公共照明物料供應－電纜

SUPPLY OF MATERIALS FOR PUBLIC LIGHTING – CABLES

公開招標

Public Tender

招標案卷

Tender Document

標書編號: **PLD-MP396/23/55**

澳門電力股份有限公司

Companhia de Electricidade de Macau - CEM, S.A.

SUPPLY OF MATERIALS FOR PUBLIC LIGHTING – CABLES

Tender Document

English version is for reference only.

Tender Document

Index

SUPPLY OF MATERIALS FOR PUBLIC LIGHTING – CABLES

I. PUBLIC ANNOUNCEMENT

Tender Ref.: PLD-MP396/23/55

Companhia de Electricidade de Macau – CEM, S.A.

Announcement

"Supply of Materials for Public Lighting – Cables"

Public Tender

(Tender Ref. PLD-MP396/23/55)

1. **Tendering entity:** Companhia de Electricidade de Macau – CEM, S.A.
2. **Tender type:** Public tender
3. **Purpose of supply:** To Supply Public Lighting Materials – Cables
4. **Supply quantity:** 2 types of cables, 165,000 meters in total
5. **Delivery Time:** The above quantities will be split by CEM into several orders in 2024 based on actual needs. CEM will place a purchase order for each order and the Supplier shall deliver the cables within 60 days from the date of notification of the purchase order
6. **Validity of proposals:** 90 days, starting from the date of public tender opening, may be extended following the instructions set in Program of Tender
7. **Type of award:** Remunerated according to list of unit prices
8. **Tender security:** MOP210,000.00 (Two Hundred and Ten Thousand Patacas)
9. **Performance guarantee:** In the amount of ten (10) percent of the total contract value, either in the form of cash deposit, a QR code cheque or a bank guarantee in favour of Companhia de Electricidade de Macau - CEM, S.A.
10. **Base price:** No base price
11. **Date, location and price to check and obtain tender documents:**

    Date: From date of publication of this announcement until 26th February 2024

    Time: 09:00 – 13:00 and 15:00 – 17:00 on working days

    Location: Procurement and Logistics Department (PLD)
    Estrada D. Maria II, Edif. CEM, 11/F, Macao

    Copy of the tender documents can be requested from CEM by paying a fee of MOP200.00 (Two Hundred Patacas) and the amount received is reserved in favour of CEM; the tender documents can also be downloaded free of charge at CEM website (www.cem-macau.com).
12. **Date, time and location for proposal submission:**

    Deadline: 26th February 2024 (Monday), at 17:00

    Location: Companhia de Electricidade de Macau – CEM S.A.
    Estrada D. Maria II, Edif. CEM (Reception of Ground Floor),
    Macao
13. **Language for proposals:** Proposals shall be written in official language of Macao SAR or in English language
14. **Date, time and location of public tender opening:**

Date and time: 27th February 2024 (Tuesday) at 10:00

Location: Estrada D. Maria II, Edif. CEM, 9th Floor Multifunction Room

Bidders or their representatives should be present at the public tender opening for the purposes specified in Article 27 of Decree-Law No. 63/85/M, and to clarify any possible questions regarding the proposals submitted. Bidders can be represented by authorised persons for the public tender opening. The said authorised persons shall present the notarised authorisation documents in order to attend the opening.

15. **Proposal Evaluation Criteria and Respective Weighting Factors**:

The evaluation criteria are divided into two phases. The first phase has the nature of elimination. The Bidders can go to second phase for scoring of prices if they can comply with the technical requirements and meet the delivery schedule. The prices shall be scored in accordance with the below weighting:

Evaluation Criteria	**Weighting**
Price	70%
Delivery Time	30%
Total	**100%**

The entity to host this tender shall evaluate the proposals and award on item by item basis in accordance with the information on the proposals and the methodology and score weighting as described above.

16. **Supplementary Information:** Starting from 16th February 2024 and until the deadline of proposal submission, bidders can visit the Procurement and Logistics Department (PLD), located at Estrada D. Maria II, Edif. CEM, 11/F or CEM website (www.cem-macau.com) for supplementary information, if any.

Companhia de Electricidade de Macau - CEM, S.A., on 24th January 2024.

Leong Wa Kun
Chairman of Executive Committee

Zhang Jian
Executive Director

SUPPLY OF MATERIALS FOR PUBLIC LIGHTING – CABLES

II. PROGRAM OF TENDER

TENDER REF.: **PLD-MP396/23/55**

English version is for reference only.

PROGRAM OF TENDER
&
ANNEXES

INDEX

PROGRAM OF TENDER

1 OBJECTIVE OF TENDER

1.1 Companhia de Electricidade de Macau - CEM, S.A. henceforth referred to as CEM, is a public utility company with the sole concession to transmit, distribute and sell high, medium and low-voltage electricity in Macau. CEM also owns power generation facilities.

1.2 CEM is calling Tender for the supply of the following:

"SUPPLY OF MATERIALS FOR PUBLIC LIGHTING – CABLES" to meet the needs of public lighting system.

1.3 The purpose of this tender is to purchase cables to be installed at Zone A and the 4th bridge in Macau SAR. Details of the material description, quantity and delivery time are stated in the "Price and Delivery Schedule".

2 CONSULTATION OF TENDER DOCUMENTS

2.1 The tender documents that constitute the Program of Tender and Tender Specification are now available for consultation at the Procurement and Logistics Department on the 11th floor of CEM Building. Any interested parties could access the documents during the working day from 09:00 - 13:00 and 15:00 - 17:00, prior to tender opening date.

2.2 Bidders may pay two hundred Patacas (MOP200.00) to acquire a copy of the tender documents, or free download from CEM website (www.cem-macau.com). Bidders are responsible for acquiring the latest information or the amendment posted on the website every day before tender closing time. CEM shall not accept any complaint due to missing information arising from the responsibility of the Bidders.

3 ORGANIZATION OF THE TENDER DOCUMENT

3.1 The Tender Document is composed of the following documents:

- This Program of Tender

- Tender Specification
  - General Conditions of Purchase Contract (GCPC)
  - Technical Specification (TS)
    - NCEM C-33-041P Nov 2022
    - NCEM C-33-042P Oct 2023

- CEM Safety, Health, Environment and Quality Requirements & Responsibilities for Materials Suppliers (Version 5)

3.2 The tender documents are written in Chinese and English languages. However, the Chinese version shall prevail if there is discrepancy between the two language versions.

4 GENERAL CONDITIONS FOR TENDERING

4.1 This tender shall be calculated in the unit price that follows the unit of measure as defined by CEM;

4.2 The prices in the Proposal shall be listed in Macau Pataca (MOP) and all prices shall not be changed within the validity period;

4.3 The delivery of all Goods for tendering shall not be more than 60 days.

4.4 All Goods for tendering shall meet the respective technical requirements;

4.5 Except in the case of Force Majeure, bidders must ensure the normal supply of the selected Goods within the contract period; and

4.6 The factory producing cables must have at least 3 consecutive years of experience.

5 COMPLAINT OR QUERY TO THE TENDER DOCUMENT

5.1 The entity to host this tender is CEM. In the event that have any doubt to the explanation of the information for consultation, any complaint or clarification request can be sent to CEM in writing according to the time schedule as specified in Clause 19 of this “Program of Tender”.

5.2 The clarification in the above clause shall be replied in writing, based on the time schedule indicated in Clause 19 of this “Program of Tender”. In case there is no reply made on the last day of the schedule, it can be a reasonable reason to postpone the tender submission date if the applicant for clarification requests so.

5.3 A copy of the clarification shall be bound in the tender document, and shall inform all the interested Bidders by announcing on CEM web site (www.cem-macau.com) and in writing.

5.4 The Bidder is responsible for acquiring the latest information posted on the website before submitting the proposal.

6 SUBMISSION OF PROPOSAL

6.1 The proposal shall be delivered by the Bidder or his representative in person to the reception at the lobby of below address against a receipt no later than 17:00 of 26th February 2024 (Monday):

Companhia de Electricidade de Macau - CEM, S.A.
Estrada D. Maria II, Edif. CEM
Macau

The proposal shall also be delivered by registered post with acknowledgement of reception to the below address:

Procurement & Logistic Department
Companhia de Electricidade de Macau - CEM, S.A.
Estrada D. Maria II, Edif. CEM
Macau

6.2 The closing time for submission as indicated in the above clause shall refer to the office hour of CEM to the public.

6.3 If the proposal is submitted by post, the Bidder shall be solely responsible for the event of not acceptance of the proposal due to late submission and shall not make any complaint.

6.4 The unit price and total price in the Price and Delivery Schedule (Annex II) as provided by CEM shall be completed and the amount of prices shall only be expressed in Arabic numerals (0-9). Numerals expressed in other type or form of writing is not allowed and will lead to proposal not being accepted.

6.5 If the Bidder does not specify the unacceptable quantities of materials in the Price and Delivery Schedule (Annex II), the Bidder shall accept the award of CEM or the tender security will be handled based on the Clause 15.1 of this “Program of Tender”.

6.6 In the event of typhoon or force majeure, which results in CEM headquarter being temporarily closed, the closing time and date for receiving proposal shall be extended to the following working day at the same time.

7 VENUE, DATE AND TIME FOR PROPOSAL OPENING

7.1 All proposals and documents shall be opened at Estrada D. Maria II, Edif. CEM – 9th Floor Multifunction Room at 10:00 on 27th February 2024 (Tuesday).

7.2 In the case of force majeure, which results in CEM headquarter being temporarily closed, the proposal opening date and time listed above would thus be extended to the following working day at the same time.

7.3 Based on the foreseeable effect in accordance with article 27 of the Decree Law 63/85/M dated 6th July, the Bidders or their legal representative(s) shall attend the proposal opening. However, authorized representative(s) must produce a notarized power of attorney showing he/she is authorized to do so (Annex XI).

8 TYPE OF SUPPLY AND FORMAT OF PROPOSAL

8.1 Remunerated according to the list of Unit Prices.

8.2 The Proposal (Annex I) and Price and Delivery Schedule (Annex II), in accordance with the samples in Annex, must be written in one of the official languages of Macau SAR or English. Any amendment, insertion between the lines or deletion of words is not allowed. The documents shall only be completed by either using printer or handwriting (except the signature). If printing is used, the printer must be always the same, or, if the documents are handwritten, the same handwriting and ink must be used, and written in pencil is not accepted.

8.3 The proposal documents shall be signed by the Bidder or his/her authorized representative. When the documents are signed by the representative, a power of attorney or its certified copy with legal effect should be provided (The certified copy shall be issued within three months before the date of Proposal Opening).

8.4 The Price Proposal shall always be accompanied by the Price and Delivery Schedule that it is based on, which is formed by Annex I and Annex II.

8.5 Any Price Proposal that contravene the provisions of Clause 8.2 to 8.4 will not be accepted.

8.6 All technical documents submitted by the Bidder shall indicate the relevant CEM code number clearly; the Bidder shall not use CEM's technical specifications as his/her technical

documents in the proposal unless the item proposed matches exactly (e.g. brand, model, reference number, etc.). For item without technical specification (e.g. pictures), the Bidder is requested to provide his/her own technical information (e.g. materials, RAL colour, dimensions, etc.);

8.7 For any items (e.g. brand, model, etc.) which are phased out, the Bidder shall propose the replacement, submit the declaration and documents issued by the manufacturer or supplier, clarifying that such item is phased out and could be replaced by the item proposed in the proposal, and the technical specification shall be equal to or better than the phase-out item, or it is considered as not complying the technical specification and will not be accepted.

9 CONDITIONAL PROPOSAL

Any proposal that is submitted with changes in the conditions or with omissions, or is incompliant with the terms and conditions of "Tender Specification", will not be accepted.

10 TENDER BASE PRICE AND TENDER SECURITY

10.1 Tender Base Price: No

10.2 Amount of tender security: MOP210,000.00 (Patacas Two Hundred and Ten Thousand Only)

10.3 Tender security should be presented as cash deposit, QR code cheque (payable to CEM and drawn on one of the approved banks in Macao SAR), or presented as a bank guarantee of equal value under conditions referred to in Annex VIII.

10.4 For cash deposit, the Bidder has to come to CEM in person for application.

10.5 Bank securities shall be issued by one of the following banks, through their head-offices or representatives in Macao SAR:

Bank of China Limited, Macau Branch
Banco Nacional Ultramarino, S.A.
Luso International Banking Limited
China Guangfa Bank Co., Limited, Macau Branch
Banco Comercial de Macau, S.A.
The HongKong & Shanghai Banking Corporation Limited, Macau Branch
Tai Fung Bank Limited
Banco Well Link, S.A.
Macao Development Bank Limited
Industrial and Commercial Bank of China (Macau) Limited
China Construction Bank Corporation, Macau Branch
The Bank of East Asia Limited, Macau Branch

10.6 The Bidder is allowed to retrieve the cash deposit, the QR code cheque, or release the bank guarantee which serve as the tender security for this tender once the Contract is signed with any of the Bidder, or the expiry date of the Proposal has been reached, or that he does not submit the proposal or his proposal is not accepted by CEM.

11 CONSTITUTION OF PROPOSALS

11.1 In order to fulfill the conditions of this tender, the proposal of the Bidder must include the following documents:

a) A declaration provided by the Bidder stating his name, marital status and home address (Annex III-a). In the case that the Bidder is a company, the declaration shall indicate the company name, address, branches of the company to execute the contract, name of members of the board of directors, name of other persons with power to bear the duty of the company, and the commercial registration of setting up the company and its amendment to the constitution and statutes (Annex III-b).

