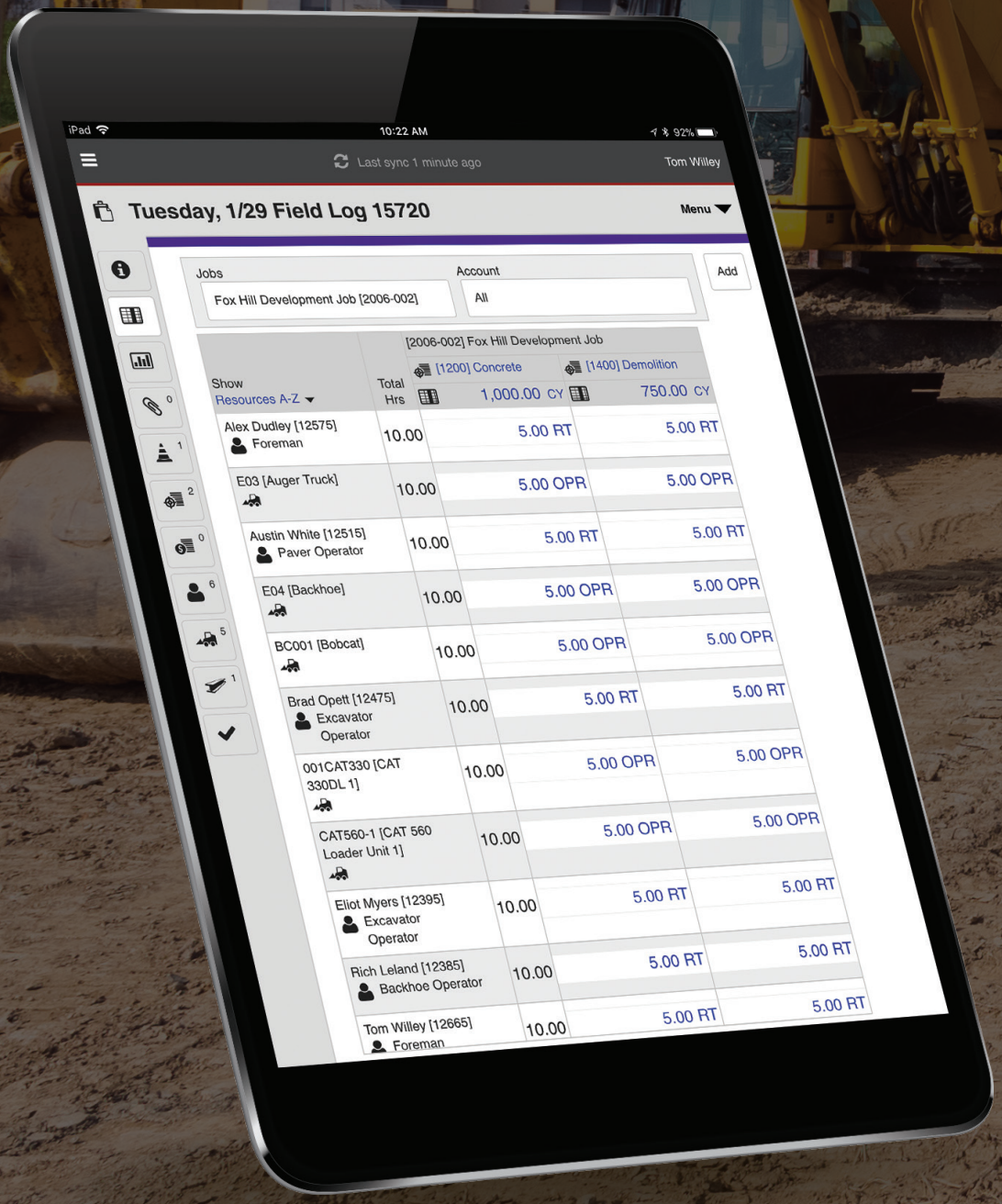
Designing the Right Cost Code Structure

For Heavy Construction Companies



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Designing the Right Cost Code Structure For Heavy Construction Companies

An effective cost code structure drives synergy and efficiency across estimating, performance tracking, accounting and reporting. Based on experiences of an expansive range of contractors using B2W Software, this whitepaper presents valuable tips for developing a strategy, structure and level of detail to meet the requirements of any company - regardless of size, software systems used or type of heavy construction work performed.

