AMENDED
NOTICE OF BOARD OF REGENTS MEETING
Board business not completed on this day will be taken up on another
day and time announced at the conclusion of the meeting.

Date: Thursday, April 20, 2017

Time: 9:30 a.m.

Place: Kaua‘i Community College
Office of Continuing Education & Training (OCET), Room 106 C&D
3-1901 Kaumuali‘i Highway
Līhu‘e, HI 96766

AGENDA

I. Call Meeting to Order

II. Public Comment Period: All written testimony on agenda items received after
posting of this agenda and up to 24 hours in advance of the meeting will be
distributed to the board. Late testimony on agenda items will be distributed to the
board within 24 hours of receipt. Registration for oral testimony on agenda items
will be provided at the meeting location 15 minutes prior to the meeting and
closed once the meeting begins. Written testimony may be submitted via US
mail, email at bor@hawaii.edu, or facsimile at 956-5156. Oral testimony is
limited to three (3) minutes.

III. Report of the President

IV. Committee Reports
   A. Report from the Committee on Independent Audit
   B. Report from the Committee on Intercollegiate Athletics
   C. Report from the Committee on Research and Innovation

V. Items for Discussion and/or Approval
   A. For Action
      1. Consent Agenda:
         a. Minutes of the March 23, 2017 Meeting
      2. Approval of Agreement for Chilled Sea Water for Air Conditioning at
         JABSOM
      3. Report of the Permitted Interaction Group for the University of Hawai‘i
         System Integrated Academic and Facilities Plan
      4. Approval of University of Hawai‘i System Integrated Academic and
         Facilities Plan
5. Award of The Honorary Doctorate Of Humane Letters Degree To The Honorable Richard R. Clifton

B. For Information/Discussion

1. FY17 Q3 Extramural Awards Analysis
2. 2017 Legislative update

VI. Executive Session (closed to the public):

A. Collective Bargaining: (To discuss authority of persons conducting labor negotiations and conducting negotiations pursuant to HRS §92-5(a)(3))
   1. Discussion of collective bargaining negotiations process

VII. Announcements

A. Next Meeting: June 1, 2017 at University of Hawai‘i Cancer Research Center

VIII. Adjournment

ATTACHMENTS

A – Personnel actions posted for information only
Attachment A: Pursuant to §89C-4, Hawaii Revised Statutes, the following proposed compensation actions for excluded executives and managers are disclosed for purposes of public comment.

<table>
<thead>
<tr>
<th>Campus</th>
<th>Last Name</th>
<th>First Name &amp; Middle Initial</th>
<th>Proposed Title</th>
<th>Unit</th>
<th>Nature of Action</th>
<th>Monthly Salary</th>
<th>Effective Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hawai‘i CC</td>
<td>Kaleiwahea</td>
<td>Kenneth</td>
<td>Interim Vice Chancellor</td>
<td>Administrative Affairs</td>
<td>Appointment</td>
<td>$7,648</td>
<td>April 24, 2017 - April 23, 2018</td>
</tr>
<tr>
<td>Hawai‘i CC</td>
<td>Wilson</td>
<td>Melanie</td>
<td>Dean</td>
<td>Liberal Arts and Public Services</td>
<td>Appointment</td>
<td>$8,334</td>
<td>June 1, 2017</td>
</tr>
</tbody>
</table>
Item III. Report of the President

Verbal Report
Kauaʻi
Community
College

Presentation to the
Board of Regents
April 20, 2017

Chancellor Helen Cox
Who are our students?

Fall 2016 Enrollment, 1401

- **Women**: 64%
- **Men**: 36%
- **18 or younger**: 37%
- **20 to 24**: 29%
- **25 to 34**: 19%
- **35 and older**: 15%
- **Other**: 27%
- **Hawaiian or Part Hawaiian**: 31%
- **Filipino**: 21%
- **Caucasian**: 21%
57.5% of our students want to earn a certificate or degree from us, and another 19.7% plan to transfer.
64.8% of respondents would like to complete a BA or MA without leaving Kaua‘i.
KauCC Historical Enrollment
Fall 2007 to Fall 2016

Enrollment:
- 2007: 1,051
- 2008: 1,104
- 2009: 1,345
- 2010: 1,428
- 2011: 1,433
- 2012: 1,495
- 2013: 1,530
- 2014: 1,424
- 2015: 1,401
- 2016: 1,401

Kaua`i CC Fall Enrollment
KauCC Distance Education

* 9.9% of all registrations at KauCC were in DE classes Fall 2016
### KauCC Results on UHCC Performance Measures

<table>
<thead>
<tr>
<th>Category</th>
<th>Weight</th>
<th>Goal</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degrees &amp; Certificates</td>
<td>35%</td>
<td>239</td>
<td>248</td>
</tr>
<tr>
<td>NH Degrees &amp; Certificates</td>
<td>10%</td>
<td>63</td>
<td>72</td>
</tr>
<tr>
<td>STEM Degrees &amp; Certificates</td>
<td>10%</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>Pell Degrees &amp; Certificates</td>
<td>10%</td>
<td>129</td>
<td>145</td>
</tr>
<tr>
<td>Transfers</td>
<td>35%</td>
<td>186</td>
<td>196</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>100%</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

FY 2016
Community College Survey of Student Engagement (CCSSE) Results

Where we are strong

- Peer tutoring
- Community-based projects
- Discuss ideas with instructors outside of class
- Work with instructors on activities other than coursework

Biggest barriers

- Students come to class unprepared
- Students have work obligations and little money to make the progress they wish to make
UHCC
Student Success Pathway

Connection
Interest to Registration

Entry
Registration to completion of college level Math and English (0-25%)

Progress & Learning
Entry into Program of Study to 75% completion of requirements (25%-75%) &

Completion to Transfer
To streamlined Transfer (75%-100%)

Completion to Career
To receipt of credentials with labor market value (75%-100%)
Focus on Connection and Entry

- Cognition
- Early College
- Mandatory New Orientation
- Prior Learning Assessment
- Revised Introduction to College Course
- Creation of Exploratory Majors
- STAR GPS Registration
- New Approach to Developmental Education
- Early Alert
- First Year Experience
New KauCC Model: College Level

**English**

- 2013: 140 Placed into College Level, 63 Passed College Level
- 2016: 155 Placed into College Level, 66 Passed College Level

**Math**

- 2013: 51 Placed into College Level, 18 Passed College Level
- 2016: 66 Placed into College Level, 26 Passed College Level
KauCC New Model: One Level Below College

English
- 2013: Placed One Level Below College - 96
- 2016: Placed One Level Below College - 74
- 2016: Passed College Level - 29

Math
- 2013: Placed One Level Below College - 91
- 2013: Passed College Level - 8
- 2016: Placed One Level Below College - 127
- 2016: Passed College Level - 30
## KauCC Fall 2013 vs. Fall 2016

<table>
<thead>
<tr>
<th></th>
<th>English</th>
<th>Math</th>
</tr>
</thead>
<tbody>
<tr>
<td>College Level (0)</td>
<td>• Similar Pass Rate</td>
<td>• Similar Pass Rate</td>
</tr>
<tr>
<td></td>
<td>• 3 additional students passed College Level</td>
<td>• 8 additional students passed College Level</td>
</tr>
</tbody>
</table>
| 1 Level Below College Level (-1) | Improvement  
• 28 additional students passed College Level and saved one semester  
• Pass rate increased by 38% | Improvement  
• 22 additional students passed College Level and saved one semester  
• Pass rate increased by 15% |
Thanks to new placement and course models, greater % of entering students passed college level in 1 semester compared to 3 semesters (ENG) or 2 Semesters (MATH).
### Early College at KauCC

<table>
<thead>
<tr>
<th></th>
<th>Number of Classes at Kauaʻi HS</th>
<th>Number of Classes at Kapaa HS</th>
<th>Number of Classes at Waimea HS</th>
<th>Total Early College Enrollment</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Spring 2015</strong></td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>48</td>
</tr>
<tr>
<td><strong>Fall 2015</strong></td>
<td>1</td>
<td>3</td>
<td>1</td>
<td>89</td>
</tr>
<tr>
<td><strong>Spring 2016</strong></td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>79</td>
</tr>
<tr>
<td><strong>Fall 2016</strong></td>
<td>2</td>
<td>4</td>
<td>3</td>
<td>189</td>
</tr>
<tr>
<td><strong>Spring 2017</strong></td>
<td>2</td>
<td>4</td>
<td>4</td>
<td>149</td>
</tr>
<tr>
<td><strong>Fall 2017</strong></td>
<td>2</td>
<td>3</td>
<td>6</td>
<td>Pending</td>
</tr>
</tbody>
</table>
Early College Courses

- Accounting
- Art
- Business
- Culinary
- English
- Horticulture
- Hospitality and Tourism
- Introduction to College
- Japanese

- Math including Calculus
- Philosophy
- Physics
- Psychology
- Spanish
- Speech
- Sustainable Science (Alternative Energy)
Other Highlights

- Accreditation Work
- Strengthened Assessment
- Innovation Center: Tiny House, Apiary, Cogs
- Wai‘ale‘ale Program
- International Experiences for students in Agriculture, Engineering, Japanese, and Nursing
- Students Presenting at National and International Conferences
Imua!

ʻAʻohe hana nui ke alu ʻia.

No task is too big when done together by all.
FACULTY SENATE UPDATE

VICTORIA MATHIS
Associate Professor
APRN-RX,MSN

Faculty Senate Chair
Kauaʻi Community College
HIGH DEMAND/SMALL NUMBER PROGRAMS

• It’s what we do best...
• Our response to a small population base
• Our response to community demands
• We prevent market saturation
• We provide highly qualified job applicants
• We help keep graduates and their educational capital on Kaua’i
HIGH DEMAND SMALL NUMBER: WHY IT WORKS on KAUA’I

- Small agile programs
- Small class size
- Cohort models
- Peer to peer learning
- Social support
- Block scheduling for working adults
- Faculty firmly established on Kaua’i
- Faculty with extensive industry experience
- Faculty with strong industry connections
HYBRID AND ELECTRONIC TECHNOLOGY

• *Emerging sector* in an existing market
• Developed without additional cost to the college
• Modified and uses existing campus space

• Competency based program
• Strong community partnership
• Articulation agreements
• Low number of graduates meets high industry demand on Kaua’i
• [Automotive Program Web Site](#)
MEDICAL ASSISTING

• *Emerging sector* in an existing market
• Developed without additional cost to the college
• Uses existing campus space

• Competency based program
• Articulation agreement in the works
• Low number of graduates meets critical industry need on Kaua’i
• National accreditation
• Strong advisory committee support
• High certification exam pass rates
• High job placement
• [MEDA Program Web Site](#)
CREATIVE MEDIA

- New program
- Articulated
- Across discipline potential
- Uses existing campus space
- Extensive industry experience
- Strong community relationships
- New KCC Digital Media Coordinator Has Big Plans
- Free Weekend Workshops
- Creative Media Homepage
WE ARE GETTING IT RIGHT: STUDENT SUCCESS

• Small programs with high persistence, graduation and satisfaction rates
• Graduates obtain jobs on Kaua‘i
• Graduates earn a living wage
• Graduates give back to the community they live and work in
<table>
<thead>
<tr>
<th>Agenda Item</th>
<th>Discussion</th>
<th>Follow Up/Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minutes</td>
<td>None</td>
<td>Approved</td>
</tr>
<tr>
<td>Testimony</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>For Information: Item IV.A.1. Whistleblower report update</td>
<td>Internal Auditor Shizumura provided a summary of the cases reported and status, and that trending are personnel issues, with none involving alleged breach of policies.</td>
<td>An item to be included in every meeting.</td>
</tr>
<tr>
<td>For Information: Item IV.A.2. Update on Enterprise Risk Management</td>
<td>VP Gouveia provided an update on ERM program status that the program is a work in progress, and upon mapping the areas of risk, the top focus areas are construction and facilities, and enrollment management. Extensive discussion ensued on the scope of review for risk assessment, such as athletic facilities, the good progress to identify risks and subordinate risks to date. It was discussed how the UH System is deemed as a low risk by insurers. The next step is to evaluate again in November to update mapping.</td>
<td>Continue to periodically report. Consider an annual report with OGC on legal fees and identifying a pattern to identify priorities as to risk.</td>
</tr>
<tr>
<td>For Review and Acceptance: Item IV.B.1. Community College Financial and Operational Oversight of Revenue Generating Programs policy review and compliance evaluation</td>
<td>Internal Auditor Shizumura explained the report for acceptance and status on the Community College Financial and Operational Oversight of Revenue Generating Programs policy review and compliance evaluation since finalizing in December. Observations showed some risk areas and mitigated so long as policies are applied consistently, including budgets that are in progress and underway.</td>
<td>Accepted</td>
</tr>
<tr>
<td>For Review and Acceptance: Item IV.B.2. UHM Commuter Services evaluation of Corrective Action Status</td>
<td>Internal Auditor Shizumura explained the report for acceptance on the UHM Commuter Services evaluation of Corrective Action Status that recommendations are completed and in process of being implemented. The committee commended the work done.</td>
<td>Accepted</td>
</tr>
<tr>
<td>For Review and Acceptance: Item IV.B.3. UH Press Audit and Management Response</td>
<td>Internal Auditor Shizumura explained the report for acceptance on the UH Press Audit and Management Response. Discussion involved future plans for self-sufficiency, keeping reserves intact as expense reduce, and consideration of a strategic plan for libraries of the future and digital products.</td>
<td>Accepted</td>
</tr>
<tr>
<td>Board Education: Item IV.C. Professional Development: AICPA Toolkit Chapters 15 (evaluating the internal audit function), 17 (committee self-evaluation), 18 and 19 (enterprise risk management)</td>
<td>External Auditor Kubota explained the chapters in the AICPA Toolkit on the areas of evaluating the internal audit function, committee self-evaluation methods and focus as a gauge to measure and use to target education topics, and fundamentals and focus of enterprise risk management in terms of the independent audit committee roles and responsibilities, and utilization as a tool for early alerts, and to debrief to learn and apply in the future.</td>
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<tr>
<td>For Information: Item IV.A.1. UH Mānoa Athletics – Update on facilities, Health &amp; Wellness, and Finances</td>
<td>UHM AD Matlin provided an update on the status of the athletics facilities and finances, and athlete health and wellness. He explained which facilities were slated for repair and renovation upon completion of RFPs pending, and hopefully will come in within budget and projected timelines. Discussion with the stadium authority on plans for a new stadium and long range plan for the lower campus area are ongoing. Regarding health and wellness, concussion and return to play protocols, training, and mental health services were explained. The programs are NCAA compliant, provide services to all athletes, directly and through the student health services center, and no hospitalization occurred this academic year although no systematic statistics are tracked. Financial condition of the program is stable, below the projected deficit, and continues to trend upwards. Fundraising strategic plan is planned; new revenue expense models are being assessed, and adjustments to merchandising program and other revenue generating contracts are underway, including marketing and sports apparel contracts.</td>
<td></td>
</tr>
<tr>
<td>For information: Item IV.A.2. UH Hilo Athletics – Update on Facilities, Health &amp; Wellness, and Finances</td>
<td>UHH AD Guillen provided an update on the status of the athletics facilities and finances, and athlete health and wellness. He explained the CIP projects that have been recently completed, and future priority projects as funding becomes available, based on anticipated maintenance due, reducing utilizing off campus facilities, and improving recruitment. Regarding health and wellness, concussion occurrences have decreased, credited to staffing and focus on prevention and proactive treatment training that follow the NCAA protocols, and providing trainers and interns at all games. Other training expands to areas of mental health, substance abuse, sex assault intervention education, as well as professional development for all athletes. The financial snapshot is positive with a surplus for this academic year. The conference remains intact despite the withdrawal of BYU. Other options such as game guarantees in lieu of more expensive travel are being explored, as well as additional revenue generating opportunities such as online merchandising, corporate sponsorships, and naming opportunities.</td>
<td></td>
</tr>
</tbody>
</table>
## Agenda Item

<table>
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<td></td>
</tr>
<tr>
<td><strong>Item A. For Information:</strong></td>
<td></td>
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</tr>
<tr>
<td>1. Update on FY17 Q3 Extramural Awards</td>
<td>Extramural awards projections are close to actual figures and expected to meet projections for the year.</td>
<td></td>
</tr>
<tr>
<td><strong>Item A.2. FY 2016 F&amp;A (Indirect) Cost Proposal</strong></td>
<td>Administration provided a presentation on the proposal for the upcoming negotiation for a new F &amp; A rate that targets reaching the cap of 26% for Administration Indirect Costs and approximately 25% for Facilities indirect Costs, and provided historical comparisons, explanation of new favorable guidelines for utilities and depreciation, and components of the proposal. Discussion included strategies to leverage funds, ensuring research budgets are based on funds net of overhead costs, and return on investment considerations to prioritize research opportunities.</td>
<td></td>
</tr>
<tr>
<td><strong>Item A.3. Internal Allocation of Recovered Indirect Costs (Research &amp; Training Revolving Fund)</strong></td>
<td>Administration provided a presentation of the current allocation methodology for recovered indirect costs and investments. The recommended best practice included focusing on fine tuning current practices, and that the UHM methodology and allocation practices are within reasonable, though more generous ranges than peers. Discussion included consideration of allocations based on strategic initiatives, incentivizing awards, providing better measurements to ensure return on investments, adding student education as a goal, clearer reporting on expenditures, increasing funds to develop talent, and prioritizing funds given current climate of threatened budget cuts, and a better understanding of how RTRF funds are expended by the school/college/ORU.</td>
<td></td>
</tr>
<tr>
<td><strong>Item A.4. Update on Advancing Research at UH Mānoa</strong></td>
<td>Due to time constraints, the report was deferred to the next meeting in May. VC Bruno added that the External Advisory Committee (EAC) will be meeting and conducting a site visit in April 27 and 28th after which the presentation will include the outcomes and set of recommendations that will help determine the role of the board going forward. The sessions are open to the public. Chair Sullivan disclosed that her husband is on the committee and would recuse herself at the appropriate time if necessary. The agenda for the EAC to be shared and open for regents to attend.</td>
<td></td>
</tr>
<tr>
<td><strong>Item A.5. Committee self evaluation</strong></td>
<td>The committee chair shared a form for the committee to consider and comment, and stated that a survey would be sent to fill out and will be used to lay the groundwork for next year’s committee.</td>
<td></td>
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</tbody>
</table>
April 13, 2017

TO: Jan N. Sullivan  
Chairperson, Board of Regents

VIA: David Lassner  
President

FROM: Kalbert K. Young  
Vice President for B&F/CFO

SUBJECT: JOHN A. BURNS SCHOOL OF MEDICINE – CHILLED WATER SERVICE FROM HONOLULU SEAWATER AIR CONDITIONING

SPECIFIC ACTION REQUESTED:
It is recommended that the Board of Regents of the University of Hawai‘i (the “Board”) authorize the University of Hawai‘i ("University") Administration to enter into the attached Chilled Water Customer Agreement with Honolulu Seawater Air Conditioning, LLC (“HSWAC”) for providing Chilled Water Service to the John A. Burns School of Medicine (“JABSOM”) facilities in Kaka‘ako.

RECOMMENDED EFFECTIVE DATE:
Upon Board approval.

ADDITIONAL COSTS:
No additional costs are associated with this request.

PURPOSE:
Pursuant to Regent Policy (RP) 8.201, the University desires Board authorization and approval to permit the Administration to enter into an agreement with HSWAC to provide a future option to source chilled water for air-conditioning purposes at JABSOM. HSWAC is building a district cooling system in downtown Honolulu and Kaka‘ako. The University, JABSOM, and HSWAC’s shared goal and mutual desire is to significantly reduce energy usage, enact measurable sustainability practices, implement technology

2444 Dole Street, Bachman Hall, Room 201  
Honolulu, Hawai‘i 96822  
Telephone: (808) 956-8903  •  Fax: (808) 956-5286  
An Equal Opportunity/Affirmative Action Institution
originally developed as a direct result of collaborative research by the University, and maintain fiscal sustainability at the JABSOM facilities. The purpose of this memorandum is to provide the Board with an overview of the HSWAC project, summarize project analyses, and highlight the due diligence financial review regarding the costs and benefits for the University and JABSOM in entering into a conditional Chilled Water Service Agreement with HSWAC. With the concurrence of the Board, the Administration proposes to enter into the agreement with HSWAC.

BACKGROUND INFORMATION:
JABSOM’s facilities currently receive chilled water for air-conditioning purposes from the Honolulu Board of Water Supply (“BWS”) through an existing Chilled Water Service Agreement between the University and BWS. This agreement went into effect in September 2005 and will expire in September 2025. The chilled water supplied by BWS to JABSOM is produced by water cooled chillers owned by the BWS and housed in JABSOM’s central plant building. With the Chilled Water Service Agreement between the BWS and JABSOM approaching the end of its term in eight years, it is prudent for the University and JABSOM to pursue fiscally, technically, and environmentally superior options to ensure the long-term, uninterrupted supply of chilled water to JABSOM.

HSWAC, a private Honolulu-based company, is currently planning to build and operate a district cooling system large enough to supply roughly one half of the buildings in Kaka’ako and Downtown Honolulu with chilled fresh water for air-conditioning purposes. HSWAC’s primary source of cooling will be from cold deep seawater, pumped from 1,750 feet deep at 4.5 miles off the coast of Honolulu. This seawater will be used as the primary source of cooling for a closed loop system filled with treated fresh water. This chilled fresh water is the source of cooling for the district cooling system’s customers; no salt water will be distributed to any HSWAC customer, avoiding any issues associated with the corrosive properties of salt water.

The Seawater Air Conditioning (“SWAC”) process was first demonstrated in the early 1980s by Dr. Arlo Fast under a UH Sea Grant funded project at Keahole Point at the State-owned Natural Energy Lab of Hawaii (“NELHA”). Today this same cold, deep seawater at NELHA is being used to develop cutting edge Ocean Thermal Energy Conversion (“OTEC”) technology and commercial agricultural and aquaculture activities and research, while reliably providing cold seawater as the primary source of cooling to chill fresh water used for air conditioning at the NELHA facilities. HSWAC expects to produce chilled water with the same proven process, using cold, deep seawater as the primary source of cooling to cool the closed freshwater loop which will then be distributed to customers at a much larger scale via its Downtown Honolulu District Cooling System.
HSWAC has completed all predevelopment tasks needed to begin construction of its district cooling system. Major milestones for government approvals and permits that have been completed by HSWAC as of the date of this memorandum include:


3) Approval of the National Pollutant Discharge Elimination System (NPDES) Individual Permit and Clean Water Act, Section 401 Water Quality Certification (2016).

4) Federal, HCDA, State and City and County of Honolulu easements for offshore seawater pipes and onshore distribution pipes.

5) Detailed engineering and construction design completed.

6) Preliminary contractor bids for construction.

DISCUSSION:
JABSOM and the University have been working with HSWAC to thoroughly explore the technical, operational, contractual, and financial benefits of the opportunity to source chilled water from the HSWAC district cooling system as a future potential replacement of chilled water supplied from the BWS. Based on this extensive examination, the Administration believes that an agreement with sufficient protection and assurances for the University and JABSOM could be developed with HSWAC. The Administration further believes that entering into a Chilled Water Customer Agreement between the University and HSWAC at this time would be highly advantageous, ensuring the future availability of HSWAC service to JABSOM. A mutual agreement between the University and HSWAC has been reached that will preserve the option for the University to unilaterally opt-out of the agreement if several key, pre-determined milestones are not met.

Specific benefits of HSWAC's Chilled Water Service for the University will be:

1) Eliminate potable water usage in cooling tower operation by 14,000,000 gallons a year, 50% of the total campus usage.

2) Eliminate sewage discharge from cooling tower operation by 1,300,000 gallons a year, 34% of the total campus usage.

3) Eliminate 11,400,000 lbs. of carbon dioxide emissions a year.
4) Eliminate 6,900,000 kWh of electrical consumption a year, 50% of the total campus usage, equivalent to a 4.8 Mega Watt solar photovoltaic system.

5) 24/7/365 chilled water service.

6) Simplify chilled water supply, outsource chilled water production to a dedicated utility provider.

7) Guaranteed rates for chilled water long term which allows JABSOM to better manage its budget and operational costs.

8) Eliminate future need for significant capital costs to be invested in expensive chilled water production equipment. These funds can be reallocated to other critical capital projects.

Dean Jerris Hedges, MD, has concurred that receiving Chilled Water Service from HSWAC will benefit the JABSOM campus, as it is both an environmentally and fiscally sustainable long term solution to support the chilled water requirements of the campus, to the benefit of JABSOM’s students and staff.

The University’s Office of Legal Affairs and General Counsel has reviewed and approved as to form the Chilled Water Service Agreement, a copy of which is provided.

**CHILLED WATER SERVICE AGREEMENT TERMS AND CONDITIONS:**
The following are the key terms of this agreement:

**Service** – Chilled Water will be delivered at 44 degrees Fahrenheit, 24 hours a day, 7 days a week, and 365 days a year, sourced from deep seawater. HSWAC’s Chilled Water plant will be built with sufficient redundancy to ensure no interruption of Chilled Water service (Sections 1.12 and 14.1). The University retains an option to terminate the Agreement if water is not provided at the specified temperature and/or if service dependency is less than anticipated. Note additional “Subject To” provisions and “Opt-Out/Conditional Opportunities” identified below.

**Term** – 20 years from First Service Date (Section 1.4).

**Estimated First Service Date** – 18 to 22 months after start of construction (Section 1.10(b)).

**Effective Date** – Upon execution of Chilled Water Customer Agreement (Section 1.1).
Rates –

- **Capacity Charge Rate**: $80.00 per ton per month; fixed annual adjustment 3% (Section 1.7 (a)).

- **Non-Energy Operating Charge Rate**: $0.0400 per ton-hour; annual adjustment CPI, no less than 0% (Section 1.7 (b)).

- **Energy Operating Charge Rate**: $0.051415 per ton-hour; adjusted monthly with HECO (Sections 1.7 (b) and 7.2).

Amount of Cooling – Cooling quantities will be metered and billed monthly.

- Monthly Contract Capacity 1,415 tons; adjusted annually based on actual usage (Sections 1.7 (a) and 6.2).

- Monthly Ton-hour usage estimate 567,000 Ton-hours; billed based upon actual usage (Section 7.3).

Subject to –

1) HSWAC securing construction financing (Section 1.8). UH may opt-out of the Agreement anytime prior to HSWAC commencing pre construction financing. UH may opt out of the Agreement if HSWAC does not obtain construction financing.

2) Termination of existing BWS Chilled Water Service Agreement dated as of September 16, 2005 (Section 1.13).

3) HSWAC commencing construction by specific date after project has been financed (Section 1.10(a)). UH may opt-out of the Agreement should HSWAC not start construction by the date specified.

4) HSWAC completing construction and starting service by specific date with 9-month grace period (Section 1.10(b)). UH may opt-out of the Agreement should HSWAC not complete construction by the date specified.

5) HSWAC providing Chilled Water using deep seawater as an essential component of the delivery system (Section 1.12(a)). UH may opt-out of the Agreement should HSWAC not deliver chilled water using deep seawater.

6) HSWAC providing uninterrupted, 24/7/365 Service (Section 14.1 (e)). UH may opt-out of the Agreement should HSWAC not deliver chilled water 24/7/365.
ACTION RECOMMENDED:
Authorize the University President, or his designee(s), upon final review by the Office of General Counsel, to sign an agreement with HSWAC for Chilled Water Service, substantially in the form provided herein.

Attachments:
HSWAC Chilled Water Customer Agreement and Exhibits

Supporting Documents:
Exhibit 1: Financial Overview Brief
Exhibit 2: Sustainability Report
Exhibit 3: HSWAC FAQ
Exhibit 4: Availability Report
HSWAC CHILLED WATER CUSTOMER AGREEMENT AND EXHIBITS
HONOLULU SEAWATER AIR CONDITIONING

CHILLED WATER CUSTOMER AGREEMENT

UNIVERSITY OF HAWAI´I

For its Buildings constituting the John A. Burns School of Medicine
located at
Kaka´ako, Oahu

This Chilled Water Customer Agreement ("Agreement") is entered into between Honolulu Seawater Air Conditioning, LLC, ("HWSAC"), a Hawai´i limited liability company, whose business address is 1132 Bishop Street, Suite 1410, Honolulu Hawai´i 96813 and the University of Hawai´i, ("Customer" or alternatively "University"), the state university and a body corporate of the State of Hawai´i, organized under the Constitution and laws of the State of Hawai´i, whose business address is Bachman Hall, 2444 Dole Street, Honolulu, Hawai´i 96822, for the benefit of the John A. Burns School of Medicine ("JABSOM").

ARTICLE 1

BASIC CHILLED WATER PURCHASE PROVISIONS

The following Basic Chilled Water Purchase Provisions are an integral part of this Agreement between HWSAC and Customer. These provisions are summarized in this Article for the convenience of the parties, and are specified in more detail and governed by other Sections of this Agreement. This Agreement is comprised of Article 1 (Basic Chilled Water Purchase Provisions), Articles 2 – 20 (Uniform Provisions of Chilled Water Customer Agreement), and Exhibits A - E. In the event of an inconsistency or conflict between Article 1 of this Agreement and Articles 2 – 20 of this Agreement or any Exhibit incorporated into the Agreement, the provisions of Article 1 shall prevail.

1.1 Effective Date of this Agreement: ________________

This Agreement shall take effect upon approval and authorization by the Board of Regents of the University and execution of the Agreement by authorized representatives of the parties ("Effective Date"). Prior to the Effective Date of this Agreement, the parties may
negotiate in good faith and exchange business information, subject to confidentiality and non-disclosure principles.

Following the Effective Date of this Agreement, the University may without penalty explore other options to air condition its Kaka’ako buildings. These options include installing conventional equipment or extending the existing contract with the Honolulu Board of Water Supply (“BWS”). HSWAC shall continue to pursue its business plan and focus on obtaining construction financing.

1.2 **Chilled Water Provider:**

Honolulu Seawater Air Conditioning, LLC (“HSWAC”)

HSWAC’s Address for Notice:

Honolulu Seawater Air Conditioning, LLC
1132 Bishop Street, Suite 1410
Honolulu, Hawai‘i 96813
Attn: President

1.3 **Customer:**

University of Hawai‘i (“Customer” or alternatively “University”), the state university and a body corporate of the State of Hawai‘i, for the benefit of the John A. Burns School of Medicine (“JABSOM”)

Customer’s Address for Notice:

JABSOM
651 Ilalo Street
Honolulu Hawai‘i 96813
Attn: Jerris Hedges, Dean

1.4 **Duration of Chilled Water Service:**

The period during which HSWAC is to deliver Chilled Water and accept return water from the University shall commence on the First Service Date and end on the last day of the calendar year in which the 20th anniversary of the First Service Date falls, (“Term”).

1.5 **Service Location:**

The Customer’s primary buildings to be served by this Agreement are the ancillary Central Plant Building, the Medical Education Building and the Biological Sciences Building (“Buildings” or “Building”) of JABSOM, located in Kaka’ako, Honolulu.

JABSOM
Upon terms mutually acceptable, the parties may agree to provide additional Chilled Water service to the University of Hawai‘i Cancer Center (“UHCC”) building, located in proximity to the Buildings. Together, JABSOM and UHCC form the medical complex for the University located at Kaka‘ako, Honolulu.

University of Hawai‘i Cancer Center
701 Ilalo Street
Honolulu, Hawai‘i 96813

1.6 Chilled Water Service Point of Delivery; Responsibility for Equipment:

HSWAC shall deliver Chilled Water to the Point of Delivery, currently projected to be the existing chiller equipment in the Central Plant Building of JABSOM, (see Exhibit A) and shall accept return water at the same.

HSWAC is responsible for providing the necessary equipment (such as valves, meters, gauges, shunts, and pipes) up to the Point of Delivery; subject to the provisions of Section 1.17(a) regarding HSWAC’s responsibility for the Building Conversion, the University is responsible for providing the necessary equipment to accept Chilled Water from the Point of Delivery, to circulate the water through its buildings, and to return the water to the Point of Delivery. The parties shall coordinate the technical specifications of their respective equipment to assure compatibility, efficiency, ease of maintenance, and safety, and the University shall provide reasonable access and rights of way over University property to HSWAC.

1.7 Overview of Monthly Charges to Customer:

The monthly cost of service consists of two primary components: (A) a monthly Capacity Charge, and (B) a monthly Operating Charge.

(a) Capacity Charge Rate:

The monthly Capacity Charge is calculated by multiplying the “Contract Capacity” by the applicable monthly “Capacity Charge Rate.” At the First Service Date, the Contract Capacity is 1,415 tons, and the monthly Capacity Charge Rate is Eighty Dollars ($80.00) per Ton Cooling.

Customer’s Contract Capacity for Chilled Water shall remain in effect during the first 24 Billing Periods subsequent to the First Service Date. Thereafter the Contract Capacity shall be re-established as provided in Section 6.2.

The monthly Capacity Charge Rate from the First Service Date through and including December 31 immediately following the First Service Date shall be $80.00 per Ton Cooling. Beginning January 1, immediately following the First Service Date, and on each
January 1 thereafter, through the Term of this Agreement, the Capacity Charge Rate shall be increased by three percent (3%).

If and when additional tons are available, HSWAC shall offer up to 500 tons of additional Contract Capacity to the University for use for the UHCC building, on a right of first refusal basis. The University shall have a thirty (30) day period to accept or refuse additional Contract Capacity.

(b) Operating Charge Rate:  

[See also Section 7.2]

Monthly Operating Charge Rate

<table>
<thead>
<tr>
<th>Operating Charge Rate</th>
<th>Operating Charge Rate per Ton-hour cooling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Energy Operating Charge Rate as adjusted below</td>
<td>$0.0400</td>
</tr>
<tr>
<td>Energy Operating Charge Rate From the First Service Date</td>
<td>$0.051305*</td>
</tr>
</tbody>
</table>

*Example based upon HECO July 2016 effective rate for schedule P and determined per Section 7.2

The Operating Charge Rate shall be the sum of the Non-Energy Operating Charge Rate, plus the Energy Operating Charge Rate.

The Non-Energy Operating Charge Rate from the First Service Date through and including December 31 immediately following the First Service Date thereafter shall be the Non-Energy Operating Charge Rate set forth in this Section. Beginning January 1 immediately following the First Service Date and on each January 1 thereafter, through the Term of this Agreement, the Non-Energy Operating Charge Rate shall be subject to an annual percentage increase from the rate set forth above equal to the average annualized percentage increase in the Honolulu, HI Consumer Price Index for All Urban Consumers (CPI-U) (1982-84=100) as determined by the Bureau of Labor Statistics from the first half CPI-U or generally recognized successor Index, no less than zero percent (0.0%).

PERFORMANCE MILESTONES AND OPT-OUT OPPORTUNITIES PRIOR TO ACTUAL COMMENCEMENT OF SERVICE

This Agreement is executed at a time when HSWAC has not obtained financing or built its facilities. The University currently receives air conditioning services from the BWS under a Chilled Water service contract that is due to expire in 2025. In light of these circumstances, the parties agree to the following schedule of performance milestones, and “opt out” termination opportunities that are projected to occur prior to the actual commencement of service. Notwithstanding the terms of any “opt out” termination opportunities set forth in this Agreement, HSWAC and the University specifically agree that if HSWAC has not commenced construction of its Chilled Water District Cooling System by December 31, 2021, then the University shall have the absolute right at its sole discretion to terminate this Agreement by providing HSWAC with written notice of such termination within fifteen (15) business days following December 31, 2021.
1.8 Notification of Pre-Financing Activities/Customer’s Right to Terminate:

Pre-Financing Activities by HSWAC consists of execution by HSWAC of an Engagement Letter ("Engagement Letter") with a credit rating agency, as required as part of HSWAC’s construction financing. Customer shall have the absolute right at its sole discretion to terminate this Agreement at any time prior to the deadline set forth hereafter. After HSWAC executes an Engagement Letter, HSWAC shall give Customer written notice thereof and a copy of the executed Engagement Letter, from which confidential information may be redacted at HSWAC’s discretion. Upon Customer receiving such notice, Customer shall have the option of terminating this Agreement by providing written notice thereof to HSWAC, on or before fifteen (15) business days after receiving such notice, and upon such termination, this Agreement shall be null and void and of no further force and effect, and HSWAC and Customer shall have no further obligations to each other under this Agreement.

1.9 Obtaining Financing:

HSWAC shall endeavor to obtain financing upon terms and scheduling, the acceptability of which shall be solely within the discretion of HSWAC to determine. If HSWAC fails to obtain financing on terms and conditions it deems acceptable, HSWAC or the University may terminate this Agreement, and shall promptly notify the University in writing. If this Agreement is terminated for failure of HSWAC to obtain financing, the parties shall have no further obligations to each other under this Agreement.

1.10 Post Financing Obligations:

Upon receiving financing, HSWAC shall estimate to the best of existing knowledge, the following dates, and the University shall confirm the dates in the manner set forth herein.

Within five (5) days after the expiration of Customer’s right to terminate this Agreement pursuant to Section 1.8 above, HSWAC shall deliver to Customer for execution a Confirmation Certificate of Dates ("Confirmation Certificate"), in the form shown in Exhibit E, attached hereto and by this reference made a part hereof. Customer agrees that it shall be deemed to have accepted the dates specified in the Confirmation Certificate in the event Customer fails, within fifteen (15) business days after Customer’s receipt of the Confirmation Certificate, (i) to execute and return the Confirmation Certificate to HSWAC, or (ii) to inform HSWAC in writing of the reasons Customer does not agree with the dates specified in the Confirmation Certificate, if such is the case.

(a) Estimated Construction Start Date:

The Estimated Construction Start Date is the expected effective date of the notice to proceed for construction of HSWAC’s Chilled Water District Cooling System, based on facts and circumstances known as of the completion of the Confirmation Certificate (Exhibit E).
(b) **Estimated First Service Date:**

The Estimated First Service Date is the expected date of First Service, upon completion of construction, that has been determined by engineering and project management standards prior to the start of construction, and is based on the Estimated Construction Start Date in Section 1.10(a).

HSWAC will provide at least nine (9) months prior written notice to the Customer of the actual Scheduled First Service Date (as defined in Article 2).

1.11 **Option to Terminate Upon Occurrence of a Termination Event:** [See also Section 14.1(d)]

Prior to Commencement of Service the University or HSWAC may terminate this Agreement in the event of any of the following occurrences:

(a) Failure to commence construction. The University may terminate this Agreement if HSWAC does not commence construction by the Estimated Construction Start Date.

(b) Failure to provide Chilled Water by Estimated First Service date. The University may terminate this Agreement if HSWAC is not capable of providing Chilled Water to the Buildings in the amounts contemplated by this Agreement by the Estimated First Service Date, provided that the University shall allow a nine (9) consecutive month grace period to allow for construction delays.

1.12 **Option to Terminate Upon Non-Performance After Commencement of Service:**

(a) Failure to provide Chilled Water after actual service has commenced. The University or HSWAC may terminate this Agreement if HSWAC is unable to deliver Chilled Water in the amounts contemplated by this Agreement using deep seawater as an essential component of its delivery system, for one hundred and eighty (180) consecutive days following the First Service Date. Upon such termination, this Agreement shall be null and void and of no further force and effect, and HSWAC and Customer shall have no further obligations to the other under this Agreement, other than such obligations or liabilities which expressly survive termination of this Agreement, if any.

(b) Failure of University to fulfill financial obligations for payment of service. HSWAC may terminate this Agreement if the University fails to fulfill its obligations to make timely payments as set forth in Articles 6, 7, and 8, below, provided that HSWAC allows a “cure” period to the University as set forth below in Section 14.2(a).

(c) Other Post Commencement Termination events. See Article 14, below.

