OIL & GAS DEVELOPMENT COMPANY LIMITED
PROCUREMENT DEPARTMENT (LOCAL), ISLAMABAD
SCHEDULE OF REQUIREMENT

Material :**PURCHASE OF COOLING TOWER PVC FILLS & DRIFT ELIMINATORS FOR KPD TAY PLANT**

Due Date:

Tender Enquiry No: **PROC/LD/PT/18702/22**

Bid Bond Value : RS.150,000/-

Attachment(if any) : YES

EVALUATION WILL BE CARRIED OUT ON FULL

Sr No	Description	Quantity	Make/Brand offered	Unit	Unit Price (PKR) Inclusive Of All Taxes Except GST	Unit Price (PKR) Inclusive of GST	Total Price (PKR) Inclusive of GST	Delivery Period Offered	deviation from Tender Spec. If Any
1	Cooling Tower Fill Sheet Size 1000 mm x 500 mm (Depth: 33.3mm) (Material: PVC) as per TOR	1500		Number					
2	Cooling Tower Fill Sheet Size 1000 mm x 750 mm (Depth: 33.3mm) (Material: PVC) as per TOR	1800		Number					
3	Cooling Tower Fill Sheet Size 850 mm x 500 mm (Depth: 33.3mm) (Material: PVC) as per TOR	250		Number					
4	Cooling Tower Fill Sheet Size 900 mm x 500 mm (Depth: 33.3mm) (Material: PVC) as per TOR	750		Number					
5	Cooling Tower Fill Sheet Size 900 mm x 750 mm (Depth: 33.3mm) (Material: PVC) as per TOR	600		Number					
6	DRIFT ELIMINATOR BUNDLES Size 1000 mm x 400 mm (Material: PVC) as per TOR	4		Number					
7	DRIFT ELIMINATOR BUNDLES Size 1000 mm x 500 mm (Material: PVC) as per TOR	12		Number					
8	DRIFT ELIMINATOR BUNDLES Size 950 mm x 400 mm (Material: PVC) as per TOR	36		Number					
9	DRIFT ELIMINATOR BUNDLES Size 950 mm x 500 mm (Material: PVC) as per TOR	108		Number					

Special Note: The prospective bidders also download the master set of Tender Document

- The prospective bidders may keep in touch with OGDCL web site for downloading the clarifications/amendments (if any) issued by OGDCL.
- BID VALIDITY 180 DAYS FROM TECHINCAL BID OPENING.DELIVERY AT KPD TAY PLANT,HYDERABAD IN 120 DAYS FROM LPO ISSUE DATE. PAYMENT AFTER DELIVERY & INSPECTION AT SITE.

OIL & GAS DEVELOPMENT COMPANY LIMITED
PROCUREMENT DEPARTMENT (LOCAL), ISLAMABAD
SCHEDULE OF REQUIREMENT

Mandatory Checklist

Please confirm the compliance of the following mandatory information along with the bid(s) (failing which bids(s) will not be accepted)

Documents	To be Attached with the Technical/Financial Bids	Compliance	
Original Bid Bond	Technical Bid	Yes ☐	No ☐
Copy of NTN Certificate	Technical Bid	Yes ☐	No ☐
Copy of GST Certificate	Technical Bid	Yes ☐	No ☐
Confirmation that the Firm is appearing on FBR's Active Taxpayer List	Technical Bid	Yes ☐	No ☐
Duly signed and stamped **Annexure–A (Un–priced)**	Technical Bid	Yes ☐	No ☐
Duly filled, signed and stamped **Annexure–B**	Technical Bid	Yes ☐	No ☐
Duly filled, signed and stamped **Annexure–D**	Technical Bid	Yes ☐	No ☐
Duly filled, signed and stamped **Annexure–L** on Company's Letterhead	Technical Bid	Yes ☐	No ☐
Duly signed and stamped **Annexure–M** on Company's Letterhead	Technical Bid	Yes ☐	No ☐
Duly signed and stamped **Annexure–N** on Non–Judicial Stamp Paper duly attested by Notary Public	Technical Bid	Yes ☐	No ☐
Duly filled, signed and stamped **Annexure–A (Priced)**	Financial Bid	Yes ☐	No ☐
Duly filled, signed and stamped **Annexure–C**	Financial Bid	Yes ☐	No ☐
Duly filled, signed and stamped **Annexure–E**	Financial Bid	Yes ☐	No ☐

OIL & GAS DEVELOPMENT COMPANY LIMITED
PROCUREMENT DEPARTMENT (LOCAL), ISLAMABAD
SCHEDULE OF REQUIREMENT

For the Vendors/Contractors who opt to submit Bank Draft/Call Deposit/Pay order against Bid Bond/Performance Bond, our Accounts Department has finalized an arrangement for online payment to such Vendors/Contractors, which will be processed through (IBFT & LFT) for which following information is required:

i.	IBAN No. (International Bank Account Number 24 Digits)	
ii.	Vendor Name as per Title of their Bank Account	
iii.	Contact No.of Company's CEO/ Owner (Mobile & Landline)	
iv.	Bank Name.	
v.	Bank Branch Name and Code	

Name, Sign and Stamp of the authorized official of the Bidder(s) _____

OIL & GAS DEVELOPMENT COMPANY LTD

TOR FOR

SUPPLY OF COOLING TOWER FILLS AND DRIFT ELIMINATOR BUNDLES INSTALLED AT KPD-TAY PLANT

TABLE OF CONTENTS

1.0 INTRODUCTION:

Oil and Gas Development Company Ltd (OGDCL) is Pakistan's National Oil & Gas Exploration and Production Company. OGDCL is currently operating Country's largest Oil & Gas sector including saleable Oil & Gas Processing Plants.

Kunnar-Pasakhi-Deep and Tando-Allah-Yar (KPD-TAY) is a Gas & LPG Processing Plant, located in Hyderabad District about 25 km away from Hyderabad and approx. 195 km from Karachi, Sindh Province of Pakistan. The Plant is comprised of two gas processing trains installed in the close proximity of oil wells. The processing plant is connected with the wells through gas gathering network which terminates into slug catcher at the process plant premises.

OGDCL intends to purchase Cooling Tower Fills and Drift Eliminators in mentioned quantities as per section 3, from an experienced and well reputed manufacturer / contractor / supplier to fulfil the operational requirement.

2.0 DEFINITIONS, ERRORS & CONFLICTS:

Owner /Company : Oil & Gas Development Company Limited (OGDCL)

Supplier /Contactor : Parties, which vendors and / or supplies material, equipment and services to perform the duties as specified by Company in the scope of supply.

2.1 Errors or Omissions.

2.1.1 Review and comment by the Company at any Contractor / Supplier's drawings, procedures or documents shall only indicate acceptance of general requirements and shall not relieve the Contractor / Supplier of its obligations to comply with the requirements of this specification and other related parts of the contract documents.

2.1.2 Any errors or omissions noted by the Contractor / Supplier in this Specification shall be immediately brought to the attention of the Company.

2.2 Conflicting Requirements.

In the event of conflict, inconsistency or ambiguity between this Specification, National Codes & Standards referenced in this Specification or any other documents, the Contractor/ Supplier shall refer to the Company whose decision shall prevail.

3.0 SCOPE OF SUPPLY:

The scope covers supply of Cooling Tower Fills and Drift Eliminator Bundles in below mentioned quantities & specifications provided below and in attached drawings.

Sr #	Description	QTY	UOM
	Cooling Tower PVC Fills		
1	Cooling Tower Fill Sheet Size 1000 mm x 500 mm (Depth: 33.3mm) (Material: PVC)	1500	No

2	Cooling Tower Fill Sheet Size 1000 mm x 750 mm (Depth: 33.3mm) (Material: PVC)	1800	No
3	Cooling Tower Fill Sheet Size 850 mm x 500 mm (Depth: 33.3mm) (Material: PVC)	250	No
4	Cooling Tower Fill Sheet Size 900 mm x 500 mm (Depth: 33.3mm) (Material: PVC)	750	No
5	Cooling Tower Fill Sheet Size 900 mm x 750 mm (Depth: 33.3mm) (Material: PVC)	600	No
Cooling Tower Drift Eliminators			
6	Drift Eliminator Bundles Size 1000 mm x 400 mm (Material: PVC)	4	No
7	Drift Eliminator Bundles Size 1000 mm x 500 mm (Material: PVC)	12	No
8	Drift Eliminator Bundles Size 950 mm x 400 mm (Material: PVC)	36	No
9	Drift Eliminator Bundles Size 950 mm x 500 mm (Material: PVC)	108	No

4.0 REFERENCE STANDARD:

DLT-742 (Technical Specification for Plastic Parts of Cooling Tower)

5.0 GENERAL REQUIREMENTS:

a. All the specifications / dimensions should be as per attached drawings.
b. Inspection (after shipment of material) by OGDCL representative.
c. All supplied parts/material must comply with all the requirements of DLT-742 (Technical Specification for Plastic Parts of Cooling Tower)
d. The Contractor / Supplier must make all necessary arrangements including for transport of Cooling Tower Fills and Drift Eliminator Bundles to KPD-TAY Plant.
e. Guarantee / warrantee of Cooling Tower Fills and Drift Eliminator Bundles for a period of one year after installation and being taken into service or 18 months after shipment, whichever comes first.
f. Bidders must submit all the technical information pertaining to the specifications, design, dimensions, and profiles of Cooling Tower Fills and Drift Eliminators in the technical bid.
g. Bidders must submit OEM's name, address, contact details and website in the technical bid.
h. Spare items are not available to provide as sample. Hence, it will only be provided if operationally possible otherwise provision of sample is not guaranteed as OGDCL has to dismantle the same from running cooling towers. In order to eliminate any confusion regarding specifications, shape, design, dimensions, and profiles, bidders may visit the KPD-TAY Plant site for collection of any technical / dimensional data of existing installed fills and drift eliminators prior to bidding (if required). Successful bidder can also visit KPD-TAY Plant after award of contract to obtain any required detail.

6.0 CONTRACTOR RESPONSIBILITIES:

a. The Contractor / Supplier shall be responsible for safe transportation of Cooling Tower Fills and Drift Eliminator Bundles to the KPD-TAY Plant.
b. In case the supplied material is damaged / divergent from provided specifications & standards / short in quantity, the Contractor / Supplier shall immediately rectify / replace the same with in delivery period. Any delay in rectification will be liable to LDs as per OGDCL standard tender document.
c. The Contractor / Supplier shall provide all relevant Material Test Certificates / Quality Certificates as per referenced standard.

7.0 OGDCL RESPONSIBILITIES:

OGDCL will provide the following facilities:

i. OGDCL will provide 30Ton crane and Fork Lifter for unloading of material at site.
ii. OGDCL will provide food & accommodation at site if any representative of the bidder will visit KPD-TAY site for any technical clarification before bidding or after award of the contract.

8.0 PAYMENT TERMS:

Payment will be made after Delivery / transportation to KPD-TAY Plant & satisfactory inspection of material.

9.0 DELIVERY SCHEDULE:

The Cooling Tower Fills and Drift Eliminator Bundles shall be delivered at KPD-TAY Plant within 120 days after placement of Purchase Order.

10.0 MINIMUM REQUIREMENTS FOR CONTRACTOR / SUPPLIER QUALIFICATION:

All the interested parties intending to participate must fulfil all the requirements / parameters for Contractor / Supplier qualification as per tender document in their bids. The Contractors / Suppliers are required to provide the following documents for Contractor / Supplier qualification:

i. Certified copy of valid NTN / GST certificates.
ii. Contractor / Supplier (if bidder not manufacturer) to provide a letter of authorization issued by the OEM declaring the Contractor / Supplier as their nominated representative of materials.
iii. The OEM should have minimum 10 years' experience of manufacturing of Cooling Tower Fills and Drift Eliminator Bundles or complete cooling towers of similar nature. Contractor / Supplier must submit a list of his clients to which material of similar nature has been supplied. Copies of relevant documents (purchase orders, contracts etc.) shall be provided in the bid to prove 10 years' experience.
iv. Contractor / Supplier declared as black listed at PPRA website will not be entertained.

