Standard Form of Civil Engineering Cost Analysis

Consultation Document 7

Definition of standard elements for pipelines and ducts

Building Cost Information Service, RICS
Standard Form of Civil Engineering Cost Analysis Consultation

The objective of a Standard Form of Civil Engineering Cost Analysis (SFCECA) is the standardisation of formats for analysing and presenting civil engineering costs.

The proposed SFCECA documents were developed to provide the Defence Infrastructure Organisation (DIO) with a database of the cost of its civil engineering projects, to complement its database of building projects.

BCIS is keen to consult as widely as possible to establish:
- whether there is a general need for an SFCECA;
- whether the approach developed is generally acceptable by:
  o seeking comments and suggestions on the proposed structure,
  o engaging with specialist clients and consultants to incorporate existing definitions of entity types and functional cost data structures; and
- if there is a desire for an industry database.

The main consultation document is the SFCECA Outline Data Structure.

In addition to the outline data structure, BCIS prepared for the DIO, the ‘General principles, instructions definitions and common elements’ for preparing a cost analysis and specific definitions for certain entities.

BCIS would be happy to receive comments on these proposals and copies are available on request from BCIS or can be downloaded from: [http://www.bcis.co.uk/sfcecaconsult](http://www.bcis.co.uk/sfcecaconsult)

The consultation documents are:
1. Outline data structure: Key consultation document that describes the general concepts and shows the proposed data structure.
2. Principles, instructions, definitions and common elements: Sets out the principles of analysis; details the supporting information required so that the costs analysed can be fully understood; sets out the cost breakdown for works that occur on most projects (external works, facilitating works), and for preliminaries, temporary works, design fees, etc.
3. Pavements, which covers roads, runways, hard standings etc. Includes specific definitions for Airfield Pavements.
4. Railways.
5. Quays, Piers, Jetties, Platforms and the like.
7. Pipelines and Ducts.

Possible presentation format: What a civil engineering cost analysis might look like.

Comments and queries: to the address or e-mail below.

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1 Introduction
This document should be read in conjunction with the *Standard form of cost analysis for civil engineering - Principles, instructions, definitions and common elements*

This document defines elements for the entity ‘Pipelines’. It contains:
- definition of entity
- classification of user functions
- elements; and
- definition of the elements

2 Pipelines and ducts entity definition
*Definition:* Enclosed conduits for the flow and containment of solids, powders, liquids and gases.
*Includes:* Pipes, ducts, etc.
*Primary functional unit:* Length (m).

3 User classification

*Pipelines by use*
- Oil
- *Water*
- Gas
- *Drains*

*Ducts*
- *For telecommunications cables*
4 Elements for pipelines

1 Substructure
   1A Excavation
   1B Beds and surrounds

2 Pipeline
   2A Work to existing pipelines
   2B Pipes
   2C Inline fittings
   2D Terminal fittings
   2E Pipe protection and marking

3 Pipeline completion
   3A Drainage
   3B Electrical power installation
   3C Lighting installation
   3D Heating installation
   3E Water installations
   3F Communications
   3G Protection and security
   3H Special installation
   3I Ancillary (structures and equipment)
   3J BWIC

4 External works
   See Principles, Instructions and Definitions

5 Facilitating works
   See Principles, Instructions and Definitions

6 Preliminaries
   See Principles, Instructions and Definitions

7 Location related temporary works
   See Principles, Instructions and Definitions

8 Contingencies and risk
   See Principles, Instructions and Definitions

9 Design fees on design and build schemes
   See Principles, Instructions and Definitions

10 Other client costs
   See Principles, Instructions and Definitions
5 Element definitions for pipelines

1 SUBSTRUCTURE

Definition: Trench excavation, beds and surrounds to pipes.

Functional definition: To transfer the load of the pipe and protect it from ground movement.

Measurement: Length (m).

Note: where the cost of the excavation and surround is not separately identified it should be included with the pipes and stated as such here.

1A Excavation

Definition: Excavation and filling.

Functional definition: To facilitate the laying of pipes at the required depth.

Measurement: Length of trench (m).

Design criteria to be stated:

- Average depth
- Size of pipe(s)
- Numbers of pipes

Includes: Excavation

Excludes:

- Earthwork support
- Levelling and ramming

1B Beds and surrounds

Definition: Beds and surrounds to pipe.

Functional definition: To protect the pipes from ground movement.

Measurement: Length of trench (m).

Design criteria to be stated:

Includes: Beds

Excludes: Surrounds

2 PIPELINE

Definition: Pipes and ducts.

Functional definition: To provide an enclosed conduit for the flow and containment of solids, powders, liquids and gases.

Measurement: Length of pipe (m).

Note: Where the cost of the excavation and surround is not separately identified it should be included here and stated as such in Substructure.
2A Preparation (for refurbishment)

**Definition:** Work required to facilitate the refurbishment of pipelines, etc.

**Functional definition:** Not a functional element but a cost category included for accounting and analysis purposes.

**Measurement:** Length of pipe (m).

**Design criteria to be stated:**

**Includes:**
- Clearing blockages
- Cleaning
- CCTV surveys

**Excludes:**
- Relining pipes (see Pipes, ducts)

2B Pipes, ducts

**Definition:** Pipes, ducts, etc.

**Functional definition:** To provide an enclosed conduit for the flow and containment of solids, powders, liquids and gases.