1.13 **Existing BWS contract (expiring 2025):**
The parties agree that, notwithstanding any other provision in this Agreement, this Agreement is contingent upon the termination of that certain Chilled Water Service Agreement, dated as of September 16, 2005, by and between the University of Hawai‘i, on behalf of the John A. Burns School of Medicine, and the Board of Water Supply of the City and County of Honolulu (the “BWS Agreement”). If a decision on termination of the BWS Agreement has not been terminated made by December 31, 2021___________ date, HSWAC and Customer shall each have the option of terminating this Agreement, by providing written notice thereof to the other, and upon such termination, this Agreement shall be null and void and of no further force and effect, and HSWAC and Customer shall have no further obligations to the other under this Agreement. If HSWAC and Customer do not elect to terminate this Agreement, then this Agreement shall continue in full force and effect.

1.14 Procedures to Terminate:

To exercise an option to terminate under Sections 1.11, 1.12. or 1.13 hereof, either party must provide the other party with its written notice of intent to terminate no later than thirty (30) business days following the occurrence of an event of termination, plus an additional “grace or cure period” as applicable. The party receiving such notice is thereafter provided thirty (30) business days following receipt of the notice to respond to the notice of intent to terminate. After receiving the response, the noticing party may elect to terminate, or at its discretion, may discuss alternative arrangements with the responding party.

1.15 Consequences in event of termination:

If this Agreement is terminated under this Article 1, Customer and HSWAC shall have no further obligation or liability to each other, other than such obligations or liabilities that expressly survive termination of this Agreement, if any, and subject to the following principle:

In the event of termination under this Article 1, Customer shall be liable to HSWAC only for any Capacity Charges, Operating Charges, fees, or other assessments for Chilled Water that was actually delivered. By way of illustration, if HSWAC fails to commence construction by the Estimated Construction Start Date, and Customer thereby elects to terminate this Agreement, Customer shall not be liable for any Capacity or Operating Charges or any other fee or assessment. By way of further illustration, if HSWAC delivers Chilled Water as contemplated under this Agreement for six (6) years, then HSWAC abandons Chilled Water delivery using deep seawater as an essential component, Customer shall be liable only for those months it received Chilled Water under this Agreement, and shall not be liable for Capacity Charges for the balance of the Term. This Section shall in no way affect the termination provisions set forth in Section 14.2.

ADDITIONAL SPECIAL TERMS AND CONDITIONS

1.16 To address the University's unique circumstances, the parties have accepted the following additional special terms and conditions:
(a) **Approval by University Board of Regents.** The University is the public university of the State of Hawai‘i established by the Constitution and laws of the State of Hawai‘i and under the general control and oversight of the University Board of Regents. This Agreement shall be effective only if the Board of Regents formally approves this Agreement and has delegated the authority to implement this Agreement and execute other ancillary documents reasonably required to perform this Agreement to the President of the University or the President’s designee.

(b) **Customer’s Financial Obligations Subject to Available Funds.** Because Customer is a state agency, any financial obligation arising under this Agreement is subject to funds being made available to Customer pursuant to legislative authorization, appropriation, and the state’s executive budgetary procedures. Customer shall use good faith efforts to assure that such funds are made available to Customer.

(c) **Confidentiality Protection and Disclosure of Documents.** Customer is a public agency of the State of Hawai‘i and is subject to state laws such as HRS Chapter 92F (Uniform Information Practices Act) concerning the public disclosure of government records, including government contracts. Prior to any disclosure required by law of material specifically designated by HSWAC as proprietary or confidential, Customer shall make good faith efforts to inform HSWAC of the request for disclosure and shall consult with HSWAC as to possible protections of records under applicable law. Subject to the foregoing, neither party shall disclose to any third party (except as may be required pursuant to court order or by lenders of the parties, and except for any information which has become part of the public record of any bankruptcy or other judicial proceedings) the terms and conditions of this Agreement without the prior written consent of the other party; it is expressly understood that this Agreement, including all Exhibits, is a public government record.

(d) **Marketing and Publicity.** The University’s name and indicia such as logos, seals, symbols, marks, verbiage and other trademarks identified with the University shall not be used by HSWAC in any marketing or advertising, or in any manner likely to give the impression of the University’s endorsement of HSWAC or its District Cooling System project, without the express written authorization of the University.

**AMENDMENTS TO UNIFORM PROVISIONS OF CHILLED WATER CUSTOMER AGREEMENT**

1.17 Customer and HSWAC have agreed to the following amendments to the Uniform Provisions of Chilled Water Customer Agreement.

(a) Section 4.1 is deleted and replaced with the following:

The parties agree that HSWAC shall be responsible for the completion of the Building Conversion from the Point of Delivery to which Chilled Water shall be delivered through the District Cooling System to Customer as described in Exhibit C. This shall include establishing the basis of design, managing the design/bid process, selection of the contractor(s), oversight of the completion of the Building Conversion and responsibility for it being designed in accordance with the Standards. Customer understands and agrees
that HSWAC is not a licensed contractor pursuant to Chapter 444 of the Hawaii Revised Statutes. HSWAC shall install or cause to be installed within the Building at the point identified on Exhibit A, an interconnection linking the Building to the District Cooling System. Included in this interconnection is Building Conversion work necessary to isolate the Building’s existing chiller plant and connect the Building to receive Chilled Water from the District Cooling System. The work described in this Section shall include and be in accordance with Exhibit C, and has been estimated by HSWAC to be at a cost of $650,000. In the event that HSWAC reasonably determines that the actual cost of the Building Conversion exceeds $650,000 and HSWAC does not wish to proceed with the Building Conversion at its cost, HSWAC may terminate this Agreement by first providing written notice to the Customer. Within thirty (30) days of delivery of such written notice, the Customer may agree, by providing written notice to HSWAC, to pay additional Capacity Charge Rate proportional to the excess Building Conversion cost as determined by HSWAC, which value shall be provided by HSWAC in such notice to Customer. Should no written notice from Customer to HSWAC to pay for these excess Building Conversion costs through additional Capacity Charge Rate payments be delivered before said 30 day period, HSWAC may exercise its option to terminate this Agreement by providing Customer written notice. Should HSWAC terminate this Agreement, subject to this Section, this Agreement shall be null and void and Customer and HSWAC shall have no further obligation or liability to each other, other than such obligations or liabilities which expressly survive termination of this Agreement, if any.

The Customer and HSWAC will fully cooperate to obtain any and all necessary building permits or other necessary governmental approvals for any work on the property of Customer to extend the Chilled Water distribution service lines from the point where they enter the Customer’s private property to the Customer’s Point of Delivery through the footprint of the Building wall. The Building Cooling System shall not include the Metering Equipment, which shall be furnished and maintained by HSWAC.

Upon completion of the Building Conversion, pursuant to Section 1(g) of Exhibit C, interest in the “Qualified Equipment” as defined in Article 2; and provided further, HSWAC’s ownership/property interest in the “Qualified Equipment” as defined in Article 2 shall end and the Qualified Equipment shall belong to and be owned exclusively by Customer, its successors and assigns, as owner of the Building. Consistent with Article 9.3 of this Agreement, HSWAC shall remain the owner of all Metering Equipment.

(b) Customer agrees to assign, at no cost to HSWAC, only energy efficiency rebates specifically related to seawater air conditioning for the Building Conversion work as administered by Hawaii Energy, or its successors, of $300 per replaced ton as approved by the PUC on 9/24/2008 in Docket No. 2007-0341, to HSWAC or to HSWAC’s designee, and to fully cooperate with HSWAC in this regard.

(c) Except with respect to Section 14.2(c) and 14.2(d), in the event of HSWAC’s election to terminate this Agreement pursuant to Section 14.2 of this Agreement prior to the expiration of its Term, HSWAC shall promptly bill Customer as damages deemed reasonable by the parties and Customer shall pay HSWAC within thirty (30) days after receipt of such bill the unamortized portion of the cost incurred by HSWAC in causing the Building Conversion, such cost shall be the total amount of expenses actually paid,
expensed or incurred by HSWAC for materials, labor or services, or the financing thereof, with respect to constructing the Building Conversion. Within twelve (12) months of the First Service Date, HSWAC shall inform Customer of HSWAC’s cost (set forth above) in causing the Building Conversion, which cost is to be fully amortized on a straight-line basis over the Term.

(d) Section 8.1 is deleted and replaced with the following:

8.1 Customer shall pay reasonable charges incurred by HSWAC as a result of the action or inaction of Customer for specific services (as set forth in Exhibit D) charged to Customer, solely for reasonable expenses and costs directly related to the following: (a) service shutoff and/or reinstatements caused by the fault or negligence of Customer; (b) damage to Building Cooling System or District Cooling System equipment on Customer’s property caused by the fault or negligence of Customer or Customer’s employees, agents, tenants, licensees, or trespassers; (c) consumption of system water, caused by the fault or negligence of Customer; and (d) service calls for problems caused by the fault or negligence of Customer. Customer shall pay such charges in addition to Capacity Charges and Operating Charges as due and said charges shall be included in Customer’s monthly billing.

(e) Section 10.3 is deleted and replaced with the following:

10.3 Customer shall be charged a “Late Fee” for making less than a full payment of all amounts due pursuant to a Service Bill in accordance with terms and conditions authorized by statute, as amended from time to time, currently Hawai‘i Revised Statutes Section 103-10.

(f) Section 11.2 is deleted and replaced with the following:

11.2 Customer shall be responsible for damage or injury caused by its employees acting in the course and scope of their employment in the performance of this Agreement to the extent that Customer’s liability for such damage or injury has been determined by a court or has otherwise been accepted by Customer. Customer shall pay for such damage or injury to the extent permitted by law and provided that funds are appropriated, allotted, and available under Customer’s risk management program, or otherwise properly made available for that purpose. This provision does not constitute nor should be interpreted to be any obligation by Customer to indemnify, defend, or hold HSWAC harmless from any third party claim.

(g) Section 11.3 is deleted and replaced with the following:

11.3 Customer shall establish and maintain a risk management program (consisting of third party insurance and self-insured retention) to cover claims and losses reasonably anticipated to arise during the course of this Agreement. Customer shall secure and maintain appropriate workers’ compensation and employers’ liability insurance as required by the laws of the State of Hawai‘i for Customer’s employees working in or at the Buildings and on Customer’s premises.
(h) Section 12.2 is deleted and replaced with the following:

12.2 HSWAC shall be responsible for damage or injury caused by its employees acting in the course and scope of their employment in the performance of this Agreement to the extent that HSWAC's liability for such damage or injury has been determined by a court or has otherwise been accepted by HSWAC. HSWAC shall pay for such damage or injury to the extent permitted by law and provided that funds are available under HSWAC's risk management program, or otherwise properly made available for that purpose. This provision does not constitute nor should be interpreted to be any obligation by HSWAC to indemnify, defend, or hold Customer harmless from any third party claim.

(i) The last paragraph of Section 14.2 is deleted and replaced with the following:

In the event that HSWAC elects to terminate this Agreement because

i. Customer failed to duly observe or perform any covenant or obligation as provided under Section 14.2(b); or

ii. Customer failed to pay any amounts due as provided under Section 14.2(a) and notice was provided; or

iii. Customer failed to accept, when HSWAC is prepared to deliver, Chilled Water to Customer’s Building for a period of three (3) consecutive months after the Scheduled First Service Date under Section 14.2(e);

such election to terminate by HSWAC shall not release Customer of Customer’s Capacity Charge obligations for the remaining Term of this Agreement. Such remaining Capacity Charge shall upon such termination under this Section 14.2 be immediately due and owing from Customer to HSWAC. For a termination under Section 14.2(e), the remaining Capacity Charge shall be calculated as if the First Service Date is the last day of the period of three (3) consecutive months after the Scheduled First Service Date.

HSWAC shall, however, have an obligation to reasonably mitigate its damages under this Section 14.2.

(j) Section 17.1 is deleted and replaced with the following:

17.1 In the event that the parties experience a dispute regarding any term of this Agreement, the parties agree to work in good faith to amicably resolve the dispute to the satisfaction of each party. To fulfill this commitment, the parties agree to meet informally on one or more occasions to seek resolution. In the event the informal negotiations do not resolve the dispute, the parties agree that each will designate a senior manager to meet in a continued effort to revisit the dispute and seek resolution. The parties agree that if any controversy or claim arising under or in connection with this Agreement cannot be resolved by negotiation, including but not limited to the correctness of the computational or
measurement process related to calculation of Customer’s Operating Charges or Capacity Charges, the parties shall engage in non-binding arbitration in Honolulu, Hawai’i, conducted by Dispute Prevention & Resolution Inc., or similar organization of mutual acceptability. The arbitration shall use one arbitrator, in accordance with the rules of the organization and the laws of the State of Hawai‘i, including but not limited to Chapter 658A, Hawai‘i Revised Statutes, or successor provisions, except that because the arbitration is non-binding, there shall be no judicial review. Each party shall bear their respective costs of said arbitration and any litigation. If mediation and non-binding arbitration fails to resolve the dispute to their mutual satisfaction, the parties may seek judicial relief in any court of competent jurisdiction.

(k) Section 19.3 is deleted and replaced with the following:

19.3 Customer acknowledges and accepts the fact that the HSWAC financing of this capital-intensive deep water district cooling project requires the creation of one or more mortgages, liens, security interests and subordinated mortgage, liens and security interests on the District Cooling System that may require assignment of this Agreement and Customer’s direct payment or payments to third parties. In no event, however, is Customer required to pledge Customer’s real property or personal property as collateral to secure HSWAC’s financing, nor is Customer required to assume any obligation as a guarantor or co-borrower of HSWAC’s debts.

(l) Section 20.3 is deleted and replaced with the following:

20.3 RESERVED

(m) Section 20.4 is deleted and replaced with the following:

20.4 Performance of this Agreement is subject to the good faith performance by the parties and neither party shall be penalized or adversely affected in the performance of this Agreement by force majeure events, including, without limitation, acts of war, acts of terrorism, acts of God or the public enemy, strikes or labor disputes, civil disturbance, unanticipated change in law or governmental action, or acts of nature, or similar occurrences beyond the reasonable control of the parties.

1.18 Exhibits:

The exhibits listed in this Section and attached to this Agreement are incorporated by reference and are to be construed as a part of this Agreement. Each party agrees to perform any obligations on its part stated in any and all such Exhibits:

- **Exhibit A**  
  Point of Delivery and Right-Of-Way
- **Exhibit B**  
  Customer Connection Standards for HSWAC District Cooling
- **Exhibit C**  
  Building Conversion Work
- **Exhibit D**  
  Service Charges
Exhibit E  Confirmation Certificate of Dates

[SIGNATURE PAGE TO FOLLOW]
IN WITNESS WHEREOF, Customer and HSWAC have executed and delivered this Agreement as of the______ day of _____________________, 2017.

CUSTOMER:
University of Hawai‘i, on behalf of
The John A. Burns School of Medicine
Buildings located at its Kaka‘ako Complex

HSWAC:
HONOLULU SEAWATER AIR
CONDITIONING, LLC

Central Plant Building, Medical Education Building and Biological Sciences Building

The public state university and a body corporate of The State of Hawai‘i

A Hawai‘i Limited Liability Company

By:____________________________________       By:____________________________________

_______________________________       ______________________________
Please print/type name           Please print/type name

Its:____________________________________       Its:____________________________________

By:____________________________________

_______________________________
Please print/type name

Its:____________________________________

Approved by the Board of Regents, University of Hawai‘i, at a public meeting conducted on ____________

Approval Certified on _________________by

_______________________________

Cynthia Quinn, Executive Secretary
University of Hawai‘i, Board of Regents
UNIFORM PROVISIONS OF
CHILLED WATER CUSTOMER AGREEMENT

ARTICLE 2
DEFINITIONS

2.1 Capitalized terms used in this Agreement and not otherwise defined shall have the following meanings.

**Agreement:** This Chilled Water Customer Agreement including Article 1, the Uniform Provisions and its Exhibits between HSWAC and the Customer for the Customer’s Building.

**Billing Period:** There shall be twelve (12) Billing Periods in a calendar year. Each Billing Period shall be a calendar month, plus or minus three (3) days.

**Building Conversion:** Modification of or alteration to the Building and its Building Cooling System, as shall be required to make the Building Cooling System compatible with (a) the performance specifications required by HSWAC, as specified in the Standards, and (b) utilization of Chilled Water in accordance with this Agreement.

**Building Cooling System:** The Customer’s Building internal cooling system.

**Contract Capacity:** The Capacity specified in Section 1.7(a) that HSWAC is obligated to deliver to Customer and Customer is obligated to purchase from HSWAC.

**Capacity:** A measure, in units of Tons, of the rate at which the HSWAC Chilled Water removes Ton-hours from the Building.

**Capacity Charge:** The product of the Customer’s Contract Capacity for the Billing Period multiplied by the applicable Capacity Charge Rate.

**Capacity Charge Rate:** The rate, in units of dollars per ton, used to calculate the Capacity Charge for a Billing Period by multiplying this rate by the Contract Capacity, as re-established from time to time (Section 1.7(a) and Section 6.2).

**Chilled Water:** The medium in the District Cooling System that provides cooling to Customer’s Point of Delivery.

**Confirmation Certificate:** A notice confirming dates listed in Section 1.10.

**Contract Capacity:** The Capacity, in units of Tons, used to calculate the Capacity Charge for a Billing Period, as re-established from time to time per Section 6.2.

**District Cooling System:** All equipment, Metering Equipment, and any other type of property owned by HSWAC for the purpose of delivering the Chilled Water to Customer’s
Point of Delivery, excluding any part of Customer’s Building Cooling System. HSWAC shall own all Chilled Water within or supplied by the District Cooling System.

**DPR:** Dispute Prevention and Resolution, Inc.

**Energy Operating Charge Rate:** The rate, in units of dollars per Ton-hour, used to calculate the Customer’s Operating Charge for a Billing Period by multiplying this rate by the Ton-hours delivered in a given Billing Period. (Section 7.2).

**First Service Date:** The date when Customer first receives Chilled Water at Customer’s Point of Delivery

**Late Fee:** The charge to be paid by Customer for making less than a full payment of all amounts due pursuant to a Service Bill in accordance with terms and conditions authorized by statute, as amended from time to time, currently Hawai‘i Revised Statutes Section 103-10.

**Metering Equipment:** The equipment installed by HSWAC necessary to accurately measure and record (a) Customer’s Ton-hours utilized and (b) Customer’s Contract Capacity.

**Non-Energy Operating Charge Rate:** The rate, in units of dollars per Ton-hour, used to calculate the Customer’s Operating Charge for a Billing Period by multiplying this rate by the Ton-hours delivered in a given Billing Period (Section 1.7(b)).

**Operating Charge:** The product of the Operating Charge Rate for the Billing Period multiplied by the number of Ton-hours utilized by Customer for such Billing Period.

**Point of Delivery:** That point, as identified on the attached Exhibit A, to which Chilled Water shall be delivered through the District Cooling System to the Customer and the point at which such water shall be returned from Customer’s Building Cooling System to the District Cooling System; the Point of Delivery shall demarcate the Building Cooling System from the District Cooling System.

**Qualified Equipment:** The piping, valves, controls and other ancillary equipment (after service shut-off valves at isolation flanges), that is paid for and installed by HSWAC without contribution from Customer (Exhibit C).

**Scheduled First Service Date:** The date that HSWAC provides by written notice that Chilled Water Service is likely to be available to Customer at its property. The Scheduled First Service Date shall be scheduled once construction has progressed to such a point that HSWAC, through engineering and project management standards, is able to identify this date.

**Service Bill:** A bill from HSWAC sent to the Customer by U.S. Mail, or otherwise delivered to Customer, including the date of sending or delivery and the amounts due by Customer to HSWAC for Chilled Water services provided during the Billing Period, any prior Billing Periods and other Customer charges.
Standards: The performance specifications required by HSWAC as specified in the document titled “Customer Connection Standards for HSWAC District Cooling” dated December 1, 2011, prepared by HSWAC and reviewed and accepted by Customer on the attached Exhibit B.

Term: The period during which HSWAC is to deliver Chilled Water and accept return water from the University (Section 1.4)

Ton: Means a ton of refrigeration, being the rate at which heat is removed, which is equivalent to 12,000 BTU’s per hour.

Ton-hour: A measured unit of energy consumption understood to be 12,000 BTU’s.

Uniform Provisions: Attached and deemed incorporated into the Agreement are Articles 2 - 20 Uniform Provisions of the Chilled Water Customer Agreement.

ARTICLE 3

DISTRICT COOLING SYSTEM

3.1 HSWAC represents that it intends to construct and operate a district cooling Chilled Water system in the City and County of Honolulu, Hawai’i. HSWAC also intends that the District Cooling System will provide adequate Chilled Water needed to meet the aggregated Capacity in Tons of all HSWAC customers purchasing Chilled Water at the design condition of 88 degrees Fahrenheit dry bulb and 73 degrees Fahrenheit wet bulb. The Chilled Water supply temperature will be 44 degrees Fahrenheit.

ARTICLE 4

CONVERSION OF BUILDING

4.1 To the extent not inconsistent with the Standards and this Agreement, Customer may design the Building Conversion to the specifications desired by Customer. The Customer and HSWAC will fully cooperate to obtain any and all necessary building permits or other necessary governmental approvals for any work on the property of Customer to extend the Chilled Water distribution service lines from the point where they enter the Customer’s private property to the Customer’s Point of Delivery through the footprint of the building wall. The Building Cooling System shall not include the Metering Equipment, which shall be furnished and maintained by HSWAC.

ARTICLE 5

HSWAC PROPERTY
5.1 All property constituting a part of the District Cooling System in or on the Building, or its surrounding premises, shall at all times be the property of HSWAC. Upon the earlier of termination or expiration of this Agreement, HSWAC shall have the right to remove such property from the Building and its premises. Additionally, except for a Section 14.2 occurrence, Customer may require HSWAC to remove such property from the Building and its premises. Within thirty (30) days after the earlier of the termination or expiration of this Agreement, HSWAC shall inform Customer in writing of its intentions regarding removal of such property from the Building and premises, and Customer shall inform HSWAC in writing regarding removal of such property from the Building and premises. If HSWAC shall elect or Customer shall require to cause the removal of such property, HSWAC shall do so within sixty (60) days following the date of notice of the intention to remove, or such property shall become the property of Customer if agreed to by Customer. Promptly after such removal HSWAC shall cause the Building and premises to be returned to substantially the same condition as would have existed but for such removal and allowance for ordinary wear and tear.

ARTICLE 6

CAPACITY CHARGE

6.1 Commencing on the First Service Date and continuing for the term of this Agreement, Customer shall pay HSWAC a Capacity Charge for each Billing Period equal to the product of Customer’s Contract Capacity for such period multiplied by the applicable Capacity Charge Rate in Section 1.7(a). A Capacity Charge will not be initiated until Chilled Water is available from HSWAC for Customer’s use.

6.2 Effective for Billing Periods after the first 24 Billing Periods subsequent to the First Service Date, Contract Capacity for Chilled Water will be re-established by taking the average of the eight (8) greatest building Capacity data points in Tons, using the four (4) greatest building Capacity points from each year of the previous two completed years. The determination of building Capacity data points in Tons under this Agreement shall be based upon Customer’s greatest one-hour average consumption in Tons. The Contract Capacity as reestablished shall not be less than ninety percent (90%) of the Contract Capacity in Section 1.7(a).

Beginning January 1 after the first 24 Billing Periods, Contract Capacity for Chilled Water will be re-established annually using the same method as above.

6.3 HSWAC shall agree to reasonable increases in Customer’s Contract Capacity, subject to available Capacity in the HSWAC District Cooling System, and shall give existing customers preference over new customers in the allocation of additional Capacity.

The monthly “Additional Capacity Charge Rate” for any additional Capacity as re-established per Section 6.2 in excess of Customer’s Contract Capacity in Section 1.5 shall be $80.00 per Ton cooling. Beginning January 1, immediately following the first 24 Billing Periods, the monthly Additional Capacity Charge Rate for any additional Capacity shall be subject to an annual percentage increase equal to three percent (3%).
ARTICLE 7

OPERATING CHARGE

7.1 Customer’s Operating Charge for a given Billing Period shall be the Operating Charge Rate multiplied by the number of Ton-hours utilized by Customer for such Billing Period.

7.2 The Energy Operating Charge Rate shall be the sum of (a) the Hawaiian Electric Company, Inc. (“HECO”) demand charge in $/kW multiplied by 0.004 and (b) the energy charge in $/kWh, multiplied by 0.2 according to the effective rate for schedule P, large power service, as submitted the same month as HSWAC’s corresponding Billing Period by HECO to the Hawai‘i Public Utilities Commission (“PUC”), and is published monthly at the following link on the HECO web site: https://www.hawaiianelectric.com/my-account/rates-and-regulations/effective-rate-summary.

By way of an example the Energy Operating Charge Rate, for the Billing Period of July 2016, using the effective rate for schedule P as submitted by HECO for July, 2016 would be:

Demand charge schedule P for July, 2016: $24.34 per kW
Energy charge schedule P for July, 2016: $0.159165 per kWh

Energy Operating Charge Rate for July, 2016 = 0.2 x ((0.004 x $24.34) + $0.159165)
Energy Operating Charge Rate for July, 2016 = $0.051305

In the event the effective rate submittal by HECO to PUC is discontinued or the HECO rate structure is substantially altered, HSWAC and the Customer shall reasonably agree on a revised Energy Operating Charge Rate.

7.3 Customer’s Ton-hours shall be determined by measuring the volume of Chilled Water delivered to Customer’s Building and the difference between the temperature of the Chilled Water received at the Point of Delivery from the District Cooling System and the temperature of the Chilled Water returned at the Point of Delivery.

ARTICLE 8

MISCELLANEOUS CHARGE
CONSIDERATIONS

8.1 Customer shall pay reasonable charges incurred by HSWAC as a result of the action or inaction of Customer for specific services charged to Customer, solely for reasonable expenses and costs directly related to the following: (a) service shutoff and/or reinstatements caused by the fault or negligence of Customer; (b) damage to system equipment caused by the fault or negligence of Customer or Customer’s employees, agents, tenants, licensees, or trespassers; (c) consumption of system water, caused by the fault or negligence of Customer; and (d) service calls for problems caused by the fault or negligence of Customer. Customer shall pay such charges in addition to Capacity Charges and Operating Charges as due and said charges shall be included in Customer’s monthly billing.
Customer’s allowable Chilled Water flow in any Billing Period shall be equal to or less than 144 gallons per Ton-hour multiplied by Ton-hours used in that period. Beginning on January 1 immediately following the First Service Date, for any month in which Customer’s Chilled Water flow is less than 130 gallons per Ton-hour used, Customer shall receive a “Reduced Flow Credit” (described herein below). Beginning on January 1 immediately following the First Service Date, for any month in which Customer’s actual Chilled Water flow exceeds 160 gallons per Ton-hour used, Customer shall pay an “Excess Flow Charge” (described herein below). The rate of such Reduced Flow Credit shall be $1.00 for every thousand gallons below 130 gallons per Ton-hour used and the rate of such Excess Flow Charge shall be $1.00 for every thousand gallons above 160 gallons per Ton-hour used. Thereafter on each subsequent January 1, the Reduced Flow Credit and the Excess Flow Charge shall be subject to an annualized percentage adjustment from the charge set forth above equal to the average annualized percentage adjustment in the Energy Operating Charge Rate, as defined in Section 7.2.

ARTICLE 9
METERING

9.1 Prior to Customer’s First Service Date, HSWAC shall install, at HSWAC’s expense, all Metering Equipment. The Metering Equipment shall be read by HSWAC to determine Customer’s Ton-hours utilized and Contract Capacity, at least once each Billing Period, subject to Section 9.6.

9.2 Subject to the provisions of Article 15 below, Customer shall permit HSWAC to install Metering Equipment in Customer’s Building or on Customer’s premises in the area adjacent to the Point of Delivery or such other area as may be specified by mutual agreement of the parties, taking into account accessibility and Customer’s need for Building security.

9.3 HSWAC shall own and maintain the Metering Equipment in good repair and operating condition at HSWAC’s expense. Customer shall not cause or permit any modification or alteration to any part of the Metering Equipment except in an emergency situation.

9.4 Any electricity reasonably required for the operation or maintenance of the Metering Equipment shall be supplied by Customer at Customer’s expense.

9.5 Customer shall promptly notify HSWAC in writing if at any time Customer has reason to believe the Metering Equipment is not accurately measuring the Ton-hours used by the Building Cooling System or Customer’s Contract Capacity.

9.6 In any Billing Period during which the Metering Equipment shall fail to register utilization of Ton-hours by Customer, the amount of Ton-hours utilized by Customer during such period shall be estimated by HSWAC based on the average Ton-hours utilized by Customer over the preceding twelve (12) month billing periods (or such lesser period as may be available), and Customer shall be billed and shall pay accordingly. At least quarterly, HSWAC shall read the Metering Equipment and thereafter appropriately credit or charge Customer for the Ton-
hours it actually utilized in comparison with the previously estimated utilization that was billed to and paid by Customer.

9.7 HSWAC shall test and calibrate the Metering Equipment as may be reasonably necessary to ensure the accuracy of such equipment.

ARTICLE 10

BILLING AND PAYMENT

10.1 HSWAC shall within thirty (30) days following the end of a Billing Period send to Customer a Service Bill.

10.2 Payment of a Service Bill shall be due and payable within thirty (30) days without set-off, counterclaim, abatement, or reduction by Customer.

10.3 Customer shall be charged a fee of one and one-half percent (1.5%) per month of the amount due as a “Late Fee” for making less than a full payment of all amounts due pursuant to a Service Bill within thirty (30) days of the date of such bill.

10.4 In the event delivery of Chilled Water to Customer is suspended or terminated without fault or negligence of HSWAC and Customer requests resumption of delivery of Chilled Water to Customer such resumption shall not occur, until Customer pays in full all charges incurred by or properly assessed upon Customer to the date of resumption of delivery of Chilled Water.

10.5 The State of Hawai‘i General Excise Tax, if applicable, and any other similar governmental tax or charge will be included as a separate charge to Customer on the Service Bill, such that when added to charges due, shall yield to HSWAC after deduction of all such tax payable by HSWAC with respect to such charges a net amount which HSWAC would have realized from such charges had no such tax been imposed.

ARTICLE 11

ADDITIONAL CUSTOMER COVENANTS AND OBLIGATIONS

11.1 Without the prior express, written consent of HSWAC, Customer shall not cause or voluntarily permit any action which interferes with the delivery or return of Chilled Water, the utilization of Ton-hours, or the operation, maintenance, repair, replacement, construction, installation, expansion, removal or alteration of the District Cooling System or the Metering Equipment, except in an emergency situation where life, health or property is threatened (in which case Customer shall notify HSWAC as soon thereafter as possible).

11.2 Customer shall hold harmless and indemnify HSWAC from and against liabilities, losses, damages, costs, expenses (including attorneys’ fees), claims, actions, judgments, and settlements of any nature whatsoever, for any personal injury, death, or property or economic
damage arising out of or incidental in any manner whatsoever, to the operation of Customer’s Building Cooling System, but only to the extent such injury, death or damage was not caused by the negligence, recklessness or intentional misconduct of HSWAC or its officers, employees, agents, lessees, licensees, invitees, or contractors.

11.3 Customer shall secure and maintain in good standing reasonable amounts of commercial general liability insurance and appropriate workers’ compensation and employers’ liability insurance as is required by the laws of the State of Hawai‘i for all employees working in or at the Building and its surrounding premises.

11.4 Customer shall not provide Chilled Water from its Building Cooling System to any building other than such Building or buildings and appurtenant structures, as identified in Section 1.3, without the prior express, written consent of HSWAC.

ARTICLE 12
ADDITIONAL HSWAC COVENANTS AND OBLIGATIONS

12.1 In accordance with the applicable laws and regulations, HSWAC shall maintain the District Cooling System and the Metering Equipment in good repair and operating condition and cause it to be operated in a safe and efficient manner.

12.2 HSWAC shall hold harmless and indemnify Customer from and against liabilities, losses, damages, costs, expenses (including attorney’s fees), claims, actions, judgments, and settlements of any nature whatsoever, for any personal injury, death or property or economic damage arising out of or incidental in any manner whatsoever to the operation of the District Cooling System or Metering Equipment, but only to the extent such injury, death, or damage was not caused by the negligence, recklessness or intentional misconduct of Customer or its officers, employees, agents, lessees, licensees, invitees, or contractors. In no event shall HSWAC be liable to Customer for any indirect, consequential, special or punitive damages.

12.3 HSWAC shall secure and maintain in good standing reasonable amounts of commercial general liability insurance and appropriate workers’ compensation and employers’ liability insurance as is required by the laws of the State of Hawai‘i for all employees working in or at the Building and its surrounding premises, and all necessary permits, easements, licenses, franchises and rights necessary or desirable to make and continue the delivery of Chilled Water to Customer.

ARTICLE 13
INTERRUPTION OF SERVICE

13.1 Customer’s obligation to make payments for, and HSWAC’s obligation to charge, a Capacity Charge shall be adjusted by appropriate reduction to any Billing Period during which HSWAC is unable for 24 consecutive hours to perform its obligations to deliver Chilled Water in
accordance with this Agreement. Any such Billing Period Capacity Charge adjustment shall be equal to the Billing Period Capacity Charge, before the adjustment, times the ratio of the amount of Ton-hours actually utilized by Customer during the Billing Period to an estimate of the total Ton-hours Customer would have used if HSWAC had fully performed in accordance with this Agreement.

13.2 Subject to appropriate reduction in charges in accordance with Section 13.1 above, HSWAC shall have the right to interrupt, reduce or discontinue the delivery of Chilled Water to the least extent necessary, for purposes of inspection, maintenance, repair, replacement, construction, installation, removal or alteration of the District Cooling System or the Metering Equipment. HSWAC shall, to the extent reasonably possible, give written notice to Customer of any expected interruption of delivery of Chilled Water at least sixty (60) days prior to the date of such interruption and shall use commercially reasonable efforts to inform Customer of the expected length of any interruption.

13.3 HSWAC shall not be required to supply Chilled Water to Customer and may suspend or terminate such supply at any time HSWAC reasonably believes Customer’s Building Cooling System to be in an unsafe condition, provided HSWAC has given written notice of the basis for such belief at least thirty (30) days prior to suspension or termination of Chilled Water delivery unless such condition constitutes an emergency condition in which case HSWAC shall have the immediate right to interrupt service. In the event that, during such 30-day period Customer cures, or demonstrates to the reasonable satisfaction of HSWAC that it has made progress toward cure of such unsafe condition, then such suspension or termination shall be canceled or delayed by HSWAC.

ARTICLE 14

TERMINATION

14.1 If one or more of the following events or conditions shall exist or occur, Customer may elect to terminate this Agreement by giving written notice to HSWAC of such fact no less than thirty (30) days prior to the date of such termination:

(a) Customer’s Building is destroyed or demolished for which rebuilding or substantial repairs are not undertaken or planned within twelve (12) months following such destruction. In the event that rebuilding or substantial repairs are undertaken or planned within twelve (12) months following such destruction or demolition, the full terms of this Agreement shall be reinstated commencing on the first day the Building utilize any Chilled Water; or

(b) Customer’s Building becomes permanently abandoned, inoperable and uninhabitable and has been so for a period in excess of twelve (12) months; or

(c) It becomes unlawful under any final federal, state or local law, regulation or rule for HSWAC to deliver to Customer or for Customer to receive and pay for Chilled Water; or
(d) HSWAC fails to provide Chilled Water to Customer’s Building on or before the Option to Terminate Date provided in Section 1.10 or

(e) Following the initial delivery of Chilled Water to Customer’s Building, subject to Section 20.4, HSWAC is unable to deliver Chilled Water at a supply temperature of 44 degrees Fahrenheit or lower for a cumulative period of 5% or more of the time during a calendar year.

14.2 If one or more of the following events or conditions shall exist or occur, HSWAC may elect to terminate this Agreement by giving written notice to Customer of such fact not less than thirty (30) days prior to the date of such termination:

(a) Customer fails to pay any amounts due under Customer’s Service Bill within forty-five (45) days from the date thereof; or

(b) Customer fails to duly observe or perform any material covenant or obligation to be observed or performed by Customer pursuant to this Agreement (other than nonpayment of Service Bills) and Customer fails to cure such failure or so observe or perform (or demonstrate to the reasonable satisfaction of HSWAC that Customer has made progress toward cure with a reasonable expectation of full cure within a reasonable period) within the forty-five (45) days following a written, specific request from HSWAC to do so; or

(c) Customer’s Building, or any substantial portion of the District Cooling System, is permanently abandoned, destroyed, demolished, substantially destroyed or demolished, becomes permanently inoperable or is taken by right of eminent domain; or

(d) It becomes unlawful under any final federal, state or local law, regulation or rule for HSWAC to deliver to Customer or for the Customer to receive and pay for Chilled Water.

(e) Customer fails to accept, when HSWAC is prepared to deliver, Chilled Water to Customer’s Building for a period of three (3) consecutive months after the Scheduled First Service Date.

Except with respect to Section 14.2(c) and 14.2(d) above, the HSWAC election to terminate this Agreement shall not release Customer of Customer’s Capacity Charge obligations for the remaining Term of this Agreement. Such remaining Capacity Charge shall upon such termination under this Section 14.2 be immediately due and owing from Customer to HSWAC. For a termination under Section 14.2(e), the remaining Capacity Charge shall be calculated as if the First Service Date is the last day of the period of three (3) consecutive months after the Scheduled First Service Date. HSWAC shall, however, have an obligation to reasonably mitigate its damages under this Section 14.2.

ARTICLE 15

RIGHT-OF-WAY; ACCESS TO BUILDING
15.1 In order to implement the provisions of this Agreement, Customer shall grant HSWAC the necessary right-of-way to enter Customer’s land and Building for the purpose of installation of the customer connection to the District Cooling System. Both parties contemplate that the right-of-way will be consistent with Exhibit A. Duly authorized agents, officers, and employees of HSWAC shall have the right to enter into the Building and onto the surrounding premises of Customer’s Building at reasonable times and on reasonable notice when necessary for construction, installation, inspection, repair, replacement, removal, alteration or calibration of the Metering Equipment and the District Cooling System, subject to reasonable supervision by Customer. Except in an emergency situation, HSWAC shall provide Customer at least one (1) business day advance written notice. Customer shall duly grant such access to the Building and surrounding premises to the extent reasonably necessary to cause and continue delivery of Chilled Water, and so long as same does not materially impair the continued use of the Building and surrounding premises. HSWAC shall comply with all laws and regulations in connection with any such entry, and any damage to the Building or surrounding premises caused or made by HSWAC or HSWAC’s agents shall be promptly repaired by HSWAC; and HSWAC shall put the Building and surrounding premises back in the same pre-HSWAC damaged condition as before the entry. HSWAC hereby agrees to indemnify, defend and hold Customer harmless from and against claims, damage, injury or liability proximately caused by HSWAC or HSWAC’s agents under this Section 15.1.

ARTICLE 16

RECORDS AND ACCOUNTS

16.1 HSWAC shall keep and maintain such true and complete books, records, and accounts as shall be necessary to compute Service Bills, Contract Capacity, and specific service charges, preserving the same for a period not less than three (3) years following the calendar year to which they apply.

16.2 Subject to entering into a confidentiality agreement reasonably acceptable to HSWAC, Customer shall have the right, to be exercised not more than once during each calendar year, at any reasonable time during HSWAC’s business hours, upon three (3) business days’ prior written notice to HSWAC, to examine, audit or copy, at Customer’s expense, all books, records and accounts of HSWAC applicable to Capacity and Operating Charges, or upon Customer’s account or Customer’s required performance of this Agreement; provided that HSWAC shall not be required by this provision to disclose confidential operating information of other customers unless such information is required to be disclosed pursuant to law, court order or subpoena.