In the event of a consortium, it is also required to submit a declaration of incorporation, together with indication of the names of the composition of the consortium and their representatives, the percentage of composition and the members of the directors of the consortium.

If the Bidder is not a local citizen, or whose headquarters of the company are not set up in Macau SAR, a notarized Declaration must be submitted by the bidder (Annex I), stating that for all actions undertaken for this tender and supply, they shall renounce any rights derived from other legal jurisdictions of any other country.

The signatures of the above said documents have to be notarized.

b) A certificate issued by the Financial Services Bureau (DSF) to prove that the Bidder does not owe any tax and duties to the Macao SAR Government within five years (Annex IV). This document has to be issued within three months before the date of tender opening;

c) A certificate proving that the Bidder has paid the Business Registration Tax or has been exempted from such tax for the most recent year (it has to be certified if photocopy is submitted);

d) A declaration by the Bidder stating his commitment to not using materials of qualities not meeting or lower than the requirements as specified in the Tender Specification, design requirements and technical scope of the Tender Document once he is awarded the Contract. (Annex V, signature of the declaration has to be notarized);

e) A declaration by the Bidder stating his commitment to accept and comply with the "Rules for Integrity and Honesty" (Annex VI, signature of the declaration has to be notarized). For any violation of the said rules, the awarding entity reserves the right to terminate the contract, whereupon the supplier has to be responsible for compensation for all losses resulted therefrom;

f) A declaration with signature notarized indicating that the Bidder or the bidding company whose current/former partners and current/former members of board of directors have not been sentenced by the court for involvement in acts of active or passive corruption in the exercise of functions in the last five years, supported with relative documents. (Annex VII, signature has to be notarized);

g) A proof of tender security presented as specified in clause 10, in cash or in the form of a QR code cheque or as a bank guarantee (Annex VIII);

h) A document which is issued by the Bidder for proving the manufacturer of the cables has experience in manufacturing cables or similar materials for 3 consecutive years or above (Annex IX, signature has to be notarized);

i) The Supply Track Record, showing the Bidder’s recent 5 years supply history of cables to other companies (Annex X, signature has to be notarized);

j) The Data Schedules and documents in “Tender Specification” should be duly filled in and submitted (one English version is mandatory);

k) Each item proposed, shall be submitted with a catalogue, brochure or all the other relevant documents showing the dimensions, details or all the technical characteristics of the proposed equipment and materials;

l) Other information considered advantageous for the evaluation, namely compliance with the existing brand, type and RAL color of finishing (if any).

11.2 All documents above shall be written in one of the official languages of Macau SAR or English.

11.3 In the event that the Bidder has submitted false declaration in Clause 11.1 f), CEM shall report thereon to the Public Prosecutions Office for initiating the criminal litigation procedure.

12 SUBMISSION REQUIREMENTS FOR PROPOSAL AND OTHER DOCUMENTS

12.1 The documents a), b), c), d), e), f) and g) as specified in Clause 11.1 shall be wax-sealed in a closed opaque envelope with the following information labeled on the outside:

- "Documents"
- Name of the Bidder
- "SUPPLY OF MATERIALS FOR PUBLIC LIGHTING – CABLES"
- Companhia de Electricidade de Macau - CEM, S.A.

12.2 All documents, including the proposal document as referred to the sample in "Annex I" and Price and Delivery Schedule "Annex II", document h), i), j), k) and l) in clause 11.1 shall be inserted in an envelope with same conditions as Clause 12.1. The envelope shall be labeled with the following information:

- "Proposal"
- Name of the Bidder
- "SUPPLY OF MATERIALS FOR PUBLIC LIGHTING – CABLES"
- Companhia de Electricidade de Macau - CEM, S.A.

12.3 All the above envelopes shall be inserted in a third opaque envelope, named as "Exterior Envelope", which shall also be wax-sealed. The envelope shall be delivered by hand at the reception at the lobby of Companhia de Electricidade de Macau - CEM, S.A., Estrada D. Maria II, Edif. CEM, Macau, upon acknowledge a receipt; or registered post with acknowledgement of reception sending to the Procurement and Logistics Department, Companhia de Electricidade de Macau - CEM, S.A., Estrada D. Maria II, Edif. CEM, Macau.

12.4 The Exterior Envelope must be labeled with the name of the Bidder and address. It is also required to label **<Proposal for the Public Tender of "Supply of Materials for Public Lighting – Cables" on 27th February 2024 (Tender Ref. PLD-MP396/23/55)>** under the address.

12.5 All documents as enclosed in the proposal shall be indicated with the name of the Bidder or company, so as to provide an identification of the documents. If documents have no information for identification, the proposal shall not be accepted.

12.6 The Bidder must submit only one proposal, which must be the best proposal.

12.7 In case the Bidder does not provide information on the documents as specified in Clause 11.1 or does not submit the documents in accordance with Clause 12.1, 12.2 and 12.3, the Proposal will not be considered.

12.8 In case the English version of documents j) in Clause 11.1 is found missing, the Bidder must submit the missing document within 24 hours after receiving notification from CEM. Otherwise, the proposal will not be considered.

12.9 In case of force majeure, which results in CEM headquarter being temporarily closed, the proposal submission date and time listed above shall be extended to the following working day at the same time.

13 VALIDITY OF PROPOSALS

The period of validity for the Proposals shall be **90 days**, counting from the opening date of the Proposals. All Bidders who have not received the award notification shall cease the obligation of keeping their Proposals.

14 CLARIFICATION OF THE BIDDER

14.1 Bidders should provide clarification which is deemed necessary for any document constituting the Proposal to CEM, so as to allow CEM to evaluate the conditions of guaranteeing the good technical execution for the awarded works, conditions of price and delivery time, or any other conditions which are of the general or local special public interest.

14.2 During the evaluation stage, if CEM has any doubts about the real economic and financial conditions or technical capacities of any Bidder, CEM can request for any documents or information of accounting nature, or that which is essential for clarifying the doubts, prior to the award of the Contract.

14.3 In case the Bidder is required to provide clarification for the above clause 14.1 and 14.2, the Bidder must clarify in writing or in a meeting within 8 days after receiving the notification of CEM.

15 AWARD OF THE CONTRACT AND PERFORMANCE GUARANTEE

15.1 Within eight (8) days after receiving the order confirmation, the selected Bidder must submit a Performance Guarantee, in the amount of ten (10) percent of the total contract value and under the terms referred to in the GCPC (Clause 6). If the selected Bidder fails to provide the Performance Guarantee on time, and such submission failure does not depend on his/her will that is considered as reasonable fact, it will lead to the award to be considered void immediately and the tender security will be seized.

15.2 These guarantees, whose charges will be fully borne by the Bidders, can be presented as a cash deposit (QR code cheque payable to CEM and drawn on one of the approved banks in Macau), or presented as a bank guarantee of equal value, under the conditions referred to in the Annex XII.

15.3 Bank guarantee shall be issued by one of the following banks, through their head-offices or representatives in Macau:

Bank of China Limited, Macau Branch
Banco Nacional Ultramarino, S.A.
Luso International Banking Limited
China Guangfa Bank Co., Limited, Macau Branch
Banco Comercial de Macau, S.A.
The HongKong & Shanghai Banking Corporation Limited, Macau Branch
Tai Fung Bank Limited
Banco Well Link, S.A.
Macao Development Bank Limited
Industrial and Commercial Bank of China (Macau) Limited
China Construction Bank Corporation, Macau Branch
The Bank of East Asia Limited, Macau Branch

15.4 In the event that the selected Bidder does not sign the contract within the assigned date without justified reason, the award decision shall be ineffective immediately and the Performance Guarantee will be seized.

15.5 The above Performance Guarantee shall be returned 30 days after the end of the **3 years**' warranty period of the Goods and after deduction of any other fee and cost.

15.6 In the event that the amount of the Performance Guarantee is deducted due to pre-defined reason, the selected Bidder shall arrange the Performance Guarantee to be reinstated in the required amount of the purchase order within ten (10) calendar days.

16 APPLICABLE LAW

Any omissions in the hereby Program of Tender shall be governed by the Decree-Law No. 122/84/M dated 15th December and its amendment no. 30/89/M dated 15th May, and Decree-Law no. 63/85/M dated 6 July.

17 PROPOSAL EVALUATION

17.1 All documents submitted in the "Proposal" envelope shall be evaluated by an Evaluation Committee. The Evaluation Committee shall perform the evaluation based on the methodology listed in Clause 18. For evaluation purposes, the Committee may, during this stage, request the Bidders to provide additional information and/or clarification.

17.2 CEM reserves the right to decide not to award the contract to any party under the following conditions:

a) CEM suspects collusion between relevant Bidders;
b) No proposed "Proposals" meet the minimum evaluation requirements;
c) The proposed price of all or the best proposal greatly exceeds the budget estimated for this project.

18 PROPOSAL EVALUATION METHODOLOGY

The evaluation criteria is divided into two phases. The first phase has the nature of elimination. Bidders advance to the second phase for scoring of prices if they comply with the technical requirements and meet the delivery schedule. Finally, prices shall be scored in accordance with the below weighting:

Proposal Evaluation Crtieria	**Score Weighting**
Price	70%
Delivery Time	30%
Total	**100%**

1) Price: The Bidder who offers the lowest price will get the highest score and the Bidder who submits the highest price will get the lowest score; and

2) Delivery time: The Bidder who offers the shortest delivery time will get the highest score and the Bidder who offers the longest delivery time will get the lowest score.

The entity to host this tender shall evaluate the proposals and award on item by item basis in accordance with the information submitted and the methodology and score weighting described above.

19 ARRANGEMENT OF TENDER SCHEDULE

The tender schedule is arranged as follow:

- Start Date of Tender ---------- 24/1/2024
- Last Date of Request for Tender Clarification---------- 5/2/2024
- Last Date of Reply to Tender Clarification ---------- 16/2/2024
- Last Date of Tender Submission ---------- 26/2/2024 – 17:00H
- Date of Tender Opening ---------- 27/2/2024 – 10:00H

20 TERMINATION OR CANCELLATION OF TENDER

CEM reserves the right to terminate or cancel the Tender at any stage or without any reason without notifying any Bidder.

21 COMPLAINTS

Any complaints regarding the omission or irregularity of procedures related to the invitation to tender must be submitted in writing and mailed or hand delivered to CEM:

The Director of the Procurement and Logistics Department
Companhia de Electricidade de Macau - CEM, S.A.
Procurement & Logistic Department (PLD)
Estrada D. Maria II, Edf. CEM
Macau
Labeled with “Complaints regarding Tender Ref. PLD-MP396/23/55”

22 BRIBES

22.1 If a Bidder or any of his agents or servants offers to give or agrees to offer or give to any person, any bribe, gift, gratuity or commission as an inducement or reward for doing or forbearing to do any action in relation to his Tender, CEM may disqualify the Bidder.

22.2 Any attempt by a Bidder to influence CEM in the process of examination, clarification, evaluation and comparison of Tenders or in the decision concerning the award of any contract or to disclose any information on his Tender or the evaluation

process to any other Bidder or person not officially involved with such process may result in the rejection of the Tender.

23 CONFIDENTIALITY

All information relating to the examination, clarification, evaluation and comparison of Tenders and recommendations concerning the award of any contract will be kept confidential by CEM.

ANNEX I
SAMPLE OF PROPOSAL

_____ *[name, marital status, occupation and residential address, or company and address of Bidder]*, upon taking note the objective of the Tender of "**Supply of Materials for Public Lighting – Cables**" that was announced on the Government Gazette on _____ *[day, month, year]* by Companhia de Electricidade de Macau - CEM, S.A., we hereby declare that the Goods will be supplied in accordance with the Program of Tender, Tender Specification and Technical Specification in the total amount of MOP _____ *[in numbers and words]*, according to the Price Schedule enclosed and the delivery time in this Proposal.

*It is also declared for the execution of the Contract, the undersigned shall abide by Macau SAR laws, as well as to renounce any rights derived from other legal jurisdictions of any other country.

The undersigned also declared to provide the performance guarantee if the contract is awarded.

Date: *[day/month/year]*

Signature and Company Stamp: _____*

Printed Name/Title: _____

* Signature(s) shall be officially certified by a Notary.

* Only applicable to the Bidder representative who is not a local citizen or whose company headquarters are not set up in Macau SAR.

Note: This sample is used for reference only; Bidders shall produce their document based on their own suitable contents or it may be considered as missing documentation.

ANNEX II
PRICE AND DELIVERY SCHEDULE

ITEM NO.	CEM CODE NO.	MATERIALS DESCRIPTION	QUANTITY (METER)	NUMBERS OF DELIVERY DAYS	UNIT PRICE (MOP)	TOTAL PRICE (MOP)
1	3006867	CABLES, LOW SMOKE ZERO HALOGEN, 4X16 SQMM – 0.6/1KV, BLACK (According to Specification NCEM C-33-041P Nov 2022)	25,000			
2	3006910	CABLES, LOW SMOKE ZERO HALOGEN, 1X35 SQMM – 0.6/1KV, BLACK (According to Specification NCEM C-33-042P Oct 2023)	140,000			
TOTAL PRICE (MOP)						

Delivery Schedule: The above quantities will be split by CEM into several orders in 2024 (not more than 10 times) based on actual needs. However, CEM reserves the right not to order all quantities within the contract period. CEM will place a purchase order for each order and the Supplier shall deliver the cables to the warehouse that was appointed by CEM within **60 days** from the date of notification of the purchase order. The quantities shall be verified by CEM.

