KSERC – 3913/21 **15.01.2022**

To

The Secretary
Kerala State Electricity Regulatory Commission
K.P.F.C. Bhavanam, C.V. Raman Pillai Road,
Vellayambalam, Thiruvananthapuram – 695 010.

Sir,

Sub : Thrissur Corporation – Electricity Department – Capital Investment projects for control period 22 – 27 regarding.
Ref : Letter No. 2515/Con (F)/2021/KSERC/1107.

Capital investment projects of TCED for the control period 2022 – 2027 (7 copies plus one soft copy containing two volumes, volume I Revamped distribution sector scheme projects, volume II other projects) is submitted herewith.

DD No. 86209 of Federal Bank dt. 15.01.2022 of Rs. 10,000/- as petition fee for capital investment projects is attached.

TCED humbly requests to consider TCED's capital investment projects favorably.

Thanking you,

Yours faithfully,

Assistant Secretary

Enclosures:

1. Seven copies of Capital Investment projects.
2. One soft copy (CD)
3. DD No. 86209 of Federal Bank Dt. 15.01.2022 amounting Rs. 10,000/-.

J.15.01.2022.

Before the Hon'ble KSERC

Name of the licensee **Thrissur Corporation**
Implementing Project : **Electricity Department**

CAPITAL INVESTMENTS

2022 – 2027

INTRODUCTION

History

Thrissur Corporation Electricity Department (TCED) is one of the 10 Electricity Distribution Companies in the state of Kerala, under Electricity Act 2003. TCED has an operational history of 84 years, starting from August 1937. The area of TCED corresponds to the administrative limits of the old Thrissur Municipality limits covering an area of approximately 12.65 sq.km Serving Electricity to around 40000 consumers with an annual purchase of about 150 MU.

About the project

This is the capital investment project plan for the year 2022-2027. Each project includes the DPR (DETAILED PROJECT REPORT) of the same

Objectives of the Project

- Distribution system of TCED needs to be strengthened in time with modern needs
- TCED has to implement project tapping the source of renewable energy's like
    - solar energy
    - small hydel projects
- TCED intends to renovate its office look
- TCED with the aid of central government scheme (RDSS) put forth its plan in three major streams
    - Loss Reduction
    - Modernization
    - Smart Metering

TCED looks forward to a most modern distribution licencee by implementing its investment projects 2022-27

INDEX

VOLUME I

DPR of Various **RDSS(REVAMPED DISTRIBUTION SECTOR SCHEME)** project to be submitted(Attached separately)

VOLUME II

CHAPTER I

Installation of 200KW solar power plant

CHAPTER II

Renovation of office

CHAPTER III

Kannankuzhy small hydel project – 7 MW

CHAPTER II

THRISSUR CORPORATION ELECTRICITY DEPARTMENT

PROJECT AT A GLANCE

PROJECT NAME :- RENOVATION OF OFFICE

ESTIMATE COST :- **₹ 30,10,790 /-**

BUDGET PROVISION :- IT CAN BE MET OUT WITH INTERNAL

FUNDINGS

തീരുമാനം നമ്പർ 28 തിയ്യതി 16/9/2020

വിഷയം വിശദമായി ചർച്ച ചെയ്തു. വൈസ്പ്രസിഡന്റ് വിഭാഗ
സെക്ഷൻ ഓഫീസർക്കുള്ള തൊഴിലാളിയുടെ പ്രവൃത്തികൾ സുഗ
മമാക്കുന്നതിനും കാലഹരണപ്പെട്ട ഓഫീസ് സംവിധാനങ്ങൾ
നവീകരിക്കുന്നതിനുമായി തയ്യാറാക്കിയ 30,10,790/- രൂപയുടെ
എസ്റ്റിമേറ്റ് അംഗീകരിക്കുന്നതിനും വെബ്സൈറ്റ് സൗകര്യ
മായ തരത്തിൽ സിസ്റ്റം ഏർപ്പെടുത്തുന്നതിനും തീരുമാനിച്ചു.

(ഒപ്പ്)
മേയർ
ശരി പകർപ്പ്

കൗൺസിൽ സെക്രട്ടറി

KERALA SMALL INDUSTRIES DEVELOPMENT CORPORATION LIMITED
(AN UNDERTAKING OF THE GOVERNMENT OF KERALA)

MARKETING CENTRE, INDUSTRIAL ESTATE
OLLUR,THRISSUR – 680 306

Phone: 0487-2352447

e-mail: olrsidco@yahoo.in

TIN : 32070375494
CST : 0703C007549

എസ്എംസി/ഒഎൽആർ/ജനറൽ/2021-22 തിയ്യതി : 18-09-2021

ദി അസിസ്റ്റന്റ് സെക്രട്ടറി,
ഇലെക്ട്രിസിറ്റി ഡിപ്പാർട്മെൻറ്,
തൃശൂർ നഗരസഭ

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

സർ,

വിഷയം:സിഡ്കോ മാർക്കറ്റിംഗ് സെന്ററർ, ഒല്ലൂർ- തൃശൂർ നഗരസഭ -വൈദ്യുതി വിഭാഗം സെക്ഷൻ നവീകരണം -പുതുക്കിയ എസ്റ്റിമേറ്റ് സമർപ്പണം സംബന്ധിച്ച്:-

സൂചന:1) തൃശൂർ നഗരസഭ -വൈദ്യുതി വിഭാഗം കത്ത് നമ്പർ EDI-4571/20 Dt.05-08-2021

മേൽസൂചന പ്രകാരം തീയതിയിൽ അങ്ങയുടെ ഓഫീസിൽ ചേർന്ന യോഗത്തിലെ തീരുമാന പ്രകാരം അങ്ങയുടെ ഓഫീസിലെ വിവിധ സെക്ഷനുകളുടെ നവീകരണത്തിന് ആവശ്യമായ പുതുക്കിയ എസ്റ്റിമേറ്റ് തയ്യാറാക്കി നൽകുവാൻ അറിയിച്ചത് പ്രകാരമുള്ള എസ്റ്റിമേറ്റ് തുടർനടപടികൾക്കായി സമർപ്പിക്കുന്നു.

പുതുക്കിയ എസ്റ്റിമേറ്റിന്റെ വിശദാംശങ്ങൾ ചുവടെ ചേർക്കുന്നു.

Proforma Invoice Number & Date	Section	Total Amount
270/16-09-2021	Section 01 Office Room	6,03,819/-
271/16-09-2021	Section 04 Office Room	5,98,555/-
272/16-09-2021	Store Room	2,21,236/-
273/16-09-2021	Rest Room	1,65,927/-
274/16-09-2021	Section 02 Office Room	5,98,555/-
275/16-09-2021	Section 03 Office Room	5,29,737/-
276/16-09-2021	First Floor Office Room	2,92,961/-
	Total	30,10,790/-

വിശ്വസ്തതയോടെ,

Manager
SIDCO Marketing Centre
Industrial Estate

PROFORMA INVOICE

SIDCO MARKETING CENTRE OLLUR
SIDCO Marketing Centre,
Industrial Estate, Ollur
Ph:04872352447
GSTIN/UIN: 32AAACK9435C4ZT
State Name : Kerala, Code : 32
Contact : 0487-2352447
E-Mail : olrsidco@yahoo.in

Voucher No.	Dated
SMC OLR/PI/21-22/270	**16-Sep-21**
	Mode/Terms of Payment
Buyer's Ref./Order No.	Other References
SMC OLR/PI/21-22/270	
Dispatched through	Destination
City/Port of Loading	City/Port of Discharge

Consignee (Ship to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Terms of Delivery

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Buyer (Bill to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
1	**Staff Table** *(1200x600x750mm)* *Staff Table Made with 18mm Prelaminated HMR Board. and Four Sides Edge Banded, Joinery with Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism, Auto Close Drawer Slides System, Handles With Quality-Stick* *(FOR SECTION 01 OFFICE ROOM)*	9403	18 %	*16-Sep-21*	**6 nos**	11,000.00	nos	**66,000.00**
2	**Partition** *Staff Table Top Partion (Height-350mm) Partition Made with 18mm Prelaminated HMR Board. and Four Sides Edge Banded, Joinery With Mini Fixes and Dowel Systems.*	9403	18 %	*16-Sep-21*	**27.00 sqft.**	648.00	sqft.	**17,496.00**

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PROFORMA INVOICE(Page 2)

SIDCO MARKETING CENTRE OLLUR
SIDCO Marketing Centre,
Industrial Estate, Ollur
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Consignee (Ship to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
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Buyer (Bill to)

The Assistant Secretary,
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Terms of Delivery

Office of the Manager
Industrial Estate
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Thrissur
SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
3	**Partition** *(Height-1200mm) Partition Made with 18mm Prelaminated HMR Board. and Four Sides Edge Banded, Joinery with Mini Fixes and Dowel Systems.*	9403	18 %	*16-Sep-21*	**94.00 sqft.**	675.00	sqft.	**63,450.00**
4	**Table** *AE Table(1400x600x750mm) AE Table Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.Hardware Includes Auto Close Hinge Mechanism, Auto Close Drawer Slides System, Handles with Quality Stick.*	9403	18 %	*16-Sep-21*	**1 nos**	15,400.00	nos	**15,400.00**

continued ...

PROFORMA INVOICE(Page 3)

SIDCO MARKETING CENTRE OLLUR SIDCO Marketing Centre, Industrial Estate, Ollur Ph:04872352447 GSTIN/UIN: 32AAACK9435C4ZT State Name : Kerala, Code : 32 Contact : 0487-2352447 E-Mail : olrsidco@yahoo.in	Voucher No. **SMC OLR/PI/21-22/270**	Dated **16-Sep-21**	
		Mode/Terms of Payment	
	Buyer's Ref./Order No. **SMC OLR/PI/21-22/270**	Other References	
Consignee (Ship to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32	Dispatched through	Destination	
	City/Port of Loading	City/Port of Discharge	
Buyer (Bill to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32	Terms of Delivery Office of the Manager Industrial Estate Ollur Thrissur SIDCO Marketing Centre		

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
5	**Table** *DRAFTSMAN TABLE (1400x600x750mm) Table Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes And Dowel Systems.Hardware Includes Auto Close Hinge Mechanism,Auto Close Drawer Slides System, Handles with Quality-Stick.*	9403	18 %	*16-Sep-21*	**1 nos**	15,400.00	nos	**15,400.00**
6	**Partition** *Storage Unit 01 (1800x450x2400mm(H))Storage Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Min Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism,Handles with Quality Stick.*	9403	18 %	*16-Sep-21*	**47.00 sqft.**	1,512.00	sqft.	**71,064.00**

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PROFORMA INVOICE(Page 4)

SIDCO MARKETING CENTRE OLLUR
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Consignee (Ship to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
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Buyer (Bill to)

The Assistant Secretary,
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SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
7	**Partition** *Storage Unit 02* *(1590x430x2300mm(H))* *Storage Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.Hardware Includes Auto Close Hinge Mechanism,Handles with Quality-Stick.*	9403	18 %	*16-Sep-21*	**39.00 sqft.**	1,512.00	sqft.	**58,968.00**
8	**Stool** *(400x400x450mm(H))* *Stool Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.*	9402	18 %	*16-Sep-21*	**4 nos**	4,400.00	nos	**17,600.00**
9	**Conference Table** *(1500x1000x750mm)* *Conference Table Is Made With 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.*	9403	18 %	*16-Sep-21*	**1 nos**	28,673.00	nos	**28,673.00**

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PROFORMA INVOICE(Page 5)

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Buyer's Ref./Order No.	Other References
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Dispatched through	Destination
City/Port of Loading	City/Port of Discharge

Consignee (Ship to)
The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Buyer (Bill to)
The Assistant Secretary,
Electricity Department, Thrissur Corporation.
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State Name : Kerala, Code : 32

Terms of Delivery

Office of the Manager
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Thrissur
SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
10	**Bench** *Conference Room Bench With Upholstery (1500x5000x450mm) Conference Room Bench with Upholstery Is Made With 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery With Mini Fixes and Dowel Systems with Upholstery.*	9403	18 %	*16-Sep-21*	**2 nos**	10,450.00	nos	**20,900.00**
11	**Partition** *Wall Full Height Partition Is Made with Gypsum Board With Frame Work(with Putty Paint)*	9403	18 %	*16-Sep-21*	**377.00 sqft.**	205.20	sqft.	**77,360.40**
12	**Architrave for Doors**	9403	18 %	*16-Sep-21*	**2 nos**	13,200.00	nos	**26,400.00**
13	**Door** *Doors Is Made with Block Board with Laminate Finish.*	9403	18 %	*16-Sep-21*	**2 nos**	16,500.00	nos	**33,000.00**
								5,11,711.40
	Central Tax							**46,054.03**
	Less : ***State Tax***							**46,054.03**
	Roundoff							**(-)0.46**
	Total							**₹ 6,03,819.00**

Amount Chargeable (in words)
INR Six Lakh Three Thousand Eight Hundred Nineteen Only

E. & O.E

Company's PAN : **AAACK9435C**

for SIDCO MARKETING CENTRE OLLUR

Authorised Signatory

This is a Computer Generated Document

MANAGER
SIDCO Marketing Centre

PROFORMA INVOICE

SIDCO MARKETING CENTRE OLLUR
SIDCO Marketing Centre,
Industrial Estate, Ollur
Ph:04872352447
GSTIN/UIN: 32AAACK9435C4ZT
State Name : Kerala, Code : 32
Contact : 0487-2352447
E-Mail : olrsidco@yahoo.in

Voucher No. **SMC OLR/PI/21-22/274**	Dated **16-Sep-21**
	Mode/Terms of Payment
Buyer's Ref./Order No. **SMC OLR/PI/21-22/274**	Other References
Dispatched through	Destination
City/Port of Loading	City/Port of Discharge

Consignee (Ship to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Buyer (Bill to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
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Terms of Delivery

Office of the Manager
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SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
1	**Partition** *STORAGE UNIT 01 (1800X450X2400mm(H)) Storage Unit Is Made With18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.Hardware Includes Auto Close Hinge Mechanism,Handles with Quality-Stick (SECTION 02 OFFICE ROOM*	9403	18 %	*16-Sep-21*	**47.00 sqft.**	1,512.00	sqft.	**71,064.00**
2	**Partition** *STORAGE UNIT 02 1340X430X2300mm(H)) Storage Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems. Hardware Includes.Auto Close Hinge Mechanism, Handles With Quality-Stick*	9403	18 %	*16-Sep-21*	**33.00 sqft.**	1,512.00	sqft.	**49,896.00**

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PROFORMA INVOICE(Page 2)

SIDCO MARKETING CENTRE OLLUR
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Consignee (Ship to)
The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Buyer (Bill to)
The Assistant Secretary,
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Terms of Delivery

Office of the Manager
Industrial Estate
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SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
3	**Partition** *STORAGE UNIT 03 (1350X310X2840mm(H)) Storage Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.Hardware Includes Auto Close Hinge Mechanism,Handles with Quality-Stick*	9403	18 %	*16-Sep-21*	**41.00 sqft.**	1,404.00	sqft.	**57,564.00**
4	**Partition** *STORAGE UNIT 04 1350X310X2250MM(H)) Storage Unit Is Made with 18mm Prelaminated HMR Board.Four Sides Edge Banded Joinery with Mini Fixes and Dowel System. Hardware, Includes Auto Close Hinge Mechanism,Handles with Quality-Stick*	9403	18 %	*16-Sep-21*	**33.00 sqft.**	1,404.00	sqft.	**46,332.00**

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PROFORMA INVOICE(Page 3)

SIDCO MARKETING CENTRE OLLUR SIDCO Marketing Centre, Industrial Estate, Ollur Ph:04872352447 GSTIN/UIN: 32AAACK9435C4ZT State Name : Kerala, Code : 32 Contact : 0487-2352447 E-Mail : olrsidco@yahoo.in	Voucher No. **SMC OLR/PI/21-22/274**	Dated **16-Sep-21**	
		Mode/Terms of Payment	
	Buyer's Ref./Order No. **SMC OLR/PI/21-22/274**	Other References	
	Dispatched through	Destination	
	City/Port of Loading	City/Port of Discharge	

Consignee (Ship to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Buyer (Bill to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Terms of Delivery

Office of the Manager
Industrial Estate
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Thrissur
SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
5	**Partition** *STORAGE UNIT 05 (1350X300X2900mm(H)) Storage Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Bandedjoinery with Mini Fixes And Dowel System.Hardware Includes Auto Close Hinge Mechanism,Handles with Quality-Stick*	9403	18 %	*16-Sep-21*	**42.00 sqft.**	1,404.00	sqft.	**58,968.00**
6	**Partition** *STORAGE UNIT 06 (790X300X2400MM(H)) Storage Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism, Handles With Quality-Stick*	9403	18 %	*16-Sep-21*	**20.00 sqft.**	1,404.00	sqft.	**28,080.00**

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PROFORMA INVOICE(Page 4)

Kerala Sidco	**SIDCO MARKETING CENTRE OLLUR** SIDCO Marketing Centre, Industrial Estate, Ollur Ph:04872352447 GSTIN/UIN: 32AAACK9435C4ZT State Name : Kerala, Code : 32 Contact : 0487-2352447 E-Mail : olrsidco@yahoo.in	Voucher No. **SMC OLR/PI/21-22/274**	Dated **16-Sep-21**
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Buyer (Bill to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32		Terms of Delivery	

Office of the Manager
Industrial Estate
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SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
7	**Stool** *(400x400x450mm(H))* *Stool Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.*	9402	18 %	*16-Sep-21*	**4 nos**	4,400.00	nos	**17,600.00**
8	**Staff Table** *(1200x600x750mm)* *Staff Table Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems,Hardware Includes Auto Close Hinge Mechanism,Auto Close Drawer Slides System,Handles With Quality-Stick*	9403	18 %	*16-Sep-21*	**6 nos**	11,000.00	nos	**66,000.00**

continued ...