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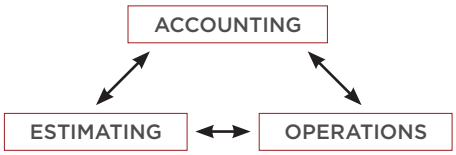
CREATE A COMMON LANGUAGE



Cost codes create a common language to unify estimating, operational and accounting workflows.

SYNCH WITH ACCOUNTING

How a new cost code structure will fit in with existing accounting systems and practices or the requirements of a new accounting system is an important consideration in the planning stage.

Why Focus on Cost Codes?

Cost codes give construction companies a tool for organizing activities and items into logical categories. Applying and assigning cost codes consistently through the estimating, budgeting, scheduling and execution phases of projects allows them to track and analyze the financial performance of those activities and items. This data is extremely valuable in adjusting estimates and operations to improve profitability on an ongoing basis.

There is no single best solution for designing a cost code structure. There are, however, proven strategies for developing a system to match the unique requirements of each individual company, balancing practical usability in the field and the office with a level of detail that will provide meaningful insight.

Identifying the Goals

Many contractors rush into a highly detailed cost code system. The belief is that, any activity or item that *can* be coded and tracked *should* be.

A better approach is to begin by assessing what the company wants to get out of the coding system. Asking questions like '*What information do we already know about operations?*' and '*What kind of additional data could give us valuable insight into running operations more profitably?*' can shape a cost code structure with solid business justifications rather than one built to track anything and everything.

For most companies, the answers to these questions will center around getting a better picture of actual production rates, bidding more accurately, analyzing equipment costs and finding out precisely which activities are making or losing money.

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COST CODE STAKEHOLDERS AND PRIORITIES

Executives:
Analyzing production rates and job progress vs. plan; assessing profitability

Accounting and Payroll:
Job costing; tracking activities and hours against budgets

Estimators:
Turning bids into budgets; improving accuracy

Project Managers and Field Personnel:
Capturing project information appropriately; tracking activities and hours against plan

Involving the Right People in Planning

Leaving development of a cost code structure up to accountants or executives alone is a mistake.

Estimators, project managers, field personnel and other employees can provide important perspectives. They often have the best sense of the everyday logistics of using and assigning codes and the most realistic feel for what level of detail is practical.

Engaging hands-on, non-financial users in the development process also enhances buy in. A new cost code system will change their daily work requirements and it may mean additional work for them, at least in the beginning. These employees will be more likely to use codes properly if they had a role in developing them and understand why they are important to their co-workers and the company as a whole.

Once a team is assembled to establish a cost code structure, using a familiar tool like Excel or PowerPoint for the design phase can make it easy to collaborate. The team should also try not to rush. Developing initial ideas, stepping away and reviewing them, and then revising them over time before finalizing the system is usually the best process.

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The Ideal Level of Detail

Getting the right level of detail to meet reporting objectives and requirements is the number-one challenge contractors face in developing an effective cost code structure. One size does not fit all, and the 'sweet spot' between too much detail and too little will vary widely from company to company.

Three codes to differentiate between 'small', 'medium' and 'large' pipe could be enough for one utility contractor. There may be no measurable difference, for example, in the process, equipment or labor that company would use to install six-inch or a ten-inch pipe. Another contractor, however, may need 15 different codes to track 15 specific pipe diameters and types that its crews install in order to analyze and adjust operations.

Acme Utilities, Inc.	
20-100	Small Pipe: less than 6"
20-200	Medium Pipe: 6" - 12"
20-300	Large Pipe: more than 12"

Jones Brothers Construction	
20-000	PVC Pipe
20-004	4" PVC Pipe
20-005	5" PVC Pipe
20-006	6" PVC Pipe
20-008	8" PVC Pipe
20-010	10" PVC Pipe
20-012	12" PVC Pipe
20-014	14" PVC Pipe
20-016	16" PVC Pipe
20-018	18" PVC Pipe
20-020	20" PVC Pipe
20-024	24" PVC Pipe
30-000	Cast Iron Pipe
30-006	6" Cast Iron Pipe
30-008	8" Cast Iron Pipe
30-010	10" Cast Iron Pipe
30-012	12" Cast Iron Pipe

A complex coding structure with an excessive volume of codes, however, can be an unnecessary burden on those who have to use it. Employees can end up wasting a lot of time looking up and trying to assign precisely the right code just to generate information at a level of detail that isn't useful or not worth the effort it takes to get it. Extremely granular or specific options also create more opportunities for coding errors, which lead to misleading reporting.

Agreeing on reporting goals at the outset can minimize the level of detail and the volume of codes.

Another good way to determine how detailed the cost code structure should be is to weigh the cost of the time employees will spend assigning, correcting and reporting on codes against the additional money that the company will earn by acting on the intelligence produced by that effort.

START SMALL AND BUILD

Starting with the basic codes required and then adding more, as needed, is almost always a better approach than starting with a high level of detail and then trying to eliminate and consolidate codes later.

WHAT TO AVOID

- Codes too specific to be practical:
  WM-PVC-06-048-Sand
  6" PVC Water Main at 48-inch depth with sand bedding
- Codes too generic to be meaningful:
  E-30
  Earthwork
- Different codes for the same activity or item in estimating, job tracking and accounting/payroll

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BEST PRACTICES:

Five digits tends to be a good minimum length for numeric cost codes
This provides room to add items under a main category or sub-category signified by the first one or two digits.

Avoid '0' as the first number
It may be dropped if data is imported to or exported from Excel spreadsheets.

Alphanumeric codes
This may be a good option, as long as they are accepted by the accounting systems. A code like EXC470, for example, makes it easy to identify that the item is related to excavating.

Choosing a Character Scheme

Contractors can use virtually any combinations of numbers or letters in their cost codes, depending on individual preferences and requirements. However, there are some proven best practices that can make structures more effective and prevent unforeseen problems related to sharing codes across systems or expanding the list of codes to add detail in the future.

Making sure the numerical or alphanumerical concept is compatible with the accounting and ERP systems as well as any reporting systems is also a critical first step. This means being conscious of things like character count limits and the use of dashes, periods or other special characters.

Organizing by Category

Organizing cost codes into logical categories makes a lot more sense than assigning them arbitrarily or in a random numerical succession. Categories make it easier to recognize quickly where an activity or item belongs without having to remember or look up dozens or even hundreds of codes.

The basic structure illustrated below presents a good example. All items in the "10000" category are related to General Conditions, all items in the "20000" category involve Land Clearing/Demo, and so on.

This is also a flexible concept, making it easy to increase the level of detail in a parent-child relationship under each category. In example 2, Electricity and Internet have been added to provide more specific detail for coding Temporary Utilities.

General Conditions	**10000**
Mobilization	11000
Temp Utilities	12000
Supervision	13000
Land Clearing / Demo	**20000**
Clearing / Grubbing	21000
Concrete / Pavement Removal	22000
Structure Demo	23000
Earthwork	**30000**
General Excavation	31000
Trenching	32000
Grading	33000
Concrete	**40000**
Precast	41000
Curb & Gutter	42000
Flatwork	43000

Example 1

General Conditions	**10000**
Mobilization	11000
Temp Utilities	12000
Electricity	12100
Internet	12200
Supervision	13000
Land Clearing / Demo	**20000**
Clearing / Grubbing	21000
Concrete / Pavement Removal	22000
Structure Demo	23000

Example 2

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Implementation Tips

Some contractors opt for a gradual “soft” start. They roll out new cost codes to one crew or division at a time or give field personnel the option of using old and new systems simultaneously over a period of weeks or months so they can get comfortable with the new codes.

This approach seems sensible, but it can backfire. Maintaining two systems for a period of time can lead to errors, uncertainty and extra work. Given the easy option, field personnel may also stick with the old system they are familiar and comfortable with for as long as possible and delay embracing the new codes.

Assuming that previous steps for envisioning and creating an effective code structure have been met, it’s almost always better to establish and stick to a hard “go live” date. Companies that start with a basic level of detail and then expand the volume of codes as needed over time are also in a better position to succeed with this method.

Examples

The following pages include some examples of various cost code structures for heavy construction.

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EXAMPLE: Detailed Cost Code Structure

In this numerical cost code structure, the first two digits indicate major categories, the next two digits indicate subcategories and the final two digits indicate specific activities and items within those categories. (Note: Some subcategories and codes are hidden to minimize the size of the example.)

Earthwork	**10-0000.**
Temp Fertilizer (125-30-15)	10-0202.
Temp Seed (Canada Wildrye)	10-0203.
Temp Seed (Sterile Wheatgrass)	10-0204.
Temp Seed (Grain Oats)	10-0205.
Soil Erosion Mix	10-0206.
Sediment Removal	10-0210.
Mulch (Tacking Slurry)	10-0260.
Mulch (Temp)	10-0270.
Mulch (Perm) (Set Price)	10-0280.
Erosion Control (CL 1) (TY C)	**10-0300.**
Erosion Control	10-0301.
Water Pollution Control Manager	10-0302.
Fertilizer	10-0304.
Seed (Canada Wild-Rye)	10-0310.
Seed (Indiangrass) (Osage)	10-0311.
Seed (Little Bluestem Grass) (Aldous)	10-0312.
Seed (Ryegrass) (Perennial)	10-0313.
Seed (Prairie June)	10-0314.
Seed (Side Oats Grama) (El Reno)	10-0315.
Seed (Sterile Wheatgrass)	10-0316.
Bio-Log (9")	10-0331.
Bio-Log (12")	10-0332.
Bio-Log (20")	10-0333.
Clearing and Grubbing	**10-0400.**
Removal of Existing Structures	**10-0500.**
Pavement Removal	10-0505.
Unclassified Excavation	**10-0800.**
Common Excavation (Contractor Furnished)	10-0801.
Common Excavation (Rural Small)	10-0802.
Class III Excavation (RCB)	10-0803.
Rock Excavation	10-0805.
Contractor Construction Staking	10-0810.
Salvaged Topsoil	**10-0900.**
Earthwork Compaction	**10-1000.**
Compaction of Earthwork (Type A) (5-5)	10-1001.
Compaction of Earthwork (Type AA) MR-3-3	10-1003.
Compaction of Earthwork (Type AA) (5-5)	10-1055.
Grading	**10-1300.**
Pipe (Sewer / Storm / Water)	**20-0000.**
CRP RCP	**20-2000.**
CRP (15')(RCP)(CL III)	20-2015.
CRP(18")(RCP)(CL III)	20-2018.
CRP(24")(RCP)(CL III)	20-2024.
CRP(30")(RCP)(CL III)	20-2030.
CRP(36")(RCP)(CL III)	20-2036.
CRP(42")(RCP)(CL III)	20-2042.
CRP(48")(RCP)(CL III)	20-2048.
CRP(54")(RCP)(CL IV)	20-2054.
CRP(60")(RCP)(CL V)	20-2060.
CRP CMP	**20-2100.**
CRP(12")(CMP ALUM TY II)	20-2112.
CRP(15')(CMP ALUM TY II)	20-2115.
CRP (18")(CMP ALUM TY II)	20-2118.
CRP (24")(CMP ALUM TY II)	20-2124.
CRP (30")(CMP ALUM TY II)	20-2130.
CRP(36")(CMP ALUM TY II)	20-2136.
CRP(72"x44")(CMAP ALUM TY II)	20-2172.
End Section (15")	20-2215.
End Section (24")	20-2224.
End Pipe (EP) (15")	20-2315.
End Pipe (EP) (24")	20-2324.
Temp Ditch Check (Rock)	20-3801.
Inlet (Type IV Median)	20-3804.
Inlet (Type V Median)	20-3805.
Manhole (Precast)	20-3810.
Inlet-Manhole	20-3813.
Inlet (Type 22 Curb)	20-3822.
Slope Prot (Aggregate)	20-3903.
30" Flapgate	20-3951.
36" Flapgate	20-3952.
Prefabricated Interception Device	20-3953.

Asphalt Paving	**30-000.**
Asphalt Commercial Grade	**30-4000.**
Asphalt Base	30-4010.
Asphalt Intermediate	30-4020.
Asphalt Milling	30-4023.
Rumble Strips	30-4024.
HMA-Commercial GR (Class A)	30-4030.
Emul Asph (SS-1HP)	30-4038.
Emul Asph (EBL)	30-4039.
Ashalt Patching	30-4040.
Subgrade Failure Patching	30-4045.
Asphalt Oil	30-4050.
Asphaly Specialty Mix	30-4060.
Asphalt Air Void Pay Adjustment	30-4970.
Asphalt Density Pay Adjustment	30-4971.
Concrete Paving	**40-0000.**
Subgrade and Agg Base Shoulder	**50-0000.**
Aggregate Base	
Pavement Edge Wedge (Rock)	50-5505.
Aggregate Base (AB-3)(6")	50-5506.
Aggregate Base (AB-3)(8")	50-5508.
Aggregate Base (AB-3)(10")	50-5510.
Aggregate Base (AB-3)(24")	50-5524.
Crushed Stone Subgrade	50-5600.
Crushed Stone Subgrade (6")	50-5606.
Surface Mat'l (AB-3)	50-5608.
Geotextile Fabric	50-5700.
Agg Ditch Lining (4")	50-5704.
Demolition	**60-0000.**
Structures	**70-0000.**
Guardrail, ST PL	70-1000.
Guardrail, Rem ST PL	70-1050.
Guardrail, Rem & Reconst ST PL	70-1060.
Guardrail End Terminal (MGS-SRT)	70-1061.
Guardrail End Terminal (MSG-FLEAT)	70-1062.
Reinf Steel (GR 60) (EPOXY)	**70-2060.**
Conc (GR 4.0) (RCB BR)	**70-3000.**
Conc (GR 4.0) (AE) (RCB BR)	70-3010.
Reinf Steel (GR 60)	70-3060.
Silt Fence	**70-6100.**
Conc Safety Barrier	**70-6200.**
Conc Safety Barrier (TY F3) (Temp-Rel)	70-6201.
Inertial Barrier System	70-6250.
Granular Backfill (Wingwalls)	70-6410.
Concrete for Seal Course	70-6811.
Foundation Stabilization (Set Price)	**70-7000.**
Inspection	70-7002.
Temporary Shoring	70-7050.
Incidental Construction	**80-0000.**
Quality Control Testing	80-7001.
Sign Assesmbly (Small)	80-7005.
Miscellaneous Work	**80-7100.**
Flagger (Set Price)	80-7103.
Traffic Signal Install (Temp)	80-7104.
Traffic Control (Initial Setup)	80-7105.
Right-of-Way Survey Monument	80-7150.
Work Zone Signs (0 to 9.25 SQ FT)	80-7160.
Work Zone Signs (> 9.25 SQ FT)	80-7161.
Work Zone Barrier (Ty III-4 to 12 LF)	80-7164.
Field Office	80-7201.
Work Zone Warning Light	80-7320.
Pavement Marking Removal	80-7400.
Pavement Marking	80-7414.

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EXAMPLE: Alphanumeric Cost Code Structure with Medium Detail

This is an alphanumeric cost code structure. The first three letters indicate the major categories. Subcategories are indicated by the numbers, with room to add additional items and codes if needed.