(Remarks: The Bidder who offers the shortest delivery time will get the highest score; and the Bidder who offers the longest delivery time will get the lowest score. If the proposed Delivery Time exceeds 60 days, the entity hosting this tender reserves the right to reject this Proposal)

Warranty period: **3 years**

Remarks: 1) The prices must be fixed and firmed for 90 days
2) Currency must be in MOP
3) The entity to host this tender can award on item by item basis
4) If Bidder does not specify the unacceptable quantities of materials in above table, the Bidder shall accept the award of CEM or the tender security will be handled based on the Clause 15.1 of this "Program of Tender"

Dated this *[day/month/year].*

Signature and Company Stamp: _____*

Printed Name/Title: _____

* Signature(s) shall be officially certified by a Notary.

ANNEX III - a
SAMPLE OF DECLARATION (TYPE I)

_____ *[name],* _____ *[marital status]*, residing in Macau at _____ *[address]*, declares to fully assume the responsibility for the Proposal submitted for the public tender that was launched by Companhia de Electricidade de Macau - CEM, S.A., on _____ *[day, month, year]*, for the "**Supply of Materials for Public Lighting – Cables**", and will supply all the required cables in accordance with the technical specifications and quality requirements specified in the Tender Document.

The undersigned declares that all documents submitted are valid and true.

Date: *[day/month/year]*

Signature and Company Stamp: _____*

Printed Name/Title: _____

* Signatures shall be officially certified by a notary.

Note: This sample is used for reference only; Bidders shall produce their document based on their own suitable contents or it may be considered as missing submission.

ANNEX III - b
SAMPLE OF DECLARATION (TYPE II)

_____ *[name of Company]*, with its headquarters located in Macau at _____ *[company address]*, with the branches that are related to the execution of the Contract are: _____ *[Name of Corporate]*, the director(s) of the executive committee are: _____ *[names]*, the other persons entitled with sufficient legal powers to represent it are: _____ *[names]*, to set up the company and its amendment to the constitution and statutes registered at the "Conservatória dos Registos Comercial e de Bens Móveis" with the registration number _____, _____ pages of Book _____, declares to fully assume the responsibility for the proposal(s) submitted for the public tender that was launched by Companhia de Electricidade de Macau - CEM, S.A., on _____ *[day, month, year]*, for the "**Supply of Materials for Public Lighting – Cables**", and will supply all the required cables in accordance with the technical specifications and quality requirement specified in the tender document.

The undersigned declares that all documents submitted are valid and true.

Date: *[day/month/year]*

Signature and Company Stamp: _____*

Printed Name/Title: _____
Attachment: Commercial Registry of the constitution and the amendments.

* Signatures shall be officially certified by a notary.

Note: This sample is used for reference only; Bidders shall produce their document based on their own suitable contents or it may be considered as missing submission.

ANNEX IV
FINANCIAL SERVICES BUREAU EVIDENCE DOCUMENT SAMPLE

(This sample serves for reference only; Bidders should apply the certificate from Financial Services Bureau)

Certificate No. _____

_____, Head of Tax Department

Upon being requested by "__ _____ _____", dated _____ of _____ of the current year, registered in this Bureau under the number _____, which is filed here, that after examining the file of business registration tax and other information that are stored in this Bureau, it is certified that the company named "_____", in English "_____", and in Chinese "_____", located at _____, registered under the name of _____ , and registered in our Department with business registration tax number "_____", owes nothing to the Fiscal Administration of the Macau Special Administrative Region in respect of taxes and duties.

For being true, I instructed the issuance of this certificate which will be signed by me and authenticated with the embossed seal of this Department.

Date: *[day/month/year]*

Signature: _____

ANNEX V
SAMPLE OF DECLARATION

_____ (*Name*), _____ (*Marital Status*), residing in Macau at _____ (*Address*), legal representative of _____ (*Name of Company*), hereby declare that materials of qualities not meeting or below the requirements as specified in the Technical Specification and technical scope of the Tender Document will not be used in the execution of the Contract of "**Supply of Materials for Public Lighting – Cables**".

Date: *[day/month/year]*

Signature and Company Stamp: _____*

Printed Name/Title: _____

* Signatures shall be officially certified by a notary.

Note: This sample is used for reference only; Bidders shall produce their document based on their own suitable contents or it may be considered as missing submission.

ANNEX VI
SAMPLE OF DECLARATION

_____(Name), _____(Marital Status), residing in Macau _____ (address), being the legal representative of _____ (name of company), hereby declares that during the execution of the Contract "**Supply of Materials for Public Lighting – Cables**", we will accept and comply strictly with the "Rules for Integrity and Honesty" as listed below:

1. Suppliers, their shareholders and employees should strive not to commit any act of corruption and bribery; if the supplier suspected infringements of its staff in crimes of corruption and bribery, they must report immediately to the Commission Against Corruption (CCAC) of the Macao SAR.
2. When the supplier, its shareholders and employees deal with staff of Companhia de Electricidade de Macau - CEM, S.A. (henceforth referred to as CEM) for business purposes (especially during tendering process or the execution of contract), they cannot offer any benefits or hospitality for CEM staff or their family members, unless the hospitality is consumable on site and is according to traditional custom (for example supply of drinks to the site inspectors), and / or for the fulfillment of contractual obligations.
3. During the tendering process and execution of the contract, if it appears there is existence of intimate relationships between the supplier itself, its shareholders and employees, and CEM staff responsible for the work [e.g., spouses or cohabitants, lineal relatives or collateral relatives or relatives by marriage (parents, children, sons-in-law, daughters-in-law, siblings, brothers-in-law, sisters-in-law etc.)], or partners of common interests (for example, business partners or debt or credit of above thirty thousand Patacas), or at severe enmity (for example, a private prosecution is taking place), supplier is obliged to report the fact immediately to CEM in writing.
4. If the supplier, its shareholders, subcontractors and employees violate the above terms, the awarding entity is entitled to terminate the contract and the supplier will be responsible for any expenses arising therefrom.

CEM shall have the right to terminate the contract for any infringement of the above terms. We will be liable for any compensation arising therefrom.

Date: *[day/month/year]*

Signature and Company Stamp: _____*

Printed Name/Title: _____

* Signatures shall be officially certified by a notary.

Note: This sample is used for reference only; Bidders shall produce their document based on their own suitable contents or it may be considered as missing submission.

ANNEX VII
SAMPLE OF DECLARATION

_____ (Name), _____ (Marital Status), residing in Macau at _____ (Address), owner of commercial entrepreneur or its legal representative of _____ (name of Entrepreneur)/legal representative of _____ (Name of the Company), for all intents and purposes, hereby declare that I, or current / former shareholders and current / former members of executive committee have not been sentenced by the court due to involvement in acts of active or passive corruption during services in the last five years.

Date: *[day/month/year]*

Signature and Company Stamp: _____*

Printed Name/Title: _____

* Signatures shall be officially certified by a notary.

Note: This sample is used for reference only; Bidders shall produce their document based on their own suitable contents or it may be considered as missing submission.

ANNEX VIII
TENDER SECURITY (SAMPLE)

By this Guarantee, we, _____ with Head Office at _____, at the request of _____ (hereinafter called "the Bidder"), are bound unto Companhia de Electricidade de Macau - CEM, S.A. (hereinafter called "CEM") in the sum of **MOP210,000.00** (Patacas Two Hundred and Ten Thousand Only) required for the admission to the tender for "**Supply of Materials for Public Lighting – Cables**", for which payment the Bank binds itself, its successors and assigns by these presents.

The conditions of this obligation are:

1. The Bank undertakes to pay to CEM any sum up to the above amount upon receipt of written demand from CEM. The execution of this covenant must offer CEM equal guarantee to the one resulting from a money deposit made by the Bidder, so, the Bank will deliver the money demanded by CEM without delay.
2. The guarantee will remain irrevocably in full force and effect up to 30 days after the period of validity of the Bidder's offer or, should the Contract be awarded to the Bidder, until its replacement by the Performance Security for the Works.

This guarantee is governed by the laws and regulations of Macao SAR.

N.B. This security must be signed with the authorized signatures of the Bank, with the witness of a Public Notary.

ANNEX IX
SAMPLE OF DECLARATION
FOR THE EXPERIENCE IN MANUFACTURING CABLES

_____ (Name), _____ (Marital Status), residing in Macau at _____ (Address), owner of commercial entrepreneur or its legal representative of _____ (name of Entrepreneur) /legal representative of _____ (Name of the Company), for all intents and purposes, hereby declare that the manufacturer of cables has experience in manufacturing cables for 3 consecutive years or above.

Date: *[day/month/year]*

Signature and Company Stamp: _____*

Printed Name/Title: _____

* Signatures shall be officially certified by a notary.

Note: This sample is used for reference only; Bidders shall produce their document based on their own suitable contents or it may be considered as missing submission.

ANNEX X
SUPPLY TRACK RECORD OF CABLES

Year	Customer's Name	Country	Types of Cables	Quantity

Date: *[day/month/year]*

Signature and Company Stamp: _____

Printed Name/Title: _____

Note: This sample is used for reference only; Bidders shall produce their document based on their own suitable contents or it may be considered as missing submission.

ANNEX XI
SAMPLE OF TENDER OPENING PARTICIPANTS FORM

To: Companhia de Electricidade de Macau – CEM S.A.

It is to inform that the following personnel:

	Name	Type of Identity Card and Number (First 4 Digits or Letters)
1.	_____	_____
2.	_____	_____
3.	_____	_____

will represent our company _____, with Head Office located at _____, to participate in the Tender Opening for **"Supply of Materials for Public Lighting – Cables"** at 10:00 of 27th February 2024.

Date: *[day/month/year]*

Signature and Company Stamp: _____*

Printed Name/Title: _____

* Signatures shall be officially certified by a notary.

ANNEX XII
SAMPLE OF PERFORMANCE SECURITY

By this Guarantee, we, _____ with Head Office at _____, at the request of _____ (hereinafter called "the Supplier"), are bound unto Companhia de Electricidade de Macau - CEM, S.A. (hereinafter called "CEM") in the sum of MOP_____ (Patacas _____ Only), being ten percent (10%) of the contract value, for which payment the Bank binds itself, its successors and assigns by these presents.

Whereas CEM has awarded the Supplier the contract for "**Supply of Materials for Public Lighting – Cables**"

The conditions of this obligation are:

1. The Bank undertakes to pay to CEM any sum up to the above amount upon receipt of written demand from CEM. The execution of this covenant must offer CEM equal guarantee to the one resulting from a money deposit made by the Supplier, so, the Bank will deliver the money demanded by CEM without delay and without it being necessary to prove to the Bank the defects or shortcomings or debts of the Supplier.

2. This guarantee is valid until xx/x/20xx.

This guarantee is governed by the laws and regulations of Macau.

N.B. This security must be signed with the authorized signatures of the Bank, with the witness of a Public Notary.

SUPPLY OF MATERIALS FOR PUBLIC LIGHTING – CABLES

III. TENDER SPECIFICATION

TENDER REF.: **PLD-MP396/23/55**

English version is for reference only.

ORGANIZATION OF THE TENDER SPECIFICATION

The Tender Specification is composed of the following documents:

1. General Conditions of Purchase Contract (GCPC);
2. Technical Specification(TS):
   - NCEM C-33-041P NOV 2022
   - NCEM C-33-042P OCT 2023

GENERAL CONDITIONS OF PURCHASE CONTRACT

PLD-MP396/23/55

English version is for reference only.

INDEX

1. DEFINITIONS

In the Purchase Contract the following words shall have the meanings herein assigned to them unless there is something in the subject matter or context inconsistent with such construction:-

CEM means the Companhia de Electricidade de Macau - CEM, S.A.

Delivery Date means the date specified in the Purchase Contract for delivery of the Goods subject to such adjustments as may be made in accordance with the Purchase Contract.

Goods means the material/equipment to be supplied in accordance with the requirements and Specification for which CEM purchased from the Supplier, or any portion of it which shall be made clear by the context.

Contract Price means the amount established in accordance with the Purchase Contract to be paid by CEM to the Supplier for the supply and delivery of each item of Goods ordered by CEM

Purchase Contract means the agreement between CEM and the Supplier, howsoever made, for the supply of Goods, including all documents referred to therein which set out the rights and obligations of the parties under the said agreement.

Supplier means the person(s), firm, company, whose Proposal has been accepted by CEM and includes the Supplier's legal personal representatives, successors and permitted assignees.

2. FORMATION OF PURCHASE CONTRACT AND VALIDITY

2.1 According to item 1b) of article 12 of Decree-Law No. 122/84/M dated 15 December amended by Decree-Law No. 30/89/M dated 15 May, written contract must be established for the award of this public tender.

Stamp duty and all handling fees due to the signing of the written contract shall be borne by the Supplier.

2.2 The Supplier shall arrange to commence the manufacturing or acquire of Goods upon signing of the Purchase Order with CEM.

2.3 The Purchase Contract shall consist of the following documents including their amendments and other related documents:

- The Purchase Contract itself;
- These General Conditions of Purchase Contract;
- The Technical Specifications;
- Program of Tender
- The Minutes of Clarification meetings (if applicable) and
- The Tenderer's Proposal

2.4 In case of apparent contradictions in the Purchase Contract documents, to the extent that they cannot be reconciled, the preceding document shall prevail over the documents that follow, in the sequence set forth here above and, for documents on the same level as per above list, that document issued at a later date shall prevail over the earlier ones.

3. PURCHASE CONTRACT OBLIGATION

3.1 The Supplier hereby warrants that:

- He possesses the necessary professional qualifications, skilled personnel, expertise to carry out his obligations according to this Purchase Contract.