PROFORMA INVOICE(Page 5)

SIDCO MARKETING CENTRE OLLUR
SIDCO Marketing Centre,
Industrial Estate, Ollur
Ph:04872352447
GSTIN/UIN: 32AAACK9435C4ZT
State Name : Kerala, Code : 32
Contact : 0487-2352447
E-Mail : olrsidco@yahoo.in

Voucher No.	Dated
SMC OLR/PI/21-22/274	**16-Sep-21**
	Mode/Terms of Payment
Buyer's Ref./Order No.	Other References
SMC OLR/PI/21-22/274	
Dispatched through	Destination
City/Port of Loading	City/Port of Discharge

Consignee (Ship to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Terms of Delivery

Buyer (Bill to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
9	**Partition** *STAFF TABLE TOP PARTITION (HEIGHT 350mm) Partition Made with 18mm Prelaminated HMR Board. Foursides Edge Banded Joinery with Mini Fixes and Dowel Systems.*	9403	18 %	*16-Sep-21*	**27.00 sqft.**	648.00	sqft.	**17,496.00**
10	**Partition** *(HEIGHT.1200mm) Partition Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.*	9403	18 %	*16-Sep-21*	**94.00 sqft.**	675.00	sqft.	**63,450.00**
11	**Table** *AE TABLE(1400X600X750mm) AE Table Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery With Mini Fixesand Dowel Systems.Hardware Includes Auto Close Hinge Mechanism, Auto Close Drawer Slides System, Handles with Quality-Stick*	9403	18 %	*16-Sep-21*	**1 nos**	15,400.00	nos	**15,400.00**

continued ...

PROFORMA INVOICE(Page 6)

Kerala Sidco

SIDCO MARKETING CENTRE OLLUR
SIDCO Marketing Centre,
Industrial Estate, Ollur
Ph:04872352447
GSTIN/UIN: 32AAACK9435C4ZT
State Name : Kerala, Code : 32
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Voucher No.	Dated
SMC OLR/PI/21-22/274	**16-Sep-21**
	Mode/Terms of Payment
Buyer's Ref./Order No.	Other References
SMC OLR/PI/21-22/274	
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Consignee (Ship to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Terms of Delivery

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Buyer (Bill to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
12	**Table** *DRAFTSMAN TABLE (1400X600X750mm) Draftsman Table with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.Hardware Includes Auto Close Hinge Mechanism, Auto Close Drawer Slides System Handles with Quality-Stick*	9403	18 %	*16-Sep-21*	**1 nos**	15,400.00	nos	**15,400.00**
								5,07,250.00
	Central Tax							**45,652.50**
	State Tax							**45,652.50**
	Total							**₹ 5,98,555.00**

Amount Chargeable (in words)
INR Five Lakh Ninety Eight Thousand Five Hundred Fifty Five Only

E. & O.E

Company's PAN : **AAACK9435C**

for SIDCO MARKETING CENTRE OLLUR

Authorised Signatory

MANAGER
SIDCO Marketing Centre

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PROFORMA INVOICE

SIDCO MARKETING CENTRE OLLUR
SIDCO Marketing Centre,
Industrial Estate, Ollur
Ph:04872352447
GSTIN/UIN: 32AAACK9435C4ZT
State Name : Kerala, Code : 32
Contact : 0487-2352447
E-Mail : olrsidco@yahoo.in

Voucher No. **SMC OLR/PI/21-22/275**	Dated **16-Sep-21**
	Mode/Terms of Payment
Buyer's Ref./Order No. **SMC OLR/PI/21-22/275**	Other References
Dispatched through	Destination
City/Port of Loading	City/Port of Discharge
Terms of Delivery	

Consignee (Ship to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Buyer (Bill to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
1	**Staff Table** *(1200X600X750mm)* *Staff Table Made with 18mm Prelaminated HMR Board. And Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.Hardware Includes Auto Close Hinge Mechanism,Auto Close Drawer Slides System, Handles with Quality-Stick* *(SECTION 3 OFFICE ROOM)*	9403	18 %	*16-Sep-21*	**6 nos**	11,000.00	nos	**66,000.00**
2	**Partition** *STAFF TABLE TOP PARTITION (HEIGHT 350mm)* *Partion Made with 18mm Prelaminated HMR Board. And Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.*	9403	18 %	*16-Sep-21*	**27.00 sqft.**	648.00	sqft.	**17,496.00**

continued ...

PROFORMA INVOICE(Page 2)

Kerala Sidco	**SIDCO MARKETING CENTRE OLLUR** SIDCO Marketing Centre, Industrial Estate, Ollur Ph:04872352447 GSTIN/UIN: 32AAACK9435C4ZT State Name : Kerala, Code : 32 Contact : 0487-2352447 E-Mail : olrsidco@yahoo.in	Voucher No. **SMC OLR/PI/21-22/275**	Dated **16-Sep-21**
			Mode/Terms of Payment
		Buyer's Ref./Order No. **SMC OLR/PI/21-22/275**	Other References
Consignee (Ship to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32		Dispatched through	Destination
		City/Port of Loading	City/Port of Discharge
Buyer (Bill to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32		Terms of Delivery	

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
3	**Partition** *HEIGHT-1200mm)* *Partition Made With18mm Prelaminated HMR Board.* *And Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.*	9403	18 %	*16-Sep-21*	**94.00 sqft.**	675.00	sqft.	**63,450.00**
4	**Table** *AE TABLE(1400X600X750mm)* *AE Table Is Made with 18mm Prelaminated HMR Board.* *Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.Hardware Includes Auto Close Hinge Mechanism, Auto Close Drawer Slides System,* *Handles with Quality-Stick.*	9403	18 %	*16-Sep-21*	**1 nos**	15,400.00	nos	**15,400.00**

continued ...

PROFORMA INVOICE(Page 3)

SIDCO MARKETING CENTRE OLLUR SIDCO Marketing Centre, Industrial Estate, Ollur Ph:04872352447 GSTIN/UIN: 32AAACK9435C4ZT State Name : Kerala, Code : 32 Contact : 0487-2352447 E-Mail : olrsidco@yahoo.in	Voucher No. **SMC OLR/PI/21-22/275**	Dated **16-Sep-21**
		Mode/Terms of Payment
	Buyer's Ref./Order No. **SMC OLR/PI/21-22/275**	Other References
Consignee (Ship to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32	Dispatched through	Destination
	City/Port of Loading	City/Port of Discharge
Buyer (Bill to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32	Terms of Delivery Office of the Manager Industrial Estate Ollur Thrissur SIDCO Marketing Centre	

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
5	**Table** *DRAFTSMAN TABLE (1400X600X750mm) Draftsman Table Is Made With 18mm Prelaminated HMR Board.Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems, Hardware Includes Auto Close Hinge Mechanism,Autoclose Drawer Slides System, Handles with Quality-Stick.*	9403	18 %	*16-Sep-21*	**1 nos**	15,400.00	nos	**15,400.00**
6	**Partition** *STORAGE UNIT-01 (1800X450X2400mm) Storage Unit Is Made with 18mm Interior Grade Prelaminated Particle Boards. Four Sides Edge Banded Joinery With Mini Fixes and Dowel Systems.Hardware Includes Autoclose Hinge Mechanism, Handles with Quality-Stick*	9403	18 %	*16-Sep-21*	**47.00 sqft.**	1,512.00	sqft.	**71,064.00**

continued ...

PROFORMA INVOICE(Page 4)

SIDCO MARKETING CENTRE OLLUR
SIDCO Marketing Centre,
Industrial Estate, Ollur
Ph:04872352447
GSTIN/UIN: 32AAACK9435C4ZT
State Name : Kerala, Code : 32
Contact : 0487-2352447
E-Mail : olrsidco@yahoo.in

Voucher No.	Dated
SMC OLR/PI/21-22/275	**16-Sep-21**
	Mode/Terms of Payment
Buyer's Ref./Order No.	Other References
SMC OLR/PI/21-22/275	
Dispatched through	Destination
City/Port of Loading	City/Port of Discharge

Consignee (Ship to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Terms of Delivery

Buyer (Bill to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
7	**Partition** *STORAGE UNIT-02 (1330X310X2260mm) Storage Unit Is Made with 18mm Interior Grade Prelaminated Particle Board. Four Sides Edge Banded Joinery With Mini Fixes and Dowel Systems.Hardware Includes Auto Close Hinge Mechanism, Handles with Quality-Stick.*	9403	18 %	*16-Sep-21*	**32.00 sqft.**	1,404.00	sqft.	**44,928.00**
8	**Partition** *STORAGE UNIT-03 (1330X320X2750mm) Storage Unit Is Made with 18mm Interior Grade Prelaminated Particle Boards. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.Hardware Includes Autoclose Hinge Mechanism,Handles with Quality-Stick*	9403	18 %	*16-Sep-21*	**39.00 sqft.**	1,404.00	sqft.	**54,756.00**

continued ...

PROFORMA INVOICE(Page 5)

Kerala Sidco	**SIDCO MARKETING CENTRE OLLUR** SIDCO Marketing Centre, Industrial Estate, Ollur Ph:04872352447 GSTIN/UIN: 32AAACK9435C4ZT State Name : Kerala, Code : 32 Contact : 0487-2352447 E-Mail : olrsidco@yahoo.in	Voucher No. **SMC OLR/PI/21-22/275**	Dated **16-Sep-21**
			Mode/Terms of Payment
		Buyer's Ref./Order No. **SMC OLR/PI/21-22/275**	Other References
		Dispatched through	Destination
		City/Port of Loading	City/Port of Discharge
Consignee (Ship to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32		Terms of Delivery	
Buyer (Bill to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32			

Office of the Manager ★ Industrial Estate Ollur Thrissur ★ SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
9	**Partition** *STORAGE UNIT-04 (1330X320X2750mm) Storage Unit Is Made with 18mm Interior Grade Prelaminated Particle Boards. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.Hardware Includes Autoclose Hinge Mechanism,Handles with Quality-Stick*	9403	18 %	*16-Sep-21*	**39.00 sqft.**	1,404.00	sqft.	**54,756.00**
10	**Partition** *STORAGE UNIT-05 (790X300X2400mm) Storage Unit Is Made with 18mm Interior Grade Prelaminated Particle Boards. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.Hardware Includes Autoclose Hinge Mechanism,Handles with Quality-Stick*	9403	18 %	*16-Sep-21*	**20.00 sqft.**	1,404.00	sqft.	**28,080.00**

continued ...

PROFORMA INVOICE(Page 6)

SIDCO MARKETING CENTRE OLLUR
SIDCO Marketing Centre,
Industrial Estate, Ollur
Ph:04872352447
GSTIN/UIN: 32AAACK9435C4ZT
State Name : Kerala, Code : 32
Contact : 0487-2352447
E-Mail : olrsidco@yahoo.in

Voucher No.	Dated
SMC OLR/PI/21-22/275	**16-Sep-21**
	Mode/Terms of Payment
Buyer's Ref./Order No.	Other References
SMC OLR/PI/21-22/275	
Dispatched through	Destination
City/Port of Loading	City/Port of Discharge

Consignee (Ship to)
The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Terms of Delivery

Buyer (Bill to)
The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
11	**Stool** *(400x400x450mm)* *Stool Is Made with 18mm Prelaminated HMR.Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.*	9402	18 %	*16-Sep-21*	**4 nos**	4,400.00	nos	**17,600.00**
								4,48,930.00
	Central Tax							**40,403.70**
	Less : ***State Tax***							**40,403.70**
	Roundoff							**(-)0.40**
	Total							**₹ 5,29,737.00**

E. & O.E

Amount Chargeable (in words)
INR Five Lakh Twenty Nine Thousand Seven Hundred Thirty Seven Only

Company's PAN : **AAACK9435C**

for SIDCO MARKETING CENTRE OLLUR

Authorised Signatory

This is a Computer Generated Document

MANAGER
SIDCO Marketing Centre,
Industrial Estate Ollur

PROFORMA INVOICE

SIDCO MARKETING CENTRE OLLUR
SIDCO Marketing Centre,
Industrial Estate, Ollur
Ph:04872352447
GSTIN/UIN: 32AAACK9435C4ZT
State Name : Kerala, Code : 32
Contact : 0487-2352447
E-Mail : olrsidco@yahoo.in

Voucher No. **SMC OLR/PI/21-22/271**	Dated **16-Sep-21**
	Mode/Terms of Payment
Buyer's Ref./Order No. **SMC OLR/PI/21-22/271**	Other References
Dispatched through	Destination
City/Port of Loading	City/Port of Discharge

Consignee (Ship to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Buyer (Bill to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Terms of Delivery

Office of the Manager ★ Industrial Estate Ollur Thrissur ★ SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
1	**Staff Table** *(1200x600x750mm)* *Staff Table Made with 18mm Prelaminated HMR Board. and Four Sides Edge Banded, Joinery with Mini Fixes and Dowel Systems.Hardware Includes Auto Close Hinge Mechanism,Auto Close Drawer Slides System, Handles with Quality-Stick.* *(FOR SECTION 04 OFFICE ROOM)*	9403	18 %	*16-Sep-21*	**6 nos**	11,000.00	nos	**66,000.00**
2	**Partition** *Staff Table Top Partition (Height-350mm) Partition Made with 18mm Prelaminated HMR Board. and Four Sides Edge Banded, Joinery with Mini Fixes and Dowel Systems.*	9403	18 %	*16-Sep-21*	**27.00 sqft.**	648.00	sqft.	**17,496.00**
3	**Partition** *(Height-1200mm) Partion Made With 18mm Prelaminated HMR Board. And Four Sides Edge Banded, Joinery with Mini Fixes and Dowel Systems.*	9403	18 %	*16-Sep-21*	**94.00 sqft.**	675.00	sqft.	**63,450.00**

continued ...

PROFORMA INVOICE(Page 2)

SIDCO MARKETING CENTRE OLLUR SIDCO Marketing Centre, Industrial Estate, Ollur Ph:04872352447 GSTIN/UIN: 32AAACK9435C4ZT State Name : Kerala, Code : 32 Contact : 0487-2352447 E-Mail : olrsidco@yahoo.in	Voucher No. **SMC OLR/PI/21-22/271**	Dated **16-Sep-21**
		Mode/Terms of Payment
	Buyer's Ref./Order No. **SMC OLR/PI/21-22/271**	Other References
Consignee (Ship to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32	Dispatched through	Destination
	City/Port of Loading	City/Port of Discharge
	Terms of Delivery	

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Buyer (Bill to)
The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
4	**Table** *AE TABLE (1400x600x750mm)* *AE Table Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes And Dowel Systems. Hardware Includes Auto Close Hinge Mechanism, Auto Close Drawer Slides System,Handles with Quality-Stick.*	9403	18 %	*16-Sep-21*	**1 nos**	15,400.00	nos	**15,400.00**
5	**Table** *DRAFTSMAN TABLE (1400x600x750mm)* *AE Table Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery With Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism, Auto Close Drawer Slides System, Handles with Quality Stick.*	9403	18 %	*16-Sep-21*	**1 nos**	15,400.00	nos	**15,400.00**

continued ...

PROFORMA INVOICE(Page 3)

SIDCO MARKETING CENTRE OLLUR SIDCO Marketing Centre, Industrial Estate, Ollur Ph:04872352447 GSTIN/UIN: 32AAACK9435C4ZT State Name : Kerala, Code : 32 Contact : 0487-2352447 E-Mail : olrsidco@yahoo.in	Voucher No. **SMC OLR/PI/21-22/271**	Dated **16-Sep-21**
		Mode/Terms of Payment
	Buyer's Ref./Order No. **SMC OLR/PI/21-22/271**	Other References
	Dispatched through	Destination
	City/Port of Loading	City/Port of Discharge
Consignee (Ship to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32	Terms of Delivery	
Buyer (Bill to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32		

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
6	**Partition** *Storage Unit 01 (1800x450x2400mm(H)) Storage Unit Is Made With 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery With Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism, Handles With Quality-Stick.*	9403	18 %	*16-Sep-21*	**47.00 sqft.**	1,512.00	sqft.	**71,064.00**
7	**Partition** *Storage Unit 02 (1340x430x2300mm(H)) Storage Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism, Handles with Quality-Stick*	9403	18 %	*16-Sep-21*	**33.00 sqft.**	1,512.00	sqft.	**49,896.00**

continued ...

PROFORMA INVOICE(Page 4)

SIDCO MARKETING CENTRE OLLUR
SIDCO Marketing Centre,
Industrial Estate, Ollur
Ph:04872352447
GSTIN/UIN: 32AAACK9435C4ZT
State Name : Kerala, Code : 32
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Voucher No.	Dated
SMC OLR/PI/21-22/271	**16-Sep-21**
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Buyer's Ref./Order No.	Other References
SMC OLR/PI/21-22/271	
Dispatched through	Destination
City/Port of Loading	City/Port of Discharge

Consignee (Ship to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Terms of Delivery

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Buyer (Bill to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
8	**Partition** *Storage Unit 03 (1350x310x2840mm(H) Storage Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism, Handles with Quality-Stick.*	9403	18 %	*16-Sep-21*	**41.00 sqft.**	1,404.00	sqft.	**57,564.00**
9	**Partition** *Storage Unit 04 (790x300x2400mm(H)) Storage Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism, Handles With Quality-Stick.*	9403	18 %	*16-Sep-21*	**20.00 sqft.**	1,404.00	sqft.	**28,080.00**

continued ...

PROFORMA INVOICE(Page 5)

Kerala Sidco

SIDCO MARKETING CENTRE OLLUR
SIDCO Marketing Centre,
Industrial Estate, Ollur
Ph:04872352447
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Consignee (Ship to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
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Terms of Delivery

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The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
10	**Partition** *Storage Unit 05 (1350x300x2900mm(H)) Storage Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism, Handles with Quality-Stick.*	9403	18 %	*16-Sep-21*	**42.00 sqft.**	1,404.00	sqft.	**58,968.00**
11	**Partition** *Storage Unit 06 (1350x310x2250mm(H)) Storage Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism, Handles with Quality Stick.*	9403	18 %	*16-Sep-21*	**33.00 sqft.**	1,404.00	sqft.	**46,332.00**

continued ...