ARTICLE 17

ARBITRATION
17.1 In the event that the parties experience a dispute regarding any term of this Agreement, the parties agree to work in good faith to amicably resolve the dispute to the satisfaction of each party. To fulfill this commitment, the parties agree to meet informally on one or more occasions to seek resolution; in the event the informal negotiations do not resolve the dispute, the parties agree that each will designate a senior manager to meet in a continued effort to revisit the dispute and seek resolution. The parties agree that any controversy or claim arising under or in connection with this Agreement that cannot be resolved by negotiation, including but not limited to the correctness of the computational or measurement process related to calculation of Customer’s Operating Charges or Capacity Charges, shall be settled by binding arbitration in Honolulu, Hawai’i, conducted by DPR. In the event that DPR is not available, a substantially similar arbitration service shall be utilized. The arbitration shall use one arbitrator, in accordance with the rules of DPR and the laws of the State of Hawai’i, including but not limited to Chapter 658A, Hawai’i Revised Statutes, or successor provisions, subject to any rights of appeal, modification, vacation, or confirmation before a court of competent jurisdiction. Each party shall bear their respective costs of said arbitration and any litigation. Judgment on the arbitrator’s award may be entered by any court of competent jurisdiction.

ARTICLE 18

AMENDMENT AND WAIVER

18.1 Except as otherwise expressly provided herein, neither this Agreement, nor any of its terms, may be terminated, amended, altered, or modified except by an instrument in writing executed by Customer and HSWAC; provided, however, no such amendment shall be made which shall conflict with, or cause a default, penalty, new lien or acceleration of performance, under any HSWAC indenture or financing agreement.

18.2 Any waiver at any time by either HSWAC or Customer of its rights concerning a default or any matter arising from or incidental to this Agreement shall not constitute a waiver concerning any other default or matter.

18.3 Failure of HSWAC or Customer to enforce at any time any provision of this Agreement to require at any time performance by the other party of any provision herein shall not constitute or be deemed a waiver of such provision nor affect in any manner the validity of this Agreement or the right of such party to enforce any provision herein unless such waiver be in writing and specifically referring to the provision sought to be enforced.

ARTICLE 19

ASSIGNMENT; SUCCESSORS

19.1 Except as set forth in this Article 19, neither party shall assign or otherwise transfer any interest in this Agreement without the prior written consent of the other, which consent shall not be unreasonably withheld. For purposes of this Section 19.1, any change in ownership or control of a party shall be deemed an assignment. This Agreement shall inure to the benefit of
and be binding upon the successors, personal representatives, heirs, trustees and assigns of
the parties hereto.

19.2 In the event that Customer conveys by any means all, or substantially all, of Customer’s
interest in the Building and fails to secure an assumption of this Agreement reasonably
acceptable to HSWAC, then and in that event, HSWAC may, in its sole discretion, suspend or
terminate services to the Building.

19.3 Customer acknowledges and accepts the fact that the HSWAC financing of this capital-
intensive deep water district cooling project requires the creation of one or more
mortgages, liens, security interests and subordinated mortgage, liens and security interests
on the District Cooling System that may require assignment of this Agreement and
Customer’s direct payment or payments to third parties.

ARTICLE 20

GENERAL PROVISIONS

20.1 If any of the terms, covenants or conditions of this Agreement shall be held invalid by any
court having jurisdiction, all other terms, covenants and conditions of this Agreement and
their application shall remain valid, enforceable and not affected thereby.

20.2 The validity, performance, construction, interpretation and enforcement of this Agreement
and all of its terms, covenants and conditions, shall be governed by and be in accordance with
the laws of the State of Hawai‘i.

20.3 All indemnification provisions shall survive the Term and termination of this Agreement.

20.4 Performance of this Agreement is subject to the good faith performance by the parties and
neither party shall be penalized or adversely affected in the performance of this Agreement by
acts of war or acts of nature, or similar occurrences beyond the reasonable control of the
parties, including without limitation construction, governmental acts, actions or inaction.

20.5 Nothing in this Agreement, express or implied, is intended to confer any rights or remedies
whatsoever upon any person, other than Customer and HSWAC and their lenders,
respective successors and permitted assigns and transferees.

20.6 This is the sole and only agreement between the parties on the subject matter hereof. Any
and all prior oral or written representations, correspondence, letters of intent and
agreements are merged into and superseded by this Agreement and shall be of no force or
effect.
HONOLULU SEAWATER AIR CONDITIONING

CHILLED WATER CUSTOMER AGREEMENT

UNIVERSITY OF HAWAIʻI

For its Buildings constituting the John A. Burns School of Medicine
located at
Kakaʻako, Oahu

This Chilled Water Customer Agreement ("Agreement") is entered into between Honolulu Seawater Air Conditioning, LLC, ("HSWAC"), a Hawaiʻi limited liability company, whose business address is 1132 Bishop Street, Suite 1410, Honolulu Hawaiʻi 96813 and the University of Hawaiʻi, ("Customer" or alternatively "University"), the state university and a body corporate of the State of Hawaiʻi, organized under the Constitution and laws of the State of Hawaiʻi, whose business address is Bachman Hall, 2444 Dole Street, Honolulu, Hawaiʻi 96822, for the benefit of the John A. Burns School of Medicine ("JABSOM").

ARTICLE 1

BASIC CHILLED WATER PURCHASE PROVISIONS

The following Basic Chilled Water Purchase Provisions are an integral part of this Agreement between HSWAC and Customer. These provisions are summarized in this Article for the convenience of the parties, and are specified in more detail and governed by other Sections of this Agreement. This Agreement is comprised of Article 1 (Basic Chilled Water Purchase Provisions), Articles 2 – 20 (Uniform Provisions of Chilled Water Customer Agreement), and Exhibits A - E. In the event of an inconsistency or conflict between Article 1 of this Agreement and Articles 2 – 20 of this Agreement or any Exhibit incorporated into the Agreement, the provisions of Article 1 shall prevail.

1.1 Effective Date of this Agreement: ________________

This Agreement shall take effect upon approval and authorization by the Board of Regents of the University and execution of the Agreement by authorized representatives of the parties ("Effective Date"). Prior to the Effective Date of this Agreement, the parties may
negotiate in good faith and exchange business information, subject to confidentiality and non-disclosure principles.

Following the Effective Date of this Agreement, the University may without penalty explore other options to air condition its Kaka’ako buildings. These options include installing conventional equipment or extending the existing contract with the Honolulu Board of Water Supply ("BWS"). HSWAC shall continue to pursue its business plan and focus on obtaining construction financing.

1.2 **Chilled Water Provider:**

Honolulu Seawater Air Conditioning, LLC ("HSWAC")

HSWAC’s Address for Notice:

Honolulu Seawater Air Conditioning, LLC
1132 Bishop Street, Suite 1410
Honolulu, Hawai‘i 96813
Attn: President

1.3 **Customer:**

University of Hawai‘i ("Customer" or alternatively "University"), the state university and a body corporate of the State of Hawai‘i, for the benefit of the John A. Burns School of Medicine ("JABSOM")

Customer’s Address for Notice:

JABSOM
651 Ilalo Street
Honolulu Hawai‘i 96813
Attn: Jerris Hedges, Dean

1.4 **Duration of Chilled Water Service:**

The period during which HSWAC is to deliver Chilled Water and accept return water from the University shall commence on the First Service Date and end on the last day of the calendar year in which the 20th anniversary of the First Service Date falls, ("Term").

1.5 **Service Location:**

The Customer’s primary buildings to be served by this Agreement are the ancillary Central Plant Building, the Medical Education Building and the Biological Sciences Building ("Buildings" or "Building") of JABSOM, located in Kaka’ako, Honolulu.

JABSOM
651 Ilalo Street
Honolulu Hawai‘i 96813

Upon terms mutually acceptable, the parties may agree to provide additional Chilled Water service to the University of Hawai‘i Cancer Center (“UHCC”) building, located in proximity to the Buildings. Together, JABSOM and UHCC form the medical complex for the University located at Kaka‘ako, Honolulu.

University of Hawai‘i Cancer Center
701 Ilalo Street
Honolulu, Hawai‘i 96813

1.6 Chilled Water Service Point of Delivery; Responsibility for Equipment:

HSWAC shall deliver Chilled Water to the Point of Delivery, currently projected to be the existing chiller equipment in the Central Plant Building of JABSOM, (see Exhibit A) and shall accept return water at the same.

HSWAC is responsible for providing the necessary equipment (such as valves, meters, gauges, shunts, and pipes) up to the Point of Delivery; subject to the provisions of Section 1.17(a) regarding HSWAC’s responsibility for the Building Conversion, the University is responsible for providing the necessary equipment to accept Chilled Water from the Point of Delivery, to circulate the water through its buildings, and to return the water to the Point of Delivery. The parties shall coordinate the technical specifications of their respective equipment to assure compatibility, efficiency, ease of maintenance, and safety, and the University shall provide reasonable access and rights of way over University property to HSWAC.

1.7 Overview of Monthly Charges to Customer:

The monthly cost of service consists of two primary components: (A) a monthly Capacity Charge, and (B) a monthly Operating Charge.

(a) Capacity Charge Rate: [See also Section 6.1]

The monthly Capacity Charge is calculated by multiplying the “Contract Capacity” by the applicable monthly “Capacity Charge Rate.” At the First Service Date, the Contract Capacity is 1,415 tons, and the monthly Capacity Charge Rate is Eighty Dollars ($80.00) per Ton Cooling.

Customer’s Contract Capacity for Chilled Water shall remain in effect during the first 24 Billing Periods subsequent to the First Service Date. Thereafter the Contract Capacity shall be re-established as provided in Section 6.2.

The monthly Capacity Charge Rate from the First Service Date through and including December 31 immediately following the First Service Date shall be $80.00 per Ton Cooling. Beginning January 1, immediately following the First Service Date, and on each
January 1 thereafter, through the Term of this Agreement, the Capacity Charge Rate shall be increased by three percent (3%).

If and when additional tons are available, HSWAC shall offer up to 500 tons of additional Contract Capacity to the University for use for the UHCC building, on a right of first refusal basis. The University shall have a thirty (30) day period to accept or refuse additional Contract Capacity.

(b) Operating Charge Rate: [See also Section 7.2]

Monthly Operating Charge Rate

<table>
<thead>
<tr>
<th>Operating Charge Rate</th>
<th>Operating Charge Rate per Ton-hour cooling</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Energy Operating Charge Rate as adjusted below</td>
<td>$0.0400</td>
</tr>
<tr>
<td>Energy Operating Charge Rate From the First Service Date</td>
<td>$0.051305*</td>
</tr>
</tbody>
</table>

*Example based upon HECO July 2016 effective rate for schedule P and determined per Section 7.2

The Operating Charge Rate shall be the sum of the Non-Energy Operating Charge Rate, plus the Energy Operating Charge Rate.

The Non-Energy Operating Charge Rate from the First Service Date through and including December 31 immediately following the First Service Date thereafter shall be the Non-Energy Operating Charge Rate set forth in this Section. Beginning January 1 immediately following the First Service Date and on each January 1 thereafter, through the Term of this Agreement, the Non-Energy Operating Charge Rate shall be subject to an annual percentage increase from the rate set forth above equal to the average annualized percentage increase in the Honolulu, HI Consumer Price Index for All Urban Consumers (CPI-U) (1982-84=100) as determined by the Bureau of Labor Statistics from the first half CPI-U or generally recognized successor Index, no less than zero percent (0.0%).

PERFORMANCE MILESTONES AND OPT-OUT OPPORTUNITIES PRIOR TO ACTUAL COMMENCEMENT OF SERVICE

This Agreement is executed at a time when HSWAC has not obtained financing or built its facilities. The University currently receives air conditioning services from the BWS under a Chilled Water service contract that is due to expire in 2025. In light of these circumstances, the parties agree to the following schedule of performance milestones, and “opt out” termination opportunities that are projected to occur prior to the actual commencement of service. Notwithstanding the terms of any “opt out” termination opportunities set forth in this Agreement, HSWAC and the University specifically agree that if HSWAC has not commenced construction of its Chilled Water District Cooling System by December 31, 2021, then the University shall have the absolute right at its sole discretion to terminate this Agreement by providing HSWAC with written notice of such termination within fifteen (15) business days following December 31, 2021.
1.8 **Notification of Pre-Financing Activities/Customer’s Right to Terminate:**

Pre-Financing Activities by HSWAC consists of execution by HSWAC of an Engagement Letter (“Engagement Letter”) with a credit rating agency, as required as part of HSWAC’s construction financing. Customer shall have the absolute right at its sole discretion to terminate this Agreement at any time prior to the deadline set forth hereafter. After HSWAC executes an Engagement Letter, HSWAC shall give Customer written notice thereof and a copy of the executed Engagement Letter, from which confidential information may be redacted at HSWAC’s discretion. Upon Customer receiving such notice, Customer shall have the option of terminating this Agreement by providing written notice thereof to HSWAC, on or before fifteen (15) business days after receiving such notice, and upon such termination, this Agreement shall be null and void and of no further force and effect, and HSWAC and Customer shall have no further obligations to each other under this Agreement.

1.9 **Obtaining Financing:**

HSWAC shall endeavor to obtain financing upon terms and scheduling, the acceptability of which shall be solely within the discretion of HSWAC to determine. If HSWAC fails to obtain financing on terms and conditions it deems acceptable, HSWAC or the University may terminate this Agreement, and shall promptly notify the University in writing. If this Agreement is terminated for failure of HSWAC to obtain financing, the parties shall have no further obligations to each other under this Agreement.

1.10 **Post Financing Obligations:**

Upon receiving financing, HSWAC shall estimate to the best of existing knowledge, the following dates, and the University shall confirm the dates in the manner set forth herein.

Within five (5) days after the expiration of Customer’s right to terminate this Agreement pursuant to Section 1.8 above, HSWAC shall deliver to Customer for execution a Confirmation Certificate of Dates (“Confirmation Certificate”), in the form shown in Exhibit E, attached hereto and by this reference made a part hereof. Customer agrees that it shall be deemed to have accepted the dates specified in the Confirmation Certificate in the event Customer fails, within fifteen (15) business days after Customer’s receipt of the Confirmation Certificate, (i) to execute and return the Confirmation Certificate to HSWAC, or (ii) to inform HSWAC in writing of the reasons Customer does not agree with the dates specified in the Confirmation Certificate, if such is the case.

(a) **Estimated Construction Start Date:**

The Estimated Construction Start Date is the expected effective date of the notice to proceed for construction of HSWAC’s Chilled Water District Cooling System, based on facts and circumstances known as of the completion of the Confirmation Certificate (Exhibit E).
(b) **Estimated First Service Date:**

The Estimated First Service Date is the expected date of First Service, upon completion of construction, that has been determined by engineering and project management standards prior to the start of construction, and is based on the Estimated Construction Start Date in Section 1.10(a).

HSWAC will provide at least nine (9) months prior written notice to the Customer of the actual Scheduled First Service Date (as defined in Article 2).

1.11 **Option to Terminate Upon Occurrence of a Termination Event:** [See also Section 14.1(d)]

Prior to Commencement of Service the University or HSWAC may terminate this Agreement in the event of any of the following occurrences:

(a) Failure to commence construction. The University may terminate this Agreement if HSWAC does not commence construction by the Estimated Construction Start Date.

(b) Failure to provide Chilled Water by Estimated First Service date. The University may terminate this Agreement if HSWAC is not capable of providing Chilled Water to the Buildings in the amounts contemplated by this Agreement by the Estimated First Service Date, provided that the University shall allow a nine (9) consecutive month grace period to allow for construction delays.

1.12 **Option to Terminate Upon Non-Performance After Commencement of Service:**

(a) Failure to provide Chilled Water after actual service has commenced. The University or HSWAC may terminate this Agreement if HSWAC is unable to deliver Chilled Water in the amounts contemplated by this Agreement using deep seawater as an essential component of its delivery system, for one hundred and eighty (180) consecutive days following the First Service Date. Upon such termination, this Agreement shall be null and void and of no further force and effect, and HSWAC and Customer shall have no further obligations to the other under this Agreement, other than such obligations or liabilities which expressly survive termination of this Agreement, if any.

(b) Failure of University to fulfill financial obligations for payment of service. HSWAC may terminate this Agreement if the University fails to fulfill its obligations to make timely payments as set forth in Articles 6, 7, and 8, below, provided that HSWAC allows a “cure” period to the University as set forth below in Section 14.2(a).

(c) Other Post Commencement Termination events. See Article 14, below.

1.13 **Existing BWS contract (expiring 2025):**
The parties agree that, notwithstanding any other provision in this Agreement, this Agreement is contingent upon the termination of that certain Chilled Water Service Agreement, dated as of September 16, 2005, by and between the University of Hawai‘i, on behalf of the John A. Burns School of Medicine, and the Board of Water Supply of the City and County of Honolulu (the “BWS Agreement”). If a decision on termination of the BWS Agreement has not been made by December 31, 2021, HSWAC and Customer shall each have the option of terminating this Agreement, by providing written notice thereof to the other, and upon such termination, this Agreement shall be null and void and of no further force and effect, and HSWAC and Customer shall have no further obligations to the other under this Agreement. If HSWAC and Customer do not elect to terminate this Agreement, then this Agreement shall continue in full force and effect.

1.14 Procedures to Terminate:

To exercise an option to terminate under Sections 1.11, 1.12. or 1.13 hereof, either party must provide the other party with its written notice of intent to terminate no later than thirty (30) business days following the occurrence of an event of termination, plus an additional “grace or cure period” as applicable. The party receiving such notice is thereafter provided thirty (30) business days following receipt of the notice to respond to the notice of intent to terminate. After receiving the response, the notifying party may elect to terminate, or at its discretion, may discuss alternative arrangements with the responding party.

1.15 Consequences in event of termination:

If this Agreement is terminated under this Article 1, Customer and HSWAC shall have no further obligation or liability to each other, other than such obligations or liabilities that expressly survive termination of this Agreement, if any, and subject to the following principle:

In the event of termination under this Article 1, Customer shall be liable to HSWAC only for any Capacity Charges, Operating Charges, fees, or other assessments for Chilled Water that was actually delivered. By way of illustration, if HSWAC fails to commence construction by the Estimated Construction Start Date, and Customer thereby elects to terminate this Agreement, Customer shall not be liable for any Capacity or Operating Charges or any other fee or assessment. By way of further illustration, if HSWAC delivers Chilled Water as contemplated under this Agreement for six (6) years, then HSWAC abandons Chilled Water delivery using deep seawater as an essential component, Customer shall be liable only for those months it received Chilled Water under this Agreement, and shall not be liable for Capacity Charges for the balance of the Term. This Section shall in no way affect the termination provisions set forth in Section 14.2.

ADDITIONAL SPECIAL TERMS AND CONDITIONS

1.16 To address the University’s unique circumstances, the parties have accepted the following additional special terms and conditions:
(a) **Approval by University Board of Regents.** The University is the public university of the State of Hawai‘i established by the Constitution and laws of the State of Hawai‘i and under the general control and oversight of the University Board of Regents. This Agreement shall be effective only if the Board of Regents formally approves this Agreement and has delegated the authority to implement this Agreement and execute other ancillary documents reasonably required to perform this Agreement to the President of the University or the President’s designee.

(b) **Customer’s Financial Obligations Subject to Available Funds.** Because Customer is a state agency, any financial obligation arising under this Agreement is subject to funds being made available to Customer pursuant to legislative authorization, appropriation, and the state’s executive budgetary procedures. Customer shall use good faith efforts to assure that such funds are made available to Customer.

(c) **Confidentiality Protection and Disclosure of Documents.** Customer is a public agency of the State of Hawai‘i and is subject to state laws such as HRS Chapter 92F (Uniform Information Practices Act) concerning the public disclosure of government records, including government contracts. Prior to any disclosure of material specifically designated by HSWAC as proprietary or confidential, Customer shall make good faith efforts to inform HSWAC of the request for disclosure and shall consult with HSWAC as to possible protections of records under applicable law. Subject to the foregoing, neither party shall disclose to any third party (except as may be required pursuant to court order or by lenders of the parties, and except for any information which has become part of the public record) the terms and conditions of this Agreement without the prior written consent of the other party; it is expressly understood that this Agreement, including all Exhibits, is a public government record.

(d) **Marketing and Publicity.** The University’s name and indicia such as logos, seals, symbols, marks, verbiage and other trademarks identified with the University shall not be used by HSWAC in any marketing or advertising, or in any manner likely to give the impression of the University’s endorsement of HSWAC or its District Cooling System project, without the express written authorization of the University.

**AMENDMENTS TO UNIFORM PROVISIONS OF CHILLED WATER CUSTOMER AGREEMENT**

1.17 Customer and HSWAC have agreed to the following amendments to the Uniform Provisions of Chilled Water Customer Agreement.

(a) Section 4.1 is deleted and replaced with the following:

The parties agree that HSWAC shall be responsible for the completion of the Building Conversion from the Point of Delivery to which Chilled Water shall be delivered through the District Cooling System to Customer as described in Exhibit C. This shall include establishing the basis of design, managing the design/bid process, selection of the contractor(s), oversight of the completion of the Building Conversion and responsibility for it being designed in accordance with the Standards. Customer understands and agrees that HSWAC is not a licensed contractor pursuant to Chapter 444 of the Hawaii Revised
Statutes. HSWAC shall install or cause to be installed within the Building at the point identified on Exhibit A, an interconnection linking the Building to the District Cooling System. Included in this interconnection is Building Conversion work necessary to isolate the Building’s existing chiller plant and connect the Building to receive Chilled Water from the District Cooling System. The work described in this Section shall include and be in accordance with Exhibit C, and has been estimated by HSWAC to be at a cost of $650,000. In the event that HSWAC reasonably determines that the actual cost of the Building Conversion exceeds $650,000 and HSWAC does not wish to proceed with the Building Conversion at its cost, HSWAC may terminate this Agreement by first providing written notice to the Customer. Should HSWAC terminate this Agreement, subject to this Section, this Agreement shall be null and void and Customer and HSWAC shall have no further obligation or liability to each other, other than such obligations or liabilities which expressly survive termination of this Agreement, if any.

The Customer and HSWAC will fully cooperate to obtain any and all necessary building permits or other necessary governmental approvals for any work on the property of Customer to extend the Chilled Water distribution service lines from the point where they enter the Customer’s private property to the Customer’s Point of Delivery through the footprint of the Building wall. The Building Cooling System shall not include the Metering Equipment, which shall be furnished and maintained by HSWAC.

Upon completion of the Building Conversion, pursuant to Section 1(g) of Exhibit C, HSWAC’s ownership/property interest in the “Qualified Equipment” as defined in Article 2 shall end and the Qualified Equipment shall belong to and be owned exclusively by Customer, its successors and assigns, as owner of the Building. Consistent with Article 9.3 of this Agreement, HSWAC shall remain the owner of all Metering Equipment.

(b) Customer agrees to assign, at no cost to HSWAC, only energy efficiency rebates specifically related to seawater air conditioning for the Building Conversion work as administered by Hawaii Energy, or its successors, of $300 per replaced ton as approved by the PUC on 9/24/2008 in Docket No. 2007-0341, to HSWAC or to HSWAC’s designee, and to fully cooperate with HSWAC in this regard.

(c) Except with respect to Section 14.2(c) and 14.2(d), in the event of HSWAC’s election to terminate this Agreement pursuant to Section 14.2 of this Agreement prior to the expiration of its Term, HSWAC shall promptly bill Customer as damages deemed reasonable by the parties and Customer shall pay HSWAC within thirty (30) days after receipt of such bill the unamortized portion of the cost incurred by HSWAC in causing the Building Conversion, such cost shall be the total amount of expenses actually paid, expensed or incurred by HSWAC for materials, labor or services, or the financing thereof, with respect to constructing the Building Conversion. Within twelve (12) months of the First Service Date, HSWAC shall inform Customer of HSWAC’s cost (set forth above) in causing the Building Conversion, which cost is to be fully amortized on a straight-line basis over the Term.

(d) Section 8.1 is deleted and replaced with the following:
8.1 Customer shall pay reasonable charges incurred by HSWAC as a result of the action or inaction of Customer for specific services (as set forth in Exhibit D) charged to Customer, solely for reasonable expenses and costs directly related to the following: (a) service shutoff and/or reinstatements caused by the fault or negligence of Customer; (b) damage to Building Cooling System or District Cooling System equipment on Customer’s property caused by the fault or negligence of Customer or Customer’s employees, agents, tenants, licensees, or trespassers; (c) consumption of system water, caused by the fault or negligence of Customer; and (d) service calls for problems caused by the fault or negligence of Customer. Customer shall pay such charges in addition to Capacity Charges and Operating Charges as due and said charges shall be included in Customer’s monthly billing.

(e) Section 10.3 is deleted and replaced with the following:

10.3 Customer shall be charged a “Late Fee” for making less than a full payment of all amounts due pursuant to a Service Bill in accordance with terms and conditions authorized by statute, as amended from time to time, currently Hawai’i Revised Statutes Section 103-10.

(f) Section 11.2 is deleted and replaced with the following:

11.2 Customer shall be responsible for damage or injury caused by its employees acting in the course and scope of their employment in the performance of this Agreement to the extent that Customer’s liability for such damage or injury has been determined by a court or has otherwise been accepted by Customer. Customer shall pay for such damage or injury to the extent permitted by law and provided that funds are appropriated, allotted, and available under Customer’s risk management program, or otherwise properly made available for that purpose. This provision does not constitute nor should be interpreted to be any obligation by Customer to indemnify, defend, or hold HSWAC harmless from any third party claim.

(g) Section 11.3 is deleted and replaced with the following:

11.3 Customer shall establish and maintain a risk management program (consisting of third party insurance and self-insured retention) to cover claims and losses reasonably anticipated to arise during the course of this Agreement. Customer shall secure and maintain appropriate workers’ compensation and employers’ liability insurance as required by the laws of the State of Hawai’i for Customer’s employees working in or at the Buildings and on Customer’s premises.

(h) Section 12.2 is deleted and replaced with the following:

12.2 HSWAC shall be responsible for damage or injury caused by its employees acting in the course and scope of their employment in the performance of this Agreement to the extent that HSWAC’s liability for such damage or injury has been determined by a court or has otherwise been accepted by HSWAC. HSWAC shall pay for such damage or injury to the extent permitted by law and provided
that funds are available under HSWAC’s risk management program, or otherwise properly made available for that purpose. This provision does not constitute nor should be interpreted to be any obligation by HSWAC to indemnify, defend, or hold Customer harmless from any third party claim.

(i) The last paragraph of Section 14.2 is deleted and replaced with the following:

In the event that HSWAC elects to terminate this Agreement because

i. Customer failed to duly observe or perform any covenant or obligation as provided under Section 14.2(b); or

ii. Customer failed to pay any amounts due as provided under Section 14.2(a) and notice was provided; or

iii. Customer failed to accept, when HSWAC is prepared to deliver, Chilled Water to Customer’s Building for a period of three (3) consecutive months after the Scheduled First Service Date under Section 14.2(e);

such election to terminate by HSWAC shall not release Customer of Customer’s Capacity Charge obligations for the remaining Term of this Agreement. Such remaining Capacity Charge shall upon such termination under this Section 14.2 be immediately due and owing from Customer to HSWAC. For a termination under Section 14.2(e), the remaining Capacity Charge shall be calculated as if the First Service Date is the last day of the period of three (3) consecutive months after the Scheduled First Service Date.

HSWAC shall, however, have an obligation to reasonably mitigate its damages under this Section 14.2.

(j) Section 17.1 is deleted and replaced with the following:

17.1 In the event that the parties experience a dispute regarding any term of this Agreement, the parties agree to work in good faith to amicably resolve the dispute to the satisfaction of each party. To fulfill this commitment, the parties agree to meet informally on one or more occasions to seek resolution. In the event the informal negotiations do not resolve the dispute, the parties agree that each will designate a senior manager to meet in a continued effort to revisit the dispute and seek resolution. The parties agree that if any controversy or claim arising under or in connection with this Agreement cannot be resolved by negotiation, including but not limited to the correctness of the computational or measurement process related to calculation of Customer’s Operating Charges or Capacity Charges, the parties shall engage in non-binding arbitration in Honolulu, Hawai’i, conducted by Dispute Prevention & Resolution Inc., or similar organization of mutual acceptability. The arbitration shall use one arbitrator, in accordance with the rules of the organization and the laws of the State of Hawai’i, including but not limited to Chapter 658A, Hawai’i Revised Statutes, or successor provisions, except that because the arbitration is non-binding, there shall be no judicial review. Each party shall bear their respective costs of said arbitration and
any litigation. If mediation and non-binding arbitration fails to resolve the dispute to their mutual satisfaction, the parties may seek judicial relief in any court of competent jurisdiction.

(k) Section 19.3 is deleted and replaced with the following:

19.3 Customer acknowledges and accepts the fact that the HSWAC financing of this capital-intensive deep water district cooling project requires the creation of one or more mortgages, liens, security interests and subordinated mortgage, liens and security interests on the District Cooling System that may require assignment of this Agreement and Customer’s direct payment or payments to third parties. In no event, however, is Customer required to pledge Customer’s real property or personal property as collateral to secure HSWAC’s financing, nor is Customer required to assume any obligation as a guarantor or co-borrower of HSWAC’s debts.

(l) Section 20.3 is deleted and replaced with the following:

20.3 RESERVED

(m) Section 20.4 is deleted and replaced with the following:

20.4 Performance of this Agreement is subject to the good faith performance by the parties and neither party shall be penalized or adversely affected in the performance of this Agreement by force majeure events, including, without limitation, acts of war, acts of terrorism, acts of God or the public enemy, strikes or labor disputes, civil disturbance, unanticipated change in law or governmental action, or acts of nature, or similar occurrences beyond the reasonable control of the parties.

1.18 Exhibits:

The exhibits listed in this Section and attached to this Agreement are incorporated by reference and are to be construed as a part of this Agreement. Each party agrees to perform any obligations on its part stated in any and all such Exhibits:

- **Exhibit A**  Point of Delivery and Right-Of-Way
- **Exhibit B**  Customer Connection Standards for HSWAC District Cooling
- **Exhibit C**  Building Conversion Work
- **Exhibit D**  Service Charges
- **Exhibit E**  Confirmation Certificate of Dates

[SIGNATURE PAGE TO FOLLOW]
IN WITNESS WHEREOF, Customer and HSWAC have executed and delivered this Agreement as of the______ day of ____________________, 2017.

CUSTOMER:
University of Hawai‘i, on behalf of
The John A. Burns School of Medicine
Buildings located at its Kaka‘ako Complex

HSWAC:
HONOLULU SEAWATER AIR
CONDITIONING, LLC

Central Plant Building, Medical Education Building
and Biological Sciences Building

The public state university and a body corporate of
The State of Hawai‘i

By:____________________________________
    Please print/type name

Its:____________________________________

By:____________________________________
    Please print/type name

Its:____________________________________

By:____________________________________
    Please print/type name

Its:____________________________________

Approved by the Board of Regents, University of Hawai‘i, at a public meeting conducted on __________

Approval Certified on _________________ by

____________________________________

Cynthia Quinn, Executive Secretary
University of Hawai‘i, Board of Regents
UNIFORM PROVISIONS OF
CHILLED WATER CUSTOMER AGREEMENT

ARTICLE 2
DEFINITIONS

2.1 Capitalized terms used in this Agreement and not otherwise defined shall have the following meanings.

**Agreement:** This Chilled Water Customer Agreement including Article 1, the Uniform Provisions and its Exhibits between HSWAC and the Customer for the Customer’s Building.

**Billing Period:** There shall be twelve (12) Billing Periods in a calendar year. Each Billing Period shall be a calendar month, plus or minus three (3) days.

**Building Conversion:** Modification of or alteration to the Building and its Building Cooling System, as shall be required to make the Building Cooling System compatible with (a) the performance specifications required by HSWAC, as specified in the Standards, and (b) utilization of Chilled Water in accordance with this Agreement.

**Building Cooling System:** The Customer’s Building internal cooling system.

**Contract Capacity:** The Capacity specified in Section 1.7(a) that HSWAC is obligated to deliver to Customer and Customer is obligated to purchase from HSWAC.

**Capacity:** A measure, in units of Tons, of the rate at which the HSWAC Chilled Water removes Ton-hours from the Building.

**Capacity Charge:** The product of the Customer’s Contract Capacity for the Billing Period multiplied by the applicable Capacity Charge Rate.

**Capacity Charge Rate:** The rate, in units of dollars per ton, used to calculate the Capacity Charge for a Billing Period by multiplying this rate by the Contract Capacity, as re-established from time to time (Section 1.7(a) and Section 6.2).

**Chilled Water:** The medium in the District Cooling System that provides cooling to Customer’s Point of Delivery.

**Confirmation Certificate:** A notice confirming dates listed in Section 1.10.

**Contract Capacity:** The Capacity, in units of Tons, used to calculate the Capacity Charge for a Billing Period, as re-established from time to time per Section 6.2.

**District Cooling System:** All equipment, Metering Equipment, and any other type of property owned by HSWAC for the purpose of delivering the Chilled Water to Customer’s
Point of Delivery, excluding any part of Customer’s Building Cooling System. HSWAC shall own all Chilled Water within or supplied by the District Cooling System.

**DPR:** Dispute Prevention and Resolution, Inc.

**Energy Operating Charge Rate:** The rate, in units of dollars per Ton-hour, used to calculate the Customer’s Operating Charge for a Billing Period by multiplying this rate by the Ton-hours delivered in a given Billing Period. (Section 7.2).

**First Service Date:** The date when Customer first receives Chilled Water at Customer’s Point of Delivery.

**Late Fee:** The charge to be paid by Customer for making less than a full payment of all amounts due pursuant to a Service Bill in accordance with terms and conditions authorized by statute, as amended from time to time, currently Hawai’i Revised Statutes Section 103-10.

**Metering Equipment:** The equipment installed by HSWAC necessary to accurately measure and record (a) Customer’s Ton-hours utilized and (b) Customer’s Contract Capacity.

**Non-Energy Operating Charge Rate:** The rate, in units of dollars per Ton-hour, used to calculate the Customer’s Operating Charge for a Billing Period by multiplying this rate by the Ton-hours delivered in a given Billing Period (Section 1.7(b)).

**Operating Charge:** The product of the Operating Charge Rate for the Billing Period multiplied by the number of Ton-hours utilized by Customer for such Billing Period.

**Point of Delivery:** That point, as identified on the attached Exhibit A, to which Chilled Water shall be delivered through the District Cooling System to the Customer and the point at which such water shall be returned from Customer’s Building Cooling System to the District Cooling System; the Point of Delivery shall demarcate the Building Cooling System from the District Cooling System.

**Qualified Equipment:** The piping, valves, controls and other ancillary equipment (after service shut-off valves at isolation flanges), that is paid for and installed by HSWAC without contribution from Customer (Exhibit C).

**Scheduled First Service Date:** The date that HSWAC provides by written notice that Chilled Water Service is likely to be available to Customer at its property. The Scheduled First Service Date shall be scheduled once construction has progressed to such a point that HSWAC, through engineering and project management standards, is able to identify this date.

**Service Bill:** A bill from HSWAC sent to the Customer by U.S. Mail, or otherwise delivered to Customer, including the date of sending or delivery and the amounts due by Customer to HSWAC for Chilled Water services provided during the Billing Period, any prior Billing Periods and other Customer charges.
Standards: The performance specifications required by HSWAC as specified in the document titled “Customer Connection Standards for HSWAC District Cooling” dated December 1, 2011, prepared by HSWAC and reviewed and accepted by Customer on the attached Exhibit B.

Term: The period during which HSWAC is to deliver Chilled Water and accept return water from the University (Section 1.4)

Ton: Means a ton of refrigeration, being the rate at which heat is removed, which is equivalent to 12,000 BTU’s per hour.

Ton-hour: A measured unit of energy consumption understood to be 12,000 BTU’s.

Uniform Provisions: Attached and deemed incorporated into the Agreement are Articles 2 - 20 Uniform Provisions of the Chilled Water Customer Agreement.

ARTICLE 3

DISTRICT COOLING SYSTEM

3.1 HSWAC represents that it intends to construct and operate a district cooling Chilled Water system in the City and County of Honolulu, Hawai‘i. HSWAC also intends that the District Cooling System will provide adequate Chilled Water needed to meet the aggregated Capacity in Tons of all HSWAC customers purchasing Chilled Water at the design condition of 88 degrees Fahrenheit dry bulb and 73 degrees Fahrenheit wet bulb. The Chilled Water supply temperature will be 44 degrees Fahrenheit.

ARTICLE 4

CONVERSION OF BUILDING

4.1 To the extent not inconsistent with the Standards and this Agreement, Customer may design the Building Conversion to the specifications desired by Customer. The Customer and HSWAC will fully cooperate to obtain any and all necessary building permits or other necessary governmental approvals for any work on the property of Customer to extend the Chilled Water distribution service lines from the point where they enter the Customer’s private property to the Customer’s Point of Delivery through the footprint of the building wall. The Building Cooling System shall not include the Metering Equipment, which shall be furnished and maintained by HSWAC.

ARTICLE 5

HSWEPAC PROPERTY
5.1 All property constituting a part of the District Cooling System in or on the Building, or its surrounding premises, shall at all times be the property of HSWAC. Upon the earlier of termination or expiration of this Agreement, HSWAC shall have the right to remove such property from the Building and its premises. Additionally, except for a Section 14.2 occurrence, Customer may require HSWAC to remove such property from the Building and its premises. Within thirty (30) days after the earlier of the termination or expiration of this Agreement, HSWAC shall inform Customer in writing of its intentions regarding removal of such property from the Building and premises, and Customer shall inform HSWAC in writing regarding removal of such property from the Building and premises. If HSWAC shall elect or Customer shall require to cause the removal of such property, HSWAC shall do so within sixty (60) days following the date of notice of the intention to remove, or such property shall become the property of Customer if agreed to by Customer. Promptly after such removal HSWAC shall cause the Building and premises to be returned to substantially the same condition as would have existed but for such removal and allowance for ordinary wear and tear.

ARTICLE 6

CAPACITY CHARGE

6.1 Commencing on the First Service Date and continuing for the term of this Agreement, Customer shall pay HSWAC a Capacity Charge for each Billing Period equal to the product of Customer’s Contract Capacity for such period multiplied by the applicable Capacity Charge Rate in Section 1.7(a). A Capacity Charge will not be initiated until Chilled Water is available from HSWAC for Customer’s use.

6.2 Effective for Billing Periods after the first 24 Billing Periods subsequent to the First Service Date, Contract Capacity for Chilled Water will be re-established by taking the average of the eight (8) greatest building Capacity data points in Tons, using the four (4) greatest building Capacity points from each year of the previous two completed years. The determination of building Capacity data points in Tons under this Agreement shall be based upon Customer’s greatest one-hour average consumption in Tons. The Contract Capacity as reestablished shall not be less than ninety percent (90%) of the Contract Capacity in Section 1.7(a).

Beginning January 1 after the first 24 Billing Periods, Contract Capacity for Chilled Water will be re-established annually using the same method as above.

6.3 HSWAC shall agree to reasonable increases in Customer’s Contract Capacity, subject to available Capacity in the HSWAC District Cooling System, and shall give existing customers preference over new customers in the allocation of additional Capacity.

The monthly “Additional Capacity Charge Rate” for any additional Capacity as re-established per Section 6.2 in excess of Customer’s Contract Capacity in Section 1.5 shall be $80.00 per Ton cooling. Beginning January 1, immediately following the first 24 Billing Periods, the monthly Additional Capacity Charge Rate for any additional Capacity shall be subject to an annual percentage increase equal to three percent (3%).
ARTICLE 7

OPERATING CHARGE

7.1 Customer’s Operating Charge for a given Billing Period shall be the Operating Charge Rate multiplied by the number of Ton-hours utilized by Customer for such Billing Period.