- He will make available the necessary facilities, manpower and services to perform the production or acquire and delivery of Goods in an efficient, workmanlike and timely manner in accordance with all the conditions and terms of this Purchase Contract.

3.2 CEM hereby agrees to purchase and receive the Goods, and pay the Supplier pursuant to the terms and conditions set forth in this Purchase Contract.

4. SUPPLIER TO INFORM HIMSELF FULLY

4.1 The Supplier shall be deemed to have examined the Tender Specification, together with such schedules, drawings and plans as may be annexed thereto or

referred to therein and to have satisfied himself as to all matters he may be required to undertake in fulfilling his obligations under the Purchase Contract.

4.2 The Supplier shall be deemed upon acknowledge receipt and accept the Purchase Contract if no objection is raised within 5 working days after receiving the Purchase Contract draft.

5. SUFFICIENCY OF PURCHASE CONTRACT PRICES

The Supplier shall be deemed to have satisfied himself as to the correctness and sufficiency of the prices which shall cover all his obligations under this Purchase Order and all matters, and things necessary for the proper supply and delivery of Goods.

6. PERFORMANCE GUARANTEE

6.1 If it is requested in the Program of Tender, the Supplier shall guarantee the due fulfillment of its obligations under this Purchase Contract by providing at his own expense a Performance Guarantee in the form described below.

6.2 The Performance Guarantee shall remain in force until its validity date insofar as the Supplier has by that date fulfilled his obligations stated at the guarantee of the Performance Guarantee.

6.3 The Performance Guarantee shall be in the form of an unconditional bank Security or a certified cash cheque/bank draft, in an amount as specified on the Program of Tender.

Bank security shall be payable in Macau and shall be issued by one of the approved banks. It must be payable to CEM on first demand, without any need for judicial settlement and despite any objection by the Supplier or the bank.

Certified cheque shall be payable to CEM in Macau and drawn on one of the approved banks in Macau.

6.4 Due authority for an extension of the validity of this Performance Security shall be lodged by the Supplier with the Bank of Guarantor concerned if such extension is desired by CEM.

6.5 Should the Supplier fail to produce evidence of the establishment of the Performance Guarantee on time, CEM shall be entitled to cancel the Purchase Contract without compensation for the Supplier.

7. OBLIGATION OF SUPPLY

7.1 By signing the Purchase Contract, the Supplier shall be deemed to accept the obligation of supplying everything necessary for the object mentioned in the Purchase Contract.

7.2 The Supplier shall accept the responsibility for the completeness and faultless execution of the supply, packaging and delivery, which shall be done in accordance with the technical specifications and relevant requirements, in such a manner that a maximum of operational reliability and efficiency is assured.

7.3 The Supplier shall apply to CEM if he so requires for any clarification concerning obscurities or discrepancies in the Purchase Contract documents. The Supplier shall be responsible for any error or loss resulting from his failure to timely obtain such clarification.

8. DELIVERY

8.1 The supplier shall deliver all Goods to the warehouse that was appointed by CEM in accordance with the time schedule as stated in the "PRICE SCHEDULE". The supplied quantities shall be confirmed by the CEM staff.

8.2 All Goods shall be well packed and protected for transportation. The Supplier has to employ a reliable forwarder to deliver the Goods.

9. FORCE MAJEURE

9.1 Neither the Supplier nor CEM shall be responsible for any failure to fulfill their respective obligations under this Purchase Contract if fulfilment has been delayed, hindered, interfered with curtailed or prevented by:

(A) An act of God; or

(B) Hostilities, riot or civil commotion; or

(C) Acts of any national, regional, state, municipal or local government (including any agency, commission or authority thereof) taken within its legal authority; or

(D) Any strike, lock out or labour dispute etc. (whether or not Supplier or CEM as the case may be are parties thereto or would be able to influence or procure the settlement thereof); or

9.2 If any circumstance mentioned in Clause 9.1 arises, then the party affected thereby shall give immediate written notice thereof to the other party providing the fullest information as to the likely effect on the ability of the party affected to perform its obligation hereunder.

9.3 If as a result of force majeure Supplier is unable to meet its quantity commitment fully or partly as stated in the Purchase Contract, the Supplier shall use their reasonable endeavours to procure the Goods (in accordance with our technical specification) sufficient to meet the deficiency and to sell to CEM at the same price as agreed on the Purchase Contract.

9.4 Notwithstanding the provisions of Clause 9.3, CEM shall be free to purchase the quantity of deficiency from any other sources without notice to the Supplier.

9.5 In the case of supply disruption of the Goods, the Supplier shall give CEM the same priority treatment as Supplier's other customers of a similar nature having regard to CEM's responsibility as a major utility company in Macau.

9.6 Upon a force majeure situation being resolved or terminated, the Supplier shall immediately give CEM written notice of the cessation of force majeure and restore supplies of the Goods in accordance with the agreed quantity within a reasonable period of time.

9.7 Under no circumstances shall CEM be excused under the force majeure provisions from their obligations to make payment for all amounts due on account of the Goods previously supplied hereunder.

10. RIGHT TO TERMINATE

10.1 If either party should go into liquidation (other than voluntary liquidation for the purpose of corporate reconstruction) or if a receiver or sequestrator of the undertaking of assets (or any part thereof) of either party should be appointed or if either party should become insolvent, should enter into a deed of arrangement or a composition for the benefit of its creditors or should do or suffer any equivalent act or thing under the applicable law, the other party may, by written notice, forthwith terminate this Purchase Contract without prejudice to any right of action or claim accrued at the date of termination.

10.2 CEM shall have the right to terminate this Purchase Contract on giving not less than (30) days written notice to the Supplier if the Goods supplied by the Supplier do not meet the requirements set out in the Technical Specification or the proposals as provided in Supplier's tender document.

10.3 CEM shall have the right to terminate this Purchase Contract on giving not less than 30 days notice to the Supplier if the Supplier does not meet their obligations under Clause 9.2, 9.3, 9.4, 9.5 or 9.6, or not able to restore the normal supplies of the Goods within a period of 30 days after the date of the notice of force majeure or the effective date of supply disruption, whichever is the latter.

10.4 Save as otherwise stated herein the termination of the Purchase Contract by either party shall not prejudice any right or remedy accruing before, at or in consequence of the termination or any proceeding with respect to such right or remedy including any proceeding by way of arbitration hereunder.

11. ASSIGNMENT

Neither party may assign this Purchase Contract in whole or in part, directly or indirectly to any third party (other than an affiliate of that party) without the prior written consent of the other party. Subject to the foregoing, this Purchase Contract shall be binding upon and shall inure to the benefit of the legal representatives and successors of the parties

hereto. Any purported assignment by either party without the said written consent by the other party shall be void and of no effect.

12. NO WAIVER

No waiver by either party of any breach of any of the terms and conditions of this Purchase Contract shall be construed as a waiver of any subsequent breach of the same or any other terms and conditions.

13. ARBITRATION

13.1 Any dispute between the parties hereto relating to the meaning or effect of this Purchase Contract or any matter arising out of the same, shall be referred to three arbitrators in Macau, according to the relevant rules of the "Decreto-Lei n.° 29/96/M de 11 de Junho", and the arbitration proceedings shall be conducted in English and shall take place in Macau.

13.2 Should the parties fail to agree upon the arbitrator within 15 days of the date of notifying a dispute by a party to the other, the same shall be appointed by the Judge President of the Judicial Court of Macau SAR (Tribunal de Competencia Generica de Macau R.A.E.M.) upon application by either party.

13.3 The award or decision of such arbitration shall be judged according to the equity and shall be final and binding on the parties.

14. PRICES AND PAYMENTS

14.1 CEM shall pay the order prices as defined in the Purchase Order as compensation in full for the supply and delivery of Goods, for all responsibilities, liabilities of the Supplier under this Purchase Order, for all risks connected to it, except as may be expressly provided for in this Purchase Order.

14.2 The Supplier shall pay all taxes, duties, insurance, fuel surcharges, handling charges, CFS charges, etc. outside Macau due or to become due in connection with the supply and delivery of Goods.

14.3 Payments are made against invoices presented by the Supplier. Invoices shall be duly documented and shall be subject to the CEM's approval.

14.4 Approved invoices shall be paid by CEM by the forty-fifth day after CEM has accepted the Goods in accordance with the technical requirements at the location of storage.

14.5 Non-approved invoices shall be returned to the Supplier within 10 working days after their receipt.

15. BUSINESS ETHICS

The Supplier and his agents are not expected or authorised to take any action on behalf of CEM which would violate applicable laws. All financial statements, reports, billings, and other documents rendered shall completely and accurately reflect the facts about all activities and transactions handled for the account of CEM. The Supplier shall immediately notify the CEM of any and all violations of this Clause upon becoming aware of such violation. The Supplier shall be solely responsible for all legal consequence due to his violation of the applicable laws.

16. SAFETY, HEALTH, ENVIRONMENT AND QUALITY

The Supplier agrees and acknowledges that it will strictly comply with "CEM Safety, Health, Environment and Quality Requirements and Responsibility for Materials Suppliers".

17. PENALTY

17.1 In the event that not all the Goods are supplied within the delivery date that was promised in the Proposal and the reasons are attributed to the Supplier, in addition to deliver the remaining quantities as soon as possible, the Supplier shall also receive a penalty of 2% of the total value of the order per day until the date of the supplied quantities are all delivered.

17.2 Apart from paying the penalty due to late delivery of Goods, Supplier shall also pay the price difference for the purchase of alternatives from the market for replacing the undelivered Goods and all additional expenses or burden.

17.3 The penalty, price difference and additional expenses under Clause 17.1 and 17.2 shall be deduced from the Performance Guarantee that is provided by the Supplier.

18. SPECIAL REQUIREMENTS

18.1 Warranty – From the date of the temporary acceptance, the Supplier shall offer **three-year** warranty on the Goods.

18.2 Extra Obligation of Supplier during Warranty Period – During the warranty period, upon CEM's notification, Supplier must replace within twenty working days, any damaged or faulty equipment, whenever, failure, malfunction or damage are found to be of Supplier's responsibility. If the Supplier could not replace the faulty equipment, the contract shall be unitarily terminated.

18.3 Conditions for Contract Termination – In addition to the conditions in Clause 10, it will lead to contract termination in the condition that the penalty to the Supplier has accumulated to 20% of the total contract amount. All supplied Goods will be returned to the Supplier and the Supplier shall be responsible for sending away the Goods and the transportation costs. The Supplier shall refund all the payment within 30 days upon receiving and signing the receipt of notification of the contract termination.

19 REJECTION

19.1 If the Goods are found to be not in accordance with the Purchase Order documents, CEM shall have the right to reject the whole lot of Goods or part thereof and request the Supplier to set out appropriate remedy measures within mutual agreed reasonable period. In the event that the Supplier failed to remedy or refused to take appropriate measures after the expiry of the aforesaid period, CEM shall be free to take necessary measures without prejudice to the provisions set forth in Clause 10 of this General Conditions of Purchase Order of Enquiry Specification. However, the costs incurred shall be responsible by the Supplier and the amount shall be drawn from the Performance Guarantee for the fulfillment of such obligations. In the case that the amount of the Performnce Guarantee is not enough, the Supplier shall pay the insuficient amount within the period.

19.2 The Supplier's claim for any payment connected with the rejected Goods is void by the act of rejection.

20. OFFERS, PAYMENTS, AGREEMENT AND PROMISES

The Supplier hereby represents and warrants that neither the Supplier nor any of its officers, directors, employees, representatives and/or any agent acting on behalf of the Supplier has made or will make, directly or indirectly, any offer, payment, agreement or promise to pay money or anything of value, or has authorized or will authorize the offer, gift, agreement or promise to pay money or anything of value, in either case to any person or entity unlawfully to influence or induce any act, omission or decision of CEM including, without limitation, in connection with this Purchase Contract, the negotiation, preparation, execution or performance of this Purchase Contract or the procurement process leading to the award of this Purchase Contract.

21. APPLICABLE LAWS

In the case of any omissions in this General Conditions of Purchase Order of Program of Enquiry, it shall be governed by the applicable Law, especially governed by Decree-Law no. 122/84/M dated 15th December and Decree-Law no. 63/85/M dated 6 July.

Technical Specification

PLD-MP396/23/55

NCEM C-33-041P
Nov 2022

LSZH 4x16 mm2 cable

Technical specification

Circular Copper conductors, XLPE insulated, Steel Tape Armoured, LSZH outer sheath, Low Voltage Cable. (CU·XLPE·STA·LSZH)

CEM Code	Description
3006867	Cable LSZH 4 x 16 mm^2.

1. Object

This specification covers the technical requirements, performance and leading dimensions of 3-phase+neutral Copper cables for CEM underground Low Voltage Distribution Network, which captioned cables to be supplied, shall comply.

Cables are XLPE insulated with a 0.6/1.0 (1.2) kV rated voltage, 50 Hz, provided with Copper conductors and galvanized double steel tape armour. Phase conductors and neutral conductors are in circular shape.

The insulation colors of phase conductors are: brown, black and grey, and the insulation color of neutral conductor is blue.

Outer sheath of the cables is LSZH colored black type ST 8, provided of an environmentally acceptable anti-termite protection mainly adequate for both termite types "Odontermus Formosanus" and "Copottermes French".

The standardized delivery length is 1000 m per drum.

The cable will be installed in the underground cable conduit (uPVC 150mm).

The cable design life should not be less than 30 years.