PROFORMA INVOICE(Page 6)

SIDCO MARKETING CENTRE OLLUR
SIDCO Marketing Centre,
Industrial Estate, Ollur
Ph:04872352447
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Contact : 0487-2352447
E-Mail : olrsidco@yahoo.in

Voucher No.	Dated
SMC OLR/PI/21-22/271	**16-Sep-21**
	Mode/Terms of Payment
Buyer's Ref./Order No.	Other References
SMC OLR/PI/21-22/271	
Dispatched through	Destination
City/Port of Loading	City/Port of Discharge

Consignee (Ship to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Terms of Delivery

Office of the Manager Industrial Estate Ollur Thrissur SIDCO Marketing Centre

Buyer (Bill to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
12	**Stool** *(400x400x450mm(H))* *Stool Is Made with 18mm Prelaminated HMR Board.* *Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems.*	9402	18 %	*16-Sep-21*	**4 nos**	4,400.00	nos	**17,600.00**
								5,07,250.00
	Central Tax							**45,652.50**
	State Tax							**45,652.50**
	Total							**₹ 5,98,555.00**

Amount Chargeable (in words)
INR Five Lakh Ninety Eight Thousand Five Hundred Fifty Five Only

E. & O.E

Company's PAN : **AAACK9435C**

for SIDCO MARKETING CENTRE OLLUR

Authorised Signatory

MANAGER
SIDCO Marketing Centre

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PROFORMA INVOICE

SIDCO MARKETING CENTRE OLLUR
SIDCO Marketing Centre,
Industrial Estate, Ollur
Ph:04872352447
GSTIN/UIN: 32AAACK9435C4ZT
State Name : Kerala, Code : 32
Contact : 0487-2352447
E-Mail : olrsidco@yahoo.in

Voucher No.	Dated
SMC OLR/PI/21-22/273	**16-Sep-21**
	Mode/Terms of Payment
Buyer's Ref./Order No.	Other References
SMC OLR/PI/21-22/273	
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City/Port of Loading	City/Port of Discharge
Terms of Delivery	

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The Assistant Secretary,
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State Name : Kerala, Code : 32

Buyer (Bill to)

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State Name : Kerala, Code : 32

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
1	**Partition** *STORAGE UNIT 01 (970X450X2400mm(H)) Storage Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism, Handles with Quality-Stick. (FOR REST ROOM)*	9403	18 %	*16-Sep-21*	**25.00 sqft.**	1,512.00	sqft.	**37,800.00**
2	**Partition** *STORAGE UNIT 02 (1380x450x2300mm(H)) Storage Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism,Handles with Quality Stick.*	9403	18 %	*16-Sep-21*	**34.00 sqft.**	1,512.00	sqft.	**51,408.00**

continued ...

PROFORMA INVOICE(Page 2)

SIDCO MARKETING CENTRE OLLUR SIDCO Marketing Centre, Industrial Estate, Ollur Ph:04872352447 GSTIN/UIN: 32AAACK9435C4ZT State Name : Kerala, Code : 32 Contact : 0487-2352447 E-Mail : olrsidco@yahoo.in	Voucher No. **SMC OLR/PI/21-22/273** Dated **16-Sep-21** Mode/Terms of Payment Buyer's Ref./Order No. **SMC OLR/PI/21-22/273** Other References Dispatched through Destination City/Port of Loading City/Port of Discharge Terms of Delivery
Consignee (Ship to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32	
Buyer (Bill to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32	

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
3	**Partition** *STORAGE UNIT 03 (1380x450x2300mm(H)) Storage Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism, Handles With Quality-Stick.*	9403	18 %	*16-Sep-21*	**34.00 sqft.**	1,512.00	sqft.	**51,408.00**
								1,40,616.00
	Central Tax							**12,655.44**
	State Tax							**12,655.44**
	Roundoff							**0.12**
	Total				**93.00 sqft.**			**₹ 1,65,927.00**

Amount Chargeable (in words)
INR One Lakh Sixty Five Thousand Nine Hundred Twenty Seven Only

E. & O.E

Company's PAN : **AAACK9435C**

for SIDCO MARKETING CENTRE OLLUR

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MANAGER
SIDCO Marketing Centre
Industrial Estate Ollur

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SIDCO Marketing Centre,
Industrial Estate, Ollur
Ph:04872352447
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SMC OLR/PI/21-22/272	
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The Assistant Secretary,
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Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Buyer (Bill to)

The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
1	**Partition** *STORAGE UNIT 01 (4800x540x2400mm(H)) Storge Unit Is Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism, Handles with Quality-Stick. (STORE ROOM)*	9403	18 %	*16-Sep-21*	**124.00 sqft.**	1,512.00	sqft.	**1,87,488.00**
	Central Tax							**16,873.92**
	State Tax							**16,873.92**
	Roundoff							**0.16**
	Total				**124.00 sqft.**			**₹ 2,21,236.00**

Amount Chargeable (in words)
INR Two Lakh Twenty One Thousand Two Hundred Thirty Six Only

E. & O.E

Company's PAN : **AAACK9435C**

for SIDCO MARKETING CENTRE OLLUR

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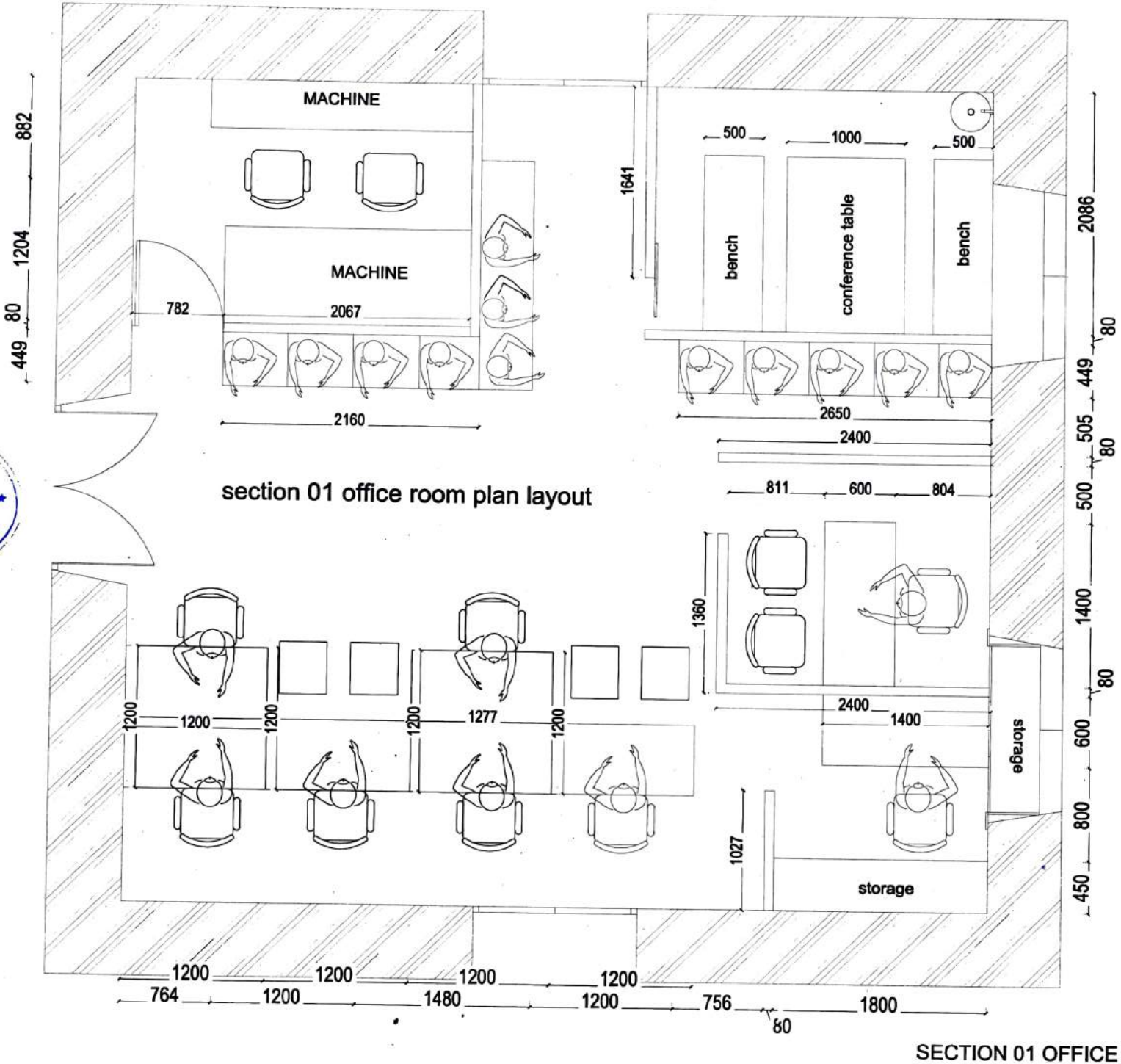
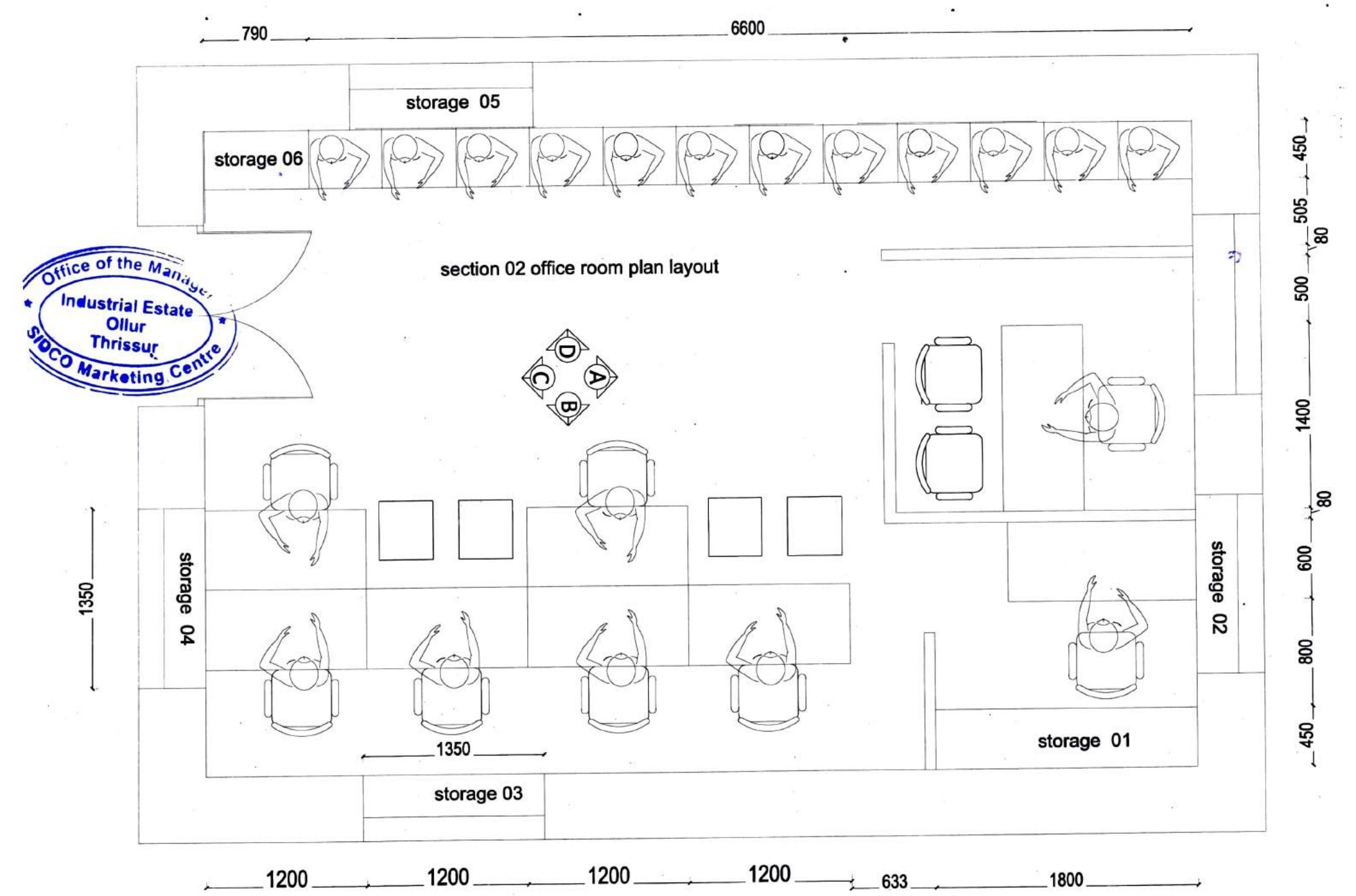
MANAGER
SIDCO Marketing Centre,