11.0 **FINANCIAL BID FORMAT:**

No.	Description	Quantity	Unit Price (PKR)	Total Price (PKR)
1	Cooling Tower Fill Sheet Size 1000 mm x 500 mm (Depth: 33.3mm) (Material: PVC)	1500		
2	Cooling Tower Fill Sheet Size 1000 mm x 750 mm (Depth: 33.3mm) (Material: PVC)	1800		
3	Cooling Tower Fill Sheet Size 850 mm x 500 mm (Depth: 33.3mm) (Material: PVC)	250		
4	Cooling Tower Fill Sheet Size 900 mm x 500 mm (Depth: 33.3mm) (Material: PVC)	750		
5	Cooling Tower Fill Sheet Size 900 mm x 750 mm (Depth: 33.3mm) (Material: PVC)	600		
6	Drift Eliminator Bundles Size 1000 mm x 400 mm (Material: PVC)	4		
7	Drift Eliminator Bundles Size 1000 mm x 500 mm (Material: PVC)	12		
8	Drift Eliminator Bundles Size 950 mm x 400 mm (Material: PVC)	36		
9	Drift Eliminator Bundles Size 950 mm x 500 mm (Material: PVC)	108		
10	Packing & Transportation Cost	Lump sum		
	Grand Total			

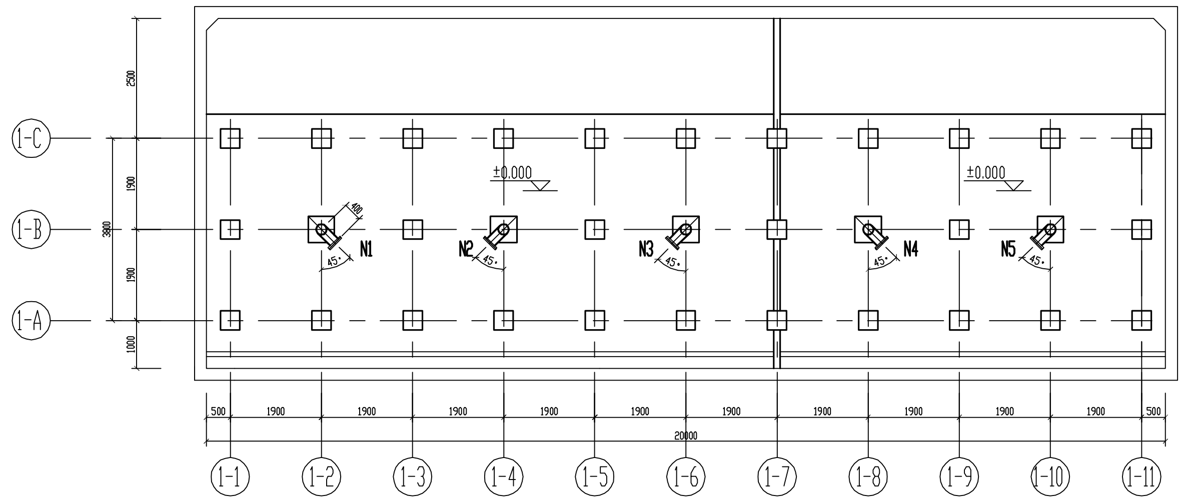
Note:

i. Bid price must be quoted in PKR otherwise the bid will be rejected.
ii. Bid price shall be inclusive of all taxes, duties, levies, charges etc. GST should be mentioned separately.
iii. **Contract will be awarded to technically qualified and financially lowest evaluated bidder on complete package basis.**

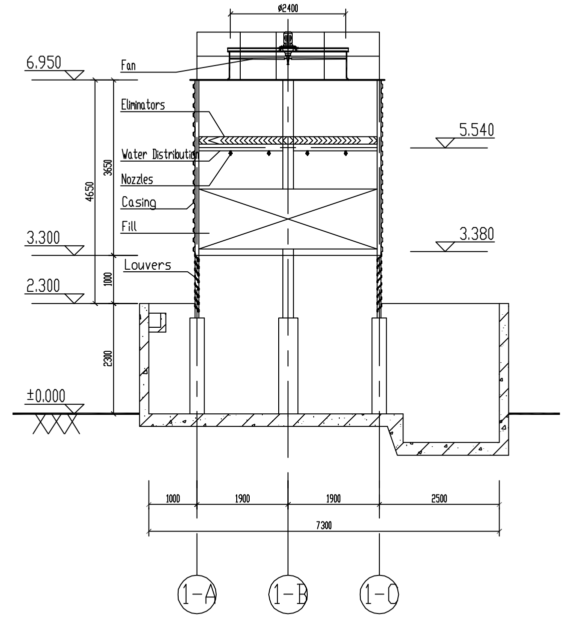
12.0 **ATTACHMENT:**

Following drawings are attached with TOR.

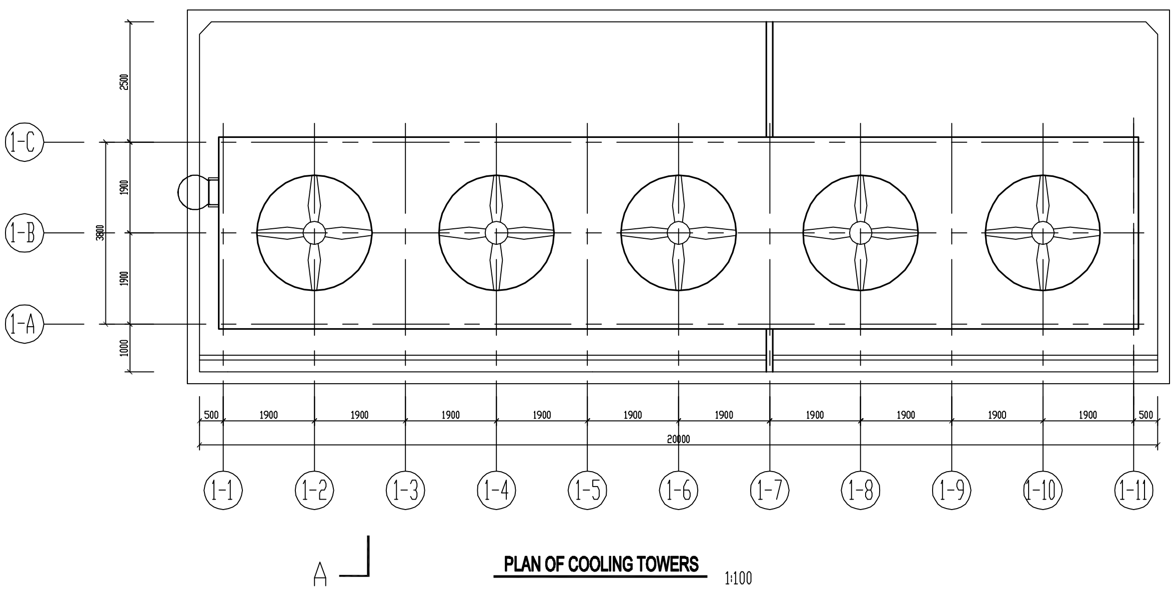
i. Drawing No. F98-01-MEF-DWG-03-01 to 16 (Drawings For Cooling Tower).
ii. Drawing No. F98-CT-FILLS-01 to 02 (Drawings For Cooling Tower Fills).
iii. Drawing No. F98-CT-ELIMINATORS-01 (Drawings For Cooling Tower Drift Eliminators).



PLAN OF CONNECTION 1:100



A-A 1:100



PLAN OF COOLING TOWERS 1:100

SCHEDULE OF CONNECTION

[illegible]	QTY.	SIZE	SERVICE	FLANGE		ELEVATION	Remark
				SIZE /TYPE	MATIERAL		
N1	1	8"	INLET	CL150 WN RF ASME B16.5-2009	ASTM A105	COP2.400	From 8"-98-CV-053-A1
N2	1	8"	INLET	CL150 WN RF ASME B16.5-2009	ASTM A105	COP2.400	From 8"-98-CV-054-A1
N3	1	8"	INLET	CL150 WN RF ASME B16.5-2009	ASTM A105	COP2.400	From 8"-98-CV-055-A1
N4	1	8"	INLET	CL150 WN RF ASME B16.5-2009	ASTM A105	COP2.400	From 8"-98-CV-056-A1
N5	1	8"	INLET	CL150 WN RF ASME B16.5-2009	ASTM A105	COP2.400	From 8"-98-CV-057-A1

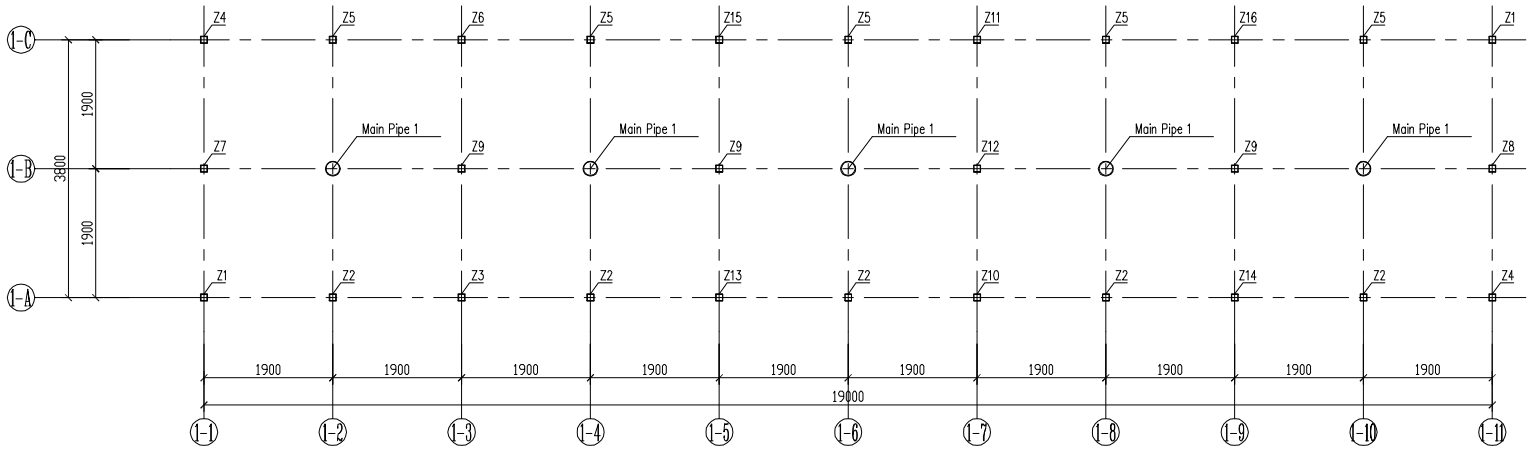
NOTE:
1.All dimension are mm, all elevation are m.
2.The EL0.000 is equivalent to general elevation of 21.0m in the figure.

