ALL STAR SERIES COUNTERFLOW

Interstate Paper Company — Riceboro, Georgia — 1992

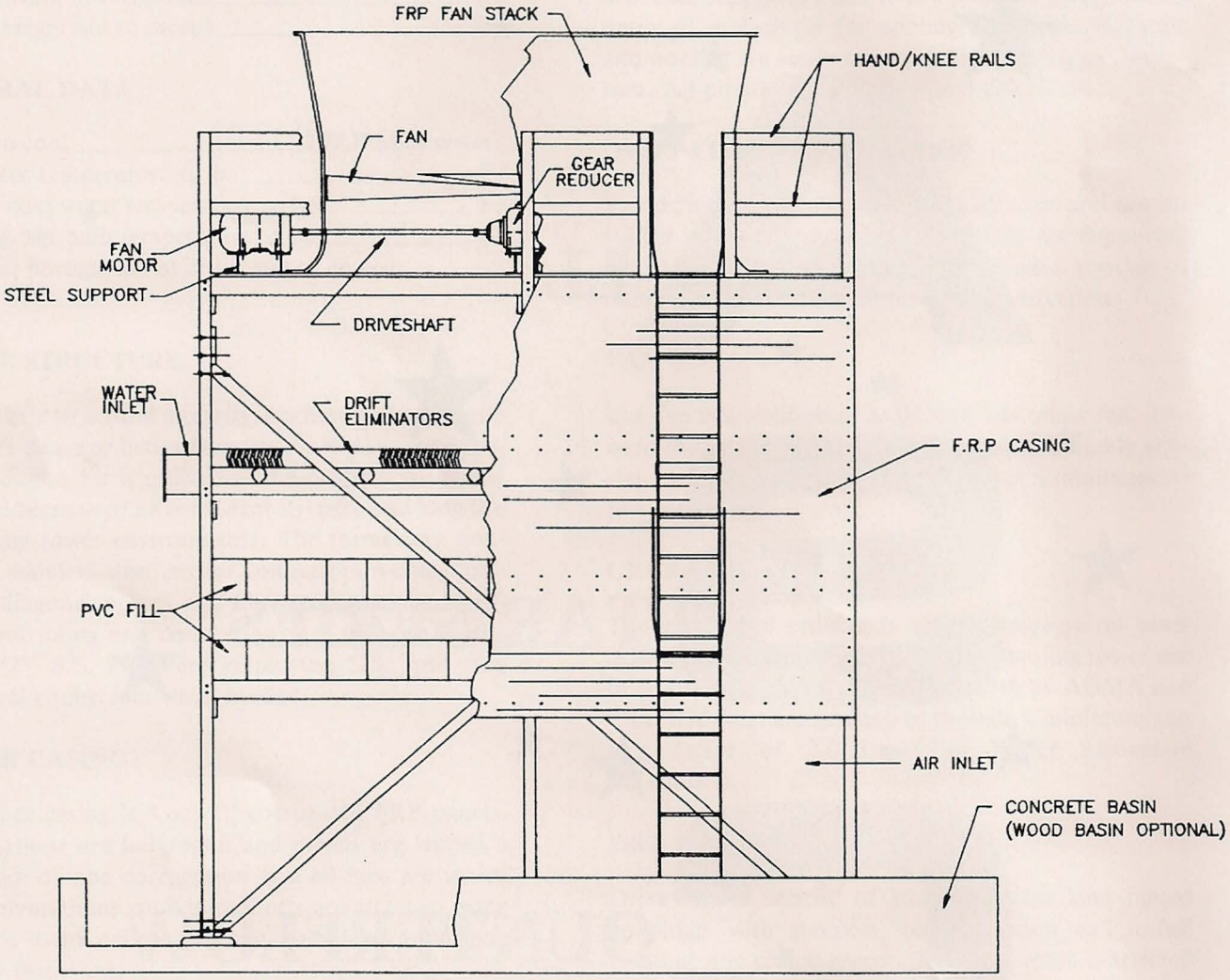
Field erected cooling towers for industrial process, large institutional and air conditioning applications.

- 16 Models with capacities from 500 to 1500 tons per cell, and flow rates from 1,000 to 10,000 gpm per cell
- High Efficiency Components
- Performance Engineered to Lower Operating Costs
- Meets or Exceeds CTI Code Specifications

STAR
COOLING TOWERS

STAR COOLING TOWER SERVICES, INC.

TYPICAL CROSS SECTION ASC SERIES



ASC OPTIONAL CONSTRUCTION AND ACCESSORIES

OPTIONAL STRUCTURAL MATERIALS

- *Redwood lumber and 2 x 6 T & G redwood fan deck can be provided.*

ACCESS AND SAFETY

- *Ladder safety cage can be added to standard ladder for additional safety.*
- *Optional stairway of wood construction for fan deck access.*

OPTIONAL BASIN

- *Wood cold water basin for installation on steel grillage provided by owner.*

MECHANICAL EQUIPMENT

- *Vibration shut-off switch on mechanical equipment support.*
- *Drive shaft and couplings of stainless steel.*

SELECTION TABLES

SINGLE CELL CAPACITY IN U.S. GALLONS PER MINUTE

WET BULB		70				75				78				80			
TEMPERATURES		95/85	100/85	100/90	105/90	95/85	100/85	100/90	105/90	95/85	100/85	100/90	105/90	95/85	100/85	100/90	105/90
MODEL	H.P.																
ASC1 1-1	15	2236	1726	2932	2241	1767	1392	2493	1924	1414	1136	2190	1673	1179	960	1931	1557
ASC1 2-1	20	2437	1882	3196	2441	1927	1515	2713	2096	1538	1234	2386	1820	1279	1043	2100	1694
ASC1 3-1	25	2607	2009	3417	2606	2057	1617	2901	2242	1641	1316	2552	1944	1366	1112	2243	1808
ASC1 4-1	30	2754	2120	3610	2754	2172	1708	3065	2364	1732	1386	2692	2053	1439	1172	2366	1907
ASC2 1-1	15	2498	1988	3209	2523	2028	1646	2770	2208	1680	1387	2447	1972	1447	1212	2253	1833
ASC2 2-1	20	2722	2165	3493	2747	2209	1791	3015	2404	1827	1508	2667	2146	1572	1317	2454	1995
ASC2 3-1	25	2910	2314	3734	2936	2360	1915	3228	2571	1953	1608	2849	2293	1679	1404	2623	2130
ASC2 4-1	30	3073	2442	3947	3103	2492	2021	3406	2714	2059	1697	3005	2416	1771	1481	2770	2250
ASC3 3-1	25	3479	2682	4560	3481	2747	2161	3869	2994	2197	1762	3327	2599	1832	1489	3000	2362
ASC3 4-1	30	3671	2832	4814	3678	2900	2282	4092	3158	2317	1858	3595	2743	1927	1570	3168	2563
ASC3 5-1	40	4002	3085	5248	4008	3163	2485	4455	3441	2522	2017	3918	2986	2096	1707	3446	2780
ASC3 6-1	50	4282	3297	5612	4280	3377	2653	4758	3680	2691	2153	4191	3189	2236	1821	3681	2967
ASC4 5-1	40	5432	4195	7118	5445	4299	3382	6046	4681	3434	2755	5320	4065	2866	2330	4685	3694
ASC4 6-1	50	5812	4483	7610	5815	4589	3611	6457	5002	3684	2936	5690	4341	3048	2486	5005	3941
ASC4 7-1	60	6138	4732	8039	6145	4844	3813	6831	5276	3867	3093	6002	4584	3215	2621	5280	4165
ASC4 8-1	75	6557	5059	8591	6260	5184	4074	7295	5643	4125	3304	6417	4890	3431	2796	5641	4441