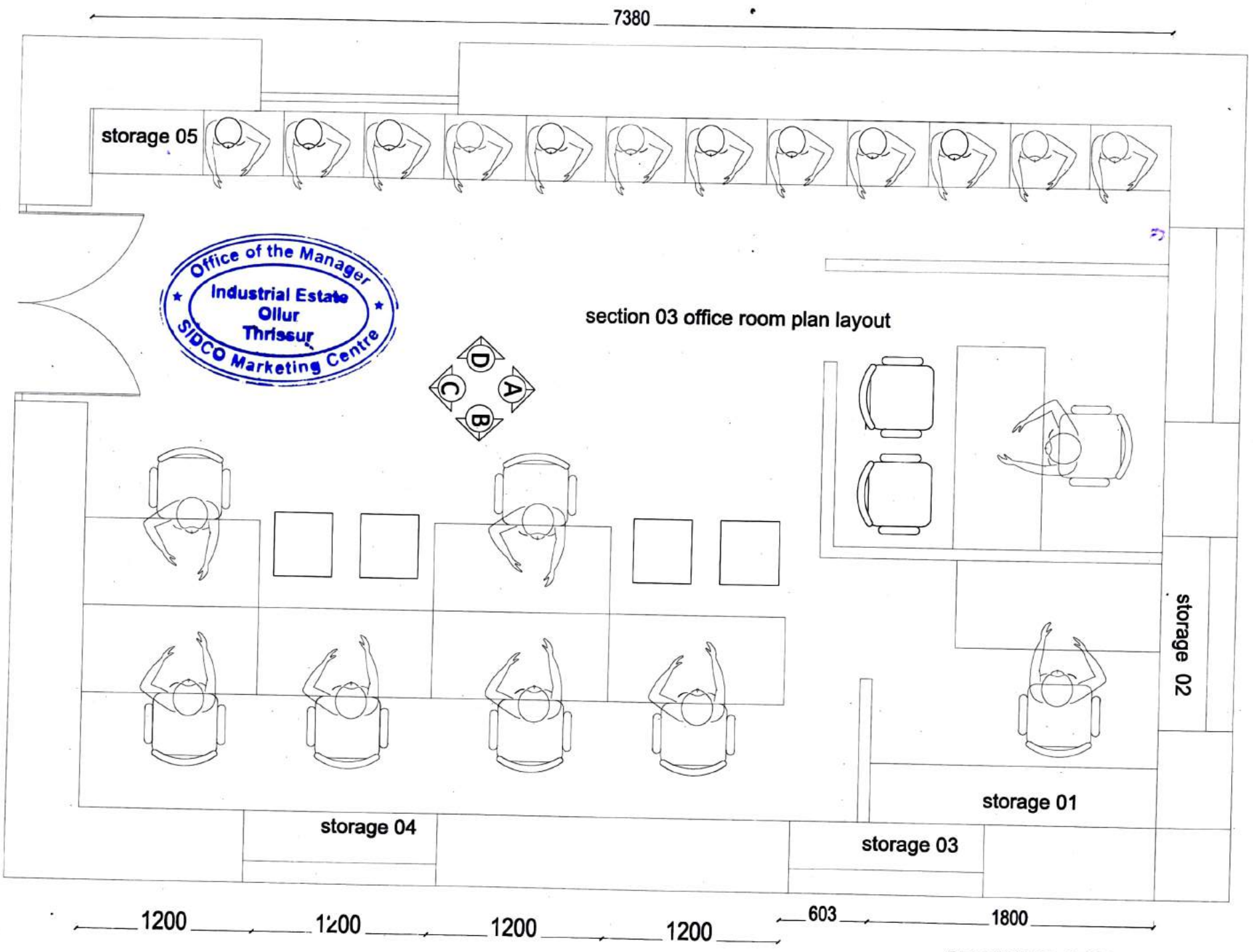
section 01 office room plan layout

Office of the Manager
Industrial Estate
Ollur
Thrissur
CO Marketing Centre

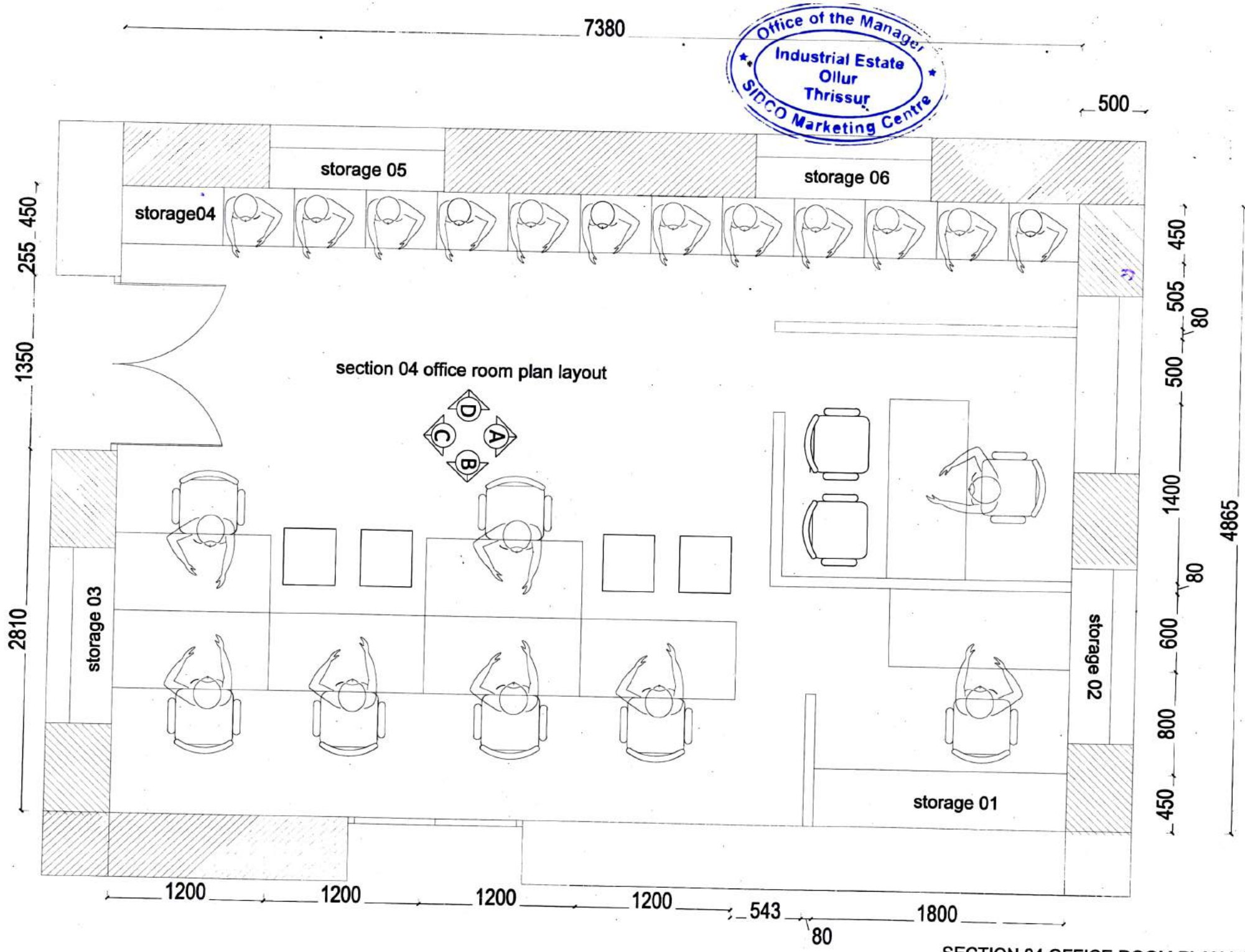
SECTION 01 OFFICE ROOM PLAN LAYOUT



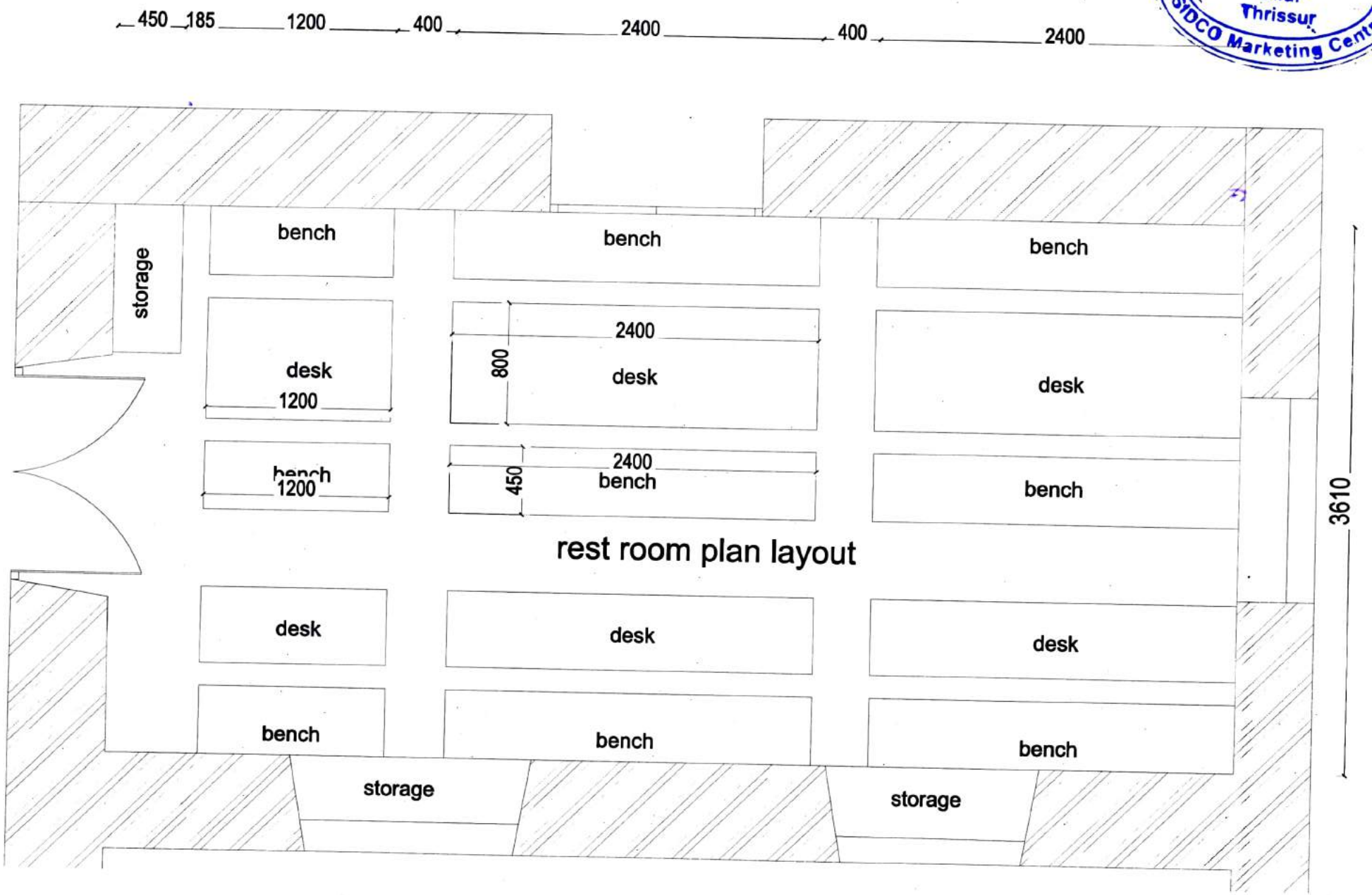
SECTION 02 OFFICE ROOM PLAN



SECTION 03 OFFICE ROOM PLAN LAY

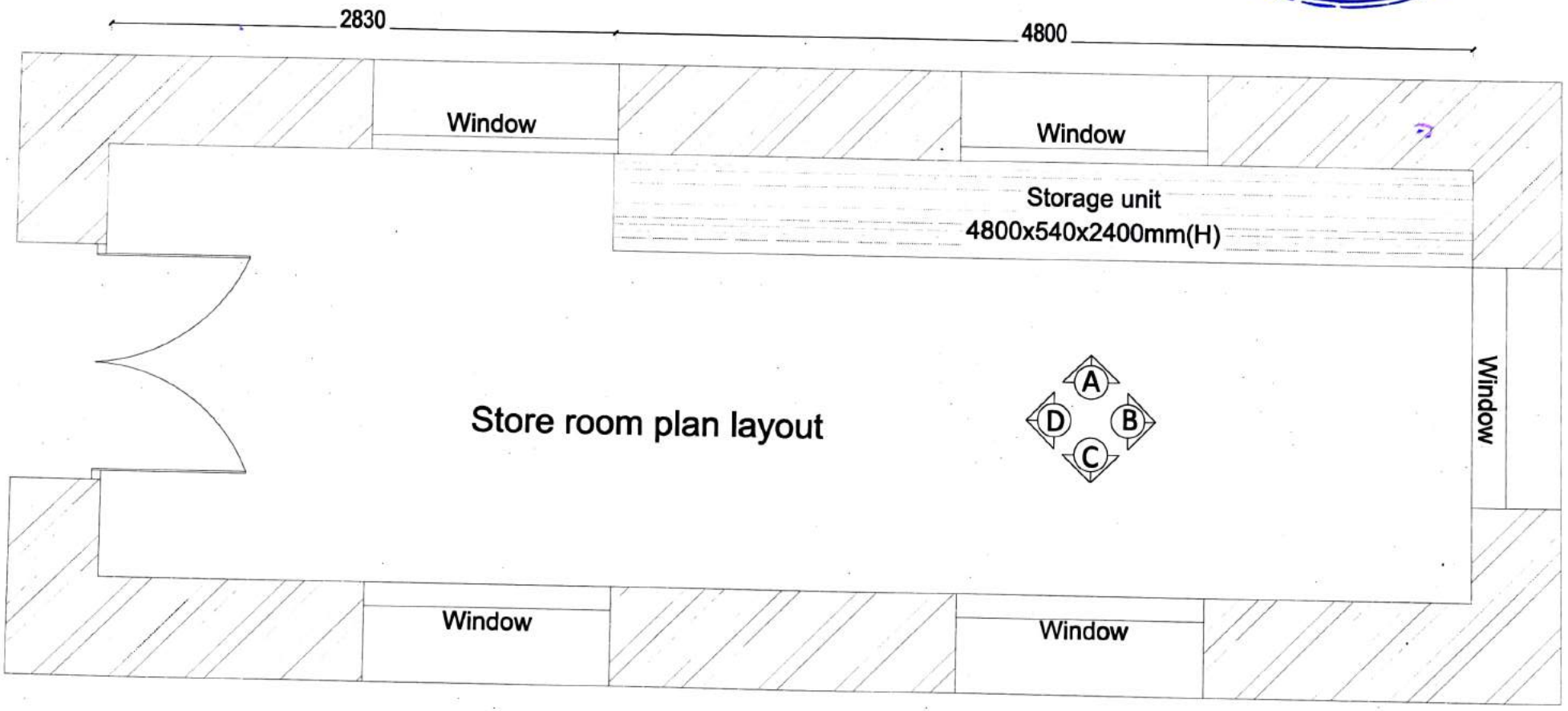


SECTION 04 OFFICE ROOM PLAN LA

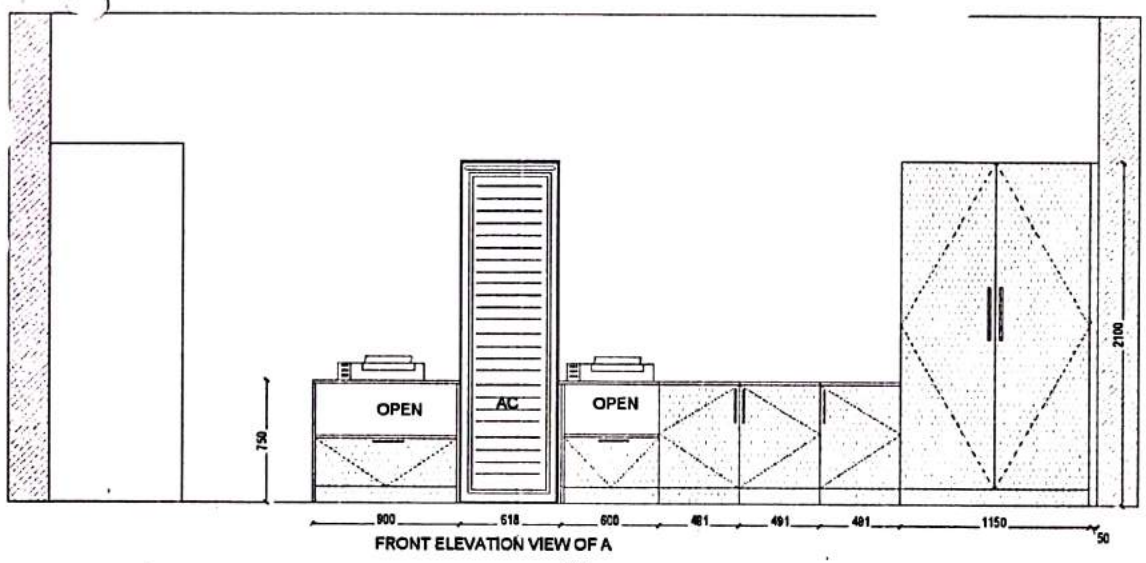


REST ROOM PLAN LAYOUT

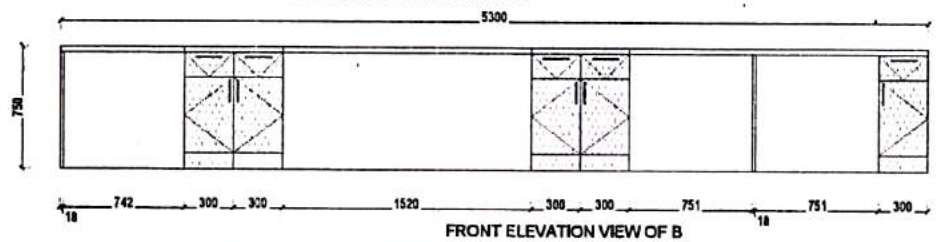
Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre



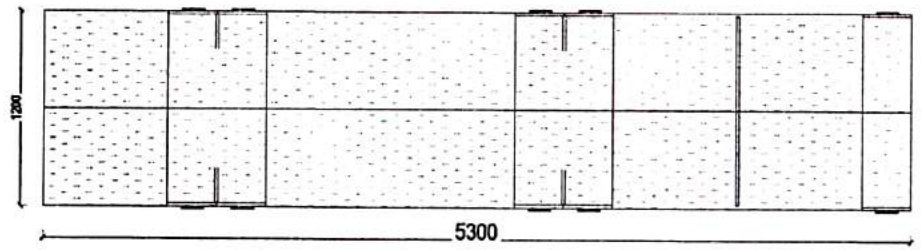
STORE ROOM PLAN LAYOUT



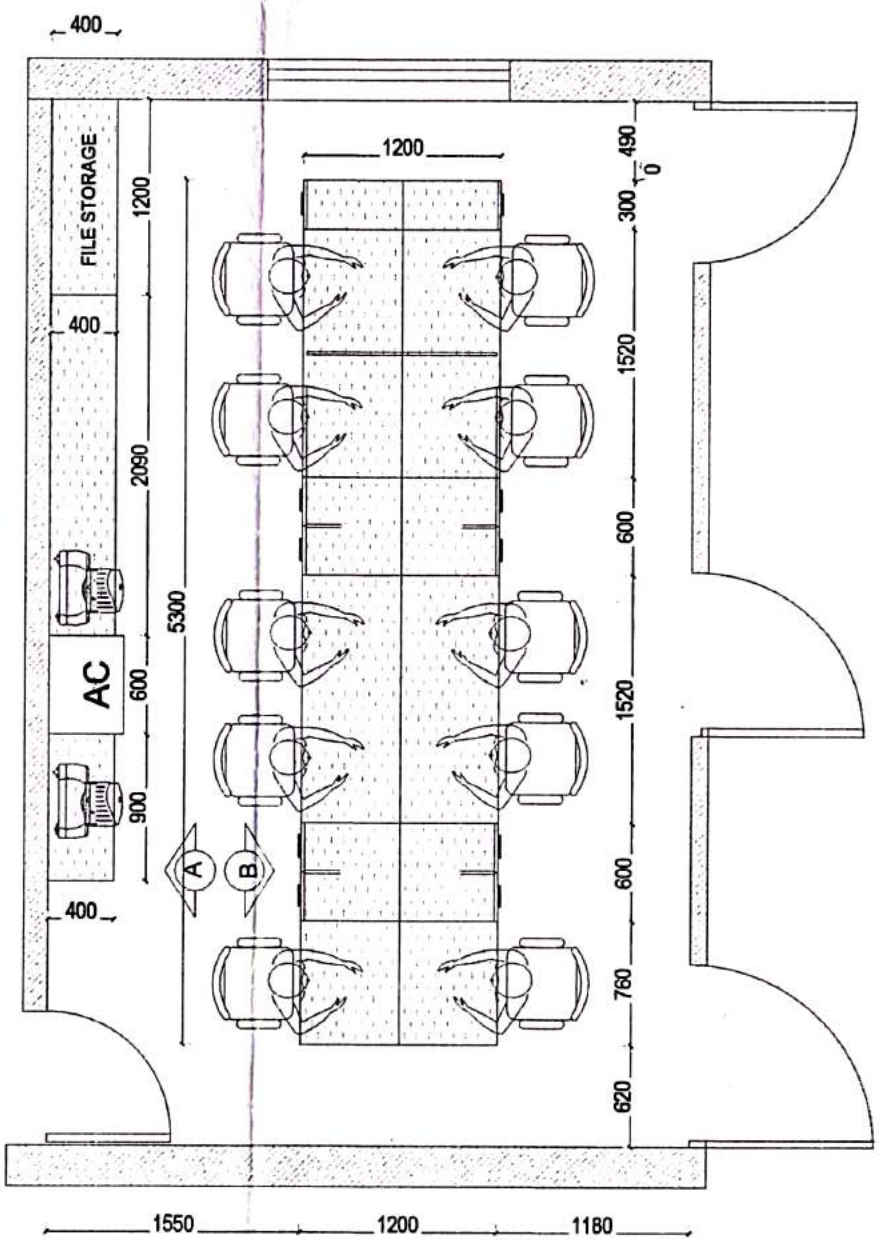
FRONT ELEVATION VIEW OF A



FRONT ELEVATION VIEW OF B



PLAN LAYOUT WORKSTATION



FIRST FLOOR OFFICE

FIRST FLOOR OFFICE PLAN LAYOUT

PROFORMA INVOICE

SIDCO MARKETING CENTRE OLLUR SIDCO Marketing Centre, Industrial Estate, Ollur Ph:04872352447 GSTIN/UIN: 32AAACK9435C4ZT State Name : Kerala, Code : 32 Contact : 0487-2352447 E-Mail : olrsidco@yahoo.in	Voucher No. **SMC OLR/PI/21-22/276**	Dated **16-Sep-21** Mode/Terms of Payment
	Buyer's Ref./Order No. **SMC OLR/PI/21-22/276**	Other References
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	City/Port of Loading	City/Port of Discharge
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Buyer (Bill to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32		

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
1	**Staff Chair** *Imported Nylon and PP Back Frame with Lumber Adjust 12mm Seat Plywood Adjustable PU Handle High Density Moulded Foam Seat Heavy Push Back Mechanism Class 4 High Quality Gas Lift with Cover Metal/chrome/nylon Base with Wheel (FIRST FLOOR OFFICE ROOM)*	9403	18 %	*16-Sep-21*	**10 nos**	5,600.00	nos	**56,000.00**
2	**Table** *STAFF WORKSTATION TABLE(5300X1200X750mm) Staff Work Station Table Made with 18mm Prelaminated HMR Board. Four Sides Edge Banded ,Joinery with Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism,Auto Close Drawer Slides System,Handles With Quality-Stick*	9403	18 %	*16-Sep-21*	**10 nos**	11,000.00	nos	**1,10,000.00**

continued ...

