, heat exchangers, sound attenuation, and vibration isolation, and
- (g) Piping, duct, and equipment insulation.

6.12.4.2 Excludes:

- (a) Electric, gas, or oil fired unit heaters (see D 3050, Terminal and Package Units),
- (b) Furnaces (gas or oil) (see D 3050, Terminal and Package Units),
- (c) Floor, ceiling, and rooftop package units (see D 3050, Terminal and Package Units), and
- (d) Controls and instrumentation (see D 3060, Controls and Instrumentation).

6.12.5 *Terminal and Package Units (D 3050):*

6.12.5.1 Includes:

- (a) Electric baseboard,
- (b) Electric or fossil fuel fired unit heaters, unit ventilators, and radiant heaters,
- (c) Window or through-the-wall air conditioners, with or without heating of any type,
- (d) Reverse-cycle, water- or air-cooled, terminal heat pumps,
- (e) Wall sleeves where required,
- (f) Electric or fossil fuel fired air-handling units or furnaces,
- (g) Self-contained, air- or water-cooled, floor, ceiling, and rooftop air conditioners, and heat pumps,
- (h) Ductwork and accessories, including flue stacks, and
- (i) Factory-integrated controls.

6.12.5.2 Excludes:

- (a) Piping and accessories (see D 3040, Distribution Systems),
- (b) Hydronic or steam convectors, fan-coil units (see D 3040, Distribution Systems),
- (c) Cooling towers, remote air-cooled condensers, evaporative coolers (see D 3030, Cooling Generation Systems),
- (d) Air-handling units with only hydronic heating or steam coils (see D 3040, Distribution Systems), and
- (e) Air-handling units with chilled water or direct expansion cooling coils (see D 3040, Distribution Systems).

6.12.6 *Controls and Instrumentation (D 3060):*

6.12.6.1 Includes for:

- (a) Heating generating systems,
- (b) Cooling generating systems,
- (c) Heating/cooling air handling units,
- (d) Exhaust and ventilating systems,
- (e) Terminal devices,
- (f) Energy monitoring and control, and
- (g) Building automation systems.

6.12.6.2 Excludes:

- (a) Factory-installed controls, when an integral part of terminal and package units (see D 3050, Terminal and Package Units).

6.12.7 *Systems Testing and Balancing (D 3070):*

6.12.7.1 Includes:

- (a) Piping systems testing and balancing, and
- (b) Air systems testing and balancing.

6.12.8 *Other HVAC Systems and Equipment (D 3090):*

6.12.8.1 Includes:

- (a) Special cooling systems and devices,
- (b) Special humidity control,
- (c) Dust and fume collectors,
- (d) Air curtains,
- (e) Air purifiers,
- (f) Paint spray booth ventilation systems, and
- (g) General construction items associated with mechanical systems.

6.13 *Fire Protection (D 40):*

6.13.1 *Sprinklers (D 4010):*

6.13.1.1 Includes:

- (a) Water supply equipment,
- (b) Piping valves and fittings, and
- (c) Sprinkler heads and release devices.

6.13.2 *Standpipes (D 4020):*

6.13.2.1 Includes:

- (a) Water supply equipment,
- (b) Piping valves and fittings, and
- (c) Cabinets and hoses.

6.13.3 *Fire Protection Specialties (D 4030):*

6.13.3.1 Includes:

- (a) Fire extinguishers, and
- (b) Fire extinguisher cabinets.

6.13.4 *Other Fire Protection Systems (D 4090):*

6.13.4.1 Includes:

- (a) Carbon dioxide systems,
- (b) Clean agent systems,
- (c) Foam generating systems,
- (d) Dry chemical systems, and
- (e) Exhaust hood systems.

6.14 *Electrical (D 50):*

6.14.1 *Electrical Service and Distribution (D 5010):*

6.14.1.1 Includes:

- (a) Primary transformers,
- (b) Secondary transformers,
- (c) Main switchboard,
- (d) Interior distribution transformers,
- (e) Branch circuit panels,
- (f) Enclosed circuit breakers,
- (g) Motor control centers, and
- (h) Conduit and wiring to circuit panels.

6.14.1.2 Excludes:

- (a) Outdoor transformers (see G 4010, Electrical Distribution),
- (b) Emergency power (see D 5090, Other Electrical Systems), and
- (c) Branch wiring (see D 5020, Lighting and Branch Wiring).

- 6.14.2 *Lighting and Branch Wiring (D 5020):*
- 6.14.2.1 Includes:
- (a) Branch wiring and devices for lighting fixtures,
 - (b) Lighting fixtures,
 - (c) Branch wiring for devices and equipment connections,
 - (d) Devices, and
 - (e) Exterior building lighting.
- 6.14.2.2 Excludes:
- (a) Underfloor raceways (see D 5090, Other Electrical Systems), and
 - (b) Exterior site lighting (see G4020, Site Lighting).
- 6.14.3 *Communications and Security (D 5030):*
- 6.14.3.1 Includes:
- (a) Fire alarm systems,
 - (b) Call systems,
 - (c) Telephone systems,
 - (d) Local area networks,
 - (e) Public address and music systems,
 - (f) Intercommunication systems and paging,
 - (g) Clock and program systems,
 - (h) Television systems, and
 - (i) Security systems.
- 6.14.3.2 Excludes:
- (a) Other electrical systems (see D 5090, Other Electrical Systems).
- 6.14.4 *Other Electrical Systems (D 5090):*
- 6.14.4.1 Includes:
- (a) Emergency generators,
 - (b) UPS,
 - (c) Emergency lighting systems,
 - (d) Power factor correction,
 - (e) Lightning and grounding protection systems, and
 - (f) Raceway systems, and
 - (g) Power generation systems.
- 6.14.4.2 Excludes:
- (a) Electric baseboard (see D 3050, Terminal and Package Units),
 - (b) Electric coils and duct heaters (see D 3040, Distribution Systems),
 - (c) Building automation and energy monitoring systems (see D 3060, Controls and Instrumentation), and
 - (d) Communications and security systems (see D 5030, Communications and Security).
- 6.15 *Equipment (E 10):*
- 6.15.1 *Commercial Equipment (E 1010):*
- 6.15.1.1 Includes:
- (a) Security and vault equipment,
 - (b) Teller and service equipment,
 - (c) Registration equipment,
 - (d) Checkroom equipment,
 - (e) Mercantile equipment,
 - (f) Commercial laundry and dry cleaning equipment,
 - (g) Vending equipment, and
 - (h) Office equipment.
- 6.15.2 *Institutional Equipment (E 1020):*
- 6.15.2.1 Includes:
- (a) Ecclesiastical equipment,
 - (b) Library equipment,
 - (c) Theater and stage equipment,
 - (d) Instrumental equipment,
 - (e) Audio-visual equipment,
 - (f) Detention equipment,
 - (g) Laboratory equipment,
 - (h) Medical equipment, and
 - (i) Mortuary equipment.
- 6.15.3 *Vehicular Equipment (E 1030):*
- 6.15.3.1 Includes:
- (a) Vehicular service equipment,
 - (b) Parking control equipment, and
 - (c) Loading dock equipment.
- 6.15.4 *Other Equipment (E 1090):*
- 6.15.4.1 Includes:
- (a) Maintenance equipment,
 - (b) Solid waste handling equipment,
 - (c) Food service equipment,
 - (d) Residential equipment,
 - (e) Unit kitchens,
 - (f) Darkroom equipment,
 - (g) Athletic, recreational, and therapeutic equipment,
 - (h) Planetarium equipment,
 - (i) Observatory equipment, and
 - (j) Agricultural equipment.
- 6.16 *Furnishings (E 20):*
- 6.16.1 *Fixed Furnishings (E 2010):*
- 6.16.1.1 Includes:
- (a) Fixed artwork,
 - (b) Fixed casework,
 - (c) Window treatment,
 - (d) Fixed floor grilles and mats,
 - (e) Fixed multiple seating, and
 - (f) Fixed interior landscaping.
- 6.16.2 *Movable Furnishings (E 2020):*
- 6.16.2.1 Includes:
- (a) Movable artwork,
 - (b) Furniture and accessories,
 - (c) Movable rugs and mats,
 - (d) Movable multiple seating, and
 - (e) Movable interior landscaping.
- 6.17 *Special Construction (F 10):*
- 6.17.1 *Special Structures (F 1010):*
- 6.17.1.1 Includes:
- (a) Air supported structures,
 - (b) Pre-engineered structures, and
 - (c) Other special structures.
- 6.17.2 *Integrated Construction (F 1020):*
- 6.17.2.1 Includes:
- (a) Integrated assemblies,
 - (b) Special purpose rooms, and
 - (c) Other integrated construction.
- 6.17.3 *Special Construction Systems (F 1030):*
- 6.17.3.1 Includes:
- (a) Sound, vibration, and seismic construction,
 - (b) Radiation protection,
 - (c) Special security systems, and
 - (d) Other special construction systems.
- 6.17.4 *Special Facilities (F 1040):*

6.17.4.1 Includes:

- (a) Aquatic facilities,
- (b) Ice rinks,
- (c) Site constructed incinerators,
- (d) Kennels and animal shelters,
- (e) Liquid and gas storage tanks, and
- (f) Other special facilities.

6.17.5 *Special Controls and Instrumentation (F 1050)*:

6.17.5.1 Includes:

- (a) Recording instrumentation,
- (b) Building automation systems, and
- (c) Other special controls and instrumentation.

6.18 *Selective Building Demolition (F 20)*:

6.18.1 *Building Elements Demolition (F 2010)*:

6.18.1.1 Includes:

- (a) Demolition of existing building components.

6.18.1.2 Excludes:

(a) Site demolition (see G1020, Site Demolition and Relocations).

6.18.2 *Hazardous Components Abatement (F 2020)*:

6.18.2.1 Includes:

(a) Removal or encapsulation of hazardous building materials and components.

7. Description of Building-Related Sitework

7.1 The following lists show what items are included and excluded in the sitework classification at Level 3. Note again that the table in Fig. 3 incorporates an alphanumeric designation for the classification; a single character letter code for Level 1 Major Group Elements, a three character alphanumeric code for Level 2 Group Elements, and a five character code for Level 3.

7.2 *Site Preparation (G 10)*:

7.2.1 *Site Clearing (G 1010)*:

7.2.1.1 Includes:

- (a) Clearing and grubbing, and
- (b) Tree removal and thinning.

7.2.2 *Site Demolition and Relocations (G 1020)*:

7.2.2.1 Includes:

- (a) Complete building demolition,
- (b) Demolition of site components, and
- (c) Relocation of buildings and utilities.

7.2.2.2 Excludes:

(a) Selective demolition within building (see F 20, Selective Building Demolition).

7.2.3 *Site Earthwork (G 1030)*:

7.2.3.1 Includes:

- (a) Grading, excavating, and fill to modify site contours,
- (b) Soil stabilization and treatment,
- (c) Site dewatering,
- (d) Site shoring, and
- (e) Embankments.

7.2.3.2 Excludes:

(a) Building excavation for foundations and basements (see A 10, Foundations and A 20, Basement Construction).

7.2.4 *Hazardous Waste Remediation (G 1040)*:

7.2.4.1 Includes:

- (a) Removal and restoration of contaminated soil.

7.3 *Site Improvement (G 20)*:

7.3.1 *Roadways (G 2010)*:

7.3.1.1 Includes:

- (a) Paving sub-base,
- (b) Paving and surfacing,
- (c) Curbs and gutters,
- (d) Rails and barriers,
- (e) Painted lines, and
- (f) Markings and signage.

7.3.2 *Parking Lots (G 2020)*:

7.3.2.1 Includes:

- (a) Parking lot paving and surfacing,
- (b) Curbs, rails, and barriers,
- (c) Parking booths and equipment, and
- (d) Markings and signage.

7.3.3 *Pedestrian Paving (G 2030)*:

7.3.3.1 Includes:

- (a) Paving and surfacing, and
- (b) Exterior steps.

7.3.3.2 Excludes:

(a) Waterproof membranes under terrace and plaza paving (see B3010, Roof Coverings).

7.3.4 *Site Development (G 2040)*:

7.3.4.1 Includes:

- (a) Fences and gates,
- (b) Retaining walls,
- (c) Terrace and perimeter walls,
- (d) Signs,
- (e) Site furnishings,
- (f) Fountains, pools, and watercourses,
- (g) Playing fields,
- (h) Flagpoles,
- (i) Miscellaneous structures, and
- (j) Site equipment (for example, car wash, banking system and theatre equipment located on the site).

7.3.4.2 Excludes:

(a) Signs (see G2010, Roadways, and G2020, Parking Lots).

7.3.5 *Landscaping (G 2050)*:

7.3.5.1 Includes:

- (a) Fine grading and soil preparation,
- (b) Top soil and planting beds,
- (c) Seeding and sodding,
- (d) Planting,
- (e) Planters,
- (f) Other landscape features, and
- (g) Irrigation systems.

7.3.5.2 Excludes:

(a) Interior planters and planting (see E 20, Furnishings), and
 (b) Site grading (see G 1030, Site Earthwork).