TWO (2) CELL CAPACITY IN U.S. GALLONS PER MINUTE

WET BULB		70				75				78				80			
TEMPERATURES		95/85	100/85	100/90	105/90	95/85	100/85	100/90	105/90	95/85	100/85	100/90	105/90	95/85	100/85	100/90	105/90
MODEL	H.P.																
ASC1 1-2	15	4411	3402	5789	4421	3482	2740	4912	3798	2784	2281	4224	3298	2372	1927	3889	3069
ASC1 2-2	20	4810	3706	6317	4816	3794	2983	5353	4136	3097	2482	4599	3589	2576	2096	4238	3340
ASC1 3-2	25	5142	3960	6746	5143	4055	3189	5716	4420	3307	2648	4908	3830	2749	2238	4529	3565
ASC1 4-2	30	5431	4185	7126	5435	4286	3365	6047	4662	3492	2791	5185	4043	2901	2360	4783	3766
ASC2 1-2	15	4935	3928	6339	4986	4004	3248	5474	4363	3347	2765	4880	3933	2851	2391	4450	3619
ASC2 2-2	20	5382	4278	6906	5430	4360	3535	5963	4747	3643	3008	5321	4284	3102	2596	4849	3938
ASC2 3-2	25	5748	4571	7383	5803	4660	3780	6374	5079	3897	3211	5686	4576	3313	2771	5181	4206
ASC2 4-2	30	6072	4823	7805	6127	4917	3986	6731	5357	4109	3387	5998	4826	3496	2920	5470	4443
ASC3 3-2	25	6830	5258	8965	6842	5389	4239	7611	5877	4397	3526	6533	5101	3661	2976	6022	4744
ASC3 4-2	30	7208	5555	9465	7224	5687	4474	8030	6204	4642	3719	6901	5384	3859	3140	6357	5010
ASC3 5-2	40	7862	6053	10330	7864	6198	4869	8752	6759	5056	4039	7516	5860	4197	3415	6926	5454
ASC3 6-2	50	8407	6471	11034	8409	6626	5206	9365	7224	5399	4319	8022	6264	4480	3648	7404	5822
ASC4 5-2	40	10617	8192	13935	10638	8382	6594	11812	9146	6844	5488	10166	7934	5701	4635	9366	7378
ASC4 6-2	50	11357	8755	14899	11360	8954	7048	12652	9775	7307	5851	10849	8485	6071	4944	10009	7884
ASC4 7-2	60	11985	9243	15728	12017	9468	7440	13346	10311	7717	6168	11462	8943	6412	5215	10559	8326
ASC4 8-2	75	12824	9878	16819	12834	10109	7944	14253	11027	8239	6590	12247	9551	6843	5564	11295	8887

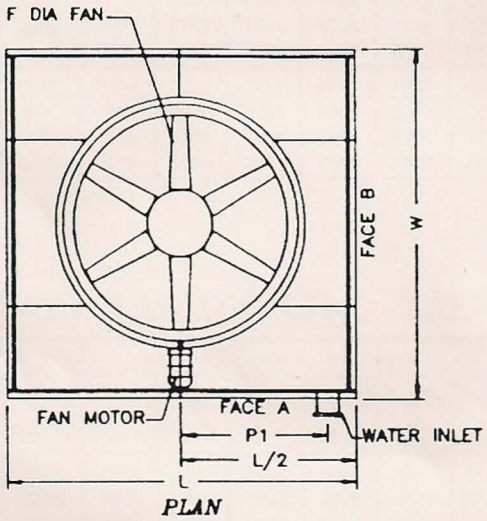
NOTES:

1. TABLE SHOWS PERFORMANCE CAPABILITY AT VARIOUS COMMON CONDITIONS. FOR CONDITIONS NOT SHOWN, CONSULT YOUR S.C.T.I. REPRESENTATIVE.
2. CAPACITIES ARE SHOWN FOR ONE AND TWO CELL MODELS IN OPEN, UNOBSTRUCTED INSTALLATIONS. WHEN MORE THAN TWO CELLS ARE REQUIRED OR WHEN THERE ARE LESS THAN THREE UNOBSTRUCTED AIR INLETS PER CELL, CONSULT YOUR LOCAL S.C.T.I. REPRESENTATIVE.
3. TO CONTROL ALL POTENTIAL CONTAMINANTS, A WATER TREATMENT PROGRAM MUST BE EMPLOYED. FOR SPECIFIC RECOMMENDATIONS ON WATER TREATMENT, CONTACT YOUR S.C.T.I. REPRESENTATIVE OR A COMPETENT WATER TREATMENT SUPPLIER.