PROFORMA INVOICE(Page 2)

Kerala Sidco

SIDCO MARKETING CENTRE OLLUR
SIDCO Marketing Centre,
Industrial Estate, Ollur
Ph:04872352447
GSTIN/UIN: 32AAACK9435C4ZT
State Name : Kerala, Code : 32
Contact : 0487-2352447
E-Mail : olrsidco@yahoo.in

Voucher No.	Dated
SMC OLR/PI/21-22/276	**16-Sep-21**
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Buyer's Ref./Order No.	Other References
SMC OLR/PI/21-22/276	
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City/Port of Loading	City/Port of Discharge

Consignee (Ship to)
The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Terms of Delivery

Buyer (Bill to)
The Assistant Secretary,
Electricity Department, Thrissur Corporation.
GSTIN/UIN : 32AAALT1623J1Z7
State Name : Kerala, Code : 32

Office of the Manager
Industrial Estate
Ollur
Thrissur
SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
3	**Partition** *STORAGE UNIT 01 (1200X400X2100mm(H) Storage Uni9t Is Made with 18mm Prelaminated HMr Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism, Handles with Quality-Stick*	9403	18 %	*16-Sep-21*	**27.13 sqft.**	1,620.00	sqft.	**43,950.60**
4	**Partition** *STORAGE UNIT 02 (2090x400x750mm(H) Storage Unit Is Made 18mm Prelaminated HMR Board. Four Sides Edge Banded Joinery with Mini Fixes and Dowel Systems. Hardware Includes Auto Close Hinge Mechanism,Handles with Quality-Stick*	9403	18 %	*16-Sep-21*	**16.87 sqft.**	1,620.00	sqft.	**27,329.40**

continued ...

PROFORMA INVOICE(Page 3)

SIDCO MARKETING CENTRE OLLUR SIDCO Marketing Centre, Industrial Estate, Ollur Ph:04872352447 GSTIN/UIN: 32AAACK9435C4ZT State Name : Kerala, Code : 32 Contact : 0487-2352447 E-Mail : olrsidco@yahoo.in	Voucher No. **SMC OLR/PI/21-22/276**	Dated **16-Sep-21**
		Mode/Terms of Payment
	Buyer's Ref./Order No. **SMC OLR/PI/21-22/276**	Other References
Consignee (Ship to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32	Dispatched through	Destination
	City/Port of Loading	City/Port of Discharge
Buyer (Bill to) **The Assistant Secretary,** Electricity Department, Thrissur Corporation. GSTIN/UIN : 32AAALT1623J1Z7 State Name : Kerala, Code : 32	Terms of Delivery	

Office of the Man... Industrial Estate Ollur Thrissur SIDCO Marketing Centre

Sl No.	Description of Goods	HSN/SAC	GST Rate	Due on	Quantity	Rate	per	Amount
5	**Partition** *STORAGE UNIT 03 (900X400X750mm(H))* *Storage Unit Is Made with 18mm Prelaminated HMR Board.* *Four Sides Edge Banded Joinery With Mini Fixes and Dowel Systems.Hardware Includes Autoclose Hinge Mechanism, Handles with Quality-Stick*	9403	18 %	*16-Sep-21*	**7.27 sqft.**	1,512.00	sqft.	**10,992.24**
								2,48,272.24
	Central Tax							**22,344.50**
	State Tax							**22,344.50**
	Less : ***Roundoff***							**(-)0.24**
	Total							**₹ 2,92,961.00**

Amount Chargeable (in words)
INR Two Lakh Ninety Two Thousand Nine Hundred Sixty One Only

E. & O.E

Company's PAN : **AAACK9435C**

for SIDCO MARKETING CENTRE OLLUR

Authorised Signatory

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MANAGER
SIDCO Marketing Centre

CHAPTER III

TECHNO ECONOMIC FEASIBILITY REPORT

KANNANKUZHY SMALL HYDRO ELECTRIC PROJECT (2x3.5 MW)

THRISSUR CORPORATION ELECTRICITY DEPARTMENT

PREFACE

The proposed Kannankuzhy Small HE scheme is situated in Thrissur District, Athirappally village near Athirappally water fall. The Kerala State Electricity Board had prepared the Detailed Project Report (DPR) in 2016.The installed capacity of the Kannankuzhy Small HE Project is 7 MW with 16.69 Mu annual generation. The project is envisaged as a run of the river scheme in Kannankuzhy Thodu which is a tributary of Chalakkudypuzha. A Dam of 111 m length and 20.35m height maximum has to be constructed across the Kannankuzhy Thodu.

As part of its Renewable Power Purchase obligation, Expert Advisory Committee determined the necessity of SHEP for Thrissur Corporation Electricity Department(TCED). Accordingly, as per the 58th decision of Council on 11-06-2014, sanction were accorded to take up SHEP by TCED. Hence Thrissur Corporation Electricity Department (TCED) proposes to set up Small Hydel Projects in various part of the state. TCED was awarded four SHEP by KSEB and Kannankuzhy SHEP is the first preferred one. TCED has already remitted 191.25lakhs and equivalent amount as bank Guarantee to the govt. for awarding all four projects.

Out of the four projects TCED planned to concentrate on kannankuzhy Projects at first. Therefore TCED has approached KSEB and collected DPR which is prepared as on March 2010.Then the estimate was revised as per DSR 2018 and the cost of construction is now Rupees 93.75 Crores.

TCED proposes a funding pattern of 70:30 with Debit and Equity.

The Project was earmarked by the Government of Kerala for implementation by Independent Power Producers (IPP) through competitive bid route.

The total outlay of the project comes to Rs 93.75 Crores. The project proposal along with the DPR was forwarded to Technical Advisory Group (TAG) and then for placing in the DPC for approval. The State Local Self Government Department and State level expert committee suggested to have a Power Purchase Agreement with KSEB.

The TEFR has been prepared after conducting several visits to the component structures of the project, detailed survey and investigation studies and inter action with local people. The study includes the river behavior, environment aspect, verification of documents related to hydrology from KSEB.

All the efforts are made to accomplish the standards put forth by Central water commission and power department, Government of Kerala.

We wish all success to Thrissur Corporation for setting up Kannankuzhy Small HE Project which is the first project taken up by the Thrissur Corporation. There is no doubt that this project will add to the power potential of Kerala Grid.

INDEX

CHAPTER - I

SUMMARY OF THE PROJECT

1.1 Introduction

The Kannankuzhy Small H.E Scheme is proposed in Athirappilly Gramapanchayath of Mukundapuram Taluk in Thrissur District. The scheme is proposed as a run of the river scheme and utilizes the water from the upper reaches of KannankuzhyThodu ,which is a tributary of Chalakudipuzha. The catchment area is 35 Km^2 and the average annual yield from the catchment is 94.82 Mm^3 . The net head available is 110 m. The proposed installed capacity of the scheme is 7.0 MW and the expected annual energy generation is 16.69 Mu. The tail water can be diverted for further power generation utilizing the head potential available. The overall cost of the project is estimated as Rs.9375 Lakhs.(based on 2018 DSR).The cost including IDC is Rs.10410 Lakhs. The cost per MW installed capacity is 1487 Lakhs. The cost of energy per unit on the first year of operation after commissioning of the project at present purchase rate comes to Rupees 9.43. The payback period of the scheme will be12 years. The cost of energy per unit after payback period is worked out as Rupees 4.78

The main components of the scheme are

1) A concrete gravity dam 20.35 m high and 111 m long without gate spillway of length 60 m to provide an effective storage of 0.1785 Mm^3 between FRL at +277 m and MDDL at 269.0 m
2) A concrete lined Tunnel D shaped with diameter 2.50 m &length 836 m
3) A Surge shaft 6m diameter and 25 m height
4) Low pressure pipe,1.5 diameter and 80 m long
5) A single steel penstock of length 200 m and diameter 1.5 m with shell thickness 10 mm.
6) A surface powerhouse of size 25.5x10.5x14.00 m
7) A Tail race pool of size 7 m x 5 m and a tail race channel of size 3.00 m x 1.90 m.

1.2 Alternate Proposals

As per the initial proposal, the dam is identified 146m d/s of the finally proposed site. At this location, the dam is 147 m length and height about 25 m will be required to keep the FRL at +277m. An alternate site for dam is identified at the new location due to the reasons viz

1) The length of dam reduces from 147 m to 111m.
2) The height of dam is reduced by 5 m and the section is also got reduced.
3) Good abutment is available with exposed rock on sides and bed of river.

The water conductor system is extended towards the dam by 228.28 m. Though there is some increase in the cost of tunnel, there is considerable savings in the cost of construction of dam.

An alternate alignment for water conductor system along the right bank of Kannankuzhy thodu was considered and was observed that the intake has been proposed at 265 m u/s of initially proposed dam site and the length of water conductor system has been increased from 850 m to 905 m and available head was reduced to 105 m . Also the alignment is passing through the sloping side of the hill where lateral cover for the water conductor system will be less. Hence the alignment of water conductor system along the left bank with a net head of 110 m has been proposed. The intake is located, at a distance of 35 m u/s of the newly proposed weir site, at +274 m.

1.3. Geographical Disposition

The scheme is located in latitude $10^0$21’55’’ N and longitude $76^0$33’30’’ E. Entire area comes under to po sheet No.58 B/11.

1.4. Topography

The entire area lies in between elevation 140 m and 1000 m above Mean Sea Level and is situated in forest area. Exposed rocks are seen in the river bed at weir site. Catchment area of the scheme is worked out as 35 km^2.

1.5 Geology

The dam site, river bed, abutments etc. have exposed rocks. Geological Exploration revealed that proposed Dam Axis is found to be suitable and no adverse geological features are found. Along the power tunnel alignment rock cover varies from 5 to 9 times tunnel diameter, except at portal location where the thickness of fresh rock cover is only 1.5 m. At surge shaft location, fresh rock is available at a depth of 4.86m. Power house site is located by the side of a tributary and foundation grade rock is available at a depth of about 6m.

1.6. Hydrology

The scheme catchment experiences Southwest monsoon during June-August and North east monsoon during September- November . These two monsoons contribute the major portions of the annual yield. However, precipitations are there in dry season also with comparatively insignificant quantity. No river gauge is available in the Kannankuzhy thode. The flow is worked out from the rainfall data recorded at Kannankuzhy, which is situated outside the catchment area.

1.7 Description of the River

The scheme utilizes water from Kannankuzhy thode which is a tributary of Chalakudy river.. Tailwater after power generation discharges into Kannankuzhy thode and finally reaches in Chalakudy river.

1.8 Development of the river basin

The scheme is in the Chalakudy river basin. The Chalakudy river with her tributaries is one of the rivers having the finest hydro power potential. The principal streams in the catchment area of the Chalakudy basin drain the relatively higher mountain area of Kerala. Though there are three commissioned projects for Board in the basin with Installed capacity 54 MW, 32 MW& 16 MW, there is much scope for further development in the power sector. The development of the entire power potential of the basin requires consideration in view of the deficit in power generation in Kerala.

1.9 Location of the Project Area

The Project area is located in Athirappilly Grama Panchayat of Mukundapuram Taluk in Thrissur district.

1.10 Communication facilitites

Kannankuzhy is 28 km away from Chalakudy, on Anamalai road, near Athirappilly falls. The nearest railway station is Chalakudy and nearest airport is Nedumbassery which is 55 km away from Kannankuzhy. The project site is 12 km away from Kannankuzhy. There exists 6 km coup road along the route and access road is to be formed for another 6 km. Contour survey has been done for normal road formation but the alignment of road is not possible between the chainages 10.77km and 11.37 km. The proposal for a road tunnel is found feasible for the above reach of 600 m. The proposed tunnel route traverses through deep valley on one side and vertical embankment on the other side.

1.11 Climatic condition

The Scheme area experiences tropical climate. From June to November, it is generally rainy season and remaining months are dry and temperature is high. Temperature ranges from 15^0c to 34^0c annually.

1.12 Population and Socio economic Aspects

No human inhabitation is found in the vicinity of the project area. Hence rehabilitation measures do not come in the picture. After the commissioning of the Project, the entire project area will become an excellent tourist place.

1.13 Survey and Investigation Works

GTS Map.No.58 B/11 covers area proposed for Kannankuzhy scheme. Reconnaissance survey as well as field investigation has been conducted for the project. Detailed Geological survey of the region as a whole is carried out. Bore hole details were taken at sites of various components of the scheme. Design of various components is done based on the survey details obtained from the field office.

1.14 Environment and Ecological Aspects

For minimizing environmental Impact, the storage proposed is only 0.1785Mm^3, with a submergence of 3.48 Ha at F R L including river course. The tail water after power generation reaches the same river at about 1000 m downstream of the dam.

1.15 Land requirement for the project

The entire project area lies in forestland under Vazhachal and Pariyaram ranges. Total forestland required for the project comes to 20.50 Ha. Which includes river course also. The land is under the authority of Charpa and Pariyaram forest ranges under Vazhachal forest division.

1.16 Transmission and Distribution

The power generated can be stepped up to 33 KV and fed into the 33 KV substation at Pariyaram which is approximately 23 km away from the scheme.

1.17 Cost

The overall cost of the project is estimated as Rs.9375 lakhs at 2018 price level. The cost including IDC is 10410 lakhs.. The cost per MW installed capacity works out to Rs. 1487lakhs. The cost of energy during the first year of operation after commissioning of the project works out to Rs. 7.86/unit. The cost of energy after pay back period is only Rs. 4.78 / kwh. This is very low when compared to other sources of energy.

1.18 Benefits and Financial aspects

Annual energy that can be generated from the scheme is expected as 16.69 MU. Payback period for the scheme is 12 years and the cost of energy after payback period is Rs.4.78/kwh.

CHAPTER - 2

NEED OF THE PROJECT

Thrissur corporation is the one of the public sector licensee to distribute power in kerala. Now due to lack of monsoon and stalemate in new Hydro projects due to various reasons, the state is in the grip of power shortage. The power cuts though not there now, will most probability have to continue in the years to unless new Projects are taken up and completed urgently. As part of its Renewable Power Purchase obligation, Expert Advisory Committee determined the necessity of SHEP for TCED. Accordingly, as per the 58th decision of Council on 11-06-2014, sanction were accorded to take up SHEP by TCED. Hence Thrissur Corporation Electricity Department (TCED) proposes to set up Small Hydel Projects in various part of the state. Thus there is need for additional energy generation and increase in plant capacity in the Kerala Grid.

PROJECT PROPOSALS

The Southwest strip of India, Kerala is bounded with Western Ghat on the east and Arabian sea on the west. Blessed with such a topography, the land of Kerala has rich water wealth owing to the southwest and northeast monsoons. The rivers are originating from western ghat (41nos are flowing to the west to join the Arabian sea and 3nos are flowing to the east to join the river Cauvery), making the state blessed with plenty of river water wealth. As far as our small state is considered, hydropower is the cheapest and environmentally benign source of energy.

The peak demand and energy requirement as per the 17th power survey of Central Electricity Authority, Ministry of Power, Government of India The demand cannot be met from the power sources already developed in the state. Hence to meet the energy requirements, new power projects have to be taken up. Priority is being given for hydro stations wherein the environmental & resettlement problems are minimum and which could be executed in minimum time with sophisticated machinery. Hydel schemes have certain specific advantages such as cheap and simple maintenance, no escalation in cost of production, long service etc. when compared to thermal, nuclear, diesel power plants etc. Due to the above reasons, exploitation of all possible hydel sources including the proposed scheme is the need of the hour. Also, the implementation of the scheme will lead to the socio-economic development of the locality.

The implementation of the proposed scheme imprints minimum impact on environment and the ecology of the area on the initial stages of implementation, which will later be made up very efficiently. The forest land required for the scheme is about 20.50Ha. The Kannankuzhy Small H E P with 7.0 MW installed capacity when completed will add 16.69 Mu to the grid annually, which can partly meet the growing energy needs of the state.

The Kannankuzhy HE Scheme is proposed to explore the yield from a catchment area of 35 km2 of Kannankuzhy thodu. A diversion Dam of 111m long, 60m long spillway in the middle and non overflow sections of 25.5m and 25.5m length on right and left bank respectively.

An intake of 35 m long leading channel,2.5m dia “D” shaped Power Tunnel of length 836 m, LPP of 80m length and 1.5 m diameter to convey the waters from the Tunnel to Penstock. A single inclined Penstock of 200m length and 1.5 m diameter penstock branching into tow horizontal feeder pipes of 10m length and 1.2 m diameter each, near the Power House. A power House having 2 machines of 3.5MW with an annual generation of 16.69 Mu of energy will be contributed grid.

Detailed investigation has been done by the Engineers of KSEB and prepared detailed project report. The technical details, design of component structures, cost estimates and financial viability of this project are explained in the forthcoming chapters. This report is prepared strictly adhering to the guide lines laid by MNRES and CWC for the preparation of such reports.

CHAPTER - 3

SALIENT FEATURES

3.1 LOCATION:

(i)	State	:	Kerala
(ii)	District	:	Thrissur
(iii)	Taluk	:	Chalakkudy
(iv)	Latitude	:	10^0 21’55” N
(v)	Longitude	:	76^0 33’30” E
(vi)	Access	:	28 KM away from Chalakkudy on Athirappally Road and then 6 km coup road from kannankuzhy and 6 km by walk.

3.2 CATCHEMENT

(i)	Catchment of the Project	:	Chalakkudy Bazin
(ii)	Main river	:	Kannankuzhy Thodu

3.3 HYDROLOGY:

(i)	Catchment area	:	35 km^2
(ii)	Average Annual rainfall	:	3542 mm
(iii)	Design flood Discharge	:	324 m^3/Sec.