7.2 The Energy Operating Charge Rate shall be the sum of (a) the Hawaiian Electric Company, Inc. (“HECO”) demand charge in $/kW multiplied by 0.004 and (b) the energy charge in $/kWh, multiplied by 0.2 according to the effective rate for schedule P, large power service, as submitted the same month as HSWAC’s corresponding Billing Period by HECO to the Hawai’i Public Utilities Commission (“PUC”), and is published monthly at the following link on the HECO web site: https://www.hawaiianelectric.com/my-account/rates-and-regulations/effective-rate-summary.

By way of an example the Energy Operating Charge Rate, for the Billing Period of July 2016, using the effective rate for schedule P as submitted by HECO for July, 2016 would be:

Demand charge schedule P for July, 2016: $24.34 per kW
Energy charge schedule P for July, 2016: $0.159165 per kWh

Energy Operating Charge Rate for July, 2016 = 0.2 x ((0.004 x $24.34) + $0.159165)
Energy Operating Charge Rate for July, 2016 = $0.051305

In the event the effective rate submittal by HECO to PUC is discontinued or the HECO rate structure is substantially altered, HSWAC and the Customer shall reasonably agree on a revised Energy Operating Charge Rate.

7.3 Customer’s Ton-hours shall be determined by measuring the volume of Chilled Water delivered to Customer’s Building and the difference between the temperature of the Chilled Water received at the Point of Delivery from the District Cooling System and the temperature of the Chilled Water returned at the Point of Delivery.

ARTICLE 8

MISCELLANEOUS CHARGE CONSIDERATIONS

8.1 Customer shall pay reasonable charges incurred by HSWAC as a result of the action or inaction of Customer for specific services charged to Customer, solely for reasonable expenses and costs directly related to the following: (a) service shutoff and/or reinstatements caused by the fault or negligence of Customer; (b) damage to system equipment caused by the fault or negligence of Customer or Customer’s employees, agents, tenants, licensees, or trespassers; (c) consumption of system water, caused by the fault or negligence of Customer; and (d) service calls for problems caused by the fault or negligence of Customer. Customer shall pay such charges in addition to Capacity Charges and Operating Charges as due and said charges shall be included in Customer’s monthly billing.
8.2 Customer’s allowable Chilled Water flow in any Billing Period shall be equal to or less than 144 gallons per Ton-hour multiplied by Ton-hours used in that period. Beginning on January 1 immediately following the First Service Date, for any month in which Customer’s Chilled Water flow is less than 130 gallons per Ton-hour used, Customer shall receive a “Reduced Flow Credit” (described herein below). Beginning on January 1 immediately following the First Service Date, for any month in which Customer’s actual Chilled Water flow exceeds 160 gallons per Ton-hour used, Customer shall pay an “Excess Flow Charge” (described herein below). The rate of such Reduced Flow Credit shall be $1.00 for every thousand gallons below 130 gallons per Ton-hour used and the rate of such Excess Flow Charge shall be $1.00 for every thousand gallons above 160 gallons per Ton-hour used. Thereafter on each subsequent January 1, the Reduced Flow Credit and the Excess Flow Charge shall be subject to an annualized percentage adjustment from the charge set forth above equal to the average annualized percentage adjustment in the Energy Operating Charge Rate, as defined in Section 7.2.

ARTICLE 9

METERING

9.1 Prior to Customer’s First Service Date, HSWAC shall install, at HSWAC’s expense, all Metering Equipment. The Metering Equipment shall be read by HSWAC to determine Customer’s Ton-hours utilized and Contract Capacity, at least once each Billing Period, subject to Section 9.6.

9.2 Subject to the provisions of Article 15 below, Customer shall permit HSWAC to install Metering Equipment in Customer’s Building or on Customer’s premises in the area adjacent to the Point of Delivery or such other area as may be specified by mutual agreement of the parties, taking into account accessibility and Customer’s need for Building security.

9.3 HSWAC shall own and maintain the Metering Equipment in good repair and operating condition at HSWAC’s expense. Customer shall not cause or permit any modification or alteration to any part of the Metering Equipment except in an emergency situation.

9.4 Any electricity reasonably required for the operation or maintenance of the Metering Equipment shall be supplied by Customer at Customer’s expense.

9.5 Customer shall promptly notify HSWAC in writing if at any time Customer has reason to believe the Metering Equipment is not accurately measuring the Ton-hours used by the Building Cooling System or Customer’s Contract Capacity.

9.6 In any Billing Period during which the Metering Equipment shall fail to register utilization of Ton-hours by Customer, the amount of Ton-hours utilized by Customer during such period shall be estimated by HSWAC based on the average Ton-hours utilized by Customer over the preceding twelve (12) month billing periods (or such lesser period as may be available), and Customer shall be billed and shall pay accordingly. At least quarterly, HSWAC shall read the Metering Equipment and thereafter appropriately credit or charge Customer for the Ton-
hours it actually utilized in comparison with the previously estimated utilization that was billed to and paid by Customer.

9.7 HSWAC shall test and calibrate the Metering Equipment as may be reasonably necessary to ensure the accuracy of such equipment.

ARTICLE 10

BILLING AND PAYMENT

10.1 HSWAC shall within thirty (30) days following the end of a Billing Period send to Customer a Service Bill.

10.2 Payment of a Service Bill shall be due and payable within thirty (30) days without set-off, counterclaim, abatement, or reduction by Customer.

10.3 Customer shall be charged a fee of one and one-half percent (1.5%) per month of the amount due as a “Late Fee” for making less than a full payment of all amounts due pursuant to a Service Bill within thirty (30) days of the date of such bill.

10.4 In the event delivery of Chilled Water to Customer is suspended or terminated without fault or negligence of HSWAC and Customer requests resumption of delivery of Chilled Water to Customer such resumption shall not occur, until Customer pays in full all charges incurred by or properly assessed upon Customer to the date of resumption of delivery of Chilled Water.

10.5 The State of Hawai‘i General Excise Tax, if applicable, and any other similar governmental tax or charge will be included as a separate charge to Customer on the Service Bill, such that when added to charges due, shall yield to HSWAC after deduction of all such tax payable by HSWAC with respect to such charges a net amount which HSWAC would have realized from such charges had no such tax been imposed.

ARTICLE 11

ADDITIONAL CUSTOMER COVENANTS AND OBLIGATIONS

11.1 Without the prior express, written consent of HSWAC, Customer shall not cause or voluntarily permit any action which interferes with the delivery or return of Chilled Water, the utilization of Ton-hours, or the operation, maintenance, repair, replacement, construction, installation, expansion, removal or alteration of the District Cooling System or the Metering Equipment, except in an emergency situation where life, health or property is threatened (in which case Customer shall notify HSWAC as soon thereafter as possible).

11.2 Customer shall hold harmless and indemnify HSWAC from and against liabilities, losses, damages, costs, expenses (including attorneys’ fees), claims, actions, judgments, and settlements of any nature whatsoever, for any personal injury, death, or property or economic
damage arising out of or incidental in any manner whatsoever, to the operation of Customer’s Building Cooling System, but only to the extent such injury, death or damage was not caused by the negligence, recklessness or intentional misconduct of HSWAC or its officers, employees, agents, lessees, licensees, invitees, or contractors.

11.3 Customer shall secure and maintain in good standing reasonable amounts of commercial general liability insurance and appropriate workers’ compensation and employers’ liability insurance as is required by the laws of the State of Hawai‘i for all employees working in or at the Building and its surrounding premises.

11.4 Customer shall not provide Chilled Water from its Building Cooling System to any building other than such Building or buildings and appurtenant structures, as identified in Section 1.3, without the prior express, written consent of HSWAC.

ARTICLE 12

ADDITIONAL HSWAC COVENANTS AND OBLIGATIONS

12.1 In accordance with the applicable laws and regulations, HSWAC shall maintain the District Cooling System and the Metering Equipment in good repair and operating condition and cause it to be operated in a safe and efficient manner.

12.2 HSWAC shall hold harmless and indemnify Customer from and against liabilities, losses, damages, costs, expenses (including attorney’s fees), claims, actions, judgments, and settlements of any nature whatsoever, for any personal injury, death or property or economic damage arising out of or incidental in any manner whatsoever to the operation of the District Cooling System or Metering Equipment, but only to the extent such injury, death, or damage was not caused by the negligence, recklessness or intentional misconduct of Customer or its officers, employees, agents, lessees, licensees, invitees, or contractors. In no event shall HSWAC be liable to Customer for any indirect, consequential, special or punitive damages.

12.3 HSWAC shall secure and maintain in good standing reasonable amounts of commercial general liability insurance and appropriate workers’ compensation and employers’ liability insurance as is required by the laws of the State of Hawai‘i for all employees working in or at the Building and its surrounding premises, and all necessary permits, easements, licenses, franchises and rights necessary or desirable to make and continue the delivery of Chilled Water to Customer.

ARTICLE 13

INTERRUPTION OF SERVICE

13.1 Customer’s obligation to make payments for, and HSWAC’s obligation to charge, a Capacity Charge shall be adjusted by appropriate reduction to any Billing Period during which HSWAC is unable for 24 consecutive hours to perform its obligations to deliver Chilled Water in
accordance with this Agreement. Any such Billing Period Capacity Charge adjustment shall be equal to the Billing Period Capacity Charge, before the adjustment, times the ratio of the amount of Ton-hours actually utilized by Customer during the Billing Period to an estimate of the total Ton-hours Customer would have used if HSWAC had fully performed in accordance with this Agreement.

13.2 Subject to appropriate reduction in charges in accordance with Section 13.1 above, HSWAC shall have the right to interrupt, reduce or discontinue the delivery of Chilled Water to the least extent necessary, for purposes of inspection, maintenance, repair, replacement, construction, installation, removal or alteration of the District Cooling System or the Metering Equipment. HSWAC shall, to the extent reasonably possible, give written notice to Customer of any expected interruption of delivery of Chilled Water at least sixty (60) days prior to the date of such interruption and shall use commercially reasonable efforts to inform Customer of the expected length of any interruption.

13.3 HSWAC shall not be required to supply Chilled Water to Customer and may suspend or terminate such supply at any time HSWAC reasonably believes Customer’s Building Cooling System to be in an unsafe condition, provided HSWAC has given written notice of the basis for such belief at least thirty (30) days prior to suspension or termination of Chilled Water delivery unless such condition constitutes an emergency condition in which case HSWAC shall have the immediate right to interrupt service. In the event that, during such 30-day period Customer cures, or demonstrates to the reasonable satisfaction of HSWAC that it has made progress toward cure of such unsafe condition, then such suspension or termination shall be canceled or delayed by HSWAC.

ARTICLE 14

TERMINATION

14.1 If one or more of the following events or conditions shall exist or occur, Customer may elect to terminate this Agreement by giving written notice to HSWAC of such fact no less than thirty (30) days prior to the date of such termination:

(a) Customer’s Building is destroyed or demolished for which rebuilding or substantial repairs are not undertaken or planned within twelve (12) months following such destruction. In the event that rebuilding or substantial repairs are undertaken or planned within twelve (12) months following such destruction or demolition, the full terms of this Agreement shall be reinstated commencing on the first day the Building utilize any Chilled Water; or

(b) Customer’s Building becomes permanently abandoned, inoperable and uninhabitable and has been so for a period in excess of twelve (12) months; or

(c) It becomes unlawful under any final federal, state or local law, regulation or rule for HSWAC to deliver to Customer or for Customer to receive and pay for Chilled Water; or
(d) HSWAC fails to provide Chilled Water to Customer’s Building on or before the Option to Terminate Date provided in Section 1.10 or

(e) Following the initial delivery of Chilled Water to Customer’s Building, subject to Section 20.4, HSWAC is unable to deliver Chilled Water at a supply temperature of 44 degrees Fahrenheit or lower for a cumulative period of 5% or more of the time during a calendar year.

14.2 If one or more of the following events or conditions shall exist or occur, HSWAC may elect to terminate this Agreement by giving written notice to Customer of such fact not less than thirty (30) days prior to the date of such termination:

(a) Customer fails to pay any amounts due under Customer’s Service Bill within forty-five (45) days from the date thereof; or

(b) Customer fails to duly observe or perform any material covenant or obligation to be observed or performed by Customer pursuant to this Agreement (other than nonpayment of Service Bills) and Customer fails to cure such failure or so observe or perform (or demonstrate to the reasonable satisfaction of HSWAC that Customer has made progress toward cure with a reasonable expectation of full cure within a reasonable period) within the forty-five (45) days following a written, specific request from HSWAC to do so; or

(c) Customer’s Building, or any substantial portion of the District Cooling System, is permanently abandoned, destroyed, demolished, substantially destroyed or demolished, becomes permanently inoperable or is taken by right of eminent domain; or

(d) It becomes unlawful under any final federal, state or local law, regulation or rule for HSWAC to deliver to Customer or for the Customer to receive and pay for Chilled Water.

(e) Customer fails to accept, when HSWAC is prepared to deliver, Chilled Water to Customer’s Building for a period of three (3) consecutive months after the Scheduled First Service Date.

Except with respect to Section 14.2(c) and 14.2(d) above, the HSWAC election to terminate this Agreement shall not release Customer of Customer’s Capacity Charge obligations for the remaining Term of this Agreement. Such remaining Capacity Charge shall upon such termination under this Section 14.2 be immediately due and owing from Customer to HSWAC. For a termination under Section 14.2(e), the remaining Capacity Charge shall be calculated as if the First Service Date is the last day of the period of three (3) consecutive months after the Scheduled First Service Date. HSWAC shall, however, have an obligation to reasonably mitigate its damages under this Section 14.2.

ARTICLE 15

RIGHT-OF-WAY; ACCESS TO BUILDING
15.1 In order to implement the provisions of this Agreement, Customer shall grant HSWAC the necessary right-of-way to enter Customer’s land and Building for the purpose of installation of the customer connection to the District Cooling System. Both parties contemplate that the right-of-way will be consistent with Exhibit A. Duly authorized agents, officers, and employees of HSWAC shall have the right to enter into the Building and onto the surrounding premises of Customer’s Building at reasonable times and on reasonable notice when necessary for construction, installation, inspection, repair, replacement, removal, alteration or calibration of the Metering Equipment and the District Cooling System, subject to reasonable supervision by Customer. Except in an emergency situation, HSWAC shall provide Customer at least one (1) business day advance written notice. Customer shall duly grant such access to the Building and surrounding premises to the extent reasonably necessary to cause and continue delivery of Chilled Water, and so long as same does not materially impair the continued use of the Building and surrounding premises. HSWAC shall comply with all laws and regulations in connection with any such entry, and any damage to the Building or surrounding premises caused or made by HSWAC or HSWAC’s agents shall be promptly repaired by HSWAC; and HSWAC shall put the Building and surrounding premises back in the same pre-HSWAC damaged condition as before the entry. HSWAC hereby agrees to indemnify, defend and hold Customer harmless from and against claims, damage, injury or liability proximately caused by HSWAC or HSWAC’s agents under this Section 15.1.

ARTICLE 16

RECORDS AND ACCOUNTS

16.1 HSWAC shall keep and maintain such true and complete books, records, and accounts as shall be necessary to compute Service Bills, Contract Capacity, and specific service charges, preserving the same for a period not less than three (3) years following the calendar year to which they apply.

16.2 Subject to entering into a confidentiality agreement reasonably acceptable to HSWAC, Customer shall have the right, to be exercised not more than once during each calendar year, at any reasonable time during HSWAC’s business hours, upon three (3) business days’ prior written notice to HSWAC, to examine, audit or copy, at Customer’s expense, all books, records and accounts of HSWAC applicable to Capacity and Operating Charges, or upon Customer’s account or Customer’s required performance of this Agreement; provided that HSWAC shall not be required by this provision to disclose confidential operating information of other customers unless such information is required to be disclosed pursuant to law, court order or subpoena.

ARTICLE 17

ARBITRATION
17.1 In the event that the parties experience a dispute regarding any term of this Agreement, the parties agree to work in good faith to amicably resolve the dispute to the satisfaction of each party. To fulfill this commitment, the parties agree to meet informally on one or more occasions to seek resolution; in the event the informal negotiations do not resolve the dispute, the parties agree that each will designate a senior manager to meet in a continued effort to revisit the dispute and seek resolution. The parties agree that any controversy or claim arising under or in connection with this Agreement that cannot be resolved by negotiation, including but not limited to the correctness of the computational or measurement process related to calculation of Customer's Operating Charges or Capacity Charges, shall be settled by binding arbitration in Honolulu, Hawai‘i, conducted by DPR. In the event that DPR is not available, a substantially similar arbitration service shall be utilized. The arbitration shall use one arbitrator, in accordance with the rules of DPR and the laws of the State of Hawai‘i, including but not limited to Chapter 658A, Hawai‘i Revised Statutes, or successor provisions, subject to any rights of appeal, modification, vacation, or confirmation before a court of competent jurisdiction. Each party shall bear their respective costs of said arbitration and any litigation. Judgment on the arbitrator’s award may be entered by any court of competent jurisdiction.

ARTICLE 18

AMENDMENT AND WAIVER

18.1 Except as otherwise expressly provided herein, neither this Agreement, nor any of its terms, may be terminated, amended, altered, or modified except by an instrument in writing executed by Customer and HSWAC; provided, however, no such amendment shall be made which shall conflict with, or cause a default, penalty, new lien or acceleration of performance, under any HSWAC indenture or financing agreement.

18.2 Any waiver at any time by either HSWAC or Customer of its rights concerning a default or any matter arising from or incidental to this Agreement shall not constitute a waiver concerning any other default or matter.

18.3 Failure of HSWAC or Customer to enforce at any time any provision of this Agreement to require at any time performance by the other party of any provision herein shall not constitute or be deemed a waiver of such provision nor affect in any manner the validity of this Agreement or the right of such party to enforce any provision herein unless such waiver be in writing and specifically referring to the provision sought to be enforced.

ARTICLE 19

ASSIGNMENT; SUCCESSORS

19.1 Except as set forth in this Article 19, neither party shall assign or otherwise transfer any interest in this Agreement without the prior written consent of the other, which consent shall not be unreasonably withheld. For purposes of this Section 19.1, any change in ownership or control of a party shall be deemed an assignment. This Agreement shall inure to the benefit of
and be binding upon the successors, personal representatives, heirs, trustees and assigns of the parties hereto.

19.2 In the event that Customer conveys by any means all, or substantially all, of Customer’s interest in the Building and fails to secure an assumption of this Agreement reasonably acceptable to HSWAC, then and in that event, HSWAC may, in its sole discretion, suspend or terminate services to the Building.

19.3 Customer acknowledges and accepts the fact that the HSWAC financing of this capital-intensive deep water district cooling project requires the creation of one or more mortgages, liens, security interests and subordinated mortgage, liens and security interests on the District Cooling System that may require assignment of this Agreement and Customer’s direct payment or payments to third parties.

ARTICLE 20

GENERAL PROVISIONS

20.1 If any of the terms, covenants or conditions of this Agreement shall be held invalid by any court having jurisdiction, all other terms, covenants and conditions of this Agreement and their application shall remain valid, enforceable and not affected thereby.

20.2 The validity, performance, construction, interpretation and enforcement of this Agreement and all of its terms, covenants and conditions, shall be governed by and be in accordance with the laws of the State of Hawai‘i.

20.3 All indemnification provisions shall survive the Term and termination of this Agreement.

20.4 Performance of this Agreement is subject to the good faith performance by the parties and neither party shall be penalized or adversely affected in the performance of this Agreement by acts of war or acts of nature, or similar occurrences beyond the reasonable control of the parties, including without limitation construction, governmental acts, actions or inaction.

20.5 Nothing in this Agreement, express or implied, is intended to confer any rights or remedies whatsoever upon any person, other than Customer and HSWAC and their lenders, respective successors and permitted assigns and transferees.

20.6 This is the sole and only agreement between the parties on the subject matter hereof. Any and all prior oral or written representations, correspondence, letters of intent and agreements are merged into and superseded by this Agreement and shall be of no force or effect.
EXHIBIT A: POINT OF DELIVERY AND RIGHT-OF-WAY
Any and all information contained in these documents should be considered proprietary copyrighted materials, and competition sensitive. Use or disclosure of information in this document is subject to written authorization of Honolulu Seawater Air Conditioning.
EXHIBIT B: CUSTOMER CONNECTION STANDARDS FOR HSWAC DISTRICT COOLING
Exhibit B

Customer Connection Standards for HSWAC District Cooling and
Recommended Practices for Designing and Maintaining District Cooling Connected Building Systems

Version 2.2 December 1, 2011

Honolulu Seawater Air Conditioning, LLC

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PART 1
CUSTOMER CONNECTION STANDARDS FOR HSWAC DISTRICT COOLING

1. INTRODUCTION
The Honolulu Seawater Air Conditioning, LLC. (“HSWAC”) District Cooling Customer Connection Standards have been prepared to ensure that customer connections installed in accordance with these criteria, will operate efficiently and reliably to the benefit of all customers connected to the district cooling system. These Standards describe the minimum connection requirements. Additional guidance and suggestions for optimal performance of building systems connected to district cooling can be found in “Part 2 – Recommended Practices for Designing and Maintaining HSWAC District Cooling Connected Building Systems” or by contacting HSWAC.

2. SERVICES PROVIDED BY HSWAC

2.1 Primary Chilled Water System Design Criteria

a) System Temperature
The HSWAC district cooling primary chilled water system is designed to supply 44°F chilled water to the Customer. The HSWAC district cooling pumping system is designed for a minimum chilled water return temperature of 54°F.

b) System Pressure
The district cooling distribution system components are designed for 150 PSIG and are pressure tested at 225 PSIG. The system will normally operate at less than 150 PSIG. Differential pressures between chilled water supply and return will vary. A minimum differential of 15 PSI will be maintained at the end of the distribution system.

c) Maximum Static Head
The maximum installed height of buildings that can be directly connected to the primary system is 175 ft. above Mean Sea Level (MSL). Customers that have chilled water piping or equipment installed below MSL are required to have all piping and equipment rated for 250 PSIG or to install a heat exchanger.

2.2 Equipment/Devices/Services provided by HSWAC

a) Chilled Water Service Pipes
Chilled water supply and return pipes will be installed to a location just inside of the Customer’s building wall. Termination will be with a shut-off valve and flange. HSWAC will provide wall openings for existing buildings. The Customer is required to provide wall openings for new construction. Location and sizes of the openings will be coordinated with HSWAC. HSWAC will install a “shunt assembly” consisting of drains or vents on the supply and return lines and a connecting line between the supply and return lines to allow a minimal flow during the times chilled water is not utilized for extended periods by the Customer. HSWAC will insulate the primary piping from the building wall to the shut off valves and the “shunt assembly” piping and valves.
b) **Dielectric Isolation Kit**
   To provide cathodic protection to its distribution piping system, HSWAC will provide a dielectric isolation kit for installation by the Customer's mechanical contractor. Isolation kit is to be installed at the flange downstream of the HSWAC installed shut off valves.

c) **Meter**
   HSWAC will furnish a meter with accessories that is capable of measuring and recording energy use and peak capacity and will furnish shop drawings for the meter installation. Customer will furnish a 120V, 20 amp dedicated circuit breaker and wiring to the meter location. Customer's mechanical contractor will install the flow meter and temperature sensor wells and flow tube. Installation of metering electronics, related wiring, calibration and commissioning of the meter assembly, as well as all future maintenance will be provided by HSWAC.

d) **Initial System Fill**
   HSWAC will provide the initial fill of treated chilled water for the Customer's direct connected system. HSWAC personnel will open service valves and coordinate filling procedure with Customer.

e) **Makeup Water**
   HSWAC anticipates small volumes of make-up water will be required for normal operation of Customer's direct connected chilled water system. Large volumes of make-up water, caused by draining of the system or a break in the building distribution system will be billed to the Customer at cost.

f) **Chemical Treatment**
   All chemical treatment for chilled water will be provided by HSWAC for direct connected Customers. No water treatment chemicals or other products shall be injected or introduced into the chilled water system by direct connected Customers.

g) **Thermal Expansion**
   The design of the primary chilled water system will accommodate thermal expansion, including expansion within the Customer's direct connected secondary system.

h) **Inspection**
   HSWAC will inspect Customer's installation and open service valves to fill system. HSWAC shall be notified of cleaning and pressure tests. Witness of the testing to be at the discretion of HSWAC.

i) **Differential Transmitter**
   For some Customers, a system differential transmitter may be installed by HSWAC in the Customer's building to assist in the monitoring and control of the distribution system pressure.
3. CUSTOMER REQUIREMENTS

3.1 General Secondary Chilled Water Building System Design

a) General

Customer is responsible for the design, installation and maintenance of the secondary chilled water system serving their building. The secondary chilled water system shall be hydraulically isolated from the primary system via the cross over bridge or heat exchanger. Use of a heat exchanger isolates the district cooling service from the Customer’s system; this type of connection is labeled an indirect connection. Direct connection to the district cooling service is also available if the building system component pressure rating, building height, etc. is according to the parameters set forth in this Customer Connection Standards.

The secondary system shall include, but not be limited to, circulating pumps, regulating devices, heat exchangers, temperature controls, accessories and distribution piping as detailed in the connection drawings included in this document. The secondary system must have separate circulating pumps. The HSWAC primary distribution system pumps will not be sized to circulate chilled water through the Customer's system.

Existing secondary chilled water systems, especially in older buildings, will have to be carefully studied. Existing systems are required to be modified or upgraded to accommodate design temperatures and pressures as described in Section 2.1 of this document.

Key to the successful design of the Customer's system is the ability to return a minimum of 54°F chilled water return temperature back to the HSWAC primary system.

The Customer's system design, as prepared under the guidelines of these Standards, must be reviewed and approved prior to installation. Any alteration or modification to the approved design must be approved by HSWAC.

b) Secondary System Temperatures

The secondary chilled water supply should be designed for 44°F entering the building. The secondary system must be designed for a minimum chilled water return temperature of 54°F. For greater efficiency in HSWAC’s primary pumping systems new buildings should be designed for 58°F chilled water return temperature.

c) Secondary System Pressures

Direct connected secondary systems are required to have all piping, valves, coils, and system components rated for 150 PSIG operating pressure at MSL or above and pressure tested to 195 PSIG. Indirectly connected secondary systems, isolated from HSWAC’s primary system by a heat exchanger, are not required to meet the pressure rating above.

d) Service Piping, Entrance

HSWAC will install chilled water supply and return pipes into the Customer's building, just far enough to terminate with service valves and flanges. Wall openings for existing buildings will be provided by HSWAC. Wall openings for new construction will be provided by the Customer.
e) Insulation
Pipe insulation from HSWAC’s isolation valve is the responsibility of Customer. It is recommended that all exposed piping, valves, fittings, strainers, etc., be insulated to protect from corrosion. Provide a one inch minimum, fiberglass, or equivalent insulation with an encapsulating, protective covering for all exposed surfaces. Prior to insulating, flushing and pressure testing of primary and secondary piping must be completed per Section 3.1h System Cleaning, Flushing and Pressure Testing.

f) District Cooling Control Valve
The district cooling control valve is to be provided by Customer. Recommended valve types are V-notched ball valves (a characterized ball or rotary valve) or globe valves. (Note: Globe valve shall be Envire-seal or single PTFE v-ring type to ensure long service life.)

Valve specifications:
• ANSI class 125.
• 5 PSI maximum pressure drop.
• 75 PSI minimum differential pressure.
• 1:50 minimum rangeability.
• Industrial quality electrical actuator with position indicator and manual operation capability.
• Valve seat leakage classification minimum Class IV.

Control sequence:
• Proportional Integral (PI) loop control; equal percentage.
• Modulate valve to maintain a minimum chilled water return temperature of 54°F in existing buildings and 58°F in new buildings. Accuracy of controller should be +/- 1/2° F.
• Valve actuator to be normally closed (NC) and shall be capable of closing against full differential pressure.
• Valve to go to the full closed position when Customer pumps are stopped.

g) Miscellaneous Piping Accessories
Strainer - Install strainer(s) with blowdown valve as shown on piping diagrams. The strainer is required to protect the control valve, meter and HSWAC’s primary system. Install pressure gauge across strainer. Blowdown of the strainer is the responsibility of the Customer. Maximum allowable pressure drop across strainer is 2 PSI. The stainless steel screen shall have .045 inch mesh for pipe diameters up to 4 inch and 1/10 inch for 5 inch and larger sizes.

Isolating flanges - Flanges are provided by HSWAC to be installed downstream of service valves. HSWAC will also provide a dielectric kit, including insulating gasket, plastic bolt sleeves and plastic washers, to be installed by Customer. The dielectric kit will provide cathodic isolation between HSWAC primary distribution system and Customer’s secondary system.

Pressure gauges and thermometers - Provide where shown in Section 5, Figure 5.1 or Figure 5.2.
h) **System Cleaning, Flushing and Pressure Testing**

Customer shall clean, de-grease, flush and hydrostatically pressure test the secondary chilled water system. Customer's consultant should specify exact procedure to be used. The procedure is to be submitted to HSWAC for review. Minimum procedural requirements are:

- Fill system with city water.
- Add tri-sodium phosphate or other commercial cleaner to water at a concentration as recommended by product manufacturer.
- Circulate for 8 hours.
- Drain and refill with city water.
- Circulate for 4 hours.
- Blow-down at frequent intervals until conductivity approaches that of city water.
- Hydrotest primary piping to 195 PSIG with the building side filled and isolated for indirect connected systems with heat exchanger. Direct connected systems require complete system test of 195 PSIG for all piping, valves, and air handling coils.
- A HSWAC representative shall witness all testing and cleaning.

### 3.2 Design Requirements for Direct Connection to HSWAC

If Customer's secondary chilled water system has been designed to operate at 150 PSIG at MSL or above, tested to 195 PSIG (per ASME Code section VIII, Div. 1) for a minimum of 30 minutes, and is able to return chilled water to the HSWAC primary system at 54°F, it can be directly connected to HSWAC’s district cooling system.

It is the Customer's responsibility to review their chilled water system design, making modifications as required (and approved by HSWAC) and install all piping, valves and equipment from the point of service (See Section 5, Figure 5.1). The system is to be installed in an area protected from hazards. Wherever possible, system components shall be accessible without the use of ladders and lifts.

System is to be designed so that secondary chilled water pumps run whenever cooling in the building is required.

### 3.3 Design Requirements for Indirect Connection With Heat Exchanger

A heat exchanger is required to physically separate the primary HSWAC district cooling system from the Customer's secondary system if any of the following conditions exist:

- Customer's building exceeds 175 ft. height above Mean Sea Level.
- Customer's building base is lower than Mean Sea Level and Customer’s chilled water system is not designed to operate above 150 PSIG.
- Customer's chilled water system is not designed to operate at 150 PSIG.
- Customer's chilled water system requires isolation from HSWAC district cooling system, typically because of special operating temperatures or special chemical treatment.

When a heat exchanger is required because of building height, it is not necessary for the heat exchanger to be sized for the entire building. The heat exchanger only needs to serve the portion of the building that exceeds 175 feet above Mean Sea Level.
There are several types of heat exchangers that would serve this application. Generally a plate type heat exchanger (plate and frame) should be used. It will allow for the closest approach temperatures to the HSWAC chilled water supply temperature. The heat exchanger should be selected to meet the following criteria:

- Maximum pressure drop, primary side, 7 PSI
- 44°F. EWT and 54°F. LWT (primary side)
- Designed for 150 PSIG operating pressure, ASME stamped
- Threaded or flanged connections
- Insulation with external shroud protector

It is the Customer's responsibility to review their chilled water system design, making modifications as required and install all piping, valves and equipment from the point of service (See Section 5, Figure 5.2). Customer is responsible for make-up water and chemical treatment on the secondary side of the heat exchanger.

3.4 Engineering Drawings and Specifications

Drawings and Specifications to be submitted to HSWAC for review prior to request for proposal for the Customer connection installation. The following shall be included for review:

- Cooling load calculations (both tons and GPM)
- System volume (gallons)
- Pressure ratings for all equipment
- Cleaning and flushing procedure
- Temperature control sequences
- Flow diagrams/piping schematics
- Plans indicating location of service entrance

4. DEFINITIONS

Mean Sea Level (MSL) ... Tidal datum determined over a 19-year National Tidal Datum Epoch (NTDE) as maintained by the Center for Operational Oceanographic Products and Services. The present NTDE is 1983 through 2001.

Dielectric......................... An insulator\(^1\); A coupling designed to isolate two dissimilar metals or provide isolation to another piping system.

Furnish ......................... Deliver to the site item(s) and store for installation as specified.

Heat Exchanger, Plate & Frame

Fixed plates which segment and keep separate hot and cold fluids.\(^1\)

Install......................... Set in position, connect (including sub-assemblies furnished), and adjust for use. Provide miscellaneous specialty items such as hangers, valves, unions, piping, sheet metal as required for a complete and operating installation.

\(^1\) 1981 ASHRAE Fundamentals Handbook
Meter .............................. An instrument for measuring rates or integrating rates over a period of time.\(^1\)

Modulating ...................... Of a control, tending to adjust by increments and decrements; also one modified by variation of a second condition.\(^1\)

Pressure ......................... The normal force exerted by a homogenous liquid or gas, per unit of area, on the wall of the container.\(^1\)

Pressure, Gauge .............. Pressure above atmosphere; pound per square inch. All pressure referenced in this document as gauge pressure stated in PSIG.

Pressure, Static ............. (1) the pressure with respect to a stationary surface tangent to the mass flow velocity vector; (2) the pressure with respect to a surface at rest in relation to the surrounding fluid.\(^1\)

Pressure Drop ............... Static pressure loss in fluid pressure, as from one end of a pipe to the other, due to friction, etc.\(^1\)

Pressure Relief Valve ..... A valve closed by a spring or other means and designed to automatically relieve pressure in excess of its setting; also called safety valve.\(^1\)

Primary/Secondary Pumping Systems
When two circuits are inter-connected, flow in one will not cause flow in the other if the pressure drop in the piping common to both is eliminated.\(^2\) The primary system is defined as the main distribution for the chilled water system, circulated by HSWAC. The secondary system is defined as the building side of the chilled water system, circulated by the Customer.

Service Point .................. Point at which HSWAC terminates service entry piping which Customer connects to. Indicated by a \(\bullet\) symbol.

Thermometer .................. An instrument for measuring temperature\(^1\)

\(^2\) Bell & Gossett – Primary Secondary Pumping Application Manual, 1968
5. SCHEMATICS

Figure 5.1 Piping Schematic – Direct Connection to HSWAC District Cooling

NOTES:
1. SCHEMATIC IS REPRESENTATION OF CHILLED WATER PIPING. CONTRACTOR REQUIRED TO CONFIRM SUPPLY AND RETURN WATER LINES WITH HSWAC.
2. ALL SERVICE PIPING AND VALVES TO BE RATED FOR 150 PSIG MINIMUM WORKING PRESSURE AND CLEANED AND TESTED TO 195 PSIG PER HSWAC CONNECTION STANDARD SECTION 3.1. ALL ISOLATION VALVES TO BE BALL OR BUTTERFLY TYPE DESIGN.
3. CUSTOMER IS RESPONSIBLE FOR DESIGN OF SYSTEM INTERFACE.
4. FLOW METER REQUIRES SPECIFIC PIPE DIAMETER SIZED FOR INSTALLATION. CONSULT HSWAC PRIOR TO INSTALL.
5. ALL THERMAL WELLS REQUIRE 45 DEGREE PLACEMENT AGAINST WATER FLOW OR INTO A TEE/ELBOW WITH INSTALLATION OF WELL AGAINST THE WATER FLOW.
6. PROVIDE HIGH POINT VENTS AND LOW POINT DRAINS.

FIG. 5.1 - PIPING SCHEMATIC
DIRECT CONNECTION TO HSWAC DISTRICT COOLING

JV1242007
Figure 5.2 Piping Schematic – Indirect Connection to HSWAC District Cooling with Heat Exchanger

**NOTES:**
1. SCHEMATIC IS REPRESENTATION OF CHILLED WATER PIPING. CONTRACTOR REQUIRED TO CONFIRM SUPPLY AND RETURN WATER LINES WITH HSWAC.
2. ALL SERVICE PIPING AND VALVES TO BE RATED 150 PSIG MINIMUM WORKING PRESSURE AND CLEANED AND TESTED TO 195 PSIG PER HSWAC CONNECTION STANDARD SECTION 3.1. ALL ISOLATION VALVES TO BE BALL OR BUTTERFLY TYPE DESIGN.
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6. PROVIDE HIGH POINT VENTS AND LOW POINT DRAINS.

CUSTOMER RESPONSIBLE FOR ALL PIPING FROM ISOLATION FLANGE.
Figure 5.3 Piping Schematic – Energy Meter Installation

1. CUSTOMER SERVICE SHUT OFF VALVES - 150 lb RATED, BALL OR BUTTERFLY TYPE.
2. LINE STRAINER WITH BLOW DOWN VALVE.
3. PRESSURE GAUGE WITH SHUT OFF VALVES (BALL TYPE).
4. DIGITAL WATER THERMOMETER.
5. VENT VALVE (ALL HIGH POINTS).
6. DRAIN VALVE (ALL LOW POINTS).
7. PIPE REDUCER TO MATCH FLOW METER INLET, NOTE PIPE LENGTH.
8. PIPE INCREASER TO REVERT BACK TO REQUIRED LINE SIZE, SEE NOTE.
9. TEMPERATURE SENSORS REQUIRE INSTALLATION OF WELLS AT 45 DEG ANGLE AGAINST THE DIRECTION OF WATER FLOW. OPTIONAL INSTALLATION REQUIRES PLACEMENT OF THE WELL IN A PIPE "T" AGAINST THE FLOW OF WATER SEE INSET FIGURE 3A.

ITEMS FURNISHED BY HSWAC:
*Thermal wells and temp sensors (2 typ)
*Flow meter

ITEMS FURNISHED AND INSTALLED BY HSWAC:
*Energy meter and related sensor wiring

ITEMS TO BE FURNISHED AND INSTALLED BY CONTRACTOR:
*Mating (flow meter) flanges, gaskets, and bolts
*Electrical power and J-box as noted above
*Flow meter grounding stud (2) ½"thread by 2" long threaded rod welded (or tapped) to each outside flange.
*All piping, valves, and related items (150 lb rating) from HSWAC service flanges

FIG. 5.3 - PIPING SCHEMATIC
ENERGY METER INSTALLATION

JV1242007
1. INTRODUCTION

These guidelines are intended to assist the building system engineers in designing and maintaining a building system and the interface with the district cooling system in a manner which will maximize the performance and efficiency of the district cooling service provided by HSWAC. The Recommended Practices can also help the building operator understand the requirements for efficient operation of the district cooling service.

This Recommended Practice document is designed to be used in conjunction with "Part 1 - Customer Connection Standards for HSWAC District Cooling (hereafter referred to as "Standards"). Please review the Standards, which provides:

- definitions of key terms;
- basic design criteria, equipment and services provided by HSWAC; and
- minimum Customer requirements for design of the building system and design of the connection to the HSWAC district cooling system.

2. GENERAL DESIGN CONSIDERATIONS

2.1. Temperature difference

The HSWAC primary chilled water system is designed to supply 44° F water to the Customer. The primary system is designed for a minimum return water temperature of 54° F, resulting in a temperature difference (delta T) of 10° F. A larger delta T - 12° F or more - is highly desirable and is generally achievable. HSWAC strongly recommend a design of at least a 14° F delta T, and higher whenever possible, when selecting replacement of cooling coils.

An adequate delta T is critical. Low delta T will utilize less of the seawater energy and require additional flow, thereby increasing the utilization of chillers and decreasing the capacity of the HSWAC distribution system. Ensuring adequate delta T is an important objective of the recommended practices presented in this document.

At the minimum 10° F delta T, 144 gallons of water will deliver one ton-hour of cooling. If the delta T is reduced to 9° F the flow required increases to about 160 gallons per ton-hour. Under Section 8.4 of the Uniform Provisions of the HSWAC Customer Agreement, a credit or penalty will be applied based on the average flow per ton-hour each month compared to the "Allowable Chilled Water Flow" of 144 gallons per ton-hour established in the Agreement. An excess flow penalty will only be applied if the average monthly flow exceed 160 gallons per ton-hour. A flow credit will be applied if the average monthly flow is less than 130 gallons per ton-hour.