MAJOR	SIGNATURE	DATE

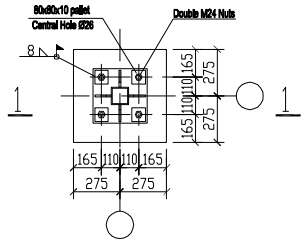
Outline Drawing of The Cooling Tower

DWG NO.	F98-01-MEF-DWG-03-01	
SCALE	SIZE	SHEET
-	A3	01/01

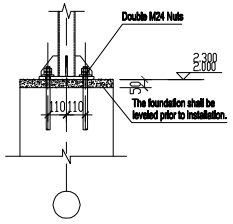
DATE | SIGNATURE | MAJOR



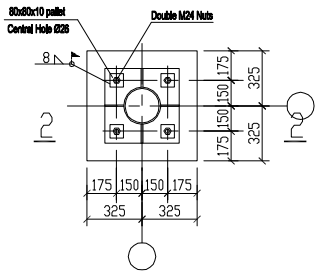
Layout Plan of Cooling Tower Columns 1:100



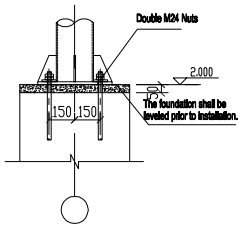
Detail of Steel Column Foot



1-1



Detail of central riser footing



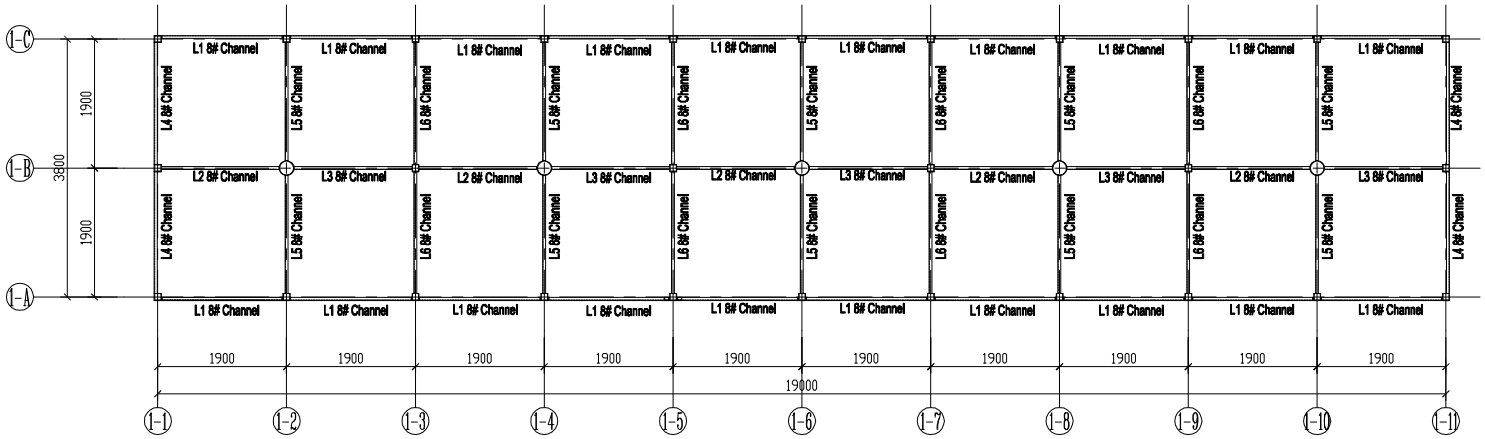
2-2

Description	Type	Model (mm)	Material	Length (mm)	Quantity (piece)	Remarks
Z1	Square Tube	100X100X4	ASTM A36	4870	2	Hot-Dip Galvanized
Z2	Square Tube	100X100X4	ASTM A36	4870	5	Hot-Dip Galvanized
Z3	Square Tube	100X100X4	ASTM A36	4870	1	Hot-Dip Galvanized
Z4	Square Tube	100X100X4	ASTM A36	4870	2	Hot-Dip Galvanized
Z5	Square Tube	100X100X4	ASTM A36	4870	5	Hot-Dip Galvanized
Z6	Square Tube	100X100X4	ASTM A36	4870	1	Hot-Dip Galvanized
Z7	Square Tube	100X100X4	ASTM A36	4870	1	Hot-Dip Galvanized
Z8	Square Tube	100X100X4	ASTM A36	4870	1	Hot-Dip Galvanized
Z9	100X4 Square Tube	100X100X4	ASTM A36	4870	3	Hot-Dip Galvanized
Z10	100X4 Square Tube	100X100X4	ASTM A36	4570	1	Hot-Dip Galvanized
Z11	100X4 Square Tube	100X100X4	ASTM A36	4570	1	Hot-Dip Galvanized
Z12	100X4 Square Tube	100X100X4	ASTM A36	4570	1	Hot-Dip Galvanized
Z13	100X4 Square Tube	100X100X4	ASTM A36	4870	1	Hot-Dip Galvanized
Z14	100X4 Square Tube	100X100X4	ASTM A36	4870	1	Hot-Dip Galvanized
Z15	100X4 Square Tube	100X100X4	ASTM A36	4870	1	Hot-Dip Galvanized
Z16	100X4 Square Tube	100X100X4	ASTM A36	4870	1	Hot-Dip Galvanized

Layout Plan of Cooling Tower Columns

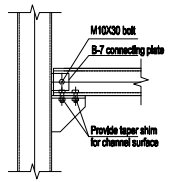
DWG NO.	F98-01-MEF-DWG-03-02		
SCALE	SIZE		SHEET
-	A3		01/01

DATE | SIGNATURE | MAJOR

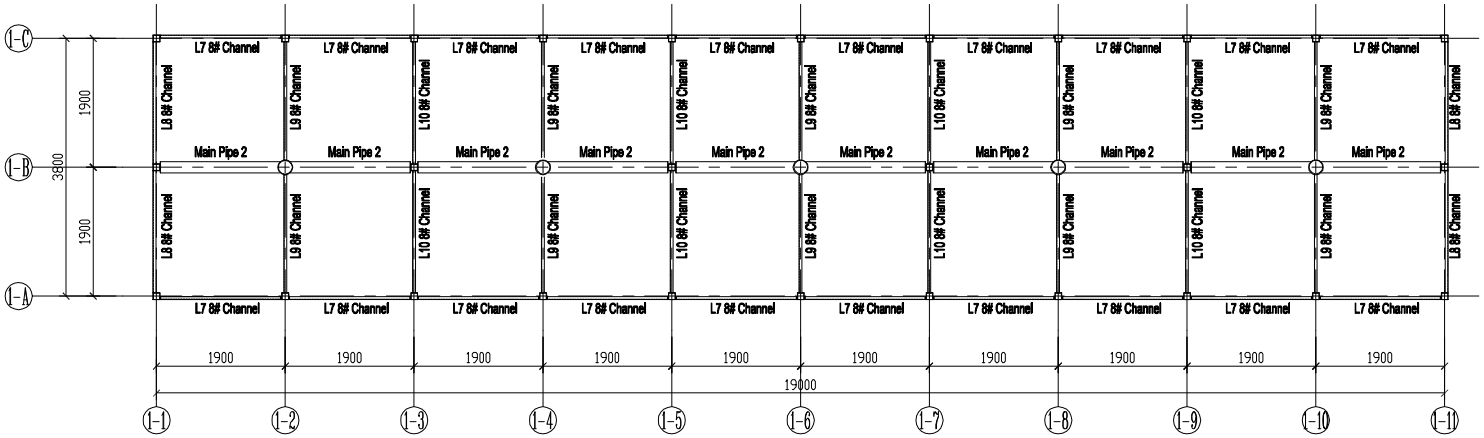


Layout Plan of Cooling Tower at 3.380m

1:100

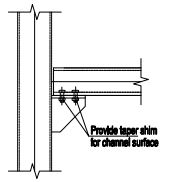


Detail of 3.380m beam and column nodes



Layout Plan of Cooling Tower at 5.480m

1:100



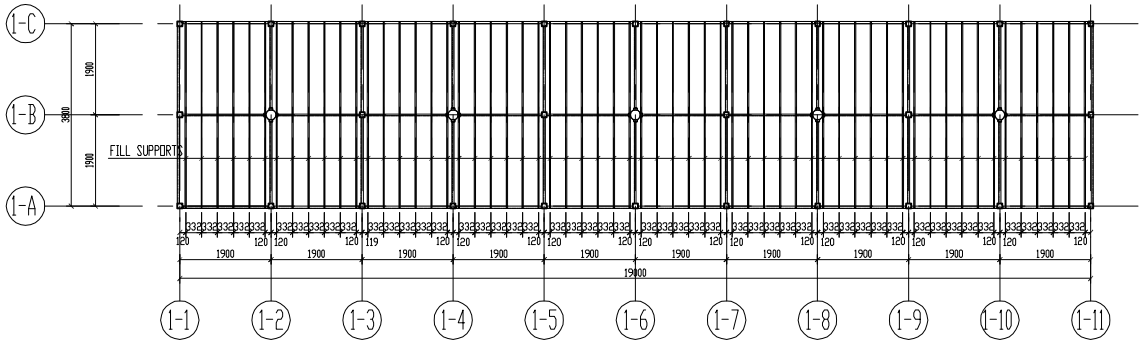
Detail of 5.480m beam and column nodes

Description	Type	Model	Material	Length (mm)	Quantity (piece)	Remarks
L1	Channel	8#	ASTM A36	1794	20	Hot-Dip Galvanized
L2	Channel	8#	ASTM A36	1736	5	Hot-Dip Galvanized
L3	Channel	8#	ASTM A36	1736	5	Hot-Dip Galvanized
L4	Channel	8#	ASTM A36	1794	4	Hot-Dip Galvanized
L5	Channel	8#	ASTM A36	1736	10	Hot-Dip Galvanized
L6	Channel	8#	ASTM A36	1736	8	Hot-Dip Galvanized
L7	Channel	8#	ASTM A36	1794	20	Hot-Dip Galvanized
L8	Channel	8#	ASTM A36	1794	4	Hot-Dip Galvanized
L9	Channel	8#	ASTM A36	1736	10	Hot-Dip Galvanized
L10	Channel	8#	ASTM A36	1794	8	Hot-Dip Galvanized
Connecting bolt	Bolt	M10X35	SS304		390	
Connecting bolt	Bolt	M10X35	SS304		84	

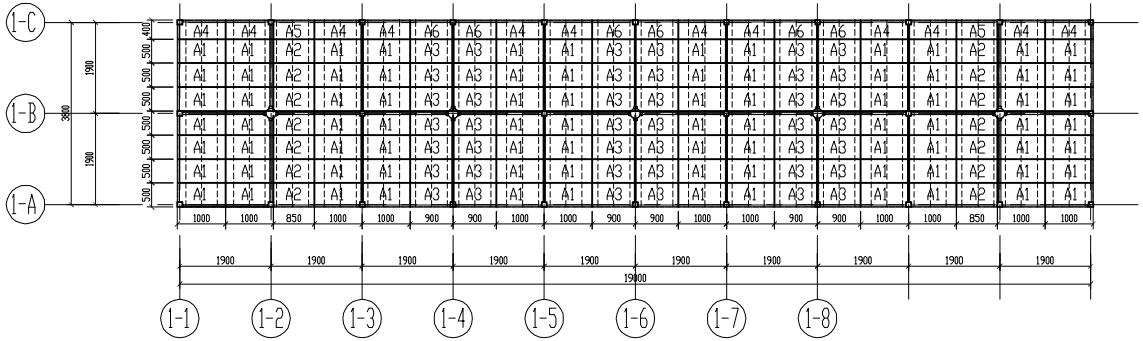
Layout Plan of Cooling Tower at 3.380m
Layout Plan of Cooling Tower at 5.480m

DWG NO.	F98-01-MEF-DWG-03-03		
SCALE	SIZE		SHEET
-	A3		01/01

MAJOR	SIGNATURE	DATE



PLAN OF FILL SUPPORTS 1:100



PLAN OF THE FIRST LAYER FILL 1:100

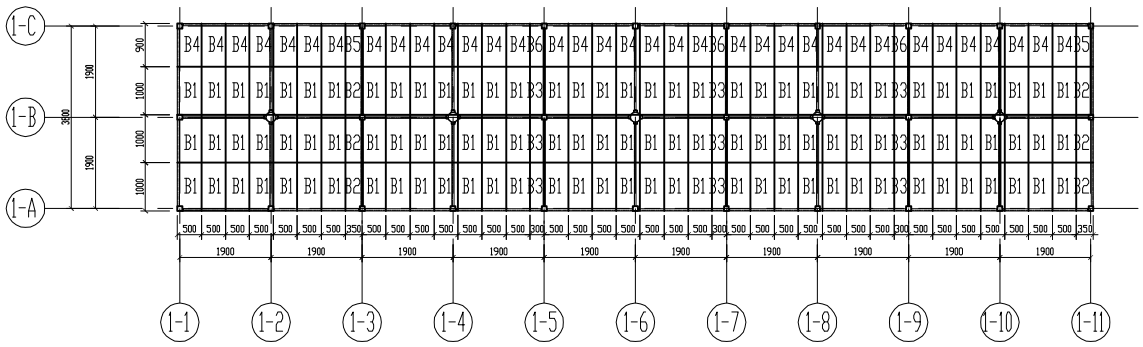
NOTE :
1.All dimension are mm, all elevation are m.
2.The EL0.000 is equivalent to general elevation of 21.0m in the figure.