3.4 COMPONENT STRCUTURES:

ii) RESERVIOR:

FRL	:	+277.00 m
MWL	:	+278.85 m
MDDL	:	+269.00 m
Storage between FRL & MDDL	:	0.1785 M m^3

ii) DAM

(i)	FRL	:	+277.00 M
(ii)	Length of weir	:	111 m
(iii)	Live Storage	:	0.1785 Mm3
(iv)	Effective storage	:	0.228 Mm3
(v)	Water spread Area at FRL	:	3.48 ha

(vi) Water spread Area at MWLL : 4.45 ha

ii).a. OVERFLOW PORTION

i)	Length	:	60 m in the middle
(ii)	Crest of spillway/ PRL	:	+277.00m
(iii)	Deepest foundation Level	:	+260.00 m
(iv)	Maximum height from nominal bed level	:	19.12 m
(v)	Maximum height from Deepest bed level	:	20.35 m
(vi)	Radius of curvature of buckets	:	3.90m
(vii)	The center of curvature of bucket	:	+265.63
(viii)	Base width maximum	:	17.0 m
(ix)	Shape	:	Ogee
(x)	Flood discharge	:	324 m^3/sec
(xi)	MWL	:	+278.85 m

ii).b. Non-overflow portion :

(i)	Length	:	50.50m 30.0m on right bank 20.5m on left bank
(ii)	Top of Dam	:	+280.35m
(iii)	Top width	:	3 m
(iv)	Downstream slope	:	**1: 0.72**
(v)	Upstream slope : 0.7H to 1 V		Vertical up to +273.824m above+273.824m
(vi)	Deepest foundation	:	+260.00m
(vii)	Maximum height	:	20.35 m

iii) **INTAKE**

(i)	Location	:	26.5m away from dam axis
(ii)	Length	:	35m, Open Channel
(iii)	Center line elevation of intake	:	+265.23 m
(iv)	Bell mouth top elevation of intake	:	+266.73 m
(v)	Bell mouth bottom elevation of intake	:	+263.73 m
(vi)	Intake gate size	:	2Nos, 2 x 3 m size
(vii)	Top elevation of intake gate	:	+266.23 m
(viii)	Bottom elevation of intake gate	:	+263.73 m
(ix)	Trash rack size	:	Semicircular, 3.9 x 7.34 m
(x)	Top elevation of trash rack	:	+269.00m(may be lifted to +270.00)
(xi)	Bottom elevation of trash rack	:	+261.66 m

iv) POWER TUNNEL.

(i)	Number of Tunnel	:	one
(ii)	Diameter	:	2.50 m
(iii)	Shape	:	D' Shape-Concrete Lined
(iv)	Length	:	836.00 m
(v)	Sill level at inlet	:	+263.73 m
(vi)	Top level at inlet	:	+266.23 m
(vii)	Top level at exit	;	+260.66 M
(viii)	Bed slope	:	1 in 150
(ix)	Max. power draft	:	8.235 m3/sec
(x)	Max. velocity	:	1.48 m/sec
(xi)	Horizontal Bend	:	3 Nos
(xii)	H-Bend-1	:	@ Ch: 68.89 m ,

Deflection Angle $73^0$59’00”

(xiii) H-Bend-2 ; @ Ch:279.11 m

Deflection angle $33^0$39’48”

(xiv) H-Bend-3 : @Ch 555.00 m,

Deflection angle $23^0$59’54”

v) SURGE SHAFT

(i)	Type :	Simple Surge	
(ii)	Size	:	6.0 m Dia, Circular
(iii)	Lining	:	Concrete
(iv)	Top level	:	+285.00 m
(v)	Bottom Level	:	+258.26 m
(vi)	Height of Surge	:	26.74 m
(vii)	Upsurge	:	+283.05 m
(viii)	Down Surge :		+263.48 m

vi) LPP

(i)	Length	:	80.00m
(ii)	Diameter	:	1.5 m
(iii)	Lining	:	Steel,8 mm thick
(iv)	C/L of LPP	:	+259.41m

vii) PENSTOCK

i.	No.of penstock	:	one
ii.	Diameter	:	1.5 m
iii.	Inclined Length	:	200 m
iv.	Max. Power Draft	:	8.235 m3

v. Max.Velocity : 4.65 m/sec

vi. Shell Thickness : 12 mm

vii. No.of feeder pipes : 2

viii. Diameter of feeder pipe : 1.2m

viii) POWER HOUSE

(i) Type : Over ground

(ii) Net head : 110 m

(iii) Size of machine hall

Length : 25.5 m

Width : 10.5 m

Height : 14.0 m

(iv) Generator floor Level : +158.00m

(v) Center line of nozzles : +159.50 m

(vi) Installed capacity : 2.x 3.5 MW

(vii) Maximum power draft : 8.235 m^3/sec

(viii) Turbine type : Horizontal shaft, FRANCIS

(ix) EOT Crane : 25T

(x) Tail race (Concrete) : Open channel 180m
3m x 2.0m ,Rectangular

(xi) Minimum TWL

(xii) Max.TWL

(xiii) Net head

(xiv) Max.Head

3.5 POWER

Energy per annum : 16.69 Mu

PLF :- 27.22 %

3.6 COST

(i) Total cost : 9375 Lakhs

(ii) Total cost including IDC : 10410 Lakhs

(ii) Cost/MW installation : Rs.1487 Lakhs

(iii) Cost of generation : Rs.4.78/unit

(iv) Sale rate : Rs.7.0/unit

(v) Time of Completion : 36 months

CHAPTER - 4

SURVEY AND INVESTIGATION

The district Thrissur is the cultural capital of kerala with blessings of ***Thrissur Pooram*** which is world famous in general tropical climate The normal rainfall in the district is around 3540 mm. Major portion of the rainfall is received during May to September. Maximum rainy days and rainfall are during June and July months. The district has moderate temperature ranges from 15^0C to 34^0C with fairly good seasonal rains. The hot season is from February to May with March the hottest month.

Kannankuzhy Small HE Project is proposed as a run of river schemes in Chalakkudi basin.The detailed investigation survey of scheme is carried out by incorporating the previous investigation findings and the geological recommendations made by the Geological Survey of India

The field works were initiated based on GTS study (GTS No. 58B/11). Various proposals of both the banks were already considered in the feasibility stage. The present location of Power House is most suitable as per site condition. In this new proposal tailrace channel discharged to a Thodu near power house to the Kannankuzhy thodu. Length of newly aligned tailrace channel is 180 m, which is 490 m in the old proposal..

SURVEYS PREVIOUSLY DONE

This site was included in the list of small hydro sites identified by the Kerala State Electricity Board way back in 2010. Kerala State Electricity Board had prepared a Detailed Project Report (DPR) as early as 2010.Due to various reasons KSEB could not implement the project

ALTERNATE PROPOSAL

As per the initial proposal, the dam is identified 145m d/s of the finally proposed site. At this location, the dam is 147 m length and height about 25 m will be required to keep the FRL at +277m. An alternate site for dam is identified at the new location due to the reasons viz

1. The length of dam reduces from 147 m to 111m.
2. The height of dam is reduced by 5 m and the section is also got reduced.
3 Good abutment is available with exposed rock on sides and bed of river.

The water conductor system is extended towards the dam by 228.28 m. Though there is some increase in the cost of tunnel, there is considerable savings in the cost of construction of dam.

An alternate alignment for water conductor system along the right bank of Kannankuzhythodu was considered and was observed that the intake has been proposed at 265 m u/s of initially proposed dam site and the length of water conductor system has been increased from 850 m to 905 m and available

head was reduced to 105 m . Also the alignment is passing through the sloping side of the hill where lateral cover for the water conductor system will be less. Hence the alignment of water conductor system along the left bank with a net head of 110 m has been proposed. The intake is located, at a distance of 35 m u/s of the newly proposed weir site, at +274 m.

Arbitrary bench marks were made at Dam site and at power house. Detailed Investigation survey using total station and GPS method and found that the weir site and the power house site found by KSEB is the most suitable site.Net head of 110 meters is available for this scheme. Since the river source is not perennial, generation can be highest only with Net Head at design discharge

The hydrological survey include the collection of hydro meteorological data for the period from 1995 to 2006 pertaining to the Kannankuzhy thodu from the metrological station established at Kannankuzhy and computed its value to Kannankuzhy Small HE Project.

PRESENT INVESTIGATION

The DPR prepared by KSEB is taken as a guide line. A detailed investigation was made to ensure the location and salient futures of the project and its suitability to site. The weir location suggested by KSEB is optimum for the designed storage, Geology/rock levels on foundation/ embankments are reasonably good. The cost of construction will be lowest. Maximum head of 110 meters is achieved for this scheme. Since the river source is not perennial, generation can be highest only with Net Head at design discharge. Kannankuzhy Small HE scheme is a run of the river scheme. Overall viability of scheme depends on tapping the river fully having arrived by plotting flow duration curve base on the details obtained from rainfall data and calculating with a correlation coefficient.

After analyzing the flow duration curve the location suggested by KSEB is approved for technically and financially viable location. The total outlay of the project while computing by KSEB at 2010 was Rs.52.15 Crores. Now we have revised the Estimate at 2018 DSR and total cost comes to Rs.93.75Crores

GTS Map.No.58 B/11 covers area proposed for Kannankuzhy scheme. Reconnaissance survey as well as field investigation has been conducted for the project. Detailed Geological survey of the region as a whole is carried out. Bore hole details were taken at sites of various components of the scheme. Design of various components is done based on the survey details obtained from the field office.

CHAPTER - 5

HYDROLOGY

5.1 General

The Kannankuzhy H.E scheme envisages the utilization of the yield from 35 km^2 of the catchment area of Kannankuzhy thodu for power generation in a surface powerhouse to be located on the left bank of Kannankuzhy thodu. The tailwater from powerhouse after power generation will be led in to the Kannankuzhythodu and then to Chalakudypuzha.

The scheme is proposed as a run of the river scheme with a live storage of 0.1785 Mm^3 . Hence generation will be mainly during monsoon . Since no rivergauge data for Kannankuzhy thodu is available, the discharge is calculated based on the rain gauge reading available from kannankuzhy rain gauge station.

5.2 Catchment

The total catchment area of proposed Scheme is 35 km^2

5.3 Climate

The Scheme area experiences tropical climate. From June to November, it is generally rainy season and remaining months are dry and temperature is moderate . Temperature ranges from 15^0c to 34^0c . The southwest monsoon sets in June and lasts till September. The northeast monsoon sets in October and continues till November.

5.4 Rainfall

The scheme catchments experiences moderate rainfall in south-west and north-east monsoons. A departmental rain gauge station is available at Kannankuzhy near the scheme catchment. The average annual rainfall is **3540mm**. Monthly rainfall reading from raingauge station at Kannankuzhy for 1995 –06 is given in Table 1

5.5 Runoff

No weir gauge station is available in the catchment area of the scheme. From the raingauge readings collected from the departmental rain gauge station at Kannankuzhy, for a period of 1995-2006, run off is worked out based on the Western Ghat formula. The average annual run off computed is **94.82 Mm^3**.

5.6 Design Flood

There is no clear flood marks available to compute the maximum flood. The maximum flood discharge is hence estimated using the well known Ryve's formula;$Q=CA^{2/3}$. Assuming value of coefficient C as

2700 and A is the catchment area in sq.miles, the value of Maximum flood discharge obtained is 439 cumecs.

5.7 DAM

At the proposed weir site, the nominal bed level is +261.23m. The deepest bed level is +261.00m. The deepest foundation level is +260.00m.

Exposed rook is available at river bed. On sides rock is expected to be available at shallow depths as indicated by outcrops.

The length of Section for Dam top level of +280.35 is 51m

5.8 OVERFLOW PROTION

The spillway is designed as an Ogres type

The spillway with a height of 15m from the nominal bed level of +261.23 will have its crest level at +277.00m which is proposed as FRL.

The 60m long overflow portion is flanked on the left and right banks by non overflow portions 25.5m and 25.5m long respectively.

The MWL being at +278.85m the top of non overflow portion of the weir is proposed at +280.35m.

The width at top is proposed as 3m.The non overflow section will have its upstream face vertical. On the downstream side it will be vertical up to + 277.0m m and then a slope of 0.72H to 1V is provided below this elevation. The maximum height of non overflow portion is on the left bank where the intake is accommodated. The stability of the sections overflow and non overflow has to be analyzed at the time of detailed designs.

5.9 DAM INTAKE:

The dam intake is proposed to be located on the left bank non overflow portion 26.5 m away from dam axis towards upstream. The intake in an open channel of 35m length and rectangular shape. The sill level is +263.73

The bell mouth openings size of 2.86 m x 4.46 m on the left bank of the reservoir. Two intake gates are provided of size 2 m x 3 m .The bottom level and top level are +263m and +267.46m respectively A trash rack of semicircular of size 3.9 x 7.34 m is provided at intake mouth and will be operated from the top of the intake.

The velocity at intake is 0.587 m/s

The area of intake gate required is equal to 5.914 m^2 and provided is 6.0m^2

The bottom sill level of intake channel at the inlet on the upstream of dam will be +263m and at its outlet will be +263.73 m.

Tunnel portal is proposed in the tunnel alignment where ever possible to get sufficient rock cover. The rectangular gates of size 2 x 3m is provided as service gate and emergency gates. An air vent is also provided. The transition from rectangular gate to 2.50m ';D' shaped tunnel is made in a length of 2.75m.

5.10 TRASH RACK

A steel trash rack with its top elevation at +263.00m and bottom elevation at +261.662m and a size of 7.34 m x 3.9 m will be provided at the bell mouth entry to check floating wooden logs or boulders from entry into intake pipe.

The area of trash rack = 28.626 m^2

5.11 POWER TUNNEL

'D' shaped power tunnel having 2.5 m diameter is designed for a capacity to carry the estimated peak flow of 8.235cum.The length of power tunnel up to surge shaft from intake is 836 m. The sill level of power tunnel at inlet is +263.73m and at exit is +258.73.The tunnel is having a longitudinal slope of 1 in 150.The tunnel will be provided with concrete lining.

5.12 LPP

A length of 80 m LPP provided with 1.5 m diameter with steel liners of 8 mm thick between power tunnel and penstock. A rough economic analysis indicated that the provision of the steel pipe of 1.5m diameter with a shell thickness of 8mm laid at a slope of 1 in 150 of a length of 80m from the exit of surge to the penstock inlet can be adopted. The site conditions also favour the choice of LPP

The centre line elevation of LPP at its start will be +258.91m. The head loss in 200m length is worked out as 0.92m. The centre line elevation of LPP at exit is +258.37m.

The shell thickness will be 8mm.

5.13 PENSTOCK

A single penstock 1.5m diameter and 200m long branching into two smaller pipes each 10m long and 1.2m diameter to feed the 2 machines of 3.5MW each, is proposed for the scheme. In choosing the diameter of Penstock a preliminary economic analysis has been done.

In deciding the thickness of shell at various levels, water hammer head raring from 0-20% was taken over the static head to assess internal head. Corrosion allowance of 1.6mm has also been considered.

Being the run of the river scheme the generation is possible in monsoon months of June to November in general.

5.14 WATER QUALITY:

The water is already being utilized for irrigation without any adverse effect. The water quality is suitable for power generation as well.

CHAPTER - 6

POWER POTENTIAL STUDIES

6.1 General

The Kannankuzhy small H.E Scheme is proposed as a run of the river scheme and utilizes the water from the upper reaches of KannankuzhyThodu, which is a tributary of Chalakudipuzha. The catchment area is 35 Km^2 and the average annual yield from the catchment is 94.82 Mm^3 .The FRL of the reservoir has been fixed at +277 m and the minimum draw down level is +269 m. The minimum tail water level is +158.00m. The net head available for power generation is 110 m..The proposed installed capacity of the scheme is 7.0 MW.,and the expected annual energy generation is 16.69Mu.

6.2 Availability of Water - Hydrological studies

The scheme catchment experiences both the southwest and northeast monsoons. The scheme envisages to utilise the water from the catchment of about 35 sq.km.. No rain gauge station is available in the catchment area of the scheme. From the raingauge readings collected from the departmental raingauge station at Kannankuzhy, for a period of 11 years from 1995-2006, runoff is worked out based on the Western Ghat formula. The average annual run off computed is 94.82 Mm^3.

6.3 Installed Capacity

Power potential studies has been done for different installed capacities ranging from 4MW to 12MW and the optimization chart is appended as (Table 20). The incremental increase in energy generation for different installed capacities has been compared with the incremental increase in cost. Accordingly an installed capacity of 7.0 MW (2 x 3.5 MW) has been selected as optimum considering all the aspects. Out of 94.82 Mm^3 of average inflow, 64.28 Mm^3 can be utilised annually which comes to 67.77%, of the total inflow with a machine capacity of 7 MW. The Daily working table is based on the calculated daily discharge data from June 1995 to May 2006. The working table for the year 2005-2006 is appended as table 4. The yearly abstract of energy generated for 7 MW is appended in Table 10. Energy Curve for various Installed capacities is shown in Table 11. The average annual energy of the scheme is 16.69 Mu.

6.4 Evacuation of Power

The power generated can be stepped up to 33 KV and fed into the 33 KV substation Pariyaram which is approximately 23 km away from the proposed location of the scheme.

Being a run of the river scheme the generation is possible in monsoon months of June-November in general. Daily working table is done to assess the power potential.

The realizable energy with installed capacities of 4MW, 5MW, 6MW, 7MW, 8MW, 9MW, 10MW, 11MW and 12MW have been attempted.

In this process of operation 10% overloading of machines has been allowed. The base load has been limited to 50% of unit load capacity.

Table 2 of Section III gives the monthly working for eleven years from 1995 June to May 2006. The daily working table is given as Table 4. Results are as indicated below.

Installed Capacity MW	**Machine combination**	**Average Annual Energy Mu**	**Increment at energy**	**Energy /MW**	**% Utilization**	**PLF**
4	2 x 2 MW	12.12		3.03	49.20	34.58 %
5	2. x 2.5 MW	13.91	1.79	2.78	56.48	31.76 %
6	2 x 3 MW	15.42	1.51	2.57	62.63	29.34 %
7	**2 x 3.5MW**	**16.69**	**1.27**	**2.38**	**67.77**	**27.22 %**
8	2 x 4 MW	17.79	1.1	2.22	72.25	25.39 %
9	2 x 4.5MW	18.73	0.96	2.08	76.15	23.79 %
10	2 x 5 MW	19.57	0.82	1.96	79.47	22.34 %
11	2 x 5.5MW	20.26	0.69	1.84	82.25	21.02 %
12	2 x 6 MW	20.85	0.59	1.74	84.66	19.83 %

Installation of 7MW is found to the ideal which ensures 67.77 % utilization of the average annual yield affords realization of about 27.22% of PLF.

Annual energy realizable is 16.69 Mu for 2 x 3.5MW installations. A flow duration curve is attached which has been used to select the unit size and installation capacity.

