

# Application Concepts

**By: Tom Cabezut**

**LAKOS Webinar April 14, 2020**

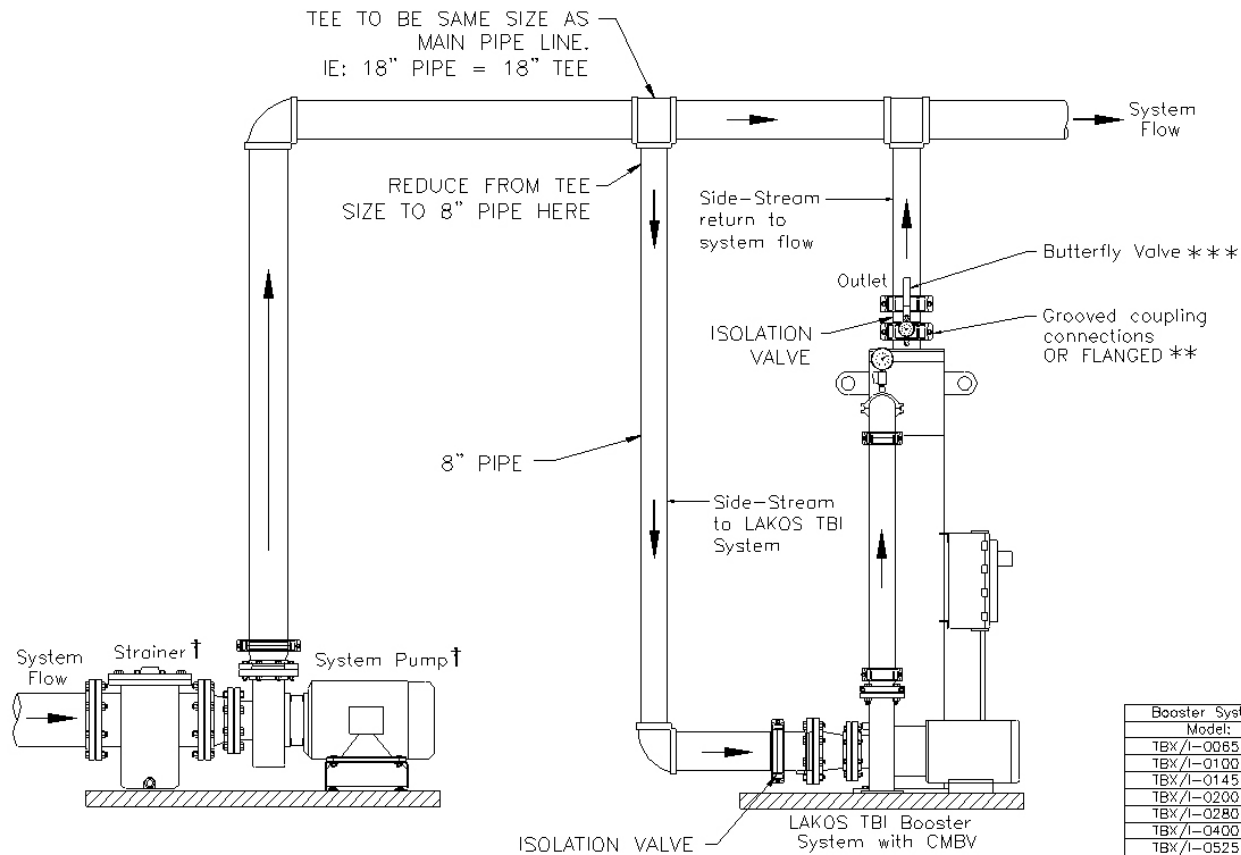
# Objective

- To be able to apply and size LAKOS filtration packages including separators in basic HVAC applications.
- We are going to cover:
  1. Side Stream applications (Sand filters and TB systems)
  2. Sweeping cooling tower basins and remote sumps.

# What's available to meet the customers requirements?

HEAT TRANSFER Application Product Guide		PROTECTION	
		Heat Exchangers, Chillers, Etc.	Cooling Tower Basins & Remote Sumps
PROBLEMS	Settleable Solids  sand, silt, grit, dirt, rust, scale, etc.	Full-Stream / Side-Stream HTX-HTH-ILB Closed Loop Systems: 5-10% HTX-HTH-ILB SideStreamClean system w/booster pump (TBI/TPX) SideStreamCleanPLUS system w/booster pump (SPI/SPX)	TowerClean system w/booster pump (TCI/TCX) TowerCleanPLUS for finer filtration (TPI/TPX) STS/swp or CTS/swp w/ higher pressure pump (secondary option) (each with HydroBoosters)
	Floating Solids  algae, organics, cottonwood seeds, bugs, slime	STS CTS FTS Side-Stream Only 5-25%	STS CTS FTS Use Turnover Rate, Not Basin Size

## SIDE-STREAM APPLICATION LAKOS TBI Booster System



Booster System Model:	Flow Rate		Pump HP
	U.S. gpm	m <sup>3</sup> /hr	
TBX/I-0065-SRV	65	15	1.5
TBX/I-0100-SRV	100	23	2
TBX/I-0145-SRV	145	33	3
TBX/I-0200-SRV	200	45	5
TBX/I-0280-SRV	280	64	5
TBX/I-0400-SRV	400	91	7.5
TBX/I-0525-SRV	525	119	15
TBX/I-0825-SRV	825	187	20
TBX/I-1100-SRV	1100	250	20

