

Estimating Methodology Manual Education and Healthcare



Updated 5/08/2019

Prepared in conjunction with
CUMMING

TABLE OF CONTENTS

Page #

Estimating Methodology Overview	3
Division 1 General Requirements	6
Division 2 Existing Conditions	10
Division 3 Concrete	11
Division 4 Masonry	16
Division 5 Metal	17
Division 6 Woods & Plastics	21
Division 7 Thermal & Moisture Protection	24
Division 8 Doors & Windows	30
Division 9 Finishes	34
Division 10 Specialties	44
Division 11 Equipment	48
Division 12 Furnishings	51
Division 13 Special Construction	51
Division 14 Conveying Systems	53
Division 21 Fire Suppression	55
Division 22 Plumbing	56
Division 23 HVAC	62
Division 25 Integrated Automation	70
Division 26 Electrical	70
Division 27 Communications	77
Division 28 Electronic Safety and Security	79
Division 31 Earthwork	81
Division 32 Exterior Improvements	82
Division 33 Utilities	84
Appendix A: Infrastructure vs. Tenant Interior Delineations	86
Appendix B: WBS Template for Construction Costs	88

UNIVERSITY OF UTAH ESTIMATING METHODOLOGY OVERVIEW

Purpose

The Estimating Methodology Manual is intended to assist the University of Utah and its partners in standardizing project estimates & Contract Schedule of Values to allow for more efficient budgeting & communication.

DFCM & University of Utah Design Requirements & Contracts

Architects, Engineers, Contractors, & Consultants are to adhere to DFCM and University of Utah Design Requirements & Contracts on all projects for the University, whether the contract originates from DFCM or from the University of Utah. The requirements of these DFCM and University of Utah documents take precedence over this Estimating Methodology Manual.

Pricing

The University of Utah follows the traditional method of blending subcontractor costs into a single unit rate. This means that unit costs include not only the labor, materials, and equipment required for completion of the line item scope itself, but also the overhead, profit, burden, etc. required for a complete subcontract. A version of CSI MasterFormat is used. "Below the line" items are items carried by the Contractor and not by the Subcontractors, and may include the following:

- Bonds (Including Payment, Performance, and Subcontractor Bonds)
- General Liability Insurance
- Subcontractor Default Insurance
- Municipal or University Fees (Including Permits, Inspection Fees, Impact Fees, or Utility Connection Fees)
- Contractor's Fee
- Contractor's Contingency
- Allowances

DISCLAIMER

Pricing methodology indicated herein is intended to capture total system costs whenever possible. While this guide serves to provide as detailed a description as possible for all items comprising a system, it is by no means exhaustive. Additional details or break-outs beyond this manual may be requested.

Quantity Surveying

The University's quantity survey methodology is driven by the pricing methodology. For example, while it is possible to measure the actual linear feet of light-gauge steel studs, the University utilizes a square foot takeoff methodology since this is the industry standard for how interior framing scope is priced.

In certain instances, the quantity of material presented in the estimate does not necessarily reflect the actual physical quantity to be installed, but rather the standard measurement metric that goes along with the pricing metric. For example, interior framing areas do not deduct area at doors or windows. This is a standard in the industry, as the added area at these locations offsets the costs for headers, jambs, sills, cripple studs, and other factors that contribute to the overall cost of the system. Some of these methodology caveats are described in detail below.

Generic Measuring Conventions

FAÇADE

Door/window openings less than 50 square feet in size are only deducted from the overall system area if they represent a true cost savings. For example, by measuring plaster through punched windows, the added quantity offsets the cost incurred for returns, cut-ins, and difficulty associated with the perimeter of the windows. This applies to both the finish system as well as the framing system. Exceptions to this are handled on a case-by-case basis as appropriate for the specific project and finish material. These exceptions are noted in the introduction to the estimate.

GENERAL SITE UTILITY MEASURING CONVENTIONS

Measure all underground utility scope to within 5'-0" of the building perimeter (unless otherwise instructed). All costs outside of the range are typically carried under a separate "Site" estimate and segregated from the building costs.

CANOPIES / CONNECTOR BRIDGES

When detail is available, each component of the canopy / connector bridge (foundation, steel, finish, etc.) is broken out and included in the appropriate division as a separate line item and labeled accordingly **when attached to the structure**. When a canopy is a stand-alone element, it will be carried with the site improvements. When a canopy is attached to the building, but the entire scope is a separate buyout item, it is included in Division

MEP INFRASTRUCTURE BREAKOUT

The University of Utah defines MEP infrastructure as inclusive of the following:

- Main vertical plumbing lines (waste, vent, supply)
- Vertical ductwork penetrating floor slabs
- All roof drain systems
- All penetration, sleeving, and firestopping costs
- All rooftop equipment systems, including curbs, supplemental steel, anchorage, etc.
- All equipment in a remote central plant
- All equipment within a defined “mechanical” room
- All MEP within a tunnel, including racks
- All equipment craning costs
- All electrical scope upstream of the subpanel
- All envelope penetrations (roof vents, exhaust fans, etc.)
- All communications scope from the MPOE to the racks

All other MEP scope is generally considered a tenant improvement cost, and hinges on specific program/layout. See Appendix A: Infrastructure vs. Tenant Interior for further explanation

DIVISION 1 – GENERAL REQUIREMENTS

Administrative Requirements (Supervision & Coordination)

01 30 00

Material

None

Labor

Project staffing, including but not limited to: project administrators & assistants, project engineers, project managers, superintendents, assistant superintendents, and pro-rated project executives.

Equipment

None

Miscellaneous

Project meeting, office postage and reprographics, IT support, cost of pulling permits (permit fees excluded), digital & physical copies of as-built drawings.

Factors Affecting Cost

Staffing plan, duration, drug-testing requirements including immunization or other health screening, governing jurisdiction.

Excluded

Permits, city fees, independent third-party inspections, tests, agency fees, or quality consultants.

Notes

Items specifically noted above are not exhaustive of all general or supplemental conditions included in markup.

Progress Documentation & Building Information Modeling

01 32 00

Progress Documentation

Includes scheduling, photographic documentation, long lead & purchase order tracking, & other documentation to fulfill contract obligations. Survey & layout data that includes licensed land survey and control points for building and site throughout all phases of the project.

Building Information Modeling

BIM Development or management, as agreed upon by all parties, and generally to Level of Development 400. Detailing for shop drawings, clash detection, and as-builts are generally distributed within the trades' unit rates.

Sustainable Design Reporting

01 33 00

Includes administration & other costs related to the **required** compliance with DFCM's High-Performance Building Systems, LEED requirements (as applicable), or other sustainable design found in DFCM or University Design Standards, Owner's Project Requirements, Basis of Design, or Project Narrative.

Phasing Requirements

01 35 00

Project phasing effecting scheduling & cost.

Infection and Dust Control (GSF):

01 35 33

Includes temporary conditions required for infection or dust control and should be detailed out as much as possible. However, lacking this detail, an overall cost metric is applied to all scope occurring in or adjacent to existing facilities and is based on area impacted. Such scope includes temporary construction barriers / doors, HEPA filters installed in existing ductwork, negative air-machines, sticky entrance mats, and other items as required to protect existing space.

NOTE: "Dust Control" refers to controlling dust and other debris from entering existing spaces, whereas water sprayed on soil to prevent dust from rising into the air is under phase 01 50 00.

Indoor Air Quality Procedures (GSF):

01 35 46

Indoor Air Quality Controls are required and enforced by the University & DFCM. Procedures include, but are not limited to, temporary air plan, covering air grilles with filter media, "soft" barrier/enclosures, zip poles, fire rated visqueen poly, carpet masks, sticky mats, and tape.

Quality Requirements

01 40 00

Quality assurance & quality control measures, testing & inspections not by Owner, field samples & reporting, & mock-ups (includes costs for all trades)

Temporary Construction (Sometimes Called "General Conditions")

01 50 00

Material: Perimeter fence & gates, temporary access roads and parking, shuttling, parking SWPPP, tool/lunch structures, traffic / construction signage, temporary pavement markings, temporary trash chutes as required, temporary ladders / stairs, safety measures, temporary roof/weather protection.

Office trailer rental, office furniture, storage trailers, computers, copiers,

Labor: Fencing relocation, pest control, dust control, moisture tests, drug testing, daily cleanup, guard service, continuous cleanup, final cleanup, debris removal / dumpster pulls, and miscellaneous carpentry, pumping/mucking, street cleaning/sweeping, incentives/training programs, fire watch. Time is also included for acquiring Access Requests, Safety Requirements, and Fire Wall Penetration Log updating, etc., as required by the Scope of Work and Contract Documents.

Equipment: Material hoisting (including operator), trailer mobilization and setup, temporary water meter rental, temporary utility/lighting, temporary heat, office trailer dumpster / trash removal, temporary sanitary facilities, temporary ventilation equipment, temporary generators, forklift and material handling equipment rental, and water truck rental.

Temporary Electricity (MTH / GSF):

01 51 13

Temporary Power carried in Div. 01, even if provided by Electrical trade

Sanitary Facilities (MO):

01 52 19

Includes temporary toilets and hand washing stations, etc.

Temporary Hoist and Rigging (LS):

01 54 16

The cost of tower/crane required specifically to hoist large equipment such as air handlers is segregated and included here. Other smaller hoisting cost, provided by trades, to be included with trade costs.

Temporary Scaffolding and Platforms (SF):

01 54 23

The metric for pricing scaffolding is a square foot area equal to the entire envelope's overall area. Unit cost includes setup, engineering specialist, maintenance/inspection, and dismantling of scaffolding systems over the entire duration. Scaffolding is always segregated from other facade cost.

Temporary Equipment (Small Tools) (LS):

01 54 33

Includes skill saw, grinders, rotor hammers and drills, etc.

Offsite Parking (% / HRS): **01 55 19**

The labor cost associated with off-site parking is segregated for each trade and included as a lump sum figure. Percentage indicated is mathematically a factor on aggregate direct cost (labor + material + equipment), however effective percentage rate is derived based on assumed man-hour loss. Percentage depends on assumed man-hours lost per day due to round-trip travel time plus wait time. Premium assumes total workday is extended by the amount of time lost in transit / waiting.

Traffic Control (LS): **01 55 26**

Monitoring movement of cranes, dump trucks, material haulers and concrete trucks where pedestrian traffic is involved.

Temporary Barriers and Enclosures (SF / LF / EA): **01 56 00**

Temporary Barriers and Enclosures include, but not limited to, barricades, temporary construction signage, and other procedures to keep members, employees and providers safe during construction.

Execution and Closeout Requirements **01 70 00**

Progress Cleaning (HR): **01 74 13**

Includes continuous clean-up pre and post construction (daily)

Construction Waste Management & Disposal (LS): **01 74 19**

Includes trash dumpsters, concrete washout, etc.

Final Cleaning (LS): **01 74 23**

May include a preliminary final & final cleaning

Starting & Adjusting (LS): **01 75 00**

Includes all starting & adjusting of systems as required by project documents

Closeout Submittals (LS): **01 78 00**

As-builts & project manuals

DIVISION 2 – EXISTING CONDITIONS

<u>Existing Conditions or Assessment</u>	02 20 00
Existing Conditions or Assessment (LF / SF / CY / LS): Boring & exploratory drilling; geotechnical & seismic investigation; groundwater monitoring, etc.	02 20 00
<u>Demolition</u>	02 40 00
Gross Demolition (GSF) If detailed demo drawings are not provided, the cost of demolition is included as an overall GSF cost based on area being demolished.	02 41 00
Selective Demolition Scope (LF / SF / EA / PR): Selective demolition is detailed out according to the same unit of measurement as the new system metrics (SF for wall, EA/PR for doors, etc.).	02 41 19
<u>Site Remediation</u>	02 50 00
Site Recompaction (SF): Typically carried with sitework and segregated from the building cost.	02 55 00
<u>Contaminated Site Material Removal</u>	02 60 00
Removal and Disposal of Contaminated Soils (CY / LS) Contaminated soils will be job specific and measured by CY or LS if a quote is available.	02 61 00
<u>Facility Remediation</u>	02 80 00
Asbestos Remediation (SF / LS) Cost to include Asbestos report, air testing, removal and containment of hazardous material. Cost as per SF of LS by a professional sub-contractor. <u>This scope of work is usually by the University - verify for each project.</u>	02 82 00

DIVISION 3 - CONCRETE

Concrete Reinforcing

03 21 00

Material: Reinforcing bar, tie-wire, chairs, safety caps, couplers

Labor: Shop fabrication of rebar and field installation

Equipment: Rebar bending equipment

Factors Affecting Unit Cost: Stainless steel and/or epoxy coated rebar (required at some imaging rooms). Grade 60 or 75 material.

Miscellaneous: Typically details for reinforcing bar are not available until the latter stages of design; therefore the University employs an estimating methodology of utilizing metrics such as LBS / CY or LBS / SF to derive appropriate quantities of reinforcing from the bank measurement of poured concrete. When information about these metrics is not available from the structural engineer, the University relies on historical data to determine appropriate metrics to use. When applied to the concrete volume, a concrete waste factor also translates to a rebar factor.

When performing a “neat” measurement of rebar, it is important to allow for the required bends and overlap.

NOTE: All typical ranges indicated below are rules of thumb only based on grade 60, and special circumstances can place the reinforcing scheme outside of these ranges.

Slab on Grade Reinforcing (LB):

03 21 00

Slab on grade reinforcing is relatively simpler than other concrete systems, as the rebar is laid out in a grid pattern which is only broken up at openings and edges. A typical range of slab-on-grade reinforcing schemes is between 1.00 – 1.50 lbs / sf (or roughly 100 lbs / CY). Sometimes welded wire fabric is utilized instead of reinforcing bar, in which case the overall cost is typically reduced. WWF is often utilized for sidewalks or systems not requiring much customization.

Spread Footing Reinforcing (LB):

03 21 00

Spread footing reinforcing is usually relatively simple, involving a standard scheme/spacing in a grid pattern on the bottom (and sometimes top) of the footing. A typical range of spread footing reinforcing schemes is between 75 and 150 lbs / CY.

Continuous Footing / Grade Beam Reinforcing (LB):**03 21 00**

Continuous footing / grade beam reinforcing is also usually relatively simple, involving a standard scheme/spacing in a longitudinal pattern on the bottom (and sometimes top) of the footing. A typical range of continuous footing reinforcing schemes is between 100 and 125 lbs / CY and a typical range for grade beam (often supporting significantly more load) is between 150 and 300 lbs / CY.

Pile Cap Reinforcing (LB):**03 21 00**

Pile cap reinforcing is somewhat of a blend between a spread footing system, a column system, and a mat foundation system, with a standard scheme/spacing in a stacked grid pattern. A typical range of pile cap reinforcing schemes is between 150 and 200 lbs / CY.

Mat Foundation Reinforcing (LB)**03 21 00**

Mat foundations are required to carry a significant load and resist substantial tensile pressure (via the reinforcing bar); however the large concrete volume often “dilutes” the lbs / CY metric. For a 3'-0" to 4'-0" thick mat system, a reinforcing scheme of between 125 lbs / CY and 175 lbs / CY is typical; however the thickness of the mat can quickly cause this to vary substantially; grade 75 may be used as a cost savings measure if approved by the architect, engineer, and University.

Retaining Wall / Shear Wall Reinforcing (LB):**03 21 00**

Retaining walls / shear walls are required to transfer a significant load from the superstructure down to the foundation, and therefore the reinforcing scheme is quite high. Typical ranges would be in the 250 to 350 lbs / CY range, but vary drastically based on thickness of wall.

Concrete Column Reinforcing (LB):**03 21 00**

Column reinforcing is often achieved by pre-fabricating cages (either on or off-site) and hoisting them into place. Because columns are required to transfer such a significant load from the superstructure down to the foundation through such a small volume, the reinforcing scheme is very high. Typical ranges would be in the 300 to 450 lbs / CY range.

Elevated Beam Reinforcing (LB):**03 21 00**

Elevated beams are also critical to the transfer of loads down to columns (and on down to foundations) therefore the reinforcing scheme is high. Typically ranges may be in the 300 to 400 lbs / CY range. Also, if the beam requires post-tensioning, the estimator will need to add in for PT tendons in addition to the mild steel elements.

Elevated Slab Reinforcing (LB):**03 21 00**

Elevated slabs can be reinforced in a variety of ways. If the slab does not utilize any post-tensioning, it may require a substantial reinforcing scheme if the span is large. This application is somewhat unusual and because the span is so important, doesn't fall within a standard. If the slab incorporates post-tensioning, standard ranges of reinforcing metrics would be 2.0 lbs / sf of mild steel reinforcing, plus an additional 1.0 to 1.5 lbs / sf of PT tendons.

Precast Concrete Reinforcing (N/A):

Reinforcing for precast concrete elements is included with the unit pricing for the elements themselves as a complete package - see Division 03 40 00.

Form Savers / Couplers (EA):**03 21 00**

Formsavers / couplers are used in lieu of drilling through forms for continuous reinforcing bar.

Drill, Dowel, Epoxy (EA):**03 21 00**

Measurement is reflected by each location where it is required to drill into an existing element and insert an epoxy-secured dowel to provide a connection from new to existing.

Welded Wire Fabric Reinforcing (SF):**03 22 00**

Reinforcing mesh for slabs and decks is measured per square foot. If WWF is not used in slabs, fibers may be used along with rebar over the beams/girders with approval from the architect, engineer, and University.

Cast-In-Place Concrete (Includes Formwork)

03 30 00

Material: Concrete from batch plant, including cement, aggregate, water, admixtures (accelerators, integral color, air-entraining agents, retarders, etc.) Formwork surface, studs, walers, kickers, bracing, stakes, crossties and all other components to resist head pressure during the pour. Sundry items such as screws, nails, miscellaneous hardware, and form-release spray.

Labor: Batch plant mixing, trucking, pumping, placing, vibrating, finishing. Erecting formwork, applying form-release, removing formwork, engineering / calculations

Equipment: Concrete trucks, pumps, levelers, vibrators. Scissor lifts for high formwork (elevated slabs, columns, beams)

Factors Affecting Unit Cost: Higher than 3,000 PSI strength represents a higher ratio of cement.

Miscellaneous: Quantities reflect a bank (in-place) quantity with a percentage added for waste. Typically pumping is included with the in-place concrete cost; however for some projects such as high-rise towers, an additional cost is applied for added pumping that cannot be discharged with a truck-mounted pump. Excavation, backfill, hauling of spoils is carried under the Earthwork division. Additives such as accelerators or air entrainment are not included in the concrete cost unless otherwise noted.

Formwork costs vary due to the complexity, head-pressure resistance requirements, ability to reuse formwork, elevated slab slopes/depressions, and other factors.

Slab on Grade Concrete (SF):

03 31 13

Includes formwork, pumping and placing of concrete, protection during curing (blankets and applying moisture to concrete), construction / control joints, thickening of slab edges, vapor barrier, and slab finish. Unit cost excludes gravel underlayment.

Footing Concrete (CY):

03 31 13

Includes formwork, pumping and placing of concrete, protection during curing (blankets and applying moisture to concrete). Includes grade beams, spread footings, and pile caps. Unit cost excludes excavation, backfill, and hauling of spoils (see earthwork division).

Mat Foundation Concrete (CY):**03 31 13**

Given the volume of the pour, mat foundation concrete is typically slightly less expensive than other concrete systems overall. The economies of scale, however, is slightly offset by the fact that mats are often poured over the course of a single long day, which requires a certain amount of assumed overtime be factored in to the unit cost. Note that any traffic control associated with large pour days is covered under Division 1 general requirements. Formwork is included.

Light Weight Concrete (SF):**03 31 16**

Often concrete deck fill with a thickness that accounts for the flutes, plus any included waste factor. Unit price includes costs for pumping to high pours and formwork, however excludes reinforcing..

Concrete Cutting & Boring (LF):**03 38 00**

Concrete cutting or boring, measured per lineal feet.

Precast Concrete**03 40 00**

Material: Concrete, aggregates, reinforcing, and formwork.

Labor: All formwork, fabrication, delivery, and final installation labor is included with the unit costs.

Equipment: All equipment used in the manufacturing facility is included

Factors Affecting Unit Cost: If precast elements are required for structural integrity of the building rather than aesthetics, there may be a premium. If precast elements are not repetitive and require special forms for one offs.

Miscellaneous: Precast concrete is typically manufactured off-site and brought in as a complete package, therefore formwork and reinforcing are included with the unit costs of precast items and not broken out separately like cast-in-place concrete

Precast columns (LF):**03 41 33**

Precast structural columns are priced by their overall height/length and segregated based on their size. Shipping cost to jobsite to be included. For long members, the shipping logistics often adds significant cost.

Precast beams (LF):**03 41 33**

Precast structural beams (often found in parking structures) are priced by their overall height/length and segregated based on their size. Double-tee members are segregated from single-tee members and quantified in SF. Shipping cost to jobsite to be included. For long members, the shipping logistics often adds significant cost.

Precast walls (SF): **03 41 33**

Precast structural walls are priced by their overall area (calculated as one-side) and segregated based on their thickness.