DIMENSIONING DATA - SINGLE CELL

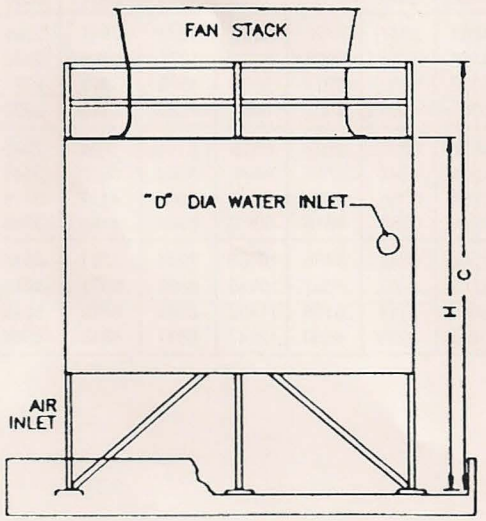
MODEL NO.	L	W	H**	B**	C**	E**	F	G	P	P1
ASC1 1-1 ASC1 2-1 ASC1 3-1 ASC1 4-1	16'-3 1/2"	16'-3 1/2"	16'-6"	11'-5 3/4"	20'-0"	22'-6"	10'-0"	1'-6"	9'-0"	7'-4"
ASC2 1-1 ASC2 2-1 ASC2 3-1 ASC2 4-1	16'-3 1/2"	16'-3 1/2"	16'-6"	11'-5 3/4"	20'-0"	22'-6"	10'-0"	1'-6"	9'-0"	7'-4"
ASC3 3-1 ASC3 4-1 ASC3 5-1 ASC3 6-1	16'-3 1/2"	24'-3 1/2"	16'-0"	11'-7 3/4"	20'-0"	26'-6"	12'-0"	1'-0"	13'-0"	2'-8"
ASC4 5-1 ASC4 6-1 ASC4 7-1 ASC4 8-1	24'-3 1/2"	24'-3 1/2"	16'-0"	11'-7 3/4"	20'-0"	26'-6"	16'-0"	1'-0"	13'-0"	2'-8"

**SEE NOTE 1

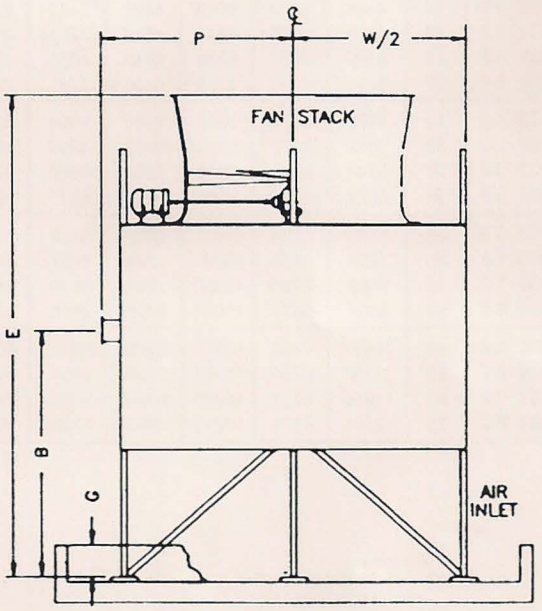


PLAN

FLOW PER INLET	D
0 - 1200	8"
1200 - 1900	10"
1800 - 2600	12"
2000 - 3250	14"
3000 - 4500	16"
3500 - 6000	18"
4000 - 7000	20"



FACE A ELEVATION



FACE B ELEVATION

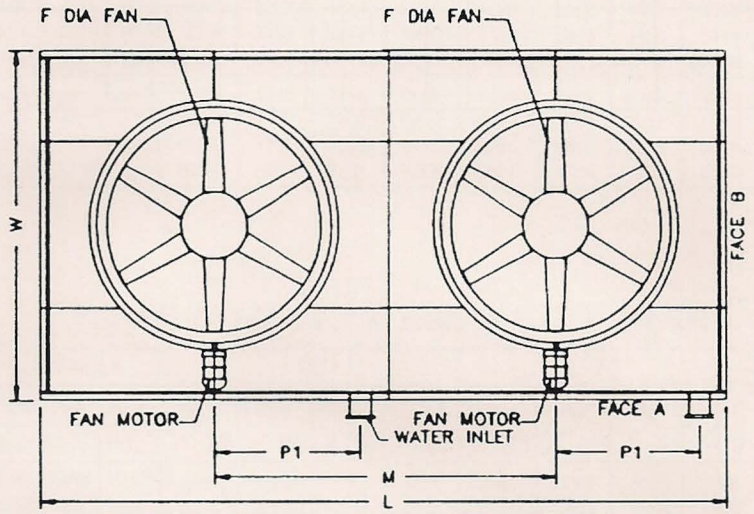
NOTES:

1. ADD 0'-7" TO DIMENSIONS TO OBTAIN ELEVATIONS FROM THE TOP OF BASIN SUPPORTS WHEN USING A WOOD BASIN.
2. INLET PIPING CONFORMS TO CLASS 150 FLAT FACED FLANGE ANSI B16.5-1973. HOLES STRADDLE VERTICAL AND HORIZONTAL CENTER LINES OF INLET.
3. RISER PIPING AND SUPPORTS TO BE PROVIDED BY OWNER. ALL PIPING AND OTHER EQUIPMENT OR MATERIAL EXTERNAL TO THE TOWER MUST BE SUPPORTED INDEPENDENTLY OF THE TOWER STRUCTURE.