Table 1 lists the per ton flow variation based on temperature rise (delta T).
TABLE 1
FLOW PER TON VS TEMPERATURE RISE (DELTA T)

<table>
<thead>
<tr>
<th>Temperature Rise °F</th>
<th>Gallons per Minute per Ton</th>
<th>Gallons per Ton-Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>4.80</td>
<td>288</td>
</tr>
<tr>
<td>6</td>
<td>4.00</td>
<td>240</td>
</tr>
<tr>
<td>7</td>
<td>3.43</td>
<td>206</td>
</tr>
<tr>
<td>8</td>
<td>3.00</td>
<td>180</td>
</tr>
<tr>
<td>9</td>
<td>2.67</td>
<td>160</td>
</tr>
<tr>
<td>10</td>
<td>2.40</td>
<td>144</td>
</tr>
<tr>
<td>11</td>
<td>2.18</td>
<td>131</td>
</tr>
<tr>
<td>12</td>
<td>2.00</td>
<td>120</td>
</tr>
<tr>
<td>13</td>
<td>1.85</td>
<td>111</td>
</tr>
<tr>
<td>14</td>
<td>1.71</td>
<td>103</td>
</tr>
<tr>
<td>15</td>
<td>1.60</td>
<td>96</td>
</tr>
</tbody>
</table>

2.2 System pressure
A variable flow pumping system at the HSWAC plant provides the pressure differential in the distribution network between the supply and return piping. The primary system pumps will overcome the flow resistance in the distribution piping plus a positive pressure differential at the Customer installation at the farthest end of the system. The amount of water that flows through Customer buildings is controlled by temperature control valves that respond to building cooling needs. The primary system will normally operate at a pressure of 150 pounds per square inch gauge (PSIG) or less. The distribution pumps in the HSWAC plant will vary the flow to maintain a minimum pressure differential of 15 PSIG at the farthest Customer location of the distribution system.

The most effective separation of the Customer building system from the HSWAC distribution system is a water-to-water heat exchanger. The heat exchanger will provide both static and dynamic separation. For Customer buildings with cooling coil locations that do not exceed 175 feet above MSL elevation, a heat exchanger is not required. However, for Customer buildings with cooling coils that are located at a height in the building that exceed 175 feet above MSL, a heat exchanger must be installed to serve the equipment located above this elevation. Customers that have chilled water piping or equipment installed below MSL are required to have all piping and equipment rated for 250 PSIG or install a heat exchanger. (See Standards, Section 2.1)

3. DESIGN FOR DIRECT CONNECTION

3.1 Air handler cooling coils
The effect of variation of flow rate on the heat transfer for coils and finned tubes is significant. Under low flow the transfer of heat takes place in a laminar flow condition, leading to poor heat transfer below the American Refrigeration Institute (ARI) standard ratings. In addition, coil temperature control valves do not operate effectively under low flow conditions. A good solution is to provide a small circulating pump on the coil that will maintain full flow through the tubes and constant velocity at the design flow through all possible load ranges. This
will maintain a high return water temperature from the coil while truly satisfying the leaving air temperature at all load levels. The small pump should be selected to take the pressure drop through the coils, and associated valves and piping.

Selection of high delta T coils will allow the building system to meet the delta T requirements in the HSWAC contract and will provide many cost savings. By designing for high delta T coils, costs for the coils will be slightly higher, but this is more than compensated for by lower costs for associated equipment, better energy use and lower operating costs due to reduced pumping. Capital cost savings result from smaller control valves, smaller pumps and reduced motor size on the pumps. In new buildings particularly, large capital cost savings can also result from reduction in pipe sizing due to lower flow requirements.

3.2 Fan coils

Fan coils are often considerably over-sized, leading to low delta T and high flow rate. Many fan coil manufacturers can provide optional high delta T coils. These fan coils require constant flow with delta T variable. The fan coil units are preferable installed with their own zone pump allowing for mixing of supply and return water when the fan coils are not operating at full capacity. Care should be taken to avoid having the pumping system forcing the control valves open on the fan coil units when the thermostat is not calling for cooling (see coil control valve sizing below).

Fan coils should be selected for high delta T. With a 12° F delta T, the chilled water flow-can be reduced to 2.0 GPM/ton (120 gallons per ton-hour) or less, thereby reducing capital costs for piping and pump installation and operating costs for pumping.

3.3 Coil control valves

The differential pressure in the variable flow primary distribution system varies depending on the load. The building terminal equipment control valves must accommodate the differential pressure of the primary distribution system.

Control valves should be of the equal percentage characteristic, two-way type for output control. Valves should be sized for no less than 10% of overall system resistance. It is important to avoid undue safety margins because over sizing of the valves leads to poor control. Control valves should be selected with adequate rangeability to adapt the minimum controllable flow to the requirements of the air discharge temperature in the cooling system. Three-way valves for output controls in constant volume flow or for blending control in any variable volume flow system should definitely not be used. Existing three-way control valves should be replaced with a new two-way equal percentage characteristic valve with minor modifications at each coil location.

The secondary system supply temperature should be high enough to keep coil tube velocities above minimums and control valves operating in the middle of their range. This will eliminate valve hunting and ensure proper dehumidification. As noted in the Standards, control valves must close positively whenever the secondary system pumps are not operating. Temperature control valve actuator shall be select to close against a minimum of 2 times the system pump head.

3.4 Primary-secondary system controls

The secondary chilled water system is hydraulically isolated from the primary system via the cross-over bridge, as illustrated in Figure 5.1 of the Standards. Adequate chilled water flow is admitted from the primary supply at the primary supply temperature to the secondary system. The return flow from the
secondary system is equal to the secondary supply flow, and the secondary return temperature is equal to the primary return temperature. The primary distribution pump provides the head to overcome the resistance in the primary system. The secondary system pump should provide the circulating head only within the secondary system including the cross-over bridge.

3.5 Pumps
Variable volume pumping shown in Figures 5.1 and 5.2 of the Standards is preferred to conserve energy, reduce electrical consumption, improve building system operation and provide the temperature rise required. A variable flow system utilizes variable speed pumps with two-way control valves on the coils in the air conditioning units. A differential pressure transmitter in the loop can be installed to vary the flow and speed on the pump motor to match the building needs. Based on engineering analyses made for different buildings, the load profile has shown that 100% of the peak load is required less than 10% of operating time, while 65% of the peak load or less is required 60% of the operating time.

In buildings where 7/24 cooling is required, such as for a computer room, a constant flow pump can be installed in parallel with the larger pumps. This pump may be interlocked with the main pump so that both pumps will not be operating in tandem. By using the smaller pump when general space cooling is not required, the building will reduce electrical consumption and save on operating costs.

In direct-connected buildings, the secondary pumping system must be designed for a working pressure that can accommodate the inlet pressure from the primary system plus the building pump pressure.

3.6 Flow meter
To ensure uniform flow, there must be a length of straight pipe upstream of the flow meter that is at least 10 times the flow meter diameter; downstream of the meter the length of straight pipe should be at least 5 times the flow meter diameter in the supply pipe (see Standards, Figure 5.3). The straight pipe segments should be of the same diameter as the inlet and outlet of the meter. The temperature sensors shall be installed at a 45 degree angle against the flow. For pipe diameters 3” and smaller, install sensors in an elbow of the piping. The flow meter should be installed in an accessible area within 4 feet from finished floor.

3.7 Water treatment
As noted in the Standards, all chemical treatment for chilled water is provided by HSWAC for direct-connected Customers. This treatment neutralizes corrosive properties and controls scaling.

3.8 Expansion system
As noted in the Standards, the design of the primary chilled water system will accommodate thermal expansion, including expansion within the Customers' direct-connected secondary systems. Air removal is included as part of this thermal expansion system. When district cooling service valves are closed, the Customer must provide adequate expansion and air removal from water in its piping circuit. However, at all times when the secondary system is open to the primary system the valve on the building expansion tank must be closed.
4. **DESIGN FOR INDIRECT CONNECTION WITH HEAT EXCHANGER**

Plate and frame heat exchangers are the most cost effective units for this application. The recommended gasket material for this application is “Nitrile” or “Buna N.” These gasket materials are rated for a temperature range of -65° F to 225° F. When piping the heat exchanger, consideration should be given to providing space for in-place chemical cleaning on both the primary and secondary sides.

See also Sections 3.1 to 3.3 for information regarding cooling coil design, Section 3.5 regarding secondary system pumps and Section 3.6 regarding flow meter installation.

![Figure 4 Typical Connection for Heat Exchanger Cleaning](image)

5. **PREVENTIVE MAINTENANCE**

District Cooling recommends that the standard preventive maintenance is applied to the cooling interface and the building system to ensure years of trouble free service.

5.1 **Primary System – Preventative Maintenance**

a) Inspect control valve functionality to ensure proper modulation and proper primary return water temperature per Section 2.1. Temperature difference.

b) Inspect primary piping for any signs of non-condensation related drips at fitting locations, especially at building heat exchanger connection.
5.2 Secondary System – Preventative Maintenance
a) Review cooling pump condition and operation. Lubricate as recommend by manufacturer and check for proper lead/lag switching operation.

b) Replace AHU filters regularly and inspect AHU condensate pans yearly to ensure drains are not plugged.

c) Clean coils to ensure proper heat transfer.

d) Commission and adjust controls for functionality of equipment start/stop schedules and for proper AHU damper actuation.
EXHIBIT C: BUILDING CONVERSION WORK
EXHIBIT C
To
HSWAC CHILLED WATER CUSTOMER AGREEMENT
For
UNIVERSITY OF HAWAI’I

Supplemental Provisions – Building Conversion Work

1. HSWAC Building Conversion Services. HSWAC will install or cause to be installed within the Building at the point identified on Exhibit A, an interconnection linking the Building to the District Cooling System. Included in this interconnection is Building Conversion work necessary to isolate the Building’s existing chiller plant and connect the Building to receive Chilled Water from the District Cooling System. The interconnection and conversion shall include and be in accordance with and subject to the following:

   (a) Subject to the terms and conditions of the Agreement, HSWAC shall perform, or contract for and cause to be performed, all engineering, construction, purchasing and installation of equipment, observation, supervision, inspection, testing, administration, and management necessary to connect the Building to the District Cooling System. The work includes: (i) isolation through shut-off valves of the existing chiller, piping and pumps; and (ii) installation of necessary piping, valves, and related metering, gauges, and other ancillary materials as necessary to provide a totally operational interconnection of the Building to the District Cooling System in accordance with all legal and code requirements, insurance industry requirements, best practices, and the Standards.

   (b) The piping, valves, controls and other ancillary equipment (after service shut-off valves at isolation flanges), that is paid for and installed by HSWAC without contribution from Customer (the “Qualified Equipment”) shall, after functional testing, certification by HSWAC’s contractor and HSWAC’s engineer, and acceptance by Customer pursuant to this Exhibit C as set forth at Section 1(g), constitute the Building Conversion work that shall become the responsibility of the Customer to operate, maintain, repair and replace except that the Metering Equipment shall remain the property of HSWAC and shall be tested, operated, maintained, repaired and replaced by HSWAC. HSWAC will provide all information and data to Customer, and assign, by written instrument in form reasonably acceptable to Customer, all manufacturers’ warranties. If any manufacturer warranty is not assignable, then HSWAC shall not assign the same to Customer but shall instead, upon the request of Customer, enforce such warranty against the manufacturer by such procedures or process as Customer shall direct. HSWAC shall securely and maintain all permits, licenses, and rights necessary to perform the Building Conversion work, and Customer shall fully cooperate therewith.
Until completion of the Building Conversion, pursuant to this Exhibit C as set forth in Section 1(g), HSWAC shall hold and retain ownership or property interest in the Qualified Equipment; and provided further that, upon the completion of the Building Conversion HSWAC’s ownership/property interest shall end and the Qualified Equipment shall belong to and be owned exclusively by Customer, its successors and assigns, as owner of the Building. Consistent with Article 9.3 of this Agreement, HSWAC shall remain the owner of all Metering Equipment.

The District Cooling System shall enter the Building at a point mutually agreeable to both parties as indicated on Exhibit A, and in the plans approved pursuant to this Exhibit B. HSWAC shall provide the Customer a copy of the complete record drawings showing the installation design and equipment layout, upon completion of the District Cooling System. The exact point of penetration of the exterior wall of the Building shall be determined and agreed by the parties as part of the development and approval of the design plans. Repair of the Building exterior wall shall be made by HSWAC to match the immediate surrounding Building exterior wall and its finish.

The Building Conversion work shall be performed by a general contractor, with such subcontractors as appropriate, pursuant to a contract with HSWAC. The general contractor and each subcontractor shall be selected by HSWAC, and HSWAC shall notify Customer in writing of such selected general contractor and subcontractor(s). The contracts shall be in such form as HSWAC deems appropriate but shall in any event contain the following: (i) warranties on the work that are customary for the type of work involved, which warranties shall be for the express benefit of Customer as well as HSWAC and shall be enforceable directly by Customer, (ii) requirements for insurance that comply with this Agreement.

Upon substantial completion of the construction work envisioned herein, HSWAC shall operationally and functionally test the interconnection work in accordance with industry standards and the recommendations of the Engineer (as defined in Section 2 below), including any testing reasonably requested by Customer. Representatives of HSWAC and Customer shall attend such testing procedures. HSWAC shall, promptly after completion of the testing certify to Customer that the Building Conversion work has been completed in accordance with the requirements of this Agreement and the interconnection, as tested, conforms to and operates and performs the standards established therefore. Testing of the work shall not be construed as receiving “Chilled Water at Customer’s Point of Delivery” for the purpose of establishing the First Service Date. Upon completion of the testing and correction of any deficiencies or required adjustments noted by Engineer (as defined in Section 2 below), HSWAC and Customer during the testing (and any appropriate re-testing) and receipt by Customer of HSWAC’s certification as provided above, Customer shall have fourteen (14) days within which to notify
HSWAC in writing of any further objections to the Building Conversion work and/or that the Customer does not accept the Building Conversion work. If Customer notifies HSWAC within such period of such objections or that the Building Conversion work is unacceptable, HSWAC shall promptly and with all due diligence correct such objections and such other corrective action as reasonably necessary to make the Building Conversion work acceptable. In the event that no such written notification is provided within the time required, Customer shall be deemed to have accepted all of the Building Conversion work. Acceptance of the Building Conversion work, whether explicit or deemed acceptance by the lapse of time without notice of objection, shall not waive or release HSWAC (or its contractor or any subcontractor) of or from any of its obligations under this Agreement or with respect to the Building Conversion work or otherwise affect the rights or obligations of Customer or HSWAC under this Agreement.

(h) No part of any of the work performed or caused to be performed in the Building by HSWAC shall include any removal, containment, or other involvement with asbestos, asbestos containing material, or hazardous waste or material (hereinafter “Hazardous Condition”), all of which shall be the exclusive responsibility and at the sole expense of the Customer. HSWAC shall have the absolute right to stop any part or all of the work in the event that a Hazardous Condition, or a suspected Hazardous Condition, is encountered during the performance of the work. HSWAC shall notify Customer of the existence or suspected existence of a Hazardous Condition and Customer shall retain such qualified experts as required to evaluate such Hazardous Condition and take corrective action as appropriate. HSWAC shall not be required to resume the work until after the Customer has obtained any required permits or approvals stating that the Hazardous Condition and any affected area is, or has been rendered, safe for the resumption of work or specifying any special conditions under which such work may be safely resumed. The Customer shall be liable for any cost of any delay related to an existing Hazardous Condition. In the event of an existing Hazardous Condition, HSWAC shall be entitled to a reasonable extension of time to perform its obligations under this Agreement. HSWAC’s agreements with its contractor(s) and subcontractor(s) shall require that such contractors and subcontractors be responsible for any hazardous material they deliver to and release at or in the Building.

(i) The Customer has exclusive responsibility for the operation, maintenance, and/or replacement of all equipment, systems, and appurtenances thereto that are located within the Building beyond the Point of Delivery, excluding the Metering Equipment, as of the date of acceptance by Customer.

2. Connection Plans. All Building Conversion work to interconnect the Building Cooling System to the District Cooling System shall be in accordance with detailed, “construction-ready” plans and specifications, including with respect to manufacturer and model for all equipment and
materials (other than commodity-type materials for which manufacturer and manufacturer’s model are customarily not specified) prepared by a professional engineering firm (the “Engineer”) selected by HSWAC. The contract with Engineer shall expressly provide that Engineer’s professional responsibility shall be to Customer, as well as to HSWAC, and provide for direct discussions and consultation with Customer with respect to the plans and specifications as Customer may from time to time reasonably request or which the Engineer itself deems appropriate. HSWAC shall cause the Engineer to prepare preliminary plans and specifications for the Building Conversion work, all in accordance with the requirements with respect to such work set forth in this Agreement (including as to sequence of the work as provided in Paragraph 4 below), and submit the same to Customer for its review. Following review by Customer of the preliminary plans and specifications, HSWAC shall cause the Engineer to prepare final plans and specifications for review by Customer, which shall be based on and consistent with the preliminary plans and specifications. The Engineer shall meet and consult with HSWAC and the Customer in connection with the preparation of such preliminary and final plans and specifications. Customer shall have fourteen (14) days in which to review each submission of plans and specifications, both preliminary and final, and to provide any questions, comments, requested changes, and/or conditions thereof, but in no case shall the review process by Customer delay the First Service Date unless otherwise agreed to in writing by the parties hereto. If Customer does not provide any questions, comments, or requested changes in writing by the end of the applicable fourteen (14) day review period, the applicable plans and specifications shall be deemed approved without condition. The final plans and specifications as approved by HSWAC, shall be the “System Connection Plans”. All fees and expenses of the Engineer in connection with the foregoing shall be paid by HSWAC. If Customer engages an independent engineer or other professional to review, evaluate or consult with Customer with respect to the System Connection Plans as part of its review process under this Paragraph, all fees and expenses of such engineer or other professional shall be paid by Customer.

3. **Customer’s Engineer.** Customer may, at its election and sole cost, engage the Engineer to review, and consult with Customer with respect to, the Building’s cooling system, including with respect to any Building Conversion work that may be required or appropriate.

4. **Sequence of Work.** The Building Conversion work, and its various parts, shall be scheduled and performed in such sequence that there shall be no interruption in the operation of the Building Cooling System (or any other Building systems) except for the shortest time reasonably possible at the point the District Cooling System would be, but for the work that requires the Building Cooling System to be shut down, substantially completed and ready for testing as part of achieving the Completion Date for the Building Conversion work.

5. **Changes to the Building Conversion Work.** No changes shall be made to the Building Conversion work unless the same has been first approved by HSWAC pursuant to a change in the approved Connection Plans which has been submitted to Customer in the same manner as provided in Paragraph 2 above in the case of the original plans and specifications therefor.
6. **Observation of the Building Conversion Work.** Customer and its representatives may be present during the performance of the Building Conversion work and may observe such work, subject to compliance with such safety rules as the general contractor or Customer shall establish for the work site. No such observation shall relieve HSWAC of its obligations with respect to the Building Conversion work.

7. **Contractor and Subcontractor Requirements.** The contractor and all subcontractors providing services for the Building Conversion work are required to comply with all Local, State, and Federal requirements for performing this work and all other contractor related requirements.
EXHIBIT D: SERVICE CHARGES
EXHIBIT D
To
CHILLED WATER CUSTOMER AGREEMENT
For
UNIVERSITY OF HAWAI’I

Service Charges Effective 2019

Pursuant to Sections 8.1 and 8.2 of the HSWAC Customer Agreement, the following rates are established for performance of specific services for an individual Customer. Service charges are payable within twenty (20) days of billing and are in addition to Capacity Charges and Operating Charges.

1. **Restoration of service after shutoff by HSWAC:**
   
   Flat charge: $200.00

2. **Damage to HSWAC system equipment:**
   
   Actual cost of repair or replacement as determined by HSWAC plus service charge of $50.00.

3. **Unauthorized drainage of HSWAC system water:**
   
   The sum of the following:
   
   (a) Estimated quantity of water lost times combined water and sewage rate and prorated water treatment cost paid by HSWAC during period of drainage;
   
   (b) Estimated thermal energy value of water lost times applicable Operating Rate; and
   
   (c) Service charge of $85.00/hour.

   Note: Drainage of system water may cause harm to other Customers and is cause for suspension of service until corrected.

4. **Service calls made at Customer’s request by HSWAC personnel for problems found to be in Customer’s and not HSWAC’s equipment:**
   
   Between 8:00 a.m. and 3:30 p.m. on Monday through Friday (excluding holidays observed by HSWAC): $85.00/hour
   
   All other times: $125.00/hour

5. **Charge for chilled water flow exceeding 160 gallons per ton-hour per billing period:** $1.00 per thousand gallons above 160 gallons per ton-hour.

6. **Credit for chilled water flow below 130 gallons per ton-hour per billing period:** (1.00) per thousand gallons below 130 gallons per ton-hour.
EXHIBIT E: CONFIRMATION CERTIFICATE OF DATES
EXHIBIT E
To
CHILLED WATER CUSTOMER AGREEMENT
For
UNIVERSITY OF HAWAI’I

Confirmation Certificate Of Dates

THIS CONFIRMATION CERTIFICATE OF DATES ("Confirmation Certificate") is made this ______ day of __________________, 20____, by and between HONOLULU SEAWATER AIR CONDITIONING, LLC, a Hawaii limited liability company, whose principal place of business and mailing address is 1132 Bishop Street, Suite 1410, Honolulu Hawai’i 96813 (hereafter called “HSWAC”), and THE UNIVERSITY OF HAWAI’I (“Customer” or alternatively “University”), the state university and a body corporate of the State of Hawai’i, organized under the Constitution and laws of the State of Hawai’i, whose business address is Bachman Hall, 2444 Dole Street, Honolulu, Hawai’i 96822, who have entered into that certain Chilled Water Customer Agreement dated ______________________, 2017 (hereinafter called the “Agreement”), providing for the servicing of the “Buildings” of JABSOM, located in Kakaako, Honolulu, and more particularly described in the Agreement. In connection with the Agreement, HSWAC and Customer agree as follows:

1. For purposes of confirming the “Estimated Construction Start Date” as provided in Section 1.10(a) of the Agreement, HSWAC and Customer hereby agree that the date of _________________, 20__ is hereby established as the “Estimated Construction Start Date” of the Agreement.

2. For purposes of confirming the “Estimated First Service Date” as provided in Section 1.10(b) of the Agreement, HSWAC and Customer hereby agree that the date of _________________, 20__ is hereby established as the “Estimated First Service Date” of the Agreement.

3. For purposes of confirming the deadline by which the parties may terminate the Agreement if the BWS Agreement is not terminated by such date, as provided in Section 1.13 of the Agreement, HSWAC and Customer hereby agree that the date of _________________, 20__ is hereby established as such deadline date of the Agreement.

4. The Agreement is hereby ratified and confirmed and shall remain in full force and effect, subject to all of the terms, covenants, and conditions therein set forth.

5. The provisions of this Confirmation Certificate shall be binding upon and inure to the benefit of the parties hereto and their respective successors and assigns.

IN WITNESS WHEREOF, the parties hereto have executed this Confirmation Certificate of Dates as of the day and year first above written.
CUSTOMER:  
University of Hawai‘i, on behalf of  
The John A. Burns School of Medicine and Cancer  
Buildings located at its Kakaako Complex  

Auxiliary Building, Medical Education Building  
and Biological Sciences Building  

The public state university and a body corporate of  
The State of Hawai‘i  

By: ____________________________________  
______________________________________  
Please print/type name  

Its: ____________________________________  
______________________________________  
Please print/type name  

By: ____________________________________  
______________________________________  
Please print/type name  

HSWAC:  
HONOLULU SEAWATER AIR  
CONDITIONING, LLC  

A Hawai‘i Limited Liability Company  

By: ____________________________________  
______________________________________  
Please print/type name  

Its: ____________________________________  
______________________________________  
Please print/type name  

By: ____________________________________  
______________________________________  
Please print/type name
SUPPORTING DOCUMENTS
## BSOM - HSWAC Fiscal Benefit

<table>
<thead>
<tr>
<th>Year</th>
<th>Yearly Cooling Energy ($/Ton/Mo)</th>
<th>Annual Charge ($/Ton/Mo)</th>
<th>% Change</th>
<th>Total Real $ Cost</th>
<th>Annual Difference %</th>
<th>TAC $ Cost</th>
<th>TAC % Cost</th>
<th>NPV of Difference %</th>
<th>Discount Rate %</th>
<th>Total Real $ Cost</th>
<th>NPV of Difference %</th>
</tr>
</thead>
<tbody>
<tr>
<td>2022</td>
<td>$14,832.330</td>
<td>$12,841.550</td>
<td>24.63%</td>
<td>$2,664,813</td>
<td>12.72%</td>
<td>$544,069</td>
<td>$258,733</td>
<td>$174,485</td>
<td>-2.12%</td>
<td>$2,226,266</td>
<td>$251,977</td>
</tr>
</tbody>
</table>

### FCAS BENEFITS

<table>
<thead>
<tr>
<th>Year</th>
<th>Base Case</th>
<th>BSOM - HSWAC</th>
<th>Total Benefit</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>$2,819,623</td>
<td>$2,582,609</td>
<td>$237,014</td>
</tr>
<tr>
<td>2020</td>
<td>$2,728,861</td>
<td>$2,402,900</td>
<td>$325,961</td>
</tr>
<tr>
<td>2021</td>
<td>$2,697,114</td>
<td>$2,306,026</td>
<td>$391,088</td>
</tr>
<tr>
<td>2022</td>
<td>$2,664,813</td>
<td>$2,226,266</td>
<td>$438,547</td>
</tr>
</tbody>
</table>
EXHIBIT 2: Sustainability Report
SUSTAINABILITY REPORT

University of Hawaii Kaka’ako Campus
Honolulu Seawater Air Conditioning Connection To
JABSOM, UHCC

October 2015
Contents

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INTRODUCTION

Many sustainability initiatives focus on making impacts in a specific area of sustainability. Water resource conservation, waste reduction, energy use reduction, elimination of environmentally unfriendly materials from use, etc. Often several specific initiatives are needed to achieve broader sustainability goals. Honolulu Seawater Air Conditioning's (HSWAC's) chilled water district cooling system provides a significant impact in no less than four of these specific areas where sustainability initiatives are measured.

The study below outlines 5 specific areas of sustainability that HSWAC’s chilled water service can have a direct impact on for the University of Hawaii Kaka'ako Campus (UHKC) including the John A. Burns School of Medicine (JABSOM) and the University of Hawaii Cancer Center (UHCC). Using historic utility bills, recorded cooling usage, industry standard estimates, and onsite observations, specific and measurable sustainability metrics have been determined.
POTABLE WATER SAVINGS

Utilizing HSWAC chilled water provides the opportunity to eliminate cooling tower operations and the associated water losses from evaporation, drift and blowdown. The water that is supplied to the cooling towers at UHKC comes from the municipal potable water supplied by the Board of Water Supply (BWS). The total projected water savings for the UHKC is 19,608,000 gallons per year by eliminating the operation of the cooling towers. Specifically JABSOM uses 14,290,000 gallons of water per year (50% of total campus water usage), and UHCC uses 5,318,000 gallons of water per year (38% of total campus water usage) in their respective cooling towers.

Table 1: Potable Water Savings at UHKC

<table>
<thead>
<tr>
<th>Facility</th>
<th>Water Usage in Cooling Towers Annually (Gallons)</th>
<th>Total Facility Water Usage Annually (Gallons)</th>
<th>% of Total Used For Air Conditioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>JABSOM</td>
<td>14,290,000 gallons</td>
<td>28,481,000 gallons</td>
<td>50%</td>
</tr>
<tr>
<td>UHCC</td>
<td>5,318,000 gallons</td>
<td>14,056,000 gallons</td>
<td>38%</td>
</tr>
<tr>
<td>Total</td>
<td>19,608,000 gallons</td>
<td>42,146,000 gallons</td>
<td>47%</td>
</tr>
</tbody>
</table>
WASTEWATER SAVINGS

An additional benefit of not having to operate cooling towers is the avoidance of flushing blowdown water into the sewage system. This is a direct reduction of waste water that needs to be treated at the City and County waste water treatment facilities. For JABSOM the volume of blowdown being discharged into the sewer system is estimated to be 1,297,000 gallons per year. For UHCC the volume of blowdown being discharged into the sewer system is estimated to be 1,098,000 gallons per year. The combined volume of blowdown being discharged into the sewer system that can be saved by not using cooling towers is 2,395,000 gallons of sewage discharge per year.

Table 2: Total Wastewater Savings at UHKC

<table>
<thead>
<tr>
<th>Facility</th>
<th>Sewage Discharge from Cooling Towers Annually (Gallons)</th>
<th>Total Facility Sewage Discharge Annually (Gallons)</th>
<th>% of Total Used For Air Conditioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>JABSOM</td>
<td>1,297,000 gallons</td>
<td>3,783,000 gallons</td>
<td>34%</td>
</tr>
<tr>
<td>UHCC</td>
<td>1,098,000 gallons</td>
<td>3,046,000 gallons</td>
<td>36%</td>
</tr>
<tr>
<td>Total</td>
<td>2,395,000 gallons</td>
<td>6,829,000 gallons</td>
<td>35%</td>
</tr>
</tbody>
</table>
CHEMICAL ELIMINATION

Chemicals such as bromine, chlorine, molybdenum, tolytriazole and others are used to maintain cooling tower water quality. These chemical additives control microbe and algae growth, and reduce the scaling on equipment components. Examples of the types of microbes that these chemicals are intended to control is the bacterium Legionella pneumophila which is responsible for most cases of Legionnaires’ disease.

As the cooling tower water evaporates and the concentration of naturally occurring silica increases beyond acceptable levels, blowdown occurs and these chemicals are discharged to the sewage system along with the water. The amount of chemicals usually discharged in the blowdown process are within MSDS levels, however removing their presence by eliminating cooling tower use completely is a better alternative for the environment.
REFRIGERANT AND LUBRICANT ELIMINATION

Electric chillers utilize refrigerants and lubricants to produce chilled water onsite. Modern chillers use between 1.5 and 2 pounds of refrigerant per ton of cooling capacity. Some refrigerants that are used in cooling equipment are intermarial regulated by the Montreal Protocol because of their contribution to Ozone Layer depletion. In addition the Environmental Protection Agency (EPA) regulates the release of refrigerant into the atmosphere. When accepting HSWAC chilled water, the onsite chillers can be mothballed and the refrigerant and lubricants removed. With the understanding that redundancy options are still being evaluated, in a case where all the chiller units at JABSOM are mothballed, an estimated 4,760 pounds of refrigerant can be removed. At UHCC, if all chillers are mothballed, 2,250 pounds of refrigerant can be removed. The combined volume of refrigerants that can potentially be removed off site by not using on-site chillers is 7,010 pounds of refrigerants.

Table 3: Total Refrigerant Savings potential at UHKC

<table>
<thead>
<tr>
<th>Facility</th>
<th>Refrigerant on site (Pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>JABSOM</td>
<td>4,760 pounds</td>
</tr>
<tr>
<td>UHCC</td>
<td>2,250 pounds</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>7,010 pounds</strong></td>
</tr>
</tbody>
</table>

In addition to refrigerants lubricants are used in chillers to ensure proper operation of the mechanical components of the equipment. Elimination of these lubricants on site is another way to reduce the potential for an unintended release of this material through leaks from the equipment itself or spare lubricants stored on site for maintenance purposes.
RENEWABLE ELECTRICAL ENERGY

The electrical energy savings brought about by Seawater air conditioning district cooling systems is defined by Hawaii Revised Statutes 269-91(2)(A) (Renewable Portfolio Standards): as Renewable electrical Energy. Thus UHKC will be able to directly apply HSWAC’s chilled water service as Renewable Electrical Energy as it strives to meet its energy use; net-zero goal with respect to energy use by January 1, 2035, as set forth in HB 1509.

Electrical Energy Savings

At most facilities, between 30% and 45% of the total electricity consumption is used to provide air conditioning. Switching from onsite chilled water production to HSWAC chilled water will eliminate the need to run compressors, condenser water pumps and cooling tower fans. At JABSOM, with the Board of Water Supply contract to operate and maintain the chilled water plant, both the total metered electricity consumption for the chilled water plant and the total metered electricity consumption for JABSOM are available. JABSOM used a total of 13,718,720 kW-hours between July 25, 2015 and July 24, 2015, of which 6,910,800 kW-hours were used to produce chilled water in the central plant. This is 50.4% of the total electricity consumption at JABSOM. At UHCC, the electricity used to produce chilled water has been estimated at 1,342,300 kW-hours. Both of these amounts represent substantial electricity savings.

Table 4: Electricity Savings at UHKC

<table>
<thead>
<tr>
<th>Facility</th>
<th>Electricity Used in Central Plant Annually (kWh)</th>
<th>Total Facility Electricity Used Annually (kWh)</th>
<th>% of Total Used For Air Conditioning</th>
</tr>
</thead>
<tbody>
<tr>
<td>JABSOM</td>
<td>6,910,800 kWh</td>
<td>13,718,720 kWh</td>
<td>50%</td>
</tr>
<tr>
<td>UHCC</td>
<td>1,342,300 kWh</td>
<td>4,849,840 kWh</td>
<td>28%</td>
</tr>
<tr>
<td>Total</td>
<td>8,253,100 kWh</td>
<td>18,568,560 kWh</td>
<td>44%</td>
</tr>
</tbody>
</table>

Fossil fuel and carbon emissions avoidance

As noted above, by using HSWAC chilled water service the total electricity saved at JABSOM and UHCC is 8,253,100 kW-hours annually. By not consuming this electricity, fuel oil does not have to burn and carbon dioxide production is reduced. This would prevent the release of a total of 16,389,000 pounds of carbon dioxide from UHKC annually. 11,394,000 and 4,995,000 pounds of carbon dioxide by JABSOM and UHCC respectively.

Table 5: Total Carbon Emission Avoidance at UHKC

<table>
<thead>
<tr>
<th>Facility</th>
<th>Carbon Emission Avoidance Annually (pounds)</th>
</tr>
</thead>
<tbody>
<tr>
<td>JABSOM</td>
<td>11,394,000 pounds</td>
</tr>
<tr>
<td>UHCC</td>
<td>4,995,000 pounds</td>
</tr>
<tr>
<td>Total</td>
<td>16,389,000 pounds</td>
</tr>
</tbody>
</table>
Photovoltaic generation equivalence

An equivalent alternative to using HSWAC’s chilled water service, utilizing deep seawater as its primary source of cooling could be electrical generation through photovoltaic (PV) panels. The electricity produced by the PV panels could be used displace the electricity required at UHKC for air conditioning.

To provide the required electricity generation needed to offset the total electricity used for air conditioning would require 16 acres of land to setup a 4.8MW photovoltaic solar array. Additional land and solar capacity would need to be installed to offset other electrical demands of the Campus, such as lights, plug loads, elevators, motors, etc. Figure 1 provides a visual to conceptualize the impact of installing 16 acres of photovoltaic panels within the Kaka’ako area. The HSWAC chilled water service will have no additional foot print impact to the campus and will be seamless in integration to UHKC and its operations. Few, if any, Renewable Electrical Energy projects will have as a significant impact on providing Renewable Electrical Energy to UHKC with no other impacts to the Campus. Wind turbines are another potential source of Renewable Electrical Energy, but again will take space and be difficult to locate on site to have a direct impact to the Campus’ Renewable Energy Portfolio.

**Figure 1:** 48MW, 16 acre solar PV Generation Equivalent to HSWAC Chilled Water Service.
CONCLUSION

Honolulu Seawater Air Conditioning’s (HSWAC’s) chilled water district cooling system provides a significant impact in no less than four specific areas where sustainability initiatives are measured.

These specific impacts for the University of Hawaii Kaka’ako Campus (UHKC) are summarized in Table 6 below. These impacts, which will contribute directly to the overall University of Hawaii’s net-zero energy goal by 2035, will come at no added upfront or operational costs to UHKC. The chilled water service offered by HSWAC will not only provide these sustainability benefits to UHKC but also provide a superior chilled water service in terms of quality and the cost to do so.

Table 6: University of Hawaii Kaka’ako Campus Sustainability Contributions Summary

<table>
<thead>
<tr>
<th>UHKC</th>
<th>Savings</th>
<th>% of Total Used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potable Water</td>
<td>19,608,000 gallons</td>
<td>47%</td>
</tr>
<tr>
<td>Sewer</td>
<td>1,098,000 gallons</td>
<td>35%</td>
</tr>
<tr>
<td>Refrigerants</td>
<td>7,010 pounds</td>
<td>100%</td>
</tr>
<tr>
<td>Electricity</td>
<td>8,253,100 kWh</td>
<td>44%</td>
</tr>
<tr>
<td>CO²</td>
<td>16,389,000 pounds</td>
<td>44%</td>
</tr>
</tbody>
</table>

Entering into a single service agreement with HSWAC, UHKC will be at the forefront of sustainable medical research and education facilities in the world. Taking advantage of Hawaii’s natural ocean resource will eliminate the utilization of tremendous natural resources used today to provide basic air conditioning to the Campus.
EXHIBIT 3: HSWAC FAQ
Frequently Asked Questions and Answers about Honolulu Seawater Air Conditioning:

1. Who is HSWAC?

Honolulu Seawater Air Conditioning (HSWAC)\(^1\), LLC is a private, Honolulu-based company developing a 28,000-ton cooling capacity district cooling system to service the downtown Honolulu and Kaka’ako districts. For reference to the capacity of the HSWAC system, one ‘ton’ of cooling is what a typical window-mounted air conditioner unit produces to cool one 500 square foot room.

HSWAC personnel have direct experience in developing Scandinavian and European projects, including Europe’s largest seawater air conditioning project in Stockholm, Sweden. The Stockholm system includes approximately 80,000 tons of

\(^{1}\) More information on HSWAC is available at [http://www.honoluluswac.com/index.html](http://www.honoluluswac.com/index.html)
cooling capacity and continues to expand. Members of HSWAC’s team recently
developed and participated in construction of two Dutch systems, both located in
Amsterdam with an aggregate capacity of more than 35,000 tons of cooling capacity.

In the development process HSWAC has partnered with local engineering and
construction firms who have proven, demonstrated expertise and knowledge in
completing other deep water pipe and district energy projects. As an example, HSWAC’s engineer for the seawater pipe, Makai Ocean Engineering, designed and
oversaw the construction for the deep water pipes in service today at the Natural
Energy Laboratory of Hawaii Authority (NELHA) located in Kona on the Big Island, that
were successfully installed over 30 years ago. Over time, additional seawater pipes
have been added and others extended, to add additional seawater capacity for
NELHA today. Makai Ocean Engineering was also the design engineer for the Toronto
and Cornell University (New York) systems.

HSWAC will not be regulated by the PUC as a Public Utility. This exemption was
codified as Act 164 of the twenty-third legislature, 2005, as HSWAC customers have
options for competitively sourcing chilled water.

### 2. What is HSWAC developing?

HSWAC is developing a district cooling system to provide efficient, utility-scale
chilled water production and distribution to the Downtown and Kaka’ako districts of
Honolulu. Once completed HSWAC’s district cooling system will not generate its chilled
water with chillers and cooling towers, but rather will draw it from cold, deep seawater.
Using simple heat exchangers to transfer heat between a chilled freshwater loop and
the cold seawater, HSWAC’s Chilled Water will not use potable water, not generate
any sewage discharge, and will not use chemicals typically used in cooling tower
evaporative cooling cycles. The use of cold seawater as the primary source of cooling
for HSWAC’s Chilled Water will improve the energy efficiency of HSWAC’s cooling
station to a level existing equipment cannot achieve. HSWAC’s chilled freshwater can
be used in any building currently employing chilled water for air conditioning. Utilizing
this heat exchange process, HSWAC will become Oahu’s single largest energy
efficiency and sustainability project.