CHAPTER - 7

ENVIRONMENTAL

7.1 General

The proposed Kannankuzhy Small HE Scheme consists of a concrete gravity type dam having 20.35 m height. A water conductor system consists of an intake, power tunnel 2.50 m dia 'D' shaped and length 836 m, a surge shaft 6 m dia, Low Pressure Pipe 80 m long and 1.5 m dia, two feeder pipes of 1.2 m dia.,bifurcating from penstock of 1.5 m dia, feeding 2 machines of capacity 3.5 MW each are proposed. Powerhouse is located on the left bank of Kannankuzhy thode. The scheme is planned as a run of the river scheme with minimum storage capacity. The storage capacity of the reservoir is only about 0.1785 Mm^3.

7.2 Forest Land

The site proposed for dam, water conductor system and Power House are in forest land under Vazhachal and Pariyaram ranges. The submergence of forestland is less and the tail waters after power generation is led directly to the same river. Submergence of forestland at FRL level is only about 3.5 Ha. The forestland required for the scheme is about 20.5 ha. excluding for transmission lines. The approximate forest land requirement for various components are as follows.

Dam & Reservoir area	=	6.20Ha
Powerhouse &other buildings	=	1.50 Ha
Water Conductor system	=	0.80 Ha
Surge,Valvehouse muck dumping etc	=	2.0 Ha
Road	=	10 Ha
Total	=	20.50 Ha

7.3 Minimum Dry Weather Flow

Many tributaries of the river are joining the downstream of the diversion structure. Hence minimum dry weather flow required to meet the down stream demand could be maintained even after building the Dam. The tail water after power generation is let out to the Kannankuzhy Thode..

7.4 Social Impact

i. Involuntary Resettlement

No human inhabitation is found in the vicinity of the project area, Hence rehabilitation measures do not come in the picture.

ii Cultural, Religious and Heritage areas

There will be no loss or relocation of cultural, religious or heritage areas of historical or religiously significant properties due to the implementation of the project.

iii Population and Socio Economic Aspects

All the component structures of the scheme are in forest land. The people in the nearby locality are farmers and forest workers. Nearest town is Chalakudy. By the completion of the project, the locality will become an attractive tourist place and eco- tourism can be developed.

iv. Employment

The construction of the proposed project will provide direct employment to approximately 300 workers for a period of about 3 years. The economic activity during the construction period and afterwards during the operation will enhance the income of the nearby populace, and will enrich the lifestyle and culture.

v. Disposal of Tunnel Muck

Muck to be disposed from the excavation of tunnel is proposed to be utilised for construction works wherever possible. The rest will be disposed carefully, with least disturbance to the nature and scenic values.

Provision is also given in the project estimate for landscaping, gardening, treatment of soil ,waste etc. Financial provision is given for supplying fuel to the labourers for cooking food during construction period.

CHAPTER - 8
GEOLOGY

8.1 General Geology and Topography.

As in page 4 of the Geological report, the weir site, river bed, abutments etc. have exposed rocks. Drilling of 10 numbers of boreholes have been done at various locations and the data is appended along with the geological report on the Geotechnical Investigation conducted by Sri. P. Charles D. Mony, Senior Geologist.

The dam site has been explored by 3 drill holes and reveals that foundation grade rock is available at shallow depth. The drill hole at tunnel intake portal indicates fresh rock at a depth of 8.17m , though rock is available from the surface.

The tunnel alignment and surge shaft has been explored by 3 drill holes, which reveal sufficient cover. Penstock route has been explored by one drill hole that indicates foundation grade rock at a reasonable depth of around 5m. the drill holes located at PH site indicate the availability of rock at RL 153.214m and 154.993m against the turbine floor level of 158.00m.

8.2 Seismicity in the Area and Earthquake Considerations

Seismo tectonic analysis of the area favours a seismic resistant design for the components as applicable to Zone III.

The detailed Geological report is appended as Annexure I.

8.3 REGIONAL GEOLOGY:

The project falls in a high grade metamorphic terrain of Archaean age with charnockite,quartzo feldspathic gneiss,homblende biotite gneiss,migmatite and migmatite chamockite.These are lenses of pyroxene granulite and amphibolite and intrusive of dolerite dykes and pegmatite veins.The regional foliation trend is variable between E-W and WNW – ESE with southerly dip at moderate angles of 40^0 to 60^0

Study of topo sheet shows that the Kannankuzhy thodu flows from north to south from its origin to its confluence with Chalakkudy River following a straight course, which is a major lineament. However, down stream of the weir site its course is off set by a E-W fault and the river flows from west to east for a distance of about 300 m and then north to south with a 35 m fall just downstream of dam site.

8.4 GEOLOGY OF DIVERSION SITE, POWER HOUSE SITE.ETC.

At the dam site the left bank rises at a fairly steep angle (35 to 40 degree) as compared to right bank. Chamockite and homblend biotite gneiss N85W-S85E and dip is 60 degree towards east. Though the

dam site falls on the Kannankuzhy thodu Lineament , it is considered as not active. Geomophological studies indicates that there could be a E-W weak zone in the vicinity of dam site as indicated by the sharp turn taken by the river. Symptoms of these zones are not seen at the dam site. However they may be intercepted in the power tunnel.

8.5 GEOLOGICAL EXPLORNTIONS:

In total 10 bore holes were drilled and these holes were located at dam site,on the power tunnel alignment and penstock alignment and at power house site. The dam is aligned in N5W-S5E direction across kannankuzhy thodu.

CHAPTER - 9

CONSTRUCTION MATERIALS

SOURCES:

For the construction of Kannankuzhy Small HE Project, the materials which are available locally as well as materials to be brought from elsewhere are to be used. The locally available materials include rubble, coarse and fine aggregates for concrete, bricks and timber materials required for shuttering of concrete and allied works. M.S.Rods for steel structure for intakes, power house building, and switch yard, G.I.sheet, fabricated doors and windows, rolling shuters, steel plates or pipes for penstock pipe, turbine ,generating equipments etc.are to be brought from outside project area.

Rubble can be obtained from blasting the rock for excavation for foundation of various structures of project or by quarrying the nearby rock. Even though river sand is available in small quantities in the stream, it is not proposed for work as safety measure to protect the environment. The sand and aggregate are proposed to be manufactured at site using rubble in aggregate processing machine. Brick is to be brought from nearby brick kilns.

Turbine and Generating equipments, if manufactured indigenously will be transported by rail up to Chalakkudy and then by road to site. All the roads in the route from Chalakkudy to Kannankuzhy are strong enough to carry heavily loaded Lorries. If the Turbine and Generating equipments are imported, the same can be harbored at Kochi and from there it can be transported by road.

TECHNICAL FEATURES OF THE PROJECT

Kannankuzhy Small HE Scheme envisages utilization of water from the upper reaches of Kannankuzhythodu which is a tributary of Chalakudy river, by the construction of a dam at about 200 m u/s of 'Kundoormedu' falls for power generation in a surface powerhouse with 7 MW installed capacity, on the left bank of Kannankuzhy thodu. The water conductor system consists of an intake structure, power tunnel surge shaft, LPP, valve house and penstock. Detailed field investigation has been conducted for the scheme. The dam, the water conductor system and the power house are designed as per the report of the geological explorations conducted along the respective locations

Dam And Spillway

The dam is aligned in N50W - S 50E direction across Kannankuzhy thodu. Kannankuzhy is 28 kms away from Chalakudy. The weir location is about 12 kms from Kannankuzhy. The general bed level is +261.23m. The deepest foundation is assumed at +260.00m. The FRL of the weir is +277.00. The MWL is 278.85m. Top level of weir is +280.35m with a top width of 3.00m. The crest of overflow section is at 277.00m. The spillway discharge capacity provided is 324 cumecs. The maximum height of non overflow portion is 20.35m. The non overflow will have its upstream face vertical and downstream slope 1 in 0.72. The overflow portion have its upstream face vertical upto elevation +273.824. The down stream slope is1 in 0.72 from elevation 274.76 .A river sluice of 1.50m dia is provided in the block adjacent to spillway in the left bank. The sluice will be controlled by an upstream emergency gate operated from the top of the dam. For energy dissipation ,trajectory type bucket is proposed. Radius of bucket is 3.90m and the centre of curvature of bucket is at 265.63m. Geological section shows, foundation grade rock is available close to surface on right bank. On the left,,the foundation grade rock is available at a depth varying from 2.50m to 3.50m. Total length of the dam is 111 m with a spillway length of 60 m.

CHAPTER – I0

ELECTRO MECHANICAL WORK

This covers the generating equipment and erection, testing, and commissioning works including establishment

Turbine type :- Horizontal shaft, FRANCIS

Works included are

A)

1. Fabrication of Trash rack
2. Testing of Steel sheet
3. Fabrication of Penstock
4. Fabrication of Bell mouth
5. Fabrication of Expansion Joint
6. Fabrication of Rocker support
7. Fabrication of Y peice
8. Fabrication of Bifurcation
9. Insertion of Draft Tube
10. Insertion of PRV
11. Fixing of Turbine
12. Fixing of Generator
13. Fixing of MIV
14. Trial run of Tuebine
15. Commissioning of Generator

B)

1. Levelling of Switch yard
2. Earth mat
3. Equipment foundation
4. Erection of Equipment
5. Commissioning

CHAPTER – 11

EVACUATION OF POWER

The power generated can be stepped up to 33 KV and fed into the 33 KV substation Pariyaram which is approximately 23 km away from the proposed location of the scheme.

CHAPTER – 12

CONSTRUCTION PLANNING AND PROGRAME

12.1 General

The main civil works include construction of dam, tunnel, surge, valve house, penstock, powerhouse, tailrace and facilities such as colonies and roads. The mechanical work includes the manufacture, fabrication and erection of gates, trash rack and intake, vertical lift gate for river outlet in the dam, butterfly valve for penstock, stop log gate for power house etc. The electromechanical work includes erection and commissioning of 2 nos, 3.5MW capacity generating equipments, erection of EOT crane, auxiliary equipments for dewatering, cooling etc**.** and construction of transmission towers and lines.

12.2 Communication Facilities

The road access to the project site is from Kannankuzhy.. The dam site is about 12 km from Kannankuzhy . There is 6 km coup road from Kannankuzhy. The coup road through forest has to be widened, improved and new roads for a total length of another 6 Km have to be formed to provide access to various component structures of the scheme.The proposal for a road tunnel is feasible for a chainage from 10.770 km to11.370 km.

12.3 Availability of Construction Materials.

i) Sand

River sand is available within a distance of 41 km from the site. However due to restrictions in collecting the river sand it is proposed to use crushed sand for the major works wherever possible.

ii) Rubble and aggregates

Aggregate required for the project can be collected from Pariyaram within a distance of 42 km. Rubble formed from the available rocks at site can be stacked and used for construction.

iii) Cement and Steel

The cement and steel is proposed to be procured by the Contractor.

12.5 Project.

This group will be under the control of a Chief Engineer (Civil) under whom the following units will be attached for the proper management and speedy execution of the project.

12.6.1 Weir and Tunnel Division

This unit headed by an Executive Engineer will be in charge of the construction of component structures, weir and tunnel. For the construction of weir and tunnel there will be three Sub-division

under Assistant Executive Engineers and each Asst.Exe. Engineer will have three Asst. Engineers and nine sub Engineers.

12.6.2 Penstock and Power House Division

This division headed by an Executive Engineer will be in charge of the construction of Penstock and Power House. There will be separate Sub Division for Penstock and Power House under Assistant Executive Engineers.

12.6.3 Roads, Camps Division

This division will be in charge of internal roads, setting up camps, offices and for land acquisition headed by an Executive Engineer.

12.6.4 Erection Division

This Division headed by an Executive Engineer (Ele.) will be responsible for all Electro mechanical works connected with the project implementation.

12.7 Construction Management

Project Administration will be under the control of the Chief Engineer (Civil-Construction)

12.8 Designs and Specification

Design of component structures will be undertaken by the Design wing at Thiruvananthapuram under the Chief Engineer (Civil).

12.9 Technical Contracts

The Chief Engineer in charge of the project will invite tenders after detailed design of structures and Chief Engineer (CP) will move for the Ist stage forest clearance.

12.10 Accommodation and other Amenities

Semi permanent and temporary buildings are proposed to be constructed at dam site, power house site etc for the accommodation of the supervisory officers and staff. One temporary I B is required at dam site. Permanent colony for the minimum requirement of operating staff shall be constructed near power house site. The work is proposed to be arranged on contract basis.

12.11 Construction Plant and Machinery.

Since the works are proposed to be executed through contract, the plant and machinery required for the construction of the project shall be provided by the contractor. Provision for special tools and plants as per CWC guidelines is not followed since all construction equipments are to be mobilised by the contractor.

12.12 Vehicles for Works Inspection

Provision for vehicles is given in the project estimate for supervisory officials.

CHAPTER – 13

COST ESTIMATES

13.1 UNIT RATES

The rates for different items of work adopted in the estimate for civil works are updated as per DSR 2018

13.2 ESTIMATES

The estimates of the different components of the project are grouped under following heads.

i) Civil Engineering Works

Under this head, the cost of civil engineering structures has been grouped. The quantities involved in different components of the scheme have been worked out from the preliminary design drawings prepared for each structure.

ii) Electro Mechanical Work

This covers the generating equipment and erection, testing, and commissioning works including establishment.

GENERAL ABSTRACT OF ESTIMATE

(As per DSR 2018)

	Direct Charges	**Rs. lakhs**
I	Works	
a)	Civil works	**5090.00**
b)	Electro Mechanical works	**4025.00**
II	Establishment	
a)	Civil works	**200.00**
a)	T & P Civil works	**51.00**
IV	Suspense	**14.00**
V	Receipts and Recoveries	**-5.00**
	Total Direct Charges	**9375.00**
	GRAND TOTAL (Rs. lakhs)	**9375.00**

Civil works	**5350.00**
Electrical works	**4025.00**
TOTAL (Rs. lakhs)	**9375.00**

CHAPTER – 14

CONCLUSION

The project is technically viable and economically attractive. The net annual energy output available to be fed into the existing grid at Kannankuzhy will be 16.69 million units. This will improve the peak voltage shortage in Thrissur and neighboring area. This is an innovative attempt on the part of a Thrissur Corporation to take up the construction and implementation of a Small Hydel Project .MNRE subsidy will also be considered the cost of production will be reduced against subsidy

VOLUME I

Volume II

CHAPTER I

THRISSUR CORPORATION ELECTRICITY DEPARTMENT

PROJECT AT A GLANCE

PROJECT NAME	:-	INSTALLATION OF 200 KW SOLAR PLANT
LOCATION	:-	VADAKKE BUS STAND, THRISSUR
ESTIMATE COST	:-	**₹ 1,33,40,748 /-**
BUDGET PROVISION	:-	IT CAN BE MET OUT WITH INTERNAL FUNDINGS

Proposal for installation of200kW Grid Connected Solar PowerPlant at vadakke bus stand

TABLE OF CONTENTS

1. Introduction - TCED

The Thrissur Municipal Corporation manages the distribution of electricity to the residents and Commercial establishments through Thrissur Corporation Electricity Department. The distribution network covers about 12.65 Sq. km. With the support and consent of Govt. of Kerala, Energy Management center, ANERT and Kerala State Electricity Regulatory Commission, TCED has been implementing various programs and projects for efficient use of energy and conservation. TCED has already commissioned 500kw Solar Power plant till date other than consumer installed solar plants. In addition, TCED will soon be having its own Small Hydel Projects as much as 4 projects are already allotted to TCED by the Kerala Government. Further TCED as part of metering RPO obligation for coming year planning to install 200Kwp solar roof top panel on our north Bus stand building. For this estimated cost comes **₹ 1,33,40,748 /- .** The above project is planning to install on FY 2022-2023

2. Grid Interactive Solar PV System - Working Principle

Photovoltaic power generation employs solar panels which exhibits photoelectric effect composed of many solar cells converting solar irradiation in to direct current electricity using semiconductor that exhibit the Photovoltaic Effect. This DC electrical energy is converted to AC (Alternate Current) power by the inverter/power conditioning unit

Grid-connected or utility-intertie PV systems are designed to operate in parallel with and interconnected with the electric utility grid. The inverter converts the DC power produced by the PV array into AC power consistent with the voltage and power quality required by the utility grid. The inverter automatically stops supplying power to the grid when the utility grid is not energized. A bi-directional interface is made between the PV system AC output circuits and the electric utility network; this allows the power produced by the PV system to either supply on-site electrical loads, or to back feed the grid when the PV system output is greater than the on-site load demand. When the electrical demand is greater than the PV system output, the balance of power required is received from the electric utility, it also ensures that the PV system will not continue to operate and feed back ontothe utility grid when the grid is down for service or repair.

Advantages

- Energy independence Reduced dependence on conventional resources.
- Less Environmental impact operates with nil emissions
- Modularity and Scalability.
- Sustainable and renewable
- Reliability and energy Security
- Reduced Electricity Bills
- Low Maintenance Cost

3. System Details & Main Components

Grid-connected or utility-intertie PV systems are designed to operate in parallel with and interconnected with the electric utility grid. The inverter converts the DC power produced by the PV array into AC power consistent with the voltage and power quality required by the utility grid. The inverter automatically stops supplying power to the grid when the utility grid is not energized. A bi-directional interface is made between the PV system AC output circuits and the electric utility network; this allows the power produced by the PV system to either supply on-site electrical loads, or to back feed the grid when the PV system output is greater than the on-site load demand. When the electrical demand is greater than the PV system output, the balance of power required is received from the electric utility, it also ensures that the PV system will not continue to operate and feed back onto the utility grid when the grid is down for service or repair.

3.a Solar PV Modules

A PV module consists of many PV cells wired in parallel to increase current and in series to increase voltage to desired level. The module is encapsulated with tempered on the front surface, and with a protective and waterproof material on the back surface. The edges are sealed for weather proofing, and there is often an aluminium frame holding everything together in a mountable unit. In the back of the module there is a junction box, or wire leads, providing electrical connections.

3.b Solar Grid Connected Inverter

A solar Grid connected inverter converts the variable direct current (DC) output of a solar photovoltaic (PV) array into a utility frequency alternating current (AC) to facilitate feeding into the grid or work in synchronization with grid to feed the local grid It must act as the interface between the PV array and the Grid. The inverter has protection features for overvoltage, under voltage, surge etc. The inverter is provided with the features for logging and display of parameters related to Plant operation & faults etc. The inverter will use MPPT to maximize energy drawn from the array. The MPPT will be microprocessor based to minimize power losses. The output from the inverter will be fed to the AC distribution Board.