DIMENSIONING DATA - TWO CELL

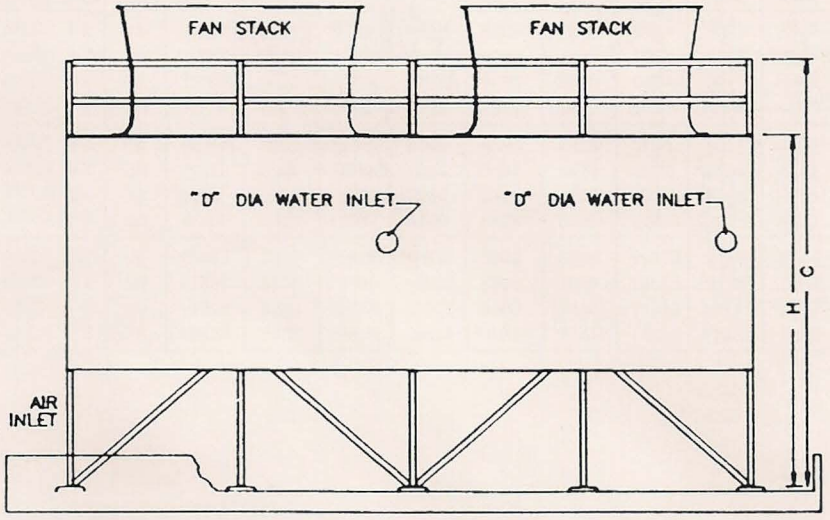
MODEL NO.	L	W	H**	B**	C**	E**	F	G	P	P1	M
ASC1 1-2 ASC1 2-2 ASC1 3-1 ASC1 4-1	32'-3 1/2"	16'-3 1/2"	16'-6"	11'-5 3/4"	20'-0"	22'-6"	10'-0"	1'-6"	9'-0"	7'-4"	16'
ASC2 1-2 ASC2 2-2 ASC2 3-2 ASC2 4-2	32'-3 1/2"	16'-3 1/2"	16'-6"	11'-5 3/4"	20'-0"	22'-6"	10'-0"	1'-6"	9'-0"	7'-4"	16'
ASC3 3-2 ASC3 4-2 ASC3 5-2 ASC3 6-2	32'-3 1/2"	24'-3 1/2"	16'-0"	11'-7 3/4"	20'-0"	22'-6"	12'-0"	1'-0"	13'-0"	2'-8"	16'
ASC4 5-2 ASC4 6-2 ASC4 7-2 ASC4 8-2	48'-3 1/2"	24'-3 1/2"	16'-0"	11'-7 3/4"	20'-0"	26'-6"	16'-0"	1'-0"	13'-0"	2'-8"	24'

**SEE NOTE 1

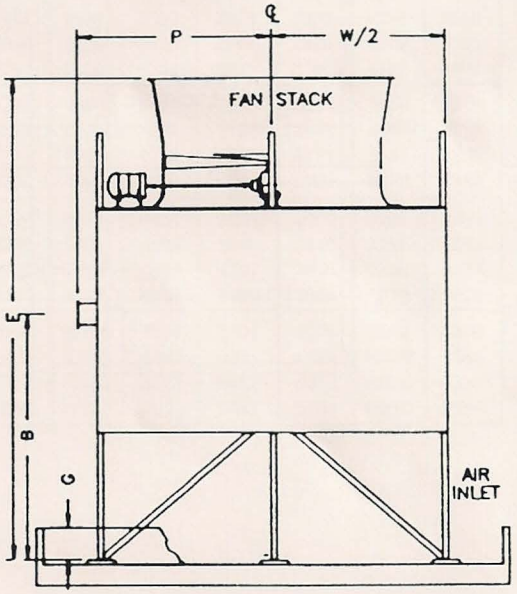


PLAN

FLOW PER INLET	D
0 - 1200	8"
1200 - 1900	10"
1800 - 2600	12"
2000 - 3250	14"
3000 - 4500	16"
3500 - 6000	18"
4000 - 7000	20"