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2 HRS Title 15, Chapter 269-1, ‘Public Utility’ (2)(K):
(http://www.capitol.hawaii.gov/session2005/bills/sb1903_cd1_.htm)
3. What is HSWAC offering?

The product that HSWAC is offering is a Chilled Water Service, where a customer will receive Chilled Water to use for all its comfort and/or process cooling applications. The chilled water will be delivered to a designated point inside a customer’s building, in the same manner that a property receives electricity from HECO, potable water from BWS or cable and internet access from its service provider. HSWAC’s Chilled Water Service is contractually guaranteed to provide 24/7/365 service at a guaranteed price over the term of the Service Agreement.

4. What is a District Cooling System?

A District Cooling System centralizes chilled water production for multiple buildings into a single central chiller plant, and distributes this chilled water to many buildings where it is needed. This allows the single, central plant to operate with higher energy efficiency and lower maintenance costs as compared to running several smaller sized plants in each individual building. UH Manoa employs this concept at the Holmes-Sakamaki-Watanabe-Art Building-University Health Services and Hawaii-Crawford-George-School of Architecture-Gartley-Dean chilled water loops.

The UH JABSOM Chiller Plant, operated by BWS is a District Cooling System that, in addition to servicing all the buildings on the JABSOM campus, was originally designed to support additional chilled water service to additional buildings in Kaka’ako Makai.

5. What is a Seawater Air Conditioning System?

A Seawater Air Conditioning (SWAC) System is a District Cooling System which uses naturally occurring cold seawater as the primary source of cooling for air conditioning. Cold water can also be sourced from a deep freshwater lake. The latter systems are commonly referred to as a lake source cooling or deep water source cooling.

6. Where will HSWAC get the cold, deep seawater from?

The HSWAC system will draw cold deep seawater from a location 4.5 miles south of Kaka’ako Waterfront Park, 1,750 feet below the surface of the sea. Using a 63'
diameter supply pipe, HSWAC will have the capacity to pump up to 44,000 gallons per minute of seawater, providing cooling capacity for customers throughout the distribution area.

7. Where will the seawater go once it has been used by HSWAC?

After the seawater goes through the HSWAC heat exchanger equipment, it will be returned to the sea through a “diffuser.” The design of the diffuser, similar to a big sprinkler system, allows the returned water to rapidly disperse into the surrounding waters between the depths of 326 to 423 feet below the surface. This prevents the seawater from returning all at once to one location at a high volume, providing for better dispersion into the surrounding waters.

8. Have the impacts of the process on the environment been determined?

Multiple studies have been conducted to determine the effects seawater being returned to the environment will have, including a State of Hawaii Environmental Impact Study3, a Federal Environmental Impact Study4 and studies resulting in the issuance of a National Pollutant Discharge Elimination System – Zone of Mixing Permit from the State of Hawaii Department of Health Clean Water Branch5. These studies have recognized the SWAC process will pull deep seawater from one depth and return it at a shallower depth. The only way the deep seawater is being altered is the addition of 6° to 14°F of heat. Retuming the seawater to a depth where the ambient temperature is higher than that of the water being discharged will ensure the return water sinks as it is mixed into the receiving waters.

Through the collective efforts of the EPA, State of Hawaii Department of Health Clean Water Branch, our design consultant and HSWAC, a depth of 326 to 423 feet below the surface of the ocean was chosen for the discharge diffuser and a suitable Zone of Mixing was established in accordance with applicable Federal and State Regulations.

5 NPDES Permit No. HI 0021842 issued October 15, 2016
9. Will seawater be circulated in the JABSOM buildings?

No. The HSWAC system will distribute chilled freshwater from its cooling station to all customers. The heat transfer between the cold seawater and the distributed chilled freshwater occurs at the HSWAC cooling station using plate and frame heat exchangers. The two fluid streams do not mix. They are kept physically separated by heat exchanger plates made from titanium. Should there be a leak in a plate, the freshwater side is kept at a higher pressure than the seawater side, so freshwater would leak into the seawater stream, not the other way around. This ensures no seawater enters into the chilled freshwater loop sent to customer buildings.

10. What modifications to the current JABSOM cooling system will be needed to use HSWAC’s Chilled Water? How does JABSOM use it?

No modifications to the chilled water piping at JABSOM would have to be made to enable HSWAC’s chilled water to be used at the JABSOM facilities. Some additional piping, other ancillary equipment such as valves and HSWAC’s metering equipment will need to be integrated into the JABSOM cooling system to facilitate the physical connection between the current JABSOM cooling system and the HSWAC chilled water supply. The installation of the additional piping and valves will take some time and effort, but will not affect current air conditioning service to JABSOM.

Once connected to the HSWAC Chilled Water Service JABSOM will use HSWAC’s chilled water to replace the chilled water generated by the existing chiller plant. There is no difference between HSWAC’s chilled water and chilled water from the existing chiller plant.

11. Where else are deep water cooling systems like this in use?

- Cornell University, Ithaca, NY
- Kona, Hawaii (Natural Energy Laboratory Hawaii Authority, NELHA)
- Stockholm, Sweden
- Amsterdam, Netherlands
- Toronto, Canada (Enwave Energy Corporation)  

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6 https://energyandsustainability.fs.cornell.edu/util/cooling/production/lsc/default.cfm
7 http://nelha.hawaii.gov/energy-portfolio/
8 http://enwavetoronto.com/district_cooling_system.html
12. What happens if seawater temperature rises?

The “coldness” of deep seawater is a sustainable energy source that is present across all of the world’s oceans ensuring an abundant source of cold water. The average temperature of all the water in the world’s oceans is 39°F. The predominant factors that contribute to the continued, natural production of deep, cold seawater are (1) stratification by temperature, salinity, and density, (2) thermohaline circulation or global circulation of water driven by heat redistribution, and (3) the vastness of the ocean. Global currents move seawater to redistribute solar energy absorbed by the surface of the oceans. The surface water loses heat to the atmosphere at the poles. As the seawater releases heat in the Polar Regions, this water becomes denser, sinks and becomes part of the deep ocean currents for extended periods of time. These factors combined with the vastness of the ocean itself, provide for a virtually endless supply of cold water that is renewed in a continuous process. Even if the surface temperature of the oceans were to rise today, the water being tapped by HSWAC is thousands of years old and the process to produce it lengthy, ensuring the availability of the cold deep seawater for an indefinite period.

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9 [www.makai.com/sea-water-air-conditioning](http://www.makai.com/sea-water-air-conditioning); [https://www.youtube.com/watch?v=rcquycxC5iq](https://www.youtube.com/watch?v=rcquycxC5iq)
10 [www.thebrando.com/stewardship](http://www.thebrando.com/stewardship)
11 [https://www.google.com/about/datacenters/inside/locations/hamina/index.html](https://www.google.com/about/datacenters/inside/locations/hamina/index.html) [https://www.youtube.com/watch?v=VChOEvKicQQ](https://www.youtube.com/watch?v=VChOEvKicQQ)
13. Isn’t JABSOM cooled by seawater now?

No. Deep wells drilled vertically into the ground just outside the campus buildings were originally intended to be used to provide cool water for condenser cooling, replacing the use of cooling towers. This well water is a mixture of fresh water from the islands fresh water lens and seawater permeating the ground from the ocean.

The water from these wells is currently not producing water cool enough to use as condenser water in the JABSOM chillers which ultimately produce the chilled water for the JABSOM facility. A study\(^\text{12}\) was commissioned in 2012 to determine what would be the more efficient option for providing condenser water for the JABSOM chillers, 1) the well water, or 2) running cooling towers. The study found that running cooling towers was the most efficient option for providing condenser water for the JABSOM chillers. Since late 2012 the cooling towers have been in use for condenser water, providing the primary method of rejecting the heat from the facility through evaporation. The wells are maintained for use as an alternative condenser water supply.

14. How is HSWAC different than the original BWS deep well system which was intended to be used to service JABSOM?

There are two differences between the BWS system and HSWAC. First, is the purpose of the water drawn. The BWS system is designed to source cool water to be

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\(^{12}\) University of Hawaii John A. Burns School of Medicine Chiller Plant Assessment, October 2012, George W. Hubbell, Johnson Controls
used in the condensers of the BWS system's three 900-ton chillers from wells drilled 750 feet vertically into the ground. These centrifugal chillers use compressed refrigerant to cool fresh water in the evaporators before pumping this fresh water in a closed loop around the JABSOM buildings on campus, thus providing cooling to each of the buildings. As designed this well water system should have eliminated cooling towers and cooling tower fans. However, this process does use chillers as the primary method of cooling the fresh water loop.

In 2012 BWS reverted to conventional cooling towers, which were also installed when JABSOM was built and kept as additional equipment, as the primary source to cool the condensers of the centrifugal chillers. The water from the wells was hotter than what is produced from the cooling towers. Using hot water from the wells requires more energy in the form of electricity to produce the same amount of cold fresh water in the centrifugal chillers to air condition the JABSOM buildings.

HSWAC will pump cold deep seawater from 1,750 feet deep and 4.5 miles offshore for its primary source of cooling. This water, averaging 44°F year-round, will be pumped through a 63” diameter pipe to the cooling station and used directly to cool the fresh water closed loop. It is this chilled freshwater that will be distributed to and circulated in the JABSOM buildings, providing cooling to the buildings.

This cooling process is accomplished via heat exchangers and not chillers. HSWAC will use centrifugal chillers for quality control to ensure the cold fresh water it delivers to JABSOM meets the contractually obligated temperature as the temperature of the seawater used for primary cooling does vary a few degrees over given time periods. HSWAC's chiller condensers will be cooled using the same deep sea water ensuring high efficiency of these chillers, and eliminating the need for cooling towers and fans.

The second difference is where the water used is drawn from. The BWS system draws its water from wells on site, and when finished with it re-injects it back underground at a different depth. HSWAC will draw the water it uses from 4.5 miles south of Kaka‘ako, accessing a virtually unlimited supply of cold seawater. These concepts are illustrated in the following two diagrams.
Existing Chilled Water Service

- JABSOM Facilities
- BWS Equipment

As designed the cool temperature of the well water was intended to replace the use of cooling towers.

The cool well water was not, in practice, available and thus the cooling towers were needed to improve the overall energy efficiency of the chiller plant.

Currently cooling towers are used to provide condenser water to the chillers.

Supply wells (two) pull water from 750' deep underground.

Injection well returns water to 1850' deep underground.

HWSAC Chilled Water Service

- JABSOM Facilities
- HWSAC

Temperature of water used is cold enough to replace chillers and cooling towers, providing tremendous reductions in energy and resources consumption.

Supply pipe accesses sea water from 1740' deep.
15. How is this HSWAC Service Agreement different than the BWS Agreement?

In addition to Capacity and Operating Charges, the BWS Service Agreement requires JABSOM to directly pay **ALL** utility costs associated with operating the chiller plant, these included electricity, water, and sewer. There is no incentive in the BWS Service Agreement for the BWS to manage the use of these utilities efficiently when operating the plant as these costs are paid by JABSOM to the respective utilities. JABSOM is 100% exposed to the risk of the non-performance of the BWS chiller plant.

The HSWAC Service Agreement does **NOT** require JABSOM to directly pay for any utility costs associated with operating HSWAC’s cooling station. HSWAC is incentivized to manage the use of its own utility costs when operating its plant. This eliminates performance risk of the chiller plant to JABSOM.

16. Is the HSWAC Chilled Water Service Financially Prudent?

Yes. The financial proforma comparing HSWAC Chilled Water Service costs with the existing means of producing chilled water has been reviewed multiple times by staff at JABSOM, UH Manoa and UH System. At each of these reviews, HSWAC Chilled Water Service has been shown to be fiscally superior over the contract term.

Additionally, HSWAC Chilled Water Service has far less dependency on electricity and thus is not as sensitive to the volatile price of electricity as is the existing means of producing chilled water.

Lastly, HSWAC Chilled Water Service costs are contractually guaranteed, with the majority comprised of fixed capacity charges. This allows future air conditioning costs to be predictable and stable, despite uncertain energy markets.

17. What would the cost for HSWAC’s Chilled Water Service have been compared to the actual cost for the BWS Chilled Water Service over the past three years and into the future.

The graphic below shows the total cost paid by JABSOM for chilled water for the past 3 years, 2014-2016. The total annual costs are comprised of the HECO Electricity bills, the cost for the potable water and sewage charges, and the cost for the current Chilled Water Service provided by the Board of Water Supply and is represented in the
green bars. This is compared to the cost of HSWAC’s Chilled Water Service represented in the blue bars. This is the cost per year if HSWAC’s Chilled Water Service had been in service for the same period. Of note is the decreasing cost trend in the Existing Operations due to the decrease in electricity prices over the past 2 years with the decrease in world oil prices. This is indicative of the sensitivity and impact of fluctuating electricity prices. Also of note is the relative stability of the cost of HSWAC Chilled Water Service.

The next graphic provides an estimate of costs for each year leading up to the end of the existing BWS Chilled Water Agreement in 2025. The total sum for each of these years is **$29.7M using Existing Operations** and **$22.9M using HSWAC Chilled Water Service**.
Combining these two views into a combined total, the result is an estimated $7.9M difference in cost for Chilled Water Service over the 12 years had HSWAC been operational in 2014\textsuperscript{13}.

\textsuperscript{13} HSWAC costs for the plots above are based upon HSWAC's contractual 2019 service pricing applied to a 2014 service date. No reduction of HSWAC's future service rates were made for this comparative analysis to actual billed costs to JABSOM for the 2014, 2015, and 2016 periods.
18. How are HSWAC's monthly charges established and are these the same as the current charges from BWS?

HSWAC:

- HSWAC's total monthly billings are comprised of three individual Charges which are all based upon contractually set rates for the term of service. The three components are:
  - A **Capacity Charge** a product of contractually established/guaranteed monthly rate ($ per ton per month) and a reserved capacity (tons) based on actual metered usage over time.
  - An **Energy Operating Charge** a product of contractually established/guaranteed HSWAC operating efficiency, cost for energy supplied by HECO ($/ton-hour), and consumed cooling energy (ton-hours).
  - A **Non-Energy Operating Charge** a product of contractually established/guaranteed rate ($/ton-hour) and measured consumed cooling energy (ton-hours).
- There are **NO** direct payments of any additional utility bills associated with HSWAC's operation of its chilled water plant.
- The results are **stable and predictable chilled water costs**.
BWS:

- BWS' total monthly billings are comprised of two individual Charges which are based upon contractually set rates for the term of service. The two components are:
  - A Capacity Charge a product of contractually established monthly rate ($ per ton per month) and a dedicated, reserved capacity (tons) based on a fixed 1,600 tons and not on actual metered usage over time.
  - An Operating Charge a product of a contractually established monthly rate ($/ton-hour) and measured consumed cooling energy (ton-hours) with a minimum charge based on a 533,333 ton-hours per month minimum.
- In addition to these BWS monthly Charges J ABSOM also pays ALL direct potable water (BWS), sewer (ENV) and electrical utility (HECO) bills associated with BWS operation of the J ABSOM chilled water plant. These other utility charges account for 60-70% of the total cost to provide J ABSOM with chilled water.

Comparison:

- Though similar in structure, HSWAC rates are not the same dollar rates as the BWS rates. When taking all costs associated with supplying J ABSOM with chilled water under the current BWS Service Agreement, and comparing those to the costs associated with suppling J ABSOM with the same chilled water under the proposed HSWAC Service Agreement, the HSWAC Service represents a fiscally prudent and sustainable alternative to the BWS Service Agreement for J ABSOM.

19. Will other customers get the same rates as J ABSOM?

No. Each HSWAC customer has specific Chilled Water Service and building connection requirements. These specific requirements may result in unique contractual rates based on accommodations made for each HSWAC customer. In J ABSOM’s case, the Capacity Charge Rate accommodates a dedicated service connection directly to J ABSOM from HSWAC’s cooling station, with HSWAC assuming responsibility for the engineering, permitting, and construction of the building interconnection.
20. Why is this new Chilled Water Service Agreement needed now? (Why not just keep using what is in place?)

The existing BWS Chilled Water Service Agreement will expire at the end its 20-year term in 2025. Planning now for the transition is a prudent action to ensure JABSOM has chilled water beyond 2025, or sooner, via the most efficient and cost effective method. As any transition will take 2-3 years to implement and bring on line in place of the current BWS service, actively planning now will ensure a smooth and effective transfer of service. Signing on to HSWAC Chilled Water Service now is an opportunity to secure a viable and beneficial option for chilled water and to minimize future risks.

UH and HSWAC have common goals in enhancing sustainability, interest in cost effective chilled water, and a unique opportunity as close physical neighbors in Kaka’ako. While HSWAC is poised to begin construction in the near future, securing a Service Agreement with HSWAC now guarantees the ability for JABSOM to take full advantage of the benefits HSWAC has to offer. The dedicated service connection directly to JABSOM from HSWAC’s cooling station needs to be designed and constructed at the same time as the rest of the HSWAC System to minimize cost and impact. If JABSOM signs on to HSWAC Chilled Water Service after the HSWAC System has been built, construction of the dedicated service connection directly to JABSOM from HSWAC’s cooling station will require additional costs which would not be necessary if included into the current construction phase. HSWAC needs to begin to design and plan for the dedicated service connection now to ensure this connection is built during construction of the system.

21. What happens to the old cooling equipment at JABSOM once the transition is made to the HSWAC Chilled Water Service?

Once a building is being supplied with chilled water from HSWAC, the existing chiller plant equipment is no longer needed. Should the space be required for other purposes the equipment can be removed, otherwise, it can remain in place.

22. How is HSWAC’s Chilled Water Service going to help people?

The people that work, do business and live in the buildings along the HSWAC service corridor do so in an extremely dense, strictly managed area. These buildings must conform to Special District regulations and design standards to conserve the unique character present in Downtown Honolulu and the surrounding districts. To
become environmentally friendly is difficult at best for building owners in this area considering the limited space and density of development. Even if they could use photovoltaic panels, there is insufficient room on these buildings to install enough panels to meet the total demand of these buildings. Use of alternative energy generated off-site is one way to make further reductions in fossil fuel based electricity, but this method is not making the building itself more sustainable. By using HSWAC’s chilled water, a building and its occupants can reduce electricity usage, conserve potable water, eliminate cooling tower blowdown to the sewage system and refrigerant usage – transforming air conditioning from a resource intensive process into a sustainable, energy efficient model for the future.

For occupants of buildings where Common Area Maintenance (CAM) charges are assessed, replacing existing air conditioning with HSWAC chilled water will stabilize the portion of their fees associated with air conditioning. As seen in recent years, there is tremendous volatility in utility rates, and stabilizing costs can help business and condo owners better manage budgets. Commercial building owners can become more cost competitive when they present leasing terms with more stable line items.

Construction of HSWAC’s District Cooling System will provide hundreds of skilled construction jobs for two years, while operating the system will employ technicians and enhance sustainability for the community for decades.

In addition to the benefits discussed above, users of HSWAC chilled water can also feel good about helping to lead change in sustainability and energy efficiency, and setting the example for others to follow in similar situations.

23. What specific environmental benefits are achieved by the HSWAC System for the State, and for JABSOM?

**The State of Hawaii**

- The following metrics are the annual environmental benefits from the entire HSWAC System.
  - Replaces 77,000,000 kW-hr of electricity with thermal energy from seawater (1% of Oahu’s annual consumption - enough to power nearly 12,000 average homes on Oahu for a year\(^4\))
    - Reduces electrical demand on the grid by 14 MW, approximately 1% of Oahu’s electrical demand
    - Prevents 178,000 barrels of fuel oil from being burned
    - Stops 84,000 tons of carbon dioxide gas emissions

\(^4\) HECO 2015 data, processed by Hawai’i Energy – stated as 537 kWh/month (homes without photovoltaic systems).
- Eliminates the need for 260,000,000 gallons of potable water used in cooling towers
- Prevents 84,000,000 gallons of water being sent to the sewage system

**JABSOM**

- The following metrics are the annual environmental benefits specific to JABSOM from the HSWAC System\(^\text{15}\).
  - Using HSWAC Chilled Water for air conditioning will reduce JABSOM’s electrical consumption by 6.9 million kW-hours compared to existing operations – a 50% reduction in the current electricity usage.
    - Eliminates 11.4 million pounds of carbon dioxide emissions – a 50% reduction based on the eliminated electricity.
    - Reduces electrical demand on the Kaka’ako and Downtown circuits.
  - Not using cooling towers saves 14 million gallons of potable freshwater annually (50% of JABSOM’s current consumption), prevents 1.3 million gallons of blowdown water from entering the sewage system (34% of JABSOM’s current usage) and eliminates the usage of over 600 pounds of water treatment chemicals.
  - Eliminating the use of JABSOM’s chillers takes all 4,760 pounds of refrigerants used by the chiller plant out of circulation.

If JABSOM were to use photovoltaic panels to offset the electricity used by the chiller plant, 16 acres of land would be required to install a 4.8 MW solar array – and that would still not produce the potable water, sewage, chemical and refrigerant elimination.

\(^{15}\) HSWAC-JABSOM-UHCC Sustainability Report 20151006_FINAL: details on how these values were calculated.
Using HSWAC chilled water allows JABSOM to achieve measurable progress towards campus carbon neutrality goals. There is no other single measure that JABSOM can take that can provide the same magnitude of sustainability benefits that switching to HSWAC Chilled Water Service can provide, while still maintaining the high quality educational and research environment at JABSOM.

24. What are the specific operational benefits for JABSOM from using the HSWAC Service?

HSWAC will provide chilled water 24 hours a day, year-round whenever it is required, with no effort from JABSOM.

If cooling requirements change at the JABSOM facilities, the cooling capacity received from HSWAC can be easily increased or decreased, without having to install new equipment. The same cannot be said for any chiller plant for increases above the installed capacity.

HSWAC costs are stable, contractually guaranteed, and will only increase by fixed annual adjustments. This will help stabilize operational budgets that have seen volatility with changes in utility rates.
Similar to the current service agreement with BWS, with HSWAC chilled water, you gain the benefits of on-call chilled water technical expertise, without the overhead and administration associated with hiring and managing direct employees.

Utilizing HSWAC chilled water also negates the need for chiller plant equipment maintenance and impacts to building operations.

Using HSWAC chilled water will negate the expense and burden of chiller plant recapitalization as the equipment nears the end of its service life, coincident to the end of the BWS Agreement. This eliminates the need to conduct further studies to define new equipment specifications, establish a replacement plan to ensure continuity of service, procurement efforts, installation and commissioning of replacement equipment. JABSOM will also not have to hire additional personnel to operate and maintain the chiller plant, or establish a separate contract for this service.

There will be impacts as HSWAC connects JABSOM to the district cooling system, such as prepping the JABSOM Chilled Water Distribution System to accept HSWAC chilled water and construction of the actual connection, but those are efforts that HSWAC will manage and coordinate, not direct burdens to the JABSOM staff or issues that they have to directly resolve.

25. Considering the technology and physical oceanography inherent in this project, has UH been involved with the development of the HSWAC System?

Yes. UH and HSWAC have worked together in multiple ways to develop many aspects of this project. The following are highlights of the collaborations had over the years:

- HSWAC has participated in multiple meetings with Dr. Brian Taylor, Dean of the School of Ocean and Earth Science and Technology at UH, Manoa along with many scientists interested in upwelling and nutrient concentrations in near surface waters.
- HURL submarines were contracted by HSWAC for the alignment survey and deep ocean benthic characterization of the offshore pipeline.
- HSWAC worked with Dr. Christopher Kelly of the Department of Oceanography to develop the deep water survey used as an appendix to the Federal EIS, and collaborated on material presented at an OTEC symposium.
- Dr. Christina Comfort, Oceanographic researcher at the Joint Institute for Marine and Atmospheric Research at UH, Manoa has done review work with HSWAC for the Federal EIS and has collaborated on data from respective research studies on characterization of the waters at and near both the HSWAC sea water intake and discharge locations.
o HSWAC has contracted Dr. Steve Dollar of the Oceanography Department to provide water samples on several occasions in collaboration with the State of Hawaii Department of Health.

o HSWAC was a presenter at the Enhanced Ocean Upwelling conference at C-MORE Institute for Dr. David Karl.

Most of the current HSWAC employees are graduates from UH, Manoa having received degrees from the Department of Ocean and Resources Engineering (ORE), the College of Engineering, and the School of Architecture. Through the years many of our past employees and interns were also from UH and the ORE Department.

And finally, no discussion about SWAC would be complete without acknowledging the technology was first implemented in the 1980’s at Keahole Point by Dr. Arlo Fast, a UH Seagrant-funded researcher working at NELHA.

As HSWAC moves to implement the technology borne here in Hawaii on a commercial scale, we are proud to acknowledge the multitude of ties back to UH that have been instrumental in making this project a reality.

26. Has this proposal been reviewed by cognizant personnel at UH?

Yes. HSWAC has been in in-depth discussions with UH personnel at JABSOM, UH Manoa and UH System for the past two years, beginning in February 2015. Regarding the technology and actual operations, JABSOM/UHCC and its consultants have been working together with HSWAC to ensure the service is compatible and beneficial. Financial reviews at JABSOM and at UH System have validated the proforma over the 20-year contract term. In addition, UHCC’s engineering consultant WSP, has produced a Feasibility Study dated December 1, 2015. Multiple briefings and presentations on the above topics have been given to JABSOM, UH Manoa’s Campus Facilities Planning Board, and UH System. Contractually, the University of Hawaii Office of General Council (OGC) has reviewed the Chilled Water Customer Agreement for form.

27. When is the service expected to start?

HSWAC has developed the project to the “shovel-ready” point. All regulatory agency permits needed for construction and operation have been issued to HSWAC. Design and construction drawings are complete. Final financing efforts (independent third party engineering review, bond rating, financial close) and final construction...
contractor selection are pending customer commitments for the service. HSWAC’s Chilled Water Service Agreement for JABSOM is a significant contribution to enabling HSWAC to ultimately start service for all customers. The specific financing process is expected to take six months from start to financial close. Construction is expected to be completed in 18 to 24 months. Should construction start in the fourth quarter of 2017 to first quarter 2018 window, as is currently anticipated, First Chilled Water Service is expected to JABSOM in early 2020.

28. Is there a danger of flooding?

No. HSWAC’s District Cooling System chilled fresh water loop is a closed loop system. Unlike an open system (such as a municipal water supply system) where a waterline break could continue leaking until the leak is detected and isolated, a closed loop system would lose pressure due to the loss of water volume in the closed system, and the flow of water would stop. Additionally, most of HSWAC’s distribution system is deep underground and any loss of pressure would see the water settling at the “low” points of the system. Any leaks inside a building receiving service are at the “high” points of the system and cannot physically “drain” out the system into the facility. The risk of flooding of any one customer’s facility due to a leak of the HSWAC system inside their building is physically limited due to these facts. HSWAC’s system will be monitored 24/7 by qualified and trained operators for leaks. Should a leak be detected, the affected line will be isolated to prevent further leaking, repair crews dispatched to expeditiously resolve the issue and bring the system back to full service. The combination of all these factors makes the probability of a leak that would cause property damage is essentially negligible.

29. Why is JABSOM alone being considered? Shouldn’t the University of Hawaii Cancer Research Center (UHCC) also be included?

UHCC was included in an earlier review, it was found that the equipment and subsystems installed at UHCC, when analyzed, would require additional energy input in the form of a gas or electric hot water system which are not required at JABSOM. This additional cost to UHCC to enable the use of the HSWAC Chilled Water Service at UHCC were determined hindrances in the process moving forward.17 18 An amendment

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17 HSWAC Service Analysis for UH Cancer Research Center Report August 2015 showed a projected combined financial benefit of $100,000 annually if JABSOM and UHCC both received HSWAC Chilled Water Service. These estimates do not monetize the sustainability, environmental and service benefits for the campus.

18 UH Cancer Research Center District Cooling Feasibility Study, October 22, 2015 and revised December 1, 2015. Report completed by University of Hawaii mechanical engineering consultant WSP.
to the Customer Service Agreement for JABSOM to add UHCC requirements can be made to provide chilled water service to UHCC. HSWAC is capable of providing service to UHCC without having to incur future significant construction costs if provisions are included during initial construction to appropriately size the dedicated service connection between JABSOM and HSWAC’s cooling station to service all of the Kaka’ako facilities.

30. What systems will HSWAC have in place to guarantee 24/7 availability of Chilled Water to JABSOM?

The HSWAC cooling station is designed with the N+1 principle for all critical equipment. N+1 is defined as having all the equipment needed to operate at maximum output, then having 1 additional piece of equipment. For example, during maximum output HSWAC will require 2 large seawater pumps to pump up the cold seawater from the offshore pipe intake. In addition to the two pumps required, HSWAC will also have an additional seawater pump installed at the cooling station in standby. This design strategy is common with large utility-scale equipment designs which allow for continuous operation of the cooling station and service to customers, while accommodating the performance of periodic equipment maintenance. Also, should a single piece of equipment go out of service outside of normal maintenance schedules, the additional piece of equipment will be brought into service in its place.

HSWAC’s cooling station will have two HECO electrical service feeds, one from the Kaka’ako substation and the other from the Downtown substation. Should a local substation have an interruption of electrical service, HSWAC chilled water would be unaffected having the second feed in place. Should both HECO substations experience an interruption of electrical service, such as in the case of an island wide blackout, the cooling station will be equipped with a diesel generator for onsite electrical power generation, allowing HSWAC to continue providing chilled water service to its customers.

End of Document
EXHIBIT 4: Availability Report
AVAILABILITY REPORT

University of Hawaii Kaka‘ako Campus
Honolulu Seawater Air Conditioning Connection To JABSOM, UHCC

October 2015
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INTRODUCTION

The ability to safely and reliably deliver chilled water service to the University of Hawaii Kaka’ako Campus (UHKC) consisting of the John A. Burns School of Medicine (JABSOM) and the University of Hawaii Cancer Center (UHCC) is the top priority of Honolulu Seawater Air Conditioning (HSWAC). The system has been designed to provide decades of efficient, dependable chilled water service for the environmental conditions seen on Oahu. Beyond the design and operation by a team that has extensive experience with district energy systems, the fundamentals for accomplishing the highest system availability lies in investing in resilient materials, incorporation of proven construction techniques, and using reputable contractors with project experience similar in size and scope. UHKC, through the integration of HSWAC’s district cooling system, will be unmatched in the robust level of availability and quality of its chilled water service to the world class medical school and research facilities at JABSOM and UHCC. This unique benefit to the UHKC will be a significant advantage that few, if any, other campus around the world will offer its students and researchers.
JABSOM EXISTING SYSTEM DESIGN

Summary:

JABSOM’s current chilled water system is owned and operated by the Board of Water Supply (BWS) which provides JABSOM 24/7 chilled water service through a 20 year service agreement that started in 2005 and will expire in 2025. The primary design was to utilize a deep well water system to draw cold brackish water, 65 degree Fahrenheit, for condenser water in the central plant centrifugal chillers. This cold water would have provided increased electrical efficiencies in the central plant chillers. A typical evaporative cooling tower arrangement was also installed as a redundant condenser water system for the central plant.

During operation of the plant it has been discovered that the deep wells, in practice, supply warmer water in the 80 degree Fahrenheit temperature range. This warmer than designed for condenser water has thus lead to the use of the evaporative cooling towers as the primary source for condenser water for the central plant chillers and the deep well water system is now used for condenser water redundancy for the evaporative cooling towers.

The maximum cooling load for JABSOM has averaged just above 1,400 tons of cooling over the past 9 years of operation. The greatest cooling load of 1,800 tons cooling was observed in 2006, the first year of operation.

JABSOM’s Chilled Water System Key Components:

- One 780 ton CVHF 0910 Trane centrifugal chiller, as operated on cooling towers
- Two 800 ton CVHF 0910 Trane centrifugal chillers, as operated on cooling towers
- Two 11,130 MBH (927 ton) 3527A-2 Baltimore Aircoil Company (BAC) Cooling Towers
- Well water condenser water loop:
  - Three 1750 GPM PFX-140-SS-FS-1-400 Armstrong plate and frame heat exchangers for well water condenser water system
  - Two 3,500 GPM 19FKH Floway Pumps
- Three 1,520 GPM 4300 12x12x13 Armstrong primary chilled water pumps
- Three 3,710 GPM 4300 12x12x17 Armstrong condenser water pumps
- Two 3,000 GPM 4300 10x10x13 Armstrong secondary chilled water pumps
- One 1,000 kW/1,250 kVA 480V, 3Φ generator

Figure 1: JABSOM Central Plant Equipment List.
JABSOM Critical Cooling Loads:

JABSOM has critical cooling loads servicing the Vivarium animal habitats, telephone and data rooms, electrical rooms, elevator machine rooms, and the security office in the Research Building. These spaces require temperature controlled environments 24/7. A study of designed total connected loads for these areas finds a total connected cooling load of 357 tons of cooling.

Chilled water is supplied to critical loads in the Research Building of which the connected cooling loads as originally designed were intended to be reduced in a primary electrical power failure mode. Per the Sequence Of Operation: Emergency Mode air handling units AHU-2-403, 404, 405 are to continue to receive full cooling for the Vivarium space, of which AHU-2-405 is kept for redundancy should AHU-2-403 or 404 experience a mechanical failure. In addition to these air handler units, all fan coil units FCU-2-101 through 403 continue to receive...
full cooling. The total connected cooling load of these air handling units and fan coils, per the equipment schedules below, is 357 tons of cooling.

Based upon operational input and experience there have been some modifications made to the Sequence of Operation: Emergency Mode as outlined in Architects Hawaii Limited drawing PC2M-610.A. Air handler AHU-2-401 and its redundant air handler AHU-2-402 have been reprogramed to also receive full cooling for the Gross Anatomy Laboratory space. As well air handler AHU-2-406 and its redundant air handler AHU-2-407 have been reprogramed to also receive full cooling for the Core Laboratory Spaces. The total connected cooling load with these additional spaces now receiving full cooling, per the equipment schedules below, is 1,065 tons. This is 37% more connected cooling load than the one 780 ton chiller on redundant electrical power can supply to the property.

Based upon this experience and operations over the past 9 years these loads are assumed to be as high as 700 tons during a period of higher than design wet bulb temperatures. During primary electrical power failures not all connected cooling loads are connected to redundant electrical generation units, thus some spaces are not cooled during this failure mode. These spaces are assumed to be non-critical office space and class rooms. Observations from past primary electrical power failures have been that the chiller that is operating to service these critical cooling loads operates at approximately a 65% load level, or 510 tons.

**Figure 2:** JABSOM Research Building mechanical equipment schedules and critical cooling loads on emergency power. Architects Hawaii Limited University of Hawaii John A. Burns School of Medicine Mechanical Equipment Schedules PC2M-622, 10/08/2004 and PC2M-624, 06/16/2003 and PC2M-610A Sequence of Operation: Emergency Mode, 11/14/2003.
JABSOM Failure Modes:

Primary Electrical Power Failure:

Primary electrical power is supplied to JABSOM from the local electrical utility, Hawaiian Electric Company (HECO). Should JABSOM lose primary electrical power from HECO, redundant electrical generation is provided to the central plant from a 1,000 kW diesel generator. The generator is sized to provide redundant power to one of the central plant chillers and associated cooling tower and pumps. This enables JABSOM to continue to provide a reduced cooling capacity of 780-800 tons. Chiller #1 (780 tons) and chiller #2 (800 tons) are on the redundant generator power buss allowing the option to operate either chiller #1 or chiller #2 during a primary electrical power failure, but not both. Should chiller #1 or chiller #2 experience a mechanical failure during a primary electrical power failure the other chiller can be brought on line to continue to provide 780-800 tons of cooling during a primary electrical power failure.

Primary Condenser Water Supply:

Primary condenser water supply is supplied to JABSOM from the local water utility, Board of Water Supply (BWS). Should JABSOM lose primary condenser water supply from BWS to supply a constant flow of potable water for the evaporative cooling towers, an average of 1,600 gallons per hour, redundant condenser water is provided to the central plant from the deep
water well system. The deep water well system is sized to provide redundant condenser water to all of the central plant chillers. Thus the JABSOM central plant can continue to provide 1,600 tons of cooling in the event of primary condenser water failure.

Mechanical Systems:

Design cooling load is supplied using two of the three chillers installed. The third 800 ton chiller is used for redundancy should one chiller come out of service due to mechanical failure or for scheduled maintenance. Each chillers condenser water and primary chilled water pumps are dedicated to the specific chiller and thus should either the condenser water or primary chilled water pump associated with a chiller fail this will render the specific chiller non-operational.

As previously mentioned the condenser water system is mechanically redundant so should the evaporative cooling tower system experience a mechanical failure such as a tower basin water leak or fan failure the JABSOM central plant can use its redundant deep well water system to supply condenser water. The deep well system uses two source wells each with its own supply pump. JABSOM central plant needs one well to be in service to supply sufficient condenser water to operate two chillers to meet full load cooling conditions. The deep well water is distributed to three plate and frame heat exchangers to isolate the brackish well water from the fresh water in the condenser water system inside the central plant. Two of the three plate and frame heat exchangers are needed to supply sufficient condenser water to operate two chillers. One of the plate and frame heat exchangers is redundant for this system.
UHCC EXISTING SYSTEM DESIGN

Summary:

UHCC’s current chilled water system is owned and operated by UHCC which provides UHCC 24/7 chilled water service. The primary design utilizes evaporative cooling through the use of centrifugal chillers located in central plant inside the UHCC building and evaporative cooling towers located on the roof of the JABSOM central plant building. There are three 375 ton centrifugal chillers for a total installed capacity of 1,125 tons. Two, two cell induced draft cooling towers rated at 250 tons of cooling per cell for a total installed cooling tower capacity of 1,000 tons. Chilled water pumping utilizes three 645 GPM chilled water pumps operating in parallel for variable/primary pumping. Condenser water pumping utilizes three 1,125 GPM condenser water pumps operating in parallel for variable pumping. Both sets of pumps utilize the third pump for redundancy should one of the other pumps in the system fail or be taken out of service for maintenance.

The maximum cooling load for UHCC has averaged 450 tons of cooling over the period of June 2013 to June 2014.

UHCC’s Chilled Water System Key Components:

- Three 375 ton York YMC2 centrifugal chillers with Optispeed VSDs
- Two 500 ton REYMSA HRFG-1414410 Cooling Towers
- Three 645 GPM Marathon KVM primary chilled water pumps
- Three 1,125 GPM Marathon KVJ condenser water pumps
- One 2,000 kW generator to operate one 375 ton chiller and associated cooling tower and pumps.

Figure 3: UHCC – Chilled and Condenser Water Schematic Diagram. shimokawa + nakamura University of Hawaii Cancer Center Mechanical Equipment Schedules PCM-4.03 2/29/2012.
UHCC Critical Cooling Loads:

UHCC has critical cooling loads servicing lab spaces. These spaces require temperature controlled environments 24/7. A study of total connected load for these areas on emergency power is 418 tons. During primary electrical power failures not all connected cooling loads are connected to redundant electrical generation units, thus some spaces are not cooled during this failure mode. These spaces are assumed to be non-critical office space and class rooms. As only one centrifugal chiller is connected to emergency power current redundancy on emergency power is only 375 tons of cooling capacity.

Figure 4: UHCC mechanical equipment schedules and critical cooling loads on emergency power. Shimokawa + Nakamura University of Hawaii Cancer Center Mechanical Equipment Schedules PCM-0.03 and PCM-0.02 8/15/2012.
UHCC Failure Modes:

Primary Electrical Power Failure:

Primary electrical power is supplied to UHCC from the local electrical utility, Hawaiian Electric Company (HECO). Should UHCC loose primary electrical power from HECO redundant electrical generation is provided to the central plant from a 2,000 kW diesel generator. The generator is wired to provide redundant power to one of the central plant chillers and associated cooling tower and pumps. This enables UHCC to continue to provide a reduce capacity of cooling of 375 tons of cooling. Only one chiller is connected to redundant generator power, should this chiller experience a failure during a primary electrical power failure no cooling will be available to UHCC.

Primary Condenser Water Supply:

Primary condenser water supply is supplied to UHCC from the local water utility, Board of Water Supply (BWS). Should UHCC loose primary condenser water supply from BWS to supply a constant flow of potable water for the evaporative cooling towers, an average of 600 gallons per hour, there is no redundant condenser water supply available to UHCC. In a primary condenser water supply failure were to occur, no cooling will be available to UHCC unit an
alternate source of potable water can be made available or the local water utility resumes service.

**Mechanical Systems:**

Design cooling load is supplied using two of the three 375 ton chillers installed. The third 375 ton chiller is used for redundancy should one chiller come out of service due to mechanical failure or for scheduled maintenance. Each chillers condenser water and primary chilled water pumps are piped in parallel to a common header and thus should either a condenser water or primary chilled water pump fail the redundant pump can be brought into service to continue to provide redundant pumping.
HSWAC SYSTEM DESIGN

Summary:

HSWAC’s district cooling chilled water system is currently under development and will be owned and operated by HSWAC providing its Downtown Honolulu and Kaka’ako customers 24/7 chilled water service through multi-year service agreements. The primary design is to utilize a deep sea water system to draw 44 deg cold water for primary cooling in to HSWAC’s cooling station. This cold water will provide primary cooling to a closed chilled fresh water loop and then be used for condenser water in centrifugal chillers that will provide quality control to the chilled water loop to bring the seasonally variable sea water cooled chilled water to its contractual obligated delivery temperature. Using the still cold return seawater, approximately 58 degrees Fahrenheit, for condenser water, HSWAC’s cooling station plant chillers electrical efficiencies will be increased beyond a conventional evaporative cooling system. HSWAC’s chiller plant has been design to provide a total of 28,000 tons of diversified cooling load to its connected customers.

HSWAC’s Chilled Water System Key Components:

- One 65” x 25,600’ seawater intake pipe at a depth of 1,750’
- Three 20,100 GPM seawater pumps
- Six 6,700 GPM (2,500 ton) plate and frame heat exchangers with titanium plates for corrosion resistance
- Five 2,500 ton centrifugal chillers
- Six 10,800 GPM chilled water distribution pumps
- One 3,000 kW generator
- 5,000 gallons of fuel storage
- 44” – 8” Subterranean chilled water distribution system with dedicated supply and return lines to customers.

Figure 5: HSWAC– Chilled and Condenser Water Schematic Diagram
HSWAC sub-systems:

1. Seawater Pipe System
2. Cooling Station
3. Power Supply
4. Chilled Fresh Water Distribution System

1. Seawater Pipe System

Significant effort and validation went into developing the seawater pipe system and determining the optimum route. The seawater intake pipe will be made of very robust, high density polyethylene (HDPE) pipe sections. This is an industry standard for large offshore pipelines and is currently in use as several effluent discharge pipelines in the Honolulu area. All flange welds will undergo ultrasonic quality tests, and once deployed the pipe will rest safely on concrete collars on the sea floor. The pipe route has been surveyed by the University of Hawaii, Hawaii Undersea Research Laboratory, Deep Submergence Vehicle to ensure optimum placement that avoids obstructions or the need to suspend the pipeline and cause stress points in the pipe. Along the shallow portion of the pipe route, the concrete collars will be secured in place by piles driven into the seafloor. In the surf zone, across the shoreline and all the way to the cooling station, the pipe will be located in a micro tunnel located deep under the seafloor. The seawater pipe system is designed to withstand hurricane generated waves, currents and tsunamis. A wave simulation model was used to simulate the largest
expected swell and waves and validate the survivability of the pipe against these forces of nature.

2. Cooling Station

The HSWAC cooling station was designed to create a very high level of operational availability. To ensure continued operation in the event of component failure and to accommodate planned maintenance, there will be redundancies for all critical main components of the system. For each series of critical components there will be at least one additional component. Critical components are:

- Seawater Pumps
- Heat Exchangers
- Auxiliary Chillers
- Distribution Pumps

Figure 6: HSWAC Redundant system schematics

3. Power Supply

Primary electrical power will be supplied to HSWAC from the local electrical utility, Hawaiian Electric Company (HECO). The cooling station will be supplied by two separate electricity feeders, each with the capacity to supply the cooling station with 100% of the maximum...
electrical demand. In the event there is a failure of both feeders, or an island wide power outage, a redundant diesel generator inside the Cooling Station will activate to power the Seawater Pumps and the Freshwater Distributions Pumps. This will ensure an uninterrupted flow of chilled water to all HSWAC customers in the event of a total island wide power outage.

4. Chilled Fresh Water Distribution System

All parts of the distribution system are located underground. The vast majority of the system will be constructed with corrosion resistant materials such as HDPE or glass fiber reinforced plastic pipes. These materials were selected not only to withstand engineering loads but also earthquakes and other natural hazards. The piping network will be equipped with shut-off valves to allow planned maintenance in confined areas while minimizing interruption of chilled water supply to customers. In order to prevent damage to the chilled water distribution piping system due to construction or repair work in the roads, a warning net, tape or another detection aid will be installed in the ground above all HSWAC underground pipe and equipment. Additionally for planned worked by other utility groups involving trenching in or around areas containing HSWAC lines, coordination of activities during planning and execution will occur, through participation with the States utility coordination service “One Call”, to prevent issues from developing. The piping network will be equipped with a leak detection system making it possible to repair leaks at an early stage minimizing interruptions. An Emergency Repair Response Plan will be developed prior to system commissioning. In the event the system is compromised once in operation the compromised section of pipe will be repaired and placed back into service with minimal downtime if any at all.

HSWAC Failure Modes:

Primary Electrical Power Failure:

Should HSWAC loose primary electrical power from HECO redundant electrical generation will be provided to the cooling station from a 3,000 kW diesel generator. The generator is sized to provide redundant power to all of the cooling station’s seawater pumps and chilled water distribution pumps. This will enables HSWAC to continue to provide a reduce capacity of cooling of 16,800 tons of cooling to its customer base. The cooling station will have 5,000 gallons of fuel stored on site allowing for a 27 hour full load operation. Longer operations from onsite fuel supplies can be expected with reduced system loads as would be expected during an island wide power failure, as most of HSWAC’s customers will not be utilizing cooling.

Most of HSWAC’s customers do not have redundant power supplies from onsite generation, an island wide power failure will result in HSWAC’s cooling load being significantly reduced as these customers will be unable to operate pumping, air handler, and or fan coil fans to supply cooling on property. In the event of a primary electrical power failure HSWAC will be able to continue supplying JABSPOM and UHCC the full cooling capacity needed to operate both facilities at full capacity. It is highly probable that a primary electrical power failure that affects HSWAC’s cooling station will also affect the UHKC and only critical cooling loads will be on line using chilled water. Other critical loads on the HSWAC system are hospitals, data centers, and some government facilities. These facilities will maintain additional onsite cooling redundancy
that can be utilized to ensure all of HSWAC connected critical cooling loads can be serviced to maximum efficiency in the case of an island wide emergency.

Once connected to the HSWAC system future availability and failure mode studies could be conducted to integrate the existing redundant generator capacity on site to operate other electrical loads on campus in the event of a primary electrical power failure assuming that HSWAC is sufficiently redundant to continue to supply chilled water during such an event.

**Primary Condenser Water Supply:**

Primary condenser water supply and primary cooling is supplied to HSWAC from the deep seawater pipe. There are few catastrophic events that would render the seawater intake pipe non-operable. Thus there is very low risk in loss of access to primary condenser water supply to the HSWAC cooling station.

**Mechanical Systems:**

Design cooling load is supplied using five of the six 2,800 ton heat exchangers and four of the five 2,500 ton chillers installed. The sixth 2,800 ton heat exchanger and fifth 2,500 ton chiller will be used for redundancy should one heat exchanger or chiller come out of service due to mechanical failure or for scheduled maintenance. Similarly one seawater and one chilled water distribution pumps will be used for redundancy should primary pump come out of service due to mechanical failure or for scheduled maintenance. Each chillers condenser water and primary chilled water pumps are piped in parallel to a common header and thus should either a condenser water or primary chilled water pump fail the redundant pump can be brought into service to continue to provide redundant pumping.
INTEGRATED SYSTEM DESIGN

Summary:

Physically connecting the JABSOM, UHCC and HSWAC’s chiller plants together will provide additional layers of redundancy over currently available options at UHKC, see Figure 7 and Figure 8. UHKC will benefit from the availability of the HSWAC chilled water system as provided for with HSWAC’s redundant design of systems and components. In addition UHKC will have the opportunity to evaluate the benefits and costs associated with leveraging resources of the existing chiller plants in an integrated redundancy option. An integrated campus has the potential to achieve a level of availability and redundancy over and above that which is offered currently at each individual plant or by HSWAC alone. As the potential number of final integrated redundancy options are many, the following three have been identified as examples of, 1) The greatest level of redundancy, 2) The minimal level of redundancy, 3) and 4) Potential scenarios of redundancy between that of 1 or 2 above.

Each integration option will have direct cost to maintain such a level of integrated redundancy. Option 1 will bring with it the highest cost to maintain this level of redundancy while option 2 will be the lowest cost. It is not within the scope of this report to identify a specific preferred option. This decision will need to be made based upon a balance between the level of redundancy required for the integrated system and the cost to maintain such a level of redundancy.

**Figure 7**: JABSOM, UHCC, and HSWAC independent schematic.

**Figure 8**: JABSOM, UHCC, and HSWAC interconnection schematic.
Option 1: Maintain All Equipment As Is

In this option both JABSOM and UHCC would maintain all chilled water system components to current levels. UHKC would continue to pay all maintenance and operational readiness costs to maintain system components at the same level as they have been maintained to date. This would provide JABSOM and UHCC the ability to isolate their respective chiller plants from the HSWAC system to provide 100% chilled water capacity to the respective facilities within minutes of an interruption of HSWAC’s primary chilled water service. In addition there would continue to be the additional chiller capacity held in reserve should these secondary systems to HSWAC’s primary chilled water service fail. This in essence would provide UHKC three levels of cooling capacity. In the event of a catastrophe that caused a failure at the HSWAC chiller plant, and that did not also affect UHKC, UHKC these systems could continue to provide chilled water service to the campus. This option would bring with it the highest cost to UHKC, as well as provide the highest level of availability through the ability to use all existing cooling equipment to solve for a potential interruption of service from HSWAC.

Option 2: Utilize HSWAC Only, Long Term Storage In-Place JABSOM And UHCC Equipment

In this option both JABSOM and UHCC would place all redundant chilled water system components into long term storage. This equipment would include, chillers, cooling towers, condenser water pumps, primary chilled water pumps at JABSOM, and electrical switch gear. There is no need to physically remove any of the existing equipment to connect the current systems to HSWAC. Thus this equipment would remain in place and available to bring back on line should the HSWAC chilled water system experience a catastrophic event that caused a failure at the HSWAC chiller plant, and that did not also affect UHKC. The response time to bring the existing equipment back in service could be relatively quickly. Immediate tasks may include the filling of the cooling tower condenser water system, recharge of the chillers refrigerants and other fluids, and in-depth start up procedures to check for leaks, damaged parts, or failures at start up that would require the system to be shut down and repaired before operating. It is feasible that startup of an system placed into long term storage could occur within hours of starting the process, however the level of confidence that the startup would be successful would not be well known since routine maintenance was not performed to identify any maintenance or mechanical problems preventing operating the equipment prior to emergency start up. This is typical for mechanical systems. It is common for mechanical systems to be placed in long term storage with the intention of successful startup following proper start up procedures and precautions to prevent mechanical failure due to starting up too quickly, failing to properly check all critical systems. Long term storage preparations as described in York Form 50.20. NM1 and 50.20-NM5 can be used to store unused chillers to ensure the greatest level of problem free restart of chiller equipment should it be needed in the future. Minimal monthly, quarterly, semiannual and annual checks can be performed on the chillers as outlined in York Form 50.20.CL5 (See Appendix)

This option would bring with it the lowest cost to UHKC, while providing a level of added availability through the reasonably expected ability to use all existing cooling equipment after proper start up procedures were followed. This option could solve for a potential longer term interruption of service from HSWAC. The time to restart existing cooling equipment would be in
the hours, to several days, time frame should the long term storage of the equipment allowed for trouble free start of the equipment.

Option 3: Utilize HSWAC, Maintain 1,600 Tons Capacity At JABSOM And 375 Tons Capacity At UHCC

In this option JABSOM and UHCC would place the currently redundant equipment into long term storage and continue to perform current maintenance on the equipment connected to redundant electrical generation. This would be two chillers at JABSOM and one chiller at UHCC and the respective cooling towers and pumps. This would provide JABSOM and UHCC the ability to isolate their respective chiller plants from the HSWAC system to provide 100% chilled water capacity at JABSOM and 50% chilled water capacity at UHCC within minutes of an interruption of HSWAC’s primary chilled water service and a simultaneous failure of the primary electrical failure at JABSOM and UHCC. In the event of a catastrophic event that caused a failure at the HSWAC chiller plant, and that did not also affect UHKC, these systems could continue to provide chilled water service to the campus. This option would bring with it additional cost to UHKC above option 2 but would be expected to be less than option 1. This option would provide the a 2nd level of availability through the ability to use the existing cooling equipment that is currently connected to redundant electrical power to solve for a potential interruption of service from HSWAC, similar as to what would be expected should there be a primary electrical supply failure at the campus as independent facilities.

Option 4: Utilize HSWAC, Maintain 1,600 Tons Capacity At JABSOM And 0 Tons Capacity At UHCC

In this option JABSOM continue to perform current maintenance on the all chiller equipment chiller #1, #2, and #3. UHCC would place all chiller equipment into long term storage. This would provide UHKC the ability to isolate the Campus from the HSWAC system to provide 1,600 tons of chilled water capacity between JABSOM and UHCC within minutes of an interruption of HSWAC’s primary chilled water service. There remains the possibility to add another cooling tower to the JABSOM chiller plant to allow for all 2,400 tons of chilled water capacity to be brought on line. The operator at JABSOM’s chiller plant indicates that currently the electric system is not such that all three chillers can be brought on line at one time. These additional efforts and associated costs would need to be properly evaluated and compared to other options to properly understand the potential for this option. However with the connection between the JABSOM and UHCC chiller plants this now becomes an option to service as 100% redundancy from the HSWAC system should the HSWAC system experience an interruption of service.

In the event of a catastrophic event that caused a failure at the HSWAC chiller plant, and that did not also affect UHKC, the JABSOM systems could continue to provide chilled water service to the Campus. This option would bring with it additional cost to UHKC above option 2 but may be less than option 1. This option would provide the a 2nd level of availability through ability to use the existing cooling equipment that is currently in place. There would be a reduction in cooling capacity should there be, at the same time, a failure of primary electrical failure at the JABSOM central plant.
This option would provide JABSOM and UHCC the ability to isolate their respective chiller plants from the HSWAC system to provide a potentially 100% chilled water capacity at JABSOM and UHCC within minutes of an interruption of HSWAC's primary chilled water service. In the event of a catastrophic event that caused a failure at the HSWAC chiller plant, and that did not also affect UHKC, the existing JABSOM system could continue to provide chilled water service to the campus. This option would bring with it additional cost to UHKC above option 2 but would be expected to be less than option 1. This option would provide a 2nd level of availability through the ability to use the existing cooling equipment of which some of this equipment is connected to redundant electrical power to solve for a potential interruption of service from HSWAC, and a slightly reduced availability should there be a primary electrical supply failure at the campus today.
CONCLUSION

JABSOM, UHCC and HSWAC have designed their respective chiller plants with appropriate redundancy to ensure the greatest level of availability and quality of chilled water to their individual facilities and customers. Through the physical interconnection, by HSWAC, the greater district cooling system of all three systems will increase that level of availability and quality beyond most, if not all, similar medical and research facilities. UHKC has an opportunity to evaluate the potential of contributing the existing chiller plants at JABSOM and UHCC, with each plant’s respective redundancy, into the larger HSWAC system to provide an integrated redundancy plan.

With the understanding that there is a wide variety of integrated system designs that will be possible through the physical connection of all three systems together, this comprehensive integrated system plan can be developed and implemented which will maximize the availability and quality of chilled water to the University of Hawaii Kaka’ako Campus for the lowest cost. Guidance from the University of Hawaii and the University of Hawaii Kaka’ako Campus administration will be needed to balance the desired cost savings, and added availability of the chilled water service to the Kaka’ako Campus of the future.
APPENDIX

1) YORK Form 50.20-NM1 (910). Long-Term Storage Requirement General

2) YORK Form 50.20-NM5 (410). Long-Term Storage Requirement – Field Preparation YMC2, YK, TY Centrifugal Chillers

3) YORK Form 50.20-CL9(410). Long-Term Storage Periodic Checklist and Logs YMC2, YK, TY Centrifugal Chillers
1) YORK Form 50.20-NM1 (910). Long-Term Storage Requirement General

Failure to comply with these requirements will render any written or implied Johnson Controls/YORK warranty null and void.

I. PURPOSE

The purpose of Long-Term Storage Requirements is to ensure that equipment manufactured by Johnson Controls does not sustain any damage or degradation due to being in a dormant state for extended periods of time. The proper implementation and adherence to the Long-Term Storage Requirements will ensure that when the equipment is started and operated it will be in the intended condition. This will benefit the customer by providing equipment with the maximum service life.

II. DEFINITION OF LONG-TERM STORAGE

In General, all equipment manufactured by Johnson Controls that meets any, some, or all of the conditions below shall be prepared for Long-Term Storage.

A. Equipment not “started” within six (6) months of leaving the Johnson Controls factory.

B. Equipment being stored within five (5)-miles of a body of salt water (time independent).

C. Equipment being shipped on a body of salt water (time independent).

“Start-up” is defined as useful operation or Testing, Charge and/or Adjustment (TCA).

Condition A is based upon the unit being stored indoors in a vibration-free, non-corrosive environment. Special provisions may be necessary for environmental conditions outside these parameters. Please contact Johnson Controls for further instructions if storage is subject to non-standard environmental changes/conditions even for periods less than six (6) months.

Failure to adhere to the Long-Term Storage Requirements as outlined can and will render any written or implied Johnson Controls warranty null and void.

III. RESPONSIBILITIES

A. SALES

The Sales Engineer shall determine the estimated Start-up date and shipping methodology for the equipment prior to completing the sale. The Sales Engineer shall inform the Customer of the requirement to provide for Long-Term Storage, the specific Long-Term Storage Requirements (including the Customer’s responsibilities), the associated costs for each piece of equipment, and the estimated shipping dates. The Sales Engineer shall notify the Customer when the equipment is actually shipped and request an updated estimated Start-up date at this time. Note that depending on the actual start-up date, customer may be required to purchase Delayed Start-Up Warranty as well. Delayed Startup Warranty must be purchased prior to units shipping from the factory.
If an estimated Start-up date is within a four (4) to six (6) month post-shipment window, the sales engineer shall notify the owner of the potential need for Long-Term Storage Requirements and the associated costs if the Start-up becomes delayed. If the local Johnson Controls Service office has not started the equipment after four (4) months, the Sales Engineer shall contact the Customer to request a revised Start-up estimate.

In the event that equipment has an unplanned delayed Start-up, the Sales Engineer shall notify Johnson Controls Product Technical Support for instructions to proceed. Every effort shall be made by all parties to make this determination and notification as soon as possible. Any delay in the process will hinder Johnson Control's ability to provide Warranty Services to the customer in a cost effective way.

B. MANUFACTURING
It shall be Manufacturing's responsibility, upon receipt of an order requiring Long-Term Storage, to inspect and protect vendor-supplied components upon receipt and before mounting in shop. Manufacturing shall carry out the instructions detailed in the factory order form, per Engineering in regards to long term storage, and the requirements there of regarding in-shop preparation of units for Long-Term Storage, and document the status of the unit prior to shipment.

C. SERVICE
The Johnson Controls Service Office shall receive and review the Long-Term Storage Periodic Check Lists and Logs that were completed by the customer. The Johnson Controls Service Office shall notify the Customer in writing of any discrepancies and any required corrective action(s) prior to Start-up and within ten (10) working days of receiving the completed Periodic Checklist and Logs from the Customer. At the time of Start-up, the Johnson Controls Service Office shall inspect all equipment that has been prepared for Long-Term Storage to ensure that its condition at Start-up corresponds with all documentation and what is expected for each specific piece of equipment.

D. CUSTOMER
It is the Customer's responsibility to ensure that the necessary procedures described have been completed. It will be the responsibility of the Customer to submit completed log sheets showing the condition of the unit and noting any discrepancies. The logs shall be sent to the Johnson Controls Service Office having eventual supervision.

If after four (4) months from shipment, the equipment has not been started and/or in the event that Start-up is delayed, the Customer shall notify the Sales Engineer as soon as possible.

In the event there is an unplanned delayed Start-up, the Customer shall notify the Sales Engineer in writing with as much information on the new schedule and the site and equipment conditions. Every effort shall be made by all parties to make this determination and notification as soon as possible. Any delay in the process will hinder Johnson Controls ability to provide Warranty Services to the customer in a cost effective way. The Customer shall be responsible for the cost of any Long-Term Storage actions that Johnson Controls determines are necessary to provide for the proper life of the equipment and subsequent ability to provide any written or implied Warranty Services.

The appropriate Long-Term Storage Preparation (Section IV) and Long-Term Storage Periodic Checklist and Logs (Section V) are listed below and can be obtained from the Sales Engineer or the local Johnson Controls Service Office.
IV. LONG-TERM STORAGE PREPARATION

For specific instructions on preparing YORK equipment for long-term storage in the field (equipment that was not prepared at the factory), refer to the following documents. Long-term storage preparation in the field shall be provided by Johnson Controls factory certified technicians.

- Packaged Roof Top Units ................................................................. Form 50.20-NM2
- Fan Coils, Unit Ventilators, Variable Air Volume Boxes, FlexSys .......... Form 50.20-NM3
- Absorption Chillers ......................................................................... Form 50.20-NM4
- Centrifugal Chillers ......................................................................... Form 50.20-NM5
- Air Cooled Screw/Scroll Chillers ...................................................... Form 50.20-NM7
- Screw chillers .................................................................................. Form 50.20-NM9

V. LONG-TERM STORAGE PERIODIC CHECK LISTS AND LOGS

For specific instructions on YORK equipment long-term storage inspections and procedures, refer to the following documents:

- Packaged Roof Top Units ................................................................. Form 50.20-CL2
- Fan Coils, Unit Ventilators, Variable Air Volume Boxes, FlexSys .......... Form 50.20-CL3
- Absorption Chillers ......................................................................... Form 50.20-CL4
- Centrifugal Chillers ......................................................................... Form 50.20-CL5
- Air Cooled Screw/Scroll chillers ...................................................... Form 50.10-CL7
- Screw chillers .................................................................................. Form 50.20-CL9

VI. WARRANTY CLAIMS

No warranty claims will be accepted for damage resulting from improper long-term storage.

VII. SIGN-OFFS

Customer Acknowledgement/Date

YORK Sales Engineer/Date

YORK Service Representative/Date
2) YORK Form 50.20-NM5 (410). Long-Term Storage Requirement – Field Preparation YMC², YK, TY Centrifugal Chillers

<table>
<thead>
<tr>
<th>YORK BY JOHNSON CONTROLS</th>
<th>LONG-TERM STORAGE REQUIREMENT - FIELD PREPARATION YMC², YK, YT CENTRIFUGAL CHILLERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SERVICE POLICY &amp; PROCEDURES</td>
<td>Supersedes: 50.20-NM5 (1208) Form 50.20-NM5 (410)</td>
</tr>
</tbody>
</table>

Failure to comply with these requirements will render any written or implied YORK/Johnson Controls warranty null and void.

I. SUPPLEMENTARY DOCUMENTATION

The following documentation is required to FULLY COMPLY with the Long-Term Storage requirements:

A. Long-Term Storage Requirements – GENERAL (refer to Form 50.20-NM1)

B. Long-Term Storage Requirements – PERIODIC CHECKLIST AND LOGS (YMC², YK, YT) (refer to Form 50.20-CL5)

II. FIELD PREPARATION FOR LONG-TERM STORAGE

A. General

1. Remove and dispose of shipping bag.

2. Perform a visual inspection of the chiller. Note any damage in the Field Comments section of the Periodic Checklist and Log Sheet (refer to Form 50.20-CL5).

3. Touch up any paint that has worn or chipped off using paint supplied in ship loose items. Prepare the surface as required using a wire brush.

4. Verify that all ship loose items are present. Note any missing items on the Periodic Checklist and Log Sheet (refer to Form 50.20-CL5).

B. Electrical Equipment And Components (Control Panels, Power Panels, Optional Panels, Motors, etc.)

1. Electrical Equipment and Components shall not be stored or left in an outdoor environment.

2. Electrical Equipment and Components shall not be stored or left in a wet or damp environment. Components sealed in plastic shrink-wrap do not exempt this requirement. Moisture will collect inside the plastic, resulting in corrosion of the cabinet, the electronic components and/or copper bus bars.

3. YORK Vapor Emitter(s) shall be installed inside each electrical and electronic components cabinet(s) to protect against corrosion. Openings in cabinets shall be taped closed to minimize air infiltration during the storage period. The quantity of emitters is determined by measuring the gross volume of space the component occupies. YORK Part Number 026-37705-000 will protect a volume up to 5 cubic feet. YORK Part Number 026-37706-000 will protect a volume up to 11 cubic ft. Both emitters have a service life of 12 months. If other emitters are used, they must supply equivalent protection.

4. Vapor emitters must be installed in the following equipment and components:

   a. The Power Panel
   b. The Control Panel
   c. Any optional Electric Enclosures
   d. YMC² Bearing Control Cabinet
5. Motor Preparation - Install a YORK Vapor Emitter (YORK p/n 026-37705-000) in motor D-flange. This will provide corrosion protection for the motor/compressor shafts and couplings. Seal D-flange from air infiltration.

6. Run the oil pump to fill the seal cavity providing an adequate seal on the shaft seal (YK and YT chillers only).

C. Shell Side Preparation

1. Units charged with refrigerant - Recover refrigerant into clean/evacuated approved cylinders. Store cylinders in a suitable location.
2. Make sure that all valves are open so that no part of the system is isolated.
3. With the machine at atmospheric pressure, install valve and pressure gauge as shown in FIGURE 1.
4. Evacuate chiller using a vacuum pump to remove any residual refrigerant.

**NOTE**

*If refrigerant remains in the unit, the pressure will fluctuate with ambient conditions. This is undesirable as it may lead one to believe that a leak is present when one is not.*

5. Pressurize the shell with approximately 5 psig of dry nitrogen.
6. Record pressure on Long-Term Storage Periodic Checklist and Log Sheet Form 50.20-CL5.
7. Make sure that plastic caps are installed on all relief valves to prevent dirt and moisture from entering valve.
8. Disconnect actuator linkage at center for PRV’s, variable orifice and hot gas bypass valve (when supplied). Nuts and bolts should be attached to loose linkage so that they do not get lost.
9. Tape off sight glass with masking tape.

D. Tube Bundle Preparation And Inspection

1. Remove existing nozzle shipping enclosures.
2. Inspect inside water box to insure that no moisture/corrosion or debris is present. Note damage on Long-Term Storage Periodic Checklist and Logs Form 50.20-CL5.
3. Replace with suitable enclosures from TABLES 3 and 4. If other enclosures are used, they must be capable of sealing and holding 15 psig pressure.

<table>
<thead>
<tr>
<th>TABLE 1 - VALVE AND PRESSURE GAUGE</th>
</tr>
</thead>
<tbody>
<tr>
<td># DESCRIPTION</td>
</tr>
<tr>
<td>1 Valve</td>
</tr>
<tr>
<td>2 Gauge</td>
</tr>
<tr>
<td>3 1/4 Swivel Union</td>
</tr>
<tr>
<td>4 1/4 Ext. Flare to 1/4 NPTI</td>
</tr>
</tbody>
</table>

![FIGURE 1 - VALVE AND PRESSURE GAUGE](image)
Machines are typically shipped with either plastic or steel cover plates on machines shipped with 150 or 300 psig flanges.

The enclosures that are shipped standard from the factory are not designed to hold a positive pressure. They must be replaced.

4. Inspect all threaded fittings and clean with Loctite 7070. Replace all fittings.

5. Install fittings on water box vent connections as shown in FIGURE 2.

6. Drain and dry bundles. Remove drain plugs/caps. Attach a nitrogen regulator to a nitrogen cylinder using a suitable hose. Purge dry nitrogen (approximately 1/2 psig) through bundle for at least 20 minutes to assure that no moisture is present in the bundles.

   The presence of moisture can be verified by placing a mirror under the drain connection. If moisture is present, the mirror will have a tendency to fog.

7. Once bundles are dry, shut off nitrogen supply, reinstall drain fitting using Loctite cleaner/primer/sealant.

8. Pressure bundles to approximately 5 psig nitrogen holding charge. Record pressure on the Long Term Storage Periodic Checklist and Logs (50.20-CL.5).

---

**TABLE 2 - WATER BOX CONNECTIONS**

<table>
<thead>
<tr>
<th>#</th>
<th>DESCRIPTION</th>
<th>YORK PIN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Valve</td>
<td>022-09539-000</td>
</tr>
<tr>
<td>5</td>
<td>Gauge</td>
<td>026-18920-000</td>
</tr>
<tr>
<td>8</td>
<td>3/4 to 1/4 Reducer</td>
<td>023-01039-000</td>
</tr>
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</table>
### TABLE 3 - COOLER CLOSURE

<table>
<thead>
<tr>
<th>SIZE</th>
<th>VICTAULIC COUPLING PART NUMBER</th>
<th>PIPE CAP PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>023-15215-000</td>
<td>023-15222-000</td>
</tr>
<tr>
<td>6&quot;</td>
<td>023-15216-000</td>
<td>023-15223-000</td>
</tr>
<tr>
<td>8&quot;</td>
<td>023-15217-000</td>
<td>023-15224-000</td>
</tr>
<tr>
<td>10&quot;</td>
<td>023-15218-000</td>
<td>023-15218-000</td>
</tr>
<tr>
<td>12&quot;</td>
<td>023-15219-000</td>
<td>023-15219-000</td>
</tr>
<tr>
<td>14&quot;</td>
<td>023-15220-000</td>
<td>023-15227-000</td>
</tr>
<tr>
<td>16&quot;</td>
<td>023-15221-000</td>
<td>023-15228-000</td>
</tr>
<tr>
<td>18&quot;</td>
<td>023-17120-000</td>
<td>023-17130-000</td>
</tr>
<tr>
<td>20&quot;</td>
<td>023-18952-000</td>
<td>023-18945-000</td>
</tr>
</tbody>
</table>

### TABLE 4 - FLANGE CLOSURES

#### 150 lb. WATER FLANGE CLOSURES

<table>
<thead>
<tr>
<th>FLANGE SIZE</th>
<th>CLOSURE PART NUMBER</th>
<th>GASKET PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>075-46450-004</td>
<td>026-10385-010</td>
</tr>
<tr>
<td>6&quot;</td>
<td>075-46450-006</td>
<td>026-10385-012</td>
</tr>
<tr>
<td>8&quot;</td>
<td>075-46450-006</td>
<td>026-10385-013</td>
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<td>10&quot;</td>
<td>075-46450-010</td>
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</tr>
<tr>
<td>15&quot;</td>
<td>075-46450-016</td>
<td>026-10385-017</td>
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</table>

#### 300 lb. WATER FLANGE CLOSURES

<table>
<thead>
<tr>
<th>FLANGE SIZE</th>
<th>CLOSURE PART NUMBER</th>
<th>GASKET PART NUMBER</th>
</tr>
</thead>
<tbody>
<tr>
<td>4&quot;</td>
<td>075-46450-104</td>
<td>028-10385-010</td>
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<tr>
<td>6&quot;</td>
<td>075-46450-106</td>
<td>028-10385-012</td>
</tr>
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<td>8&quot;</td>
<td>075-46450-108</td>
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<td>14&quot;</td>
<td>075-46450-114</td>
<td>028-10385-016</td>
</tr>
<tr>
<td>16&quot;</td>
<td>075-46450-116</td>
<td>028-10385-017</td>
</tr>
</tbody>
</table>

**NOTE:** Not all Flange Closures use the same bolt pattern. Not all Flange Closures use the same qty. of hardware.

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3) YORK Form 50.20-CL9(410). Long-Term Storage Periodic Checklist and Logs YMC², YK, TY Centrifugal Chillers
### 1.0 Monthly

<table>
<thead>
<tr>
<th>Date</th>
<th>Initial</th>
<th>Nitrogen Charge (psig)</th>
<th>Date</th>
<th>Initial</th>
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<tr>
<td></td>
<td></td>
<td>Shell</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Evaporator</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Absorber/Condenser</td>
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### 2.0 Quarterly

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<tr>
<th>Date</th>
<th>Initial</th>
<th>Date</th>
<th>Initial</th>
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</table>

### 3.0 Semi-Annual

<table>
<thead>
<tr>
<th>Date</th>
<th>Initial</th>
<th>Date</th>
<th>Initial</th>
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</table>

### 4.0 Annual

<table>
<thead>
<tr>
<th>Date</th>
<th>Initial</th>
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</thead>
</table>

**NOTES:**

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36
Proposed JABSOM Chilled Water Service Agreement

Reference Slides

Board of Regents
April 20, 2017
Overall Environmental Benefit

Total Project Annually

• Reduce potable water consumption
  – 260 million gallons.

• Reduce sewage discharge
  – 84 million gallons.

• Reduced fossil fuel consumption.
  – 77 million kWh (Equivalent to installing more than 42MW of PV or 28MW of wind in Hawaii!)

• Significant contributions to Hawaii’s Clean Energy Initiative and Sustainability Goals.
HSWAC Distribution Area
Point of Delivery to JABSOM

HSWAC Cooling Station

PROPOSED POINT OF DELIVERY 16" SERVICE INTO EXISTING JABSOM CHILLER PLANT
# JABSOM Operating Benefit

<table>
<thead>
<tr>
<th>Impact</th>
<th>Annual Savings</th>
<th>% of Totals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Potable Water</td>
<td>14M gallons</td>
<td>50%</td>
</tr>
<tr>
<td>Sewer</td>
<td>1.3M gallons</td>
<td>34%</td>
</tr>
<tr>
<td>Refrigerants</td>
<td>4,760 pounds</td>
<td>100%</td>
</tr>
<tr>
<td>Electricity</td>
<td>6.9M kWh</td>
<td>50% 2.3% in FY14-15 Additional 3.5%</td>
</tr>
<tr>
<td>CO₂</td>
<td>11.4M pounds</td>
<td>50%</td>
</tr>
<tr>
<td>20 Year (Real)</td>
<td>$13M</td>
<td>18%</td>
</tr>
</tbody>
</table>
### JABSOM Financial Benefit

*2020 prices*

<table>
<thead>
<tr>
<th></th>
<th>Current</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td>BWS Chilled Water (^{(2020)})</td>
<td>$2,600,000</td>
<td>$2,125,000</td>
</tr>
<tr>
<td>TOTAL</td>
<td>$2,600,000</td>
<td>$2,125,000</td>
</tr>
<tr>
<td><strong>Difference</strong></td>
<td><strong>$475,000</strong></td>
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</table>
### JABSOM Financial Benefit

#### *2020 prices*

#### JABSOM - HSWAC Fiscal Benefit

<table>
<thead>
<tr>
<th>Cost Key</th>
<th>USER INPUTS</th>
<th>CALCULATED CELLS</th>
</tr>
</thead>
<tbody>
<tr>
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</tr>
</tbody>
</table>

#### Total 20-Year Cost

- **Year 1:** $178,693
- **Year 2:** $183,477
- **Year 3:** $188,262
- **Year 4:** $193,047
- **Year 5:** $197,832
- **Year 6:** $202,617
- **Year 7:** $207,402
- **Year 8:** $212,187
- **Year 9:** $216,972
- **Year 10:** $221,757
- **Year 11:** $226,542
- **Year 12:** $231,327
- **Year 13:** $236,112
- **Year 14:** $240,897
- **Year 15:** $245,682
- **Year 16:** $250,467
- **Year 17:** $255,252
- **Year 18:** $259,037
- **Year 19:** $263,822
- **Year 20:** $268,607

#### 20-Year Annual Cost

- **Year 1:** $8,972
- **Year 2:** $9,067
- **Year 3:** $9,161
- **Year 4:** $9,256
- **Year 5:** $9,350
- **Year 6:** $9,445
- **Year 7:** $9,539
- **Year 8:** $9,634
- **Year 9:** $9,728
- **Year 10:** $9,823
- **Year 11:** $9,917
- **Year 12:** $10,012
- **Year 13:** $10,106
- **Year 14:** $10,201
- **Year 15:** $10,295
- **Year 16:** $10,390
- **Year 17:** $10,485
- **Year 18:** $10,580
- **Year 19:** $10,675
- **Year 20:** $10,770

#### Earnings (Including Service Agreement)

- **Year 1:** $10,374
- **Year 2:** $10,569
- **Year 3:** $10,764
- **Year 4:** $10,959
- **Year 5:** $11,154
- **Year 6:** $11,349
- **Year 7:** $11,544
- **Year 8:** $11,739
- **Year 9:** $11,934
- **Year 10:** $12,129
- **Year 11:** $12,324
- **Year 12:** $12,519
- **Year 13:** $12,714
- **Year 14:** $12,909
- **Year 15:** $13,104
- **Year 16:** $13,300
- **Year 17:** $13,495
- **Year 18:** $13,690
- **Year 19:** $13,886
- **Year 20:** $14,081

#### Earnings (Including Service Agreement - 2020 prices)

- **Year 1:** $10,075
- **Year 2:** $10,276
- **Year 3:** $10,477
- **Year 4:** $10,678
- **Year 5:** $10,879
- **Year 6:** $11,081
- **Year 7:** $11,282
- **Year 8:** $11,484
- **Year 9:** $11,685
- **Year 10:** $11,887
- **Year 11:** $12,088
- **Year 12:** $12,290
- **Year 13:** $12,492
- **Year 14:** $12,694
- **Year 15:** $12,896
- **Year 16:** $13,098
- **Year 17:** $13,299
- **Year 18:** $13,491
- **Year 19:** $13,693
- **Year 20:** $13,895
HSWAC Project Timeline

- **2017**:
  - Q3
  - Q4
  - **Q1**
- **2018**:
  - **Q2**
  - Q3
  - Q4
- **2019**:
  - Q1
  - Q2
  - Q3
  - Q4
- **2020**:
  - Q1
  - Q2

**Key Events**:
- Finalize customer agreements (2017 Q1)
- Construction start (2018 Q2)
- System completion / service start (2020 Q2)
Summary of Chilled Water Service Agreement Terms and Conditions

The following are the key terms of this agreement:

• **Service** – Chilled Water will be delivered at 44 degrees Fahrenheit, 24 hours a day, 7 days a week, and 365 days a year, sourced from deep seawater.

• There will be redundancy to ensure no interruption of Chilled Water service 24/7/365.

• **Term** – 20 years from First Service Date (Section 1.4).

• Estimated First Service Date – 18 to 22 months after start of construction (Section 1.10(b)).

• **Effective Date** – Upon execution of Chilled Water Customer Agreement (Section 1.1).

• **Rates** – Capacity Charge Rate: $80.00 per ton per month; fixed annual adjustment 3% (Section 1.7 (a)).

• **Non-Energy Operating Charge Rate**: $0.0400 per ton-hour; annual adjustment CPI, no less than 0% (Section 1.7 (b)).

• **Energy Operating Charge Rate**: $0.051415 per ton-hour; adjusted monthly with HECO (Sections 1.7 (b) and 7.2).