2. Standards

a) Except where modified, all proposed equipment's and materials used and all workmanship shall be in accordance with the latest issue of the following relevant IEC and EN Standards and their parts and amendments or in accordance with such corresponding internationally acceptable Standards as CEM may consider to be equal or superior to the Standards specified as follows:

Standards	Subject
IEC 60228	Conductors of Insulated Cables.
HD 308	Standard colors for insulation for low frequency cables and wires
IEC 60502-1	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um=1.2 kV) up to 30 kV (Um=3.6 kV).
IEC 60724	Short-circuit temperature limits of electric cables with rated voltages of 1 kV (Um = 1,2 kV) and 3 kV (Um = 3,6 kV).
IEC 60811	Common test methods for insulating and sheathing materials of electric cables and optical cables
IEC 60332-3-24	Test for vertical flame spread of vertical-mounted bunched wires or cables – Category C
IEC 61034-2	Measurement of smoke density of cables burning under defined conditions
IEC 60754-1	Test on gases evolved during combustion of materials from cables – Part 1 Determination of the halogen acid gas content

IEC 60754-2	Test on gases evolved during combustion of materials from cables – Part 2 Determination of acidity and Conductivity
IEC 60684-2	Flexible insulating sleeving – Part2: methods of test

b) In all cases, the Manufacturer must inform CEM of precisely, which Standards the equipment; materials or workmanship will conform to.

c) For such Standards, which are not written in English, the Tenderer shall make and delivery available copies of the English translation.

d) The Tenderers shall fill in the adequate "Schedule of Standards"

e) Where the Tenderers offer deviates from the CEM specification, full details shall be entered in "Schedule of Deviations".

3. Rated Voltage

- 0.6/1.0 (1.2) kV, as defined in IEC 60502-1, sub-clause 4.1.

4. Network frequency

- 50 Hz

5. Cable design

5.1 Conductors

Conductors shall be of plain Copper wires, circular shape, Class 1, in accordance with IEC 60228, sub-clause 5.1, and according to the following:

Cable LSZH 4 x 16mm^2		
	Phase conductors	**Neutral conductor**
Cross sectional areas (mm2)	16 mm^2	16 mm^2
Shape	Circular	Circular
Maximum resistance at 20 ^{o}C	1.15 ohm/Km.	1.15 ohm/Km

5.2 Insulation

The insulation shall consist of extruded cross-linked polyethylene (XLPE) obtained by either Dry Curing or Silane process, according to IEC 60502-1, clause 4.2, table 2.

The thickness of the insulation shall be equal to the nominal value specified in IEC 60502-1, sub-clause 6.2, table 6, as follows:

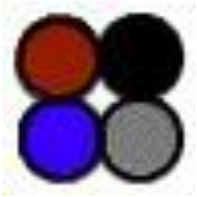
Cable LSZH 4 x 16 mm^2

Thickness of the insulation	Phase conductors (16mm^2)	Neutral conductor (16mm^2)
Nominal	0.70 mm	0.70 mm
Minimal in any particular point	≥ 0.53 mm	≥ 0.53 mm

5.3 Insulation colors

The insulation colors shall be according to HD 308 (2002) and IEC 60304 (1982-01), "Standard colors for insulation for low frequency cables and wires" as follows:

Conductor	Insulation color
Phase 1	Brown
Phase 2	Black
Phase 3	Grey
Neutral	Blue



5.4 Inner covering and fillers

The filers, binder and inner covering shall be of suitable materials adequate for the operating temperatures of the cable and compatible with the insulating material.

a) Fillers

The interstices between the cores shall be substantially filled by separate **polypropylene yarns**.

b) Binder

An open helix of Polypropylene tape shall be provided as a binder before the application of an extruded inner covering.

Cable	Approximate thickness of binder tape
LSZH 4x16 mm^2	0.20 mm

c) Inner covering

The extruded layer of Low Smoke Zero Halogen inner covering shall be with thickness displayed in the following table tabulated according to IEC 60502-1 sub-clause 7.2.3, table 8:

Cable	Fictitious diameter of laidup cores	Minimal thickness of inner covering extruded layer
LSZH 4x16 mm^2	14.30 mm	1.8 mm

5.5 Armour

The armour shall consist of double layer of **0.2 mm** thickness galvanized steel tape according to IEC 60502-1, sub-clause 12.5, table 10.

The tape armour shall be applied helically in two layers so that the outer tape is approximately central over the gap of inner tape.

The gap between adjacent turns of each tape shall not exceed 50% of the width of the tape.

The arnour shall be adequate to withstand a phase-to earth (single-phase) short-circuit current before the relative circuit protection system triggered, suffering no significant deterioration or aging subsequently.

The curve for the circuit protection system can be refer to clause 9 – Protection curve Type C. The 32A or 16A mcb will be used for the protection purpose. The longest distance between the mcb and the end of the cable will be 350 meter (32A mcb) or 700 meter (16A mcb).

5.6 Outer sheath

The outer sheath shall consist of a compound applied by as extrusion process, adequate to the rated cable temperatures in accordance with IEC 60502-1, table 4.

Outer sheath shall be of Low Smoke Zero Halogen colored black ST8, with an environmentally acceptable anti-termite repellent mainly adequate for both termite types "Odontermus Formosanus" and "Copottermes Frenchi".

The chemical product used a repellent shall be stated by Tenderers, but they should not include materials harmful to mankind and/or the environment. Undesirable products such Aldrin, Dieldrin and Lindane are not accepted.

LSZH sheathing compound shall be ST8 Type with characteristics fully compliant with IEC 60502-1, sub clause 13.2 and test method and requirement stated in tale 23

The thickness of the outer sheath shall be equal to the nominal value specified in sub clause 13.3 and sub-clause 16.5.3

Outer sheath thickness		
Cable	**Minimal in any particular point**	**Nominal**
LSZH 4x16 mm2	1.1 mm	1.6 mm

5.7 Cable Marking

a) The identification of cable shall be clearly marked by an embossing method along one line the cable outer-sheath with the following information:

"CEM - PO *(Purchase order number)* - (*Manufacturer name*) - (*Year of manufacture*) – Rated voltage - Type and conductor section (LSZH 4x16 mm2)"

b) The minimum height of the letters should be 5 (five) mm with a thickness not exceeding 0.5 mm.

c) The above-mentioned identification should be repeated throughout the cables at regular intervals and the gap between the end of one set of embossed characters and the beginning of the next shall not exceed 150mm.

6. Tests

6.1 General

The tests to be carried out on complete cables shall be according with IEC 60502-1, IEC60502-2 and IEC60811.

Factory tests mentioned in this specification or proposed by manufacturer will be carried out at manufacturer's expense.

CEM reserves the right to inspect cable during manufacturing process.

Whenever no clear definition is given on when there are doubts, the conditions to carry out such tests and their results should meet IEC Publications, whether applicable.

6.2 Testing Facilities

a) The suppliers/ tenderer shall clearly state as to what testing facilities are available in the works of manufacturer and whether the facilities are adequate to carry out Sample, Type, Routine and Acceptance Tests mentioned in this specification.

b) The facilities and calibration certification shall be provided by the bidder to purchaser's representative for witnessing the Tests in the manufacturer's works.

c) If any test cannot be carried out at manufacturer's works reason should be clearly stated in the tender.

6.3 Type Tests

a) Submission of Type Test reports (include non-electrical tests for ST8 under IEC 60502-1 clause18, Table 14 to 23 if applicable) is compulsory.

The type tests and their sequence shall be performed in accordance with IEC 60502-1, clauses 17 (electrical) and 18 (non-electrical), and IEC 60811.

b) Type Tests are required to be carried out from a sample of complete cable, 10 m to 15 m in length, from the first lot of cable ordered.

c) The sample for the Type Test will be drawn by the purchaser's representative and the Type Tests may be witnessed by him.

d) In case facilities of any of the Type Tests are not available at the works of the supplier, then such Type Test shall be carried out by the supplier at the Independent Laboratory at the cost of supplier.

e) Supplier, however, can claim exemption from carrying out Type Tests as above, provided such Type Tests were already conducted for an Independent Laboratory in the past within five years and if the test reports and certificates are acceptable. The cable sample in the type test report should be same as the cable which purchaser will purchase.

f) Submission of Type Test Reports together with tender document will given ADVANTAGE in tender evaluation.

6.4 Sample Tests

CEM requires sample tests, which are as follows:

a) Conductor examination and check of dimensions (measurement of the thickness of the insulation, over-sheath, inner covering, metallic screen and measurement of the overall diameter) according to IEC 60502-1, sub-clauses 16.2.1, sub-clause 16.4, sub-clause 16.5, sub-clause 16.7 and sub-clause 16.8.

b) Physical tests according to IEC 60502-1, sub-clauses 16.2.2, to be carried out on a number of samples taken from manufactured cables according to the table 12 of IEC 60502-1, sub-clause 16.2.2 as follows:

Cable Length		Number of Samples for Sample Test
Above km	Up to and including km	
0.49	10	1
10	20	2
20	30	3
Etc.		Etc.

c) Hot set test, according to IEC 60502-1, sub-clause 16.9.

A copy of Sample Tests Reports must be compulsorily submitted to CEM. Supplier should inquire CEM’s opinion for the cable drum which will take the cable sample.

6.5 Routine Tests

a) The submission of Routine Test reports before the delivery of the Drums is compulsory.

b) All the Routine Tests as per to IEC 60502-1, clauses 15, amended up to date, shall be carried out on each and every delivery length of cable (delivery drum).

c) Required routine tests are as follows:

c.1) Measurement of the electrical resistance of conductors, according to IEC 60502-1, sub-clause 15.2.

c.2) Measurement of the electrical resistance of metallic screen. The measurement method can refer to IEC 60502-1, sub-clause 15.2.

c.3) Voltage test, according to IEC 60502-1, sub clause 15.3.

The voltage test shall be made at ambient temperature, using either alternating voltage at power frequency or direct voltage, at the manufacturer's option.

The test voltage shall be applied for 5 min in succession between each insulated conductor and all the other conductors and each insulated conductor and metallic screen.

6.6 Acceptance Tests

a) Factory acceptance testing are performed before equipment ships to work out design and manufacturing flaws, and the acceptance procedures are as follows:

a.1) Inspection of the complete cable.

a.2) Carrying out of the Routine and Sample Test before listed in sub-clauses 6.4 and 6.5.

b) Testing upon receipt will be performed after delivery but before the equipment is signed for to ensure the shipment arrived intact.

6.7 Tests after Installation

These tests shall be carried out when the installation of the cables and its accessories has been completed and they shall be performed according to IEC 60502-1, clause 19, as follows:

- A d.c. voltage equal to 2.5 kV (4 U0) is applied for 15 min.

7. Conditions on Package and Transport

7.1 Conditional on package and transportation of the cables

a) The goods are to be deliverer in good condition of maintenance and safety and the Tenderer shall assure the packing in the best conditions in order to avoid any damage transport and storage.

b) A copy of the packing list shall be forward to CEM prior to dispatch of the goods.

c) The cable should be placed in non-returnable wood drums or steel drums so that it will be protected against deterioration during sea freight transportation, storage or intermediate operations. The ends will have to be adequately tied to the reel.

d) The minimum diameter for the cable wiring into the reel should be sufficient to guarantee the adequate packing and transport of the cable, thus eliminating any sort of damage risk.

e) Each end of the cable length should be adequately sealed with end caps before shipment in order to prevent the penetration of humidity or contaminating elements.

f) Each cable length specified by CEM should be sent on a separate drum, unless otherwise specified.

g) The goods delivered are only considered accepted after being accurately examined on arrival, the Supplier remaining responsible for any damage or loss, which occurs.

7.2 Drums

7.2.1 Steel drums (option 1)
Cable shall be packed on non-returnable steel drums. The cable drum shall be arranged to take a round spindle bar 150mm diameter. Both ends of the cable shall be firmly secured.

To prevent damage to the cable during storage and transit, the cable drums shall be covered with at least 6 pieces of curved steel plates equally spaced on the rim of drum. The thickness of the steel plate shall not be less than 1.5mm. Each steel plate shall be fixed using at least 4 Nos. of bolt and not onto the flanges of drum.

The clearance between coiled cable and curved steel plates must be careful designed by supplier taking into account the gross weight of the drum and the width of the drum. Cable drums delivered with broken steel plates or seriously dented steel plates will be rejected immediately.

The steel plates must be so arranged to ensure safety during removal of steel plates when the drum is opened.

The cable drum shall be of robust construction so as to suit shipping and transport requirements and to suit outdoor storage for at least 24 months. Details of the cable drum and steel plates shall be submitted with the Tender.

The finished cable drums shall be undergone suitable termite fumigation treatment. All materials used inside cable drums for supporting or protecting the cable shall be free of cellulose materials, linen material or cotton ropes. The supplier must state all the details in Technical Schedule if such cellulose materials, linen material or cotton ropes are used

Timber battens on the rim of cable drum will **not** be accepted

The tenders should propose the following two options for CEM considerations: -
Option 1) 1000m per cable drum (metallic).
Option 2) 500m per cable drum (metallic).

The cable length per drum will be delivered with a tolerance -3 to +10 meter.

The manufacturer must take all possible precautions to prevent the presence of appreciable quantities of inflammable gases inside the drums.

7.2.2 Wooden drum (option 2)

Cables shall be delivered in solid wooden drums made of resinous wood, and chemically treated against termites and humidity. They must have got adequate protection against deterioration during transport (special care shall be taken for sea freight), storage, and intermediate operations.

The drum core shall be larger than the minimum bending radius of the cable. The cable ends have to be firmly fastened to the reel. The distance between the outer cable layer and the lagging shall be sufficient to avoid cable damages

Care shall be taken to avoid that nails, screws, or other sharp objects, used in drum manufacturing or lagging fixing, might damage the cable.