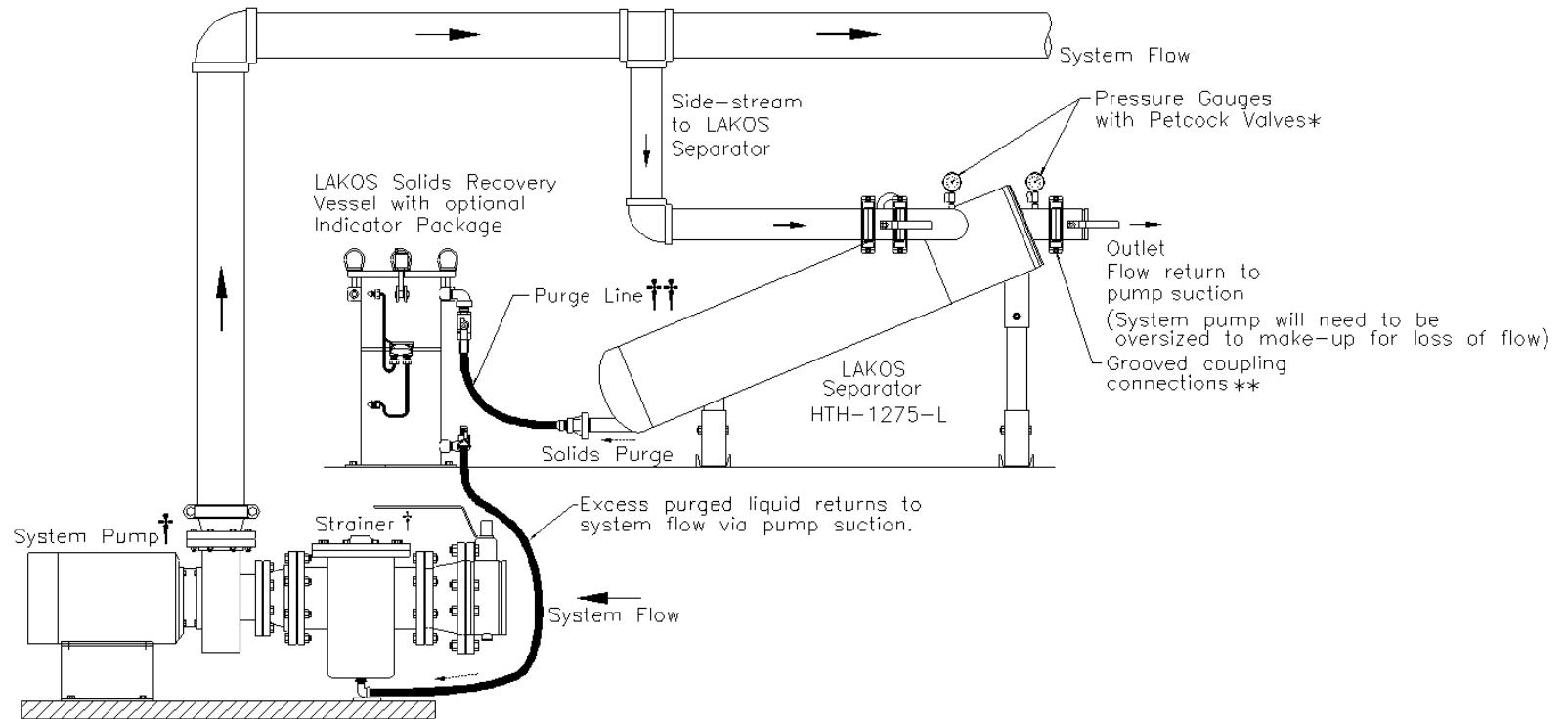
\*\* Inlet/outlet may also be specified with ANSI flanges, DIN flanges or other connections. Consult factory for details.

\*\*\* These items available as an option from LAKOS.

† These components not provided by LAKOS. Strainer is recommended standard practice for protection of pump from larger debris.

## SIDE STREAM INSTALLATION

### LAKOS HTH-L Series with Solids Recovery Vessel



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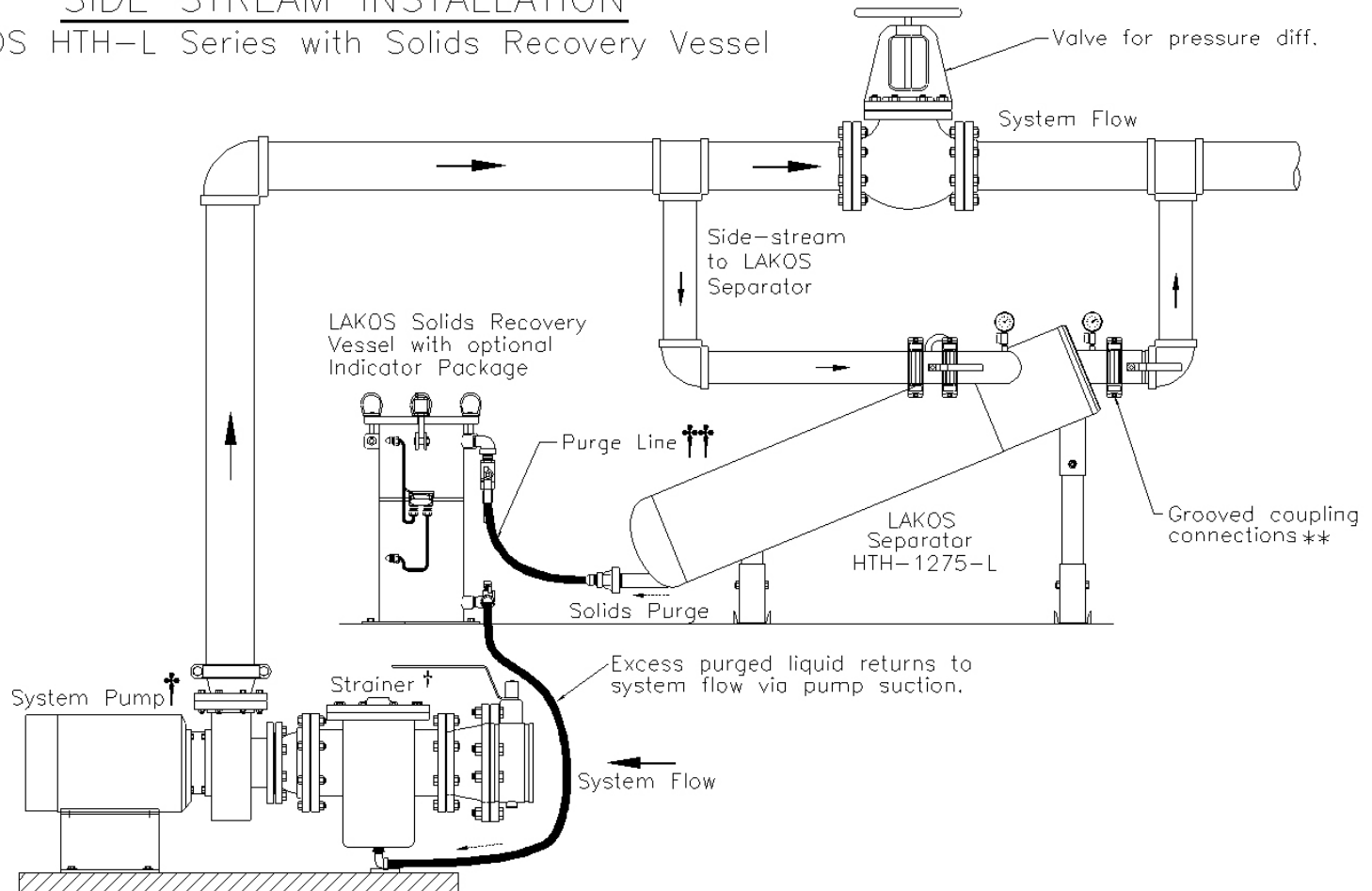
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(See reverse side for solids-purging alternative.)

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TJC1276B

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	<b>Floating Solids</b> <hr/> algae, organics, cottonwood seeds, bugs, slime	<b>STS CTS FTS</b> Side-Stream Only 5-25%	<b>STS CTS FTS</b> Use Turnover Rate, Not Basin Size

[L:\Literature\LS\\_PDF\LS-710\\_TowerCleanAndPlus\\_Brochure.pdf](L:\Literature\LS_PDF\LS-710_TowerCleanAndPlus_Brochure.pdf)

# UC Davis Medical Center, Davis CA

- (4) TCX-3100-ABV sweeping (4) 60 x 30 above grade concrete sumps
- (42) 1 ½" eductors in each of the sump totaling 2100gpm

[..\AB-216-NorCal-Medical-Center-Basin-Sweeping.pdf](#)

<https://www.lakos.com/resources/videos/>





# Nozzle types and Flow-Rates



10 gpm at 20psi  
HB-10-K, HB-18-K



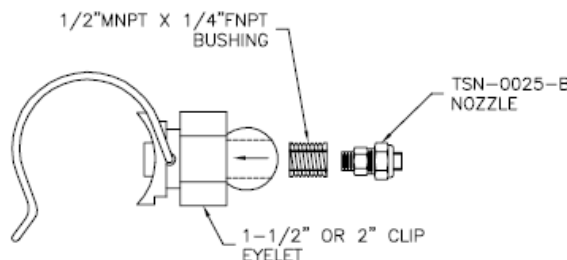
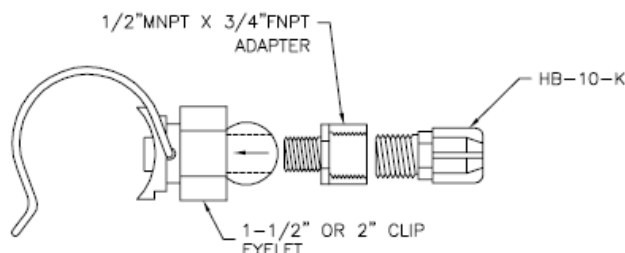
4.2 gpm at 20psi  
TSN-0025-B



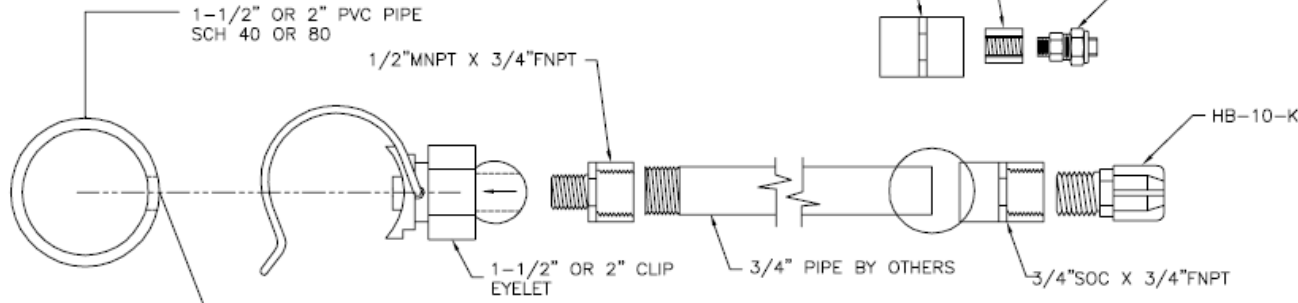
10 gpm at 10psi  
eHB-10-K

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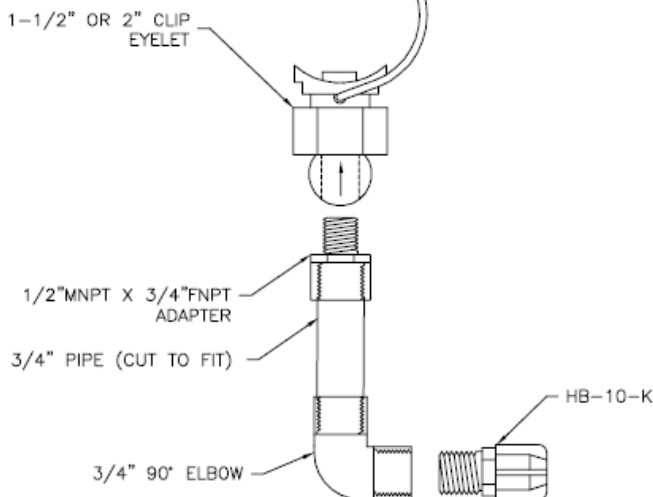
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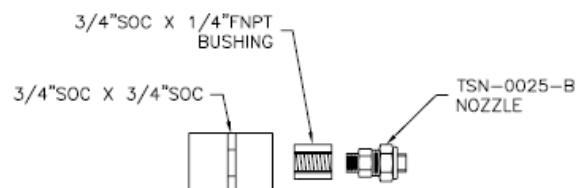
### HORIZONTAL INSTALLATION



### HORIZONTAL INSTALLATION W/ EXTENSION PIPE



### VERTICAL INSTALLATION



UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES (DIM. FRACTIONS DECIMALS ANGLES) 1/16" 3/32" 1/8" 1/4" 3/8" 1/2" 5/8" 3/4" 7/8" 1" 1 1/8" 1 1/4" 1 1/2" 1 3/4" 2" 2 1/4" 2 1/2" 2 3/4" 3" 3 1/4" 3 1/2" 3 3/4" 4" 4 1/4" 4 1/2" 4 3/4" 5" 5 1/4" 5 1/2" 5 3/4" 6" 6 1/4" 6 1/2" 6 3/4" 7" 7 1/4" 7 1/2" 7 3/4" 8" 8 1/4" 8 1/2" 8 3/4" 9" 9 1/4" 9 1/2" 9 3/4" 10" 10 1/4" 10 1/2" 10 3/4" 11" 11 1/4" 11 1/2" 11 3/4" 12" 12 1/4" 12 1/2" 12 3/4" 13" 13 1/4" 13 1/2" 13 3/4" 14" 14 1/4" 14 1/2" 14 3/4" 15" 15 1/4" 15 1/2" 15 3/4" 16" 16 1/4" 16 1/2" 16 3/4" 17" 17 1/4" 17 1/2" 17 3/4" 18" 18 1/4" 18 1/2" 18 3/4" 19" 19 1/4" 19 1/2" 19 3/4" 20" 20 1/4" 20 1/2" 20 3/4" 21" 21 1/4" 21 1/2" 21 3/4" 22" 22 1/4" 22 1/2" 22 3/4" 23" 23 1/4" 23 1/2" 23 3/4" 24" 24 1/4" 24 1/2" 24 3/4" 25" 25 1/4" 25 1/2" 25 3/4" 26" 26 1/4" 26 1/2" 26 3/4" 27" 27 1/4" 27 1/2" 27 3/4" 28" 28 1/4" 28 1/2" 28 3/4" 29" 29 1/4" 29 1/2" 29 3/4" 30" 30 1/4" 30 1/2" 30 3/4" 31" 31 1/4" 31 1/2" 31 3/4" 32" 32 1/4" 32 1/2" 32 3/4" 33" 33 1/4" 33 1/2" 33 3/4" 34" 34 1/4" 34 1/2" 34 3/4" 35" 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1/2" 324 3/4" 325" 325 1/4" 325 1/2" 325 3/4" 326" 326 1/4" 326 1/2" 326 3/4" 327" 327 1/4" 327 1/2" 327 3/4" 328" 328 1/4" 328 1/2" 328 3/4" 329" 329 1/4" 329 1/2" 329 3/4" 330" 330 1/4" 330 1/2" 330 3/4" 331" 331 1/4" 331 1/2" 331 3/4" 332" 332 1/4" 332 1/2" 332 3/4" 333" 333 1/4" 333 1/2" 333 3/4" 334" 334 1/4" 334 1/2" 334 3/4" 335" 335 1/4" 335 1/2" 335 3/4" 336" 336 1/4" 336 1/2" 336 3/4" 337" 337 1/4" 337 1/2" 337 3/4" 338" 338 1/4" 338 1/2" 338 3/4" 339" 339 1/4" 339 1/2" 339 3/4" 340" 340 1/4" 340 1/2" 340 3/4" 341" 341 1/4" 341 1/2" 341 3/4" 342" 342 1/4" 342 1/2" 342 3/4" 343" 343 1/4" 343 1/2" 343 3/4" 344" 344 1/4" 344 1/2" 344 3/4" 345" 345 1/4" 345 1/2" 345 3/4" 346" 346 1/4" 346 1/2" 346 3/4" 347" 347 1/4" 347 1/2" 347 3/4" 348" 348 1/4" 348 1/2" 348 3/4" 349" 349 1/4" 349 1/2" 349 3/4" 350" 350 1/4" 350 1/2" 350 3/4" 351" 351 1/4" 351 1/2" 351 3/4" 352" 352 1/4" 352 1/2" 352 3/4" 353" 353 1/4" 353 1/2" 353 3/4" 354" 354 1/4" 354 1/2" 354 3/4" 355" 355 1/4" 355 1/2" 355 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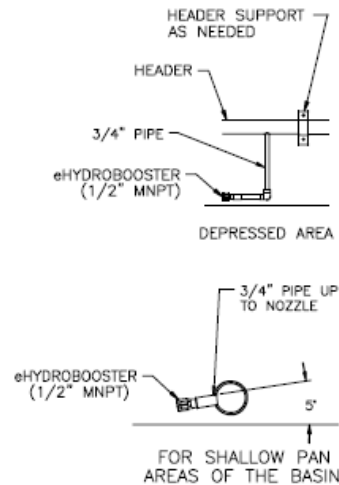
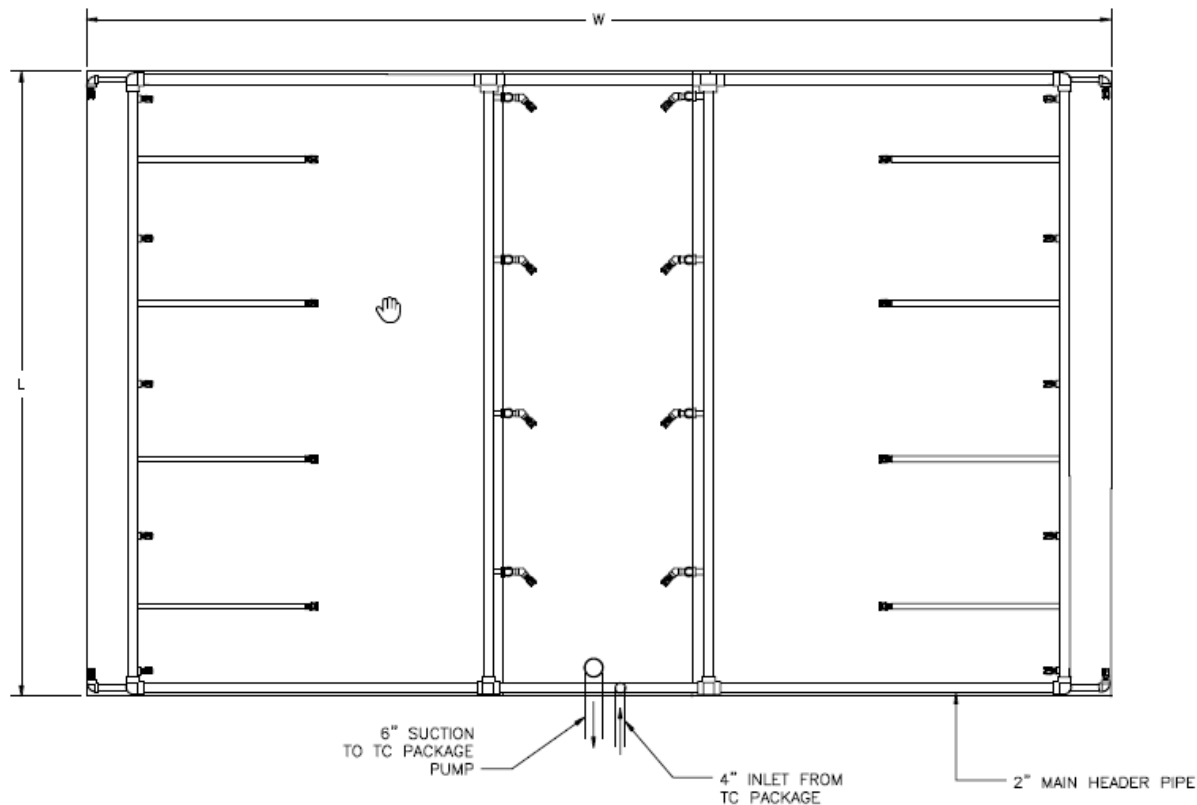
#### NOTES:

1. HYDROBOOSTERS/NOZZLES TO BE FLUSH WITH BOTTOM OF BASIN.
2. ALL DIMENSIONS TO BE FIELD VERIFIED BEFORE INSTALLATION.
3. FLOODED SUCTION REQUIRED FOR 'TC' SYSTEM PRIOR TO STARTING SYSTEM.
4. SCHEDULE 80 PVC PIPE RECOMMENDED WHERE APPLICABLE.
5. LOCATE TC SYSTEM SUCTION LINE OPPOSITE THE COOLING TOWER PUMP SUCTION IN THE BASIN.
6. MULTIPLE CELL BASINS MUST BE EQUALIZED WHEN USING A SINGLE FILTRATION PACKAGE.