The Inverter is a DC/AC converter which is connected by installers to each PV module or embedded by module manufacturers, replacing the traditional solar junction box. The Grid inverter captures maximum energy output from PV systems by constantly tracking the maximum power point (MPPT) of each module individually.

The MPPT per module allows for flexible installation design with multiple orientations, tilts and module types in the same string. When working with Grid Inverters, Grid power optimizers automatically maintain a fixed string voltage, allowing installers even greater flexibility with longer strings and strings of different lengths in order to design optimal PV systems.

3.c Monitoring system

TCED provides a web-based monitoring system for all its solar power plants. This online portal allows customers to monitor their solar power system performance in 15-minute intervals and provides them with seamless access to production data and environmental savings. With the monitoring system, our customers can easily generate and export reports that demonstrate system and environmental savings across all of their facilities. It has the following capabilities:

- Customer can monitor energy produced by an individual system or in aggregate for a fleet of sites.
- Customer can monitor environmental impact of the system like amount of C02 offset
- Data is available at 15-minute intervals and can be displayed in daily, weekly, monthly, annual or custom date ranges.
- Any data charted can be exported in CSV format.

3.d ACDB

The AC power output of the inverter shall be fed to the AC Distribution Board (isolation panel). The 230/415V AC output of the isolation panel is fed to the grid. AC energy is then synchronized with the grid and is used either by local loads or

Feed to grid ACDB is integrated with suitable rated MCCB/MCB/s, Multifunction Meter and Surge Protection Device with indication Lamps the enclosure of ACDB fabricated by GI steel. Front door is provided with hinges and locking arrangements. The enclosure has been finished with aluminium shade powder coating.

3.e CABLES

DC Solar Cables:

These cables are designed for connecting photovoltaic power supply systems. These cables can be used indoor & outdoor for flexible and fixed installations with high mechanical strength in extreme weather conditions.

Electrical Characteristics

- Maximum Permitted DC Voltage: 1.8 kV (conductor/ conductor, non-earthed system, circuit not under load)
- Working Voltage: DC 1500 V
- Insulation Resistance: 1000M Ohm – km

Constructional Characteristics

Conductor	Electrolytic Multi Stranded tinned copper conductor flexible as per IEC 60228 Class 5.
Insulation	Cross linked Halogen Free & Flame Retardant Insulation
Sheath	Cross linked Halogen Free & Flame Retardant Sheath in Black/Blue/Red Colour

AC Cables:

Multi-strand Copper/Aluminium cables will be used for interconnection of electrical components like PV Modules, Junction boxes, distribution Boards & Inverter. All the cabling will be carried out as per the standards. The size and length of the cable will be selected such that there will be minimum voltage drop. The size of cables will be selected considering the short circuit current that can

Flow through the cables. Cables will be housed inside PVC conduit pipe for unarmored cables and cable trays and trenches in case of armored cables.

- Material: Multi Strand High Conductivity Aluminium
- Type: PVC/XLPE Insulated
- Voltage Grade: Max 1100V (LT)/11000V (HT)

3.f Earthling

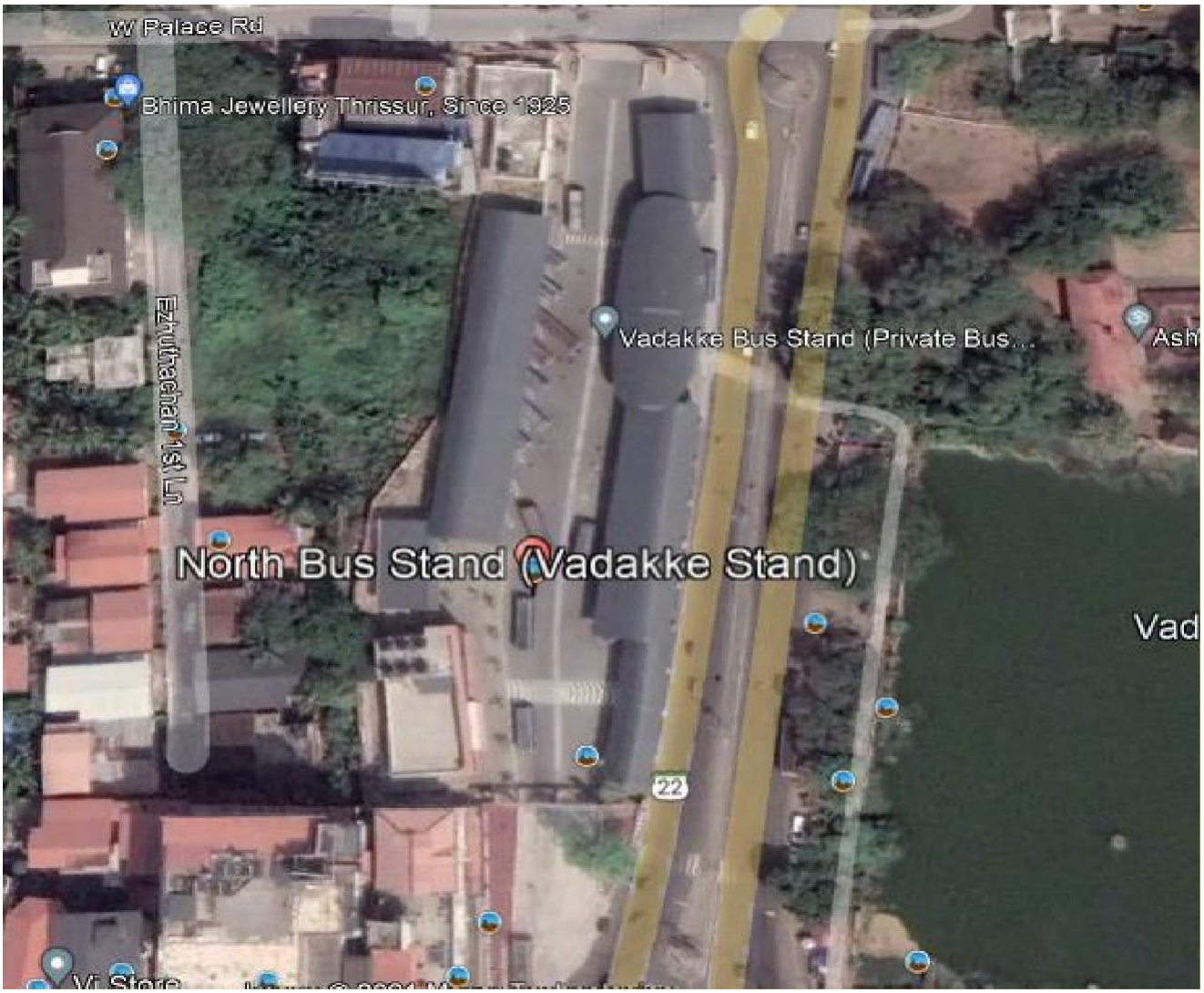
The earthling of all outdoor equipment & provision of associated earthling systems, electrodes & connections will be as per latest IEEE and IS 3043 standards and the total earth grid resistance will be less than 1 ohm. The earth electrodes will be provided in earth pits. Galvanized steel flats will be used as per approved design.The frames of all electrical equipment & structural work will be earthed by connection to the earth grid PCU, ACDB and junction will be earthed properly. The system provides adequate earthling points. This includes earthling for lightning, system grounding, separately for DC and AC active points. Maintenance free and environment friendly earth electrode set with environment friendly backfill compound are used.

3.g Lightning Protection

The SPV power plants will be provided with lightning & overvoltage protection. The main aim in this protection is to reduce the over voltage to a tolerable value before it reaches the PV or other sub system components. The entire space occupying the SPV array suitably protected against lightning by deploying required number of Lightning Arrestors (ATR). The Lighting Arrestor (LA) are made with appropriate air termination rod, and Aluminium/copper as down conductor and is earthed with earth pits based on the necessary meteorological data of the location of the projects as per IEC 62305 standards. The earthling pit shall have to be made asper IS3043.

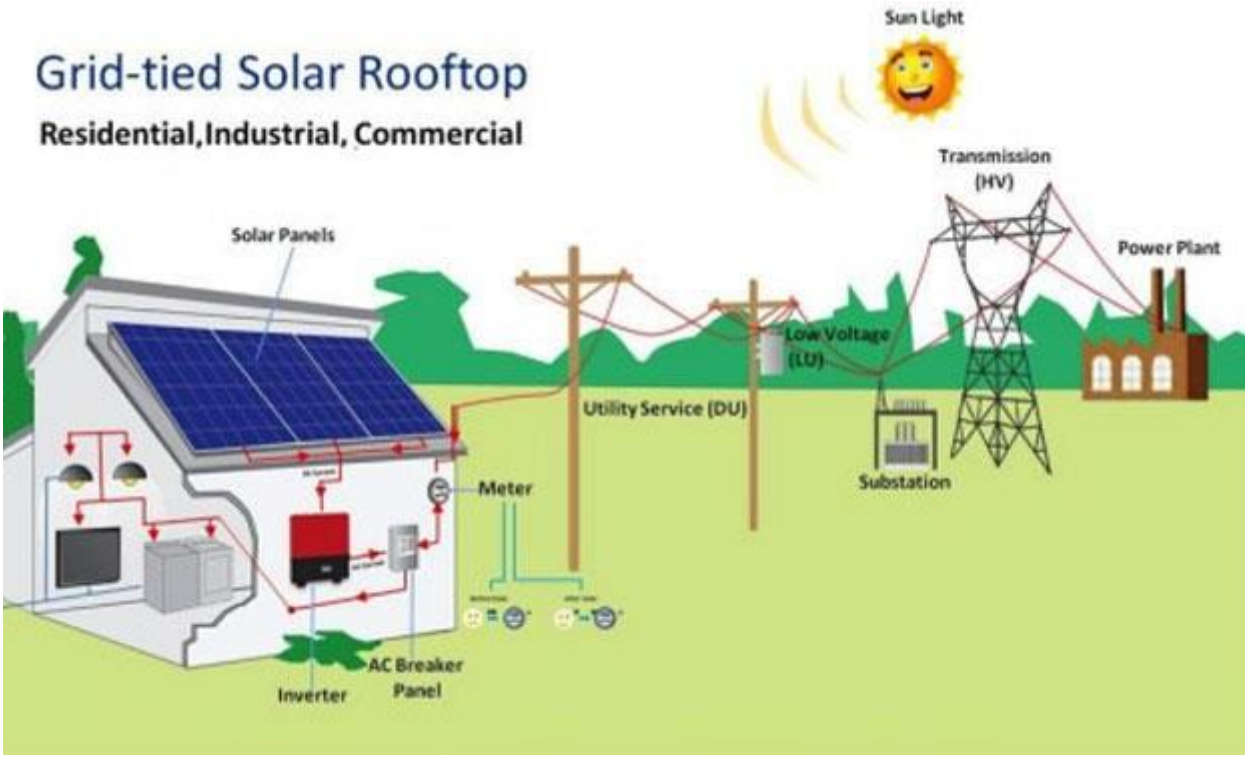
4. Site Details

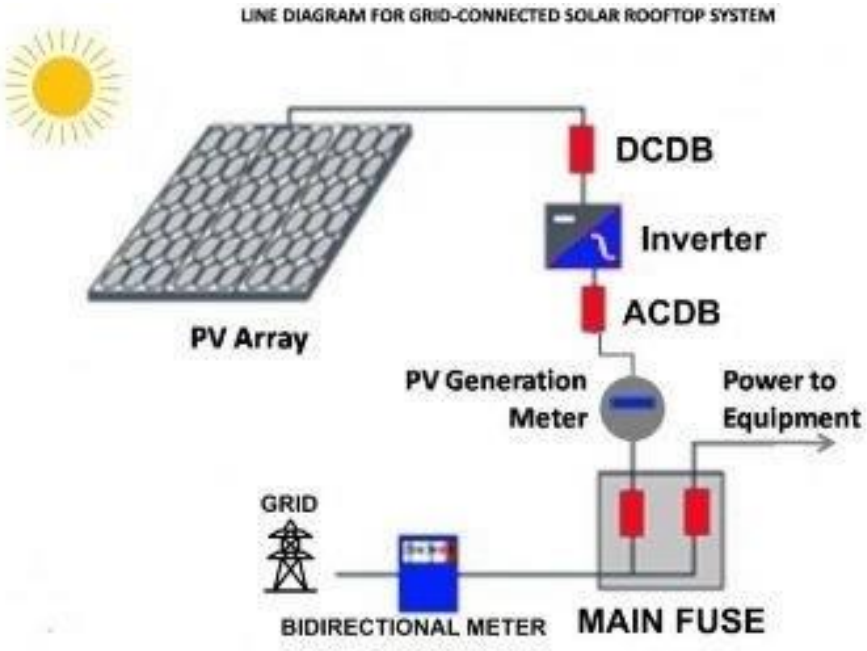
Location: Bus Terminal waiting shed Thrissur Corporation



Latitude	**10.31487**
Longitude	**76.12527**

5. Typical Grid Connected Rooftop Solar System Diagram





6. Scope of work

TCED Scope

TCED shall be responsible for execution of the proposed project, on a lump-sum, fixed-fee, turnkey basis inclusive of all the execution work set out here andafter.

Engineering: TCED shall be responsible for the development of the Executive Design for the PV Plant, in compliance with the Technical Specifications, Applicable Law and Prudent Industry Practices.

Electrical & Mechanical Equipment: TCED shall be responsible for procurement, supply, transportation (including customs clearance and import duties and other payments associated therewith) and unloading at site of the following equipment's:

- Photovoltaic modules
- Inverters
- Complete electrical cabling (DC and AC) and necessary electrical accessories
- Earthling & Lightning protection system for solar system.
- Suitable structures for mounting the solar panels
- Remote Monitoring System

Setting-up, Assembly and Installation: TCED shall supply to the Client, and install on the Site, the Equipment and all the materials, machinery, accessories and components including any necessary civil works required for the full, correct and safe operation of the PV Plant.

Commissioning: TCED shall be responsible for obtaining all regulatory and statutory approvals and permits required to install and operate the plant as follows:

1. Obtaining sanction for Energization from Electrical Inspectorate for Solar Power Plant as per their Guidelines.
2. Obtaining grid connectivity from KSEBL by conducting all inspection and tests as per provisions of the KSERC Renewable Energy and Net Metering Regulations 2020.

Customer Scope

- Unfettered access to the land and electrical room during construction & subsequent maintenance of the power plant.
- Replacement of existing tile roof of the proposed building with GI/Al sheetof superior quality.
- All Statutory fees/Refundable deposits related to KSEB/ElectricalInspectorate shall be paid by the customer.
- Auxiliary power required during construction and stable power source forthe testing of the solar system
- Suitable storage space for the inverter & other electrical hardware.
- Source of Water for cleaning along with requisite drainage facilities.
- Cutting and removal of trees/branches causing shadows to the proposedareas.

7. Specifications and Standards of Major Components& Installation

Sr. No	Item Description	Specification	Standard
1	Solar PV Modules	Type: Monocrystalline PERC with module power upto 605 Wp Make: Topsun/Renewsys/ Equivalent	As per MNRE standards 1. IEC 61215/ IS 14286 2. IEC 61701 3. IEC 61730-1,2
		Rating: 605Wp 1000V/1500V DC	
2	Solar PV Inverters of capable outdoor installati on	Type: Grid Tie MPPT Make: Delta/ABB/Hitachi/ fronius/So farEquivalent	As per MNRE standards 1. IEC 62109 2. IEC 62116 3. IEC 61683
		Rating: 3 phase 415V AC 50 KW*4 nos	4. IEC 60068-2 (1, 2, 14, 30)
	Switchgear	Type: DC& AC	

3	(Fuses, Circuit Breakers & Isolators)	Rating: As per site	As per MNRE standards 1. IS/IEC 60947
4	Surge Arrestors	Type: 2 (AC & DC) Rating: adequate	As per MNRE standards 1. IEC 61643
5	DC Cables	Type: UV Rated Solar Cable Rating: 1500V(DC)	As per MNRE standards 1. IEC 60227/IS 694, 2. IEC 60502/IS 1554
7	AC Cables	Type: PVC/XLPE Rating: 1100V (AC)	As per MNRE standards 3. IEC 60227/IS 694, 4. IEC 60502/IS 1554
8	Earthling /Lightning	Type: Maintenance Free Chemical Earthling Rating: minimum size - 6.0 mm2	As per MNRE standards 1. IEC 62561
9	Junction Boxes	Type: thermo plastic / CRCA Rating: IP 65/IP 54	As per MNRE standards 1. IEC 60529
10	Energy Meter	Type: Watt-hour Meter Rating: Class 0.5	As specified by the KSEB
11	Solar PV Roof Mounting Structure	Type: Corrosion Resistant Anodized aluminum structure Rating: 150 km/hr Wind velocity withstanding capacity	As per MNRE standards 1. IS 2062/IS 4759
14	Installation, Testing, Commissioning and Connectivity	As per Electrical Inspectorate Guide Lines	As per CEA Regulations

Note: All materials used in this project comply with MNRE Standards

8. Estimated Project Cost for Design, supply, installation, testing and commissioning of 200 kWp Grid Rooftop Solar Power Plant:

Sl. No.	Item	Quantity	Amount
1	Supply of 200kW Grid connected rooftop Solar Power Plant including all components as per the Specifications and Standards	1 Set	68,35,413.00
2	Installation, testing and commissioning of 200kW Grid connected rooftop Solar Power Plant including all components as per the Specifications and Standards, associated civil work, termination at LT Panel and obtaining connectivity approval from KSEBL and Electrical Inspectorate as per provisions of the KSERC Renewable Energy and Net Metering Regulations 2020	1 Set	29,29,463.00
3	Additional structure work, Ladder, cable,cleaning provision etc	1 Set	5,37,500.00
4	Transformer & RMU installation work for power evacuation	1 Set	13,50,906
5	**Total Basic Cost**		**1,16,53,282.00**
6	GST @ 12% on Item 1 above		8,20,249.56
7	GST @ 18% on Item 2 & 3 above		6,24,053.34
8	GST @ 18% on Item 4 above		2,43,163
9	**Total Project Cost**		**1,33,40,748.00**

- *Feasibility Application fee of Rs. 1010 + 18% GST .*