7.4 *Site Mechanical Utilities (G 30)*:

7.4.1 *Water Supply (G 3010)*:

7.4.1.1 Includes:

- (a) Potable and non-potable water systems,
- (b) Well systems,
- (c) Fire protection systems,
- (d) Pumping stations, and
- (e) Water storage.

- 7.4.1.2 Excludes:
 (a) Irrigation systems (see G 2050, Landscaping).
- 7.4.2 *Sanitary Sewer (G 3020)*:
- 7.4.2.1 Includes:
 (a) Piping,
 (b) Manholes,
 (c) Septic tanks,
 (d) Lift stations, and
 (e) Package waste water treatment plants.
- 7.4.3 *Storm Sewer (G 3030)*:
- 7.4.3.1 Includes:
 (a) Piping,
 (b) Manholes,
 (c) Catch basins,
 (d) Lift stations,
 (e) Retention ponds, and
 (f) Ditches and culverts.
- 7.4.4 *Heating Distribution (G 3040)*:
- 7.4.4.1 Includes:
 (a) Steam supply,
 (b) Condensate return
 (c) Hot water supply systems, and
 (d) Pumping stations.
- 7.4.4.2 Excludes:
 (a) Service tunnels (see G 9010, Service and Pedestrian Tunnels).
- 7.4.5 *Cooling Distribution (G 3050)*:
- 7.4.5.1 Includes:
 (a) Chilled water piping,
 (b) Wells for cooling,
 (c) Pumping stations, and
 (d) Cooling towers on site.
- 7.4.5.2 Excludes:
 (a) Service tunnels (see G 9010, Service and Pedestrian Tunnels).
- 7.4.6 *Fuel Distribution (G 3060)*:
- 7.4.6.1 Includes:
 (a) Piping,
 (b) Equipment, and
 (c) Storage tanks.
- 7.4.7 *Other Site Mechanical Utilities (G 3090)*:
- 7.4.7.1 Includes:
 (a) Industrial waste systems, and
 (b) POL (Petroleum Oil and Lubricants) distribution systems.
- 7.5 *Site Electrical Utilities (G 40)*:

- 7.5.1 *Electrical Distribution (G 4010)*:
- 7.5.1.1 Includes:
 (a) Substations,
 (b) Overhead power distribution,
 (c) Underground power distribution,
 (d) Ductbanks, and
 (e) Grounding.
- 7.5.2 *Site Lighting (G 4020)*:
- 7.5.2.1 Includes:
 (a) Fixtures and transformers,
 (b) Poles,
 (c) Wiring conduits and ductbanks,
 (d) Controls, and
 (e) Grounding.
- 7.5.3 *Site Communications and Security (G 4030)*:
- 7.5.3.1 Includes:
 (a) Overhead and underground communications,
 (b) Site security and alarm systems,
 (c) Ductbanks, and
 (d) Grounding.
- 7.5.4 *Other Site Electrical Utilities (G 4040)*:
- 7.5.4.1 Includes:
 (a) Cathodic protection, and
 (b) Emergency power generation.
- 7.6 *Other Site Construction (G 90)*:
- 7.6.1 *Service and Pedestrian Tunnels (G 9010)*:
- 7.6.1.1 Includes:
 (a) Constructed service and pedestrian tunnels and trench boxes, and
 (b) Prefabricated service and pedestrian tunnels and trench boxes.
- 7.6.2 *Other Site Systems (G 9090)*:
- 7.6.2.1 Includes:
 (a) Snow melting systems.

8. Keywords

8.1 building assemblies; building economics; building elemental format; building elements; building functional elements; building systems classification; cost estimation; cost planning; design economics; economic analysis; economic evaluation; elemental building classification; elemental/systems specifications; facilities planning; life-cycle costing; master schedules; outline specifications; risk analysis; standard classification of building systems; UNIFORMAT; value engineering

APPENDIXES**(Nonmandatory Information)****X1. Example Level 4 for the UNIFORMAT II Classification**

The example Level 4 Classification of sub-elements for buildings and related sitework in Tables X1.1 and X1.2 is adapted from Section 5 of NIST report 6389 on UNIFORMAT II⁶.

Level 4 includes an additional 274 designators for buildings, and 128 for sitework. It can be utilized to develop more comprehensive databases for capital and life-cycle costs, and to

facilitate building condition assessment, reporting, and budgeting. Level 4 of Section G, Sitework, is particularly applicable to small and medium-sized civil works projects such as parks and multi-building sites.

TABLE X1.1 Example Level 4 for the UNIFORMAT II Classification of Building Elements

| Level 3 Elements | Level 4 Sub-Elements |
|----------------------------|---|
| A1010 Standard Foundations | A101001 Wall Foundations A101002 Column Foundations A101003 Perimeter Drainage A101004 Perimeter Insulation |
| A1020 Special Foundations | A102001 Pile Foundations A102002 Grade Beams A102003 Caissons A102004 Underpinning A102005 Dewatering A102006 Raft (Mat) Foundations A102007 Pressure Injected Grouting A102099 Other Foundation Conditions |
| A1030 Slab on Grade | A103001 Standard Slab on Grade A103002 Structural Slab at Grade A103003 Inclined Slab on Grade A103004 Inclined Slab at Grade A103005 Trenches A103006 Pits & Bases A103007 Under-Slab Drainage A103008 Under-Slab Insulation |
| A2010 Basement Excavation | A201001 Excavation for Basements A201002 Structure Backfill & Compaction A201003 Sheeting, Shoring & Bracing |
| A2020 Basement Walls | A202001 Basement Wall Construction A202002 Moisture Protection A202003 Basement Wall Insulation |
| B1010 Floor Construction | B101001 Suspended Basement Floor Construction B101002 Upper Floor Construction B101003 Balcony Floor Construction B101004 Ramps B101005 Exterior Stairs and Fire Escapes B101006 Floor Raceway Systems B101099 Other Floor Construction |
| B1020 Roof Construction | B102001 Flat Roof Construction B102002 Pitched Roof Construction B102003 Vaulted Roof Construction B102004 Dome Construction B102005 Fabric (tensile) Roof Construction B102006 Canopies B102099 Other Roof Construction |
| B2010 Exterior Walls | B201001 Exterior Wall Construction B201002 Parapets B201003 Exterior Louvers, Screens, and Fencing B201004 Exterior Sun Control Devices B201005 Balcony Walls & Handrails B201006 Exterior Soffits |
| B2020 Exterior Windows | B202001 Windows B202002 Curtain Walls B202003 Storefronts B202004 Screened Openings |
| B2030 Exterior Doors | B203001 Glazed Doors & Entrances B203002 Solid Exterior Doors B203003 Revolving Doors B203004 Overhead Doors B203005 Door Wall Opening Elements B203006 Door Painting & Decoration B203099 Other Exterior Doors |
| B3010 Roof Coverings | B301001 Roof Finishes B301002 Traffic Toppings & Paving Membranes B301003 Roof Insulation & Fill B301004 Flashings & Trim B301005 Roof Eaves and Soffits B301006 Gutters and Downspouts |
| B3020 Roof Openings | B302001 Glazed Roof Openings B302002 Roof Hatches |

