

ATTACHMENT 8(A)

Materials estimate.

Table 1 responds to **Question 8(a)** by providing an estimate of the materials quantities to be used during the installation of six main activities identified in response to **Question 6(a)**.

Table 1: Materials estimates for project activities.

Activity	Material estimates
01. PoA to Douglas Cables	Cable 1 – cable composition approximately 35,000 m of 3-core 33 kV armoured electrical cable with bundled fibre-optic cable, with an external diameter of 153 mm. The single armoured submarine cable comprises a copper conductor, XLPE (Cross Linked Polyethylene), copper wires, and copper foil bonded to the Polyethylene sheath (see drawings and document 1025H0BSDG84110_CDFE03 and 1023DSBNMI85016_CDFE02_91). Cable 2 – cable composition approximately 35,000 m of 3-core 33 kV armoured electrical cable with bundled fibre-optic cable, with an external diameter of 153 mm. The single armoured submarine cable comprises a copper conductor, XLPE (Cross Linked Polyethylene), copper wires, and copper foil bonded to the Polyethylene sheath (see drawings and document 1025H0BSDG84141_CDFE02_01 to 07 and 1023DSBNMI85016_CDFE02_91). Cable 1 – external protection on approach to new Douglas platform comprising between 25x to 35x concrete mattresses (6 m x 3 m x 0.3 m) @9,800 kg each (total weight approximately 245,000-343,000 kg) (see drawing 105600BSDN84154_CDFE02_03). Cable 2 – external protection on approach to new Douglas platform comprising between 25x to 35x concrete mattresses (6 m x 3 m x 0.3 m) @9,800 kg each (total weight approximately 245,000-343,000 kg) (see drawing 105600BSDN84154_CDFE02_03).
02. Cable crossings	Cable 1 - Total cable protection for 10 crossings: Concrete mattresses approximate weight for cable route 627,200 kg. Based on approximately 64x concrete mattresses @9,800 kg each (see drawing 1025HTBSDG84176_CDFE03_02). Rock approximate weight for cable route 12,000,000-16,000,000 kg. Based on weight in Air 12,000-16,000 kg / linear metre – 200 m length per crossing (see drawing 1025HTBSDG84176_CDFE03_02). Cable 2 - Total cable protection for 10 crossings: Concrete mattresses approximate weight for cable route 627,200 kg. Based on approximately 64x concrete mattresses @9,800 kg each (see drawing 1025HTBSDG84176_CDFE03_02). Rock approximate weight for cable route 12,000,000-16,000,000 kg. Based on weight in Air 12,000-16,000 kg / linear metre – 200 m length per crossing (see drawing 1025HTBSDG84176_CDFE03_02).
03. Douglas Jacket	- four-legged steel structure measuring approximately 20 m x 20 m at the lower level and 17.5 m x 17.5 m at the upper level. - The jacket will be piled into the seabed with 8 steel piles. Each pile will be approximately 1.5 m in diameter and 40.25 m in length, with a penetration depth of around 22 m.

Activity	Material estimates
	The total weight of the steel jacket will be approximately 2,940 tonnes.
04. Douglas Toppers	- The topsides will be a predominantly steel structure, and comprise cellar, mezzanine, and weather decks, and have overall dimensions of approximately 33 m in length, 30 m in width, and 35.5 m in height to the weather deck/helideck. - The total weight of the steel topside will be approximately 2,290 tonnes.
05. Pipeline Spools	- PL1030 - approximately 608m of steel pipeline for PL1030, existing 20" gas to Point of Ayr, including 110x concrete mattresses (6 m x 3 m x 0.3 m) @9,800 kg each (total approximate weight 1,078,000 kg) (see drawing 105600BSDN84154_CDFE02_03 and 105600BSDN84152_CDFE03); - PL1039 - approximately 309m of steel pipeline for PL1039, existing 20" gas export from Hamilton Main including 70x concrete mattresses (6 m x 3 m x 0.3 m) @9,800 kg each (total approximate weight 686,000 kg). (see drawing 105600BSDN84154_CDFE02_03 and 105600BSDN84152_CDFE03); - PL1041 - approximately 205m of steel pipeline for PL 1041, existing 14" gas export from Hamilton North including 50x concrete mattresses (6 m x 3 m x 0.3 m) @9,800 kg each (total approximate weight 490,000 kg). (see drawing 105600BSDN84154_CDFE02_03 and 105600BSDN84152_CDFE03); - PL1035 - approximately 263m of steel pipeline for PL1035, existing 16" gas export from Lennox including 60x concrete mattresses (6 m x 3 m x 0.3 m) @9,800 kg each (total approximate weight 588,000 kg). (see drawing 105600BSDN84154_CDFE02_03 and 105600BSDN84152_CDFE03_03). 1036A - approximately 329m of steel pipeline for PL1036A, existing 12" gas injection to Lennox including 70x concrete mattresses (6 m x 3 m x 0.3 m) @9,800 kg each (total approximate weight 686,000 kg). (see drawing 105600BSDN84154_CDFE02 and 105600BSDN84152_CDFE03_03). - Concrete sleepers (rubber coated) for crossings on approach to new Douglas platform comprising: 2 sleepers (6m x 2m x 1.1m) for 14" Spool PL1041 and 14" PL1031 2 sleepers (6m x 2m x 1.1m) for 20" Spool PL1039 and 12" PL1036A GROUT BAGS PL1030 1 pyramid shape grout bag, approximate dimension 3m x 3m x 2.8m (or equivalent). 100 grout bags (20kg type), approx. dimension 500mm x 300mm x 75mm. (see drawing 105600BSDN84154_CDFE02_03). (total approximate weight 2,000 kg). PL1039 1 pyramid shape grout bag, approximate dimension 3m x 3m x 2.8m (or equivalent). 100 grout bags (20kg type), approx. dimension 500mm x 300mm x 75mm. (see drawing 105600BSDN84154_CDFE02_03). (total approximate weight 2,000 kg). PL1041 1 pyramid shape grout bag, approximate dimension 3m x 3m x 2.8m (or equivalent).