FACE A ELEVATION



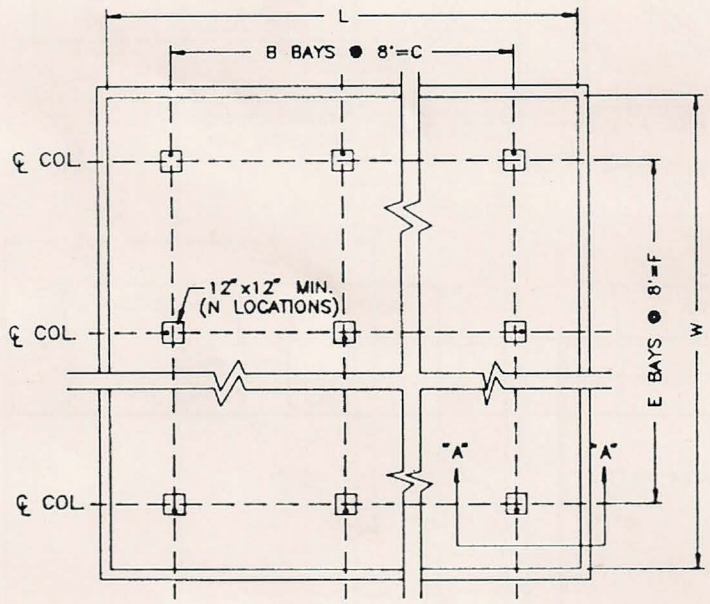
FACE B ELEVATION

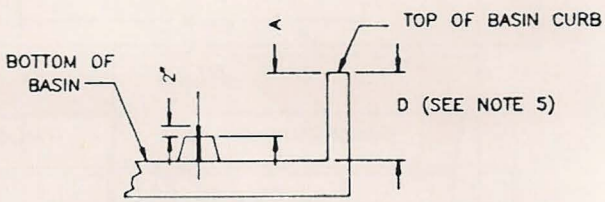
NOTES:

1. ADD 0'-7" TO DIMENSIONS TO OBTAIN ELEVATIONS FROM THE TOP OF BASIN SUPPORTS WHEN USING A WOOD BASIN.
2. INLET PIPING CONFORMS TO CLASS 150 FLAT FACED FLANGE. ANSI B16.5-1973. HOLES STRADDLE VERTICAL AND HORIZONTAL CENTER LINES.
3. RISER PIPING AND SUPPORTS TO BE PROVIDED BY OWNER. ALL PIPING AND OTHER EQUIPMENT OR MATERIAL EXTERNAL TO THE TOWER MUST BE SUPPORTED INDEPENDENTLY OF THE TOWER.

CONCRETE BASIN DIMENSIONS

MODEL NO.	ONE CELL								W	TWO CELL							
	L	B	C	E	F	A	N	OPER. WT.		L	B	C	E	F	A	N	OPER. WT.
ASC1 1 ASC1 2 ASC1 3 ASC1 4	22'-0"	2	16'-0"	2	16'-0"	1'-6"	9	34,920	22'-0"	38'-0"	4	32'-0"	2	16'-0"	1'-6"	15	64,951
ASC2 1 ASC2 2 ASC2 3 ASC2 4	22'-0"	2	16'-0"	2	16'-0"	1'-6"	9	35,879	22'-0"	38'-0"	4	32'-0"	2	16'-0"	1'-6"	15	66,735
ASC3 3 ASC3 4 ASC3 5 ASC3 6	22'-0"	2	16'-0"	3	24'-0"	1'-0"	12	51,284	30'-0"	38'-0"	4	32'-0"	3	24'-0"	1'-0"	20	95,388
ASC4 5 ASC4 6 ASC4 7 ASC4 8	30'-0"	3	24'-0"	3	24'-0"	1'-0"	16	72,609	30'-0"	54'-0"	6	48'-0"	3	24'-0"	1'-0"	28	135,052