NO.	Name	Specification	Material	Unit	QTY.	Remark
1	pipe	1″ L=3880	ASTM A106 Gr.B(GALV)	piece	60	
2	U bolt	ø8	H.D.G.S	piece	180	
3	Fill	1000x500x500	PVC	m3	90.25	DLT742

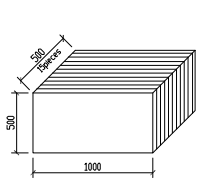
PLAN OF FILL 1

DWG NO.	F98-01-MEF-DWG-03-04	
SCALE	SIZE	SHEET
-	A3	01/01

MAJOR	SIGNATURE	DATE



PLAN OF THE SECOND LAYER FILL 1:100



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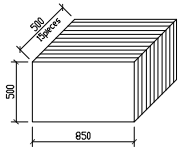

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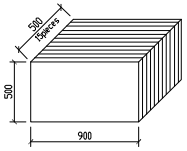

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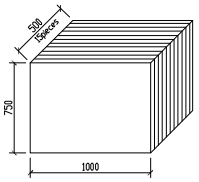

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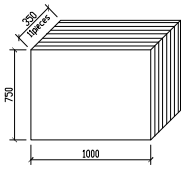

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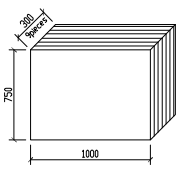
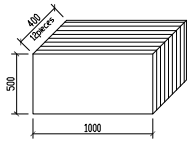
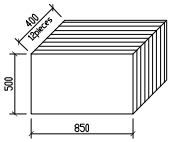


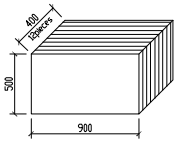
B3



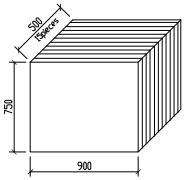
A4



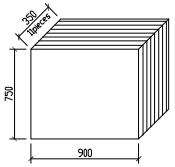
A5



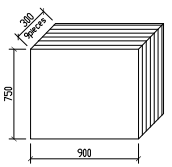
A6



B4



B5

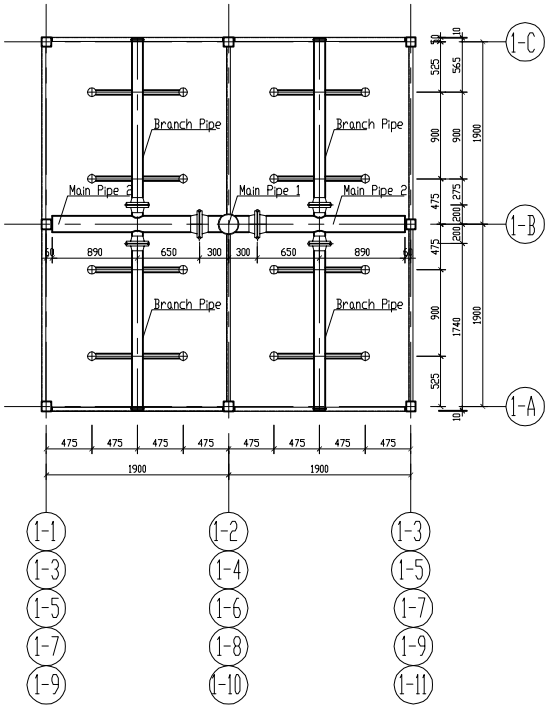


B6

PLAN OF FILL 2

DWG NO.	F98-01-MEF-DWG-03-05	
SCALE	SIZE	SHEET
-	A3	01/01

MAJOR	SIGNATURE	DATE



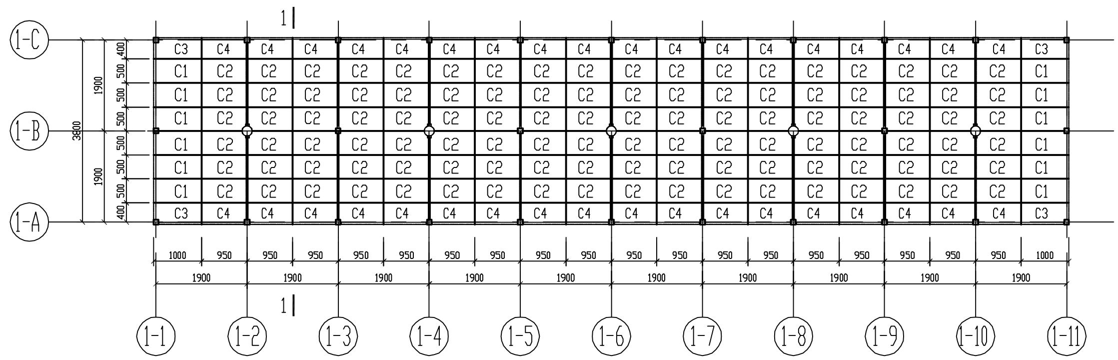
NOTE:
1.All dimension are mm, all elevation are m.
2.The EL.0.000 is equivalent to general elevation of 21.0m in the figure.

NO.	Name	Specification	Material	Unit	QTY.	Remark
1	Main Pipe 1	8″/6″	H.D.G.S	piece	5	
2	Main Pipe 2	6″/4″	H.D.G.S	piece	10	
3	Branch Pipe	4″/1.1/2″	H.D.G.S	piece	20	
4	Nozzles	1.1/2″	Nylon	piece	80	
5	SPIRAL WOUND GASKET	4″ CLASS150 RF	INNER & OUTER RING OF MATERIAL CARBON STEEL ASME B16.20	piece	20	
6		6″ CLASS150 RF		piece	10	
7		8″ CLASS150 RF		piece	5	
8	STUD BOLT(NUT)	M16x90		piece	160	bolt:ASTM A193 Gr.B7,CADMIUM PLATED nut:ASTM A194 Gr.2H-HEAVY HEX,CADMIUM PLATE
9		M20x100		piece	80	
10		M20x110		piece	40	
11	U bolt	ø12	H.D.G.S	piece	20	
12	Bolt	M12x60	SS304	piece	20	

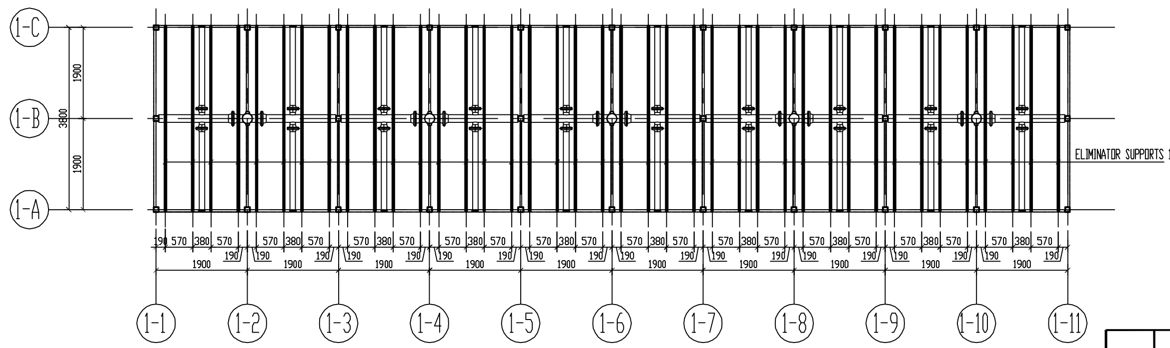
PLAN OF WATER DISTRIBUTION 1:50

PLAN OF WATER DISTRIBUTION

DWG NO.	F98-01-MEF-DWG-03-06	
SCALE	SIZE	SHEET
-	A3	01/01



PLAN OF DRIFT ELIMINATORS 1:100



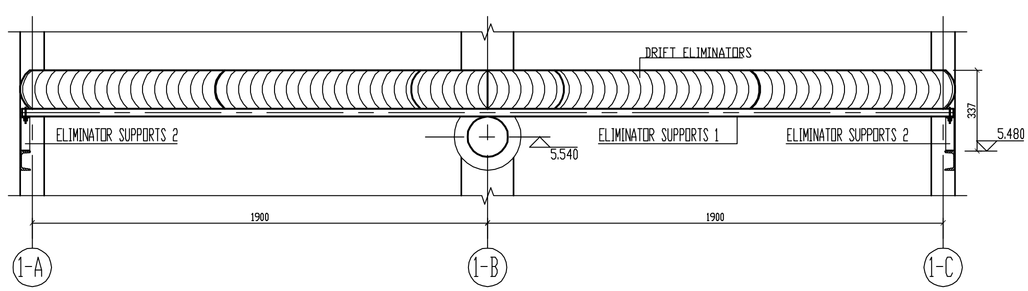
PLAN OF ELIMINATOR SUPPORTS 1:100

NOTE:

1.All dimension are mm, all elevation are m.

2.The EL0.000 is equivalent to general elevation of 21.0m in the figure.

NO.	Name	Specification	Material	Unit	QTY.	Remark
1	ELIMINATOR SUPPORTS 1	1"	ASTM A106 Gr.B(GALV)	piece	40	
2	ELIMINATOR SUPPORTS 2	angle steel L40x40x4	H.D.G.S	piece	80	
3	Bolt	M6x40	SS304	piece	160	
4	U Bolt	ø8	H.D.G.S	piece	80	
5	DRIFT ELIMINATORS		PVC	m2	72.2	DLT742



1-1 1:20

MAJOR	SIGNATURE	DATE

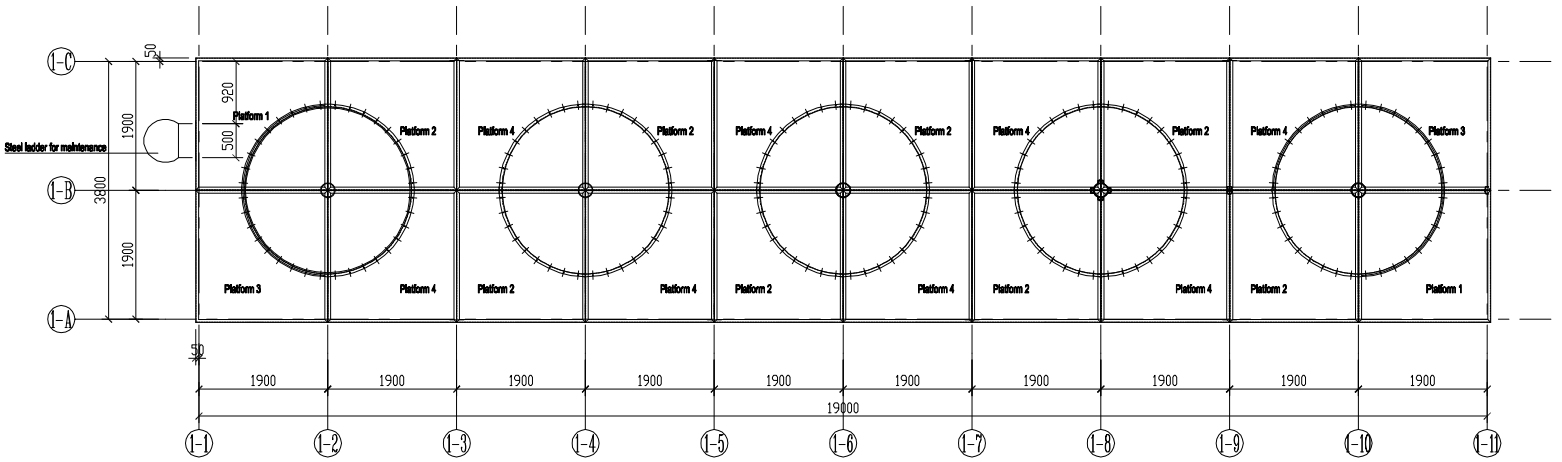
PLAN OF DRIFT ELIMINATORS

DWG NO.	F98-01-MEF-DWG-03-07	
SCALE	SIZE	SHEET
-	A3	01/01

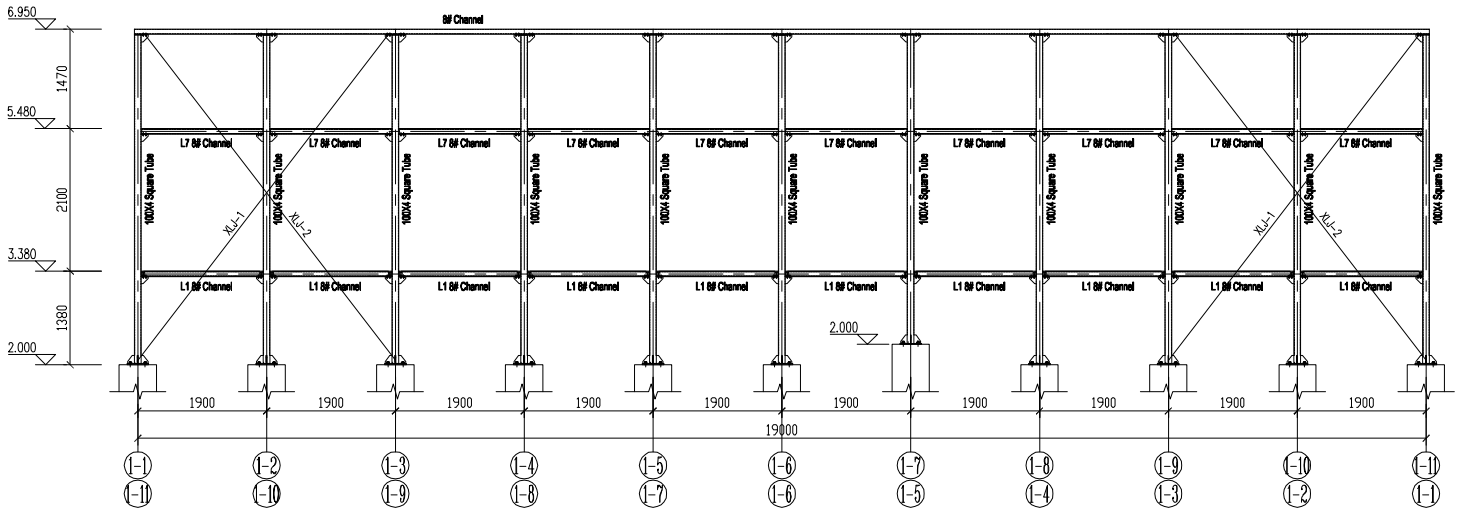
DATE

SIGNATURE

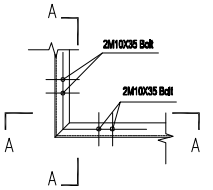
MAJOR



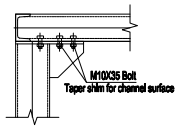
Layout Plan of Cooling Tower at 6.950m 1:100



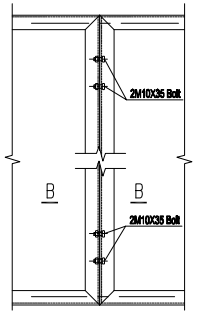
Axis 1-A/1-C Elevation Drawing 1:100



Detail of connection between roof plate and column



A-A



Detail of connection nodes between roof plates

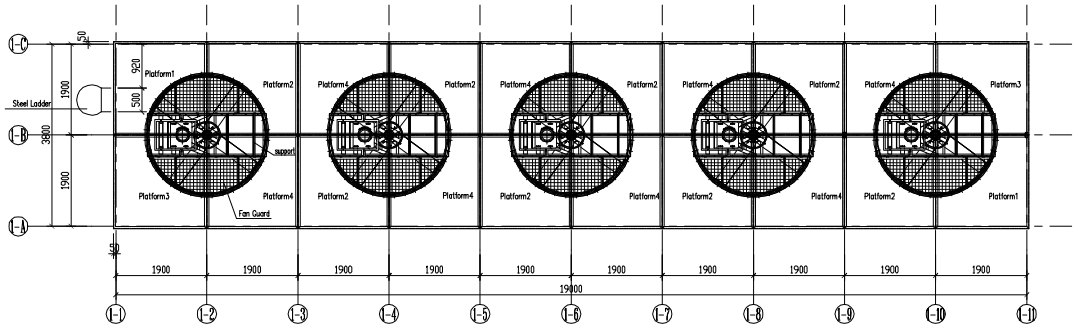
B-B

Description	Type	Model	Material	Length (mm)	Quantity (piece)	Remarks
Platform 1	Channel	8#	ASTM A36	1794	2	Hot-Dip Galvanized
Platform 2	Channel	8#	ASTM A36	1736	8	Hot-Dip Galvanized
Platform 3	Channel	8#	ASTM A36	1736	2	Hot-Dip Galvanized
Platform 4	Channel	8#	ASTM A36	1794	8	Hot-Dip Galvanized
XLJ-1	Round bar	Φ16	ASTM A36	6300	4	Hot-Dip Galvanized
XLJ-2	Round bar	Φ16	ASTM A36	6300	4	Hot-Dip Galvanized
Connecting nut		M16	SS304		32	
Bracing pad			ASTM A36		16	Hot-Dip Galvanized
Connecting bolt	Bolt	M10X35	SS304		330	
Connecting bolt	Bolt	M10X35	SS304		155	
Total						

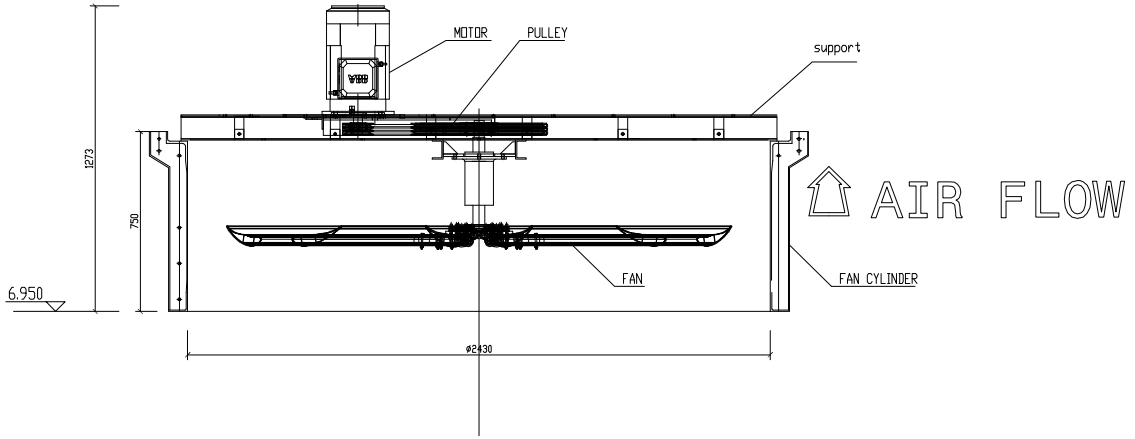
Layout Plan of Cooling Tower at 6.950m
Axis 1-A 1-C Elevation Drawing

DWG NO.	F98-01-MEF-DWG-03-08	
SCALE	SIZE	SHEET
-	A3	01/01

MAJOR	SIGNATURE	DATE



PLAN OF FAN CYLINDER、FAN AND MOTOR 1:100



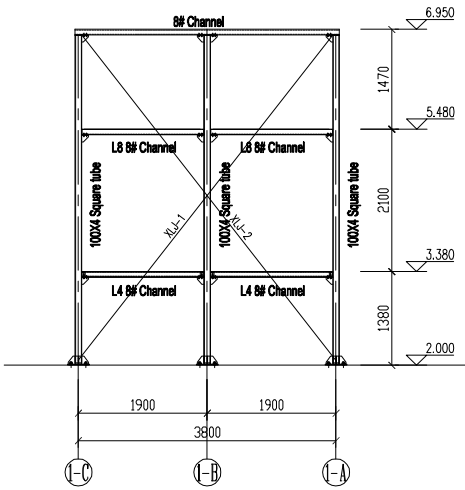
INSTALLATION DIAGRAM OF FAN CYLINDER、FAN AND MOTOR 1:20

NO.	MODEL	NAME	QTY. (piece)	MATIERAL	single weight (kg)	total weight (kg)	NOTE
11		Platform4	8	H.D.G.S			
10		Platform3	2	H.D.G.S			
9		Platform2	8	H.D.G.S			
8		Platform1	2	H.D.G.S			
7		Fan Guard	5	H.D.G.S			
6		FAN CYLINDER	5	FRP			
5	ALU/25m/04n/GS2/0400/NFAN		5	AL. ALLOY	33	165	
4		Support	5	H.D.G.S			
3		Bearing Pedestal	5		15	75	
2	SPA	PULLEY	5		10	50	
1	M2JA-H 132M	MOTOR	5		101	505	ABB IP55

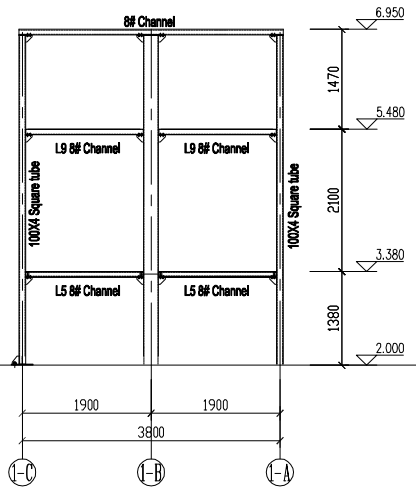
INSTALLATION DIAGRAM OF FAN CYLINDER、FAN AND MOTOR

DWG NO.	F98-01-MEF-DWG-03-09	
SCALE	SIZE	SHEET
-	A3	01/01

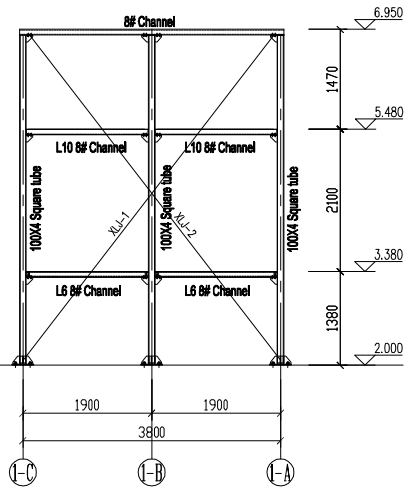
MAJOR | SIGNATURE | DATE



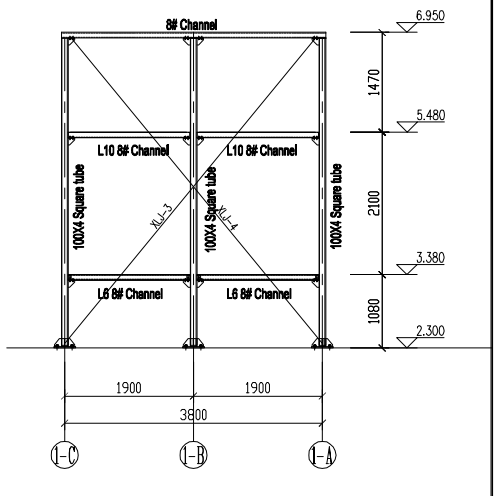
Axis (1-1)(1-1) Elevation Drawing 1:100



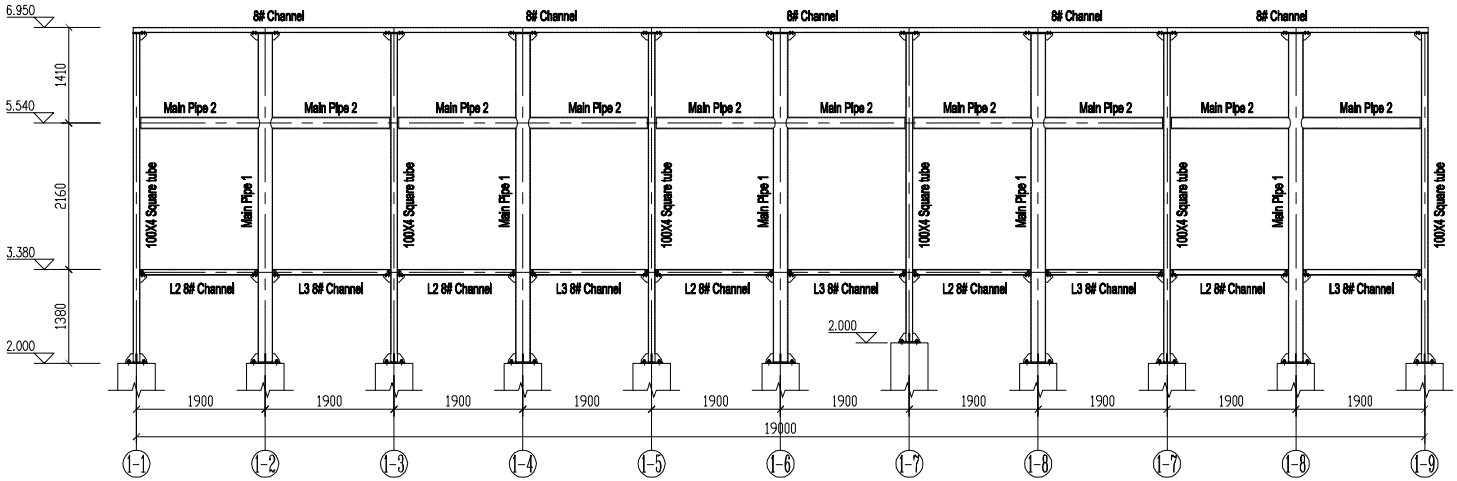
Axis (1-2)(1-4)(1-6)(1-8)(1-10) Elevation Drawing 1:100