The cable length per drum shall be delivered with a tolerance -3 to +10 meter

7.3 Drum marking

Each drum should be marked with a resistant label duly attached to the drum, indicating:

a) Destination
b) CEM Purchase Order no.
c) Drum no.
d) Length per drum
e) Conductor type and section
f) Insulation type
g) Rated voltage
h) Direction of Drum Rolling

Drums should not mention other information than that referring to this order.

8. Technical data to be supplied with Tenders.

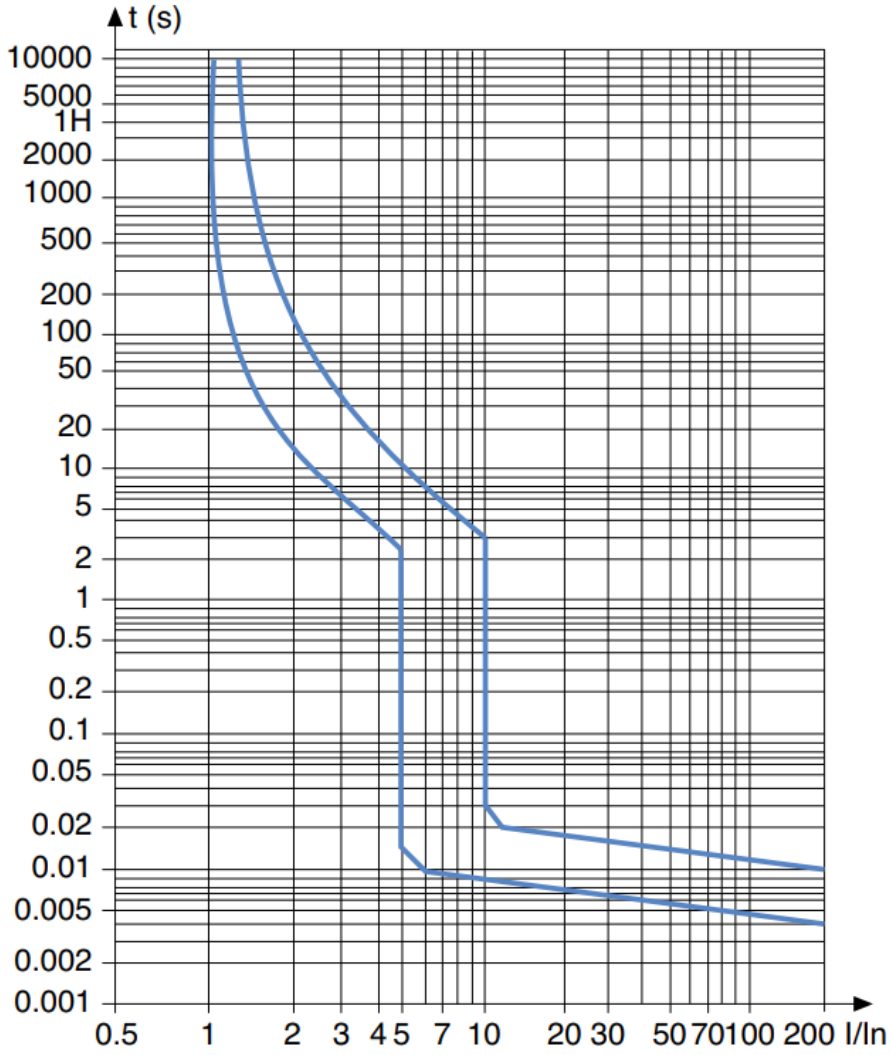
a) The attached Data Schedule, completely filled (original paper and electronic copy), where shall be specified all cable components, materials, dimensions, and characteristics as well the schematic cross-section of the proposed cable, which must be

correctly represented and completed with adequate references and Type Tests Report concerned to the proposed cable.

a) Electronic copy of the list of cables already manufactured, for voltages similar or above of the required, including the following information:

- Characteristics
- Date of manufacturing
- Buyer
- Length of supplied cable
- Date of installation, if available

9. Protection Curve



C68N C Curve/C型曲線

DS-C-33-041/P
November 2022

LSZH 4 x 16 mm2 cable

Data Schedule

Circular Copper conductors, XLPE insulated, Steel Tape Armoured, LSZH outer sheath, Low Voltage Cable.

Tender	PLD
Supplier	

CEM Code	Description
3006867	**Cable LSZH 4 x 16 mm^2.**

DATA SCHEDULE			
Tender PLD -			
Cable reference			
Manufacturer			
Place of manufacture			
Standards meet:			
Rated voltage Uo/U(Um) (kV)			
Pos	**Description**	**Unit**	**Data**
1	Materials, dimensions, geometric and mechanical characteristics.		
1.1	Cable schematic cross section		See Appendix 1
1.2	Phase conductors		
	- Material		
	- Class		
	- Core type, according to IEC 60228		
	- Shape		
	- Cross sectional area	mm^2	
	- Number of wires		
	- Diameter of wire	mm	
	- Diameter of phase conductors	mm	
	Neutral conductor		
	- Material		
	- Class		
	- Core type, according to IEC 60228		
	- Shape		
	- Cross sectional area	mm^2	
	- Number of wires		
	- Diameter of wire	mm	
	- Diameter of neutral conductors	mm	
1.3	Insulation		
	- Material		
	- Cross-linking process		
	Insulation of phase conductors		
	- Nominal thickness of insulation on phase conductors	mm	

	- Minimal thickness of insulation on phase conductors	mm	
	- Color of insulation on phase conductors		
	- Diameter over insulation on phase conductors	mm	

DATA SCHEDULE

Pos	Description	Unit	Data
	Insulation of neutral conductor		
	- Nominal thickness of insulation on neutral conductor.	mm	
	- Minimal thickness of insulation on neutral conductor.	mm	
	- Color of insulation on neutral conductor		
	- Diameter over insulation on neutral conductor	mm	
1.4	Filler		
	- Material		
	- Nominal diameter of cable over the laid-up cores.	mm	
1.5	Binder		
	- Material		
	- Thickness of the tape	mm	
	- Nominal diameter of cable over the binder	mm	
	- Describe in detail the construction of the binder tape, % of overlap/gap		
1.6	Inner covering		
	- Material		
	- Compound type		
	- Nominal thickness	mm	
	- Minimal thickness of inner covering	mm	
	- Nominal diameter of cable over the inner covering	mm	
	- Color		
	- Shore D Hardness (ISO 868 1s)		
1.7	Armour		
	- Material.		
	- Number of tapes.		
	- Thickness of each tape.	mm	
	- Width of each tape	mm	
	- Nominal diameter of cable over the tapes.	mm	
1.8	Moisture barrier/ Blinder		

	- Material		
	- Number of layers (No.)		
	- Tape radial thickness	mm	
	- Nominal diameter of cable over the moisture barrier	mm	
1.8	Outer sheath		
	- Material		
	- Compound type according to IEC 60502-1		
	- Anti-termite repellent (brand and reference)		
	- Color of the outer sheath		
	- Nominal thickness of the outer sheath	mm	
	- Minimum thickness of the outer sheath	mm	
	- Overall diameter of the cable	mm	
	- Maximum diameter of the cable	mm	
	- Minimal diameter of the cable	mm	
	- Shore D Hardness (ISO 868 1s)		
1.9	Bending Radius		
	- At the cable laying	mm	
	- After cable laying	mm	

DATA SCHEDULE			
Pos	**Description**	**Unit**	**Data**
1.10	Maximum pulling tension while cable laying		
	- Pulling eye on conductor	daN	
	- Stocking grip on outer sheath	daN	
1.11	Weight of cable	kg/m	
1.12	Standard Drum length	m	
1.13	Weight of Drum with the cable	kg	
2	Electrical Parameters		
2.1	DC resistance of conductors at 20°C		
	- Phase conductors	Ohm/km	
	- Neutral conductor	Ohm/km	
	- Metallic screen (armor layer)	Ohm/km	
2.2	AC resistance of conductors at 90°C		
	- Phase conductors	Ohm/km	
	- Neutral conductor	Ohm/km	
	- Metallic screen (armor layer)	Ohm/km	
2.3	Equivalent star reactance (per phase) of cable at 50 Hz	Ohm/km	
3	Voltage Performances		
3.1	Short-duration withstand voltage		
	- AC voltage	kV	
	- Duration	min	
3.2	Test after installation (new cables, only)		
	- DC voltage	kV	
	- Duration	min	
4	Operation Performance		
4.1	Temperature of Conductor		
	Maximum Temperature of Conductor	°C	
	Recommended temperature of conductor, taking in consideration both insulation and outer sheath materials	°C	
4.2	Maximum rated current		
	- Laid direct in ground, depth of burial 0.80 m, soil temperature 30°C , soil thermal resistivity 1.0°C m/w, at conductor temperature 90°C	A	

DATA SCHEDULE			
Pos	**Description**	**Unit**	**Data**
	- Laid in duct-banks composed by parallel 0.15 m diameter PVC pipes embedded in concrete bed, depth of burial 0.80 m, soil temperature 30°C, soil thermal resistivity 1.0°C m/w, at conductor temperature 90°C	A	
	- Laid direct in air, ambient temperature 40°C, on metal ladder protected from direct solar radiation, at conductor temperature 90°C	A	
	- Laid direct in air, ambient temperature 40°C, on floor ladder protected from direct solar radiation, at conductor temperature 90°C	A	
4.3	Rating Factors		See Appendix II
5	Short-circuit Performances		
5.1	- Maximum permissible temperature of conductor	°C	
5.2	- Conductor short-time withstand current (1s, 5s and 10s)	kA	
5.3	- Temperature of conductor at the start of short-circuit	°C	
5.4	- Temperature of conductor at the end of short-circuit	°C	
5.5	- Maximum permissible temperature of Metallic screen	°C	
5.6	- Metallic screen short-time withstand current (1s and 10s)	kA	
5.7	- Temperature of metallic screen at the start of short-circuit	°C	
5.8	- Temperature of metallic screen at the end of short-circuit	°C	

Notes:

DATA SCHEDULE

APPENDIX I

SCHEMATIC CROSS-SECTION OF PROPOSED CABLE

(All materials, thickness and diameters correctly indicated)

DATA SCHEDULE

APPENDIX II

CURRENT RATING FACTORS

1	**CABLES IN GROUND**

1.1. Rating Factors for Soil Temperature

Conductor Temperature	Soil Temperature					
	20°C	25°C	30°C	35°C	40°C	45°C
90°C						

1.2. Rating Factors for Soil Thermal Resistivity

Conductor temperature:90° C	Soil thermal resistivity °C m / W					
	0.6	0.8	1.0	1.2	1.4	1.6
Rating factor						

1.3. Rating Factors for Laying Depth

Depth of laying	0.60 m	0.80 m	1.00 m	1.20 m	1.40 m
Rating factor					

NCEM C-33-042P
Oct 2023

LSZH 1x35 mm2 cable

Technical specification

Circular Copper conductors, XLPE insulated, Copper wire screened, LSZH outer sheath, Low Voltage Cable. (CU·XLPE·CWS·LSZH)

CEM Code	Description
3006910	Cable LSZH 1 x 35 mm^2.

1. Object

This specification covers the technical requirements, performance and leading dimensions of single phase Copper cables for CEM underground Low Voltage Distribution Network, which captioned cables to be supplied, shall comply.

Cables are XLPE insulated with a 0.6/1.0 (1.2) kV rated voltage, 50 Hz, provided with Copper conductors and copper wire with copper tape metallic screen. Phase conductor is in circular shape.

Outer sheath of the cables is LSZH colored black type ST 8, provided of an environmentally acceptable anti-termite protection mainly adequate for both termite types "Odontermus Formosanus" and "Copottermes French".

The standardized delivery length is 1000 m per drum.

The cable will be installed in the underground cable conduit (uPVC 80mm).

The cable design life should not be less than 30 years.

2. Standards

a) Except where modified, all proposed equipment's and materials used and all workmanship shall be in accordance with the latest issue of the following relevant IEC and EN Standards and their parts and amendments or in accordance with such corresponding internationally acceptable Standards as CEM may consider to be equal or superior to the Standards specified as follows:

Standards	Subject
IEC 60228	Conductors of Insulated Cables.
IEC 60502-1	Power cables with extruded insulation and their accessories for rated voltages from 1 kV (Um=1.2 kV) up to 30 kV (Um=3.6 kV).
IEC 60724	Short-circuit temperature limits of electric cables with rated voltages of 1 kV (Um = 1,2 kV) and 3 kV (Um = 3,6 kV).
IEC 60811	Common test methods for insulating and sheathing materials of electric cables and optical cables
IEC 60332-3-24	Test for vertical flame spread of vertical-mounted bunched wires or cables – Category C
IEC 61034-2	Measurement of smoke density of cables burning under defined conditions
IEC 60754-1	Test on gases evolved during combustion of materials from cables – Part 1 Determination of the halogen acid gas content
IEC 60754-2	Test on gases evolved during combustion of materials from cables – Part 2 Determination of acidity and Conductivity

IEC 60684-2	Flexible insulating sleeving – Part2: methods of test

b) In all cases, the Manufacturer must inform CEM of precisely, which Standards the equipment; materials or workmanship will conform to.

c) For such Standards, which are not written in English, the Tenderer shall make and delivery available copies of the English translation.

d) The Tenderers shall fill in the adequate "Schedule of Standards"

e) Where the Tenderers offer deviates from the CEM specification, full details shall be entered in "Schedule of Deviations".

3. Rated Voltage

- 0.6/1.0 (1.2) kV, as defined in IEC 60502-1, sub-clause 4.1.