#### CONCEPTUAL DRAWING

This drawing is submitted for spacial & illustrative purposes only. Do not pre-plumb to these dimensions. Submittal or certified drawings available upon request.

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#### SUGGESTED INSTALLATION DETAILS

BOX SIZE	W	L
12 x 21.5	21'-7"	11'-10"
14 x 24	24'-0"	13'-11"


#### EQUIPMENT:

eTCX-0310-SRV  
2" HEADER  
(30) eHB-10-K HYDROBOOSTERS

#### PROJECT:

LAKOS REP:

LAKOS RSM:

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES (mm)		
TOLERANCES ARE:		
FRACTIONS	DECIMALS	ANGLES
± 1/16	± .01	± 1/2°
± 1/32	± .005	
± 1/64	± .0025	
DO NOT SCALE DRAWING		
MATERIAL	---	
	---	
FINISH	---	
	---	
		

EXCEPT AS OTHERWISE PROVIDED BY CONTRACT, THE DRAWING AND SPECIFICATIONS SHALL NOT BE REPRODUCED, COPIED, OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF WATER-RELATED EQUIPMENT WITHOUT THE WRITTEN PERMISSION OF THE CLAUD LAKEL CORPORATION, OR ITS ASSIGNEE.

# NOTES:

1. eHYDROBOOSTERS/NOZZLES TO BE FLUSH WITH BOTTOM OF BASIN.
2. ALL DIMENSIONS TO BE FIELD VERIFIED BEFORE INSTALLATION.
3. FLOODED SUCTION REQUIRED FOR eTC SYSTEM PRIOR TO STARTING SYSTEM.
4. SCHEDULE 80 PVC PIPE RECOMMENDED WHERE APPLICABLE.
5. LOCATE eTC SYSTEM SUCTION LINE OPPOSITE THE COOLING TOWER PUMP SUCTION IN THE BASIN.
6. MULTIPLE CELL BASINS MUST BE EQUALIZED WHEN USING A SINGLE FILTRATION PACKAGE.

## SUBMITTAL DRAWING

This drawing is submitted for spatial consideration only. Do not pre-plumb to these dimensions.

REVISIONS				
DATE	BY	DESCRIPTION	DATE	APPROVED
9-2-14	A	NOZZLES MOVED PER BAPCO MARKUP DWG	3/17/04	SUBOOH

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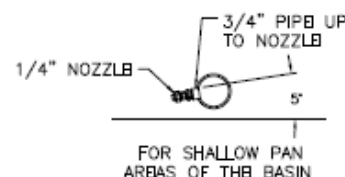
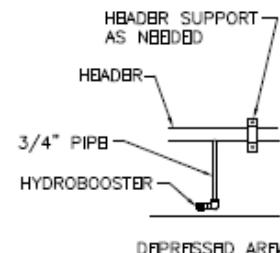
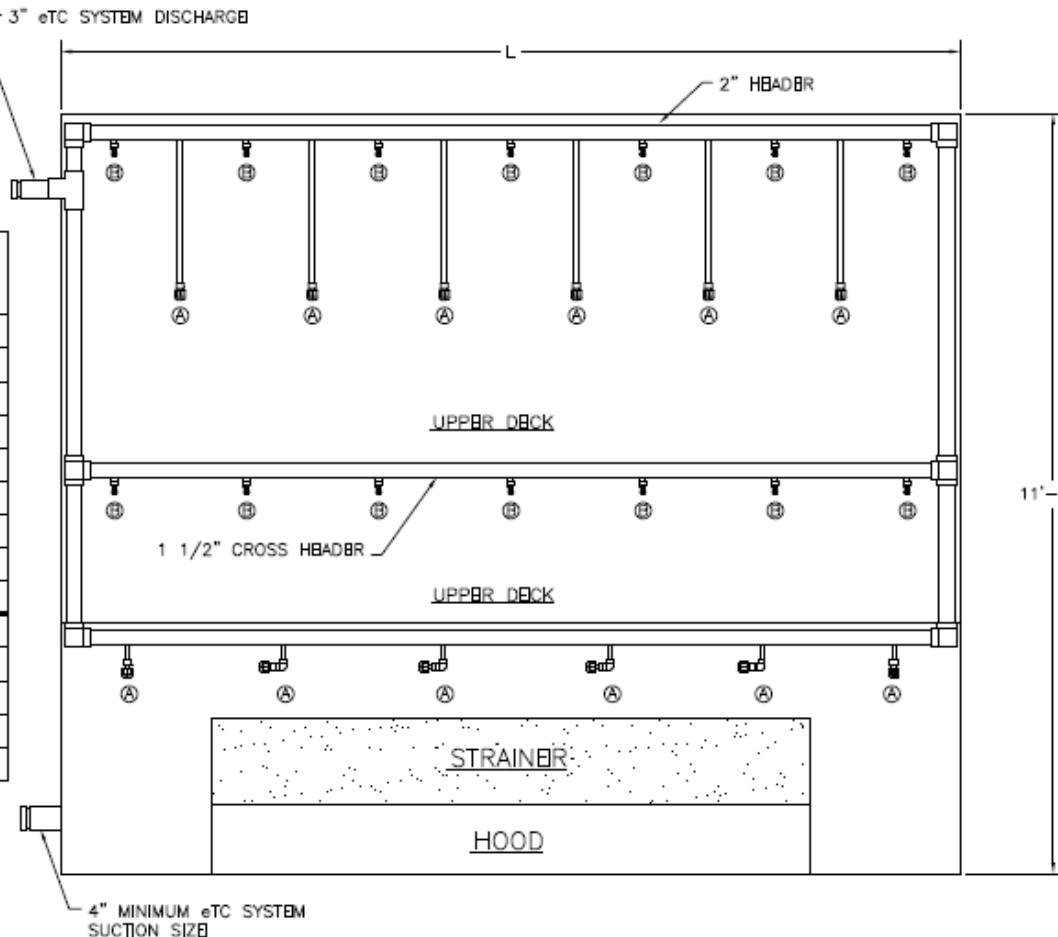
D

C

B

A

TOWER MODEL SERIES	L
AT112-012	11'-11 3/4"
AT112-112	11'-11 3/4"
AT112-212	11'-11 3/4"
AT112-312	11'-11 3/4"
AT112-512	11'-11 3/4"
AT112-612	11'-11 3/4"
AT112-712	11'-11 3/4"
AT112-812	11'-11 3/4"
AT112-912	11'-11 3/4"
AT112-314	13'-11 3/4"
AT112-414	13'-11 3/4"
AT112-714	13'-11 3/4"
AT112-814	13'-11 3/4"
AT112-914	13'-11 3/4"