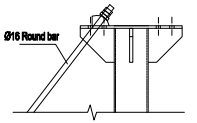
Axis (1-3)(1-5)(1-9) Elevation Drawing 1:100



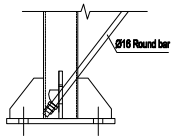
Axis (1-7) Elevation Drawing 1:100



Axis (1-1) Elevation Drawing 1:100



Detail of connection between bracing and top of column



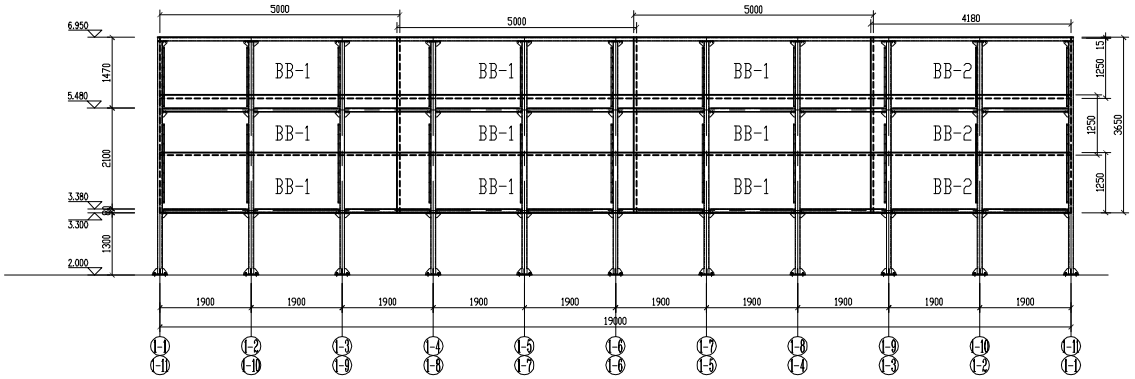
Detail of connection between bracing and column foot

Description	Type	Model	Material	Length (mm)	Quantity (piece)	Remarks
XLJ-1	Round bar	Φ16	ASTM A36	6300	5	Hot-Dip Galvanized
XLJ-2	Round bar	Φ16	ASTM A36	6300	5	Hot-Dip Galvanized
XLJ-3	Round bar	Φ16	ASTM A36	6000	1	Hot-Dip Galvanized
XLJ-4	Round bar	Φ16	ASTM A36	6000	1	Hot-Dip Galvanized
Connecting nut		M16	SS304		82	
Bracing pad			ASTM A36		40	Hot-Dip Galvanized
Total						

Layout Plan of Cooling Tower Columns

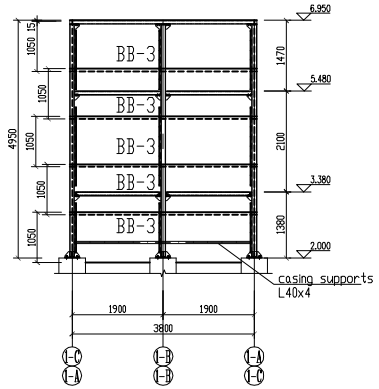
DWG NO.	F98-01-MEF-DWG-03-10	
SCALE	SIZE	SHEET
-	A3	01/01

MAJOR	SIGNATURE	DATE



Elevation Drawing of Casings 1:100

A、CAxis



Elevation Drawing of Casings 1:100

1、11 Axis

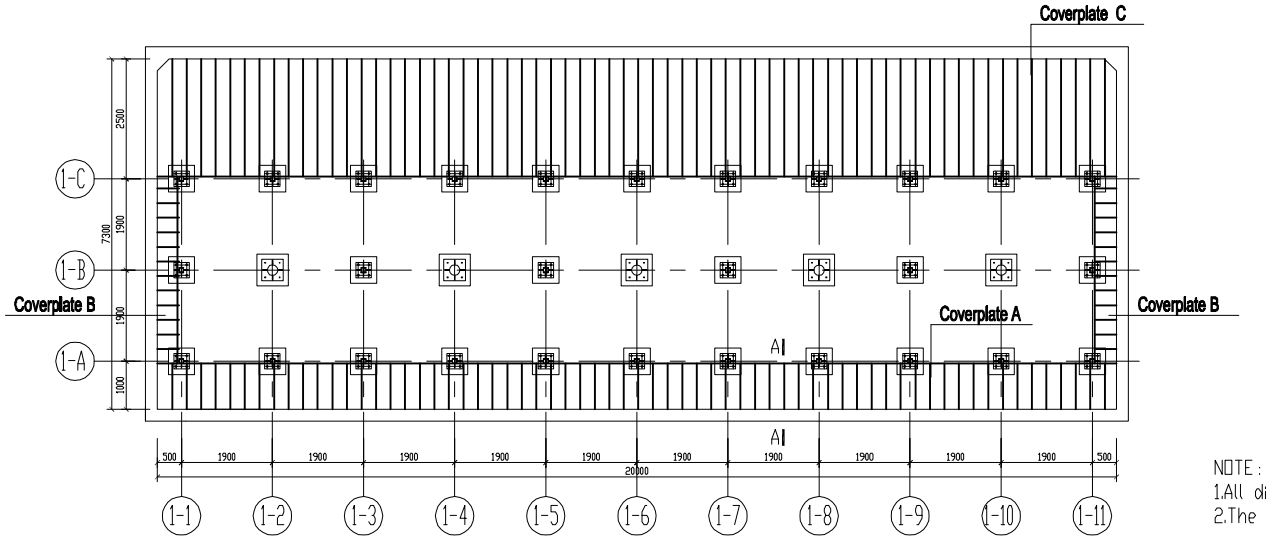
NO.	Name	Specification (mm)	Material	Unit	QTY.	Remark
1	BB-1	5000x1250	FRP	piece	18	DLT742、GB 7190 RAL7035
2	BB-2	4180x1250	FRP	piece	6	
3	BB-3	3800x1050	FRP	piece	10	

NOTE:
1.All dimension are mm, all elevation are m.
2.The EL0.000 is equivalent to general elevation of 21.0m in the figure.

Elevation Drawing of Casings

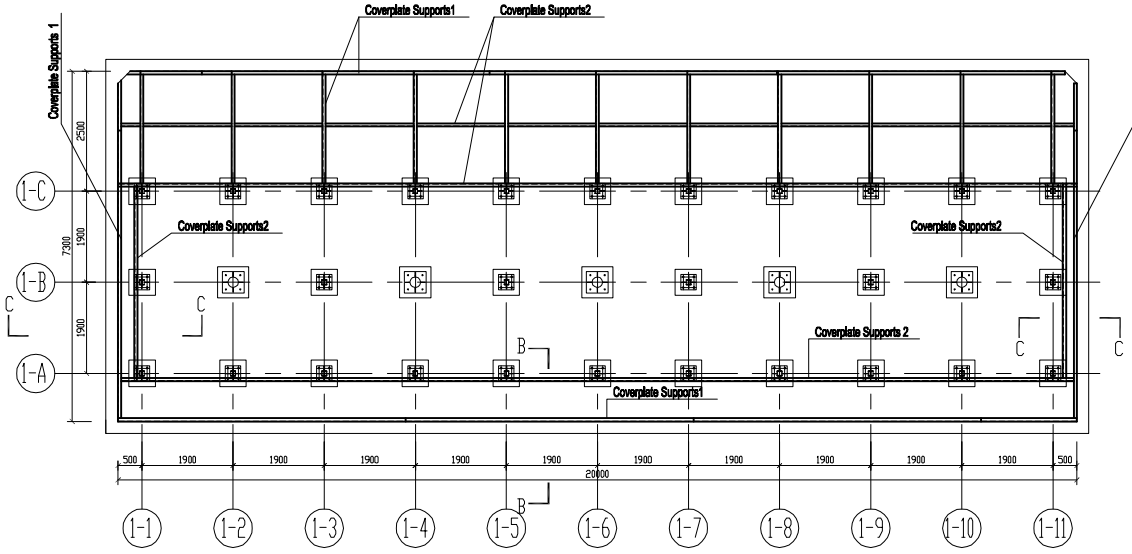
DWG NO.	F98-01-MEF-DWG-03-11	
SCALE	SIZE	SHEET
-	A3	01/01

MAJOR	SIGNATURE	DATE



PLAN OF COVERPLATES 1:100

NOTE :
1.All dimension are mm, all elevation are m.
2.The EL.0.000 is equivalent to general elevation of 21.0m in the figure.



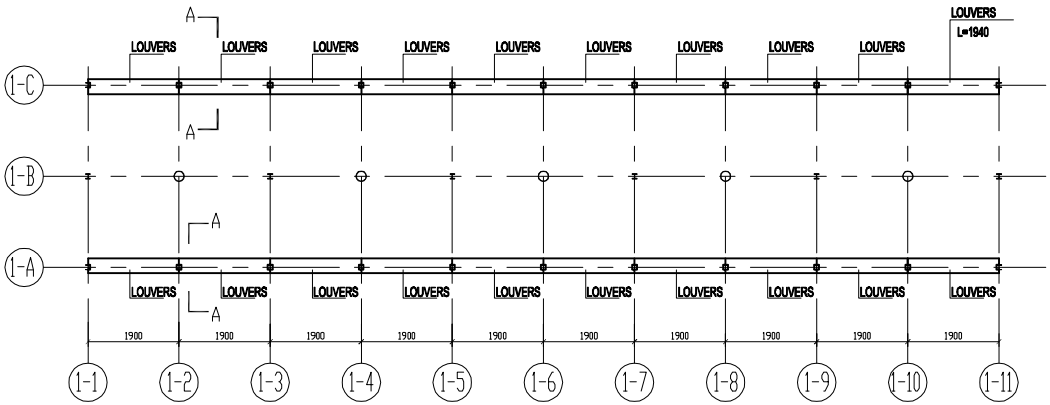
PLAN OF COVERPLATE SUPPORTS 1:100

NO.	Name	Specification (mm)	Material	Unit	QTY.	Remark
1	Coverplate A	L=950,B=304,H=55	FRP	piece	66	RAL7035
2	Coverplate B	L=420,B=304,H=55	FRP	piece	13	RAL7035
3	Coverplate C	L=2450,B=304,H=55	FRP	piece	66	RAL7035
4	Coverplate Supports 1	channel 80X43X5X8	ASTM A36	M	96	Hot-Dip Galvanized
5	Coverplate Supports 2	channel 50X37X4.5X7	ASTM A36	M	66	Hot-Dip Galvanized