4. Network frequency

- 50 Hz

5. Cable design

5.1 Conductors

Conductors shall be of plain Copper wires, circular shape, Class 2, in accordance with IEC 60228, sub-clause 5.1, and according to the following:

Cable LSZH 1 x 35mm^2	
	Phase conductors
Cross sectional areas (mm2)	35 mm^2
Shape	Circular
Minimum number of wires	7
Maximum resistance at 20 °C	0.524 ohm/Km.

5.2 Insulation

The insulation shall consist of extruded cross-linked polyethylene (XLPE) obtained by either Dry Curing or Silane process, according to IEC 60502-1, clause 4.2, table 2.

The thickness of the insulation shall be equal to the nominal value specified in IEC 60502-1, sub-clause 6.2, table 6, as follows:

Cable LSZH 1 x 35 mm^2	
Thickness of the insulation	**Phase conductors (35mm^2)**
Nominal	0.90 mm
Minimal in any particular point	≥ 0.71 mm

5.3 Metallic Screen

The metallic screen shall consist of a concentric layer of annealed copper wires applied helically and uniformly over the insulation screen and bound by a contra-helical copper tape. Contra helical copper tape is necessary to connect all the copper wires.

The metallic screen shall be adequate to withstand a phase-to earth (single-phase) short-circuit current before the relative circuit protection system triggered, suffering no significant deterioration or aging subsequently.

The curve for the circuit protection system can be refer to clause 9 – Protection type C. The 16A mcb will be used for the protection purpose. The longest distance between the mcb and the end of the cables will be 1650 meter

The cross section area of copper wire and copper tape shall not be less than 16 mm2. The design/calculation of the metallic screen must take in account the following temperatures:

a) Starting temperature on the copper wires: 85 ^{O}C
b) Maximum final temperature on the LSZH outer sheath (Alupe): 150 ^{O}C

5.4 Moisture Barrier/Bedding Tape

Two layers of water swellable bedding tape shall be applied over the metallic screen and under the outer-sheath.

5.5 Outer sheath

The outer sheath shall consist of a plastic coated Aluminium copolymer tape, with minimum thickness of 0.2 mm overlapped and longitudinally bonded to a LSZH outer jacket giving the cable radial water tightness.

LSZH sheathing compound shall be Type ST8, colored black, with characteristics fully compliant with IEC 60502-1, sub clause 13.2 and test method in clause 13 and requirement stated in table 23.

The outer sheath compound shall be applied by an extrusion process, adequate to the rated cable temperatures in accordance with IEC 60502-1, table 4.

The compound shall contain an adequate well dispersed UV stabilizer.

An environmentally acceptable anti-termite repellent mainly adequate for both termite types "Odontermus Formosanus" and "Copottermes Frenchi" shall be added to the outer jacket. The chemical product used as repellent shall be stated by Tenderers, but they

should not include materials harmful to mankind and/or the environment. Undesirable products such as Aldrin, Dieldrin and Lindane are not accepted.

The thickness of the outer sheath shall be equal to the nominal value specified in sub clause 13.3 and sub-clause 16.5.3

Outer sheath thickness		
Cable	**Minimal in any particular point**	**Nominal**
LSZH 1x35 mm2	0.9 mm	1.4 mm

5.6 Cable Marking

a) The identification of cable shall be clearly marked by an embossing method along one line the cable outer-sheath with the following information:

"CEM - PO *(Purchase order number)* - (*Manufacturer name*) - (*Year of manufacture*) – Rated voltage - Type and conductor section (LSZH 1x35 mm2)"

b) The minimum height of the letters should be 5 (five) mm with a thickness not exceeding 0.5 mm.

c) The above-mentioned identification should be repeated throughout the cables at regular intervals and the gap between the end of one set of embossed characters and the beginning of the next shall not exceed 150mm.

6. Tests

6.1 General

The tests to be carried out on complete cables shall be according with IEC 60502-1, IEC60502-2 and IEC60811.

Factory tests mentioned in this specification or proposed by manufacturer will be carried out at manufacturer's expense.

CEM reserves the right to inspect cable during manufacturing process.

Whenever no clear definition is given on when there are doubts, the conditions to carry out such tests and their results should meet IEC Publications, whether applicable.

6.2 Testing Facilities

a) The suppliers/ tenderer shall clearly state as to what testing facilities are available in the works of manufacturer and whether the facilities are adequate to carry out Sample, Type, Routine and Acceptance Tests mentioned in this specification.

b) The facilities and calibration certification shall be provided by the bidder to purchaser's representative for witnessing the Tests in the manufacturer's works.

c) If any test cannot be carried out at manufacturer's works reason should be clearly stated in the tender.

6.3 Type Tests

a) Submission of Type Test reports (include non-electrical tests for ST8 under IEC 60502-1 clause18, Table 14 to 23 if applicable) is compulsory.

The type tests and their sequence shall be performed in accordance with IEC 60502-1, clauses 17 (electrical) and 18 (non-electrical), IEC 60502-2, clauses 19.24 (water penetration test) and IEC 60811.

b) Type Tests are required to be carried out from a sample of complete cable, 10 m to 15 m in length, from the first lot of cable ordered.

c) The sample for the Type Test will be drawn by the purchaser's representative and the Type Tests may be witnessed by him.

d) In case facilities of any of the Type Tests are not available at the works of the supplier, then such Type Test shall be carried out by the supplier at the Independent Laboratory at the cost of supplier.

e) Supplier, however, can claim exemption from carrying out Type Tests as above, provided such Type Tests were already conducted for an Independent Laboratory in the past within five years and if the test reports and certificates are acceptable. The cable sample in the type test report should be same as the cable which purchaser will purchase.

f) Submission of Type Test Reports together with tender document will given ADVANTAGE in tender evaluation.

6.4 Sample Tests

CEM requires sample tests, which are as follows:

a) Conductor examination and check of dimensions (measurement of the thickness of the insulation, over-sheath, metallic screen and measurement of the overall diameter) according to IEC 60502-1, sub-clauses 16.2.1, sub-clause 16.4, sub-clause 16.5, sub-clause 16.7 and sub-clause 16.8.

b) Physical tests according to IEC 60502-1, sub-clauses 16.2.2, to be carried out on a number of samples taken from manufactured cables according to the table 12 of IEC 60502-1, sub-clause 16.2.2 as follows:

Cable Length		Number of Samples for Sample Test
Above km	Up to and including km	

0.49	10	1
10	20	2
20	30	3
Etc.		Etc.

c) Hot set test, according to IEC 60502-1, sub-clause 16.9.

A copy of Sample Tests Reports must be compulsorily submitted to CEM. Supplier should inquire CEM's opinion for the cable drum which will take the cable sample.

6.5 Routine Tests

a) The submission of Routine Test reports before the delivery of the Drums is compulsory.

b) All the Routine Tests as per to IEC 60502-1, clauses 15, amended up to date, shall be carried out on each and every delivery length of cable (delivery drum).

c) Required routine tests are as follows:

c.1) Measurement of the electrical resistance of conductors, according to IEC 60502-1, sub-clause 15.2.

c.2) Measurement of the electrical resistance of metallic screen. The measurement method can refer to IEC 60502-1, sub-clause 15.2.

c.3) Voltage test, according to IEC 60502-1, sub clause 15.3.

The voltage test shall be made at ambient temperature, using either alternating voltage at power frequency or direct voltage, at the manufacturer's option.

The test voltage shall be applied for 5 min in succession between each insulated conductor and all the other conductors and each insulated conductor and metallic screen.

6.6 Acceptance Tests

a) Factory acceptance testing are performed before equipment ships to work out design and manufacturing flaws, and the acceptance procedures are as follows:

a.1) Inspection of the complete cable.

a.2) Carrying out of the Routine and Sample Test before listed in sub-clauses 6.4 and 6.5.

b) Testing upon receipt will be performed after delivery but before the equipment is signed for to ensure the shipment arrived intact.

6.7 Tests after Installation

These tests shall be carried out when the installation of the cables and its accessories has been completed and they shall be performed according to IEC 60502-1, clause 19, as follows:

- A d.c. voltage equal to 2.5 kV (4 U0) is applied for 15 min.

7. Conditions on Package and Transport

7.1 Conditional on package and transportation of the cables

a) The goods are to be deliverer in good condition of maintenance and safety and the Tenderer shall assure the packing in the best conditions in order to avoid any damage transport and storage.

b) A copy of the packing list shall be forward to CEM prior to dispatch of the goods.

c) The cable should be placed in non-returnable wood drums or steel drums so that it will be protected against deterioration during sea freight transportation, storage or intermediate operations. The ends will have to be adequately tied to the reel.

d) The minimum diameter for the cable wiring into the reel should be sufficient to guarantee the adequate packing and transport of the cable, thus eliminating any sort of damage risk.

e) Each end of the cable length should be adequately sealed with end caps before shipment in order to prevent the penetration of humidity or contaminating elements.

f) Each cable length specified by CEM should be sent on a separate drum, unless otherwise specified.

g) The goods delivered are only considered accepted after being accurately examined on arrival, the Supplier remaining responsible for any damage or loss, which occurs.

7.2 Drums

7.2.1 Steel drums (option 1)
Cable shall be packed on non-returnable steel drums. The cable drum shall be arranged to take a round spindle bar 150mm diameter. Both ends of the cable shall be firmly secured.

To prevent damage to the cable during storage and transit, the cable drums shall be covered with at least 6 pieces of curved steel plates equally spaced on the rim of drum. The thickness of the steel plate shall not be less than 1.5mm. Each steel plate shall be fixed using at least 4 Nos. of bolt and not onto the flanges of drum.

The clearance between coiled cable and curved steel plates must be careful designed by supplier taking into account the gross weight of the drum and the width of the drum.

Cable drums delivered with broken steel plates or seriously dented steel plates will be rejected immediately.

The steel plates must be so arranged to ensure safety during removal of steel plates when the drum is opened.

The cable drum shall be of robust construction so as to suit shipping and transport requirements and to suit outdoor storage for at least 24 months. Details of the cable drum and steel plates shall be submitted with the Tender.

The finished cable drums shall be undergone suitable termite fumigation treatment. All materials used inside cable drums for supporting or protecting the cable shall be free of cellulose materials, linen material or cotton ropes. The supplier must state all the details in Technical Schedule if such cellulose materials, linen material or cotton ropes are used

Timber battens on the rim of cable drum will **not** be accepted

The tenders should propose the following two options for CEM considerations: -
Option 1) 1000m per cable drum (metallic).
Option 2) 500m per cable drum (metallic).

The cable length per drum will be delivered with a tolerance -3 to +10 meter.

The manufacturer must take all possible precautions to prevent the presence of appreciable quantities of inflammable gases inside the drums.

7.2.2 Wooden drum (option 2)

Cables shall be delivered in solid wooden drums made of resinous wood, and chemically treated against termites and humidity. They must have got adequate protection against deterioration during transport (special care shall be taken for sea freight), storage, and intermediate operations.

The drum core shall be larger than the minimum bending radius of the cable. The cable ends have to be firmly fastened to the reel. The distance between the outer cable layer and the lagging shall be sufficient to avoid cable damages

Care shall be taken to avoid that nails, screws, or other sharp objects, used in drum manufacturing or lagging fixing, might damage the cable.

The cable length per drum shall be delivered with a tolerance -3 to +10 meter

7.3 Drum marking

Each drum should be marked with a resistant label duly attached to the drum, indicating:

a) Destination
b) CEM Purchase Order no.
c) Drum no.
d) Length per drum
e) Conductor type and section
f) Insulation type
g) Rated voltage
h) Direction of Drum Rolling

Drums should not mention other information than that referring to this order.

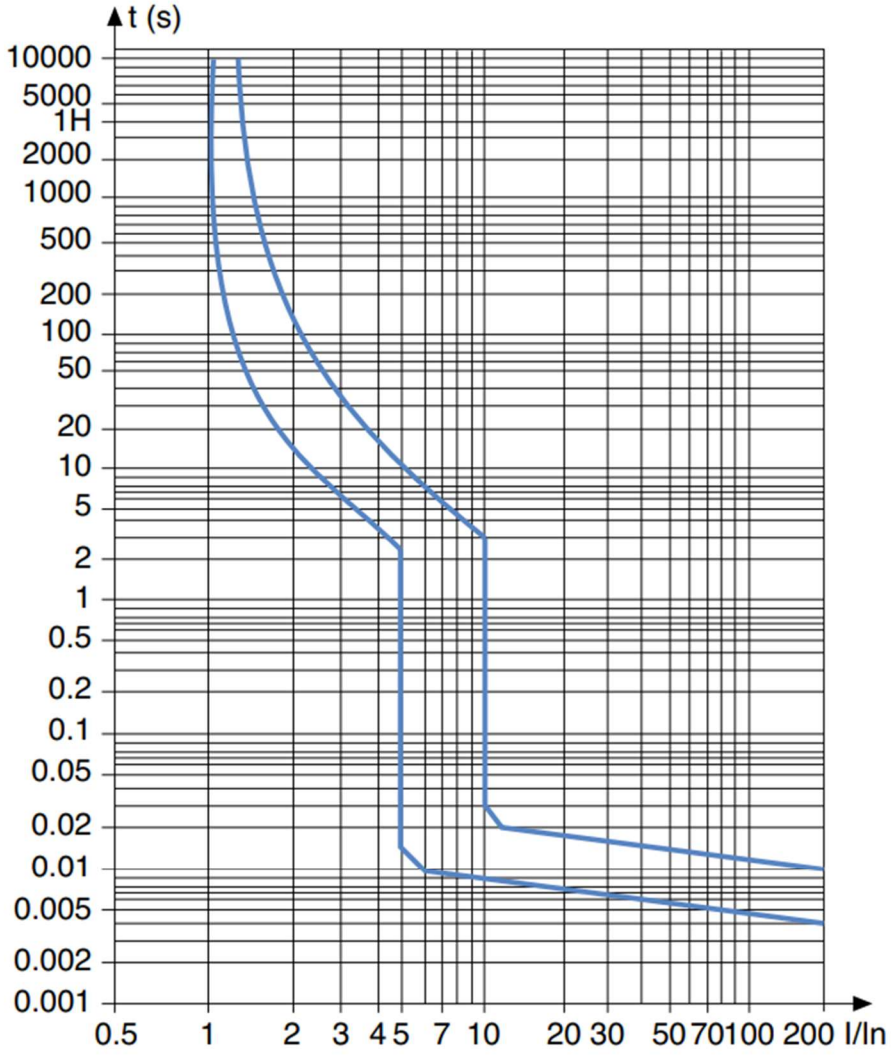
8. Technical data to be supplied with Tenders.

a) The attached Data Schedule, completely filled (original paper and electronic copy), where shall be specified all cable components, materials, dimensions, and characteristics as well the schematic cross-section of the proposed cable, which must be correctly represented and completed with adequate references and Type Tests Report concerned to the proposed cable.

a) Electronic copy of the list of cables already manufactured, for voltages similar or above of the required, including the following information:

- Characteristics
- Date of manufacturing
- Buyer
- Length of supplied cable
- Date of installation, if available

9. Protection Curve



C68N C Curve/C型曲線

DS-C-33-042/P
October 2023

LSZH 1 x 35 mm2 cable

Data Schedule

Circular Copper conductors, XLPE insulated, Copper wire screen, LSZH outer sheath, Low Voltage Cable.

Tender	PLD
Supplier	

CEM Code	Description
300xxxx	**Cable LSZH 1 x 35 mm^2.**

DATA SCHEDULE			
Tender PLD -			
Cable reference			
Manufacturer			
Place of manufacture			
Standards meet:			
Rated voltage Uo/U(Um) (kV)			
Pos	**Description**	**Unit**	**Data**
1	Materials, dimensions, geometric and mechanical characteristics.		
1.1	Cable schematic cross section		See Appendix 1
1.2	Phase conductors		
	- Material		
	- Class		
	- Core type, according to IEC 60228		
	- Shape		
	- Cross sectional area	mm^2	
	- Number of wires		
	- Diameter of wire	mm	
	- Diameter of phase conductors	mm	
1.3	Insulation		
	- Material		
	- Cross-linking process		
	Insulation of phase conductors		
	- Nominal thickness of insulation on phase conductors	mm	
	- Minimal thickness of insulation on phase conductors	mm	
	- Color of insulation on phase conductors		
	- Diameter over insulation on phase conductors	mm	

DATA SCHEDULE			
Pos	**Description**	**Unit**	**Data**
1.4	Metallic screen		
	- Water-block design (y/n)		
	- Number of copper wires (No.)		
	- Nominal diameter of each copper wire (mm)		
	- Copper equivalent cross section (mm^2)	mm	
	- Contra helical Copper tape (y/n)	mm	
	- Resistance at 20°C (Ohm/Km)	mm	
1.5	Outer sheath		
	- Material		
	- Compound type according to IEC 60502-1		
	- Anti-termite repellent (brand and reference)		
	- Color of the outer sheath		
	- Nominal thickness of the outer sheath	mm	
	- Minimum thickness of the outer sheath	mm	
	- Overall diameter of the cable	mm	
	- Maximum diameter of the cable	mm	
	- Minimal diameter of the cable	mm	
	- Shore D Hardness (ISO 868 1s)		
1.6	Bending Radius		
	- At the cable laying	mm	
	- After cable laying	mm	

DATA SCHEDULE			
Pos	**Description**	**Unit**	**Data**
1.7	Maximum pulling tension while cable laying		
	- Pulling eye on conductor	daN	
	- Stocking grip on outer sheath	daN	
1.8	Weight of cable	kg/m	
1.9	Standard Drum length	m	
1.10	Weight of Drum with the cable	kg	
2	Electrical Parameters		
2.1	DC resistance of conductors at 20°C		
	- Phase conductors	Ohm/km	
	- Metallic screen	Ohm/km	
2.2	AC resistance of conductors at 90°C		
	- Phase conductors	Ohm/km	
	- Metallic screen	Ohm/km	
2.3	Equivalent star reactance (per phase) of cable at 50 Hz	Ohm/km	
3	Voltage Performances		
3.1	Short-duration withstand voltage		
	- AC voltage	kV	
	- Duration	min	
3.2	Test after installation (new cables, only)		
	- DC voltage	kV	
	- Duration	min	
4	Operation Performance		
4.1	Temperature of Conductor		
	Maximum Temperature of Conductor	°C	
	Recommended temperature of conductor, taking in consideration both insulation and outer sheath materials	°C	
4.2	Maximum rated current		
	- Laid direct in ground, depth of burial 0.80 m, soil temperature 30°C , soil thermal resistivity 1.0°C m/w, at conductor temperature 90°C	A	

DATA SCHEDULE			
Pos	**Description**	**Unit**	**Data**
	- Laid in duct-banks composed by parallel 0.15 m diameter PVC pipes embedded in concrete bed, depth of burial 0.80 m, soil temperature 30°C, soil thermal resistivity 1.0°C m/w, at conductor temperature 90°C	A	
	- Laid direct in air, ambient temperature 40°C, on metal ladder protected from direct solar radiation, at conductor temperature 90°C	A	
	- Laid direct in air, ambient temperature 40°C, on floor ladder protected from direct solar radiation, at conductor temperature 90°C	A	
4.3	Rating Factors		See Appendix II
5	Short-circuit Performances		
5.1	- Maximum permissible temperature of conductor	°C	
5.2	- Conductor short-time withstand current (1s, 5s and 10s)	kA	
5.3	- Temperature of conductor at the start of short-circuit	°C	
5.4	- Temperature of conductor at the end of short-circuit	°C	
5.5	- Maximum permissible temperature of Metallic screen	°C	
5.6	- Metallic screen short-time withstand current (1s and 10s)	kA	
5.7	- Temperature of metallic screen at the start of short-circuit	°C	
5.8	- Temperature of metallic screen at the end of short-circuit	°C	

Notes:

DATA SCHEDULE

APPENDIX I

SCHEMATIC CROSS-SECTION OF PROPOSED CABLE

(All materials, thickness and diameters correctly indicated)

DATA SCHEDULE

APPENDIX II

CURRENT RATING FACTORS

1	**CABLES IN GROUND**

1.1. Rating Factors for Soil Temperature

Conductor Temperature	Soil Temperature					
	20°C	25°C	30°C	35°C	40°C	45°C
90°C						

1.2. Rating Factors for Soil Thermal Resistivity

Conductor temperature:90° C	Soil thermal resistivity °C m / W					
	0.6	0.8	1.0	1.2	1.4	1.6
Rating factor						

1.3. Rating Factors for Laying Depth

Depth of laying	0.60 m	0.80 m	1.00 m	1.20 m	1.40 m
Rating factor					

SUPPLY OF MATERIALS FOR PUBLIC LIGHTING – CABLES

IV.
CEM Safety, Health, Environment and Quality Requirements & Responsibilities for Materials Suppliers
(Version 5)

TENDER REF.: **PLD-MP396/23/55**

CEM

SAFETY, HEALTH, ENVIRONMENT

AND QUALITY

REQUIREMENTS & RESPONSIBILITIES

FOR MATERIALS SUPPLIERS

(Version 5)

Date: 22nd January 2015

*Reference Document: PR1.01-02 CEM Purchasing Manual

1. CEM Policy in Safety, Health, Environment and Quality

As a provider of an essential service to the development of Macao and the well being of its population, CEM is aware of its specific responsibilities and dedicated to carrying out its activities in a sustainable way, with full respect for the legitimate expectations of all interested parties.

Therefore, CEM has established an Integrated Management System in conformity with applicable international standards (ISO 9001, ISO 14001, OHSAS 18001, ISO 14064 and ISO 20000). It will provide the framework for setting and reviewing objectives and targets in the Safety, Health, Environmental and Quality areas.

CEM committed to:

- Continuously and efficiently reducing the impact of its activities on the environment, enhancing the quality of its products and services, and improving safety and health conditions;
- Complying with all applicable legislation and regulations as well as other requirements to which it may proactively subscribe;
- Applying the best available sustainable technologies in order to minimize environmental impact and achieve the highest safety, health and quality standards;
- Developing internally a Safety, Health, Environmental and Quality culture by raising awareness, educating, and training employees to carry out their activities in a responsible manner;
- Promoting awareness in the above areas amongst customers, contractors, suppliers and Macao society;
- Improving communication with customers, general public and other interested parties, for mutual benefice, as a way of enhancing the ability of all to create value.

While CEM employees are responsible for understanding and complying with this Policy, CEM management is responsible for ensuring that it is fully implemented.

2. Environmental Law for the Suppliers

CEM also expects suppliers to comply with the following laws:

1) Decree no. 35/97/M dated 25 August 1997

- The supplier / contractor shall not discharge any harmful waste water, oils, other substance or residue that can cause pollution in the area adjacent to the territorial sea, ports, rivers, docks, beaches and other areas under the jurisdiction of the Maritime Administration.

- The supplier / contractor shall maintain safety all the time for their ship(s) during sailing, embarking, unloading and mooring. Pouring of waste or any other materials, such as lubricants and liquid fuel, into the sea is prohibited. It is also not allowed to pollute or occupy the areas that are under the jurisdiction of the Maritime Administration.

- The suppliers/contractors should comply with the safety rules that were set by the *Marine and Water Bureau*, for handling hazardous materials in the dock.

2) Decree no. 58/95/M dated 14 November 1995, article 268

Suppliers/contractors who do not comply with laws and regulations by performing the following actions will be penalized:

- Pollute water or soil, or by any other way degrade their quality;

- Pollute air by using machines or installations; or
- Produce disturbing noise by using equipment, installations or vehicles.

3) The suppliers/contractors shall ensure the safety of people and properties, and the quality of the environment, in accordance with Decree no.11/99/M dated 22 March 1999.

The above laws are not exhaustive. Suppliers should check the new environmental laws that are in force in Macao from time to time.

Below are list of Safety, Health & Environmental legislations in force in Hong Kong SAR and Mainland China that CEM also proactively subscribed to as additional requirements to be observed during service provision:

1) The Construction Sites (Safety) Regulations
2) The Factories and Industrial Undertakings (Safety Offices and Safety Supervisors) Regulations
3) The Factories and Industrial Undertakings (Confined Spaces) Regulations
4) The Factories and Industrial Undertakings Ordinance (Section 6A & 6B)
5) The Factories and Industrial Undertakings (Dangerous Substances) Regulations
6) The Dangerous Goods Ordinance
7) The Electricity (Wiring) Regulations
8) The Boiler and Pressure Receiver Ordinance
9) Noise Control Ordinance (Cap 400)
10) Air Pollution Control Ordinance (Cap 311)
11) Water Pollution Control Ordinance (Cap 358)
12) Waste Disposal Ordinance (Cap 354)
13) Waste Disposal (Chemical Waste) (General) Regulation (Cap 354)
14) Waste Disposal (Charges for Disposal of Construction Waste) Regulation (Cap 354)
15) Ozone Layer Protection Ordinance (Cap.403)
16) Dumping at Sea Ordinance (Cap. 466)
17) Environmental Impact Assessment Ordinance (Cap. 499)
18) Regulations on the Safety Administration of Dangerous Chemicals
19) Inventory of the Forbidden Import Chemicals and the Strictly Controlled Import Toxic Chemicals
20) Regulation of the First-Import Chemicals and the Import/Export Toxic Chemicals
21) Provisional Regulations on Environmental Protection in Cases of Wastes Importation
22) Regulations of the People's Republic of China on the Control Over Dumping Wastes into the Sea Waters
23) Control over prevention of pollution by vessels in sea waters
24) Control over dumping wastes into the sea waters
25) Prevention and Control of Atmospheric Pollution
26) Prevention and Control of Pollution from Environmental Noise
27) Prevention and Control of Water Pollution
28) Environmental Protection Law of the PRC
29) Water Law of the PRC
30) Inventory of the Hazard Wastes

3. Responsibility of CEM Materials Suppliers

CEM suppliers are responsible for understanding and complying with the above Policy as well as the regulations stated in Section 2. **In case the suppliers/contractors offend against the laws as stated in this document, which leads to environmental pollution and the likes, they are fully responsible to provide remedy for the problem. Otherwise, CEM reserves the right to terminate the contract/purchase order.**

3.1 CEM suppliers are required to submit the following documents to CEM with their proposal **(Please specify if not applicable):**

1) Technical notice for any equipment and/or safety data sheet ***for any chemical materials including the potential impact and risk on environment, and the safety risk for users***.

These documents usually include:

- A general description

_____

_____

- Physical data

_____

_____

- Stability, toxicology for chemical products

_____

_____

- Transport and handling information

_____

_____

- Individual protection tools

_____

_____

- Certificate(s) of calibration of the measuring equipment

_____

_____

- Training records and experience of the staff for operating the measuring equipment

_____

_____

2) Disposition or treatment of waste:
A detailed description of how to dispose waste (in the form of gas, liquid and solid) during the execution and completion of work.

_____

_____

3.2 All materials or equipment should be identified and labeled with the international symbols (pictograms form) representing the dangers, when deliver to CEM.