Precast sill / lintels (LF): **03 45 13**

Precast façade elements are priced based on length, and segregated based on size. Include costs to cut around doors/windows in the unit cost.

Precast column caps (EA): **03 45 13**

Precast decorative column caps are priced per each, and segregated according to their size.

Tilt-up Concrete (SF): **03 47 13**

Tilt-up concrete includes the concrete material, curing, form stripping, preparation, erection, bracing, and welding. Form savers / couplers are carried in 03 21 00 Reinforcing.

Precast site elements (N/A): **03 48 00**

If a precast element is specific to site scope (precast trash cans, precast wheel stops, precast benches, etc.) it is included in the Site Improvement section of the estimate rather than Division 3.

Glass-Fiber Reinforced Concrete (GFRC) (SF): **03 49 13**

These prefabricated elements are priced according to overall exposed area. Column covers are segregated as discrete line items according to varying diameters.

Grouting **03 60 00**

Non-Shrink Grouting (EA): **03 62 00**

Non-shrink grout is measured by the count of structural columns and priced by the each.

DIVISION 4 - MASONRY

Unit Masonry **04 20 00**

Material: Masonry Units, Grout, Mortar, Reinforcing, Drip/Weep Screed

Labor: Layout, setting of block, grouting, installation of rebar

Equipment: Equipment required for work above 6'-0"

Factors Affecting Cost: Precision vs. split-edge vs. ground face; brick/block size

Brick (SF):**04 21 00**

Brick masonry is measured and priced based on gross system area. Measurements do not deduct for door / window openings less the 50 square feet in area, but rather measure through them to account for added cutting, waste, and coordination at such openings. Double wythe systems are denoted and such, and also priced on the area of the system (in other words, the unit cost for a double-wythe system would double, not the quantity).

Concrete Masonry Units (SF):**04 22 00**

CMU is measured and priced based on gross system area. Measurements do not deduct for door / window openings less the 50 square feet in area, but rather measure through them to account for added cutting, waste, and coordination at such openings. Double wythe systems are denoted and such, and also priced on the area of the system (in other words, the unit cost for a double-wythe system would double, not the quantity).

Stone Assemblies**04 40 00****Masonry / Stone Veneer Façade Systems (SF):****04 43 00**

Unit cost includes clips, anchors, adhesives, and other necessary connections as required to attach to the support system behind the veneer. Sheathing and waterproofing is not included in the unit cost, however. Final clean not included in unit rate.

DIVISION 5 - METALS**Structural Metal Framing****05 10 00**

Material: Structural steel members, bolts, connections, anchor plates, grout

Labor: Fabrication, delivery, field-erection, preparation of shop-drawings, vertical control surveying

Equipment: Hoisting equipment is included in the total unit cost per ton of installed steel members.

Factors Affecting Cost: Type of structural system, i.e., welded moment frame, brace frame, BRB or SidePlate, galvanized steel (members exposed to weather) as well as Architecturally Exposed Structural Steel (AESS). Preconstruction costs aside from preparation of shop-drawings are not included in the unit cost.

Structural Steel Framing (TNS):**05 12 23**

The cost of structural steel is an aggregated system cost inclusive of all aspects of the system spread over the aggregate weight of the system. Unit cost is based on measured tonnage, however several other costs are blended into the cost besides the literal weight of the steel itself (for example, crane costs, fabrication costs, shop-drawing preparation, etc.). Wide flange shapes to be fabricated and erected are to be separated whenever possible from the cost of tube steel shapes. Roof / site equipment screens are segregated, and the cost for galvanizing is applied to these weather-exposed members. Horizontal beam / girder system weight is segregated from vertical column / brace system weights (for the purposes of reconciliation with contractors. Similarly, floor system weight ideally is segregated from roof system weight (again, for the purposes of reconciliation with contractors who may be working with a systems format estimate).

Elevator Supports & Beams (LF / TNS):**05 12 23**

Priced per LF or Tons and segregated from other Elevator components.

Miscellaneous Bolts and Connections (TNS):**05 12 23**

15%-25% added to the measured weight of steel to account for items such as bolts, web-stiffeners, and other sundry items.

Metal Screen Assemblies (SF):**05 12 23**

The skin of the screen (louvers, etc.) is segregated from the structural steel skeleton, however still included within Division 051000.

Elevator Sill Supports, Separator Beams, and Guiderails (LF) :**05 12 23**

Unlike other structural steel members, these systems are measured on a linear foot basis and segregated from the other steel weights (though still included in Division 051000).

Metal Decking**05 30 00**

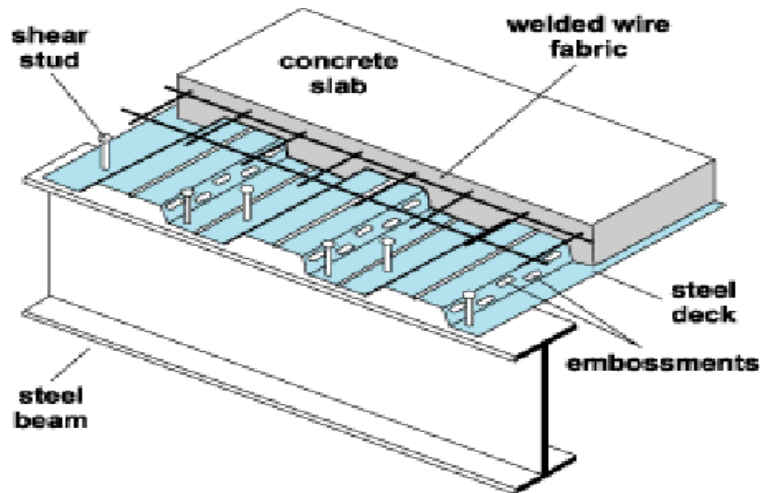
Material: Corrugated metal deck, Nelson/shear studs.

Labor: Fabrication / installation of deck system, welding of Nelson/shear studs.

Equipment: Hoisting equipment, welding equipment.

Metal Deck (SF):**05 31 13**

Unit cost includes the furnishing and installation of Nelson or shear studs. Penetrations larger than 50 square feet are deducted from the overall quantity, however smaller penetrations are not deducted. Unit cost includes penetration cutouts. Vented deck follows the same standards.

**Corrugated Metal Screen (SF):****05 31 13**

Corrugated metal deck used in a vertical application as an equipment screen is segregated from horizontal applications. Costs for access doors/panels are included as discrete line items. They can be either shop installed or field installed.

Miscellaneous deck metals (SF):**05 31 13**

Costs for added structural steel at large deck penetrations may be included if there is reason to believe the drawings do not account for such members. This is segregated because it may not fall under the bid scope of the metal deck contractor.

Bent Plate (LF):**05 31 14**

Perimeter bent plates are segregated from the metal deck system cost, and priced on a linear foot basis. Indicate bent plate versus gage metal.

Cold-Formed Metal Framing**05 40 00**

Material: Structural steel and Unistrut support assemblies

Labor: Fabrication, delivery, field-installation / welding

Equipment: Hoisting equipment (crane/lift)

Factors Affecting Cost: Limited overhead space above the ceiling may require support assemblies to be pre-fabricated and lifted into place rather than fabricated in place.

Healthcare Metal Supports (EA):**05 45 23**

Cost for equipment-specific support assemblies is segregated and priced per each piece of equipment supported. These assemblies include lifts, operating room booms, and imaging room overhead equipment.

Metal Fabrications**05 50 00**

Material: Complete metal fabricated elements and associated support.

Labor: Shop fabrication, welding, grinding, delivery, field-installation

Equipment: Hoisting (crane/lift cost)

Factors Affecting Cost: Fabricated metal assemblies exposed to the weather may require galvanizing, which adds substantial cost. Any systems to be field-painted may require added cost.

Miscellaneous Metal (LBS):**05 50 00**

This cost is included to account for miscellaneous metal items that may not yet be detailed out by the drawings. Such miscellaneous metals include tube steel supports to counters / pony walls, tie-back anchors at the roof, med gas tank anchorage, structural support to operable partitions, structural support to high-density shelving, and other items.

Davit Pedestals (EA):**05 50 00**

Pedestals to carry the weight of window washing davits are measured on a per each basis. Cost includes field-welding to structural steel.

Metal Pan Stairs (FLA / RISER):**05 51 13**

Metal pan stairs are measured per vertical linear foot, or per number of risers. The weight of the stairs is not included above under structural metal framing. Stair railings included in per foot unit cost.

Metal Ladders (EA / VLF):**05 51 33**

Elevator pit ladders, penthouse access ladders, ladders with safety cages and other ladders are priced per each; however unit cost depends on ladder height.

Metal Railings (LF):**05 52 00**

Rails are measured based on length, and fluctuate based on number of rails and desired aesthetic finish.

Metal Gratings (SF):**05 53 00**

Open grate systems are priced based on area, but do not included structural steel support members or railings.

Decorative Metal

05 70 00

Stainless Steel Countertops (LF):

05 75 00

Stainless steel countertops are segregated from the base cabinets on which they are attached. Measurements are on a linear foot basis; however width is noted in the items description and integral to the unit pricing.

Stainless Steel Shelving (LF):

05 75 00

Stainless steel shelving is measured on a linear foot basis, and is segregated according to height, depth, and number of tiers. Unit cost includes anchorage to floors and walls.

DIVISION 6 - WOODS & PLASTICS

Rough Carpentry

06 10 00

Factors Affecting Cost: LEED requirements for wood harvested only from Forest Stewardship Council (FSC) certified forests.

Wood Framing Wall Systems (SF):

06 11 00

Wood wall systems are measured similar to light-gauge wall systems, and are measured as a gross quantity (i.e. measured through door and window openings to account for framing associated at these locations). Unit cost includes all studs, sill plates, base plates, top plates, headers, and other small-dimension lumber required for a complete wall system. Structural wood framing is segregated (see below) from these non-load bearing partitions.

Wood Panel Product Sheathing: Plywood (SF)

06 16 36

Exterior plywood sheathing, as well as interior plywood backerboard (at electrical / telecom rooms) is measured based on area and included within this rough carpentry division. Fire rated plywood sheathing should be included in the unit rate.

Moisture-Resistant Sheathing Board: Denglas (SF)

06 16 53

Exterior Denglas sheathing or equal is included with Division 06 16 00.

Shop-Fabricated Structural Wood Framing (BF):**06 17 00**

Large member lumber acting as structural beams, girders, or columns is measured in board feet. This includes composite lumber systems, such as glulam, parallam, microlam members. Technically this is a volumetric measurement, where 1 board foot = a one inch thick section of one square foot of wood (i.e. 144 cubic inches).

Roof Trusses (SF):**06 17 53**

Roof truss systems are measured based on the horizontal area covered by the bottom chord of the truss. Spacing and member size is critical to the unit cost, and therefore noted in the description.

Miscellaneous Rough Carpentry (LS):**06 19 53**

Cost is included to account for miscellaneous scope to be carried out by the carpentry contractor. Carpenters employed by the general contractor are included with general conditions. Such scope includes cant strips, blocking for parapet caps, fire blocking.

Finish Carpentry**06 20 00****Standard Pattern Wood Trim: Wood Base / Door Trim****06 22 13**

Wood base is measured on a linear foot basis, and by convention is measured through door openings. Typically wood base will be applied to the surface of cabinetry as necessary (unless otherwise noted). Wood base line items are segregated based on height and wood species. Wood base may or may not warrant a separate item in Division 9 for painting / staining, depending on the spec.

Architectural Woodwork**06 40 00****Countertops (LF):****06 41 16**

Countertops (both plastic laminate and solid-surface) are segregated from the base cabinets on which they are attached. Measurements are on a linear foot basis; however width is noted in the items description and is integral to the unit pricing. Costs for integral bowl sinks is typically not included in the unit cost (see below for discrete line item). Note: stainless steel countertops are included with Division 057000, Decorative Metals.

Integral Bowl Sinks (EA):**06 41 16**

identified costs for integral bowls within countertops, and measured as a count of each bowl.

Base Cabinets (LF):**06 41 16**

Base cabinets are measured on a linear foot basis, and segregated according to depth of cabinet. Discrete items broken out for open-shelf cabinets, cabinets with wood doors, and cabinets with glass doors. Other specialty cabinets broken out separately as required.

Upper Cabinets (LF):**06 41 16**

Upper cabinets are measured on a linear foot basis, and segregated according to depth of cabinet. Discrete items broken out for open-shelf cabinets, cabinets with wood doors, and cabinets with glass doors. Other specialty cabinets broken out separately as required. Plastic laminate soffits (if called out) are broken out as a discrete line item.

Full-Height Cabinets (LF):**06 41 16**

Full-height cabinets are measured on a linear foot basis, and segregated according to depth of cabinet. Discrete items broken out for open-shelf cabinets, cabinets with wood doors, and cabinets with glass doors. Other specialty cabinets broken out separately as required.

Nurse Stations / Reception Desks (LF):**06 41 16**

Nurse stations and reception desks are measured on a linear foot basis, and are all inclusive for the entire system, including front-cladding and integral ledges. Factors affecting the linear foot cost include cladding type, ledge depth, and intricacy of staff-side cabinetry and curved stations.

Benches (LF):**06 41 16**

Locker room benches, dressing room benches, and lobby benches are included in the Architectural Woodwork Division 064000. Linear foot pricing is for a complete system, including upholstery if required.

Installation of OFCI Workstation Countertops (EA):**06 41 16**

Some projects involve workstations which are furnished by the Owner, but the final installation of the countertop is the responsibility of the contractor. In these cases, the labor cost of countertop installation is priced per workstation.

Wood Trim Associated with Cabinet Package (LF)**06 46 00**

Wood base is measured on a linear foot basis, and by convention is measured through door openings. Typically wood base will be applied to the surface of cabinetry as necessary (unless otherwise noted). Wood base line items are segregated based on height and wood species. Wood base may or may not warrant a separate item in Division 9 for painting / staining, depending on the spec.

DIVISION 7 - THERMAL & MOISTURE PROTECTION

Damp proofing and Waterproofing

07 10 00

Waterproofing at Concrete Slabs (Sheet Waterproofing) (SF):

07 13 00

Underground waterproofing systems are segregated from above-grade waterproofing systems and quantified based on the area of slab, grade beams & footings to which they are applied. Note that horizontal applications are segregated from vertical applications (see below).

Waterproofing at Elevator Pit and Basement Walls (SF):

07 13 52

Underground waterproofing systems are segregated from above-grade waterproofing systems and quantified based on the area of wall to which they are applied. Note that horizontal applications are segregated from vertical applications (see above).

Waterproofing at Finish Systems (Floor Tile) (SF):

07 13 53

Elastomeric waterproofing systems are segregated from the finishes for which they are used and quantified based on the area of wall or floor to which they are applied. Applications include waterproofing for tile flooring, tile shower walls, and water resistant barriers at exterior plaster systems.

Thermal Protection

07 20 00

Exterior Wall Insulation (SF):

07 21 00

Both batt insulation and rigid exterior insulation is measured based on the area of the façade system being insulated.

Roof Insulation in Ceiling Joists (SF):

07 22 16

Batt insulation, or other, between ceiling joists is measured based on the roof areas.

Temporary Roof (LS):

07 22 16

Temporary weatherproofing or temporary roofing is considered means/methods and included with the General Requirements scope. However, if temporary roofing is detailed out in the contract documents, a line item is included here and is to include removal.

Exterior Insulation And Finish Systems - EIFS (SF):

07 24 00

Polymer based or modified insulation cost per SF. Scaffolding is included

Weather Barriers (SF):

07 25 00

Air barriers or vapor permeable air barriers or other equal weather barrier membrane to be cost per SF. Scaffolding not included within unit rate.

Concrete Moisture Vapor Emission Control (SF): **07 26 16**

Applied to concrete slabs to protect the finished floor applied on top of them.

Moisture Test (EA): **07 26 16**

Contractor will perform moisture testing as required for flooring and roofing warranties. Cost to include testing materials and labor.

Steep Slope Roofing **07 30 00**

Steep Slope Roofing (SF): **07 30 00**

Underlayment included in unit cost. May include roofing such as metal, asphalt, concrete or clay tile, wood, or slate.

Siding Panels **07 40 00**

Exterior Metal Panel Systems (SF): **07 42 13**

Exterior metal panel systems are measured based on the net area, therefore door / window openings are deducted.

Membrane Roofing **07 50 00**

Measuring Conventions: Roof systems are measured over the gross area of the roof, through any penetrations less than 50 square feet.

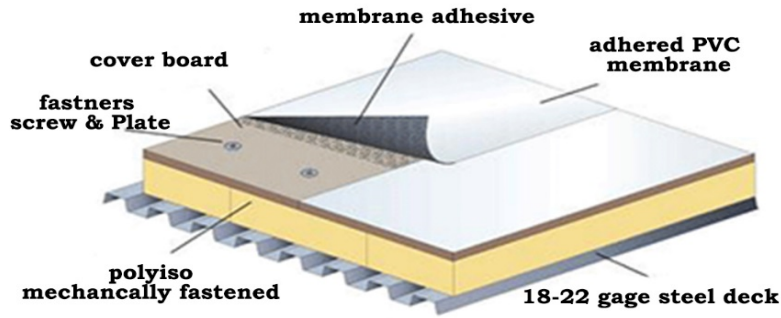
Gravel Ballast (SF): **07 51 00**

Gravel ballast is measured based on area covered, and unit pricing depends on thickness and color. Identify costs associated with white gravel ballast (pursuant to LEED credits for cool roofs). Rigid roof insulation is included in roof unit cost, as well as crickets and walk paths (unless a paver system, see 07 72 46); however, insulation in the roof ceiling joists is broken out as a separate item in Division 072200 Roof and Deck Insulation.

Single Ply / TPO Roof Systems (SF):

07 54 23

Single ply roof pricing includes the roof system itself along with any mechanical attachments and adhesives. Cover board is included in unit cost. Rigid roof insulation is included in roof unit cost, as well as crickets and walk paths (unless a paver system, see 07 72 46); however, insulation in the roof ceiling joists is broken out as a separate item in Division 072200 Roof and Deck Insulation.



Built-Up Membrane Roof System (SF):

07 55 51

Built-up membrane roof pricing includes felt, fiberglass, bitumen's, asphalt, tar, stabilizers, surfacing, and other components integral to achieving full waterproofing. Cover board is included in unit cost. Rigid roof insulation is included in roof unit cost, as well as crickets and walk paths (unless a paver system, see 07 72 46); however, insulation in the roof ceiling joists is broken out as a separate item in Division 072200 Roof and Deck Insulation. Reflective roof coating is included (if applicable).

Vegetated Protected Membrane Roofing (SF):

07 55 63

Vegetated protected membrane roofing pricing includes the complete roofing system, including the roofing membrane and vegetated green roof system. Cover board is included in unit cost. Rigid roof insulation is included in roof unit cost, as well as crickets and walk paths; however, insulation in the roof ceiling joists is broken out as a separate item in Division 072200 Roof and Deck Insulation.

Flashing and Sheet Metal

07 60 00

Standing Seam Sheet Metal Roof (SF):

07 61 13

Standing seam roof pricing includes the roof system itself along with any mechanical attachments or adhesives. Rigid roof insulation is included in roof unit cost; however, insulation in the roof ceiling joists is broken out as a separate item in Division 072200 Roof and Deck Insulation.

Cants and Upstands (LF):	07 62 00
This item is separated from the scope above, but typically measured in a similar manner on a cost per linear foot basis.	
Base Flashing / Counter flashing (LF):	07 62 00
These flashing items, typically applied to parapets, rooftop equipment pads, doghouse framing, etc., is measured on a linear foot basis and segregated by material (aluminum versus stainless steel). Counter flashing (and reglets) is separated from base flashing as a distinct line item).	
Parapet Coping (LF):	07 62 00
See Division 077113 Manufactured Copings	
Gutters and Downspouts (LF):	07 62 00
Gutters and downspouts are picked up by the architectural trades and measured based on linear footage. Line items are separated based on material (aluminum versus stainless/galvanized steel). Painting to gutters and downspouts is included under Division 09 90 00 Painting and Coating (typical with a line item for paint to miscellaneous exterior metal).	
Scuppers (EA):	07 62 00
Through-wall scuppers are picked up by the architectural trades and measured on a per each basis. Unit pricing is inclusive of all through-wall flashing items associated with the wall penetration.	
Flashing for MEP Penetrations (EA):	07 62 00
Flashing for vent stacks, dryer vents, and other roof/wall penetrations for plumbing systems is carried under Division 076200. Note that this involved coordination with the mechanical estimator to ensure an accurate count of such penetrations.	
Miscellaneous Flashing and Sheet Metal (LS):	07 62 00
During the early stages of design, often many of the flashing / sheet metal elements have yet to be identified, therefore it is common to include a cost to cover such scope (based on the gross square footage of the building). The unit cost for this scope depends on the level of design, and continually decreases towards zero as design progresses.	
Equipment Pad Cover (SF):	07 63 00
Specialty sheet metal equipment pad covers are priced based on area of the pad covered, and are inclusive of the perimeter "downturn". Unit price is for the cover only, and does not include separate flashing systems (such as base flashing around the bottom of the pad.	

Self-Adhered Sheet Flashing (SF):**07 65 26**

Exterior vapor barrier and building paper systems fall under the umbrella of Division 076500 and have a corresponding area quantity as the system it is associated with.

Roof and Wall Specialties and Accessories**07 70 00****Parapet Coping (LF):****07 71 13**

Manufactured coping systems are measured based on length of the capped wall, and segregated according to the material (aluminum versus stainless steel) as well as overall coping thickness.

Manufactured Counter flashing Systems (LF):**07 71 16**

These flashing items, typically applied to parapets, rooftop equipment pads, doghouse framing, etc., is measured on a linear foot basis and segregated by material (aluminum versus stainless steel).

Counter flashing (and reglets) is separated from base flashing as a distinct line item).

Manufactured Roof Expansion Joints (LF):**07 71 29**

Manufactured expansion joint systems are measured based on length of the joint itself, and segregated according to the material (aluminum versus stainless steel) as well as overall width. **Systems are to be separated by interior/exterior as well as floors, walls and ceilings.**

Roof Access Doors / Hatches (EA):**07 72 33**

These roof access items are priced per each, and are priced inclusive of the ladder (if applicable) as well as the associated flashing required at the penetration.

Walkway Pads (SF):**07 72 46**

Pavers at the roof are measured based on overall area covered (including small gaps between pavers). Unit price includes paver pedestals if required.

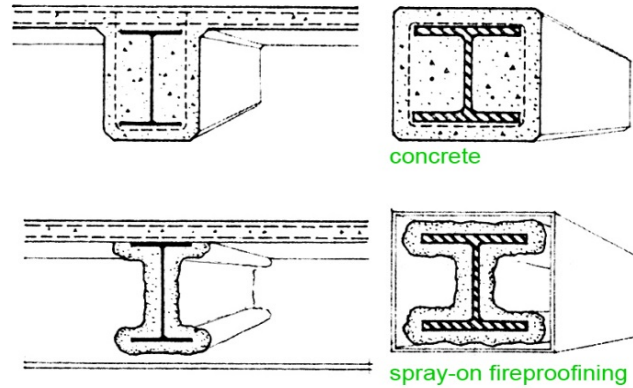
Fire and Smoke Protection

07 80 00

Applied Fireproofing : Structural Steel (BF / TNS / BLDG SF):

07 81 00

The unit of measurement for this scope is not always consistent amongst contractors. Also, concrete encasement is sometimes included with the concrete scope.



Cementitious Fireproofing to Metal Deck (SF):

07 81 16

If required, the fireproofing applied to the underside of corrugated metal decking is measured based on the horizontal surface area of the deck to which it is applied.

Cementitious Fireproofing Patching (LS):

07 81 16

A cost is included for one additional mobilization by the fireproofing contractor to come back and patch as necessary after other trades have completed the bulk of their scope. Lacking any other information, this amount may be around 10-15% of the work.

Fire Stopping and Smoke Seals at Rated Partitions (LF):

07 84 43

Costs for fire-rated walls are carried in Division 078400 Firestopping. Scope applicable to the framer is segregated from scope applicable to other trades (such as firestopping around MEP penetrations through rated walls). Scope applicable to the framer includes firestopping at the top/bottom of the wall (mineral wool, fire caulking, etc.) and identification of rated walls. Linear foot measurement reflects length of wall rather than length of bead applied.

Building Perimeter Firestopping (LF):

07 84 53

Fire safing systems at the perimeter of the building are priced based on the length of the perimeter in feet, and includes all insulating material (such as mineral wool) as well as all connections required for installation. Includes special considerations at curtain wall, and smoked sealing of voids as necessary.

Joint Protection

Caulking (SF):

07 90 00

Joint sealants are carried by each trade except for joint sealants between dissimilar materials which will be provided by a separate subcontractor. Break out costs between interior, and exterior caulking.

Sound Caulking at Interior Acoustic Partitions (LF):

07 92 19

The linear foot quantity of this line item represents the top and bottom length of a wall rather than LF caulk applied. Therefore a sound-rated partition that requires sound caulking at the top and bottom of both sides of the partition would equal the wall length x 2.

Expansion Joints (LF):

07 95 13

Expansion joints are quantified and priced based on a linear foot basis. Joints are segregated based on interior vs. exterior application, as well vertical vs. horizontal. They are further broken down by size and priced accordingly. Price includes the joint cover as well as the weather seal and all necessary materials and labor to connect to floor / ceiling / wall assembly. Excluding manufactured roof expansion joints, this is located 07 71 29.

DIVISION 8 - DOORS & WINDOWS

Doors and Frames

08 10 00

Inset Glazing and Louvers (EA):

08 10 00

Inset elements such as glass or louvers are carried as distinct costs from the base unit cost for the door/frame scope. Inset glass is segregated based on size.

Fire / Smoke Ratings (EA):

08 10 00

The cost for various fire/smoke ratings is measured per door leaf, and is isolated from the base door cost. This cost picks up both the material cost of the door itself as well as the hardware costs (smoke seals, thresholds, etc.). Each rating constitutes a separate line item (20-minute / 45-minute, 90-minute, etc.) Electrical connections are not included. (See Fire Alarm & Equipment Connections)

Exterior Doors (EA / PR):**08 11 00**

Door unit costs include the door leaf/leaves, a blended average for typical hardware, and furnishing (not installation) of the frame. Doors are segregated according to material and size. Base costs assume no fire-rating, no glazing insets, and no panic hardware (these costs are carried separately). Delivery, handling and door leaf installation cost is included with the unit cost, however frame installation is segregated as a distinct line item since it is often carried by a separate contractor.

Interior Doors (EA / PR):**08 11 00**

Door unit costs include the door leaf/leaves, a blended average for typical hardware, and furnishing (not installation) of the frame. Doors are segregated according to material and size. Sizes are grouped in 6" increments (i.e. 2'-6" - 3'-0" x 7'-0") Base costs assume no fire-rating and no glazing insets (these costs are carried separately). Delivery, handling and door leaf installation cost is included with the unit cost, however frame installation is segregated as a distinct line item since it is often carried by a separate contractor.

Frame Installation (EA):**08 12 13**

Because the framing contractor is often responsible for the installation of door frames rather than the door contractor, this item is segregated from the door cost itself. It is important to note that the furnishing of the door frame is included with the door cost, however, not this line item.

Specialty Doors and Frames**08 30 00****Specialty Doors and Frames : Glass Entrance Doors (EA / PR):****08 30 00**

Glass entrances are priced based on count, and are inclusive of the cost required for mullion schemes of the surrounding system to be adjusted. Unit price is for a complete system, including glass, hardware, and weatherproofing. Automatic openers are segregated as a separate cost. Revolving glass doors are identified as such and priced as a discrete lump sum cost per location.

Access Panels and Frames (EA):**08 31 16**

This Division carries not only panels for general access, but also panels for access to specific MEP items typically furnished by the MEP contractor (such as plumbing fixture access panels).

Sliding Glass Doors (EA):**08 32 13**

Sliding glass doors (typical at ICU rooms) are separated out from other glass doors and priced per each. Cost is inclusive of all hardware, delivery, installation, and any other items required to integrate into framing system. Doors are segregated based on both opening size and number of sliding panels.

Overhead Coiling Doors (EA):**08 33 23**

Overhead coiling doors (both for circulation and at counters) are priced per each, though pricing depends on the area of the opening. Unit price includes door, frame, hardware, and all delivery / installation. Motorized doors are priced separately; though do not include the electrical connection.

Smoke Guard Doors (EA):**08 37 00**

Elevator smoke guard doors are priced per location, and pricing reflect a complete installed unit cost.

Entrances, Storefronts, and Curtain walls**08 40 00****Automatic Glass Entrance Doors (EA / PR):****08 42 29**

Glass entrances are priced based on count, and are inclusive of the cost required for mullion schemes of the surrounding system to be adjusted. Unit price is for a complete system, including glass, hardware, and weatherproofing. Automatic openers are segregated as a separate cost. Revolving glass doors are identified as such and priced as a discrete lump sum cost per location.

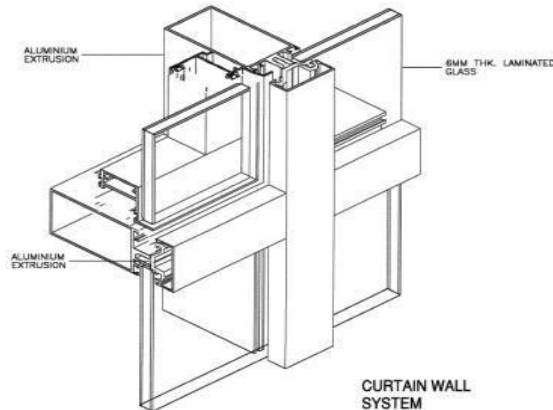
Aluminum Storefront Systems (SF):**08 43 00**

Storefront systems are measured based on gross area to the outside of the system (outside mullion frame). Cost is inclusive of all glass, mullions, gasketing, and other hardware/connection items required for a complete system installation. As a standard convention, exterior storefront systems do not deduct glass entrances.

Curtain wall Systems (SF):

08 44 00

Exterior glazing systems are measured based on total area, and include both the glass and the frame. Fritted / spandrel glass is broken out as a separate line item from vision glazing. Curved glass is broken out as a distinct line item (with a separate unit cost) as are other specialty glazing systems. As a standard convention, exterior curtain wall systems do not deduct glass entrances.



Windows

08 50 00

Exterior Glazing / Punched Window Systems (SF):

08 51 13

Exterior glazing systems are measured based on total area, and include both the glass and the frame. Fritted / spandrel glass is broken out as a separate line item from vision glazing.

Pass Windows: Pass-Through Windows (EA):

08 56 19

Pass-through windows (specimen, pharmacy, and administrative) are broken out separately from other Division 08 interior windows and carried here as a specialty item.

Hardware

08 70 00

Hardware is included with the Doors & Frames section, either built-in to the unit cost themselves or broken out as a specific cost as per below.

Automatic Openers / Panic Hardware (EA):

08 71 00

These hardware items are considered above and beyond the “blended average” hardware costs included in a typical door’s unit cost.

Miscellaneous Hardware (LS):

08 71 00

Costs to account for items such as kick plates, automatic closers, magnetic hold-opens, and other hardware.

Glazing

08 80 00

Interior Glazing (SF):

08 81 00

Interior glazing systems are measured based on total area, and include both the glass and the frame. Shielded glazing systems are included with Division 130000. Costs are segregated for fire-rating and for bullet-resistance.

Miscellaneous Glazing (SF):

08 88 00

Various other glazing systems are included in Division 08 88 00 and include but are not limited to: translucent canopy glazing, fire-rated glazing systems, security glazing (i.e. bullet-resistant glazing).

DIVISION 9 - FINISHES

Plaster Systems

09 20 00

Material: Lath, plaster, control joints

Labor: Hang lath, apply plaster (3-coats) and texture, install control joints, scaffolding erection / dismantling

Equipment: Scaffolding (separate line item), safety equipment

Factors Affecting Cost: Building height and plaster specification

Gypsum Board (Metal Framing Systems)

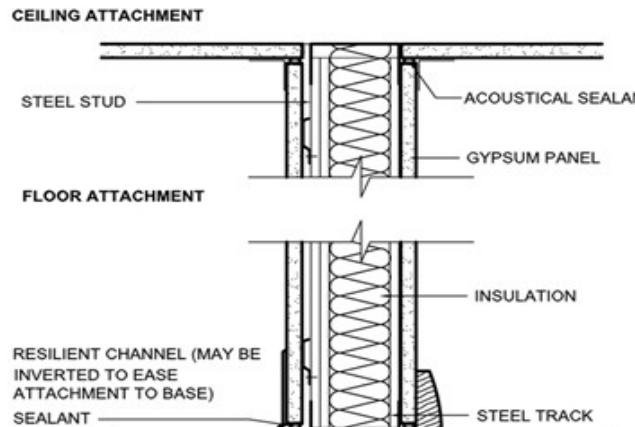
09 20 00

Material: Light gauge metal studs, top and bottom track, headers, jambs, sills, cripple studs, bracing, kickers, z-clips, screws and other sundry accessories for complete system installation. (Wood frame included in Div 6)

Labor: Layout, stud framing, framing at openings and penetrations,

Equipment: Scaffolding and Scissor lift for high work, unless included in division 1.

Factors Affecting Cost: Radius walls and column furring due to the tight dimensions required.



Exterior Framing (SF):

09 22 16

Square footage unit of measure includes all light gauge framing required to provide a complete exterior stud system. Area quantity is measured through doors and punched window systems (the area delta offsets the additional requirements for jambs, sills, and headers at these locations). Overall pricing is determined largely by the spacing, height, and gauge of the material. Anchorage to slab included. Scaffolding is not included with the unit cost.

Interior Framing (SF):

09 22 16

Square footage unit of measure includes all light gauge framing required to provide a complete interior stud system. Area quantity is measured through doors and interior glazing (the area delta offsets the additional requirements for jambs, sills, and headers at these locations). Overall pricing is determined largely by the spacing, height, and gauge of the material. When partition types are unavailable, all partitions are assumed to be full-height (this conservative assumption helps defray the added cost of bracing required at partial height partitions, and potentially equates to roughly the same cost). Typical wall assemblies assume 16" o.c. unless noted otherwise, or unless a shaftwall system (24" o.c. to accommodate shaft liner width).

The following scope is included within the unit cost of interior framing:

- BIM coordination, shop drawings and as-builts
- Layout and general trade coordination
- Top and bottom track
- Termination and interfaces with other wall systems (including exterior wall)
- Top of wall attachment to metal deck, including z clips, angle clips, welding, and lath
- All king studs, jamb studs, box headers, sill, and additional framing required for doors, windows, and other large wall penetrations
- Identification of rated walls
- Pony walls at nurse stations and other locations
- Framing adjustments required for MEP penetrations

The following scope is excluded from the unit cost of interior framing:

- Wood framing (See Division 6)
- Batt insulation (see Acoustic Treatment, Division 9)
- Sound caulking (see Acoustic Treatment, Division 9)
- Fire stopping and smoke seals (see Fire and Smoke Protection, Division 7; top of wall typically by gypsum board subcontractor)
- Vertical soffit edge framing (see separate line item under this section)
- Lead-lining required (see Integrated Construction, Division 13)

Backing (LF):

09 22 16

Backing is comprised of three types: stud backing (notched into framed wall systems) strap (flat) backing, and wood backing (incl fire treated). Backing is to follow details specific to the project, however if these details are not yet available, the following constitutes the basis of assumption:

Base cabinets: Notched backing – cabinetry length (LF) x 3

Upper cabinets: Notched backing – cabinetry length (LF) x 2

Full-height cabinets: Notched backing – cabinetry length (LF) x 3

Bathroom accessories: Flat backing – room perimeter (LF) x 1

Toilet partitions: Notched backing – perimeter of toilet partitions (LF) x2

Exam room specialties: Flat backing – room perimeter (LF) x 1

ACT Strap Attachment to Walls: Flat backing – ACT perimeter (LF) x 1 (note: this is only required on Utah State projects)

Lockers: Notched backing – length (LF) x 3

Marker boards & tackboards: Flat backing – length (LF) x 2

Wall protection: Notched backing – length (LF) x 2 of crash rail, chair rail, wall bumpers, and similar. If required for healthcare use.

Equipment: Contractor and Owner furnished equipment indicated to be wall-mounted – count (EA) x width (LF) x 2

Miscellaneous: Beyond the measured quantities indicated above, up to an 25% additional is added to the quantities to account for other miscellaneous backing required throughout the project.

Drop Gyp / Hard lid Ceiling Framing (SF):

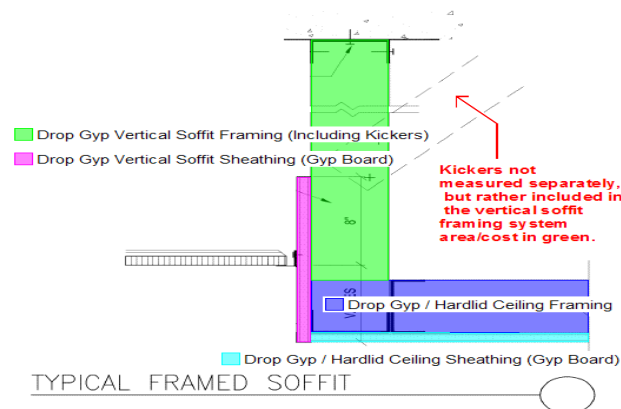
09 22 26

Square footage unit of measure includes all light gauge framing required to provide a complete hard-lid horizontal ceiling system. This line item captures the horizontal light gauge framing system, but excludes the cost of sheathing (see below for separate line item).

Drop Gyp Vertical Soffit Framing (SF):

09 22 26

Square footage unit of measure includes all vertical light gauge framing extending from bottom of soffit up to the structure above. Unit cost includes diagonal kickers as required. This line item represents only the vertical portion of the soffit framing, as the horizontal portion is captured under the line item for hard lid ceilings.



Kickers at Ceiling-Height Walls (LF):

09 22 16

Some walls that do not extend all the way up to the structure above require kickers above the ceiling to provide structural integrity. In these instances, the costs for kickers is included on a linear foot basis.

09 22 26

Installation of MEP Access Panels (EA):

09 22 16

While the MEP trades will furnish and locate their own access panels, it is often the responsibility of the framer to install them. In such instances, this installation cost is separated from Division 083100 Access Panels and Frames.

Plaster Systems (SF):

09 24 00

Plaster system includes lath and 3-coat system (scratch, brown, and finish) as well as integral color and texturing. Plaster system quantity does not measure through punched windows; however they do measure through isolated louvers, vents, and doors less than 50 square feet in area.

Control Joints (LF):**09 24 23**

Sheet metal plaster control joints are segregated from the cost of the plaster system itself and measured on a linear foot basis. If exterior elevations do not depict control joint layout, the assumed spacing (both horizontal and vertical) is 10'-0" on center.

Gyp Board and Sheathing**Drop Gyp Vertical Soffit Sheathing (SF):****09 29 00**

A distinct line item captures the single layer of gypsum board skin (including level 4 finish) applied to the framing system described above. Identify separate costs associated with moisture-resistant systems at wet rooms.

Drop Gyp / Hard lid Ceiling Sheathing (SF):**09 29 00**

A distinct line item captures the single layer of gypsum board skin (including level 4 finish) applied to the framing system described above. Identify separate costs associated with moisture-resistant systems at wet rooms.

Gypsum Board, Finished (SF):**09 29 00**

Taping effort reflects a level 4 finish, with a separate line item for areas requiring a level 5 finish. Unit cost includes gyp board, tape, joint compound, texturing, corner beads, trims, control joints, screws, and all other sundry items required for a complete scope. Note: finished gyp board (rather than unfinished) is priced at all areas to receive vinyl wallcovering - while these locations do not require texturing, they will still require the same taping effort typical of finished gyp board.

Gypsum Board, Unfinished (SF):**09 29 00**

Scope is similar to finished gyp board described above except no taping or texturing is included with the unit cost. Occurs where multiple layer of gyp board are needed and also occurs behind several types of wall finish (except tile which receives Cementitious backerboard and vinyl wallcovering which receives a finished gyp board backer).

Gypsum Board at Interior of Exterior (SF):**09 29 00**

If extensive bracing and kickers are required at exterior walls identify costs for this line item to account for intricate hanging of gyp board around the kickers and braces.

Cementitious Backerboard (SF):**09 29 00**

Cementitious backerboard is provided at areas receiving wall tile and is deducted from the overall finished gyp board quantity.

Shaft Liner (SF): 09 29 00

Shaft liner (typically 1" thick coreboard) is included where called out at shaft walls. Width is assumed to be 24" wide.

Exterior Sheathing (SF): 09 29 00

See Division 061653

Security Wire Mesh (SF): 09 29 00

This is the cost added at secure areas such as pharmacies and is included with the partition sheathing element section.

Premium Gypsum Board Systems (SF): 09 29 00

Premiums for specialty gypsum board are segregated from the standard gypsum line items above. Such premiums include, but are not limited to: moisture-resistant gyp board, bullet-resistant gyp board, and gyp board to receive level 5 finish. Note, high impact wall board is included in Division 102623 rather than in this division.

Tiling 09 30 00

Wall Tile (SF): 09 31 13

Materials may include ceramic, porcelain, quarry, stone, marble, or any other surface that requires grouting.

Floor Tile / Pavers (SF): 09 32 13

Materials may include ceramic, porcelain, quarry, stone, marble, or any other surface that requires grouting. Thin-set tile is segregated from mortar-set tile.

Base Tile / Pavers (LF): 09 32 13

Materials may include ceramic, porcelain, quarry stone, marble, or any other surface that requires grouting.

Waterproofing Membrane at Tiled Areas (SF): 09 34 00

Waterproofing beneath tiles (whether membrane or liquid-applied) is quantified based on area and linked to the tile quantities. Because the quantities are linked, the measurement methodology mirrors the system to which it is applied.

Crack Isolation Membrane (SF):**09 34 00**

If required by the specs, a crack isolation membrane is included as a separate line item from the tile cost itself, and carried here in Division 093000.

**Ceilings****09 50 00****Acoustic Ceiling Tile (SF):****09 51 23**

ACT systems are measured based on total system area, and include grid, tile, hangers, compression struts, connections, and specified attic stock of tile. Unique system types are segregated, as is the tile size. 2x2 is priced at a premium over 2x4 due to the added grid and added labor for tile installation. Washable tile is also segregated and priced separately. System is measured through any fixtures hosted by the ceiling system (in other words, area is not deducted for light fixtures, air diffusers, access panels, etc.). Utah State projects require additional strap back where attached to wall framing. See Division 092000 for more information.

Suspended Wood / Metal Panel Ceilings (SF):**09 54 00**

Measurement metrics are similar to ACT ceiling systems, but unit price is adjusted as appropriate. Price is for a complete system, including all support assemblies and anchorage.

Ceiling Access Panels (EA):**09 54 00**

See Division 083100 Access Doors and Panels.

Integrated Ceiling Assemblies: Operating Rooms (EA)**09 58 00**

Operating room ceilings are priced per each room.

Flooring

09 60 00

Terminology: “Top set” refers to base installed as a separate component from the floor itself, whereas “integral” refers to a floor system wrapped up the wall. Note that the unit cost for integral base includes radiused corner grouting as well as termination caps. “Cove” simply refers to the shape, and can apply to both top set and integral systems.

Floor Leveling / Floor Prep (SF)

09 61 00

Includes the material and labor required to achieve a flat and level surface as required for installation of floor materials. Priced per square foot.

Wood Base (LF):

09 64 00

See Division 6

Resilient / Rubber Base (LF):

09 65 13

Base by convention is measure through door openings, and is often applied to the front of casework (therefore room perimeter is a sound metric for linear foot quantification, provided walls within rooms and adjacent rooms are taken into account). Unit cost for resilient is priced separately from rubber.

Integral Coved Bases (LF):

09 65 13

Unit cost includes radiused corner grouting and well as termination caps (typically metal or plastic). Base systems should be segregated according to the same logic as flooring systems.

Resilient / Rubber Sheet Flooring (SF):

09 65 16

Several different systems fall under this umbrella including linoleum and rubber. Sheets are adhered to the subfloor (typically over some type of moisture vapor emission control system per Division 072600 when relative humidity of the slab exceeds manufactures requirements) and then be bonded to each other, either by means of head welding or chemical welding. Patterning costs are broken out separately if the patterns are intricate.

Resilient / Rubber Tile Flooring (SF):

09 65 19

Several different systems fall under this umbrella including Vinyl Composite Tile (VCT) and rubber floor tiles. Tiles are adhered to the subfloor (typically over some type of moisture vapor emission control system per Division 072600 when relative humidity of the slab exceeds manufactures requirements) and may then be bonded to each other, either by means of head welding or chemical welding. Patterning costs are broken out separately if the patterns are intricate.

Resinous Flooring (SF):**09 67 23**

Poured flooring systems, including sealed concrete, are priced on a square foot basis. Some systems may involve an integral base wrapped up the wall. Patterning costs are broken out separately if the patterns are intricate.

Carpet (SF):**09 68 00**

The University measures carpet on a square foot basis, however many contractors measure on a square yard basis. [The reason the University uses SF is to be consistent with the unit-of-measure for other flooring systems, and is for a consistent QA/QC process]. Unit cost includes carpet material, padding, tack strips, adhesives & delivery. See Division 09 61 00 for floor preparation.

Access Flooring (SF):**09 69 00**

Access flooring (typical at computer rooms and MRI rooms) are measured on a square foot basis, and are inclusive of the complete system including pedestals, grid, and finished floor. Not included in the unit pricing is the cost for creating slab depressions if needed at spaces such as MRI's.

Wall Finishes**09 70 00****Various Wall Systems (SF):****09 70 00**

Several different systems exist that would be included within Division 097000, including but not limited to wood wall systems, metal panel wall systems, stone veneer walls systems, peg board / slat wall systems, stainless steel wall systems at kitchens, etc. Generally, the methodology is to measure the net area covered, deducting for any openings greater than 50 square feet. Unit price includes both the wall finish itself, as well as any adhesives, clips, bolts, and other connections required to attach the system to the substrate.

Acoustical Treatment**09 80 00****Batt Insulation (SF):****09 81 00**

Batt insulation is measured based on area, and is segregated based on thickness or R-value. The same measuring metrics used for partitions applies to batt insulation (which is often simply linked to the appropriate wall systems on an intermediate partition matrix). Batt insulation that occurs at ceiling systems rather than partitions is segregated as a distinct line item.

Painting and Coating

09 90 00

Paint Exterior Plaster (SF):

09 91 13

If color is not integral to the plaster system, this line item is broken out separately and linked to the overall plaster quantity. No separate scaffolding cost is included; however, as the same scaffold system used by the plaster can be utilized by the painter (see Division 092400 for more information).

Paint Interior Gyp Board Walls (SF):

09 91 23

The quantity for wall paint is typically linked to the quantity for finished gypsum board, less any exceptions (such as finished gypsum board behind vinyl wall covering). Unit cost includes primer coat and two finish coats, unless noted otherwise.

Paint Interior Drop Gyp Ceilings / Soffits (SF):

09 91 23

The quantity for ceiling / soffit paint is typically linked to the quantity for finished gypsum board at these systems. Paint to vertical edges of soffits is applied only to the exposed gypsum board line item rather than the line item for metal stud framing above the ceiling. Unit cost includes primer coat and two finish coats, unless noted otherwise.

Paint Exposed Structure at Open Ceilings (SF):

09 91 23

Paint to exposed ceilings is measured based on the area of the room in square feet, and includes overhead slab/deck, exposed structural members, exposed piping, and anything else open to view that needs to be color-masked.

Paint Doors and Frames (EA):

09 91 23

This scope is quantified per door leaf and linked to the appropriate door/frame line items (and multiplied by 2 if a double door). Paint to interior doors is segregated from paint to exterior doors. Unit cost varies, depending on if paint is applied to the frame alone, or if required at both the frame and the door leaf itself.

Miscellaneous Undefined Painting (LS):

09 91 23

Often there are not details showing the paint to every single item on a project requiring paint; therefore an overall cost is utilized to capture other miscellaneous items not included above. Some such items include (but are not limited to): metal handrails, corrugated equipment screens, underside of metal stairs, warning striping at mechanical rooms, and other miscellaneous paint scope.

DIVISION 10 - SPECIALTIES

Information Specialties

10 10 00

Marker boards, Tack boards, & Whiteboards (EA):

10 11 16

Furnishing these items is typically excluded from the general contractor's scope of work, however an overall cost is carried in Division 115000 to cover installation of OFCI equipment, furnishings, and other miscellaneous OFCI items, if required in the Contract.

Interior Signage, Code-Required (SF / EA):

10 14 16

During the early stages of design, often the code-required signage scope is yet to be detailed-out, therefore it is common to include an cost to cover such scope (based on the gross square footage of the building). The unit cost for this scope depends on the level of design, and continually decreases towards zero as design progresses. If signage drawings are available, individual signs are detailed as much as possible. Code-required signage is mandated by a governing authority, whereas wayfinding signage is at the discretion of the design team (hence why there is more range in the \$ / GSF unit cost for wayfinding signage than for code-required).

Interior Signage, Wayfinding (SF / EA):

10 14 16

During the early stages of design, often the code-required signage scope is yet to be detailed-out, therefore it is common to include a cost to cover such scope (based on the gross square footage of the building). The unit cost for this scope depends on the level of design, and continually decreases towards zero as design progresses. If signage drawings are available, individual signs are detailed as much as possible. Code-required signage is mandated by a governing authority, whereas wayfinding signage is at the discretion of the design team (hence why there is more range in the \$ / GSF unit cost for wayfinding signage than for code-required).

Exterior Signage (EA / LS):

10 14 33

Given the large, relatively expensive nature of exterior signage, they are detailed out on a per each basis. If quotations are provided, they are often included in the estimate as a lump sum figure. Signage cost includes installation and connections, but does not include added structural support that would need to be integrated with the structural systems (such as added steel weight to carry heavy members).

Interior Specialties

10 20 00

Toilet Partitions (EA):

10 21 13

Toilet partitions are measured by count (rather than by linear foot) and are segregated by either standard partition or ADA-compliant partition. Description and pricing should reflect ceiling mounted versus floor mounted. Blocking and backing (neither wall nor ceiling) is not included with the unit cost (see Division 092000 for blocking and backing). Added cost is associated with stainless steel partitions (rather than phenolic).

Urinal Screens (EA):

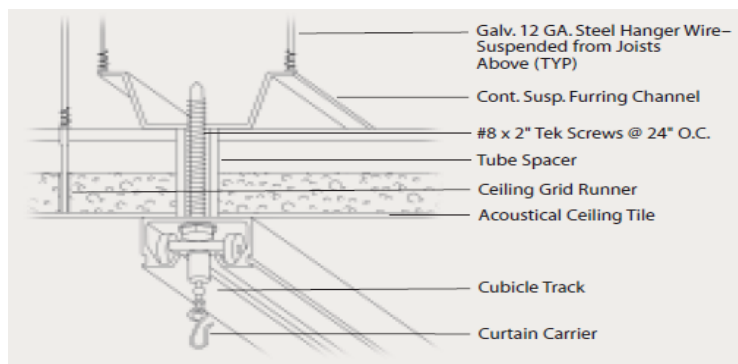
10 21 13

Urinal screens are measured by count (rather than by linear foot). Blocking and backing in the wall is not included with the unit cost (see Division 092000 for blocking and backing). Added cost is associated with stainless steel partitions (rather than phenolic).

Cubicle / Shower Curtain Track (LF):

10 21 23

Curtain track is measured on a linear foot basis and is inclusive of both the track itself and the above-ceiling support required to keep it in place. Straight versus curved is not broken out as discrete line items, but rather quantified together and reflected in the unit cost (curved curtain tracks is very typical, hence most pricing reflects a partial curve). Curtains themselves are not carried in this line item, as most owners will furnish and install the curtains themselves (see below).



Cubicle / Shower Curtains (N/A):

10 21 23

This is typically carried by the Owner and excluded by the general contractor

Chain Link Fences (LF):

10 22 13

When chain link fences are inside a building, they are included in Division 10 and quantified based on linear footage (note: when chain link systems occur on the site, they are segregated into Division 32, and unit price per linear foot is increased to account for footings). Line items are segregated according to fence height.

Chain Link Gates (EA/PR):**10 22 16**

Gates within chain link fencing are priced separately per single gate or pair, including standard hardware.

Demountable Partitions (LF):**10 22 19**

Measured in Lineal Feet, these partitions should include line items for both the material and labor costs. Demountable partitions are parametric by design for all components. It is installed very similar to standard wall construction. The top track is secured to the ceiling, bottom track and horizontal structure are set to floor, vertical, structural posts and squared to the top and bottom track. Skins come in a variety of finishes and are secured to all structure by heavy duty brackets.

Operable Partitions (LF):**10 22 26**

Operable partitions are measured based on their overall length when open. Varying heights and STC ratings are carried as separate line items. Costs for openings in the operable partitions (if called out) are broken out as a separate "per each" line item. Note: additional structure steel members intended to carry the weight of the operable partitions is not included in the unit cost, and is to be included with Division 055000 Metal Fabrications.

Undefined Wall Protection (SF):**10 26 00**

During the early stages of design, often the wall protection scope is yet to be detailed-out, therefore it is common to include a cost to cover such scope (based on the gross square footage of the building). The unit cost for this scope depends on the level of design, and continually decreases towards zero as design progresses.

Miscellaneous Interior Specialties (SF):**10 26 00**

During the early stages of design, often many of the more esoteric building specialties elements have yet to be identified, therefore it is common to include a cost to cover such scope (based on the gross square footage of the building). The unit cost for this scope depends on the level of design, and continually decreases towards zero as design progresses.

Corner Guards (EA):**10 26 13**

Corner guards are priced per each (rather than per linear foot) and segregated according to height and material. Typical materials include thermoplastic and stainless steel. Description should note if the guard is full-height or half-height.

Crash / Bumper / Chair Rails (LF): **10 26 16**

Linear wall protection systems area measured based on length and segregated based on material. Typically these items are either a plastic product or a stainless steel product.

Acrylic Wall Covering / Fiberglass Reinforced Plastic (SF) : **10 26 23**

Sheet wall protection is measured based on area, and is included in this division rather than in Division 097000 Wall Finishes. This system is often beneath crash/bumper rails in main circulation areas.

Toilet Accessories (EA): **10 28 13**

Toilet accessories are detailed out and quantified in as much detail as possible. Such accessories include: toilet tissue dispensers, paper tower dispensers/disposals, sanitary napkin dispensers/disposals, seat cover dispensers, soap dispensers, grab bars, fold-down shower seats, and coat hooks. Blocking and backing is not included with the unit cost (see Division 092000 for blocking and backing).

Restroom Mirrors (SF): **10 28 13**

Mirrors are priced based on overall area and are segregated between private restrooms (often individual framed mirrors) and public restrooms (often large-piece continuous mirror above the vanity). Cost includes all sundry connection items, but excluded blocking and backing (see Division 092000 for blocking and backing).

Janitor Mop Sink Rack (EA): **10 28 13**

This cost captures the rack system above the janitor's sink to hold mops, brooms, and cleaning supplies. Note that this is not the cost for the janitor's sink itself (which is included under plumbing) but rather just for the rack assembly.

NOTE: The above list is not exhaustive, and specialty items in particular hinge on the specific nature of each individual project.

Safety Specialties **10 40 00**

Fire Extinguishers (EA): **10 44 13**

Costs added if extinguisher is in a cabinet rather than mounted directly to the wall in a simple strip / holder. If information is not yet available regarding the location of extinguishers (typical of pre-CD documents) then the standard is roughly one extinguisher per 2,500 SF of occupied building space. This should be verified prior to construction.

Storage Specialties

10 50 00

Lockers (EA):

10 51 13

Price of lockers is per each tier, with between 1 and 6 lockers per tier. The more lockers per tier, the more shelves, doors, and hardware, therefore the higher the cost. Included in the unit cost is the concrete base required at each location.

Central Mail Delivery Boxes (LF):

10 55 13

These specialty items are carried in Division 105500 under Postal Specialties rather than with casework.

High-Density Storage Shelving (LS):

10 56 13

Sometimes this is typically a separate contract to the Owner and outside of the scope provided by the general contractor. However even if the scope is not carried by the general contractor, they are still responsible for coordinating the electrical connections, which should be indicated on the electrical drawings and carried under that scope of work.

Hat and Coat Racks (LF):

10 57 13

These specialty items are carried in Division 105700 under Wardrobe and Closet Specialties rather than with casework.

Exterior Specialties

10 70 00

Flagpoles (EA):

10 75 00

These specialty items are carried in Division 107500 under Exterior Specialties. Concrete foundations will be carried in Division 3.

DIVISION 11 - EQUIPMENT

Vehicle and Pedestrian Equipment

11 10 00

Parking Control Equipment (EA):

11 12 00

Parking control equipment such as Key and Card Control Units, Ticket Dispensers, Meters, and Gates are priced per unit. Foundations will be carried in Division 32, electrical connections in Division 26 and conduit for data connections in Division 28.

Loading Dock Bumpers (EA):

11 13 13

Dock bumpers are counted and priced separately from the leveler itself (if required). Unit price include all connections necessary to attach to concrete substrate.

Stationary Loading Dock Equipment (EA): **11 13 19**

Levelers are priced per leveler, and include a complete system. Not included are concrete costs for the loading dock itself, the electrical connections to the leveler (included within Division 260000 for Electrical Scope), or dock bumpers (segregated as a separate item per below).

Security, Detention And Banking Equipment **11 15 00**

Pass-Through Windows (EA): **11 19 13**

Pass-through windows (specimen, pharmacy, security and administrative) are broken out separately from other Division 085619 interior windows and carried here as a specialty item.

Commercial Equipment **11 20 00**

Window Washing Equipment (LS): **11 24 23**

Window washing equipment is carried under Commercial Equipment as a lump sum cost inclusive of davit arms, outriggers, platforms, monorail systems, safety equipment, and transportation equipment (such as dollies / carts). Lump sum to include tie-back anchors and installation of davit pedestals (unless by structural steel subcontractor).

Food Service Equipment **11 40 00**

Food Service Equipment (SF): **11 41 00**

The SF is the floor area that the kitchen equipment is situated, and does not include seating areas for patrons. This cost does not include plumbing / electrical connections to the equipment, but do include installation.

Walk-In Refrigerated Rooms (SF): **11 41 00**

When not explicitly included in the food service equipment cost, walk-in refrigerated rooms are priced as a SF cost for a system complete of all insulated walls, doors and ceilings, and is inclusive of the necessary mechanical refrigeration equipment. Not included in the scope is the flooring scope, which is typically provided by the flooring contractor and applied to these rooms as required. This logic applies to both food storage rooms as well as tissue storage rooms (including labs and morgues).

Educational and Scientific Equipment

11 50 00

Projection Screens (EA):

11 52 13

These items should be carefully vetted on the equipment schedule to verify if they are carried by the Owner or the contractor.

Projector / TV Mounting Brackets (EA):

11 52 16

The brackets are quantified on a per each basis. Additional framing required to support these items is carried in Division 9 under Miscellaneous Blocking and Backing for gyp board assemblies.

Healthcare and/or Education Equipment

11 70 00

Install OFCI Medical Equipment (EA / SF):

11 72 00

A cost is included for the contractor to install items furnished by the Owner. Typically this is an overall metric measured over the entire building's gross floor area, and relies on historical information for pricing. Specific equipment items may be detailed out if required for reconciliation purposes (such as the installation of headwalls), but otherwise all OFCI installation scope is assumed to be carried as a part of this cost.

Furnish Headwalls (EA):

11 73 00

Headwalls are measured per each unit, and unit cost reflects the furnishing only, as installation is often by another subcontractor (see below for installation). If service pedestals or bed dockers are also included, they are broken out as separate line items.

Patient Lifts (EA):

11 73 13

Patient lifts are counted per each and segregated based on standard capacity (440 lbs) or bariatric capacity (880 lbs). Structural support required to support the lifts is captured as a discrete line item under Division 054000 Cold-Formed Metal Framing. Unit pricing does not include electrical connections, which are carried under Division 260000.

DIVISION 12 - FURNISHINGS

Window Treatment

12 20 00

Roller Shades at Exterior Windows (SF):

12 24 13

Roller shades (i.e., Mechoshades) are priced based on the area of exterior glazing covered, and are segregated according to manual versus motor, and single shade versus double shade. Not included in the unit cost is the framing cost for shade pockets. Also not included is the electrical connection cost for motorized shades.

Lab Casework - Base Cabinets (LF):

12 30 00

LF of specialty lab casework, contracted separately from general cabinet subcontractor in Division 06 41 16.

Lab Casework - Upper Cabinets (LF):

12 30 00

LF of specialty lab casework, contracted separately from general cabinet subcontractor in Division 06 41 16.

Lab Casework - Tall Cabinets (LF):

12 30 00

LF of specialty lab casework, contracted separately from general cabinet subcontractor in Division 06 41 16.

Fixed Seating (EA):

12 60 00

Fixed seating per each, and includes all finish panels, fabric, accessories, installation, and built in lighting or power.

DIVISION 13 - SPECIAL CONSTRUCTION

Tubs and Pools (EA):

13 17 00

Includes all related finishes within the pool footprint (plaster, tile, etc.), as well as equipment, piping and electrical from the equipment to the tub or pool.

Therapeutic Pools (EA):

13 17 33

Includes all related finishes within the pool footprint (plaster, tile, etc.), as well as equipment, piping and electrical from the equipment to the tub or pool.

Controlled Environmental Rooms (SF):	13 21 00
Clean rooms, hyperbaric rooms, cold storage, or other controlled environmental space. Includes all equipment, finishes, mechanical, and electrical within the space.	
Sound, Vibration and Seismic Control (BLDG SF):	13 48 00
Dedicated construction for large scale sound, vibration, and seismic control measures.	
<u>Integrated Construction</u>	13 40 00
Lead-Shielding at Walls (SF / LBS):	13 49 19
Lead wall shielding is priced based on square footage, however since unit cost hinges on weight, it is important the line item description accurately represent the measured (or assumed) weight. Weights over 6 lbs / sf require a plywood backer system, whereas weights 6 lbs / sf or less can be integrated with gypsum board products. Unit price for gypsum board-integrated systems includes the cost of the gypsum board system itself.	
Lead-Shielding at Floors (SF / LBS):	13 49 19
If required, the cost for lead-shielded floors is measured based on net area of floor shielded, and is inclusive of all components required to attach shielding to substrate.	
Lead-Shielded Glazing (SF):	13 49 19
Lead-shielded windows are measured based on the overall area of the opening, and include both the shielded glazing as well as the shielded frames. Various glass systems are segregated based on the shielding-density requirement (2 lbs/sf from 3 lbs/sf, etc.).	
Lead-Shielded Doors (EA / PR):	13 49 19
Lead-shielded doors are measured based on the count of single/double doors, and include both the shielding applied to the door as well as the shielded frames. Various doors are segregated based on both size of door opening and thickness of shielding.	
RF-Shielding at Walls (SF):	13 49 33
RF/copper wall shielding is priced based on square footage, and is inclusive of the entire wall assembly required to support the RF-shielded system.	

RF-Shielding at Floors (SF): **13 49 33**

The cost for RF/copper-shielded floors is measured based on net area of floor shielded, and is inclusive of all components required to attach shielding to substrate.

RF-Shielding at Ceilings (SF): **13 49 33**

The cost for RF/copper-shielded ceilings is measured based on net area of ceiling shielded, and is inclusive of all components required to attach shielding to substrate.

RF-Shielded Glazing (SF): **13 49 33**

RF/copper-shielded windows are measured based on the overall area of the opening, and include both the shielded glazing as well as the shielded frames.

RF-Shielded Doors (EA / PR): **13 49 33**

RF/copper-shielded doors are measured based on the count of single/double doors, and include both the shielding applied to the door as well as the shielded frames. Various doors are segregated based on size of door.

Special Instrumentation **13 50 00**

Seismic Monitoring (LS): **13 48 00**

If structural steel requires a seismic monitoring system, it is included in Division 13 as a lump sum cost inclusive of all connections and supports.

DIVISION 14 - CONVEYING SYSTEMS

Dumbwaiters **14 10 00**

Dumbwaiters (EA): **14 10 00**

Dumbwaiters follow the same pricing logic as elevators (described below).

Elevators

14 20 00

Electric Traction Elevators (STOP):

14 21 00

Elevators typically priced per a stop, with a notation of the number of stops included within the item description. Each unique elevator system is segregated into a separate line item based on the following: number of stops, weight capacity, speed, number of doors, and overall cab size. A-typical cab/door sizes that may require special State review are priced separately. Pricing is based on a standard cab finish, and all specialty finishes are segregated into a separate item (see below). Cost includes all machinery, hoisting / safety equipment, elevator cab, as well as openings, indicator lights, and call-buttons at each stop. Unit price excludes elevator guide rails (Division 051200 Structural Steel Framing), electrical connections (Division 260000), and framing of elevator shaft (varies depending on shaft wall type).

Traction / Hydraulic Elevators (STOP):

14 24 00

See description for Division 14 21 00.

Hydraulic Elevators (STOP):

14 24 00

See description for Division 14 21 00.

Cab Finishes (EA):

14 27 00

If a higher-end finish is desired above standard (typical of passenger elevators) the finish cost is segregated from the elevator cost itself and carried with Division 142700 Custom Elevator Cabs. Each cab is quantified separately, and priced uniquely depending on desired finish.

Escalators and Moving Walks

14 30 00

Escalators (EA):

14 31 00

Escalators are priced per each escalator, and are inclusive of the complete system. The only scope excluded from unit pricing is slab depressions in the concrete floor, and electrical connections.

Other Conveying Equipment

14 90 00

Pneumatic Tube System (LOC / LS):

14 92 00

Pneumatic tubes systems are typically priced per station served, however costs may be added for additional blowers, tie-in to existing pneumatic tub system, and re-programming (if required). Alternatively, a lump sum or square footage price may be utilized if design has not progressed to the point of quantifiable station counts.

DIVISION 21 - FIRE SUPPRESSION

Water-Based Fire Suppression System

21 10 00

Material: Fire sprinkler heads, piping, connections, hangers, and consumables

Labor: Complete installation of sprinkler system, inclusive of all shop-drawing / submittal preparation and design work (if required).

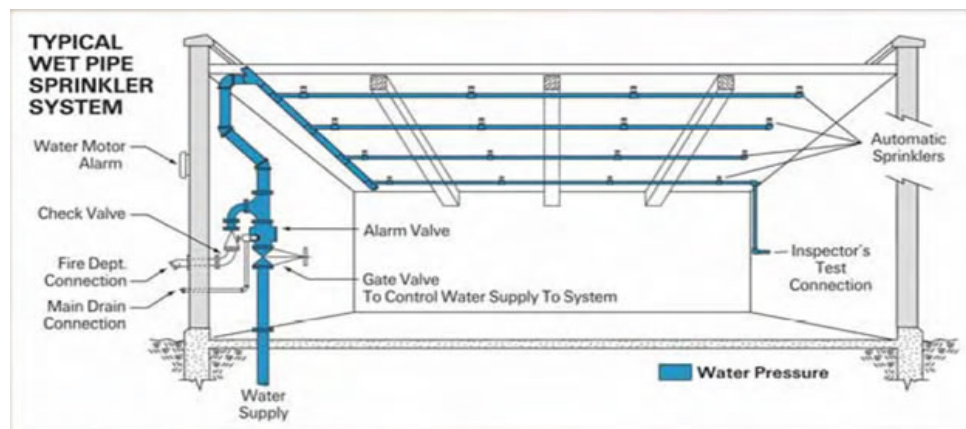
Equipment: All equipment required to provide complete installed system.

Factors Affecting Cost: Wet pipe systems segregated from dry stack systems. Pre-action, dry-agent, and foam systems are segregated and priced separately.

Wet-Pipe Sprinkler Systems (SF):

21 13 13

Fire suppression systems are priced as a complete system starting from a flange 6" above the finished floor in the pump room, with costs based on the area of building covered, and are intended to cover a complete turn-key system. Piping is based on schedule 40 carbon steel with mechanical joints (grooved-end), though University Standards allow for schedule 10 black steel pipe for piping sized 2.5" and larger. Sprinkler heads are based on typical type for the facility use. Pricing includes design/engineering requirements for this trade.



Dry-Agent (CF):

21 13 16

Priced per cubic foot of coverage, inclusive of specialties, charging, all accessories and connections.

Pre-Action (LS):

21 13 19

Unless broken-out as separate line items, this scope is not included with the overall system cost. They are priced as lump sums, inclusive of specialties, charging, all accessories and connections.

Foam Systems (LS):**21 13 39**

Priced per cubic foot of coverage, inclusive of specialties, charging, all accessories and connections.

Fire Pumps**21 30 00****Centrifugal Fire Pumps (EA):****21 31 00**

Unless broken-out as a separate line item, pumps are not included with the overall system cost. They are priced per each, inclusive of a jockey pump, specialties, all accessories and connections.

DIVISION 22 - PLUMBING**Plumbing****22 00 00****Metering and Submetering of Building Services Systems (LS):****22 05 19**

Sub metering per University Design Requirement.

Seismic Bracing (SF):**22 05 48**

The cost for seismic bracing of all plumbing systems is broken out as a separate cost and included over the entire gross floor area of the building. The cost captures anything required above and beyond standard hangers and fittings that would be required in a non-seismically braced application.

Piping Identification (EA):**22 05 53**

Pipe identification is priced per each, following the rough metric of one label per 20 linear foot of pipe, plus each valve and equipment item. Unit cost includes printed labels, metal valve tags, plastic equipment tags and/or marking and adhesives.

Pipe Insulation (LF):**22 07 19**

Pipe insulation is segregated according to size of pipe insulated. This scope is carried under division 220719 rather than in the Piping section itself. Unless indicated otherwise in the drawings or specifications, insulation is included for hot water systems only (unless at sensitive / critical applications, in which case it is included for both hot and cold water systems as well as any system sensitive to temperature gain/loss). Unit pricing is inclusive of all required fittings and equipment insulation. Exterior insulation will be carried in a separate line item.

Start-Up / Flush / Check-Out (HR):**22 08 00**

The cost of system testing is priced based on manhours and includes start-up for equipment, filling & flushing of systems with required media, circulating media, removal of construction debris and preparation for commissioning. Note that the cost for pressure testing is included within piping unit costs.

Commissioning Assist (HR):**22 08 00**

This represents the cost borne by subcontractor to assist 3rd party commissioning agent during the commissioning process. Excludes the cost for actual commissioning agent. Pricing is an overall metric, based on the gross area of the building.

Demolition and Capping (HR):**22 08 00**

If required on projects where existing work is in place, demolition costs are included in Division 020000.

Pressure Testing (N/A):**22 08 15**

Pressure testing is included with piping unit costs.

Shop-Drawings/CAD/As-Built Plans (HR):**N/A**

The cost to provide clash detection/coordination, submittals/shop drawings, and as-built drawings is to be distributed throughout the trades' unit rates.

Penetrations, Sleeving, Firestopping, and Coring (LS):**07 84 13**

The cost of penetrations and firestopping is included with Division 078413 Penetration Firestopping, even though included with the plumber's subcontract.

Plumbing Piping and Pumps**22 10 00**

Material: Tubing, joints, fittings, valves, supports

Labor: Shop fabrication, field labor, punch list reparations

Equipment: Scissor lifts for high work

Factors Affecting Cost: Copper type, overtime, and work at occupied areas

Typical Piping Systems (LF):**22 10 00**

Typical plumbing pipe systems are priced on a cost per linear foot, inclusive of all materials, labor, equipment, connections, bends, fittings, hangers, valves and consumables necessary to accommodate the pipe run. Average ratio of valves to linear feet ranges from 1:50 to 1:100 depending on the nature of the project. The linear footage measurement does not include fixture connections, which are separated out under the line item "Local Rough In." Unit costs include pressure testing. Pipe systems are segregated according to size, material, and underground vs. in-building. For all types of piping specification, refer to the contract documents and the DFCM and University Design Standards.

Underground Piping (LF):**22 10 00**

Includes pipe, fittings, coupling spacers and wrap/jacket if required. Pricing includes placement in trench. Slab-suspended pipe is separated from pipe-in-trench systems. All trenching costs are separated (see below).

Trenching, Backfill, and Compaction (CY):**31 23 16**

Earthwork required for underground systems is included under Division 312316. Sand bedding is segregated from trenching/backfill cost and included with Division 312323. Export volume is assumed to be up to 25% of trenching volume.

Concrete Encasement (CY):

Concrete encasement required for underground systems is included under Division 033000.

Equipment Connections (N/A):**22 10 00**

The piping for equipment is contained within their respective piping quantities. The specialty items are contained in the "specialties" line-item.

Pump Connections (EA):**22 10 00**

The piping for pumps is contained within their respective piping quantities. The specialty items are contained in the "specialties" line-item.

Water Heater Connections (EA):**22 10 00**

The piping for water heaters are contained within their respective piping quantities. The specialty items are contained in the "specialties" line-item.

Backflow Preventers (EA):**22 10 00**

Backflow preventers are based on line-size include independent certification.

Floor / Wall Cleanout (EA):	22 13 16
Includes cleanout plug, cover, vertical pipe to main and cleanout wye / tee.	
Vent Through Roof (EA):	22 13 16
Priced per location, and inclusive of flashing kit.	
Roof Drains (EA):	22 13 16
Roof drains are included under Division 221423 as a Storm Drainage Piping Specialty. Cost includes drain body and cover.	
Food Service Equipment Connection (EA):	22 13 19
These rough-in costs to food service equipment items are segregated from other fixture/equipment rough-in costs.	
Air Compressors (EA):	22 15 19
Air compressors are carried under Division 221500 General Service Compressed Air Systems. Unit cost is inclusive of dryers, specialties, all accessories and connections.	
Access Panels (EA):	08 31 16
Located in ceiling or wall for access to valves and accessories at drywall partitions and hard-lid ceilings. These are provided only and installed by the finishing trades. These items are carried under Division 083116.	
<u>Plumbing Equipment</u>	22 30 00
Material: Equipment, associated tanks/pumps/valves, and specialties Labor: Delivery, installation, connection	
Water Heaters (EA):	22 34 36
Water heaters are based on mbh/kw and include stands, integral valves and controls.	
Circulating / Booster Pumps (EA):	22 34 36
Circulating/booster pumps are based on hp/gpm and include stands, integral valves and controls.	
Sump Pumps and Sewage Ejectors (EA):	22 34 36
Sump pumps and sewage ejectors are based on hp/gpm and include sampling boxes, manholes, excavation, backfill & compaction and integral controls.	

Water Softeners (EA): **22 34 36**

Water softeners are based on gpm and include brine tank(s) with excavation, backfill & compaction and integral controls.

Expansion Tanks (EA): **22 34 36**

Expansion tanks are based on gallons and are segregated from the equipment cost.

Neutralization Tanks (EA): **22 34 36**

Neutralization is based on gallons and includes manholes, excavation, backfill & compaction.

Backflow Preventers (EA): **22 34 36**

Backflow preventers are based on line-size include independent certification.

Mixing / Reducing Valves (EA): **22 34 36**

Mixing and reducing valves are based on line-size.

Specialties (LS): **22 34 36**

Includes valves and piping specialties beyond those itemized specifically or already applied to piping footages. Piping pricing includes costs to include valves and specialties. This category addresses items that would be a premium (e.g. link seals, riser valves, equipment connection specialties, etc.).

Plumbing Fixtures **22 40 00**

Material: Fixture, trim (faucets / flush valves / etc.), carrier

Labor: Installation

Equipment: N/A

Factors Affecting Cost: Sensor flush valves / faucets

Commercial / Institutional Fixtures (EA): **22 42 00**

Healthcare Fixtures (EA): **22 43 00**

Plumbing fixtures are priced per each, and include the cost of the fixture itself, plus hangers/carriers. Note that the cost for local rough-in is included as a separate line item (see below). Plumbing fixtures are segregated according to the following buckets:

- Commercial Lavatories and Sinks (Division 224216)
- Commercial Faucets, Supplies, and Trim (Division 224239)
- Healthcare Water Closets (Division 224313)
- Healthcare Sinks (Division 224316)
- Healthcare Bathtubs and Showers (Division 224319)
- Emergency Plumbing Fixtures (Division 224500)
- Drinking Fountains and Water Coolers (Division 224700)

Local Rough-In - Commercial / Institutional Fixtures (EA): 22 42 39

Local Rough-In - Healthcare Fixtures (EA): 22 43 16

Counted per fixture location. Includes trap arms, traps, nipples and stops, supplies, thermal insulation (for ADA), temporary nipples and caps, anchors, hardware and caulking.

Gas and Vacuum Systems for Laboratory and Healthcare Facilities 22 60 00

Material: Equipment, piping, alarms, valves

Labor: Installation, connections, certification

Equipment: All equipment required for installation

Zone Valve Box (EA): 22 63 13

Zone valve boxes are priced per each and segregated according to number of gas services. Unit pricing includes box, valves, installation.

Master / Area Alarms (EA): 22 63 13

Alarms are priced per each and segregated by master vs. area alarms. Unit pricing includes the panel. Low-voltage wiring costs are segregated as discrete line items (see below).

Wiring, Laboratory and Medical Gas Alarm (EA): 22 63 13

Low-voltage alarm wiring is priced per each and segregated from the alarm cost itself. Unit pricing includes wiring, conduit, terminations and electrical start-up & testing as performed by a 2nd tier subcontractor.

Laboratory and Med Gas Piping Systems (LF): 22 63 13

Med gas pipe systems are priced on a cost per linear foot, inclusive of all materials, labor, equipment, connections, bends, fittings, hangers and valves necessary to accommodate the pipe run. Pricing also includes nitrogen purge and all NFPA 99 requirements. Pipe systems are segregated according to type, size, material, and underground vs. in-building.

Certification (LS): 22 63 13

Laboratory and Medical gas certification is carried as a discrete lump sum scope item. Pricing entails documentation generated by a 2nd tier, authorized subcontractor which certifies all referenced devices as meeting specified minimum requirements.

Laboratory and Med Gas Manifolds (EA): 22 63 13

Manifolds are priced per each.

Laboratory and Medical Vacuum Pumps / Air Compressors (EA): **22 63 13**

Pumps and compressors are priced per each and segregated by type and capacity (hp).

Emergency Oxygen Connections (EA): **22 63 13**

Emergency connections are priced per each.

Headwalls, OFCI (EA): **22 63 13**

Unit pricing includes pipe connections to the headwall. Med gas connections to headwalls (installation only) are segregated from the overall. Headwall furnish / install costs carried in Division 117300.

OR Gas Boom, OFCI (EA): **22 63 13**

Unit pricing includes pipe connections to the OR Boom

Outlet, Medical Gas (EA): **22 63 13**

Laboratory and Medical gas outlets are priced per each and segregated by type.

DIVISION 23 - HVAC

Heating, Ventilation, and Air-Conditioning (HVAC) **23 00 00**

Metering and Submetering of Building Services Systems (LS): **23 05 19**

Sub metering per University Design Requirements.

Seismic Bracing (SF/EA): **23 05 48**

The cost for seismic bracing of air duct and hydronic piping systems are broken out as a separate cost and included over the entire gross floor area of the building as two distinct costs. A third seismic-bracing line items is included for large equipment bracing and priced per piece of equipment. The cumulative scope captured by these three line items covers the costs above and beyond standard hangers and fittings that would be required in a non-seismically braced application.

Piping Identification (EA): **23 05 53**

Pipe/duct identification is priced per each, following the rough metric of one label per 20 linear foot of pipe/duct, each valve/damper and equipment item. Unit cost includes printed labels, metal valve tags, plastic equipment tags and/or marking/adhesives.

Test / Balance HVAC (HR):**23 05 93**

Testing and balancing is quantified based on manhours, and includes full testing and balancing of air and water systems by a NEBB or AABC qualified, independent company. Price excludes startup costs (see below). Pressure testing is included with pipe linear foot costs.

Start-Up/Check-Out (HR):**23 05 93**

Start-up / check-out is quantified based on manhours and segregated from the test / balance HVAC scope described above. Unit pricing includes Verifying power, starting equipment, ensuring and documenting proper operation and confirming no system deficiencies.

Pressure Test Piping (N/A):**23 05 93**

Pressure testing is included with pipe unit costs per linear foot.

Duct Insulation (SF):**23 07 13**

Duct insulation is measured based on area of duct insulated. Unit cost includes labor, materials, and subcontractor mark-up as provided by a 2nd tier insulation subcontractor. Quantities include fittings, equipment and waste. Insulation is segregated based on wrap, liner, sound barrier, fire-rated applications, and system type.

Pipe Insulation (LF):**23 07 19**

Pipe insulation is measured based on length of pipe insulated. Unit cost includes labor and materials as provided by a 2nd tier insulation subcontractor. Quantities include fittings, equipment and waste. Insulation is segregated based on line-size and system type.

Commissioning Assist (HR):**23 08 00**

This represents the cost borne by subcontractor to assist 3rd party commissioning agent during the commissioning process. Excludes the cost for actual commissioning agent. Pricing is an overall metric, based on the gross area of the building.

Facility Fuel Systems**23 10 00**

Material: Tank, pumps, controls, piping, equipment connections, fill stations, etc.

Labor: Installation, excavation, backfill, compacting, equipment connections

Equipment: All equipment required for installation

Factors Affecting Cost: Delivery distance, sole-source manufacturers, inclusion of first fill.

NOTE: Even though natural gas lines are typically carried as the plumber's scope of work, the scope is segregated into division 231123 to line up with 2004 CSI Master Format.

Natural Gas Piping Systems (LF):**23 11 23**

Natural gas pipe systems are priced on a cost per linear foot, inclusive of all materials, labor, pipe, fittings, hangers and valves necessary to accommodate the pipe run. Equipment connections are segregated. Pipe systems are segregated according to size, material, and underground vs. in-building. For all types of piping specification, refer to the contract documents and the DFCM and University Design Standards.

Shut-Off Valves / Regulators (EA):**23 11 23**

The gas system specialties are segregated from the \$ / LF piping unit costs and priced separately. Unit cost includes the specialty and its related labor.

Fuel Oil System (LS / GAL):**23 11 23**

Typically provided turn-key by a specialty 2nd tier subcontractor and priced as either a lump sum cost or a cost per gallon. Unit price includes all excavation, backfill, compaction, haul of excess, underground & exterior to building piping, controls, testing and start-up required for complete system installation. First fill-up is typically included and segregated as a separate line item.

HVAC Piping and Pumps**23 20 00**

Material: Pumps, storage tanks, water filters, water treatment systems, etc.

Labor: Shop fabrication, installation labor

Equipment: All equipment required for installation

Factors Affecting Cost:

OFCI Equipment (Handling, Storage Coordinate) (EA):**23 20 00**

If certain HVAC equipment items require the HVAC sub to be responsible for coordinating/handling/storage on behalf of the Owner. The cost for these services is segregated and priced per piece of equipment in question. Unit cost includes handling, storage, and coordination of the equipment.

Shop-Drawings/CAD/As-Built Plans (HR):**N/A**

The cost to provide clash detection/coordination, submittals/shop drawings, and as-built drawings is to be distributed throughout the trades' unit rates.

Hydronic Piping Systems (LF):**23 21 13**

Hydronic piping systems are priced per linear foot, and include all materials, labor, equipment, connections, bends, fittings, hangers, valves and consumables necessary to accommodate the pipe run. Unit costs include pressure testing. Pipe systems are segregated according to size, material, as well as by system. For all types of piping specification, refer to the contract documents and the DFCM and University Design Standards.

Heating and Cooling Equipment Connections (EA):**23 21 33**

Individual coil connections are priced per connection locations, and segregated according to size, material, and system (see above for system list). Unit price includes valves, pipe, fittings, and supports.

Steam and Condensate Piping Systems (LF):**23 22 00**

Steam and condensate piping systems are priced per linear foot, and include all materials, labor, equipment, connections, fittings, hangers and valves necessary to accommodate the pipe run. Pipe systems are segregated according to size, material, as by systems. For all types of piping specification, refer to the contract documents and the DFCM and University Design Standards.

Steam/Condensate Equipment/Pump/Trap Connections (EA):**23 22 00**

Includes isolation valves, flexible connections, gauges, flanges, boltups, pipe / fitting supports and specialties between the equipment package and the nearby header for both supply and return lines.

Steam and Condensate Trap and Equipment (EA):**23 22 00**

Includes isolation valves, flexible connections, gauges, flanges, boltups, pipe / fitting supports and specialties between the equipment package and the nearby header for both supply and return lines.

Refrigerant Piping Systems (LF/EA):**23 23 00**

Refrigerant piping systems are priced per linear foot, and include all materials, labor, equipment, connections, bends, fittings, hangers, valves, specialties, refrigerant and insulation necessary to accommodate the pipe run. Pipe systems are segregated according to size and material.

Refrigerant System Equipment/Pump/Trap Connections (EA):**23 23 00**

Includes isolation valves, flexible connections, gauges, flanges, boltups, pipe / fitting / supports and specialties between the equipment package and the nearby header for both supply and return lines.

Trenching, Backfill, and Compaction (CY):**31 23 16**

Earthwork required for underground systems is included under Division 312316
Sand bedding is segregated from trenching/backfill cost and included with
Division 312323.

Concrete Encasement (CY):**31 23 16**

Concrete encasement required for underground systems is included under
Division 033000.

Specialties (LS):**31 23 16**

Includes valves and piping specialties beyond those itemized specifically or
already applied to piping footages. Plumbing piping pricing includes valves and
specialties. This category addresses items that may be extra (e.g. handle
extensions, riser valves, etc.).

HVAC Air Distribution**23 30 00**

Material: Sheet metal, joints, fittings, turning vanes, volume dampers, supports,
waste, liner

Labor: Shop fabrication, installation labor, punch list reparations

Equipment: Scissor lifts for high work

Factors Affecting Cost: Kitchen ductwork and work at occupied areas (including OT
for off hours work)

Duct Insulation (SF):**23 07 13**

This is included under Division 230713 (See Above)

Metal Ducts (LB):**23 31 13**

Ductwork is priced based on overall weight. Ductwork is segregated based on
material type (galvanized, stainless steel, aluminum, or welded black steel). Unit
price includes all required fittings, hangers, waste, flexible connections, duct
access doors, wire mesh screens and consumables. Unit cost includes cleaning
during installation, but excludes post-installation cleaning. Cryogen quench vents
are segregated from the overall weight and included as a separate line item (see
below). Unit cost includes leakage testing. For all types of duct & exhaust
specification, refer to the contract documents and the DFCM and University
Design Standards.

Cryogen Quench Vent (LF):**23 31 13**

Quench vents are segregated from the overall weight and priced per linear foot.
Material is based on stainless steel (welded) material per SMACNA standards.
Unit cost includes labor, materials, and connection to related equipment.

Boiler Exhaust (LF):**23 31 13**

Boiler exhausts are priced per linear foot and segregated by size and material. Unit cost includes labor, material, test ports, thimbles and/or caps, supports and connections to equipment.

Dampers (EA):**23 33 13**

Air dampers are priced per each, and segregated based on operation (motorized vs. manual) as well as application (fire vs. smoke vs. combination). Dampers include actuators, angle-iron and access doors as required.

Flexible Ducts (LF):**23 33 46**

Flexible ductwork is included under Division 233346 as an Air Duct Accessory and priced based on linear footage. Duct is not segregated by size, but rather aggregated over total length of duct. Insulated flex duct is segregated from non-insulated.

HVAC Fans: Supply / Exhaust Fans (CFM):**23 34 00**

Fans are quantified per CFM, and are inclusive of all fans contributing to the volume of air moved (incidentally, the reason for this metric is limit the number of new line items per each estimate and provide a more meaningful basis of comparison across several projects). Unit cost includes labor, materials, curbs, seismic-requirements, back-draft dampers and penetration coordination. Bases and guide wires are included with "utility-set" fans. Variable frequency drives are included in a separate line item. NOTE: Fume hood exhausts are segregated from other exhaust fans and included within Division 233800 Ventilation Hoods (see below).

Air Terminal Units (EA):**23 36 00**

Air terminal units (including constant (CAV) and variable (VAV) boxes) are quantified per each. Unit cost includes labor, material reheat coil (pipe connection with piping category), seismic-requirements and support. Venturi valves are segregated.

Air Distribution Devices (Diffusers, Registers, and Grilles) (EA):**23 37 13**

Devices are priced per location, and segregated into diffusers, registers, and grilles, and further segregated into normal, linear, and laminar applications as required for accurate pricing. Cost includes hangers, cans, and trim, but excludes attached ductwork. True linear diffusers are priced per linear foot.

Louvers (SF):	23 37 13
Non-architectural louvers (i.e. those only indicated on the mechanical drawings and not an integral part of the façade system) are included in the HVAC scope of work, and priced based on overall area. Unit price include frame, louver blades, and all labor/equipment required for installation. Costs for all high-velocity systems are separate.	
Ventilation Hoods (CFM):	23 38 00
Fume hood exhausts are segregated from other exhaust fans and included within Division 233800 Ventilation Hoods. Line items are segregated for kitchen fume hood exhausts (Division 233813), and laboratory fume hood exhausts (Division 233816).	
<u>Central Heating Equipment</u>	23 50 00
Material: Equipment Labor: Shop fabrication, delivery, installation labor, and start-up. Equipment: All equipment required for complete installation Factors Affecting Cost: Delivery distance, congestion of area, sole-sourced manufacturer	
Boilers (EA):	23 52 00
Boilers are segregated by each capacity and included separately. Unit pricing includes labor, materials to set the equipment.	
Boiler Feed Water Unit (EA):	23 52 00
Quantity is measured per each, and unit cost includes labor, materials to set the equipment.	
Expansion Tank (EA):	23 52 00
Quantity is measured per each, and unit cost includes labor, materials to set the equipment.	
Air Separator / Blow down Separator (EA):	23 52 00
Quantity is measured per each, and unit cost includes labor, materials to set the equipment.	
Pressure Reducing Valve (EA):	23 52 00
Quantity is measured per each, and unit cost includes labor, materials and	
Chilled / Heating Water Pumps (EA):	23 53 00
Quantity is measured per each, and unit cost includes labor, materials to set the equipment, inertia bases, grouting and aligning of pumps.	

Chemical Treatment (LS):**23 53 00**

The cost for chemical treatment of Heating Equipment is segregated from the equipment costs themselves and included as a discrete line item. Unit cost includes an independent 2nd tier chemical treatment subcontractor, filling, flushing, removal of debris and temporary pumps/pipe connections as required.

Central HVAC Equipment**23 70 00**

Material: Equipment package

Labor: Shop fabrication, delivery, installation labor, and start-up.

Equipment: All equipment required for complete installation

Factors Affecting Cost: Delivery distance, congestion of area, sole-sourced manufacturer

Air Handlers (CFM):**23 74 13**

Air handling units are quantified per CFM, and are inclusive of all units contributing to the volume of air moved. (Incidentally, the reason for this metric is to limit the number of new line items per each estimate and provide a more meaningful basis of comparison across several projects). Unit cost includes labor, seismic-requirements, construction filters, and materials to set the equipment and penetration coordination. The following integral components are also included; supply and return/exhaust fans, heating/cooling coils, humidification, de-humidification, variable frequency drives, pre and final filters, dampers and air-flow monitoring stations. Pricing excludes hoisting, rigging, and start-up costs. If required, sound traps are isolated as a separate unit cost and priced per each.

Decentralized HVAC Equipment**23 80 00**

Material: Equipment package

Labor: Shop fabrication, delivery, installation labor, and start-up.

Equipment: All equipment required for complete installation

Factors Affecting Cost: Delivery distance, congestion of area, sole-sourced manufacturer

Fan Coil Units (TN):**23 82 19**

Fan coil units are quantified per ton. Unit cost includes labor, materials, integral fans & coils, seismic-requirements, secondary drain pans, supports and isolation. Piping connections are included in the piping category. Pricing excludes hoisting, rigging, and start-up costs.

Humidifiers (EA):**23 84 13**

Humidifiers are quantified per each, and segregated according to size and purity requirements. Unit cost includes labor, materials, distribution grid and supports.

DIVISION 25 – INTEGRATED AUTOMATION

Integrated Automation Facility Controls (DDC Controls)

25 50 00

Material: Hardware, conduit, wiring, supports, control valves

Labor: Shop fabrication, delivery, installation labor, start-up, programming, training

Equipment: All equipment required for complete installation

Factors Affecting Cost: Specification, sole-sourced subcontractor

Miscellaneous Points (LS):**25 51 00**

Typically a lump sum cost is included for miscellaneous connection points, and is based on roughly 5% of overall controls package price.

Integrated Automation Control of Plumbing (EA):**25 54 00**

Quantified based on count of equipment served. Unit price includes low voltage wiring, but excludes power wiring unless otherwise referenced. Includes DDC controls.

Integrated Automation Control of HVAC (EA):**25 55 00**

Quantified based on count of equipment served. Unit price includes low voltage wiring, but excludes power wiring unless otherwise referenced. Includes DDC controls.

DIVISION 26 - ELECTRICAL

Electrical

26 00 00

Material: Conduit, couplings, junction boxes, connectors, elbows, pull-strings, in-wall straps / supports, ceiling straps / supports, anchors, one-hole straps, and other sundry accessories.

Labor: Shop fabrication, conduit bending, complete installation including support installation

Equipment: Hoisting / rigging equipment for large equipment packages

Factors Affecting Cost: Wire material (copper vs. aluminum)

Shop-Drawings/CAD/As-Built Plans (HR):**N/A**

The cost to provide clash detection/coordination, submittals/shop drawings, and as-built drawings is to be distributed throughout the trades' unit rates.

Electrical Conduit (LF):**26 05 33**

Includes primary and secondary conduit feeders for transformers, panels, and switchboards. Also, typical Unistrut support racking in electrical rooms at panels and switchgear included, along with associated straps, anchors, etc... Feeder wire and branch wires are separated from conduit costs, as well as termination of wire. Coring, sleeving and fire seal of penetrations also separated from conduit cost. Trenching and backfill is separated as unique line items under the Earthwork Division. Refer to University Design Requirements for further detail. Systems are segregated as follows:

- Normal and Emergency Power Service and Distribution
- HVAC Equipment Connections
- Convenience Power Backbone
- Lighting Fixtures and Switches - Branch and Backbone

Grounding and Bonding (LS):**26 05 26**

Grounding and testing is included as a lump sum cost and includes testing and certification by a qualified, independent company.

Electrical Feeders / Wire (LF / CLF):**26 05 33**

Electrical wire is segregated based on size (#12, #4, #1/0 etc.) and material. Whenever possible the type of wire insulation is included in the description, however since the cost delta between various insulation types is negligible, often a single line item for wire may capture multiple insulation types. Feeder costs are based on the use of copper conductors, full-size neutrals, and grounds based on Article 250 of the NEC. Aluminum wire (if applicable) is segregated as a distinct line item at a unique unit cost from copper wire. Wire used in a health care facility must be "Health Care Facility" (HCF) rated, with extra green ground wire.

Penetrations, Sleeving, Firestopping, and Coring (LS):**07 84 13**

The cost of penetrations and firestopping, including putty pads, is included with Division 078413 Penetration Firestopping, even though included with the electrician's subcontract.

Trenching, Backfill, and Compaction (CY):**31 23 16**

Earthwork required for underground systems is included under Division 312316 Sand bedding is segregated from trenching/backfill cost and included with Division 312323.

Concrete Encasement (CY): **31 23 33**

Concrete encasement required for underground systems is included under Division 033000.

Commissioning (LS): **26 08 00**

This represents the cost borne by subcontractor to assist 3rd party commissioning agent during the commissioning process. Excludes the cost for actual commissioning agent. Pricing is an overall metric, based on the gross area of the building.

Specialty Studies (LS): **26 08 00**

Short-circuit coordination studies are included with equipment unit pricing (as this is typical of how the prices are quoted). If arc fault studies are required, they will be separated out as distinct line items in this section.

Instrumentation and Control for Electrical System (EA / LS): **26 08 00**

Deviating from standard CSI formatting, lighting control panels and dimming systems are segregated from equipment unit prices and carried in Div. 28 40 00.

Electrical Power Monitoring and Controls (LS): **26 09 13**

Sub metering is per University Design Requirements.

Medium-Voltage Electrical Distribution **26 10 00**

Meters (EA): **26 10 01**

Primary meters are priced per each meter, and are inclusive of instrumentation accessories such as current transformers, power transformers, etc. as well as all terminations in the switchboard line items. Transient Voltage Surge Suppression (TVSS) is included with the unit cost of the switchgear. Meters are segregated and priced according to amps and voltage/phasing. Meters used to acquire data for building management systems via SCADA protocols are also priced separately in Divisions 27 or 28 and are inclusive of instrumentation accessories and programming software (costs for BacNet or other data network are a separate price).

Substations (EA):**26 11 00**

Medium voltage electrical substations are priced per each piece of equipment, and are inclusive of the mounting hardware, over-current devices, coordination studies, etc. as well as all terminations. Transient Voltage Surge Suppression (TVSS) is a separate cost when attached to unit substations. Substations are segregated and priced according to the size of the unit transformer (in kVA), amps and voltage/phasing. Where paralleling gear is applicable, costs are included as a separate line item with the paralleling gear and labeled as such in the description.

Transformers (5 kva and larger) (EA):**26 12 00**

Transformers are priced per each piece of equipment, and are inclusive of mounting as well as all terminations. Transformers are segregated and priced according to kVA rating and voltage/phasing.

Medium-Voltage Switchgear (EA):**26 13 00**

Medium voltage electrical switchgear is priced per each piece of equipment, and is inclusive of the mounting hardware, over-current devices, coordination studies, etc. as well as all terminations. Transient Voltage Surge Suppression (TVSS) is included with the unit cost of the switchgear. Switchgear is segregated and priced according to size in amps and voltage/phasing.

Low-Voltage Electrical Distribution**26 20 00****Transformers (Less than 5 kva) (EA):****26 22 00**

Transformers are priced per each piece of equipment, and are inclusive of mounting requirements as well as all terminations. Transformers are segregated and priced according to kVA rating and voltage/phasing.

Switchboards / Dist. Boards / Panel Boards / MCC's (EA):**26 24 00**

Panels (including distribution panels) are priced per each panel, and are inclusive of mounting requirements, panel door requirements, main over-current device (if any) and all sub-breakers as well as all terminations. Panels are segregated and priced according to amps and voltage/phasing, as well as double or triple, tandem / non-tandem units.

Convenience Power / Wiring Devices (EA):**26 27 26**

Outlets and other convenience power devices are quantified per each as indicated on the plans. Floor outlets are based on a multi-use 8"x8" partitioned cast-in-place box with (2) duplex outlets, (2) data ports, and (1) A/V port. Ceiling-mounted outlets are assumed to be Simplex-type with a single gang escutcheon. Unit costs include the box, mud-ring, connectors, hangers, device, ground pigtail, wire nuts, fabrication, consumables, etc. Hospital grade receptacles are included only as required by code at patient bed locations and as specified or per KP standards. Branch circuits (including supports, boxes, hangers, consumables, etc.) are included as separate conduit / wire unit cost rather than with the device unit cost in Division 260533.

Seismic Bracing (EA):**26 05 48**

Measured per brace location. Frequency depends largely on local jurisdiction. Only accounts for scope beyond normal supports.

Facility Electrical Power Generating and Storing Equipment**26 30 00****Static Uninterruptable Power Supply (EA):****26 33 53**

UPS systems are priced per each, with pricing specific for each individual system. Unit cost includes the static transfer switch, inverter, bypass sections (if any) and battery section. Flywheel UPS units also include the flywheel section but no battery section. Cost drivers for UPS systems are the by-pass requirements, redundant feed sections and battery time.

Automatic Transfer Switches (EA):**26 36 23**

ATS's are priced per each piece of equipment, and are inclusive of mounting requirements, maintenance by-pass features, other options (such as open or closed transition), etc. Transfer switches are segregated by amperage, with a discrete line item carried for digital metering and/or SCADA control (if specified).

Electrical and Cathodic Protection**26 40 00****Electrical and Cathodic Protection System (LS):****26 42 00**

Includes lightning protection as a line item. Transient Voltage Surge Suppression (TVSS) at substations is carried as a separate cost in Division 264313.

Grounding (SF / LS):**26 05 26**

Grounding is included with the unit cost of the item being grounded for the transformers, panel boards, switchboards, etc. However, there is a separate line item included to account for the grounding riser (if there is one), the bonds to the building steel, cold water piping, etc. If there is a counterpoise system, this item is listed as a separate line item.

Lighting**26 50 00****Light Fixtures (EA / LF):****26 51 13**

Light fixtures are priced as costs per each with the exception of linear fixtures, which are priced on a linear foot basis. Unit cost for light fixtures includes ballasts, lamps, installation, supports and terminations. Unit cost also includes flex whip as allowed by code (6 feet average length). Branch circuits (including supports, boxes, hangers, consumables, etc.) are included as separate conduit / wire unit cost rather than with the light fixture unit cost in previous section 260533. Exterior lighting is segregated per fixture from interior.

Emergency Light Fixtures (EA):**26 52 00**

Emergency light fixtures follow the methodology described above, however are segregated discretely.

Exit Light Fixtures (EA):**26 53 00**

Exit light fixtures follow the methodology described above, however are segregated discretely.

Exterior Light Fixtures (EA):**26 56 00**

Site light fixtures follow the methodology described above, however are segregated discretely. The light fixture cost is inclusive of the pole and anchor bolts. The pole base will be carried in Division 32.

Light Control Devices (EA):**26 09 23**

Light control devices (switches, dimmers, motion sensors, etc.) are quantified per location based on the documents. Unit price includes the box, connectors, hangers and supports, trim, covers, device, plate and out of the wall branch conduit at an average of 10'-0", including terminations. See Div. 284000 for control panelboards and LV cable.

Electrical Connections

26 60 00

Equipment Connections (EA):

26 61 00

Connections are priced per piece of equipment served. Quantity is based on a comparison between the mechanical and electrical plans. Unit cost includes connections, and either a.) installation of disconnects (FBO) or b.) line out to specific disconnect (inclusive of amps, volts, phase, and NEMA rating descriptions). Controls and control wiring are excluded (see Division 250000 for Integrated Automation). Equipment branch circuits (including supports, boxes, hangers, consumables, etc.) are included as separate conduit / wire unit cost rather than with the equipment unit cost.

Mechanical Connections (EA):

26 61 13

Connections are priced per piece of equipment served. Quantity is based on a comparison between the mechanical and electrical plans. Unit cost includes connections, and either a.) installation of disconnects (FBO) or b.) line out to specific disconnect (inclusive of amps, volts, phase, and NEMA rating descriptions). Controls and control wiring are excluded (see Division 250000 for Integrated Automation). Equipment branch circuits (including supports, boxes, hangers, consumables, etc.) are included as separate conduit / wire unit cost rather than with the equipment unit cost.

Laboratory and Medical Equipment Connections (EA):

26 61 17

Laboratory and medical connections are priced per piece of equipment served or per specialty room (i.e. OR/MRI/CT/etc.). Quantity is based on a comparison and coordination between the medical equipment plans and the electrical plans. Unit cost includes connections, and either a.) installation of disconnects (FBO) or b.) line out to specific disconnect (inclusive of amps, volts, phase, and NEMA rating descriptions). Controls and control wiring are excluded (see Division 250000 for Integrated Automation). Equipment branch circuits (including supports, boxes, hangers, consumables, etc.) are included as separate conduit / wire unit cost rather than with the equipment unit cost.

Laboratory and Medical Equipment Allowance (EA):

26 61 17

Laboratory and medical equipment allowance includes all conduit loops, floor and ceiling pull boxes, wall/riser duct, power and installation of equipment panels (fbo), EPO units, shunt trip breakers. Feeders and primary power conduit and cables should be carried in separately within discrete line items. Note that control room devices and equipment may not be shown on the plans, but could still require power and data.

Electrical Equipment

26 70 00

Electric Vehicle Charging Stations (EA):

26 74 00

Unit rate priced per each for electrical vehicle charging station by a certified contractor.

DIVISION 27 - COMMUNICATIONS

Communications

27 00 00

Ground Bars (EA):

27 05 26

Ground bars are segregated and priced per location. Unit price includes the copper ground bar, insulated stand-off brackets, mounting, terminations, etc.

Telephone Equipment Room (TER), Intermediate rooms (IDF), Cable Management, and Grounding (EA):

27 05 28

Communication pathways to these rooms are quantified per schedules and as indicated on plans. Unit cost includes conduit sleeves through the floors and walls, telephone plywood backboards, 110 punch down blocks on the backboards, "panduit" or other cable management, 19" floor standing racks, ladder tray above the racks with turn-outs, isolated grounding conductors between rooms (attached to the ground bus bars), etc.

J-Hook Raceways for Communications (EA)

27 05 33

J-hook support assemblies are priced per each and consist of the J-hook, an anchoring device, all associated hardware, and cable securing devices (i.e. cable ties, wraps, etc.).

Audio / Video Raceways and Boxes (EA/LF):

27 05 33

Device unit cost is inclusive of the box, ring, and conduit stub with bushing. Raceway conduit is segregated and measured/priced on a linear foot basis similar to other conduit systems (see Electrical section above for a description of this methodology).

Voice and Data Raceways and Boxes (EA/LF):

27 05 33

Device unit cost is inclusive of the box, ring, and conduit stub with bushing. Raceway conduit is segregated and measured/priced on a linear foot basis similar to other conduit systems (see Electrical section above for a description of this methodology).

Nurse Call Raceways (LF): **27 05 33**

Raceway conduit for the nurse call system is included within Division 270533 for Raceways and is measured and priced on a linear foot basis similar to other conduit line items (see Electrical division above for this methodology). Cabling with the raceway is included within Division 271343 Communications Services Cabling, and device cost itself is included with Division 275223 Nurse Call / Code Blue Systems.

Structured Cabling **27 10 00**

Structured Cabling (N/A): **27 10 00**

Structured cabling is assumed to be provided by Owner's IT for the following systems unless noted otherwise:

- Voice / Data, including mod taps
- Distributed Antennae System (see below)

Structured Cabling to Nurse Call System (LF): **27 13 43**

Rated cable for the nurse call system is included in Division 271000 Structured Cabling and quantified on a linear foot basis. Unit cost includes cabling and labor. Plenum-rated cable is segregated from non-plenum rated.

Audio-Video Communication **27 40 00**

Audio / Video CATV System Accessories (EA/LF) **27 41 23**

Device unit cost is inclusive of the box, ring, and conduit stub with bushing. Raceway conduit is segregated and measured/priced on a linear foot basis similar to other conduit systems (see Communication section above for a description of this methodology).

Distributed Communications and Monitoring Systems **27 50 00**

DAS Telemetry Antennae Systems (LS): **27 51 00**

Telemetry systems are included as a lump sum cost under Division 275100 Distributed Audio-Video Communications Systems. Price includes cost for antennas, back boxes, ceiling supports, insulated throat connectors, cover plates and pathways to tray.

Public Address and Mass Notification Systems (EA/LF): **27 51 16**

Speaker / clock unit cost is inclusive of the box, ring, and conduit stub with bushing. Raceway conduit is segregated and measured/priced on a linear foot basis similar to other conduit systems (see Electrical section above for a description of this methodology).

Sound Masking Systems (EA,LS)**27 51 19**

System cost is inclusive of panel's antennae and actual device, plus any boxes, plates, mud-rings, wire-nuts, power/conduit, terminations, grounding, and rough-in to the device.

Patient Monitoring and Telemetry Systems (EA):**27 52 13**

Device unit cost is inclusive of device itself, plus any boxes, plates, mud-rings, wire-nuts, power/conduit terminations, grounding, and rough-in to the device.

Nurse Call Code Blue System Devices (EA):**27 52 23**

Device unit cost is inclusive of device itself, plus any boxes, plates, mud-rings, wire-nuts, power/conduit terminations, grounding, and rough-in to the device.

Clock Systems (EA/LS)**27 53 13**

Device unit cost is inclusive of device itself, plus any boxes, plates, mud-rings, wire-nuts, power/conduit terminations, grounding, and rough-in to the device.

DIVISION 28 - ELECTRICAL SAFETY AND SECURITY

Electronic Safety and Security**28 00 00****Low Voltage Cabling (LF):****28 05 13**

The backbone cable is segregated from the unit cost of devices and raceway which are carried elsewhere. Plenum rated cable is segregated from non-plenum rated.

Raceways (LF):**28 05 13**

The backbone runs of conduit are segregated here from the unit cost of devices themselves (which are included in a separate division). Raceways are measured and priced on a linear foot basis similar to other conduit line items (see Electrical division above for this methodology).

Electronic Access Control and Intrusion Detection**28 10 00****Access Control Devices / Interfaces (EA):****28 13 00**

Device and interface unit cost is inclusive of the box, ring, and conduit stub with bushing.

Electronic Surveillance

28 20 00

Video Surveillance Systems Infrastructure (EA):

28 23 23

Device unit cost is inclusive of the box, ring, and conduit stub with bushing, mount, and camera programming. Client IT is responsible for cable, termination, patch panel, switch, and switch programming.

Electronic Detection and Alarm

28 30 00

Fire Alarm Raceways (LF):

28 05 28

The backbone runs of conduit are segregated here from the unit cost of devices themselves (which are included separately below). Raceways are measured and priced on a linear foot basis similar to other conduit line items (see Electrical division above for this methodology). Separate costs for tying in to existing systems.

Fire Alarm Cabling (LF):

28 05 28

The backbone cable is segregated from the unit cost of devices and raceway which are carried as separate line items. Plenum rated cable is segregated from non-plenum rated.

Fire Alarm Control, Graphic User Interface, and Logic Systems (EA):

28 31 13

Unit cost includes panel (with responder type designation) as well as related accessories, plus boxes, plates, mud-rings, wire-nuts, power/conduit terminations, grounding and rough-in to the panel. All panels are assumed to be per NFPA 72 and NFPA 201. Fire alarm system is assumed to be addressable (Class A).

Fire Detection and Alarm Annunciation Panel (EA):

28 31 33

Unit cost includes panel as well as related accessories, plus boxes, plates, mud-rings, wire-nuts, power/conduit terminations, grounding and rough-in to the panel. All panels are assumed to be per NFPA 72 and NFPA 201. Fire alarm system is assumed to be addressable (Class A).

Fire Alarm Devices (EA):

28 31 53

Device unit cost is inclusive of device itself, plus any boxes, plates, mud-rings, wire-nuts, power/conduit terminations, grounding and rough in to the device. All devices are assumed to be per NFPA 72 and NFPA 101. Fire alarm system is assumed to be addressable (Class A).

Electronic Monitoring and Control

28 40 00

Electronic Monitoring and Control (Lighting Controls) (EA):

28 46 00

Deviating from standard CSI formatting, lighting control panels and dimming systems are segregated from equipment unit prices and carried in Div. 284000. Sub-sections could include Lighting Control Panels, and Central Dimming Systems. Costs include gateways and LV cabling. Dimmers and switches are carried in Div. 265113.

DIVISION 31 - EARTHWORK

Earthmoving

31 20 00

Fine Grading (SF):

31 22 16

Fine grading is measured based on overall area graded. Unit cost includes all equipment, fuel, and labor. Unit price does not include the removal of any spoils, or the import of fill materials (see below). Surveying costs as required to validate final grade elevations are included in unit cost.

Excavation (CY):

31 23 16

Excavation and grading included down to formation level (top of footings). When calculating basement excavation a 4 foot wide working area around the perimeter of the basement is added to the overall basement excavation quantity. Where excavation exceeds 5 feet depth, a 1:1 slope cut is allowed unless stated otherwise in soils report / structural drawings; OSHA guidelines to supersede. Measurements are bank, with 10% added for bulking.

Backfill (CY):

31 23 16

Backfill of excavated material calculated as gross export minus concrete volume minus net volume enclosed.

Structural Fill (CY):

31 23 16

Backfill using structural fill per structural drawings, soils report, or soils testing.

Dewatering (LS):

31 23 19

Dewatering is job specific and priced by lump sum.

Sand Bedding (CY):

31 23 23

Sand bedding for slab on grade and MEP trench systems is segregated and included here in Division 31.

Trenching / Backfill (CY): **31 23 33**

Trenching and backfill for mechanical, electrical, and plumbing systems is segregated from the unit cost and included here in Division 31.

Haul Excess (CY): **31 23 43**

If not usable elsewhere on site, all net spoils are assumed to require haul offsite. Pricing is based on the gross cubic yards exported, and unit prices can vary depending on distance hauled.

Shoring and Underpinning **31 40 00**

Shoring (SF): **31 41 00**

Where slope back is not possible, shoring is utilized instead. Shoring cost is complete in place, including driven H-piles, lagging, shotcrete, sheet piling, waterproofing (if required), removal, etc. Layout required for this work along with spoils removal shall be included in the cost.

DIVISION 32 - EXTERIOR IMPROVEMENTS

Bases, Ballasts, and Paving **32 10 00**

Asphalt Paving (SF): **32 12 16**

Asphalt paving is measured and priced by the SF. The price is inclusive of base and asphalt. Thicknesses are noted and priced accordingly.

Concrete Paving (SF): **32 13 13**

Concrete paving is measured and priced by the SF. The price is inclusive of base and concrete. Thicknesses are noted and priced accordingly.

Curbs and Gutters (LF): **32 16 13**

Concrete curbs and gutters are measured and priced by the LF and according to height. Curbs and curbs with gutter are separated.

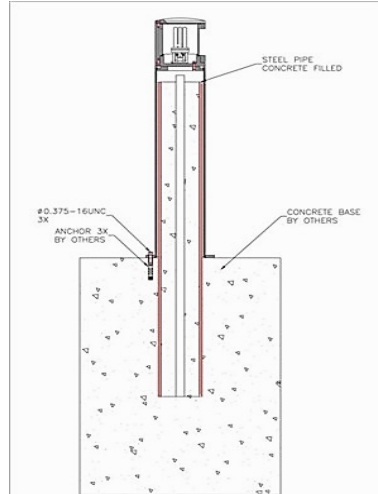
Site Improvements

32 30 00

Bollard and Pole Bases (EA)

32 38 17

Concrete foundations/bases for bollards, site light poles, and parking equipment.
Includes concrete, formwork, reinforcing, excavation, and backfill.
Equipment/bollards/poles provided under separate line items.



Irrigation

32 80 00

Irrigation (SF):

32 82 00

Irrigation is measured and priced by the SF and is inclusive of all controls and necessary components.

Planting

32 90 00

Maintenance (LS):

32 91 00

Typically 90 day maintenance period for new landscaping.

Sod and Ground cover (SF):

32 92 00

Sod and groundcover is measured priced by the SF.

Mulch (SF):

32 92 00

May include bark or rock mulch.

Soil Import (CY):

32 92 00

Soil imported in order to achieve specified soil quality and grades.

Soil Amendment (CY):

32 92 00

Soil requiring amendment achieve specified soil quality and grades.

Shrubs (EA):

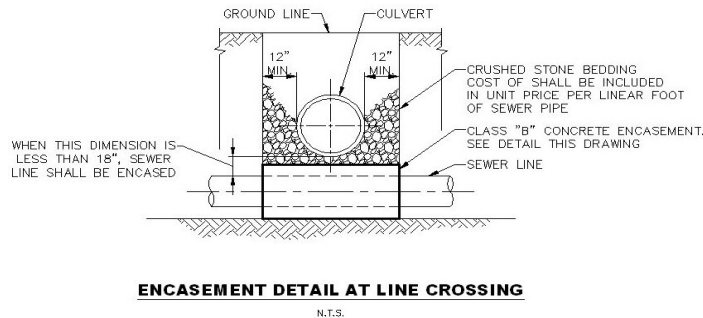
32 93 33

Shrubs are measured and priced by the each. They are separated by gallon size.

Trees (EA):**32 93 43**

Trees are measured and priced by the each. They are separated by gallon or box size.

DIVISION 33 - UTILITIES

Underground Utilities**33 00 00**

Underground utilities including water, sewer, storm drain (including trench drains) and gas are measured and priced by the LF and broken out by size. The unit price includes trenching and backfill. Major utility meters, valves etc. are priced individually in the appropriate section. Concrete encasement of utilities is included under division 03 32 00. Sand bedding is included under division 31 23 23.

Concrete Encasement : MEP Systems (CY):**33 05 11**

Concrete encasement required for underground mechanical / electrical systems is included in this Division and priced per cubic yard. Unit price includes concrete material, delivery, pumping, placement, cleanout, and all other aspects carried under the umbrella of a sub-tier bid to the mechanical / electrical / plumbing contractor.

Water Utilities (LF):**33 10 00**

Includes pipe, fittings, coupling spacers and wrap / jacket if required. Pricing includes placement in trench. Slab-suspended pipe is separated from pipe-in-trench systems. All trenching costs are to be included in Division 31 23 33.

Sanitary Sewerage Utilities (LF):**33 30 00**

Includes pipe, fittings, coupling spacers and wrap / jacket if required. Pricing includes placement in trench. Slab-suspended pipe is separated from pipe-in-trench systems. All trenching costs are to be included in Division 31 23 33.

Storm Drainage Utilities (LF): **33 40 00**

Includes pipe, fittings, coupling spacers and wrap / jacket if required. Pricing includes placement in trench. Slab-suspended pipe is separated from pipe-in-trench systems. All trenching costs are to be included in Division 31 23 33.

Fuel Distribution Utilities (LF): **33 50 00**

Includes pipe, fittings, coupling spacers and wrap / jacket if required. Pricing includes placement in trench. Slab-suspended pipe is separated from pipe-in-trench systems. All trenching costs are to be included in Division 31 23 33.

Hydronic and Steam Energy Utilities (LF): **33 70 00**

Includes pipe, fittings, coupling spacers and wrap / jacket if required. Pricing includes placement in trench. Slab-suspended pipe is separated from pipe-in-trench systems. All trenching costs are to be included in Division 31 23 33.

Electrical Utilities (LF): **33 70 00**

Includes pipe, fittings, coupling spacers and wrap / jacket if required. Pricing includes placement in trench. Slab-suspended pipe is separated from pipe-in-trench systems. All trenching costs are to be included in Division 31 23 33.

Communications Utilities (LF): **33 80 00**

Includes pipe, fittings, coupling spacers and wrap / jacket if required. Pricing includes placement in trench. Slab-suspended pipe is separated from pipe-in-trench systems. All trenching costs are to be included in Division 31 23 33.

Appendix A: Infrastructure vs. Tenant Interior



Appendix A: Infrastructure vs. Tenant Interior

Unless otherwise directed, the University defines tenant improvement scope as work based on specified program function (as opposed to work generally required regardless of program function). As an example, imagine the floor of a building functioning as a working office building. Now imagine this space is to be repurposed as a patient treatment floor of a completely different layout. All scope that would need to be replaced is classified as "tenant improvement", whereas all scope that can remain and be re-utilized would be classified as "infrastructure".

Infrastructure	Tenant Interior
Architectural	
Any unique costs not found on a typical Client project	Any interior architectural items found on a typical Client project, including:
Demolition	Interior partitions (excluding interior of exterior wall)
All exterior skin work	Interior finishes
Public restrooms	Single occupancy restrooms
Conveyance (elevator equipment, egress stairs)	Conveyance (elevator cab finish upgrades, smoke guard doors required due to change in occupancy, stair embellishments/finishes)
Interior finish of exterior wall	Equipment
Shafts	Specialties
Edge of slab firestopping	
Structural	
All structural Upgrades	
Structural CMU	
General MEP	
Risers, Trunks, and Mains	Drops, Branches, and Distribution
All penetration, sleeving, and firestopping costs	
All rooftop equipment	
All equipment in a remote central plant	
All equipment within a defined "Mechanical" room	
All equipment craning costs	
All envelope penetrations (roof vents, exhaust fans, etc.)	
Plumbing	
Main vertical plumbing lines (waste, vent, supply)	All fixtures along with associated local waste/supply lines
All roof drain systems	All horizontal plumbing lines (supply, waste, vent)
Condensate drainage	
Facility natural gas piping	
Mechanical	
Vertical ductwork penetrating floor slabs	All HVAC trim fixtures (grilles, registers, diffusers, returns)
	All horizontal ductwork
	All horizontal hydronic piping
	All fire/smoke or volume dampers
	Exhaust fans (if required for a tenant-specific purpose such as chemo prep hoods or patient isolation rooms)
	VAV/CAV boxes
Electrical	
All electrical scope upstream of the subpanel	All electrical scope downstream of the subpanel
All communication scope from the MPOE to the racks	

Appendix B: WBS Template for Construction Costs



Appendix B: WBS Template for Construction Costs

University of Utah - WBS Template

Date

Project Name & Number

University of Utah Project Manager

Architecture Firm

Contracting Firm / Estimating Firm

Title of Estimate or Submittal

						BUILDING NAME BUILDING SF		
Div.	Code	Component Description	Qty	Unit	Unit Cost	Total \$	\$/SF	% of Total
1	01 00 00	GENERAL REQUIREMENTS						
1	01 30 00	Administrative Requirements (Supervision & Coordination)						
1	01 32 00	Progress Documentation & Building Information Modeling (BIM)						
1	01 33 00	Sustainable Design Reporting						
1	01 35 00	Phasing Requirements						
1	01 35 33	Infection and Dust Control						
1	01 35 46	Indoor Air Quality Procedures						
1	01 40 00	Quality Requirements						
1	01 50 00	Temporary Construction (General Conditions)						
1	01 51 13	Temporary Electricity						
1	01 52 19	Sanitary Facilities						
1	01 54 16	Temporary Hoist and Rigging						
1	01 54 23	Temporary Scaffolding and Platforms						
1	01 54 33	Temporary Equipment (Small Tools)						
1	01 55 19	Offsite Parking						
1	01 55 26	Traffic Control						
1	01 56 00	Temporary Barriers and Enclosures						
1	01 70 00	Execution and Closeout Requirements						
1	01 74 13	Progress Cleaning						
1	01 74 19	Construction Waste Management & Disposal						
1	01 74 23	Final Cleaning						
1	01 75 00	Starting & Adjusting						
1	01 78 00	Closeout Submittals						
1	01 00 00	TOTAL GENERAL REQUIREMENTS						
2	02 00 00	EXISTING CONDITIONS						
2	02 20 00	Existing Conditions or Assessment						
2	02 40 00	Demolition and Structure Moving						
2	02 41 00	Gross Demolition						
2	02 41 19	Selective Demolition Scope						
2	02 50 00	Site Remediation						
2	02 60 00	Contaminated Site Material Removal						
2	02 80 00	Facility Remediation						
2	02 00 00	TOTAL EXISTING CONDITIONS						
3	03 00 00	CONCRETE						
3	03 21 00	Concrete Reinforcing						
3	03 30 00	Cast-In-Place Concrete						
3	03 31 13	Slab on Grade Concrete						
3	03 31 13	Footing Concrete						
3	03 31 13	Mat Foundation Concrete						
3	03 31 16	Light Weight Concrete						
3	03 38 00	Concrete Cutting & Boring						
3	03 40 00	Precast Concrete						
3	03 41 33	Precast columns						
3	03 41 33	Precast beams						
3	03 41 33	Precast walls						
3	03 45 13	Precast sill / lintels						
3	03 45 13	Precast column caps						
3	03 47 13	Tilt-up Concrete						
3	03 48 00	Precast site elements						
3	03 49 13	Glass-Fiber Reinforced Concrete (GFRC)						
3	03 60 00	Grouting						
3	03 00 00	TOTAL CONCRETE						

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						BUILDING NAME BUILDING SF		
Div.	Code	Component Description	Qty	Unit	Unit Cost	Total \$	\$/SF	% of Total
4	04 00 00	MASONRY						
4	04 20 00	Unit Masonry						
4	04 21 00	Brick						
4	04 22 00	Concrete Masonry Units						
4	04 40 00	Stone Assemblies						
4	04 70 00	Manufactured Masonry						
4	04 00 00	TOTAL MASONRY						
5	05 00 00	METALS						
5	05 10 00	Structural Metal Framing						
5	05 12 23	Structural Steel Framing						
5	05 12 23	Elevator Supports & Beams						
5	05 12 23	Miscellaneous Bolts and Connections						
5	05 12 23	Metal Screen Assemblies						
5	05 12 23	Elevator Sill Supports, Separator Beams, and Guidrails						
5	05 20 00	Metal Joists						
5	05 30 00	Metal Decking						
5	05 31 13	Metal Deck						
5	05 31 13	Corrugated Metal Screen						
5	05 31 13	Miscellaneous deck metals						
5	05 31 14	Bent Plate						
5	05 40 00	Cold-Formed Metal Framing						
5	05 45 23	Healthcare Metal Supports						
5	05 50 00	Metal Fabrications						
5	05 50 00	Miscellaneous Metals						
5	05 50 00	Davit Pedestals						
5	05 51 13	Metal Pan Stairs						
5	05 51 33	Metal Ladders						
5	05 52 00	Metal Railings						
5	05 53 00	Metal Gratings						
5	05 70 00	Decorative Metal						
5	05 75 00	Stainless Steel Countertops						
5	05 75 00	Stainless Steel Shelving						
5	05 00 00	TOTAL METALS						
6	06 00 00	WOOD, PLASTICS, and COMPOSITES						
6	06 10 00	Rough Carpentry						
6	06 11 00	Wood Framing Wall Systems						
6	06 16 36	Wood Panel Product Sheathing: Plywood						
6	06 16 53	Wood Panel Product Sheathing: Densglas						
6	06 17 00	Shop-Fabricated Structural Wood Framing						
6	06 17 53	Roof Trusses						
6	06 19 53	Miscellaneous Rough Carpentry						
6	06 20 00	Finish Carpentry						
6	06 40 00	Architectural Woodwork						
6	06 41 16	Countertops						
6	06 41 16	Integrated Bowl Sinks						
6	06 41 16	Base cabinets						
6	06 41 16	Upper cabinets						
6	06 41 16	Full-Height Cabinets						
6	06 41 16	Nurse Stations / Reception Desks						
6	06 41 00	Benches						
6	06 41 16	Install of OFCI Workstation Countertops						
6	06 46 00	Wood Trim Associated with Cabinet Package						
6	06 00 00	TOTAL WOOD, PLASTICS, and COMPOSITES						

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Title of Estimate or Submittal

						BUILDING NAME BUILDING SF		
Div.	Code	Component Description	Qty	Unit	Unit Cost	Total \$	\$/SF	% of Total
7	07 00 00	THERMAL and MOISTURE PROTECTION						
7	07 10 00	Dampproofing and Waterproofing						
7	07 13 00	Waterproofing at Concrete Slabs						
7	07 13 52	Waterproofing at Elevator Pit and Basement Walls						
7	07 13 53	Waterproofing at Finish Systems						
7	07 20 00	Thermal Protection						
7	07 21 00	Exterior Wall Insulation						
7	07 22 16	Roof Insulation in Ceiling Joists						
7	07 22 16	Temporary Roof						
7	07 24 00	Exterior Insulation and Finish Systems - EIFS						
7	07 25 00	Weather Barriers						
7	07 26 16	Concrete Moisture Vapor Emission Control						
7	07 26 16	Moisture Test						
7	07 30 00	Steep Slope Roofing						
7	07 40 00	Siding Panels						
7	07 50 00	Membrane Roofing						
7	07 51 00	Gravel Ballast						
7	07 54 23	Single Ply / TPO Roof Systems						
7	07 55 51	Built-up Membrane Roof System						
7	07 55 63	Vegetated Protected Membrane Roofing						
7	07 60 00	Flashing and Sheet Metal						
7	07 61 13	Standing Seam Sheet Metal Roof						
7	07 62 00	Cants and Upstands						
7	07 62 00	Base Flashing / Counter Flashing						
7	07 62 00	Parapet Coping						
7	07 62 00	Gutters and Downspouts						
7	07 62 00	Scuppers						
7	07 62 00	Flashing for MEP Penetrations						
7	07 62 00	Misc. Flashing and Sheet Metal						
7	07 63 00	Equipment Pad Cover						
7	07 65 26	Self-Adhered Sheet Flashing						
7	07 70 00	Roof and Wall Specialties and Accessories						
7	07 71 13	Parapet Coping						
7	07 71 16	Manufactured Counter Flashing Systems						
7	07 71 29	Manufactured Roof Expansion Joints						
7	07 72 33	Roof Access Doors / Hatches						
7	07 72 46	Walkway Pads						
7	07 80 00	Fire and Smoke Protection						
7	07 81 00	Applied Fireproofing: Structural Steel						
7	07 81 16	Cementitious Fireproofing to Metal Deck						
7	07 81 16	Cementitious Fireproofing Patching						
7	07 84 43	Fire Stopping and Smoke Seals at Rated Partitions						
7	07 84 53	Building Perimeter Firestopping						
7	07 90 00	Joint Protection						
7	07 90 00	Caulking						
7	07 92 19	Sound Caulking at Interior Acoustic Partitions						
7	07 95 13	Expansion Joints						
7	07 00 00	TOTAL THERMAL and MOISTURE PROTECTION						

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University of Utah - WBS Template

Date

Project Name & Number

University of Utah Project Manager

Architecture Firm

Contracting Firm / Estimating Firm

Title of Estimate or Submittal

						BUILDING NAME BUILDING SF		
Div.	Code	Component Description	Qty	Unit	Unit Cost	Total \$	\$/SF	% of Total
8	08 00 00	OPENINGS						
8	08 10 00	Doors and Frames						
8	08 10 00	Inset Glazing and Louvers						
8	08 10 00	Fire / Smoke Ratings						
8	08 11 00	Exterior Doors						
8	08 11 00	Interior Doors						
8	08 12 13	Frame Installation						
8	08 30 00	Specialty Doors and Frames						
8	08 30 00	Specialty Doors and Frames: Glass Entrance Doors						
8	08 31 16	Access Panels and Frames						
8	08 32 13	Sliding Glass Doors						
8	08 33 23	Overhead Coiling Doors						
8	08 37 00	Smoke Guard Doors						
8	08 40 00	Entrances, Storefronts, and Curtain Walls						
8	08 42 29	Automatic Glass Entrance Doors						
8	08 43 00	Aluminum Storefront Systems						
8	08 44 00	Curtain Wall Systems						
8	08 50 00	Windows						
8	08 51 13	Exterior Flashing / Punched Window Systems						
8	08 56 19	Pass Windows: Pass-Through Windows						
8	08 60 00	Roof Windows and Skylights						
8	08 70 00	Hardware						
8	08 71 00	Automatic Openers / Panic Hardware						
8	08 71 00	Miscellaneous Hardware						
8	08 80 00	Glazing						
8	08 81 00	Interior Glazing						
8	08 88 00	Miscellaneous Glazing						
8	08 90 00	Louvers and Vents						
8	08 00 00	TOTAL OPENINGS						
9	09 00 00	FINISHES						
9	09 20 00	Plaster and Gypsum Board						
9	09 22 16	Exterior Framing						
9	09 22 16	Interior Framing						
9	09 22 16	Backing						
9	09 22 16	Kickers at Ceiling-Height Walls						
9	09 22 16	Installation of MEP Access Panels						
9	09 22 26	Drop Gyp / Hard Lid Ceiling Framing						
9	09 22 26	Drop Gyp Vertical Soffit Framing						
9	09 24 00	Plaster Systems						
9	09 24 23	Control Joints						
9	09 29 00	Drop Gyp Vertical Soffit Sheathing						
9	09 29 00	Drop Gyp / Hard Lid Ceiling Sheathing						
9	09 29 00	Gypsum Board, Finished						
9	09 29 00	Gypsum Board, Unfinished						
9	09 29 00	Gypsum Board at Interior of Exterior						
9	09 29 00	Cementitious Backerboard						
9	09 29 00	Shaft Liner						
9	09 29 00	Exterior Sheathing						
9	09 29 00	Security Wire Mesh						
9	09 29 00	Premium Gypsum Board Systems						
9	09 30 00	Tiling						
9	09 31 13	Wall Tile						
9	09 32 13	Floor Tile / Pavers						
9	09 32 13	Base Tile / Pavers						
9	09 34 00	Waterproofing Membrane at Tiled Areas						
9	09 34 00	Crack Isolation Membrane						

Appendix B: WBS Template for Construction Costs

University of Utah - WBS Template

Date

Project Name & Number

University of Utah Project Manager

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						BUILDING NAME BUILDING SF		
Div.	Code	Component Description	Qty	Unit	Unit Cost	Total \$	\$/SF	% of Total
9	09 50 00	Ceilings						
9	09 51 23	Acoustic Ceiling Tile						
9	09 54 00	Suspended Wood / Metal Panel Ceilings						
9	09 58 00	Integrated Ceiling Assemblies: Operating Rooms						
9	09 60 00	Flooring						
9	09 61 00	Floor Leveling / Floor Prep						
9	09 65 13	Resilient / Rubber Base						
9	09 65 13	Integral Coved Bases						
9	09 65 16	Resilient / Rubber Sheet Flooring						
9	09 65 19	Resilient / Rubber Tile Flooring						
9	09 67 23	Resinous Flooring						
9	09 68 00	Carpet						
9	09 69 00	Access Flooring						
9	09 70 00	Wall Finishes						
9	09 80 00	Acoustic Treatment						
9	09 90 00	Painting and Coating						
9	09 91 13	Paint Exterior Plaster						
9	09 91 23	Paint Interior Gyp Board Walls						
9	09 91 23	Paint Interior Drop Gyp Ceilings / Soffits						
9	09 91 23	Paint Exposed Structure at Open Ceilings						
9	09 91 23	Paint Doors and Frames						
9	09 91 23	Miscellaneous Undefined Painting						
9	09 00 00	TOTAL FINISHES						
10	10 00 00	SPECIALTIES						
10	10 10 00	Information Specialties						
10	10 11 16	Marker Boards, Tack Boards, & Whiteboards						
10	10 14 16	Interior Signage, Code-Required						
10	10 14 16	Interior Signage, Wayfinding						
10	10 14 33	Exterior Signage						
10	10 20 00	Interior Specialties						
10	10 21 13	Toilet Partitions						
10	10 21 13	Urinal Screens						
10	10 21 23	Cubicle / Shower Curtain Track and Curtains						
10	10 22 13	Chain Link Fences & Gates						
10	10 22 16	Demountable Partitions						
10	10 22 19	Operable Partitions						
10	10 22 26	Undefined Wall Protection						
10	10 26 00	Miscellaneous Interior Specialties						
10	10 26 00	Corner Guards						
10	10 26 13	Crash / Bumper / Chair Rails						
10	10 26 16	Acrylic Wall Covering / Fiberglass Reinforced Plastic						
10	10 26 23	Toilet Accessories						
10	10 28 13	Restroom Mirrors						
10	10 28 13	Janitor Mop Sink Rack						
10	10 30 00	Fireplaces and Stoves						
10	10 40 00	Safety Specialties (Fire Extinguishers)						
10	10 50 00	Storage Specialties						
10	10 51 13	Lockers						
10	10 55 13	Central Mail Delivery Boxes						
10	10 56 13	High-Density Storage Shelving						
10	10 57 13	Hat and Coat Racks						
10	10 70 00	Exterior Specialties (Flagpoles)						
10	10 80 00	Other Specialties						
10	10 90 00	Hospital Specialties						
10	10 00 00	TOTAL SPECIALTIES						

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University of Utah - WBS Template

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University of Utah Project Manager

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Div.	Code	Component Description	Qty	Unit	Unit Cost	Total \$	\$/SF	% of Total
11	11 00 00	EQUIPMENT						
11	11 10 00	Vehicle and Pedestrian Equipment						
11	11 12 00	Parking Control Equipment						
11	11 13 13	Loading Dock Bumpers						
11	11 13 19	Stationary Loading Dock Equipment						
11	11 15 00	Security, Detention and Banking Equipment						
11	11 20 00	Commercial Equipment						
11	11 40 00	Foodservice Equipment						
11	11 41 00	Foodservice Equipment						
11	11 41 00	Walk-In Refrigerated Rooms						
11	11 50 00	Educational and Scientific Equipment						
11	11 52 13	Projection Screens						
11	11 52 16	Projector / TV Mounting Brackets						
11	11 65 00	Athletic and Recreational Equipment						
11	11 70 00	Healthcare Equipment						
11	11 72 00	Install OFCI Medical Equipment						
11	11 73 00	Furnish Headwalls						
11	11 73 13	Patient Lifts						
11	11 90 00	Other Equipment						
11	11 00 00	TOTAL EQUIPMENT						
12	12 00 00	FURNISHINGS						
12	12 20 00	Window Treatments						
12	12 30 00	Lab Casework						
12	12 30 00	Lab Cabinets - Base Cabinets						
12	12 30 00	Lab Cabinets - Upper Cabinets						
12	12 30 00	Lab Cabinets - Tall Cabinets						
12	12 60 00	Fixed Seating						
12	12 90 00	Other Furnishings						
12	12 00 00	TOTAL FURNISHINGS						
13	13 00 00	SPECIAL CONSTRUCTION						
13	13 10 00	Special Facility Components						
13	13 17 00	Tubs and Pools						
13	13 17 33	Therapeutic Pools						
13	13 20 00	Special Purpose Rooms						
13	13 30 00	Special Structures						
13	13 40 00	Integrated Construction						
13	13 48 00	Sound Vibration and Seismic Control						
13	13 48 00	Seismic Monitoring						
13	13 49 19	Lead-Shielding at Walls, Floors, Glazing						
13	13 49 19	Lead-Shielded Doors						
13	13 49 33	RF/Copper Shielding at Walls, Floors, Glazing						
13	13 49 33	RF/Copper Doors						
13	13 50 00	Special Instrumentation						
13	13 00 00	TOTAL SPECIAL CONSTRUCTION						
14	14 00 00	CONVEYING SYSTEMS						
14	14 10 00	Dumbwaiters						
14	14 20 00	Elevators						
14	14 21 00	Electric Traction Elevators						
14	14 21 00	Traction/Hydraulic Elevators						
14	14 21 00	Hydraulic Elevators						
14	14 27 00	Cab Finishes						
14	14 30 00	Escalators and Moving Walks						
14	14 90 00	Other Conveying Equipment (Including Pneumatic Tube System)						
14	14 00 00	TOTAL CONVEYING SYSTEMS						

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University of Utah - WBS Template

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Div.	Code	Component Description	Qty	Unit	Unit Cost	Total \$	\$/SF	% of Total
		MECHANICAL						
21	21 00 00	FIRE SUPPRESSION						
21	21 10 00	Water-Based Fire-Suppression Systems						
21	21 13 13	Wet-Pipe Sprinkler System						
21	21 13 16	Dry-Agent						
21	21 13 19	Pre-Action						
21	21 13 39	Foam Systems						
21	21 30 00	Fire Pumps						
21	21 00 00	TOTAL FIRE SUPPRESSION						
22	22 00 00	PLUMBING						
22	22 00 00	Plumbing						
22	22 10 00	Plumbing Piping and Pumps						
22	22 30 00	Plumbing Equipment						
22	22 40 00	Plumbing Fixtures						
22	22 50 00	Pool and Fountain Plumbing Systems						
22	22 60 00	Gas and Vacuum Systems For Laboratory and Healthcare Facilities						
22	22 00 00	TOTAL PLUMBING						
23	23 00 00	HVAC						
23	23 00 00	Heating, Ventilating, and Air-Conditioning (HVAC)						
23	23 10 00	Facility Fuel Systems						
23	23 20 00	HVAC Piping and Pumps						
23	23 30 00	HVAC Air Distribution						
23	23 50 00	Central Heating Equipment						
23	23 60 00	Central Cooling Equipment						
23	23 70 00	Central HVAC Equipment						
23	23 80 00	Decentralized HVAC Equipment						
23	23 00 00	TOTAL HVAC						
		TOTAL MECHANICAL						
25	25 00 00	INTEGRATED AUTOMATION						
25	25 50 00	Integrated Automation Facility Controls						
25	25 51 00	Miscellaneous Points						
25	25 54 00	Integrated Automation Control of Plumbing						
25	25 55 00	Integrated Automation Control of HVAC						
25	25 00 00	TOTAL INTEGRATED AUTOMATION						

Appendix B: WBS Template for Construction Costs

University of Utah - WBS Template

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University of Utah Project Manager

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						BUILDING NAME BUILDING SF		
Div.	Code	Component Description	Qty	Unit	Unit Cost	Total \$	\$/SF	% of Total
		ELECTRICAL						
26	26 00 00	ELECTRICAL						
26	26 00 00	Electrical						
26	26 05 33	Electrical Conduit						
26	26 05 26	Grounding and Bonding						
26	26 05 33	Electrical Feeders / Wire						
26	26 08 00	Commissioning						
26	26 08 00	Specialty Studies						
26	26 08 00	Instrumentation and Control for Electrical System						
26	26 09 13	Electrical Power Monitoring and Controls						
26	26 10 00	Medium-Voltage Electrical Distribution						
26	26 10 01	Meters						
26	26 11 00	Substations						
26	26 12 00	Transformers (5kva and Larger)						
26	26 13 00	Medium-Voltage Switchgear						
26	26 20 00	Low-Voltage Electrical Distribution						
26	26 22 00	Transformers (Less than 5kva)						
26	26 24 00	Switchboards / Dist. Boards / panel Boards / MCC's						
26	26 27 26	Convenience Power / Wiring Devices						
26	26 05 48	Seismic Bracing						
26	26 30 00	Facility Electrical Power Generating and Storing Equipment						
26	26 32 00	Packaged Generator Assemblies						
26	26 33 53	Static Uninterruptable Power Supply						
26	26 36 23	Automatic Transfer Switch						
26	26 40 00	Electrical and Cathodic Protection						
26	26 50 00	Lighting						
26	26 51 13	Light Fixtures						
26	26 52 00	Emergency Light Fixtures						
26	26 53 00	Exit Light Fixtures						
26	26 56 00	Exterior Light Fixtures						
26	26 09 23	Light Control Devices						
26	26 60 00	Electrical Connections						
26	26 61 00	Equipment Connections						
26	26 61 13	Mechanical Connections						
26	26 61 17	Laboratory and Medical Equipment Connections						
26	26 74 00	Electrical Vehicle Charging Stations						
26	26 00 00	TOTAL ELECTRICAL						

Appendix B: WBS Template for Construction Costs

University of Utah - WBS Template

Date

Project Name & Number

University of Utah Project Manager

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Contracting Firm / Estimating Firm

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						BUILDING NAME BUILDING SF		
Div.	Code	Component Description	Qty	Unit	Unit Cost	Total \$	\$/SF	% of Total
27	27 00 00	COMMUNICATIONS						
27	27 00 00	Communications						
27	27 05 26	Ground Bars						
27	27 05 28	Telephone, Equipment Room (TER), Intermediate Rooms (IDF), Cable Management, and Grounding						
27	27 05 33	J-Hook Raceways for Communications						
27	27 05 33	Audio / Video Raceways and Boxes						
27	27 05 33	Voice and Data Raceways and Boxes						
27	27 05 33	Nurse Call Raceways						
27	27 10 00	Structured Cabling						
27	27 10 00	Structured Cabling						
27	27 13 43	Structured Cabling to Nurse Call System						
27	27 40 00	Audio-Video Communications						
27	27 50 00	Distributed Communications and Monitoring Systems						
27	27 51 00	DAS Telemetry Antennae Systems						
27	27 51 16	Public Address and Mass Notification Systems						
27	27 51 19	Sound Masking Systems						
27	27 52 13	Patient Monitoring and Telemetry Systems						
27	27 52 23	Nurse Call Code Blue System Devices						
27	27 52 13	Clock Systems						
27	27 00 00	TOTAL COMMUNICATIONS						
28	28 00 00	ELECTRICAL SAFETY and SECURITY						
28	28 00 00	Electronic Safety and Security						
28	28 10 00	Electronic Access Control and Intrusion Detection						
28	28 20 00	Electronic Surveillance						
28	28 30 00	Electronic Detection and Alarm						
28	28 40 00	Electronic Monitoring and Control						
28	28 00 00	TOTAL ELECTRICAL SAFETY and SECURITY						
		TOTAL ELECTRICAL						
31	31 00 00	EARTHWORK						
31	31 20 00	Earth Moving						
31	31 22 16	Fine Grading						
31	31 23 16	Excavation						
31	31 23 16	Backfill						
31	31 23 16	Structural Fill						
31	31 23 19	Dewatering						
31	31 23 23	Sand Bedding						
31	31 23 33	Trenching / Backfill						
31	31 23 43	Haul Excess						
31	31 40 00	Shoring and Underpinning						
31	31 50 00	Excavation Support and Protection						
31	31 70 00	Tunneling and Mining						
31	31 00 00	TOTAL EARTHWORK						

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University of Utah - WBS Template

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University of Utah Project Manager

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Div.	Code	Component Description	Qty	Unit	Unit Cost	Total \$	\$/SF	% of Total
32	32 00 00	EXTERIOR IMPROVEMENTS						
32	32 10 00	Bases, Ballasts, and Paving						
32	32 12 16	Asphalt Paving						
32	32 13 13	Concrete Paving						
32	32 16 13	Curbs and Gutters						
32	32 30 00	Site Improvements						
32	32 80 00	Irrigation						
32	32 90 00	Planting						
32	32 91 00	Maintenance						
32	32 92 00	Sod, Ground Cover, Mulch, Soil Import, Soil Amendment						
32	32 93 33	Shrubs						
32	32 93 43	Trees						
32	32 00 00	TOTAL EXTERIOR IMPROVEMENTS						
33	33 00 00	UTILITIES						
33	33 05 11	Concrete Encasement: MEP Systems						
33	33 10 00	Water Utilities						
33	33 30 00	Sanitary Sewerage Utilities						
33	33 40 00	Storm Drainage Utilities						
33	33 50 00	Fuel Distribution Utilities						
33	33 60 00	Hydronic and Steam Energy Utilities						
33	33 70 00	Electrical Utilities						
33	33 80 00	Communications Utilities						
33	33 00 00	TOTAL UTILITIES						
		SUBTOTAL						
0	00 83 00	Design Contingency						
0	01 60 00	Contractor's Contingency						
0	00 81 00	Contractor's Fee (Overhead & Profit)						
0	01 20 00	General Liability Insurance						
0	01 10 00	Bonds						
0	00 73 21	Subguard Insurance						
0	01 40 00	Municipal Fees						
0	00 00 00	Cost Escalation						
		TOTAL CONSTRUCTION PHASE COST						
		PRE-CONSTRUCTION PHASE SERVICES						
1	01 71 00	Pre Construction Fees						
1	01 71 00	Pre Construction Reimbursable Expenses						
		TOTAL PRE-CONSTRUCTION COST						