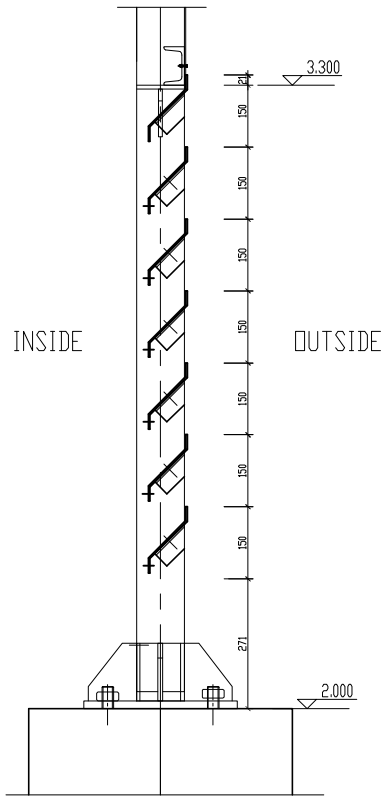
PLAN OF COVERPLATES
PLAN OF COVERPLATE SUPPORTS

DWG NO.	F98-01-MEF-DWG-03-12	
SCALE	SIZE	SHEET
-	A3	01/01

MAJOR	SIGNATURE	DATE



PLAN OF LOUVERS 1:100



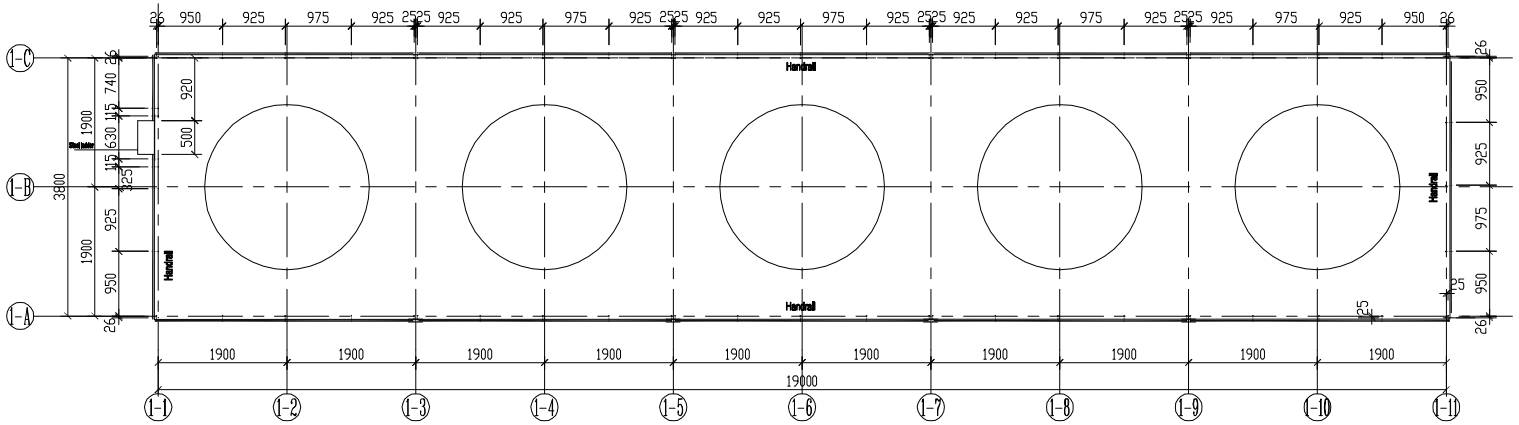
A-A 1:10

NO.	Name	Specification (mm)	Material	Unit	QTY.	Remark
1	LOUVERS	1940x110x3	FRP	piece	160	RAL7035

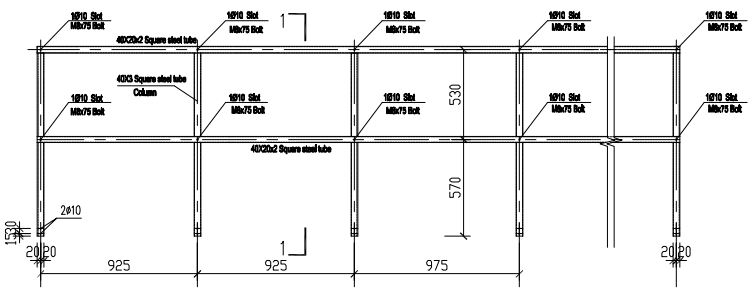
NOTE :
1.All dimension are mm, all elevation are m.
2.The EL0.000 is equivalent to general elevation of 21.0m in the figure.

	PLAN OF LOUVERS	DWG NO. F98-01-MEF-DWG-03-13
		SCALE – SIZE A3 SHEET 01/01

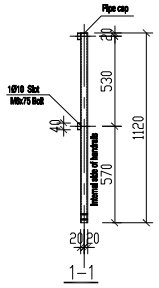
MAJOR	SIGNATURE	DATE

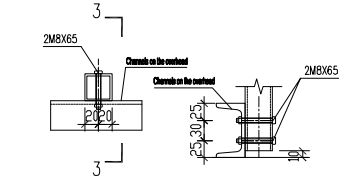


Layout plan of cooling tower handrails



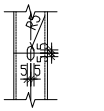
Handrail
Quantity: 6 pieces



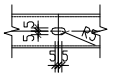


Detail of connection of handrail column lower section

Description	Type	Model (mm)	Material	Length (mm)	Quantity (piece)	Remarks
Handrail vertical pole	Square steel tube	40X3	ASTM A36	1050	64	Hot-Dip Galvanized
Handrail horizontal pole	Square steel tube	40X20X2	ASTM A36	3790	12	Hot-Dip Galvanized
Handrail horizontal pole	Square steel tube	40X20X2	ASTM A36	3841	8	Hot-Dip Galvanized
Handrail horizontal pole	Square steel tube	40X20X2	ASTM A36	3892	2	Hot-Dip Galvanized
Handrail horizontal pole	Square steel tube	40X20X2	ASTM A36	921	2	Hot-Dip Galvanized
Handrail horizontal pole	Square steel tube	40X20X2	ASTM A36	2381	2	Hot-Dip Galvanized
Bolt		M8X65	SS304		128	
Bolt		M8X75	SS304		128	
Pipe cap			PVC		64	
Total						



Slot on handrail vertical pole



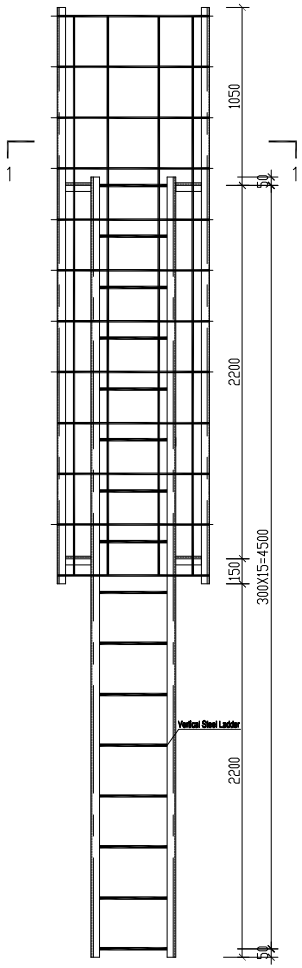
Slot on handrail hortzontal pole

Note: 1. Holes shall be drilled on the handrail components as per the drawing above. Type of handrail shall be indicated on each handrail horizontal pole after hot dip galvanizing.
2. All of the material are ASTM A36.

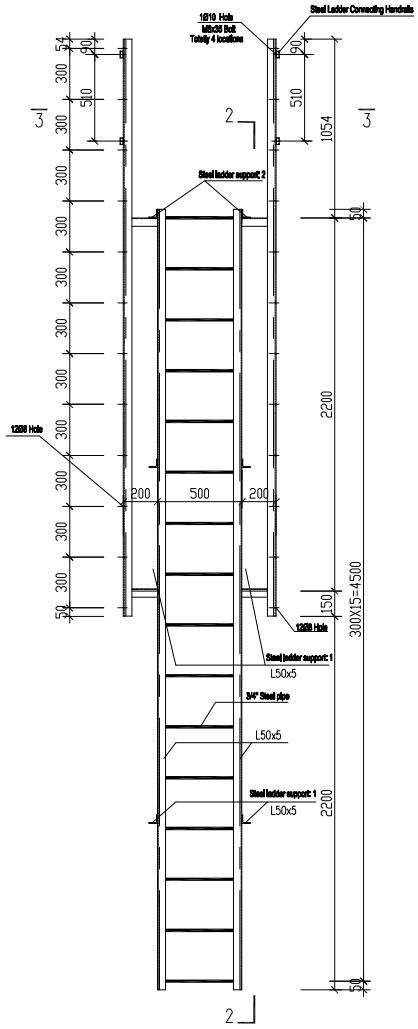
Layout plan of cooling tower handrails

DWG NO.	F98-01-MEF-DWG-03-14	
SCALE	SIZE	SHEET
-	A3	01/01

DATE	SIGNATURE	MAJOR

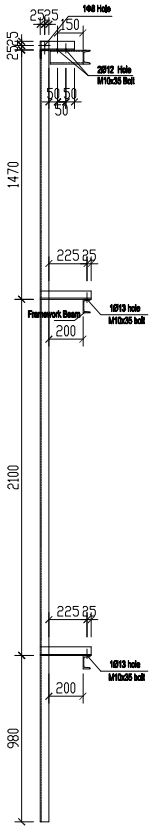


Detail of Steel Ladder for Maintenance

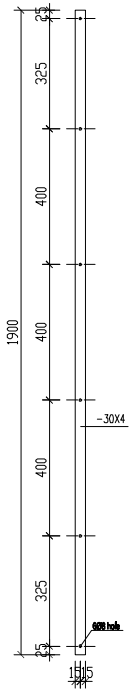


Detail of Steel Ladder

Quantity: 1 piece

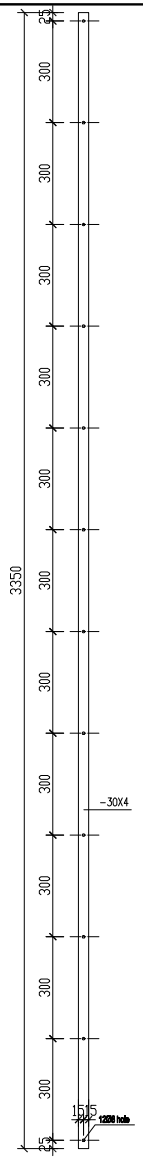


2-2 1:20



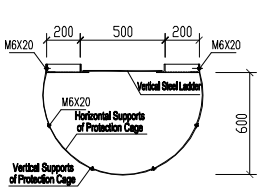
Horizontal Supports of Protection Cage

Quantity: 11 piece

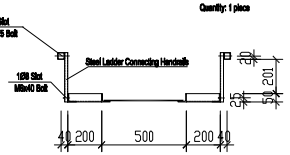


Vertical Supports of Protection Cage

Quantity: 4 piece



1-1 1:20



3-3 1:20

Detail of Steel Ladder Connecting Handrail

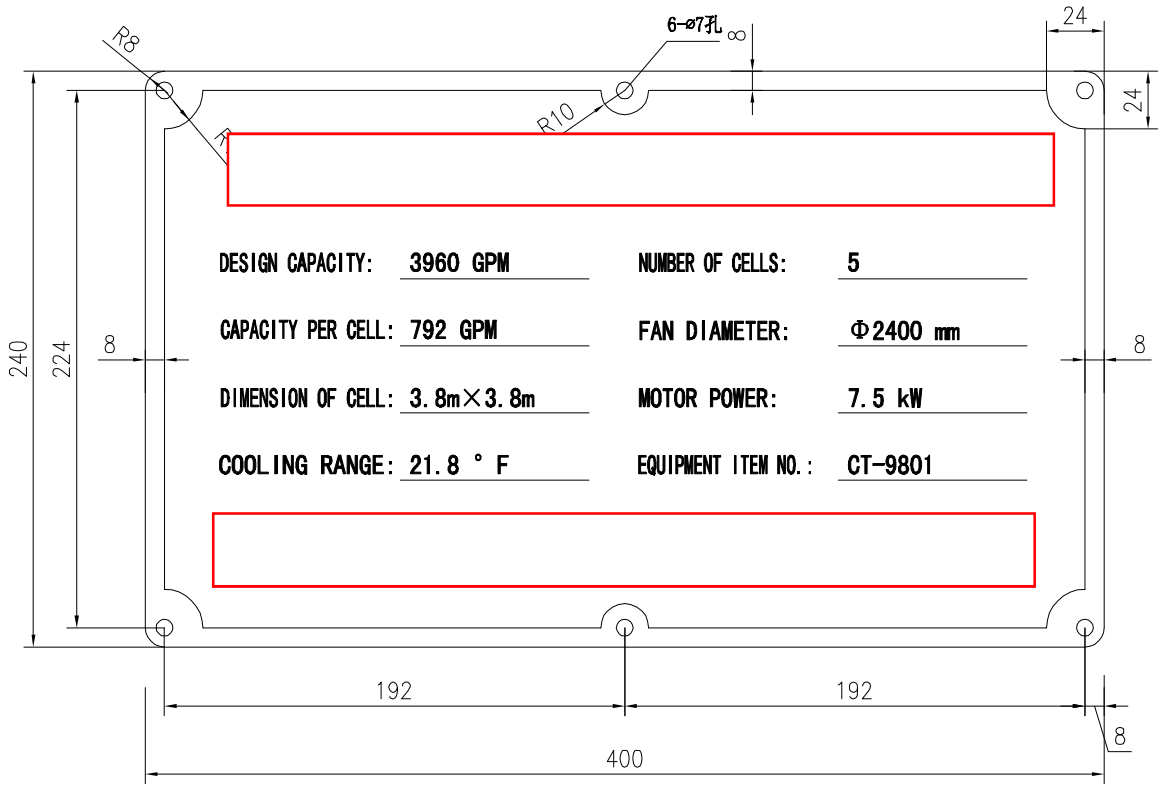
Description	Type	Model (mm)	Material	Length (mm)	Quantity (piece)	Remarks
Steel Ladder	Angle bar	50X5	ASTM A36	3404	2	Hot-Dip Galvanized
Steel Ladder	Angle bar	50X5	ASTM A36	4600	2	Hot-Dip Galvanized
Steel ladder support: 1	Angle bar	50X5	ASTM A36	200	4	Hot-Dip Galvanized
Steel ladder support: 2	Angle bar	50X5	ASTM A36	300	4	Hot-Dip Galvanized
Horizontal Supports of Protection Cage	Flat bar	30X4	ASTM A36	1900	10	Hot-Dip Galvanized
Vertical Supports of Protection Cage	Flat bar	30X4	ASTM A36	3350	4	Hot-Dip Galvanized
Bolt		M6X30	SS304		60	
Total						

NOTE:
All of the material are ASTM A36.