TABLE X1.1 *Continued*

| | |
|-----------------------------------|--|
| | B302003 Gravity Roof Ventilators |
| C1010 Partitions | C101001 Fixed Partitions C101002 Demountable Partitions C101003 Retractable Partitions C101004 Site Built Toilet Partitions C101005 Site Built Compartments and Cubicles C101006 Interior Balustrades and Screens C101007 Interior Windows & Storefronts |
| C1020 Interior Doors | C102001 Interior Doors C102002 Interior Door Frames C102003 Interior Door Hardware C102004 Interior Door Wall Opening Elements C102005 Interior Door Sidelights & Transoms C102006 Interior Hatches & Access Doors C102007 Door Painting & Decoration |
| C1030 Fittings | C103001 Fabricated Compartments & Cubicles C103002 Bath & Toilet Accessories C103003 Storage Specialties C103004 Fabricated Cabinets & Counters C103005 Identifying/Visual Aid Specialties C103006 Internal Traffic Protection/Aids C103007 Integrated Appurtenances C103099 Other Fittings |
| C2010 Stair Construction | C201001 Regular Stairs C201002 Curved Stairs C201003 Spiral Stairs C201004 Stair Handrails and Balustrades |
| C2020 Stair Finishes | C202001 Stair, Tread and Landing Finishes C202002 Stair Soffit Finishes C202003 Stair Handrail & Balustrade Finishes |
| C3010 Wall Finishes | C301001 Wall Finishes to Inside Exterior Walls C301002 Wall Finishes to Interior Walls C301003 Column Finishes |
| C3020 Floor Finishes | C302001 Floor Toppings & Coatings C302002 Traffic Membranes C302003 Hardeners and Sealers C302004 Flooring C302005 Carpeting C302006 Bases, Curbs and Trim C302007 Access Pedestal Flooring |
| C3030 Ceiling Finishes | C303001 Applied Ceiling Finishes C303002 Suspended Ceilings C303099 Other Ceiling Finishes |
| D1010 Elevators & Lifts | D101001 Passenger Elevators D101002 Freight Elevators D101003 Lifts |
| D1020 Escalators & Moving Walks | D102001 Escalators D102002 Moving Walks |
| D1090 Other Conveying Systems | D109001 Dumbwaiters D109002 Pneumatic Tube Systems D109003 Hoists & Cranes D109004 Conveyors D109005 Chutes D109006 Turntables D109007 Baggage Handling & Loading Systems D109008 Transportation Systems |
| D2010 Plumbing Fixtures | D201001 Water Closets D201002 Urinals D201003 Lavatories D201004 Sinks D201005 Bathtubs D201006 Wash Fountains D201007 Showers D201008 Drinking Fountains and Coolers D201009 Bidets D201010 Safety Showers/Eyewashes D201099 Other Plumbing Fixtures |
| D2020 Domestic Water Distribution | D202001 Cold Water Service D202002 Hot Water Service |

TABLE X1.1 *Continued*

| | |
|--------------------------------------|--|
| | D202003 Domestic Water Supply Equipment |
| D2030 Sanitary Waste | D203001 Waste Piping D203002 Vent Piping D203003 Floor Drains D203004 Sanitary Waste Equipment |
| D2040 Rain Water Drainage | D204001 Pipe & Fittings D204002 Roof Drains D204003 Rainwater Drainage Equipment |
| D2090 Other Plumbing Systems | D209001 Gas Distribution D209002 Acid Waste Systems D209003 Interceptors D209004 Pool Piping and Equipment D209005 Decorative Fountain Piping & Devices D209006 Special Water Systems D209099 Misc. Other Plumbing Systems |
| D3010 Energy Supply | D301001 Oil Supply System D301002 Gas Supply System D301003 Coal Supply System D301004 Steam Supply System D301005 Hot Water Supply System D301006 Chilled Water Supply System D301007 Solar Energy System D301008 Wind Energy System D301009 Fuel Cell Systems D301099 Other Energy Supply Systems |
| D3020 Heat Generating Systems | D302001 Boilers D302002 Boiler Room Piping & Specialties D302003 Auxiliary Equipment D302004 Insulation |
| D3030 Cooling Generating Systems | D303001 Chilled Water Systems D303002 Direct Expansion Systems |
| D3040 Distribution Systems | D304001 Air Distribution Systems D304002 Exhaust Ventilation Systems D304003 Steam Distribution Systems D304004 Hot Water Distribution D304005 Chilled Water Distribution D304006 Change-over Distribution System D304007 Glycol Distribution Systems |
| D3050 Terminal & Package Units | D305001 Terminal Self-Contained Units D305002 Package Units |
| D3060 Controls & Instrumentation | D306001 Heating Generating Systems D306002 Cooling Generating Systems D306003 Heating/Cooling Air Handling Units D306004 Exhaust & Ventilating Systems D306005 Hoods and Exhaust Systems D306006 Terminal Devices D306007 Energy Monitoring & Control D306008 Building Automation Systems D306099 Other Controls & Instrumentation |
| D3070 Systems Testing & Balancing | D307001 Piping System Testing & Balancing D307002 Air Systems Testing & Balancing D307003 HVAC Commissioning D307099 Other Systems Testing and Balancing |
| D3090 Other HVAC Systems & Equipment | D309001 Special Cooling Systems & Devices D309002 Special Humidity Control D309003 Dust & Fume Collectors D309004 Air Curtains D309005 Air Purifiers D309006 Paint Spray Booth Ventilation D309007 General Construction Items (HVAC) D309099 Misc. Other HVAC Systems & Equipment |
| D4010 Sprinklers | D401001 Sprinkler Water Supply D401002 Sprinkler Pumping Equipment D401003 Wet Sprinkler Systems D401004 Dry Sprinkler Systems |
| D4020 Standpipes | D402001 Standpipe Water Supply D402002 Pumping Equipment D402003 Standpipe Equipment |

TABLE X1.1 *Continued*

| | |
|---|---|
| | D402004 Fire Hose Equipment & Cabinets |
| D4030 Fire Protection Specialties | D403001 Fire Extinguishers D403002 Fire Extinguisher Cabinets D403099 Other Fire Protection Specialties |
| D4090 Other Fire Protection Systems | D409001 Carbon Dioxide Systems D409002 Foam Generating Equipment D409003 Clean Agent System D409004 Dry Chemical Systems D409005 Hood & Duct Fire Protection D409099 Misc. Other Fire Protection Systems |
| D5010 Electrical Service & Distribution | D501001 Incoming Service D501002 Service Distribution |
| D5020 Lighting & Branch Wiring | D502001 Branch Wiring and Devices D502002 Lighting Equipment |
| D5030 Communications & Security | D503001 Public Address & Music Systems D503002 Intercommunication & Paging Systems D503003 Telephone Systems D503004 Call Systems D503005 Television Systems D503006 Data Networking D503007 Fire Alarm Systems D503008 Security and Detection Systems D503009 Clock and Program Systems D503099 Other Communications & Security Systems |
| D5090 Other Electrical Systems | D509001 Grounding Systems D509002 Emergency Light & Power Systems D509003 Floor Raceway Systems D509004 General Construction Items (Elect.) D509005 Lightning Protection System D509099 Misc. Other Electrical Systems |
| E1010 Commercial Equipment | E101001 Security & Vault Equipment E101002 Teller and Service Equipment E101003 Registration Equipment E101004 Checkroom Equipment E101005 Mercantile Equipment E101006 Laundry & Dry Cleaning Equipment E101007 Vending Equipment E101008 Office Equipment E101099 Other Commercial Equipment |
| E1020 Institutional Equipment | E102001 Ecclesiastical Equipment E102002 Library Equipment E102003 Theater & Stage Equipment E102004 Instrumental Equipment E102005 Auto-visual Equipment E102006 Detention Equipment E102007 Laboratory Equipment E102008 Medical Equipment E102099 Other Institutional Equipment |
| E1030 Vehicular Equipment | E103001 Vehicular Service Equipment E103002 Parking Control Equipment E103003 Loading Dock Equipment E103009 Other Vehicular Equipment |
| E1090 Other Equipment | E109001 Maintenance Equipment E109002 Solid Waste Handling Equipment E109003 Food Service Equipment E109004 Residential Equipment E109005 Unit Kitchens E109007 Window Washing Equipment E109099 Misc. Other Equipment |
| E2010 Fixed Furnishings | E201001 Fixed Artwork E201002 Fixed Casework E201003 Blinds and Other Window Treatment E201004 Fixed Floor Grilles and Mats E201005 Fixed Multiple Seating E201006 Fixed Interior Landscaping |
| E2020 Movable Furnishings | E202001 Movable Artwork E202002 Furniture & Accessories E202003 Movable Rugs and Mats E202004 Movable Multiple Seating |

TABLE X1.1 *Continued*

| | |
|--|---|
| | E202005 Movable Interior Landscaping |
| F1010 Special Structures | F101001 Air Supported Structures F101002 Pre-engineered Structures F101003 Other Special Structures |
| F1020 Integrated Construction | F102001 Integrated Assemblies F102002 Special Purpose Rooms F102003 Other Integrated Construction |
| F1030 Special Construction Systems | F103001 Sound, Vibration & Seismic Const. F103002 Radiation Protection F103003 Special Security Systems F103004 Vaults F103099 Other Special Construction Systems |
| F1040 Special Facilities | F104001 Aquatic Facilities F104002 Ice Rinks F104003 Site Constructed Incinerators F104004 Kennels & Animal Shelters F104005 Liquid & Gas Storage Tanks F104099 Other Special Facilities |
| F1050 Special Controls & Instrumentation | F105001 Recording Instrumentation F105002 Building Automation Systems F105099 Other Special Controls & Instrumentation |
| F2010 Building Elements Demolition | F201001 Building Interior Demolition F201002 Building Exterior Demolition |
| F2020 Hazardous Components Abatement | F202001 Removal of Hazardous Components F202002 Encapsulation of Hazardous Components |

TABLE X1.2 Example Level 4 for the UNIFORMAT II Classification of Building Related Sitework

| | |
|-------------------------------------|---|
| G1010 Site Clearing | G101001 Clearing & Grubbing G101002 Tree Removal & Thinning |
| G1020 Site Demolition & Relocations | G102001 Building Demolition G102002 Demolition of Site Components G102003 Relocation of Buildings G102004 Utilities Relocation |
| G1030 Site Earthwork | G103001 Site Grading Excavation & Disposal G103002 Borrow Fill G103003 Soil Stabilization & Treatment G103004 Site Dewatering G103005 Site Shoring G103006 Embankments |
| G1040 Hazardous Waste Remediation | G104001 Removal of Contaminated Soil G104002 Soil Restoration & Treatment G104099 Other Hazardous Waste Remediation |
| G2010 Roadways | G201001 Bases and Sub-Bases G201002 Paving & Surfacing G201003 Curbs Gutters & Drains G201004 Guardrails and Barriers G201005 Painted Lines & Markings G201006 Signage G201007 Vehicular Bridges |
| G2020 Parking Lots | G202001 Bases and Sub-Bases G202002 Paving & Surfacing G202003 Curbs, Gutters & Drains G202004 Rails & Barriers G202005 Parking Booths & Equipment G202006 Painted Lines & Markings G202007 Signage |
| G2030 Pedestrian Paving | G203001 Bases & Sub-Bases G203002 Paving & Surfacing G203003 Drains G203004 Edging G203005 Exterior Steps & Ramps G203006 Pedestrian Bridges |
| G2040 Site Development | G204001 Fences & Gates |

TABLE X1.2 *Continued*

| | |
|---------------------------------------|---|
| | G204002 Retaining Walls G204003 Terracing & Perimeter Walls G204004 Signage G204005 Site Furnishings G204006 Fountains, Pools & Watercourses G204007 Playing Fields G204008 Flagpoles G204099 Other Site Development |
| G2050 Landscaping | G205001 Fine Grading & Soil Preparation G205002 Erosion Control Measures G205003 Top Soil and Planting Beds G205004 Seeding and Sodding G205005 Planting G205006 Planters G205007 Irrigation Systems G205099 Other Landscaping |
| G3010 Water Supply | G301001 Potable Water Distribution and Storage G301002 Non Potable Water Distrib. and Storage G301003 Well Systems G301004 Fire Protection Distribution and Storage G301005 Pumping Stations G301006 Package Water Treatment Plants |
| G3020 Sanitary Sewer | G302001 Piping G302002 Manholes & Cleanouts G302003 Septic Disposal Systems G302004 Lift Stations G302005 Packaged Water Waste Treatment Plants |
| G3030 Storm Sewer | G303001 Piping G303002 Manholes G303003 Headwalls & Catch Basins G303004 Lift Stations G303005 Retention Ponds G303006 Ditches & Culverts G303007 Dry Wells |
| G3040 Heating Distribution | G304001 Steam Supply G304002 Condensate Return G304003 Hot Water Supply System G304004 Pumping Stations |
| G3050 Cooling Distribution | G305001 Chilled Water Piping G305002 Wells for Cooling/Heating G305003 Pumping Stations G305004 Cooling Towers on Site |
| G3060 Fuel Distribution | G306001 Fuel Piping G306002 Fuel Equipment G306003 Fuel Storage Tanks G306004 Fuel Dispensing Stations |
| G3090 Other Site Mechanical Utilities | G309001 Industrial Waste Systems G309002 POL (Petroleum Oil & Lubricants) Distribution Systems |
| G4010 Electrical Distribution | G401001 Transforming Equipment G401002 Distribution Lines G401003 Distribution Equipment |
| G4020 Site Lighting | G402001 Fixtures & Transformers G402002 Poles G402003 Wiring Conduits & Ductbanks G402004 Site Lighting Controls |
| G4030 Site Communication & Security | G403001 Site Communications Systems G403002 Site Security & Alarm Systems |
| G4090 Other Site Electrical Utilities | G409001 Cathodic Protection G409002 Site Emergency Power Generation |
| G9010 Service & Pedestrian Tunnels | G901001 Service Tunnels G901002 Trench Boxes G901003 Pedestrian Tunnels |
| G9090 Other Site Systems & Equipment | G909001 Snow Melting Systems |

X2. UNIFORMAT II Elemental Estimates

The elemental estimate summary example is described in Tables X2.1–X2.3 for an 8-story office building. The example is adapted from NIST report 6389 on UNIFORMAT II⁶. Designations of Field Requirements, Office Overload and Profit conform to ASTM Standard E 2083.

Building costs are identified separately from sitework costs that tend to vary extensively from project to project. Thus the historical cost data for buildings can be recycled to develop relatively accurate budgets for new building projects.

The elemental estimate summary example that follows has three separate sections; the Building Cost Summary, the Sitework Cost Summary, and Total Construction Cost Summary. Note that Subtotal A is the total estimated subcontractor bid excluding design allowances.

TABLE X2.1 UNIFORMAT II Elemental Cost Summary for Buildings

| Project | Example - 8 Story Office Building | | | | | | GFA 54,000 SF |
|--|-----------------------------------|-----------|------|-----------|------|-------------------|---------------|
| LEVEL 2 GROUP ELEMENTS Level 3 Elements | Ratio | Element | | | | Cost per Unit GFA | |
| | Qty/GFA | Quantity | Unit | Rate | Cost | | |
| A10 FOUNDATIONS | - | - | | | | 69,726.50 | 1.29 |
| A1010 Standard Foundations | 0.11 | 6,000.00 | SF | 7.67 | | 46,026.50 | 0.85 |
| A1020 Special Foundations | - | - | | | | - | |
| A1030 Slab on Grade | 0.11 | 6,000.00 | SF | 3.95 | | 23,700.00 | 0.44 |
| A20 BASEMENT CONSTRUCTION | - | - | | | | 78,467.20 | 1.40 |
| A2010 Basement Excavation | 0.05 | 2,700.00 | CY | 5.91 | | 15,960.00 | 0.30 |
| A2020 Basement Walls | 0.07 | 3,840.00 | SF | 15.50 | | 59,407.20 | 1.10 |
| B10 SUPERSTRUCTURE | - | - | | | | 688,569.96 | 12.75 |
| B1010 Floor Construction | 0.89 | 48,000.00 | SF | 13.37 | | 641,632.56 | 11.88 |
| B1020 Roof Construction | 0.11 | 6,000.00 | SF | 7.82 | | 48,937.40 | 0.87 |
| B20 EXTERIOR ENCLOSURE | - | - | | | | 794,141.00 | 14.71 |
| B2010 Exterior Walls | 0.47 | 25,500.00 | SF | 18.43 | | 469,900.00 | 8.70 |
| B2020 Exterior Windows | 0.12 | 6,600.00 | SF | 47.58 | | 314,041.00 | 5.82 |
| B2030 Exterior Doors | 0.00 | 5.00 | LVS | 2,040.00 | | 10,200.00 | 0.19 |
| B30 ROOFING | - | - | | | | 20,269.00 | 0.38 |
| B3010 Roof Coverings | 0.11 | 6,000.00 | SF | 3.25 | | 19,472.00 | 0.36 |
| B3020 Roof Openings | 0.00 | 11.30 | SF | 70.53 | | 797.00 | 0.01 |
| C10 INTERIOR CONSTRUCTION | - | - | | | | 235,604.00 | 4.36 |
| C1010 Partitions | 0.54 | 28,979.00 | SF | 5.37 | | 155,653.80 | 2.88 |
| C1020 Interior Doors | 0.00 | 66.00 | EA | 693.50 | | 45,771.00 | 0.85 |
| C1030 Fittings | 0.00 | 1.00 | Lot | 34,179.20 | | 34,179.20 | 0.63 |
| C20 STAIRS | - | - | | | | 120,600.00 | 2.23 |
| C2010 Stair Construction | 0.00 | 18.00 | FLT | 6,700.00 | | 120,600.00 | 2.23 |
| C2020 Stair Finishes | - | - | | | | - | |
| C30 INTERIOR FINISHES | - | - | | | | 325,683.43 | 6.03 |
| C3010 Wall Finishes | 0.81 | 43,484.00 | SF | 0.90 | | 39,125.68 | 0.72 |
| C3020 Floor Finishes | 0.69 | 37,350.00 | SF | 4.16 | | 155,469.75 | 2.88 |
| C3030 Ceiling Finishes | 0.96 | 52,100.00 | SF | 2.51 | | 130,988.00 | 2.43 |
| D10 CONVEYING | - | - | | | | 270,000.00 | 5.00 |
| D1010 Elevators & Lifts | 0.00 | 18.00 | STOP | 15,000.00 | | 270,000.00 | 5.00 |
| D1020 Escalators & Moving Walks | - | - | | | | - | |
| D1090 Other Conveying Systems | - | - | | | | - | |

TABLE X2.1 Continued

| Project | | Example - 8 Story Office Building | | | | GFA 54,000 SF | |
|---|---|-----------------------------------|-----------|------|-----------|-------------------|--------------|
| LEVEL 2 GROUP ELEMENTS | | Ratio | Element | | | Cost per Unit GFA | |
| Level 3 Elements | | Qty/GFA | Quantity | Unit | Rate | | Cost |
| D20 | PLUMBING | - | - | | - | 134,926.20 | 2.50 |
| D2010 | Plumbing Fixtures | 0.00 | 78.00 | FIX | 1,007.51 | 78,586.00 | 1.46 |
| D2020 | Domestic Water Distribution | 0.00 | 78.00 | FIX | 334.10 | 26,060.00 | 0.48 |
| D2030 | Sanitary Waste | 0.00 | 78.00 | FIX | 312.24 | 24,355.00 | 0.45 |
| D2040 | Rain Water Drainage | 0.11 | 6,000.00 | SF | 0.99 | 5,924.20 | 0.11 |
| D2090 | Other Plumbing Systems | - | - | | - | - | |
| D30 | HVAC | - | - | | - | 752,480.00 | 13.93 |
| D3010 | Energy Supply | - | - | | - | - | |
| D3020 | Heat Generating Systems | 0.02 | 1,088.00 | MBH | 21.69 | 23,600.00 | 0.44 |
| D3030 | Cooling Generating Systems | 0.00 | 150.00 | TR | 985.00 | 147,750.00 | 2.74 |
| D3040 | Distribution Systems | 0.89 | 48,000.00 | SF | 10.01 | 480,600.00 | 8.90 |
| D3050 | Terminal & Package Units | 0.11 | 6,000.00 | SF | 1.48 | 8,880.00 | 0.15 |
| D3060 | Controls and Instrumentation | 1.00 | 54,000.00 | SF | 1.80 | 86,400.00 | 1.60 |
| D3070 | Systems Testing & Balancing | 1.00 | 54,000.00 | SF | 0.10 | 5,230.00 | 0.10 |
| D3090 | Other HVAC Systems & Equipment | - | - | | - | - | |
| D40 | FIRE PROTECTION | - | - | | - | 103,655.00 | 1.92 |
| D4010 | Sprinklers | 0.01 | 270.00 | HDS | 308.22 | 83,220.00 | 1.54 |
| D4020 | Standpipes | 0.00 | 9.00 | | 2,270.56 | 20,435.00 | 0.38 |
| D4030 | Fire Protection Specialties | - | - | | - | - | |
| D4090 | Other Fire Protection Systems | - | - | | - | - | |
| D50 | ELECTRICAL | - | - | | - | 702,805.00 | 13.01 |
| D5010 | Electrical Service & Distribution | 0.01 | 360.00 | kW | 242.15 | 87,175.00 | 1.61 |
| D5020 | Lighting & Branch Wiring | 1.00 | 54,000.00 | SF | 8.64 | 466,380.00 | 8.64 |
| D5030 | Communication & Security | 1.00 | 54,000.00 | SF | 2.48 | 133,665.00 | 2.48 |
| D5090 | Other Electrical Systems | 0.00 | 30.00 | kW | 519.50 | 15,585.00 | 0.29 |
| E10 | EQUIPMENT | - | - | | - | 17,310.00 | 0.32 |
| E1010 | Commercial Equipment | - | - | | - | - | |
| E1020 | Institutional Equipment | - | - | | - | - | |
| E1030 | Vehicular Equipment | 0.00 | 1.00 | Lot | 10,655.00 | 10,655.00 | 0.20 |
| E1090 | Other Equipment | 0.00 | 1.00 | Lot | 6,655.00 | 6,655.00 | 0.12 |
| E20 | FURNISHINGS | - | - | | - | 55,716.00 | 1.03 |
| E2010 | Fixed Furnishings | 0.00 | 1.00 | Lot | 55,716.00 | 55,716.00 | 1.03 |
| E2020 | Movable Furnishings | - | - | | - | - | |
| F10 | SPECIAL CONSTRUCTION | - | - | | - | - | |
| F1010 | Special Structures | - | - | | - | - | |
| F1020 | Integrated Construction | - | - | | - | - | |
| F1030 | Special Construction Systems | - | - | | - | - | |
| F1040 | Special Facilities | - | - | | - | - | |
| F1050 | Special Controls and Instrumentation | - | - | | - | - | |
| F20 | SELECTIVE BUILDING CONSTRUCTION | - | - | | - | - | |
| F2010 | Building Elements Demolition | - | - | | - | - | |
| F2020 | Hazardous Components Abatement | - | - | | - | - | |
| Subtotal A - Building Elemental Cost without Design Allowance | | | | | | 4,366,832.29 | 80.87 |
| Z10 | Design Allowance | | | | 6.00 % | 262,009.94 | 4.85 |
| Subtotal B - Building Elemental Cost with Design Allowance | | | | | | 4,628,842.23 | 86.72 |
| Z20 | Field Requirements, Office Overhead & Profit | | | | 14.00 % | 648,037.91 | 12.00 |
| Z2010 | Field Requirements | | | | 9.00 % | 416,595.80 | 7.71 |
| Z2020 | Office Overhead & Profit | | | | 5.00 % | 231,442.11 | 4.29 |
| Subtotal C - Building Construction Cost without Inflation | | | | | | 5,276,880.14 | 87.72 |
| Z30 | Inflation Allowance | | | | 3.50 % | 184,690.80 | 3.42 |
| Building Construction Cost (BCC) | | | | | | 5,491,870.94 | 101.14 |

TABLE X2.2 UNIFORMAT II Elemental Cost Summary for Sitework

| Project | | Example - 8 Story Office Building | | | NSA 37,560 SF | | |
|------------------------|-------------------------|-----------------------------------|----------|------|---------------|-------------------|------|
| LEVEL 2 GROUP ELEMENTS | | Ratio Qty/ NSA | Element | | | Cost per Unit NSA | |
| Level 3 Elements | | | Quantity | Unit | Rate | | Cost |
| G10 | SITE PREPARATION | - | - | | - | 26,357.50 | 0.70 |
| G1010 | Site Clearing | 0.23 | 8,500.0 | SF | 0.35 | 2,950.00 | 0.08 |

TABLE X2.2 Continued

| Project | | Example - 8 Story Office Building | | | | NSA 37,560 SF | | |
|---|--|-----------------------------------|----------|----|---------|------------------|-------------|--|
| G1020 | Site Demolition and Relocations | - | - | | - | - | - | |
| G1030 | Site Earthwork | 1.16 | 43,650.0 | SF | 0.54 | 23,407.50 | 0.62 | |
| G1040 | Hazardous Waste Remediation | - | - | | - | - | - | |
| G20 | SITE IMPROVEMENTS | - | - | | - | 58,601.18 | 1.56 | |
| G2010 | Roadways | 0.06 | 2,400.0 | SF | 3.50 | 8,400.00 | 0.22 | |
| G2020 | Parkings Lots | 0.49 | 18,500.0 | SF | 1.99 | 36,900.00 | 0.98 | |
| G2030 | Pedestrian Paving | 0.03 | 1,000.0 | SF | 4.26 | 4,262.50 | 0.11 | |
| G2040 | Site Development | - | - | | - | - | - | |
| G2050 | Landscaping | 0.43 | 16,250.0 | SF | 0.56 | 9,038.68 | 0.24 | |
| G30 | SITE MECHANICAL UTILITIES | - | - | | - | 59,765.05 | 1.59 | |
| G3010 | Water Supply | 0 | 80.0 | LF | 19.59 | 1,567.20 | 0.04 | |
| G3020 | Sanitary Sewer | 0 | 120.0 | LF | 10.87 | 1,304.40 | 0.03 | |
| G3030 | Storm Sewer | 1.00 | 37,560.0 | SF | 0.97 | 36,526.60 | 0.97 | |
| G3040 | Heating Distribution | - | - | | - | - | - | |
| G3050 | Cooling Distribution | - | - | | - | - | - | |
| G3060 | Fuel Distribution | 0 | 135.0 | LF | 21.99 | 2,968.65 | 0.08 | |
| G3090 | Other Site Mechanical Utilities | 0.43 | 16,260.0 | SF | 1.07 | 17,398.20 | 0.46 | |
| G40 | SITE ELECTRICAL UTILITIES | - | - | | - | 44,686.90 | 1.19 | |
| G4010 | Electrical Distribution | 0 | 160.0 | SF | 195.69 | 31,310.90 | 0.83 | |
| G4020 | Site Lighting | 0.50 | 18,600.0 | SF | 0.61 | 11,256.00 | 0.30 | |
| G4030 | Site Communications & Security | 0.50 | 18,600.0 | SF | 0.11 | 2,120.00 | 0.06 | |
| G4090 | Other Site Electrical Utilities | - | - | | - | - | - | |
| G90 | OTHER SITE CONSTRUCTION | - | - | | - | - | - | |
| G9010 | Service and Pedestrian Tunnels | - | - | | - | - | - | |
| G9090 | Other Site Systems | - | - | | - | - | - | |
| Subtotal A - Sitework Elemental Cost without Design Allowance | | | | | | 189,410.63 | 5.04 | |
| Z50 | Design Allowance | | | | 6.00 % | 11,364.64 | 0.30 | |
| Subtotal B - Sitework Elemental Cost with Design Allowance | | | | | | 200,775.27 | 5.35 | |
| Z60 | Field Requirements, Office Overhead & Profit | | | | 14.00 % | 28,108.53 | 0.75 | |
| Z6010 | Field Requirements | | | | 9.00 % | 18,069.77 | 0.48 | |
| Z6020 | Office Overhead & Profit | | | | 5.00 % | 10,038.76 | 0.27 | |
| Subtotal C - Sitework Construction Cost without Inflation | | | | | | 228,883.80 | 6.09 | |
| Z70 | Inflation Allowance | | | | 3.50 % | 8,010.93 | 0.21 | |
| Sitework Construction Cost (SCC) | | | | | | 236,894.73 | 6.31 | |

TABLE X2.3 Total Construction Cost Summary (TCC)

| | Building | | Sitework | | Total | |
|---|-----------------------|---------------|---------------------|--------------|-----------------------|--------------|
| | Cost | % | Cost | % | Cost | % |
| Elemental Cost without Design Allowance | \$4,368,832.29 | 76.6 % | \$189,410.63 | 3.3 % | \$4,556,242.92 | 80.0 % |
| Design Allowance | \$262,009.94 | 4.6 % | \$11,364.64 | 0.2 % | \$273,374.58 | 4.8 % |
| Field Req'ments, Office OH & Profit | \$648,037.91 | 11.4 % | \$28,108.53 | 0.5 % | \$676,146.44 | 11.9 % |
| Inflation Allowance | \$184,690.80 | 3.2 % | \$8,010.93 | 0.1 % | \$192,701.73 | 3.4 % |
| Total Construction Cost (TCC) | \$5,461,570.94 | 95.8 % | \$236,894.73 | 4.2 % | \$4,698,465.67 | 100 % |

X3. Preliminary Project Descriptions (PPD)

Fig. X3.1, a sample schematic phase Preliminary Project Description (PPD), is taken from NIST report 6389 on UNIFORMAT II⁶ and Construction Specification Institute Practice FF/180, Preliminary Project Descriptions and Outline Specifications.

The PPD improves communications and coordination amongst all stakeholders early on in the building design process.

B SHELL

B10 SUPERSTRUCTURE

B1010 FLOOR CONSTRUCTION

- A. Floor System: Two-hour fire-rated, composite steel beam, steel deck, and concrete slab system in 20-foot by 25-foot bay dimensions capable of supporting 75 PSF live load.

B1020 ROOF CONSTRUCTION

- A. Roof System: Two-hour fire-rated, composite steel beam, steel deck, and concrete slab system in 20-foot by 25-foot bay dimensions capable of supporting 30 PSF live load.

B20 EXTERIOR CLOSURE

B2010 EXTERIOR WALLS

- A. Masonry Cavity Wall Construction:
 - 1. Modular face brick installed in running bond with tooled concave joints.
 - 2. Extruded polystyrene board installed between horizontal masonry reinforcing.
 - 3. Bituminous dampproofing applied over concrete masonry units.
 - 4. Load-bearing concrete masonry units with galvanized horizontal joint reinforcement.
 - 5. Concrete masonry unit lintel units over openings; concrete masonry unit bond beams at top of wall.
- B. Loose galvanized steel lintels over brick openings with 8-inch minimum bearing on each side of opening
- C. Elastomeric masonry flashing at sills, lintels, and other cavity interruptions.
- D. Open weep holes in brick masonry at flashing locations on 24-inch centers.

B2020 EXTERIOR WINDOWS

- A. Windows: Commercial-grade, aluminum double-hung windows with clear anodized finish and clear insulating glass.

B2030 EXTERIOR DOORS

- A. Doors and frames: Insulated, exterior flush steel doors set in steel frames.
- B. Hardware: Ball bearing butts, closers, locksets, thresholds, and weather-stripping.

¹ Construction Specification Institute, Practice FF/180, p. 5.

FIG. X3.1 Preliminary Project Description (PPD)¹

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