



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:
 - seeking comments and suggestions on the proposed structure,
 - 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>

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.

Definitions of elements for some individual entities: Provides classification of the entity types, and detailed definitions of the elements.

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*.
6. *Support structures (Masts, Towers 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.

CONTENTS

1 INTRODUCTION.....	4
2 PIPELINES AND DUCTS ENTITY DEFINITION	4
3 USER CLASSIFICATION	4
PIPELINES BY USE	4
<input type="checkbox"/> <i>Oil</i>	4
<input type="checkbox"/> <i>Water</i>	4
<input type="checkbox"/> <i>Gas</i>	4
<input type="checkbox"/> <i>Drains</i>	4
DUCTS	4
<input type="checkbox"/> <i>For telecommunications cables</i>	4
4 ELEMENTS FOR PIPELINES	5
5 ELEMENT DEFINITIONS FOR PIPELINES	6

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
- Earthwork support
- Levelling and ramming

Excludes:

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
- Surrounds

Excludes:

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:

- Valves
- Chutes
- Outflows
- Inflow
- Pumps
- Chambers and manholes

Excludes:

- Inline fittings

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:

- Insulation
- Pipe protective cappings and coverings
- Pipe marking and identification strips

Excludes:

-

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:

- Drainage from trenches, manholes, chambers and the like to and including the first collecting manhole or soakaway

Excludes:

- 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:

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:

- Illumination levels

Includes:

- Lighting
- Supports, gantries, etc.

Excludes:

3D Heating

Definition: Heating installation.

Functional definition: To heat the pipelines.

Measurement: Length of pipe (m).

Design criteria to be stated:

Includes:

- Heating to pipeline

Excludes:

3E Water Installations

Definition: Water supply and distribution.

Functional definition: To provide water.

Measurement: Length of pipe (m).

Design criteria to be stated:

- Number of draw off points

Includes:

Excludes:

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:

- Signs
- Signals
- Supports, gantries etc

Excludes:

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:

- Fire-fighting Installations
- CCTV
- Security alarm installations
- Access control

Excludes:

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:

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

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See Principles, Instructions and Definitions