## SUGGESTED INSTALLATION DETAILS

**EQUIPMENT:**  
eTCX-0210-SRV  
(CONSULT FACTORY FOR OTHER OPTIONS)  
2" HEADER  
(12) eHB-10-K HYDROBOOSTERS (A)  
(14) 1/4" NOZZLES (B)

**PROJECT:**  
RBP:  
ENGINEER:  
CONTRACTOR:  
LAKES RSM:

**REVISIONS:**  
REVISION NO. 1/16  
DATE 1/16

**APPROVALS:**  
BY: NAC  
DATE: 4/1/00

**LAKES**  
CLAUD LAKEL CORP.  
1365 N. CLOVIS AVE.  
PESQUERA, CALIFORNIA 93727

**LAYOUT, eHYDROBOOSTER, BAPCO MODELS, AT 112-012 TO 914**

**C** **118809e** **A**

**1 OF 1**

4

3

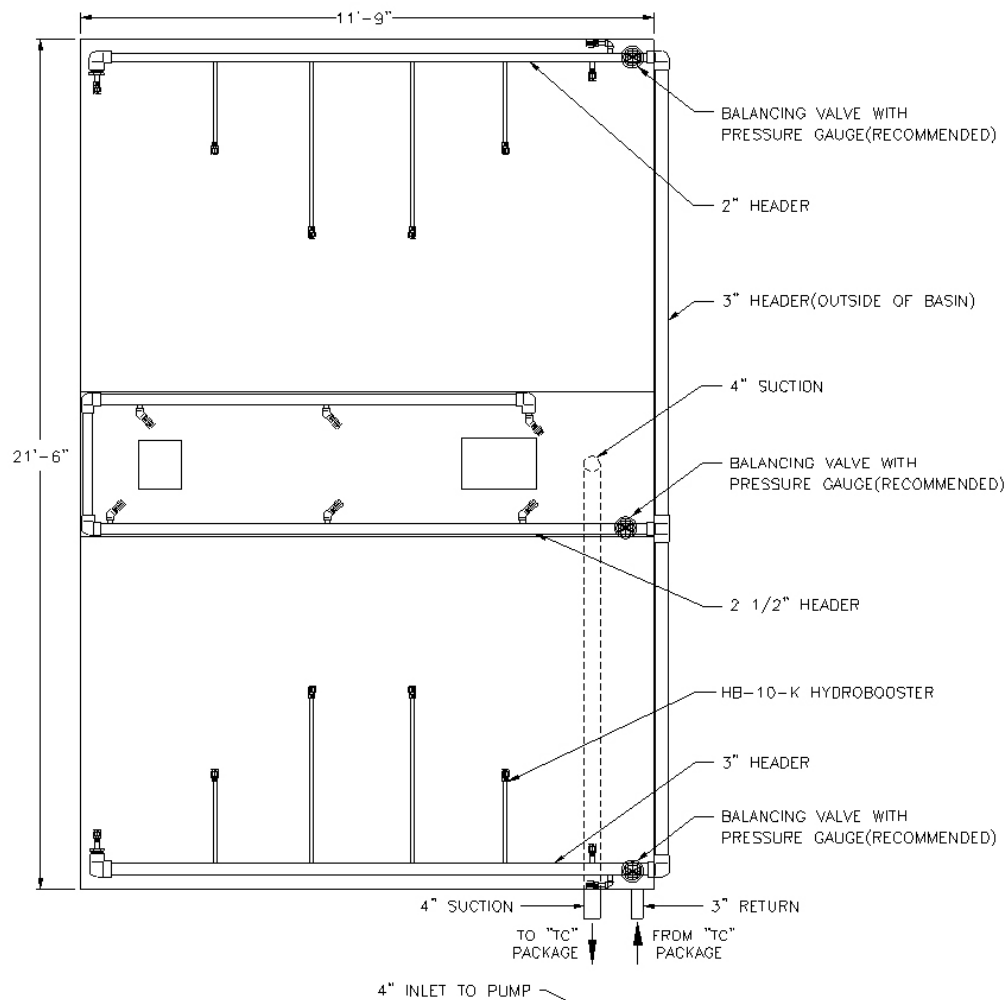
2

1

118809e

118809e

A



NOTES:



TCI-0200-SRV

EXCEPT AS OTHERWISE PROVIDED BY CONTRACT, THIS DRAWING AND SPECIFICATIONS SHALL NOT BE REPRODUCED, COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF WATER DEPENDENT MATERIAL WITHOUT THE EXPRESS WRITTEN PERMISSION OF THE CLAUDE LALAI CORPORATION OR ITS ASSOCIATES.

# NOTES:

1. HYDROBOOSTERS/NOZZLES TO BE FLUSH WITH BOTTOM OF BASIN.
2. ALL DIMENSIONS TO BE FIELD VERIFIED BEFORE INSTALLATION.
3. FLOODED SUCTION REQUIRED FOR "TC" SYSTEM PRIOR TO STARTING SYSTEM.
4. SCHEDULE 80 PVC PIPE RECOMMENDED WHERE APPLICABLE.
5. LOCATE TC SYSTEM SUCTION LINE OPPOSITE THE COOLING TOWER PUMP SUCTION IN THE BASIN.
6. MULTIPLE CELL BASINS MUST BE EQUALIZED WHEN USING A SINGLE FILTRATION PACKAGE.

This drawing is submitted for special & illustrative purposes only. Do not pre-plumb to these dimensions.

