Venice LNG S.p.A.
Marghera, Italia

Deposito Costiero GNL a Marghera

Report di Calcolo di Dimensionamento Cavi

Doc. No. P0000556-2-H18 Rev. 0 – Gennaio 2018

Rev.	0
Descrizione	Prima Emissione
Preparato da	R. Pennino
Controllato da	A. Sola
Approvato da	M. Cozzi
Data	Gennaio 2018

RINA CONSULTING

Rev.	Descrizione	Preparato da	Controllato da	Approvato da	Data
0	Prima Emissione	R. Pennino	A. Sola	M. Cozzi	22/01/2018

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ABBREVIAZIONI E ACRONIMI

ICEA	Insulated Cable Engineers Association
BT	Bassa Tensione
EDG	Emergency Diesel Generator
UPS	Uninterruptible Power Supply
XLPE	Polietilene
FLA	Full Load Ampere
PF	Fattore di Potenza

1 INTRODUZIONE

Venice LNG intende installare, all'interno dell'area portuale e industriale di Marghera (Figura 1.1), un deposito costiero avente taglia di 32,000 m^3, costituito da No. 1 serbatoio a pressione atmosferica.

Il deposito sarà alimentato mediante navi gasiere di piccola e media taglia, mentre la distribuzione sarà garantita attraverso camion e metaniere di piccola taglia ("bettoline").

Il progetto prevede un transito di 450,000 m^3/anno di GNL nella fase iniziale delle operazioni e fino a 900,000 m^3/anno a regime con l'aumento della domanda di mercato.

L'area del deposito sarà localizzata a Est dell'attuale deposito oli di proprietà DECAL, in una zona attualmente non interessata dalla presenza di attività produttive.

Il sito individuato è contiguo ad aree a vocazione industriale (sia a Est sia a Ovest) e attualmente interessate da attività produttive.

L'area di studio è collocata nella zona centro-occidentale della laguna di Venezia, all'interno dell'area portuale e industriale di Marghera; essa si trova in località Fusina all'interno del Comune di Venezia, e confina a Nord con il Canale Industriale Sud e a Sud con l'adiacente Comune di Mira.

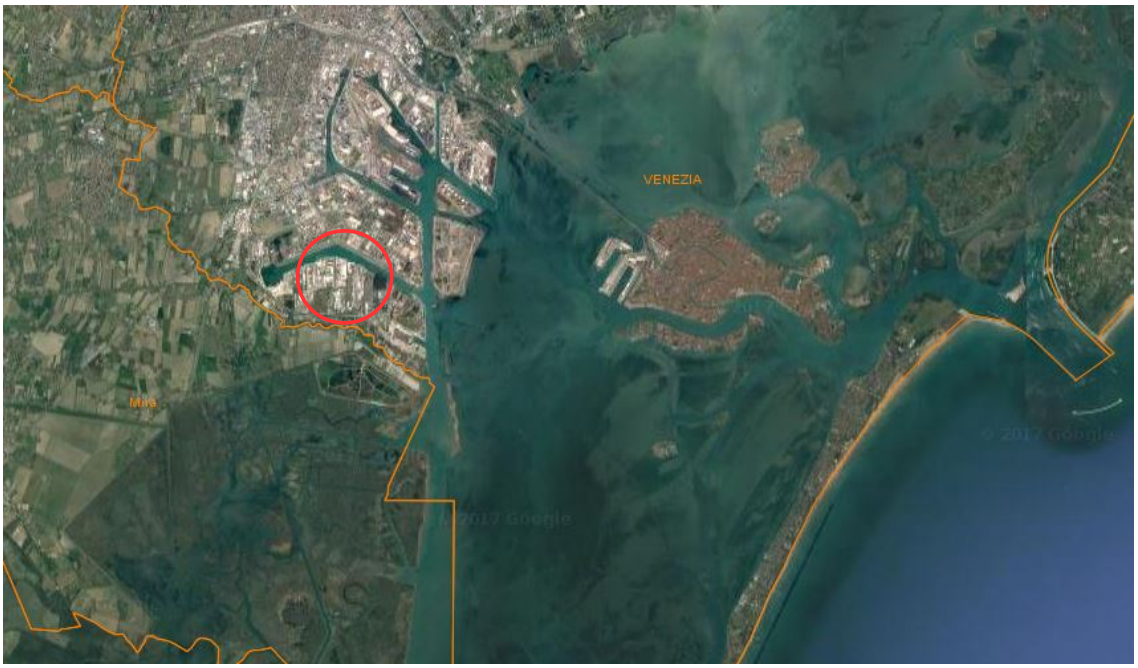

Figura 1.1: Inquadramento Generale dell'Area con evidenziato il Sito di Intervento

L'area risulta inoltre inserita all'interno del Sito di Interesse Nazionale di Venezia-Porto Marghera (SIN) come stabilito dalla legge n°426/1998 "Nuovi interventi in campo ambientale".

2 RIFERIMENTI RIFERIMENTI

2.1 DOCUMENTI DI RIFERIMENTO

1. P0000556-2-H15-Relazione Tecnica Illustrativa
2. P0000556-2-H16- Lista carichi elettrici
3. P0000556-2-H17–Report calcolo sistema elettrico
4. P0000556-2-M11-Schema unifilare elettrico
5. P0000556-2-M10-Planimetria apparecchiature elettriche

2.2 NORMATIVE DI RIFERIMENTO

1. CEI 64-8 Impianti elettrici utilizzatori per tensioni nominali fino a 1000V in corrente alternate e a 1500V in corrente continua.

   Parte 1: Oggetto, scopo e principi fondamentali

   Parte 2: Definizioni

   Parte 3: Caratteristiche generali

   Parte 4: Prescrizioni per la sicurezza

   Parte 5: Scelta ed installazione dei componenti elettrici

   Parte 6: Verifiche

   Parte 7: Ambienti ed applicazioni particolari
2. IEC 61936-1 Power installations exceeding 1 kVac – Part 1: Common rules
3. IEC 60364-1 Low-voltage electrical installations – Part 1: Fundamental Principles, assessment of general characteristics, definitions;
4. IEC 60364-4 Low-voltage electrical installations – Part 4-41: Protection for safety – Protection against electric shock;
5. IEC 60364-4 Low-voltage electrical installations – Part 4-43: Protection for safety – Protection against overcurrent;
6. IEC 60364-5 Electrical installations of buildings – Part 5-52: Selection and erection of electrical equipment – Wiring systems.

3 CRITERI DI DIMENSIONAMENTO

Il presente documento fornisce i criteri per dimensionare i cavi di potenza (media tensione e bassa tensione) per l'impianto GNL di Marghera.

I cavi previsti sono con conduttori flessibili in rame, unipolari e/o multipolari, isolati in gomma HEPR tipo G7, sotto guaina in PVC tipo FG7R e/o FG7OR, grado di isolamento 0,6/1 kV per circuiti di energia con tensione fino a 230/400 V, eventualmente schermati tipo FG7H2R e/o FG7H2OR.

Le sezioni dei cavi sono state dimensionate in conformità a:

- ✓ Corrente in transito nel cavo nelle normali condizioni di esercizio;
- ✓ Coefficienti di riduzione della portata dei cavi relativi alle condizioni di posa;
- ✓ Caduta di tensione che non deve superare il 5% della tensione nominale del circuito (a carico normale) sia per cavi alilmentanti utilizzatori di forza motrice sia luce.

In questa fase preliminare non vengono verificate l'energia passante e la protezione dai contatti indiretti che sono relativi ad una progettazione di dettaglio con le caratteristiche degli interruttori ed i valori di cortcircuito calcolati dell'impianto.

La caduta di tensione considerata è quella misurata fra il quado Power Center MCC (PMCC), a valle del trasformatore MT/BT e l'utilizzatore più lontano.

Per l'esecuzione dei calcoli di dimensionamento dei cavi dell'impianto è stato utilizzato il software ETAP in versione 14.0.0.

3.1 CALCOLO DELLA SEZIONE DI CONDUTTORI IN FUNZIONE DELLA CORRENTE CIRCOLANTE

La sezione dei conduttori è funzione della corrente d'impiego (In) (circolante) che non deve mai superare la portata massima in regime permanente del cavo che la convoglia (Iz).

La corrente d'impiego (In) è il valore che può fluire in un circuito nel servizio ordinario mentre per portata massima in regime permanente (Iz) si intende la massima corrente che il conduttore è in grado di sopportare senza che, per effetto Joule, la temperatura raggiunga valori tali da compromettere l'integrità e la durata degli isolanti.

La temperatura massima sopportabile non ha un valore fisso valido per tutti i cavi ma dipende dal tipo di isolante usato per il rivestimento del conduttore (da 70°C per isolanti economici fino ad oltre 200°C per isolanti speciali).

Le portate massime dei conduttori (Iz) e le relative sezioni ricavate devono essere verificate mediante la formula semplificata:

$$S \geq \frac{I_n}{a}$$

Dove:

- ✓ S è la sezione in mm2 del conduttore;
- ✓ In è la corrente d'impiego che può interessare un circuito nel servizio ordinario;
- ✓ A è la densità di corrente riferita al conduttore di sezione unitaria pari a:

i. 10 A/mm2 per conduttori in tubo sotto intonaco;

ii. 12 A/mm2 per conduttori a vista;

iii. 13 A/mm2 per conduttori ben ventilati.

3.2 COEFFICIENTI DI RIDUZIONE DELLA PORTATA

Il valore di Iz (portata del conduttore in condizioni normali di servizio) è stato determinato, inoltre, in base ai declassamenti dovuti ai vari coefficienti di correzione a seconda della temperatura d'impiego, del tipo di posa e del numero di conduttori posati in una unica conduttura.

I fattori di correzione presi in considerazione, che contribuiscoo alla riduzione della portata nominale del cavo, sono sostanzialmente due:

- ✓ Il fattore K1, che tiene conto della temperatura ambiente nella quale il cavo è posato;
- ✓ Il fattore K2 che tiene conto della prossimità dei cavi.

Le tabelle di riferimento contenenti i fattori K1 e K2, sono ricavabili dalla letteratura sopra indicata.

Il fattore K2 si applica nella opotesi in cui i cavi del fascio o dello strato abbiano sezioni simili, cioè contenute entro le tre sezioni adiacenti unificate; in caso contrario il fattore K2 diventa:

$$K_2 = \frac{1}{\sqrt{n}}$$

3.3 CALCOLO DELLA SEZIONE MINIMA IN FNZIONE DELLA CORRENTE EFFETTIVA DI CORTO CIRCUITO

La sezione dei conduttori deve essere definita in base alla corrente nominale del conduttore in condizioni normali di servizio (Iz), declassata come accennato al paragrafo precedente.

Occorre verificare che detta sezione non sia mai inferiore a quanto si ricava dalla seguente relazione:

$$S = \frac{I \cdot \sqrt{t}}{k}$$

dove:

- ✓ S è la sezione in mm2;
- ✓ T è la durata in secondi del corto circuito;
- ✓ I è la corrente effettiva di corto circuito in Ampere espressa in valore efficace;
- ✓ K è la costante pari a: 115 per i cavi in rame isolati in PVC (160°C), 135 per i cavi in rame isolati in gomma (220°C) e 143 per i cavi isolati in gomma G7 (250°C).

3.4 VERIFICA DELLA CADUTA DI TENSIONE

Oltre a quanto sopra indicato, i cavi devono essere verificati anche in funzione della caduta di tensione, in modo che tra l'origine dell'impianto e qualunque apparecchio utilizzatore non superi il 4% dell atensione nominale.

Cadute di tensione più alte devono essere considerate per conduttori alimentanti motori elettrici durante il periodo di avviamento, o per altri componenti elettrici che richiedano assorbimenti di corrente più elevati con la condizione che ci assicuri che le variazioni di tensione rimangono entro i limiti indicati nelle Norme CEI.

Le cadute di tensione sono state verificate con la seguente formula:

$\Delta V = 2I_b l(R\cos\varphi + Xsen\varphi)$ per i circuiti monofase e

$\Delta V = 1{,}73 I_b l(R\cos\varphi + Xsen\varphi)$ per i circuiti trifase

dove:

ΔV è la caduta di tensione in Volt proiettata sul vettore fase;

Ib è la corrente d'impiego in Ampere della linea;

φ è l'angolo di sfasamento tra la corrente Ib è la tensione di fase;

R è la resistenza al metro in Ω/m;

X è la reattanza al metro in Ω/m;

l è la lunghezza della conduttura in Km.

I valori della resistenza e della reattanza al metro sono quelli ICEA (Insulated Cable Engineers Association) della libreria di Etap.

4 REPORT DI CALCOLO

I risultati delle verifiche numeriche per il dimensionamento cavi sono riportate nel dettaglio nell'**Allegato A**.

RPN/ALS/MFC:tds

ALLEGATO A

Allegato A

Cable Sizing Report

Doc. No. P0000556-2-H18 Rev. 0 – Gennaio 2018

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Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable1	Size (mm2)	50	Jacket type:	PVC
Tag #	N/A	Source	BS6622	Jacket thickness (mm)	3.40
From Bus	Bus2	Insulation	XLPE	Sheath type	None
To Bus	Bus1	kV	33,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	St Armor/45dg/60w
No. Cond/Phase	1	Installation	Mag.	Armor thickness (mm)	3.20
Length (m)	300,000	Conduit Type	CU	Armor/Sheath Grounding	Open
				Shield Grounding	Open
				Shield Thickness (mm)	0.127

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	15	90	120	0,15	210,00	197,62	197,62 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	0,154
%Vd	2 @ 20 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	50	197,62	0,00			
Optimal Size	1	35	160.00	0.00	0.00		
1 Size Smaller	0		0.00	0.00	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable2	Size (mm2)	185	Jacket type:	PVC
Tag #	N/A	Source	Caled BS6622	Jacket thickness (mm)	3.60
From Bus	Bus3	Insulation	XLPE	Sheath type	None
To Bus	QMT Bus 4	kV	22,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	St Armor/30dg/25w
No. Cond/Phase	2	Installation	Non-Mag.	Armor thickness (mm)	3.20
Length (m)	10,000	Conduit Type	CU	Armor/Sheath Grounding	Open
				Shield Grounding	Open
				Shield Thickness (mm)	0.127

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	15	90	120	0,00	840,00	799,26	799,26 (A) Derated
	35	90	90				

Sizing Constraints	
Loading (Amps)	0
%Vd	2 @ 6 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	2	185	799,26	0,00			
Optimal Size	1	50	198.00	0.00	0.00		
1 Size Smaller	0		0.00	0.00	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable4	Size (mm2)	70	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMT Bus 4	Insulation	Rubber	Sheath type	None
To Bus	Bus7	kV	15,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	350,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	Open
				Shield Thickness (mm)	0.127

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

	Ambient Temperature	Conductor Temperature	RHO	Ampacity / Capacity Result			Allowable Ampacity / Capacity
Base				Operating	Base	Derated	
Operating	25	90	100	0,00	255,00	241,82	241,82 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	229,2
%Vd	2 @ 6 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	70	241,82	0,75	0		
Optimal Size	1	70	242.00	0.75	0.00		
1 Size Smaller	1	50	199.00	1.03	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable5	Size (mm2)	70	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMT Bus 4	Insulation	Rubber	Sheath type	None
To Bus	Bus8	kV	15,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	350,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	Open
				Shield Thickness (mm)	0.127

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

	Ambient Temperature	Conductor Temperature	RHO	Ampacity / Capacity Result			Allowable Ampacity / Capacity
Base				Operating	Base	Derated	
Operating	25	90	100	0,00	255,00	241,82	241,82 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	208,3
%Vd	2 @ 6 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	70	241,82	0,68	0		
Optimal Size	1	70	242.00	0.68	0.00		
1 Size Smaller	1	50	199.00	0.94	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable6	Size (mm2)	16	Jacket type:	None
Tag #	N/A	Source	Heesung	Jacket thickness (mm)	
From Bus	QMT-EME Bus 6	Insulation	XLPE	Sheath type	Aluminum Sheath
To Bus	Bus9	kV	6,0	Sheath thickness (mm)	2.20
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	350,000	Conduit Type	CU	Armor/Sheath Grounding	Open
				Shield Grounding	Open
				Shield Thickness (mm)	0.127

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

	Ambient Temperature	Conductor Temperature	RHO	Ampacity / Capacity Result			Allowable Ampacity / Capacity
Base				Operating	Base	Derated	
Operating	25	90	120	39,20	100,00	101,08	101,08 (A) Derated
	35	90	90				

Sizing Constraints	
Loading (Amps)	97,47
%Vd	2 @ 6 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	16	101,08	1,38	0		
Optimal Size	1	16	101.00	1.38	0.00		
1 Size Smaller	1	10	79.00	2.19	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable7	Size (mm2)	25	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMT Bus 4	Insulation	Rubber	Sheath type	None
To Bus	Bus10	kV	15,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	400,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	Open
				Shield Thickness (mm)	0.127

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	150,00	142,25	142,25 (A) Derated
	35	90	90				

Sizing Constraints	
Loading (Amps)	32,39
%Vd	2 @ 6 kV
%Vst	
Short-Circuit(kA)	

Protective Device				
Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	25	142,25	0,33	0		
Optimal Size	1	25	142.00	0.33	0.00		
1 Size Smaller	0		0.00	0.00	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable8	Size (mm2)	25	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMT Bus 4	Insulation	Rubber	Sheath type	None
To Bus	Bus13	kV	15,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	400,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	Open
				Shield Thickness (mm)	0.127

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	150,00	142,25	142,25 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	32,39
%Vd	2 @ 6 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	25	142,25	0,33	0		
Optimal Size	1	25	142.00	0.33	0.00		
1 Size Smaller	0		0.00	0.00	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable9	Size (mm2)	240	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QPC	Insulation	Rubber	Sheath type	None
To Bus	Bus15	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	3	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	500,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	1500,00	1427,38	1427,38 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	318,2
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	3	240	1427,38	2,74	0		
Optimal Size	3	240	1427.00	2.74	0.00		
1 Size Smaller	3	185	1242.00	3.23	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable10	Size (mm2)	240	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QPC	Insulation	Rubber	Sheath type	None
To Bus	Bus16	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	3	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	500,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	1500,00	1427,38	1427,38 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	318,2
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	3	240	1427,38	2,74	0		
Optimal Size	3	240	1427.00	2.74	0.00		
1 Size Smaller	3	185	1242.00	3.23	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable11	Size (mm2)	240	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QPC	Insulation	Rubber	Sheath type	None
To Bus	Bus17	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	3	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	500,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	1500,00	1427,38	1427,38 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	318,2
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	3	240	1427,38	2,74	0		
Optimal Size	3	240	1427.00	2.74	0.00		
1 Size Smaller	3	185	1242.00	3.23	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable12	Size (mm2)	240	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QPC	Insulation	Rubber	Sheath type	None
To Bus	Bus18	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	3	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	500,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	1500,00	1427,38	1427,38 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	300,7
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	3	240	1427,38	2,59	0		
Optimal Size	3	240	1427.00	2.59	0.00		
1 Size Smaller	3	185	1242.00	3.05	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable13	Size (mm2)	150	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QPC	Insulation	Rubber	Sheath type	None
To Bus	QMCC	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	2	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	20,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	770,00	732,72	732,72 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	0
%Vd	2 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	2	150	732,72	0,00			
Optimal Size	1	6	62.00	0.00	0.00		
1 Size Smaller	0		0.00	0.00	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable14	Size (mm2)	185	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC	Insulation	Rubber	Sheath type	None
To Bus	Bus19	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	2	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	350,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	870,00	827,88	827,88 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	134,2
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	2	185	827,88	1,43	0		
Optimal Size	1	185	414.00	2.86	0.00		
1 Size Smaller	1	150	366.00	3.34	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEC 60364-5-52)

General		Library		Physical	
ID	Cable15	Size (mm2)	185	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC	Insulation	Rubber	Sheath type	None
To Bus	Bus20	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	350,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEC 60364-5-52	No. of Circuit	1
Type	A/G Conduit	Circuit Clearance	
Sub-Type	In Thermally Insulated Wall	Tray Layout and #	
Method	A2	Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

	Ambient Temperature	Conductor Temperature	RHO	Ampacity / Capacity Result			Allowable Ampacity / Capacity
				Operating	Base	Derated	
Base	30	90		0,00	295,00	283,20	283,20 (A) Derated
Operating	35	90					

Sizing Constraints	
Loading (Amps)	134,2
%Vd	3 @ 0,4 kV
%Vst	80 @ 0,4 kV
Short-Circuit (kA)	
Overload (kA)	
3rd Harmonic %	
Other Harmonic(Cf) %	

Protective Device

Overload	**None**	In(A)	I2(A)	
Overcurrent (Phase)	**User-Defined**	Seconds	kA	Rating (A)
RCD/GFCI	**None**	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	185	283,20	2,86	87,96		
Optimal Size	1	185	283.00	2.86	87.96		
1 Size Smaller	1	150	249.00	3.34	86.92		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable16	Size (mm2)	120	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC	Insulation	Rubber	Sheath type	None
To Bus	Bus21	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	450,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	340,00	322,43	322,43 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	0
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	120	322,43	0,00			
Optimal Size	1	6	62.00	0.00	0.00		
1 Size Smaller	0		0.00	0.00	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable17	Size (mm2)	6	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC	Insulation	Rubber	Sheath type	None
To Bus	Bus22	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	50,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	65,00	61,64	61,64 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	0
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	6	61,64	0,00			
Optimal Size	1	6	62.00	0.00	0.00		
1 Size Smaller	0		0.00	0.00	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable18	Size (mm2)	120	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC	Insulation	Rubber	Sheath type	None
To Bus	Bus23	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	400,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	340,00	322,43	322,43 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	74,18
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	120	322,43	2,54	0		
Optimal Size	1	120	322.00	2.54	0.00		
1 Size Smaller	1	95	284.00	3.11	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable19	Size (mm2)	120	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC	Insulation	Rubber	Sheath type	None
To Bus	Bus24	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	400,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	340,00	322,43	322,43 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	74,18
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	120	322,43	2,54	0		
Optimal Size	1	120	322.00	2.54	0.00		
1 Size Smaller	1	95	284.00	3.11	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable20	Size (mm2)	10	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC	Insulation	Rubber	Sheath type	None
To Bus	Bus25	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	450,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

	Ambient Temperature	Conductor Temperature	RHO	Ampacity / Capacity Result			Allowable Ampacity / Capacity
				Operating	Base	Derated	
Base Operating	25	90	100	0,00	85,00	80,61	80,61 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	6,26
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	10	80,61	2,65	0		
Optimal Size	1	10	81.00	2.65	0.00		
1 Size Smaller	1	6	62.00	4.42	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable21	Size (mm2)	10	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC	Insulation	Rubber	Sheath type	None
To Bus	Bus26	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	450,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	85,00	80,61	80,61 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	6,26
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	10	80,61	2,65	0		
Optimal Size	1	10	81.00	2.65	0.00		
1 Size Smaller	1	6	62.00	4.42	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable22	Size (mm2)	10	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC	Insulation	Rubber	Sheath type	None
To Bus	Bus27	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	450,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	85,00	80,61	80,61 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	6,26
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	10	80,61	2,65	0		
Optimal Size	1	10	81.00	2.65	0.00		
1 Size Smaller	1	6	62.00	4.42	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable23	Size (mm2)	10	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC	Insulation	Rubber	Sheath type	None
To Bus	Bus28	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	450,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	85,00	80,61	80,61 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	6,26
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	10	80,61	2,65	0		
Optimal Size	1	10	81.00	2.65	0.00		
1 Size Smaller	1	6	62.00	4.42	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable25	Size (mm2)	6	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC	Insulation	Rubber	Sheath type	None
To Bus	Bus31	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	30,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	65,00	61,64	61,64 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	17,32
%Vd	2 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	6	61,64	0,82			
Optimal Size	1	6	62.00	0.82	0.00		
1 Size Smaller	0		0.00	0.00	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable26	Size (mm2)	6	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC- EME Bus 30	Insulation	Rubber	Sheath type	None
To Bus	Bus31	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	30,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	19,49	65,00	61,64	61,64 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	17,32
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	6	61,64	0,82			
Optimal Size	1	6	62.00	0.82	0.00		
1 Size Smaller	0		0.00	0.00	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable28	Size (mm2)	10	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC	Insulation	Rubber	Sheath type	None
To Bus	Bus33	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	50,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	85,00	80,61	80,61 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	43,3
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	10	80,61	2,03			
Optimal Size	1	10	81.00	2.03	0.00		
1 Size Smaller	1	6	62.00	3.40	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEC 60364-5-52)

General		Library		Physical	
ID	Cable29	Size (mm2)	120	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC- EME Bus 30	Insulation	Rubber	Sheath type	None
To Bus	Bus34	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	350,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEC 60364-5-52	No. of Circuit	1
Type	A/G Trays	Circuit Clearance	
Sub-Type	Unperforated	Tray Layout and #	Horizontal , 1
Method	C	Cable Layout	Touching
		Spacing	

Allowable Ampacity - Current Carrying Capacity

	Ambient Temperature	Conductor Temperature	RHO	Ampacity / Capacity Result			Allowable Ampacity / Capacity
Base				Operating	Base	Derated	
Operating	30	90		97,26	322,00	299,85	299,85 (A) Derated
	35	90					

Sizing Constraints

Loading (Amps)	94,07
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit (kA)	
Overload (kA)	
3rd Harmonic %	
Other Harmonic(Cf) %	

Protective Device

Overload	**None**	In(A)	I2(A)	
Overcurrent (Phase)	**User-Defined**	Seconds	kA	Rating (A)
RCD/GFCI	**None**	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	120	299,85	2,82	0		
Optimal Size	1	120	300.00	2.82	0.00		
1 Size Smaller	1	95	259.00	3.46	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEC 60364-5-52)

General		Library		Physical	
ID	Cable30	Size (mm2)	25	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC- EME Bus 30	Insulation	Rubber	Sheath type	None
To Bus	Bus35	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	350,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEC 60364-5-52	No. of Circuit	1
Type	U/G Buried	Circuit Clearance (mm)	0,000
Sub-Type	In Conduit	Tray Layout and #	
Method	D1	Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

	Ambient Temperature	Conductor Temperature	RHO	Ampacity / Capacity Result Operating	Base	Derated	Allowable Ampacity / Capacity
Base	20	90	250	21,60	96,00	101,39	101,39 (A) Derated
Operating	35	90	90				

Sizing Constraints	
Loading (Amps)	20,95
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit (kA)	
Overload (kA)	
3rd Harmonic %	
Other Harmonic(Cf) %	

Protective Device				
Overload	**None**	In(A)	I2(A)	
Overcurrent (Phase)	**User-Defined**	Seconds	kA	Rating (A)
RCD/GFCI	**None**	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2) Short-Circuit	Overload
Existing Size	1	25	101,39	2,77	0		
Optimal Size	1	25	101.00	2.77	0.00		
1 Size Smaller	1	16	79.00	4.31	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEC 60364-5-52)

General		Library		Physical	
ID	Cable31	Size (mm2)	6	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC- EME Bus 30	Insulation	Rubber	Sheath type	None
To Bus	Bus36	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	50,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEC 60364-5-52	No. of Circuit	1
Type	U/G Buried	Circuit Clearance (mm)	0,000
Sub-Type	In Conduit	Tray Layout and #	
Method	D1	Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	20	90	250	6,31	44,00	46,47	46,47 (A) Derated
	35	90	90				

Sizing Constraints	
Loading (Amps)	6,26
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit (kA)	
Overload (kA)	
3rd Harmonic %	
Other Harmonic(Cf) %	

Protective Device				
Overload	**None**	In(A)	I2(A)	
Overcurrent (Phase)	**User-Defined**	Seconds	kA	Rating (A)
RCD/GFCI	**None**	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	6	46,47	0,49	0		
Optimal Size	1	6	46.00	0.49	0.00		
1 Size Smaller	0		0.00	0.00	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable32	Size (mm2)	6	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC- EME Bus 30	Insulation	Rubber	Sheath type	None
To Bus	Bus37	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	50,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	6,31	65,00	61,64	61,64 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	6,26
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	6	61,64	0,49	0		
Optimal Size	1	6	62.00	0.49	0.00		
1 Size Smaller	0		0.00	0.00	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEC 60364-5-52)

General		Library		Physical	
ID	Cable33	Size (mm2)	16	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC- EME Bus 30	Insulation	Rubber	Sheath type	None
To Bus	Bus38	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Mag.	Armor thickness (mm)	
Length (m)	600,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEC 60364-5-52	No. of Circuit	1
Type	U/G Buried	Circuit Clearance (mm)	0,000
Sub-Type	In Conduit	Tray Layout and #	
Method	D1	Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

	Ambient Temperature	Conductor Temperature	RHO	Ampacity / Capacity Result			Allowable Ampacity / Capacity
				Operating	Base	Derated	
Base	20	90	250	8,43	75,00	79,21	79,21 (A) Derated
Operating	35	90	90				

Sizing Constraints

Loading (Amps)	8,18
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit (kA)	
Overload (kA)	
3rd Harmonic %	
Other Harmonic(Cf) %	

Protective Device

Overload	**None**	In(A)	I2(A)	
Overcurrent (Phase)	**User-Defined**	Seconds	kA	Rating (A)
RCD/GFCI	**None**	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	16	79,21	2,88	0		
Optimal Size	1	16	79.00	2.88	0.00		
1 Size Smaller	1	10	61.00	4.61	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable34	Size (mm2)	16	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC- EME Bus 30	Insulation	Rubber	Sheath type	None
To Bus	Bus39	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	600,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

	Ambient Temperature	Conductor Temperature	RHO	Ampacity / Capacity Result			Allowable Ampacity / Capacity
Base				Operating	Base	Derated	
Operating	25	90	100	8,43	110,00	104,31	104,31 (A) Derated
	35	90	90				

Sizing Constraints

Loading (Amps)	8,18
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device

Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	16	104,31	2,88	0		
Optimal Size	1	16	104.00	2.88	0.00		
1 Size Smaller	1	10	81.00	4.61	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEC 60364-5-52)

General		Library		Physical	
ID	Cable35	Size (mm2)	16	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	QMCC- EME Bus 30	Insulation	Rubber	Sheath type	None
To Bus	Bus40	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	1	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	600,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEC 60364-5-52	No. of Circuit	1
Type	A/G Conduit	Circuit Clearance	
Sub-Type	In Thermally Insulated Wall	Tray Layout and #	
Method	A2	Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	30	90		8,43	68,00	65,28	65,28 (A) Derated
	35	90					

Sizing Constraints	
Loading (Amps)	8,18
%Vd	3 @ 0,4 kV
%Vst	
Short-Circuit (kA)	
Overload (kA)	
3rd Harmonic %	
Other Harmonic(Cf) %	

Protective Device				
Overload	**None**	In(A)	I2(A)	
Overcurrent (Phase)	**User-Defined**	Seconds	kA	Rating (A)
RCD/GFCI	**None**	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	1	16	65,28	2,88	0		
Optimal Size	1	16	65.00	2.88	0.00		
1 Size Smaller	1	10	49.00	4.61	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

Cable Sizing Report (IEEE 399)

General		Library		Physical	
ID	Cable36	Size (mm2)	240	Jacket type:	None
Tag #	N/A	Source	ICEA	Jacket thickness (mm)	
From Bus	Bus12	Insulation	Rubber	Sheath type	None
To Bus	QPC	kV	1,0	Sheath thickness (mm)	
No./Cable	3/C	% Class	100	Armor type	None
No. Cond/Phase	3	Installation	Non-Mag.	Armor thickness (mm)	
Length (m)	20,000	Conduit Type	CU	Armor/Sheath Grounding	
				Shield Grounding	
				Shield Thickness (mm)	0.000

Installation		Layout	
Standard	IEEE 399	Rows	1
Type	U/G Buried	Column	1
		Tray Layout and #	
		Cable Layout	
		Spacing	

Allowable Ampacity - Current Carrying Capacity

				Ampacity / Capacity Result			
Base	Ambient Temperature	Conductor Temperature	RHO	Operating	Base	Derated	Allowable Ampacity / Capacity
Operating	25	90	100	0,00	1500,00	1427,38	1427,38 (A) Derated
	35	90	90				

Sizing Constraints	
Loading (Amps)	0
%Vd	2 @ 0,4 kV
%Vst	
Short-Circuit(kA)	

Protective Device				
Overload	None	In(A)	I2(A)	
Overcurrent (Phase)	User-Defined	Seconds	kA	Rating (A)
RCD/GFCI	None	Trip (mA)	Time (ms)	

Optimal Conductors Results

	#/Ph	Size	Ampacity	%Vd	%Vst	Minimum. Size (mm2)	
						Short-Circuit	Overload
Existing Size	3	240	1427,38	0,00			
Optimal Size	1	6	62.00	0.00	0.00		
1 Size Smaller	0		0.00	0.00	0.00		

+ The ID/Type field is available only when the Device ID is selected from the Protection page of the Cable Editor.

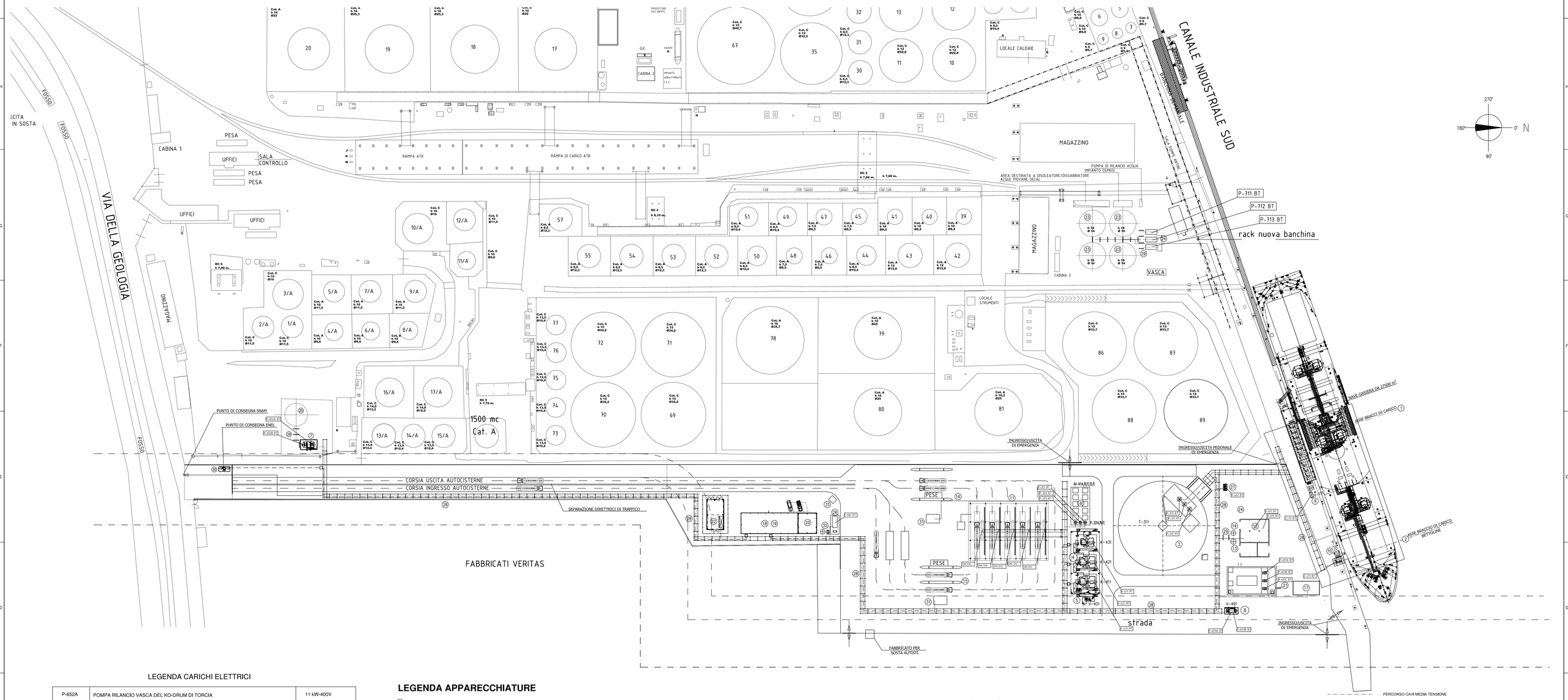
ALLEGATO B

Allegato B

Percorsi Cavi – Unifilare Generale

Doc. No. P0000556-2-H18 Rev. 0 – Gennaio 2018

RINA CONSULTING



PERCORSO CAVI MEDIA TENSIONE

PERCORSO CAVI BASSA TENSIONE E CAVI DI CONTROLLO

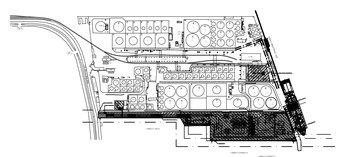
LEGENDA CARICHI ELETTRICI

P-652A	POMPA RILANCIO VASCA DEL KO-DRUM DI TORCIA	11 kW-400V
P-652B	POMPA RILANCIO VASCA DEL KO-DRUM DI TORCIA	11 kW-400V
E-601	GRUPPO ELETTROGENO DIESEL DI EMERGENZA	1000 kVA-6000V
P-321	POMPA PRESSURIZZAZIONE GNL CORREZIONE INDICE DI WOBBE	11 kW-400V
P-321	POMPA PRESSURIZZAZIONE GNL CORREZIONE INDICE DI WOBBE	75 kW-400V
P-322	POMPA PRESSURIZZAZIONE GNL CORREZIONE INDICE DI WOBBE	75 kW-400V
K-411	COMPRESSORE DEL BOG	700 kW-6000V
K-421	COMPRESSORE DEL BOG	1650 kW-6000V
K-431	COMPRESSORE DEL BOG	1650 kW-6000V
P-311	POMPA INTANK CRIOGENICA PER RICICLO DEL GNL DA SERBATOIO "ATM"	315 kW-6000V
P-312	POMPA INTANK CRIOGENICA PER RICICLO DEL GNL DA SERBATOIO "ATM"	315 kW-6000V
P-313	POMPA INTANK CRIOGENICA PER RICICLO DEL GNL DA SERBATOIO "ATM"	55 kW-400V
K-441	COMPRESSORE HD RITORNO VAPORI	130 kW-400V
K-611	COMPRESSORE ARIA STRUMENTI E SERVIZI	37 kW-400V
K-612	COMPRESSORE ARIA STRUMENTI E SERVIZI	37 kW-400V
P-651A	POMPA RILANCIO ACQUE METEORICHE	150 kW-400V
P-651B	POMPA RILANCIO ACQUE METEORICHE	150 kW-400V
P-651C	POMPA RILANCIO ACQUE METEORICHE	150 kW-400V
P-653A	POMPA RILANCIO VASCA DEL SERBATOIO DRENAGGI	3 kW-400V
P-653B	POMPA RILANCIO VASCA DEL SERBATOIO DRENAGGI	3 kW-400V
Z-111	CENTRALINA IDRAULICA DI CARICO METANIERA	11 kW-400V
Z-211	CENTRALINA IDRAULICA DI CARICO BETTOLINA	11 kW-400V

LEGENDA APPARECCHIATURE

1. BRACCI DI SCARICO GNL E RITORNO BOG NAVE METANIERA
2. BRACCI DI SCARICO GNL E RITORNO BOG NAVE BETTOLINA
3. SERBATOIO CRIOGENICO STOCCAGGIO GNL 32.000 m3
4. COMPRESSORI DEL B.O.G.
5. SUCTION DRUM
6. SISTEMA DI VAPORIZZAZIONE GNL PER CORREZIONE INDICE DI WOBBE
7. KO DRUM TORCIA volume: 30 m3 - POMPE RILANCIO VASCA
8. SERBATOIO RACCOLTA DRENAGGI volume: 15 m3 - POMPE RILANCIO VASCA
9. JETTY KO DRUM VAPORE DI RITORNO volume: 4 m3
10. JETTY KO DRUM VAPORE DI RITORNO volume: 2 m3
11. BAIE DI CARICO AUTOCISTERNE
12. EDIFICIO AUSILIARI-LOCALE PRODUZIONE ARIA COMPRESSA
13. SERBATOIO ARIA SERVIZI
14. SERBATOIO ARIA STRUMENTI
15. PESE AUTOCISTERNE IN INGRESSO
16. PESE AUTOCISTERNE IN USCITA
17. SALA CONTROLLO IN BANCHINA
18. SALA CONTROLLO - UFFICI
19. EDIFICIO ELETTRICO
20. MAGAZZINO
21. VASCA RACCOLTA E IMPIANTO TRATTAMENTO ACQUE DI PRIMA PIOGGIA
22. STAZIONE DI MISURA GAS NATURALE
23. SERBATOI STOCCAGGIO ACQUA IMPIANTO ANTINCENDIO
24. GRUPPI PACKAGES POMPE ANTINCENDIO
25. TORCIA
26. SERBATOIO GASOLIO E DIESEL DI EMERGENZA
27. COMPRESSORE HD RITORNO VAPORI
28. PIPE RACK
29. SLEEPERS
30. CABINA MT
31. POSTAZIONI DI CONTROLLO / SVOLGIMENTO OPERAZIONI
32. IMPIANTO ACQUA POTABILE

PIANTA CHIAVE



REV	DATE	DESCRIZIONE/DESCRIPTION	ESEGUITO BY	CONTROLLATO DA CHKD BY	APPROVATO/A APPROVED BY
0	12/01/2018	PRIMA EMISSIONE	PPI	ALS	MFC

CLIENTE/CLIENT

Venice LNG S.p.A.

PROGETTO/PROJECT

DEPOSITO COSTIERO GNL A MARGHERA

TITOLO/TITLE

PERCORSI CAVI
UNIFILARE GENERALE
(alleg.1)

TIMBRO/STAMP

RINA CONSULTING

	FIRMA/SIGNATURE	DATA/DATE	N° INT/INTERNAL N°	SCALA/SCALE	FOGLIO/SHEET	REV.
ESEGUITO / BY	PPI	12/01/2018	17-556-ELE-H18	1:1000	1 di 1	0
CONTROLLATO DA / CHKD BY	ALS	12/01/2018				
APPROVATO DA / APPROVED BY	MFC	12/01/2018				

A0 UNI

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