**Measurement:** Length of pipe (m).

**Design criteria to be stated:**
- Diameter
- Strength

**Includes:**
- Pipes
- Couplers in running length
- Bends and tees
- Pipe linings to existing pipes

**Excludes:**
- Fittings

2C Inline fittings

**Definition:** Fittings in the running length.

**Functional definition:** To facilitate the flow of solids, powders, liquids and gases.

**Measurement:** Length of pipe (m), Enumerate (Nr).

**Design criteria to be stated:**
- Diameter

**Includes:**
- Valves
- Pumps
- Pressure regulation valves and installations
- Chambers or manholes

**Excludes:**
- Terminal fittings
- Above ground housing, kiosks and compounds. (see Ancillaries)
2D Terminal fittings
Definition: Terminal fittings.
Functional definition: To facilitate ingress and delivery of solids, powders, liquids and gases.
Measurement: Enumerate (Nr).
Design criteria to be stated:
Includes: Excludes:
- Valves
- Chutes
- Outflows
- Inflow
- Pumps
- Chambers and manholes

2E Pipe protection and marking
Definition: Protection and marking covers and tapes.
Functional definition: To protect the pipelines from damage.
Measurement: Length of pipe (m).
Design criteria to be stated:
Includes: Excludes:
- Insulation
- Pipe protective cappings and coverings
- Pipe marking and identification strips

3 PIPELINE COMPLETION
Definition: Equipment, pipes, cables, ducts and their support, fittings, finishes and structures.
Functional definition: Systems and items required to make the entity fulfil its function and make it usable.
Measurement: Length of pipe (m).

3A Drainage
Definition: Drainage from the pipeline.
Functional definition: To remove water, etc. from the pipeline.
Measurement: Length of pipe (m). Note: costs should be shown separately for each installation.
Design criteria to be stated:
Includes: Excludes:
- Drainage from trenches, manholes, chambers and the like to and including the first collecting manhole or soakaway
- Drainage outside beyond the first collecting manhole (see 4 External works)
3B Electrical Power installations

Definition: Electric source and mains, power distribution.

Functional definition: To provide electrical power.

Measurement: Length of pipe (m).

Design criteria to be stated:
Includes:  
Excludes:

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3C Lighting installations

Definition: Lighting systems: equipment, luminaires and distribution.

Functional definition: To provide area lighting.

Measurement: Length of pipe (m).

Design criteria to be stated:
Includes:  
Excludes:

• Illumination levels

• Lighting
• Supports, gantries, etc.

3D Heating

Definition: Heating installation.

Functional definition: To heat the pipelines.

Measurement: Length of pipe (m).

Design criteria to be stated:
Includes:  
Excludes:

• Heating to pipeline

3E Water Installations

Definition: Water supply and distribution.

Functional definition: To provide water.

Measurement: Length of pipe (m).

Design criteria to be stated:
Includes:  
Excludes:

• Number of draw off points
3F Communications
Definition: Communication systems, equipment and distribution.
Functional Definition: To provide systems for communication to users of the pipeline.
Measurement: Length of pipe (m). Note: costs should be shown separately for each installation.
Design criteria to be stated: As appropriate to each installation.
Includes: Excludes:
- Signs
- Signals
- Supports, gantries etc

3G Protection and security
Definition: Protective and security installations.
Functional definition: To protect the pipeline from hazards and prevent unauthorised access.
Measurement: Length of pipe (m). Note: costs should be shown separately for each installation.
Design criteria to be stated: As appropriate to each installation.
Includes: Excludes:
- Fire-fighting Installations
- CCTV
- Security alarm installations
- Access control

3H Special Installations
Definition: Mechanical/electrical installations and systems related to the user function.
Functional definition: To provide mechanical/electrical systems related to user function.
Measurement: Length of pipe (m). Note: costs should be shown separately for each installation.
Design criteria to be stated:
Includes: Excludes:
3I Ancillaries (structure and equipment)
Definition: Items required to make the entity fulfil its function and make it usable.
Functional definition: To provide items required to make the entity fulfil its function and make it usable.
Measurement: Length of pipe (m), enumerate major items (Nr).
Design criteria to be stated: As appropriate to the works.
Includes:
- Housing, kiosks etc for pumps etc
- Compounds, fences etc for valve stations and the like.
Excludes:
- Manholes, underground chambers, etc. (see Inline fittings)

3J BWIC
Definition: Work carried out solely to facilitate the provision of services installations.
Functional Definition: To facilitate services.
Measurement: Length of pipe (m). Note: costs should be shown separately for each installation.
Design criteria to be stated:
Includes:
- Holes, chases, ducts
- Multi-use supports, gantries, etc.
Excludes: