

INTRODUCTION

- **General definition and purpose of curtailment and this guide-** This guide is provided as a resource for chilled water curtailment. Chilled water (CW) is produced and distributed from the Central Energy Facility (CEF) on campus. Chilled water is used by many buildings on campus to provide building space and equipment cooling. Not all buildings are supported by campus chilled water. Check with your supporting facilities department to see if your building is connected to the chilled water system. Chilled water is used across many areas of Stanford University, such as the adult and children hospitals, the academic campus, athletics, School of Medicine and Residential & Dining Enterprises. It is recommended that programs create action plans to be implemented when notified of a chilled water curtailment to reduce the impacts to programs and loss of equipment. Those plans should include internal communications within the program for sharing knowledge of the curtailment and actions to be taken.
- **Curtailment reasons and potential for rapid escalation-** The need to implement a chilled water curtailment can be caused by various situations or conditions. Some of the reasons are equipment problems or system failures, extreme temperatures and high humidity conditions or distribution problems. Chilled water curtailment efforts are needed to maintain cooling in non-curtailable spaces housing life safety functions. There are five (5) stages of curtailment in the plan. During periods of curtailment, the situation is often very dynamic. The response may not always be systematic beginning at stage 0 and progressing sequentially through the specified five stages. Changing situations may require rapid escalation in curtailment stage levels with limited notice. Curtailment consider actual weather as well as forecasted conditions, production capacity of the plant at the time of the curtailment against the system demands of the users of chilled water.
- **General methodology and prioritization-** All buildings that are connected to chilled water are evaluated to determine the usage need. The needs range from comfort cooling to patient care. The needs are broken down into five (5) stages (defined below). **Many of our buildings are diverse in function and may be affected at different stages of a curtailment, for details of areas curtailed at each stage please contact your facilities team.**
- **Communications-** In the event of a chilled water curtailment, every effort will be made to communicate with chilled water customers as quickly as possible. Once we are aware of a problem we will communicate information to the Stanford community using the AlertSU system. At the implementation of a stage 1 or higher curtailment the AlertSU system will be used to make the initial notification via email. The message will also be posted on the emergency.stanford.edu web site. At each change in curtailment stage a new AlertSU message will be sent out specifying the stage and an updated message will be posted to the emergency.stanford.edu web site. This guide will be posted to a web site and a link will be provided in the communications.
 - On top of the notices that goes to general campus, LBRE will be sending regular text and email notification to a list of predefined CHW critical users and building mangers.
- **Proactive measures you can take-** Building management in all buildings can help us to reduce chilled water load and prevent higher stages of curtailment by implementing the following measures:
 - Close window coverings on sunny exposures
 - Raise thermostat set points to 78F in office and common areas
 - Close laboratory fume hood sashes when not in use
 - Close operable windows in air conditioned buildings
 - Shut-off unused office equipment
 - Turn off lights in unoccupied areas
 - Where possible, shutoff lab equipment not currently being used.
 - Etc.

CURTAILMENT STAGES

DEFINED STAGE 0

Stage 0 (Soft Curtailment) - Adjustments to reduce chilled water use without directly impacting the functionality of campus facilities. Examples include temporary adjustments to space cooling temperatures while staying within campus guidelines, such as setting the thermostat to 78F in a space where the occupants may have it set at 72F.

- Examples of impact: There will be no notification sent to occupants at this stage. Occupied space will become warmer than usual.

STAGE 1

Stage 1 (Comfort Cooling) – Allowing temperatures in occupied spaces to exceed campus guidelines (temperatures may exceed 90F).

- Comfort cooling is reduced in many offices and other parts of the campus, to preserve sufficient cooling capacity for medical, research, data processing and other facilities.
- Examples of impact: Occupied space will become warmer than usual.
- Potential actions to minimize impact: Make sure your curtailment contingency plans are enacted. Alert other program members of the chilled water curtailment. This may include selectively turning off heat producing office equipment to beginning shutdown of research equipment in preparation for further curtailment stage escalation.
- Potential actions to support curtailment: Monitor web site for updated information. Let your supporting facilities department know of special events for consideration. Turn off office equipment to include lighting. Consult with your building manager and management for next steps. Refer to Human Resource guidelines & policies.

STAGE 2

Stage 2 (Temporary Disruption of Teaching, Research, and Commercial Operations) - Allowing temperatures in teaching, research, or commercial operations spaces to exceed campus guidelines (temperatures may exceed 90F), resulting in short term impact to teaching, research and commercial operations.

- Examples of impact: Temporary loss of teaching, research and commercial operations for the curtailment duration.
- Potential actions to minimize impact: Consider shutdown of research equipment that has a heat load and/or uses chilled water. Secure chemicals. Limit opening of refrigerator/freezer equipment.
- Potential actions to support curtailment: Turn off equipment that produces heat or uses chilled water. Continue to consult with your building manager and management for actions to be taken.

STAGE 3

Stage 3 (Long Term Disruption of Teaching, Research, and Commercial Operations) - Allowing temperatures in sensitive conditioned teaching, research, or commercial operations spaces to exceed campus guidelines (temperatures may exceed 90F), resulting in long term impact to teaching, research and commercial operations.

- Examples of impact: Loss of data and need for re-calibration of equipment.
- Potential actions to minimize impact: Secure research area for severe reduction of cooling. Restrict opening of refrigerator/freezer equipment. Shutdown of research equipment that has a heat load and/or uses chilled water. Consult with EH&S on safe storage of chemicals.
- Potential actions to support curtailment: Check with your School/Department for actions to be taken. Continue to consult with your building manager and management for local updates to action plans. Notify your facilities support unit that steps are being taken to shut down all program related equipment.

STAGE 4

Stage 4 - Allowing temperatures in research, data processing, or communications spaces, to exceed specifications (temperatures may exceed 90F), and impacting the process cooling water supplied directly to that equipment, resulting in equipment inoperability or damage.

- Stage 4 buildings is broken down to three sub categories as described below;
 - Stage 4a-Building spaces with the following characteristics (Low dollar lost, Low recovery duration, food storage, medium effort to reproduce/recover, departmental data centers)
 - Stage 4b-Building spaces with the following characteristics (Medium dollar lost, Medium recovery duration)

to recover, High effort to reproduce/recover)

- Stage 4c—Building spaces with the following characteristics (Significant safety concern, Non reproducible, reproducible (long duration), Non recoverable, Laser Labs and Wet Labs, MRI, High dollar, Long Duration, Campus Data Center/ECH)
- Examples of impact: University data/communications systems could be impacted. Potential failure of equipment. Potential loss of data and communication systems.
- Potential actions to minimize impact: Shutdown of computer/networking equipment. Activate other computing centers that don't use chilled water if possible. Consider opening doors and deploying fans to circulate air. Security may be necessary at open doors. Be observant to condensation from chilled water piping on computing equipment.
- Potential actions to support curtailment: Confirm with your facilities support unit of actions to be taken to include full shutdown of program equipment.

Non-curtailable spaces

Spaces in this category house life safety functions that will be greatly impacted if space temperatures increases.

For list of spaces in this category, please contact your facilities team.

Quad/ Bldg	Building Name	Zone	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 4a	Stage 4b	Stage 4c
01-001	Administration	D		x			x	X		
01-010	President's Office	D		x			x	X		
01-100	Bldg 100	D		x		x				
01-110	Bldg 110	D		x		x				
01-120	McClatchy Hall (Sociology)	D		x						
01-160	Wallenberg Hall	D	x	x			x	X		
01-170	Bldg 170 (Legal Offices/ Humanities)	D		x						
01-200	Lane History Corner	D		x						
01-320	Braun Corner	D		x						
01-380	Sloan Math. Ctr. (Math Corner)	D	x	x						
01-420	Jordan Hall (Psych)	D		x			x			X
01-460	Margaret Jacks Hall	D	x	x		x	x		X	
02-010	Bookstore	C			x					
02-020	Center for Educ. Rsch. (CERAS)	C	x	x						
02-040	Neukom Law Clinic	C		x						
02-050	Law School	C	x	x	x					
02-070	Munger Building 1	S		x						
02-070	Munger Building 2	S		x						
02-070	Munger Building 3	S		x						
02-070	Munger Building 4	S					x	X		
02-070	Munger Building 5	S					x	X		
02-100	Humanities Center (Bowman)	C	x	x						
02-140	Kingscote Gardens	C		x						
02-210	Braun Music Loop 1	C	x		x		x		X	
02-210	Braun Music Loop 2	C	x		x					
02-250	Center for Turbulence Research	A	x	x						
02-300	Tresidder Student Union North (Loop 1)	C	x	x	x		x	X		
02-300	Tresidder Student Union South (Loop 2)	C	x	x		x				
02-500	Terman Lab/Archeology	A		x			x	X		
02-500A	Terman Lab Annex	A					x	X		
02-520	Mechanical Engineering, TSG	A	x	x		x	x	X		
02-530	Mechanical Engineering Admin	A		x		x	x		X	
02-540	Blume Earthquake Lab (Civil Engr)	A		x						
02-550	Peterson Lab	A	x		x					
02-560	Center for Design Research	A	x	x			x	X		
02-565	Magnetic Resonance Resrch Lab (MRSRL)	A					x			X
02-570	Mechanical Engr Labs/Shops (HTGL)	A			x		x			X
02-635	Press Telecommunications	A					x			X
02-660	Mechanical Engineering Lab	A		x		x	x			X
02-670	408 Panama	A	x	x			x	X		
03-001	Art Gallery	D		x			x			X
03-050	Barnum Center	D		x						
03-100	Hoover Tower	D		x			x	X		
03-110	Hoover 2 (Lou Henry)	D		x			x	X		
03-120	Hoover 3 (Memorial)	D		x			x	X		
03-130	Traitel Building	D	x	x						
03-200	Green Library West (Bing Wing)	C		x			x	X		
03-210	Green Library East	C		x						
03-300	Cubberly Education	C	x	x						
03-420	Sweet Hall	C	x	x						
04-030	Packard Electrical Engineering	A	x		x		x		X	
04-040	Nanoscale Science	A		x			x			X
04-050	Paul Allen Center for Integrated Systems (CIS)	A		x			x			X
04-050A	CIS Annex	A		x			x			X
04-060	Shriram	A					x			X
04-070	Environment & Energy Building (Y2E2)	A		x			x		X	
04-080	Huang Engineering Center (HEC)	A	x	x	x		x	X		
04-270	HEPL South	A		x			x			X
04-460	Green Earth Science	A	x	x	x		x			X
04-470	Astro	A		x	x	x	x			X
04-480	Moore Materials Research	A	x		x	x	x			X
04-490	McCullough	A	x	x	x		x			X
04-510	TCSEQ (aka Regional Teaching Facility, Hewlett)	A		x	x		x	X		
04-520	Varian	A	x	x		x	x			X
04-530	Sequoia Hall (Statistics)	A		x						
04-540	Durand	A		x	x	x	x			X
04-550	Skilling	A	x		x					
04-560	Mitchell	A	x	x			x			X

Quad/ Bldg	Building Name	Zone	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 4a	Stage 4b	Stage 4c
04-640	Arrillaga Outdoor Ed & Rec Cntr	L		x						
04-650	Roble Gym	C		x			x	X	X	
04-720	Thornton Center (Terman Annex)	A	x		x					
05-130	Denning House	C		x						
06-010	Encina Center Basement	D	x	x						
06-020	Encina West	D		x						
06-030	Encina East	D		x						
06-040	Encina Commons	D		x						
06-640	Highland Hall	S					x	X		
06-750	Schwab Residential Center	S		x						
07-090	McMurtry	B			x	x	x		X	
07-100	Cantor Center (Museum)	B			x		x			X
07-110	Anderson Collection	B					x			X
07-200	Science Teaching & Learning Center	B		x	x	x				
07-210	Mudd Chemistry	B	x			x				
07-220	Keck Science	B		x	x	x	x			X
07-230	Lokey Chem-Bio	B		x			x	X	X	X
07-260	Stauffer I - Chemistry	B		x	x		x	X		X
07-270	Stauffer II - Physical Chemistry	B		x	x	x	x	X		X
07-301	NEW STANFORD HOSPITAL	H				x	x	X	X	X
07-321	NSH Garage	H				x	x	X	X	X
07-302	E.D. STONE - CENTRAL CORE	H				x	x	X	X	X
07-303	E.D. STONE - WEST PAVILION	H				x	x	X	X	X
07-304	E.D. STONE - EAST PAVILION	H				x	x	X	X	X
07-305	E.D. STONE - BOSWELL BUILDING	H				x	x	X	X	X
07-306	E.D. STONE - GRANT BUILDING	T					x			X
07-306	E.D. STONE - GRANT BUILDING	T					x			X
07-307	E.D. STONE - ALWAY BUILDING	T			x		x			X
07-308	E.D. STONE - LANE BUILDING	T				x	x			X
07-309	E.D. STONE - EDWARDS BUILDING	T					x			X
07-310	HOSPITAL CORE EXPANSION	H				x	x	X	X	X
07-314	DIAGNOSIS & TREATMENT CENTER	H				x	x	X	X	X
07-315	LPCH West	P					x			
07-317	ADVANCED MEDICINE CENTER	H				x	x	X	X	X
07-318	LPCH Main	P					x			
07-320	FALK CARDIOVASCULAR RESEARCH CENTER	T		x	x	x	x	X		
07-330	RAF 1	T								
07-335	RAF 2	T								
07-340	Clark Center Complex	B	x				x			X
07-340E	Clark Center East	B	x			x	x			X
07-340S	Clark Center South	B	x				x			X
07-34W	Clark Center West	B	x			x	x			X
07-420	Gilbert Biological Sciences	B	x		x	x	x			X
07-420A	CAFÉ	B								
07-440	Bass Biology Building	B		x			x	X		X
07-450	Gates Computer Science	B	x			x	x	X		
07-515	LI KA SHING CTR FOR LEARNING (LKSC)	T		x	x	x	x	X		
07-520	SHERMAN FAIRCHILD SCIENCE BUILDING	T		x	x	x	x		X	
07-530	BECKMAN CENTER FOR MOL & GEN MED	T		x	x	x	x		X	X
07-535	Lorry Lokey Stem Cell Research Building	T		x	x	x	x	X	X	
07-550	HAGEY PEDIATRIC REGENERATIVE MED	T				x				
07-560	MEDICAL SCHOOL OFFICE BLDG (MSOB)(1)	T		x						
07-560	MEDICAL SCHOOL OFFICE BLDG (MSOB)(2)	T			x					
07-560	MEDICAL SCHOOL OFFICE BLDG (MSOB)(3)	T					x	X		
07-570	MED SCHL LAB SURGE / MAG RES SPECTR (MSLS)	T								
07-570	MED SCHL LAB SURGE / MAG RES SPECTR (MSLS)	T								
07-590	CENTER FOR CLINICAL SCIENCES RESRCH (CCSR)	T			x		x		X	X
07-600	Biomedical Innovation	T		x	x	x	x			X
07-920	HRP - REDWOOD BUILDING (Old Psych)	T		x						
08-050	Knight Management Center (Buildings A through G)	D	x							
08-050	Knight Management Center (Buildings A through G)	D		x		x				
08-050A	Knight Management FOB East	D	x	x						
08-050A	Knight Management FOB West	D	x	x						
08-050B	Knight Management Bass Building	D	x	x						
08-050C	Knight Management Commons (Zambrano Hall / North Bldg.)	D	x	x			x	X		
08-050D	Knight Management Gunn Building	D	x	x						
08-050E	Knight Management McClelland Building	D	x	x						

Quad/ Bldg	Building Name	Zone	Stage 0	Stage 1	Stage 2	Stage 3	Stage 4	Stage 4a	Stage 4b	Stage 4c
08-050F	Knight Management MBA Class of '68	D	x	x						
08-050G	Knight Management Patterson Building	D	x	x						
08-110	Arrillaga Recreation Center	L	x	x						
08-120	Arrillaga Hall	L		x						
08-200	Burnham Pavilion	L	x	x						
08-250	Ford Center	L		x						
08-280	Gunn/SIEPR	D	x	x						
08-290	Economics	D	x	x	x					
08-350	Lathrop Library	D		x			x	X		
08-360	Littlefield Center	D	x	x						
08-365	Knight Bldg (Littlefield Link)	D	x	x						
08-450	Arrillaga Alumni Center	D	x	x			x	X		
08-650	Bing Concert Hall	C		x			x	X	X	
09-010	New Public Safety Building	C		x						
09-110	340 Bonair	D		x						
09-190	333 Bonair	D	x	x						
09-200	Fire and Police Facility	C		x						
09-300	Maples Pavilion	L		x						
09-307	Arrillaga Family Sports Center	L		x						
10-545	EVGR Bldg C	S		x			x	X		
10-550	EVGR Pavilion	S		x			x	X		
10-555	EVGR Bldg B	S		x			x	X		
13-019	PSYCHIATRY ACADEMIC & CLINIC BLDG	T			x		x		X	X
13-040	CAM	T		x						
14-070	Cordura/ Ventura (14-050)	B		x	x					
14-110	Cedar Hall	B		x		x				
14-160	Polya Hall	B		x		x				
14-170	Pine Hall	B					x	X		
14-200	Forsythe Main	B					x			X
14-200	Forsythe Data Center	B					x			X
14-200A	Forsythe Annex	B					x			X
14-220	CHEM H/SNI	B					x			X
14-650	EH & S Expansion	B	x	x						
14-690	COMPARATIVE MEDICINE PAVILION (CMP)	T								
14-696	NWDCCH	B		x						

Zone H = Stanford University Hospital (SUH)
 Zone L = Athletics (DAPER)
 Zone P = Lucile Packard Children
 Zone S = Residential & Dining Enterprises
 Zone T = School of Medicine