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REVISIONS			
DATE	REV	DESCRIPTION	APPROVED
5/24/05	A	CHG ONE CELL TO FUTURE INSTALL	TJC

D

C

B

A

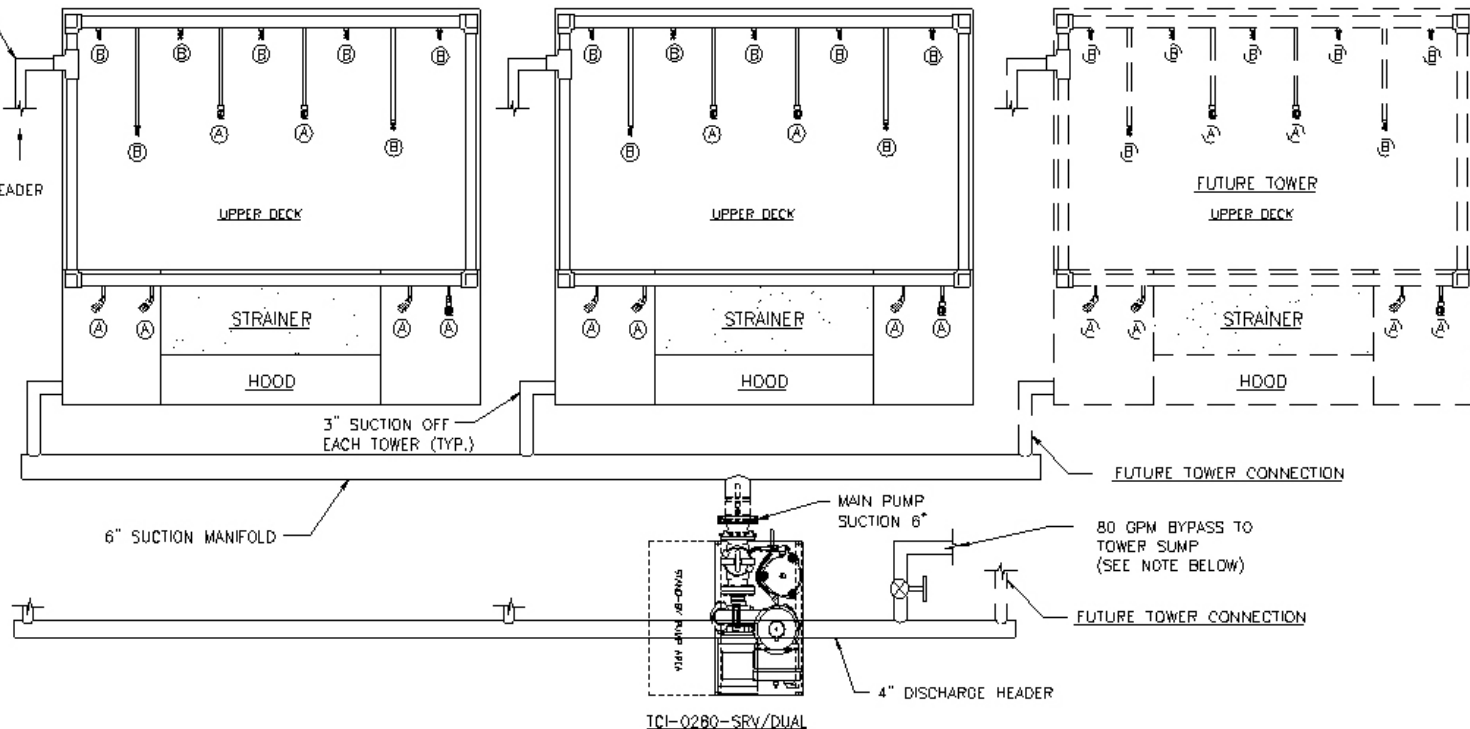
D

C

TJC1639A

1 OF 1

A



NOTE: AN 80 GPM BYPASS LINE MAYBE REQUIRED FOR THE OPERATION OF TWO CELLS IF A 3 PSI DIFFERENTIAL PRESSURE ON THE SEPARATOR CANNOT BE ACHIEVED.

**EQUIPMENT:**  
TCI-0280-SRV/DUAL  
  
PIPING IN TOWERS BY EVAPCO

**PROJECT:** INTEL  
**DEM:** TURBINE AIR SYSTEMS  
**ENGINEER:**  
**CONTRACTOR:**

LAKES DESIGN SPECIFICATIONS ARE TO BE USED IN ALL PROJECTS UNLESS OTHERWISE NOTED.	
DESIGNER	DATE
PROJECT	DATE
REVISION	DATE
BY	DATE
CHECKED	DATE
APPROVED	DATE

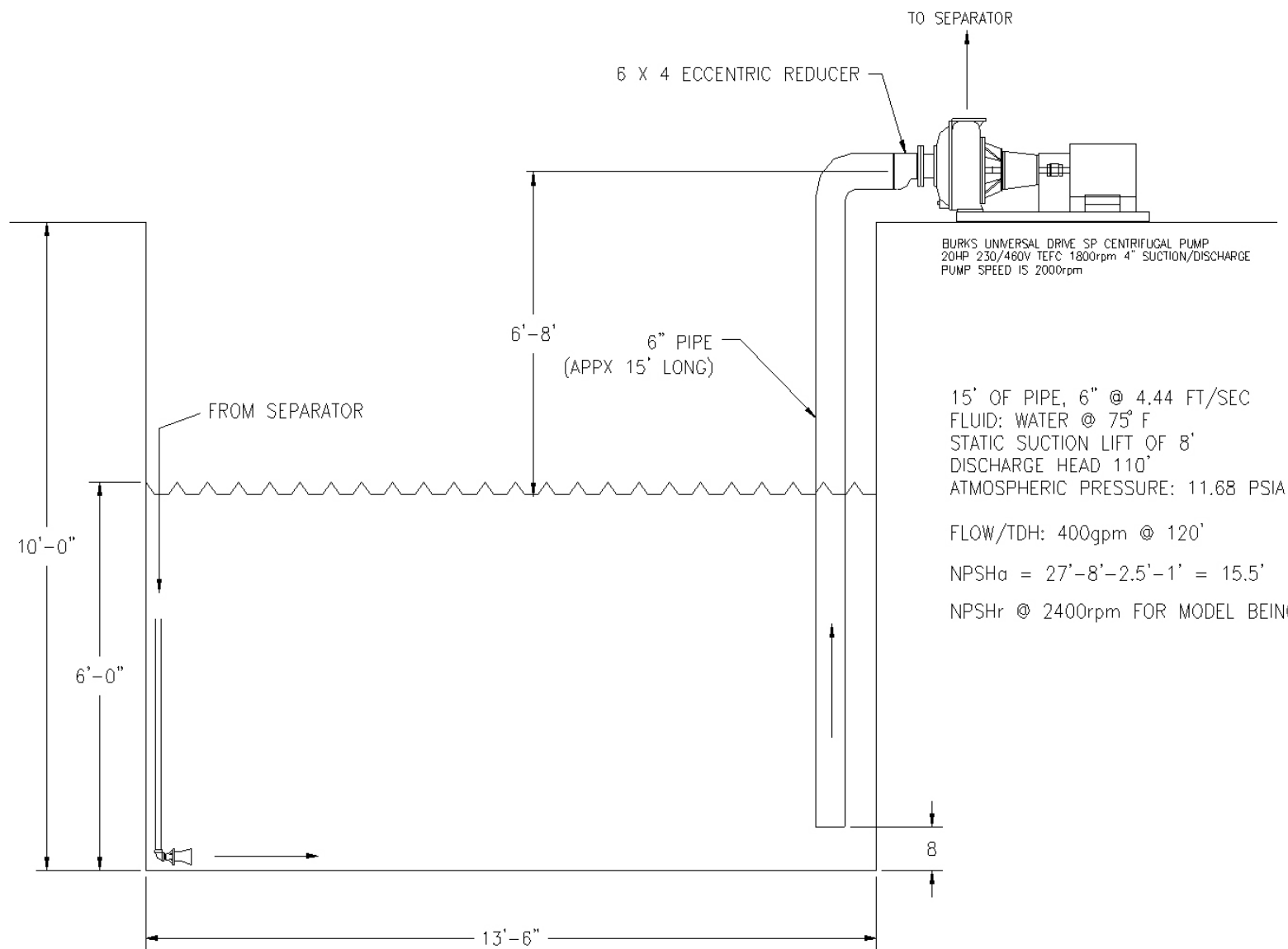
LOW TEMP	
APPROVED	DATE
DESIGN	DATE
PROJECT	DATE
REVISION	DATE
BY	DATE
CHECKED	DATE
APPROVED	DATE