Activity	Material estimates
	○ 100 grout bags (20kg type), approx. dimension 500mm x 300mm x 75mm. (see drawing 105600BSDN84154_CDFE02_03). (total approximate weight 2,000 kg). ● PL1035 ○ 1 pyramid shape grout bag, approximate dimension 3m x 3m x 2.8m (or equivalent). ○ 100 grout bags (20kg type), approx. dimension 500mm x 300mm x 75mm. (see drawing 105600BSDN84154_CDFE02_03). (total approximate weight 2,000 kg). ● PL1036A ○ 1 pyramid shape grout bag, approximate dimension 3m x 3m x 2.8m (or equivalent). ○ 100 grout bags (20kg type), approx. dimension 500mm x 300mm x 75mm. (see drawing 105600BSDN84154_CDFE02_03). (total approximate weight 2,000 kg).
06. Inter-platform Cables	● Douglas to Hamilton Main – cable composition 12,000 m of 3-core 33 kV armoured electrical cable with bundled fibre-optic cable, with an external diameter of 153 mm. The single armoured submarine cable comprises a copper conductor, XLPE (Cross Linked Polyethylene), copper wires, and copper foil bonded to the Polyethylene sheath (see drawings and document 1025DSBSDG84144_CDFE02_03 and 1023DSBNMI85016_CDFE02_91). ● Douglas to Hamilton North – cable composition 15,000 m of 3-core 33 kV armoured electrical cable with bundled fibre-optic cable, with an external diameter of 153 mm. The single armoured submarine cable comprises a copper conductor, XLPE (Cross Linked Polyethylene), copper wires, and copper foil bonded to the Polyethylene sheath (see drawings and document 1025DSBSDG84142_CDFE02_03 and 1023DSBNMI85016_CDFE02_91). ● Douglas to Lennox – cable composition 35,000 m of 3-core 33 kV armoured electrical cable with bundled fibre-optic cable, with an external diameter of 153 mm. The single armoured submarine cable comprises a copper conductor, XLPE (Cross Linked Polyethylene), copper wires, and copper foil bonded to the Polyethylene sheath (see drawings and document 1025DSBSDG84143_CDFE02_07 and 1023DSBNMI85016_CDFE02_91). ● Douglas to Hamilton Main ○ cable protection and crossings on approach to new Douglas platform comprising approximately 100x concrete mattresses (6 m x 3 m x 0.3 m) @9,800 kg each (total approximate weight 980,000 kg) (see drawing 1025H0BSDN84112_CDFE06_02). ○ Concrete bridge to be installed on approach to new Douglas platform (see document Figure 7-3 in 1025DSBSCZ84173_CDFE03_41) ● Douglas to Hamilton North ○ cable protection on approach to new Douglas platform comprising approximately 50x concrete mattresses (6 m x 3 m x 0.3 m) @9,800 kg each (total approximate weight 490,000 kg) (see drawing 1025H0BSDN84112_CDFE06_02). ○ Rock approximate weight for cable route 12,000,000-16,000,000 kg. Based on weight in Air 12,000-16,000 kg / linear metre – 200 m length per crossing (see document 1025DSBSCZ84173_CDFE03_41). ● Douglas to Lennox

Activity	Material estimates
	○ cable protection on approach to new Douglas platform comprising approximately 60x concrete mattresses (6 m x 3 m x 0.3 m) @9,800 kg each (total approximate weight 588,000 kg) (see drawing 1025H0BSDN84112_CDFE06_02). ○ Rock approximate weight for cable route 12,000,000-16,000,000 kg. Based on weight in Air 12,000-16,000 kg / linear metre – 200 m length per crossing (see document 1025DSBSCZ84173_CDFE03_41).