PRE	Preconstruction
PRE000	Mobilization
PRE005	Temporary Signs and Barricades
PRE015	Construction Layout
PRE017	Demo and Disposal of Existing Fence
PRE018	Initial Install & Removal of Temporary Dams
PRE020	Temporary Dam Removal and Replacement
PRE030	Exploratory Excavation
PRE060	Dewatering
PRE080	Concrete Washout Area
PRE172	Temporary Erosion Control
PRE175	Temporary Hay Bales
PRE190	Temporary Sediment Check Dams (Hay)
PRE195	Temporary Silt Fencing
PRE200	Temporary Stone Construction Entrance
DEM	**Demolition and Preparation**
DEM020	Remove PCC Roadway
DEM060	Removal of Asphalt Pavement
DEM120	Removal of Concrete Walks and Drives
DEM121	Remove ADA Ramps, Curb & Gutter, Sidewalk
DEM175	Remove Concrete Curb
DEM350	Saw Cut Existing Streeets, Sidewalk, Driveway
DEM360	Removal of Unsuitable Materials (TM)
EXC	**Excavation**
EXC501	Drainage Excavation
EXC502	GC Excavation for GI
EXC503	PP Excavation for GI
EXC504	SB Excavation for GI
EXC505	SL Excavation for GI
EXC506	SP Excavation for GI
EXC507	UB Excavation for GI
ERT	**Earthwork**
ERT000	Rough Grading
ERT010	Fine Grading
ERT020	DL Geotextile Fabric
ERT030	Geogrid
ERT101	Bridging Course Stone (57 WASHED)
ERT102	Bridging Course Stone (8 WASHED)
ERT103	Aggregate Course Stone (2 WASHED)
ERT104	Aggregate Course Stone (68 WASHED)
ERT120	Class II Base Course
ERT130	Bioretention soil mix
ERT135	Rip Rap (Including Fabric)
ERT150	Pine Straw Mulch
LND	**Landscaping**
LND110	Landscaping
LND115	Erosion Control System (Slope Protection)
LND130	Hydro-Seeding
LND150	Tree Protection
LND160	Root Pruning
LND165	Gravel Bed and Filter Cloth

CON	Concrete
CON010	PP Concrete Header Curb
CON030	Concrete Gutter
CON040	Combination Concrete - Curb and Gutter
CON041	Concrete Barrier - Curb and Gutter
CON060	Pervious Concrete Paving
CON110	Concrete Walk
CON150	Concrete Drive
ASP	**Asphalt**
ASP020	Asphalt Concrete (2" Thick)
ASP040	Asphalt Concrete (5" Thick)
ASP100	Milling Asphalt Pavement
SSW	**Sewer and Storm Water**
SSW005	12"-18" RCP
SSW010	24"-30" RCP
SSW015	30" + RCP
SSW201	HDPE Pipe (12"-18")
SSW211	HDPE Pipe (24"+)
SSW275	HDPE Flared End Section (12")
SSW276	HDPE Flared End Section (24")
SSW300	Misc Tie-In to Drain
SSW315	Manhole Rehabilitation Drainage
SSW375	Manhole (No 2)
SSW380	Manhole (No 3)
SSW400	SP Outfall Structure
SSW403	Conic Flared End Section (15")
SSW404	Conic Flared End Section (24")
SSW510	Adjusting Catch Basins
SSW541	Catch Basin Modification (TYPE A)
SSW575	Adjust Manhole: Raise/Lower (Bricks & Mortar)
SSW585	Catch Basin Type I
SSW615	Underdrain Pipe - Solid (PVC 6")
SSW616	Underdrain Pipe - Solid (PVC 12")
SSW621	Underdrain Pipe - Perforated (PVC 6")
SSW622	Underdrain Pipe - Perforated (PVC 12")
SSW630	Cleanout (PVC)
SSW725	Adjusted Sewer Service Lateral Connect.
OHD	**Overhead**
OHD110	Lunch
OHD120	Equipment Breakdown
OHD130	Meeting
OHD140	Travel Time
OHD150	Per Diem