LAKES CLAUDE LALAI CORP. 1385 N. CLOVIS AVE. FRESNO, CALIFORNIA 93727	
LAKES LOGO	
LAYOUT, HYDROBOOSTER, EVAPCO (3) CELL, AT 19-611	
DATE	DATE
BY	DATE
CHECKED	DATE
APPROVED	DATE

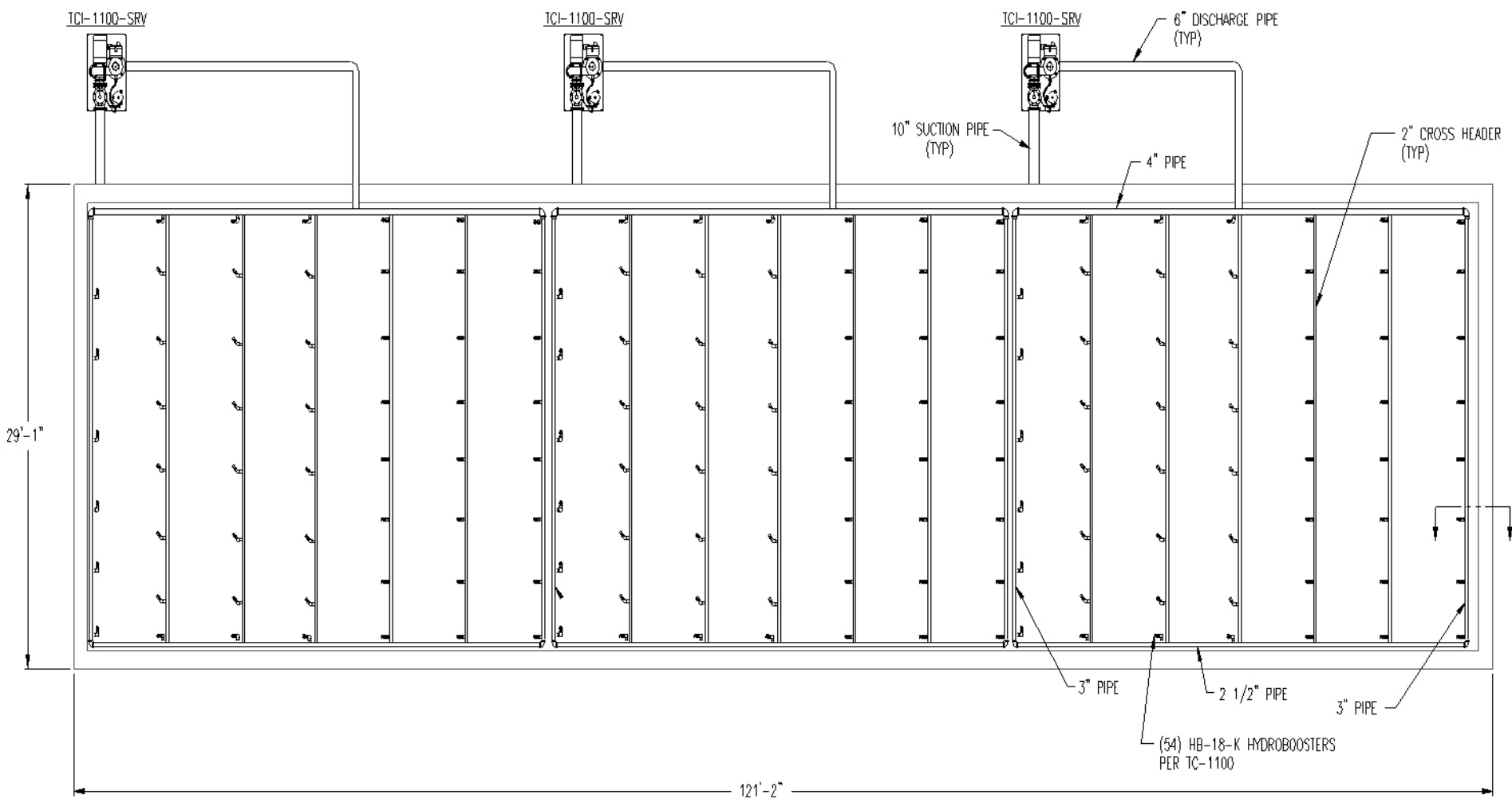


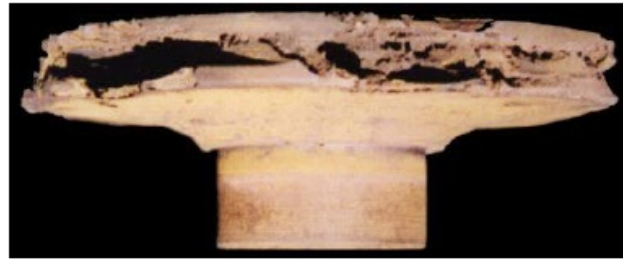
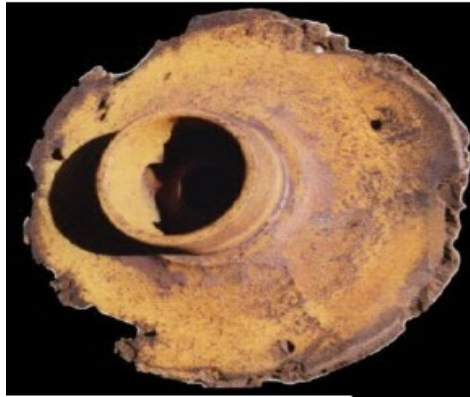
LAKES LOGO

1 OF 1









**Thank you!**  
**Tom.Cabezut@lakos.com**