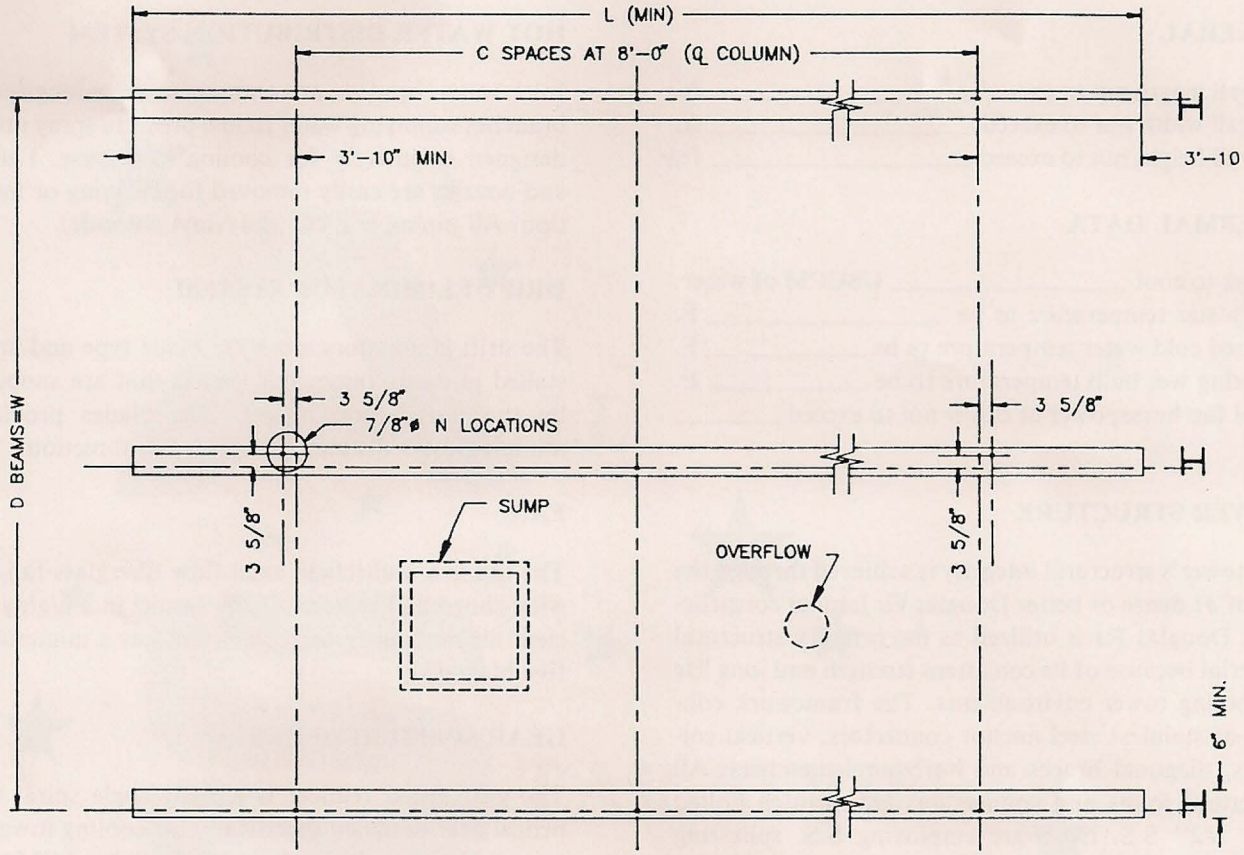


SECTION "A–A"
(MAG = 2)

NOTES:

1. (N) 3/4" ANCHOR BOLTS WITH 2" THREAD AND PROJECTION SUPPLIED AND INSTALLED BY OWNER.
2. (N) 3/4" FLAT WASHERS AND NUTS SUPPLIED BY OWNER.
3. CONCRETE BASIN, SUMP, OVERFLOW, DRAIN, CLEANOUT AND WATER MAKE-UP TO BE DESIGNED, FURNISHED AND INSTALLED BY OWNER IN ACCORDANCE WITH DIMENSIONS AND REQUIREMENTS GIVEN.
4. ALL COLUMN LOCATIONS TO BE FLUSH AND LEVEL TO WITHIN ± 1/8" OF DIMENSIONS GIVEN.
5. D DIMENSION MAY BE SPECIFIED BY OWNER.
6. ALL BOLTS ARE 3 5/8" FROM CENTER OF COLUMN.
7. OPERATING WEIGHT DOES NOT INCLUDE CONCRETE BASIN OR WATER IN BASIN.