Detail of Steel Ladder for Maintenance

DWG NO.	F98-01-MEF-DWG-03-15	
SCALE	SIZE	SHEET
-	A3	01/01

MAJOR	SIGNATURE	DATE

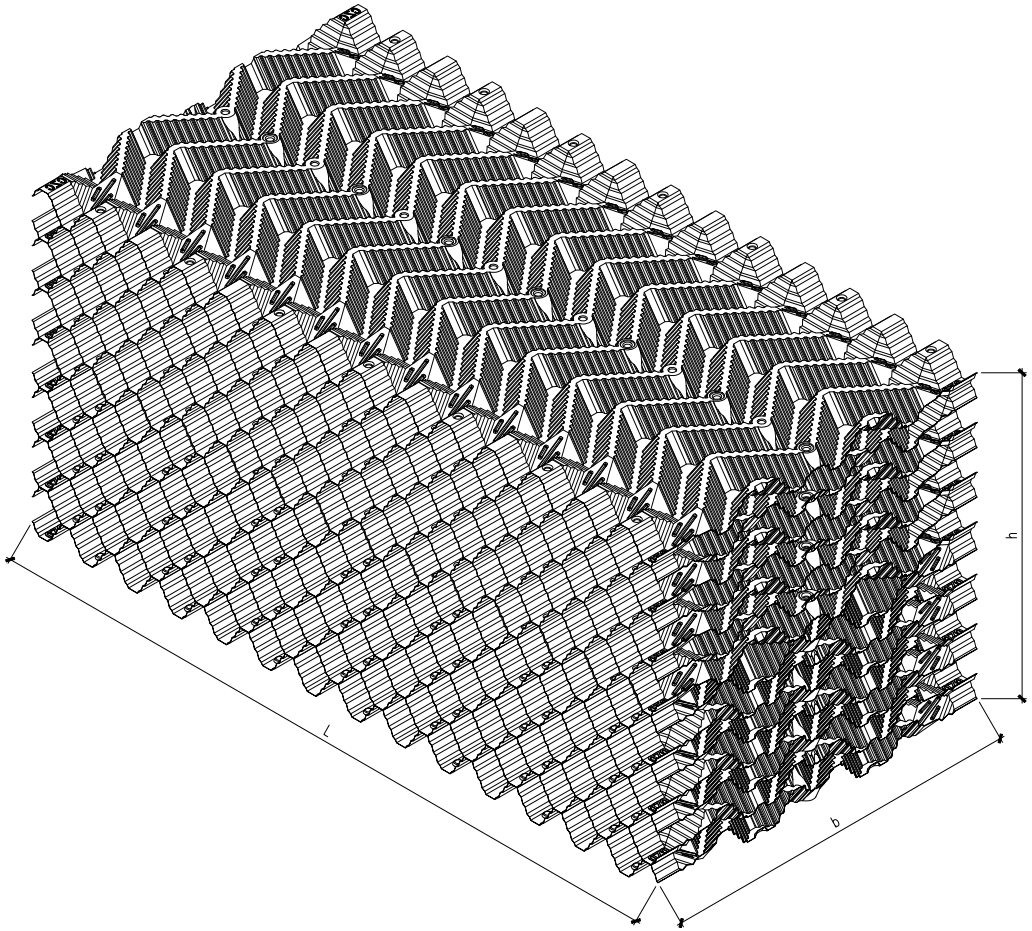


NOTE:

1. Material: SS316L。
2. Quantity: 1 piece 。
3. Thickness: 0.8mm。
4. All dimension are mm

Nameplate

DWG NO.	F98-01-MEF-DWG-03-16	
SCALE	SIZE	SHEET
-	A3	01/01



Size of fill :

A1 L=1000mm b=500mm h=500mm ; A2 L=850mm b=500mm h=500mm ;
A3 L=900mm b=500mm h=500mm ; A4 L=1000mm b=400mm h=500mm ;
A5 L=850mm b=500mm h=400mm ; A6 L=900mm b=500mm h=400mm ;
B1 L=1000mm b=500mm h=750mm ; B2 L=1000mm b=350mm h=750mm ;
B3 L=1000mm b=300mm h=750mm ; B4 L=900mm b=500mm h=750mm ;
B5 L=900mm b=350mm h=750mm ; B6 L=900mm b=300mm h=750mm ;

Quality standard of finished product of drenching filler:

1.1 The permissible error of the spacing between the water-pouring packing assembly blocks is ±1.0mm.The allowable error of the main geometrical size of the sheet shape shall not be greater than 5% and the maximum error shall not be greater than 1mm.

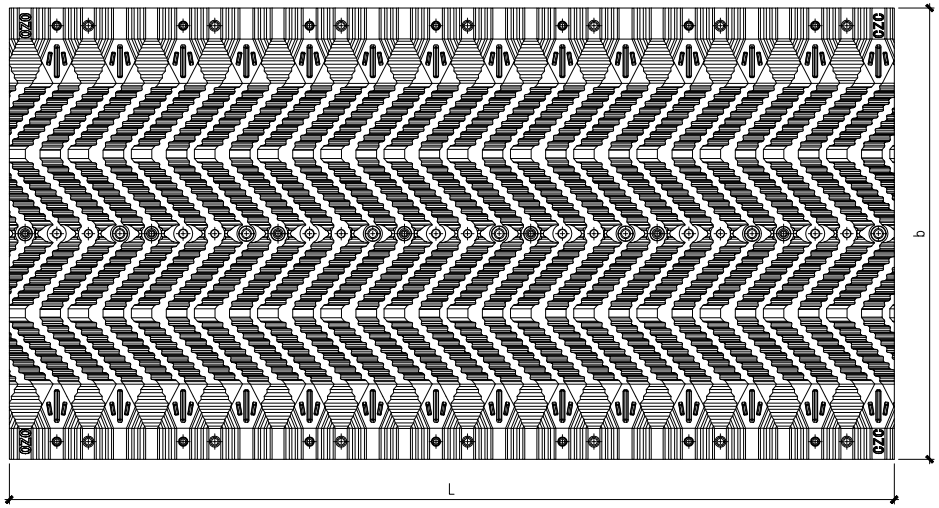
1.2 The water-pouring filler is assembled into blocks by bonding type, which shall ensure firm bonding and good overall rigidity. The adhesive must be water-resistant, heat-resistant (65 ° C), cold-resistant (-35 ° C) and age-resistant.The shear strength after 24 hours of bonding shall be no less than 1.37mpa. The bonding strength shall be tested in accordance with Table 3 of DLT742-2001. The bonding perfection rate shall be 90%.>

1.3 The drench packing assembly block shall have sufficient stiffness and strength.Under the uniformly distributed load of 2942N/m2, the standard specimen under the condition of simple support should have no obvious deformation at the supporting place and the loading surface, no residual deformation after unloading, and no loosening at the joints between the plates.

2020

drawing of fill

F98-CT-FILLS-01



Quality standard of finished product of drenching filler:

1.1 Spray packing flat sheet should be plasticized evenly, without poor dispersion of auxiliary materials, uniform appearance and color, and the surface should not be attached with all kinds of oil.

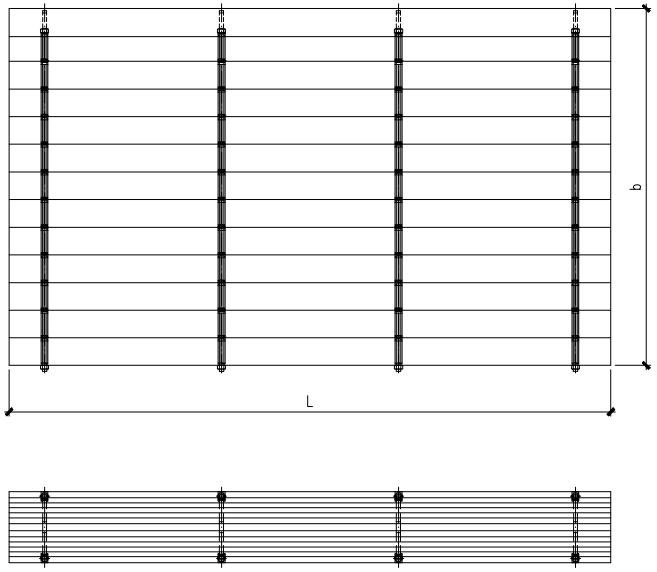
1.2 Flat surface should be flat, without obvious holes, wrinkles and bubbles; There should be no impurities greater than 1.0mm and the number of impurities with particle size of 0.6–1.0mm should not exceed 20 /m2.The dispersion shall not exceed 5 /10cm×10cm, and the damage aperture shall not exceed 2mm.Molding piece edge should be straight, no cracks or obvious gaps.

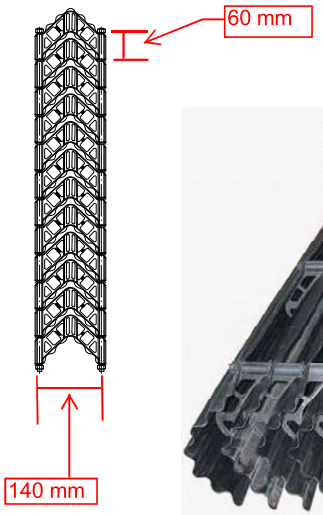
1.3 The design thickness of PVC packing flat sheet should be between 0.35mm ~ 0.45mm.The allowable deviation of flat sheet thickness is ±0.03mm.

2020

Detail Drawing of Filling

F98-CT-FILLS-02





Size of Eliminators :

C1 L=1000mm b=500mm ; C2 L=950mm b=500mm ;

C3 L=1000mm b=400mm ; C4 L=950mm b=400mm ;

The MWDP multi-function Eliminatorsr adopted by the company is based on the arc plus a number of sine waves, to achieve multiple water collection, water every wave will be energy dissipation, blocking once; At the very top edge, there are folds almost beyond the semicircle, so that the drops cannot pass at all, and almost all the liquid water is trapped; This water collector is a patented product of our company and one of the best water collectors in the industry.

Eliminators is made of modified PVC material, the sheet contains rubber and plastic components, anti-aging, no deformation, no softening when heated below 75℃, low temperature brittle point is not higher than -40℃, the sheet type is compound sine wave type, there is no perspective between the sheets, high water collecting efficiency, small airflow resistance, high strength, no deformation, good flame retardant performance. The water collector is placed on the secondary beam for easy installation and maintenance. After installation, the droplet loss rate of the cooling tower can be reduced to below 0.001%, reaching the international advanced level. The physical and chemical properties meet the requirements of DL/T742-2001 "Technical Conditions for Plastic Parts of Cooling Towers".

2020

Detail Drawing of Eliminator

F98-CT-ELIMINATORS-01