PLAN OF SUPPORTING STEEL
(OPTIONAL: Wood Cold Water Basin)



MODEL NO.	ONE CELL			W	TWO CELL			D	N
	L	C	OPER. WT.		L	C	OPER. WT.		
ASC1 1 ASC1 2 ASC1 3 ASC1 4	23'-8"	2	70,414	16'-7¼"	39'-8"	4	125,589	3	9
ASC2 1 ASC2 2 ASC2 3 ASC2 4	23'-8"	2	71,373	16'-7¼"	39'-8"	4	127,373	3	9
ASC3 3 ASC3 4 ASC3 5 ASC3 6	23'-8"		99,322	24'-7¼"	39'-8"	4	177,586	4	12
ASC4 5 ASC4 6 ASC4 7 ASC4 8	31'-8"		137,727	24'-7¼"	55'-8"	6	251,409	4	16

NOTES:

1. ALL STEEL AS SHOWN TO BE DESIGNED, FURNISHED AND INSTALLED BY OTHERS.
2. ALL HOLES ARE 7/8" DIAMETER AND ARE TO BE DRILLED BY OTHERS AT DIMENSIONS SHOWN.
3. ALL STEEL MUST BE LEVEL AND FLUSH AT TOP.
4. SUMP OR SUMPS MAY BE LOCATED ON THE CENTER LINE OF ANY BAY AS SHOWN. ADEQUATE CLEARANCE MUST BE PROVIDED BELOW STEEL GRILLAGE FOR SUMP AND PIPING.
5. OPERATING WEIGHT INCLUDES REDWOOD BASIN AND MAXIMUM WATER LEVEL OF 11 1/2" IN THE COLLECTION BASIN.

ENGINEERING SPECIFICATIONS

GENERAL

Overall length not to exceed _____ ft.
Overall width not to exceed _____ ft.
Overall height not to exceed _____ ft.

THERMAL DATA

Tower to cool _____ USGPM of water.
Hot water temperature to be _____ F.
Desired cold water temperature to be _____ F.
Entering wet bulb temperature to be _____ F.
Total fan horsepower at driver not to exceed _____ HP.

TOWER STRUCTURE

The tower's structural integrity is achieved through the use of #1 dense or better Douglas Fir lumber construction. Douglas Fir is utilized as the primary structural material because of its consistent strength and long life in cooling tower environments. The framework consists of stainless steel anchor connectors, vertical columns, diagonal braces and horizontal members. All structural joints and connections are through bolted with 1/2'' S.S. hardware employing S.S. split ring structural connectors when needed.

TOWER CASING

The tower casing is 8 oz./ft^2 corrugated FRP panels. Corrugations are horizontal and panels are lapped a minimum of one corrugation and all laps are sealed with polyurethane caulking. Sheets are attached using S.S. ring shank nails with a maximum horizontal span of four feet.

FAN DECK

The fan deck is 3/4'' treated plywood. The decking is supported by 2 x 6 joists which are in turn supported by 2 x 6 joist supports. Maximum span of deck sheathing is 24''.

HEAT TRANSFER MEDIA

Fill media is PVC film type with a minimum surface area of 42 ft^2/ft^3. Fill is installed in alternating layers at right angles to prevent excessive flow around fill and to provide improved distribution of air and water within the fill media.

HOT WATER DISTRIBUTION SYSTEM

Inlet water headers are transverse with longitudinal branches supplying water to low pressure spray nozzles designed exclusively for cooling tower use. Laterals and nozzles are easily removed for cleaning or inspection. All piping is PVC (polyvinyl chloride).

DRIFT ELIMINATOR SYSTEM

The drift eliminators are PVC blade type and are installed in easily removable panels that are supported by the distribution piping. The blades provide a minimum of 3 distinct changes in air direction.

FAN

The fan is a multiblade axial flow fiberglass fan. The wide chord and tapered design results in a highly efficient air moving system. Each fan has a minimum of five blades.

GEAR SPEED REDUCER

The gear speed reducer is a right angle spiral bevel helical gear designed specifically for cooling tower use in accordance with standards set forth by AGMA and CTI. Reducers are selected to provide a minimum service factor of 2.0 based on driver nameplate horsepower.

DRIVE SHAFTS

Drive shafts consist of non-lubricated zinc plated couplings with stainless steel hardware and a full floating zinc plated spacer. The drive shaft is selected to provide a minimum service factor of 2.0 at nameplate horsepower of driver.

MOTOR

The fan motor is single speed, single winding, totally enclosed fan cooled (TEFC) with a minimum service factor of 1.15. The motor is mounted exterior of the fan stack and is selected to operate at or below nameplate horsepower for design conditions.

MECHANICAL EQUIPMENT SUPPORT

The mechanical equipment is supported by a hot dipped galvanized structural steel support designed for ease of alignment and invariable alignment during operation.

C T I
MEMBER