• **Amount of Cooling** – Cooling quantities will be metered and billed monthly.

• **Monthly Contract Capacity** 1,415 tons; adjusted annually based on actual usage (Sections 1.7 (a) and 6.2).

• Monthly Ton-hour usage estimate 567,000 Ton-hours; billed based upon actual usage (Section 7.3).

• **Conversion Cost** HSWAC will be responsible for the conversion cost at JABSOM up to $650,000. If the cost exceeds $650,000 and if UH does not provide written notice within 30 days to pay for these excess Building Conversion cost, HSWAC may terminate the Agreement.
Subject to and Opportunities to Opt-Out of the Agreement:

1) Termination of existing BWS Chilled Water Service Agreement dated September 16, 2005 (Section 1.13);

2) HSWAC securing construction financing (Section 1.8). **UH may opt-out** of the Agreement any time prior to HSWAC commencing pre financing. **UH may opt out** of the Agreement if HSWAC does not obtain construction financing.

3) HSWAC commencing construction by specific date after project has been financed (Section 1.10(a)). **UH may opt-out** of the Agreement should HSWAC not start construction by December 31, 2021.

4) HSWAC starting service by specific date (Section 1.10(b)). **UH may opt-out** of the Agreement should HSWAC not complete construction and start service by the date specified.

5) HSWAC providing Chilled Water using deep seawater as an essential component of the delivery system (Section 1.12(a)). **UH may terminate** the Agreement should HSWAC not deliver chilled water using deep seawater.

6) HSWAC providing uninterrupted, 24/7/365 Service (Section 14.1(e)). **UH may Terminate** the Agreement should HSWAC not deliver chilled water 24/7/365. **UH may terminate** the Agreement if water is not provided at the specified temperature and/or if service dependency is less than anticipated.
Item V.A.3
Report of the Permitted Interaction Group for the UH System Integrated Academic & Facilities Plan

Verbal Report
MEMORANDUM

TO: Jan Sullivan
Chair, Board of Regents

FROM: David Lassner
President

SUBJECT: Request BOR Approval of the Integrated Academic and Facilities Plan for the University of Hawai‘i System

I. SPECIFIC ACTION RECOMMENDED:

It is recommended that the Board of Regents adopt the Integrated Academic and Facilities Plan for the University of Hawai‘i System.

II. RECOMMENDED EFFECTIVE DATE:

Effective immediately.

III. PURPOSE:

The creation of a UH System Integrated Academic and Facilities Plan (IAFP) was requested by the Board of Regents to provide a strategic vision to align and leverage the unique mission, capabilities and resources of each campus while reducing unnecessary duplication and increasing collaboration across the System.

IV. BACKGROUND INFORMATION:

In October 2015, the Board passed a resolution for the development of a systemwide Integrated Academic and Facilities Master Plan to provide clarity around academic and facilities planning decisions and help frame future discussions and decision making in these areas. Several public Board of Regents meetings included discussion of the Plan.

A first draft of the framework was circulated for university-wide comment early in the Fall 2016 semester. Work continued with a Permitted Interaction Group involving Regents and Administration.
A penultimate draft was widely circulated for comment within the university in March 2017 and was included with the public materials for the March 2017 Board of Regents meeting.

This plan presented for approval represents that penultimate draft with consideration and integration as appropriate of all comments received.

The IAFP includes a vision and a set of systemwide guiding principles and priorities. It then outlines positioning statements for the four academic units (UH Mānoa, UH Hilo, UH West O'ahu, and UH Community Colleges), which provide the necessary structure to apply fiscal, human, and physical resources across our campuses more effectively and efficiently while continuing to advance the higher education goals of the state. The unit positioning statements describe mission differentiation across the UH System.

Next steps that support and advance the IAFP include:

- **Revising the new program proposal process** and associated policies that include an executive level review to ensure alignment with campus missions, Strategic Directions, and the IAFP. This will include an updated set of guidelines and a resource allocation template to better reflect current priorities and considerations, such as an analysis of facilities and resource needs and an assessment of risk. An update on the new program proposal process was presented at the March 2017 Academic and Student Affairs Committee meeting.

- **Developing a new systemwide collaboration for distance and online learning** that provides a framework for flexible and coordinated development of courses and programs that increase access and address high priority needs of the state. The plan includes recommendations for an updated distance learning structure across the system, including a re-examination of University and Education Centers, and the development of key programs. An update on the work was presented at the March 2017 Academic and Student Affairs Committee meeting.

- **Systemwide academic planning through sector convenings** to establish strong business and industry partnerships and promote an understanding of job demand, local industry dynamics, and the skills needed for successful employment in Hawai‘i. Through this collaboration and shared knowledge, the UH System can strategically determine the optimal program mix and placement across the campuses, reduce unnecessary duplication, and maximize student pathways and opportunity.
• Creation and implementation of a Systemwide Enrollment Management Plan to strategically advance the enrollment cycle across the UH System. This plan integrates individual campus activities and provides a set of strategic system actions. A working draft of the plan was presented at the March 2017 Academic and Student Affairs Committee meeting.

• Active Facilities Planning at UH campuses that will feed into Long Range Development Plans and new rolling 6-year UH Capital Improvement Program plans each year. Plans will explore non-traditional funding opportunities within and among campuses to maximize facilities uses and contain capital funding needs across the UH System.

The IAFP will be used in budget planning and to update and conform relevant regents and executive policies and administrative procedures in the areas of academic, facilities, and financial planning. The administration will develop an implementation plan and provide the Board with annual progress updates. In addition, the IAFP will be reviewed at least every two years.

V. ACTION RECOMMENDED:

It is recommended that the Board of Regents adopt the UH System Integrated Academic and Facilities Plan as provided in Attachment 1.

Attachment

cc: Cyndi Quinn, Executive Administrator and Secretary of the Board
Integrated Academic and Facilities Plan
for the
University of Hawai‘i System

Vision

Hawai‘i is a special place where diverse people and communities live, work, learn and play together in a sustainable manner. Hawai‘i’s economy is vibrant and globally competitive, characterized by engaging living-wage jobs. Inspired by its host culture, Hawai‘i treasures and protects its amazing environment as it promotes a high quality of life for all its people.

The University of Hawai‘i system is the single most important contributor to the future of Hawai‘i. The people of Hawai‘i appreciate the excellence throughout UH, understand its value to the state and show their pride in their university system. UH campuses are recognized for their quality and value and are destinations of choice within Hawai‘i and beyond. The UH System is the premier integrated higher education system in the country.

The University of Hawai‘i System

The University of Hawai‘i (UH) is the sole provider of public higher education in the State of Hawai‘i and embraces the mission of Land Grant institutions across the country. It has an extraordinarily wide range of responsibilities ranging from educating every resident of Hawai‘i, regardless of preparation, to training doctors, lawyers, teachers and engineers. UH provides the intellectual capacity to address Hawai‘i’s challenges and opportunities and stimulates the economy through its research and scholarship. UH as a whole cannot ignore any part of its mission, from traditional education of 18-year-olds to technical workforce development to serving non-traditional students to professional education to solving problems and developing new economic sectors that create meaningful jobs.

The UH System enjoys a unique opportunity through the integration and alignment of the work of its community colleges, baccalaureate institutions and its flagship research university. Not every part of UH can or should engage in every part of this mission across every disciplinary area. UH can work collaboratively and efficiently to meet the diverse needs of Hawai‘i’s communities. It is essential for UH to thoughtfully and intentionally weave together the capacities and interests of its diverse campuses and faculties if it is to achieve its vision.

This integrated academic and facilities plan is intended to provide a comprehensive plan for how the campuses will develop and work together to ensure that the entire mission of the UH System is addressed without undue duplication or inter-campus competition. In the current fiscal environment, each
campus cannot be all things to all people. The UH System must prioritize and evaluate all programs to provide that which the state needs most.

This document provides guidance on which programs belong on each campus and which buildings should be prioritized for construction or modernization. It provides the framework for decision-making in Hawai‘i’s integrated system of public higher education in today’s economic environment.

This document is not the specific academic or facilities plan for each or any campus, but provides guidance for all such plans. Further, this document is not intended to duplicate or reaffirm the basic commitments of the University of Hawai‘i and its campuses to principles such as equitable access, quality, sustainability, Native Hawaiian student success, indigenous knowledge, and the importance of a broad education that prepares lifelong learners and engaged civic-minded citizens. Those principles are embodied and outlined in other campus and system strategies, policies and plans.

**Systemwide Guiding Principles and Priorities**

These principles and priorities are intended to guide UH’s approach to serving the people of Hawai‘i and the world, and how it applies its fiscal, human and physical resources efficiently, coherently and collaboratively.

- UH supports and rewards collaboration across all programs and activities. New silos are discouraged and current silos are eliminated or reduced. The university prioritizes and integrates systemwide articulation and transferability in all academic planning.

- Duplication of academic programs takes place only with intention and sound justification. All programs are planned in a fiscally sound and sustainable manner and placed in appropriate locations. Considerations include type of program and mission, regional and statewide demand and availability of physical space, facilities and land.

- UH will increase and diversify enrollment. Centralized enrollment management support can enhance campus efforts with clear lines of responsibility, authority and accountability.

- To advance its academic mission and ensure modern well-maintained facilities, UH must strengthen diversity of its financial base beyond the continuing critical cornerstones of and state funding and tuition revenue. Opportunities include leveraging land assets, generating more revenue from intellectual property, and increased philanthropy.
• UH is committed to shared use of facilities, particularly costly and specialized facilities. New capital projects must maximize long-term flexibility and include shared classrooms and resources to make the best use of institutional space. Campus space belongs to the university, not to a department, school or person. Specialized and costly facilities and capabilities can be shared externally to address community needs while generating revenue to support operating costs.

• UH land is an asset of the UH System, not each campus. UH will develop a systemwide plan for real estate assets that respects each campus mission while maximizing opportunities, including through the use of Public Private Partnership (P3) strategies where appropriate.

• UH is committed to prioritizing its investment of fiscal resources to support academic programs and facilities that reflect the principles and priorities set forth in this plan.

The Four Academic Units

This section applies the vision, framework and principles to each of the major academic units of the university system: UH Mānoa, UH Hilo, UH West O‘ahu and the UH Community Colleges. It provides an assessment of where the units are now, as well as implications for the future.

UH Mānoa

As a land, sea and space grant University, UH Mānoa is the cornerstone of Hawai‘i’s system of higher education. It is an internationally recognized and globally competitive research university that complements its educational activities with a fundamental mission of innovation, knowledge generation and discovery that improves human life and wellbeing. UH Mānoa focuses on programs of excellence that emphasize Hawai‘i’s many strengths and advantages of location, population and geography. As a Carnegie “R1” research university, UHM inspires, nurtures and educates tomorrow’s leaders while addressing the most challenging problems of our time.

UH Mānoa’s research and scholarly activity attract substantial extramural funding to the state, foster the development of new businesses and generate high paying jobs. The research enterprise is itself a significant employer and brings unique insights to major local and global challenges and opportunities. UH Mānoa attracts internationally competitive research-intensive faculty who attract the best students. The research and scholarship mission should continue to grow in areas of excellence and emphasis, including areas of strategic importance to Hawai‘i.
At present, UH Mānoa is not widely seen as the destination of choice for a large number of the very best undergraduate students, local and beyond, as would be expected of a research university of its caliber. Until recently, the university had to be all things to all students as the only baccalaureate granting college on O’ahu. This can change with the development of UH West O’ahu and growth at UH Hilo. But the undergraduate experience at Mānoa will also have to change.

UH Mānoa is in dire need of major investment in its instructional and research facilities, including state-of-the-art classrooms and laboratories that are environmentally and financially sustainable.

Research activities and the undergraduate experience need to be more fully integrated across disciplines and the campus as a whole. This will create more student and community engagement, thereby leveraging the unique capacity of this great research university.

As Mānoa continues to develop as a destination of choice for the best students, the admission standards may evolve to more closely reflect those typical of the world’s best research-intensive universities. Not only will Mānoa become more attractive to the best local high school graduates, it will also attract more top national and international students. This process must strengthen the unparalleled diversity that is a hallmark of UH Mānoa.

UH Mānoa must also continue to meet the professional workforce needs of Hawai‘i in areas such as education, medicine, nursing, law, business, social work and engineering. Work must continue to integrate education, innovation and scholarship, across disciplines, and to develop the next generation of Hawai‘i’s leaders.

Implications for UH Mānoa enrollment

Undergraduate enrollment management should focus on:

- Increasing market share from Hawai‘i’s high school graduates including competing strongly for more of the very best local students who might otherwise attend a mainland university.
- Distinctive Early College pathway programs that leverage unique Mānoa assets and capabilities.
- Increasing numbers of mainland U.S. students, starting with Western Undergraduate Exchange (WUE) students.
- Increasing numbers of international students.
- Building more robust recruiting and success programs for transfer students from UH community colleges that leverage and enhance the strong articulation agreements and curriculum pathways already in place.
- Improving retention and persistence of enrolled students.
Graduate enrollment management should focus particularly on attracting the best students to UH Mānoa graduate and professional programs defined as strategic. UH Mānoa can also do more to recruit UH undergraduates into some of its graduate programs, particularly master’s degree programs. Graduate enrollment management is also tied to the availability of graduate student support and the recruitment and retention of world-class faculty.

Implications for UH Mānoa facilities

The lack of modern, well-maintained facilities and spaces has become a substantial deterrent to attracting the best students and faculty. Aging facilities and a deferred maintenance backlog of some $500 million present potential risks to health and safety, public perception and reputation.

The emphasis over much of the past decade has been on the need to reduce the deferred maintenance backlog. However, a broader emphasis is now needed on modernization and optimizing space utilization. Students and faculty need more high-quality space. To address this, UH Mānoa must repurpose and modernize campus spaces to support priority programs and meet student and faculty needs. Aligning major renovations and new construction with strategic high priority needs is as important as eliminating the specific items in the deferred maintenance backlog. Fixing a leaky roof without also updating the classrooms or laboratories is not an approach that supports excellence in teaching or research.

This work must focus on the footprint that is actually required to meet the mission of the campus; campus redevelopment must reflect focused priorities. Historically, capital renewal has been approached with the assumption that existing buildings will be replaced or renovated to serve existing uses and individuals. This philosophy must change, and campus modernization should support shared facilities, classrooms, and labs, wherever possible. UH Mānoa must enhance the student experience and create high-quality learning environments consistent with current research. Flexible, digitally enabled spaces that foster collaboration, interaction, innovation and integration across disciplines are essential. Greater flexibility and adaptability will enable the campus to respond to changing needs and future requirements. This also means rethinking space as university space, rather than college, departmental or individual space.

The renovation and replacement of buildings also provides an opportunity to become more sustainable and energy efficient. Many of the buildings currently planned for renovation or replacement either do not have air conditioning systems or have inefficient retrofitted air conditioning. Louvered windows contribute to dust and noise in classrooms and laboratories. Renovation of these buildings will result in utility savings while reducing the deferred maintenance backlog and supporting enhanced teaching and research.
Serious consideration should be given to the evolution over the next decades of the entire UH Mānoa campus—from the lower campus to the upper campus to the Institute for Astronomy and Faculty Housing. A new master facilities plan will provide the impetus for the creation of inspiring spaces. Uniquely located in iconic Mānoa Valley, the flagship UH Mānoa campus can serve as a diverse source of innovation and education. Through strategic planning and public-private partnerships, the 300-plus acre campus can be transformed into a vibrant university campus that integrates world-class education and research with a mixed-use “college town” and shared community spaces.

**Implications for UH Mānoa programs**

UH Mānoa must focus on areas of selective emphasis and excellence. It can begin to transfer programs developed at Mānoa that may now be best delivered by other campuses within the UH System. It should also consider for termination degree programs and course offerings that lack critical mass or relevance. Greater focus can provide UH Mānoa the opportunity to grow compelling new programs in areas of emphasis and excellence. New undergraduate programs can attract more great students, for example in the area of sustainability where the campus has remarkable capability across its schools and colleges. And new professional master’s programs for non-traditional students can serve community needs while generating revenue and building important new relationships.

A new initiative to realign UH Mānoa’s academic organization provides an opportunity for positive change. The academic redesign initiative must consider scale as well as overlap of missions, expertise and facility needs. But even more importantly it must focus on objectives that will advance students, faculty and community. Organizational structure can help important advances such as: creating more appealing and relevant educational programs that attract students and help them succeed in their lives; enabling Mānoa to better address the grand challenges facing Hawai‘i and the world while strengthening the economy of Hawai‘i; increasing campus competitiveness for major research awards; and more strongly projecting research opportunities into undergraduate education. The academic redesign must encourage and support UH Mānoa’s continued advancement as a world-class research university through increased integration of education and research, including across disciplines.

**UH Hilo**

UH Hilo is characterized as a comprehensive, regional university. The primary focus of the campus is on providing high quality baccalaureate and select postgraduate education. In carrying out this mission, UH Hilo offers programs that take advantage of the unique physical and social characteristics of the island, attracting and serving Hawai‘i Island students who are qualified for baccalaureate entry and seek opportunities for highly engaging and experiential learning. This includes first-generation and non-traditional students, some of
whom attend part-time. Scholarship and research are an important part of faculty work and enhance student engagement in the unique learning environment of Hawai‘i island.

While a primary target for UH Hilo is residents of the Big Island, its programs should also be attractive to prospective students from other islands, the Pacific, the mainland U.S. and other countries. University-bound students from O‘ahu in particular may select UH Hilo not only for its distinctive undergraduate programs but also for its more rural setting, affordability, intimate character, and/or to leave home without leaving the state.

In addition to its undergraduate programs, UH Hilo currently offers 7 masters and 4 doctoral degree programs, 3 of each are not offered elsewhere in the state. UH Hilo is known for its distinctive role in advancing Hawaiian language immersion education and continues to prepare teachers for service in immersion schools. UH Hilo efforts at the postgraduate level will focus on ensuring the quality, relevance and enrollment level of its current graduate programs, including providing professional opportunity for residents of Hawai‘i island.

Implications for UH Hilo enrollment

UH Hilo has the physical facilities to support more students than it currently enrolls and should plan to grow both to meet the needs for a more educated populace and to be more economically viable. Enrollment growth should focus on:

- Increasing market share of baccalaureate bound students from Hawai‘i Island and throughout the state. Early College programs can help.
- Expanding transfer pathways for community college students, which will require improved alignment of requirements.
- Increasing recruitment of international and national students into programs of excellence or distinctiveness. In particular, UH Hilo can attract Pacific Island students and offer students from Western Undergraduate Exchange (WUE) states exceptional value as well as residential living.
- Increasing enrollment of West Hawai‘i students served online and in person through Hawai‘i Community College’s Pālamanui campus.
- Improving retention and persistence of enrolled students.

Implications for UH Hilo facilities

UH Hilo has largely completed its major construction plans. It is important to ensure that the campus does not develop a substantial deferred maintenance backlog. More significantly, the campus must ensure that teaching and learning spaces reflect modern technology and practice.
UH Hilo enjoys a wealth of real property assets. The Hilo Research and Technology Park represents a future opportunity. The highest current priority for land development is the creation of a commercial mixed-use district near the new residence hall to begin to create additional campus life opportunities while generating at least a modest revenue flow. Efforts to date to achieve this through public-private partnership have not succeeded to date, but will be renewed. Additional strategies to be explored will include exploration of integration with other county and state initiatives and partners.

Implications for UH Hilo programs

The focus for UH Hilo will be on baccalaureate programs and its current select postgraduate degrees, which are not available on the island via distance delivery. UH Hilo can serve more student needs on Hawai‘i Island by continuing to design and offer degree programs that articulate with Hawai‘i Community College that can be delivered via Pālamanui, the North Hawai‘i Education and Research Center and beyond. UH Hilo must also better align its general education core with the rest of the UH System to improve transfer options for community college students.

UH West O‘ahu

UH West O‘ahu also has a community-based regional mission. UH West O‘ahu provides baccalaureate degrees to students who live and work in the region and to those who choose to access its distinctive programs on campus or via distance learning. It has a primarily instructional mission with a professionally active faculty.

As the youngest baccalaureate campus, UH West O‘ahu has the opportunity to evolve in some unique ways. It has developed a special applied focus critical to Hawai‘i that should become a strong, recognized and distinctive component within the UH System. UH West O‘ahu has a number of degree programs and concentrations that emphasize practical applications including creative media, cybersecurity, facilities management, sustainable community food systems and insurance. Many of these include very efficient applied baccalaureate degree pathways for community college transfer students. UH West O‘ahu’s interdisciplinary academic structure (without departments) enables the campus to remain academically nimble. Focusing on applied and technical programs, including potentially relocating some of UH Mānoa’s highly applied professional programs, may strengthen UH West O‘ahu, serve the region and enable UH Mānoa to focus on its primary mission as Hawai‘i’s research university.

As the baccalaureate campus with the highest percentage of distance and online courses and programs, and the highest percentage of part-time students, UH West O‘ahu has the opportunity to recruit and support “non-traditional” students on all islands. West O‘ahu can more readily pioneer new models of education
and more actively target older and part-time students than the other baccalaureate campuses do today. Instructional approaches such as competency-based education and Prior Learning Assessment may be particularly appropriate, complementing distance and online learning opportunities. Implementation of alternate forms of scheduling may be more inviting to part-time students, such as active duty and retired military, many of whom live and work in the region.

**Implications for UH West O'ahu enrollment**

UH West O'ahu is small and needs to increase its enrollment, to meet the needs of a demographically growing region and to gain economies of scale. This growth should focus on:

- Continuing to focus on community college transfer students.
- Aggressively seeking increased participation of baccalaureate bound high school students from Leeward and Central O'ahu and the North Shore. Early College career pathway programs can help.
- Continuing development and recruitment of students from throughout the state into distance and online programs.
- Recruiting underserved populations, including military and retired military.
- Recruiting international students.
- Improving retention and persistence of enrolled students.

**Implications for UH West O'ahu facilities**

UH West O'ahu does not currently have the buildings and facilities to accommodate growth. Two new buildings are now funded; the administration and health sciences building has broken ground, and the creative media building is in the planning stage. These current plans for two new buildings are consistent with the focus on the development of applied baccalaureate programs. Unlike UH Mānoa, West O'ahu has substantial land assets to accommodate future growth and collaborative activities with other campuses and the community. One example might be a University Center at UH West O'ahu that would enable students in the West O'ahu service region to benefit from programs offered by other UH campuses.

As with UH Hilo, it is important that deferred maintenance or outdated facilities do not emerge as future issues for the new campus.

More important for UH West O'ahu is to complete, in partnership with the UH System, comprehensive master planning for the substantial land assets. The new high-level land plan lays out a general framework for development of the makai campus as well as the non-campus lands. The non-campus lands will be developed through a public-private partnership. Strategic opportunities include
the presence of two mass transit stations at UH West O’ahu and development of faculty and student housing that can serve the entire UH System.

Implications for UH West O’ahu programs

There should be a tight link between West O’ahu, its regional service area and workforce demand through programs that embrace 21st century innovation and provide needed technical and management skills. Monitoring and anticipating workforce needs in this evolving region will be critical to the region and the fiscal sustainability of the campus.

The current integration of community college technical programs with the applied baccalaureates at UH West O’ahu through 2+2 and 3+1 collaborations is a highly efficient approach to the delivery of technical credentials without duplication. This approach can be meaningfully extended with the addition of one or more baccalaureate STEM completion programs that serve the region.

West O’ahu avoids duplicating degrees offered by UH Mānoa and focuses on more applied and general degrees that are distinctive and serve its region. There may be select degrees offered by Mānoa that are required to strengthen and enhance UH West O’ahu’s applied programs and address specific educational needs of the region. Over time, a limited number of applied master’s degrees that meet these criteria may also be appropriate for development. It may also be appropriate to relocate particular applied programs from UH Mānoa to UH West O’ahu.

Community Colleges

The UH Community Colleges are critical in expanding access to higher education. The community college mission is enabled by open admissions, affordable costs, easy geographic access and robust programs and services to address college readiness.

The UH Community Colleges play a major role in Hawai‘i’s workforce development by providing degree and certificate programs in multiple career and technical fields. Students may use these skills for immediate employment. As pathways are developed and refined, these credentials increasingly provide the basis for transfer to a technical bachelor’s degree at UH West O’ahu. The UH Community Colleges also address workforce needs across the state through non-credit programs, short-term training and professional development.

In addition, the baccalaureate pathway for community college students is well articulated, and several policies (common general education, dual enrollment, articulated major pathways, guaranteed admissions, etc.) provide opportunities that are beyond those of other higher education systems. Through many collaborative programs, community college students often engage with their
baccalaureate student counterparts and university faculty on other campuses of the UH system.

Implications for UH Community Colleges enrollment

The UH Community Colleges experienced a 40% enrollment increase during the recession, an increase that has since decreased to about 20% above pre-recession levels. In considering enrollment, the UH Community Colleges must focus on:

- Helping address the Department of Education’s (DOE) goal to increase the college going rate from 54% to 65% of its graduating class. Most DOE students not currently going on to college would likely first attend a UH community college.
- Targeting working adults. Data suggests that Hawai‘i under-enrolls adults in comparison to comparable mainland U.S. community colleges. Serving these largely part-time students would rely heavily on online education, workplace or community based delivery, evening classes and/or special cohorts. Transfer pathways to UH's baccalaureate programs should also be provided.
- Eliminating the enrollment gap for Pacific Island students, one of Hawai‘i’s fast-growing population segments, who are currently underrepresented in higher education.
- Building more of the successful international programs, with particular emphasis on bridging programs to the baccalaureate campuses.
- Committed to increasing the persistence of students to the second year and on to completion.

Implications for UH Community College facilities

The deferred maintenance backlog at the community colleges is scheduled to be eliminated over the next three years. As with the other campuses, there remains the importance of ongoing modernization to ensure that teaching and learning spaces meet current needs.

The highest priority in physical planning for the UH Community Colleges is to decide the direction and location(s) of Hawai‘i Community College. The current Hawai‘i CC site in Hilo is no longer acceptable. The path to a 21st-century future for Hawai‘i CC needs to be affordable and should take full advantage of the proximity of UH Hilo so that high cost facilities, such as the library, can be shared. The new Pālamanui branch campus is now serving students in West Hawai‘i and will need to grow organically with enrollment.

The second priority for facilities development within the UH Community Colleges is for a replacement science and technology building at Honolulu CC. This long
overdue facility has been postponed because of the City & County requirement for upgrades in the Honolulu’s sewage infrastructure, which are at last underway.

Implications for UH Community Colleges programs

The UH Community Colleges offer three applied baccalaureate degrees at UH Maui College to meet local workforce needs. Given the ability to develop 2+2 and 3+1 partnerships with UH baccalaureate campuses, there are no plans for further baccalaureate degree programs at UH Maui or other UH community colleges.

Technical programs are driven by local workforce demands and requirements. Planning tools and processes are now being developed and releases to ensure that data about Hawai’i’s current and emerging economy, as well as the perspectives of Hawai’i business and industry, can play an important part in UH planning to respond to statewide workforce needs.

Next Steps

The next sections describe some of the actions necessary to implement this integrated academic and facilities plan, including activities already underway.

Implementation of a New Program Approval Process

The new program approval process will include a new initial assessment as to whether a proposed program is consistent with the mission and principles of this plan. This will help align program offerings more clearly and ensure appropriate placement of programs, reduce duplication and increase curricular pathways across the system. Only after this preliminary approval will a campus develop more a more formal new program proposal.

At the same time, the program proposal process must be streamlined and support far greater agility and responsiveness than today. UH needs to be able to quickly initiate new programs that respond to market demands, particularly when there are few or no new resource requirements. A new approach to describing the resource requirements and implications will be part of the process to provide better focus on overall resource use and allocation within the proposing academic unit.

The program review process will also be modified to assure that existing programs are functioning effectively and efficiently in a manner consistent with the principles of this systemwide integrated academic and facilities plan.
UH Systemwide Collaboration for Distance and Online Learning

Distance and online learning can help address some of the needs of Hawai‘i residents without increasing the burden on UH facilities or requiring new programs in multiple locations. The development of an action plan to address distance learning is underway with implementation planned beginning in the 2017-18 academic year.

UH already has a robust set of courses and programs offered primarily via online delivery and interactive television. Many UH Mānoa professional schools serve the entire state through distance learning, and UH West O‘ahu delivers many of its baccalaureate degrees and certificates to the neighbor islands. However, there has been no recent comprehensive update to planning for the systemic use of distance learning to affordably and effectively address the full range of high priority needs of the state. This includes workforce needs as well as the interests of many resident in lifelong learning opportunities.

A fundamental principle underlying UH distance learning for over 25 years has been that all campuses collaborate to serve Hawai‘i’s students. UH has a strong tradition of working together to support distance learning students through its University and Education Centers, which are now spread across six islands in locations including Moloka‘i, Lāna‘i, Hana, Lahaina, Kaua‘i, West Hawai‘i, Honoka‘a and Wai‘anae. Campuses with distinctive programs have been charged to embrace their responsibilities to serve not just those who are able to physically attend on-campus classes but students throughout the state.

A renewed planning initiative also provides the opportunity to re-examine the role and configuration of UH’s University Centers. UH pioneered this concept in the 1990s with distributed offices to support the delivery of baccalaureate and master’s degrees to three neighbor islands. The concept should perhaps now be expanded to include all sites and all campuses to support a more complete statewide framework for the delivery of programs. With this renewed development of strategic distance learning programs, UH must also develop a cohesive systemwide student support, communication and marketing strategy.

The new distance and online learning action plan will:

- Identify degree and certificate programs that should be delivered via distance and online learning to ensure that students statewide have access.
- Identify key transfer and major courses that should be delivered consistently on a known schedule to ensure that all students enrolled in a baccalaureate transfer pathway have access to major courses in a timely manner.
• Develop online baccalaureate, master’s and associate degrees that are attractive to Hawai’i students who currently enroll in for-profit online institutions at higher costs, often incurring substantial debt.
• Identify any unique signature programs that can be developed, offered and marketed to external non-resident populations.
• Redesign and upgrade intake and support services to ensure the success of an increasing number of distance learning students.
• Redesign key courses and programs by adapting them pedagogically and structurally to fit the needs of non-traditional students.
• Develop and execute a statewide marketing and communication approach.

Systemwide Academic Planning and Sector Convenings

Effective and responsive academic planning in many areas requires strong partnerships with business and industry to understand the demand for qualified graduates, the skills those graduates need to be successful, and the dynamics of local industry. At the same time, in a time of limited resources units across the UH system must work together to provide an integrated suite of offerings to meet community and workforce needs without duplication. UH must accelerate and systematize its engagement both across campuses and with community stakeholders.

UH has initiated an industry sector engagement program to identify unmet and emerging needs in the state. A web-based sector/labor mapping tool was developed locally and is now being used to engage leaders of all major economic sectors in a formal, cyclical fashion. The new tool organizes all the jobs in the state of Hawai‘i into sector groupings. Each job has its own web landing page that includes: current demand, projected demand, salary ranges, degree levels required by industry, skill sets required, and a listing of companies that are hiring.

The leadership of the banking sector and the chief information officers from all major sectors were the first to have been engaged in formal meetings around this tool, and more industry sector convenings are planned. This is already proving to be a powerful approach when used to inform systemwide academic planning around key workforce areas, and the intention is that these convenings will be a regular, recurring component of academic program planning.

The industry sector convenings and labor mapping tool provide valuable insights on the greatest current emerging workforce needs in specific regions. UH must use this information to meet those needs in a manner consistent with this systemwide integrated academic and facilities plan. UH must systematize how its differentiated campus roles can best be leveraged to meet the needs of students and employers. For example, UH does not currently have a comprehensive view of the roles and responsibilities of UH campuses to meet the needs of the hospitality sector, Hawai‘i’s largest industry. This applies
similarly in key employment areas such as: education, healthcare, agriculture, information and communication technologies, creative media and engineering.

Internal university convenings have started to collaboratively address critical shortages of K-12 teachers across the state. These meetings have been focused on creating and articulating clear pathways for both traditional students and returning students. The goals for such convenings include articulating clear and collaborative programming/pathways across the system, developing program pathways for those currently in classroom support roles who wish to obtain licensure and exploring ways UH can provide support to current teachers. An initial convening has taken place to explore programming for the hospitality sector.

As with the work in education, additional internal university convenings focused on systemwide academic planning for a specific sector must identify the needed curricular offerings and drive coherent credential pathways among campuses. These pathways can also extend into preparatory programs in high school through collaborations with the DOE and private schools. As a system, UH has the remarkable opportunity to offer a range of programming across campuses without unnecessary duplication.

Systemwide Academic Planning must:

- Provide information and insight about state workforce needs and student demand.
- Promote clarity and consistency between and among campuses that drives program placement, reduces unnecessary duplication, and maximizes student pathways and opportunity, including by collaboration with K12 partners.
- Guide strategic use of all resources including people, facilities & space, and dollars.

The development of specific academic programs remains the responsibility of campuses in accord with applicable policies, shared governance principles and practices, and accreditation requirements. Major changes and/or shifts in programs between campuses consistent with this plan, such as decisions to move a program from one campus to another, must be carried out in a consultative and orderly manner in full accord with applicable policies, shared governance, accreditation requirements and collective bargaining agreements.

Enrollment Management

UH must reverse the enrollment declines of the past five years. This sections above lay out general target populations for each unit, but UH needs a comprehensive and modern institutional approach to enrollment management.
Enrollment management includes recruitment, admissions, financial aid, retention, persistence and student outcomes. This work is increasingly data-driven, and work is underway to more systemically increase enrollment. Much of the work of enrollment management must occur at the unit level in strategic alignment with the mission and goals of each campus. But there is also an important role for our comprehensive public higher education system in statewide aspects. Work is now underway on a systemwide enrollment management action plan that will:

- Work with the DOE to increase the “going rate” of Hawai‘i high school graduates to UH campuses through active marketing, coordinated engagement with college and career counseling programs and expanded dual credit programs such as Early College.
- Coordinate collaborative marketing initiatives such as inviting every public high school junior to visit a UH campus.
- Better communicate financial aid opportunities that can help students afford higher education and a UH campus and increase the number of high school and UH students who complete the Free Application for Federal Student Aid (FAFSA).
- Coordinate Early College policies and practices across campuses
- Align campus admission and transfer standards and processes.
- Simplify internal transfer processes, including for Early College students, to increase numbers of transfer students.
- Review and revise as appropriate system policies that impact campus enrollments.
- Provide data analytics and predictive modeling to identify target populations and strategies that will increase retention and student success across the system.
- Develop and utilize sensitivity analyses of the impact of tuition rates and related factors on attendance across the system.
- Report on enrollment in a consistent manner, including for specific target populations across major units.
- Identify opportunities for systemwide recruitment to the University of Hawai‘i, with the message that there is a UH campus for everyone and a branding initiative that communicates the unique attributes of each.

Facilities Planning

There is much more to be done in developing concrete actions around facilities planning. Much of this will evolve within the campus strategic and facilities plans in accord with this integrated plan and coordinated across the system.

Seven of UH’s ten campuses are in a relatively steady state. The master plans for UH Mānoa, UH West O‘ahu and Hawai‘i Community College need comprehensive updates for development or redevelopment. Work is underway on these planning efforts, including Long Range Development Plans (LRDPs).
UH Mānoa is engaged in a new planning initiative that will result in a new facilities master plan that will drive the next LRDP. This will include developments from lower to upper campus and into Mānoa valley.

The UH West O'ahu planning initiative includes the makai campus lands and the proposed University Village public-private partnership. In addition, planning for the mauka lands addresses opportunities for alternative energy development, community-based agricultural and educational advancement and support of access to the new Honouliuli National Monument.

Strategic planning for facilities at Hawai'i CC has been underway for several years and is now reaching completion. The financial challenges facing UH and the state that limit major capital improvement initiatives, coupled with leveraging technology, may support the advancement of a new model for a 21st century community college serving Hawai'i Island.

Moving forward, all campus land and facilities plans must align with this integrated academic and facilities plan. Development at the seven campuses that are in a relatively steady state must follow their individual campus LRDPs and the new rolling 6-year UH Capital Improvement Projects Plan, which aggregates the needs and priorities of all ten UH campuses.

Recognizing that the built environment drives operating costs, new construction requests on any campus must be justified based on demonstrated utilization of what is already available. A pioneering space utilization study is underway at UH Mānoa to create a comprehensive information system that will help the campus understand how all building space is currently used and inform decision-making. This methodology can be extended systemwide. Moving forward there must be increased sharing of space, especially specialized space, on and even between campuses.

Securing the funding needed to modernize the UH Mānoa campus may be one of the most significant challenges facing UH and the state. In addition to demonstrating high performance in planning and construction, UH must understand how much space is needed and ensure that all non-state sources of funding are leveraged.

Whenever possible, opportunities for creative financing and revenue generation through public private partnerships and Transit Oriented Development (TOD) should be explored as supplements or alternatives to public funding. Public private partnerships opportunities in particular should be pursued to enhance campus development and generate revenue at UH West O'ahu, UH Hilo and UH Mānoa. TOD opportunities are developing now at UH West O'ahu, Leeward CC, and at Honolulu CC. When rail is extended to Mānoa, there will be even greater opportunity for conceptualizing multi-campus initiatives and collaborations.
The considerations above will drive a new approach to prioritization and planning of facilities and capital improvement across the UH System with an increasingly statewide perspective.

**Institutionalizing Implementation**

The principles of this plan will be incorporated into biennium budget planning, annual operating budgets, 6 year CIP plans and academic program approvals and reviews.

Following adoption of this plan by the Board of Regents, the plan will also be used to update and conform relevant regents’ policies, executive policies and administrative procedures. This work will begin with a review of policies in the areas of academic, facilities and financial planning.

The administration will develop an implementation plan that will be presented to the Board of Regents and will provide annual updates on. It is intended that this plan will be reviewed at least every two years and updated as appropriate.
MEMORANDUM

TO: Jan Naoe Sullivan  
Chair, UH Board of Regents

VIA: David Lassner  
President

VIA: David Lassner  
Interim Chancellor

FROM: Michael Bruno  
Interim Vice Chancellor for Academic Affairs and Vice Chancellor for Research

SUBJECT: AWARD OF THE HONORARY DOCTORATE OF HUMANE LETTERS DEGREE TO THE HONORABLE RICHARD R. CLIFTON

SPECIFIC ACTION REQUESTED:  
It is requested that the Board of Regents confer the Honorary Doctorate of Humane Letters upon Richard R. Clifton.

RECOMMENDED EFFECTIVE DATE:  
With the approval of the Regents, the Honorary Doctorate of Humane Letters degree will be conferred upon Richard R. Clifton at the 106th Annual Commencement Exercises in May 2017.

ADDITIONAL COST:  
No additional costs are associated with this request.

PURPOSE:  
To recognize the outstanding contributions of Richard R. Clifton in the field of law and public service in the State of Hawai‘i.

BACKGROUND:  
Regent Policy 5.209, III. A., states that the Board may confer honorary degrees to individuals with distinguished accomplishments.

At Mānoa, the Vice Chancellor for Academic Affairs convenes a committee to review proposals for honorary doctorates and to make a recommendation to the chancellor.
Candidates for the degree must possess a strong reputation nationally or internationally for scholarship, public service, and/or a distinction in a given profession, business, or industry and have a demonstrated record of making a significant contribution to society and/or achieving excellence in a scholarly field, in alignment with the mission, values, and traditions of the University of Hawai‘i System. Richard R. Clifton’s distinguished career fits within these criteria in a variety of ways.

Richard R. Clifton moved to Hawai‘i after graduating from Yale Law School in 1975 to take up a prestigious judicial clerkship with Ninth Circuit Court of Appeals Judge Herbert Y.C. Choy. Following his distinguished legal career in the law firm of Cades Schutte Fleming & Wright, Clifton became Judge Choy’s successor on the Ninth Circuit Court of Appeals in 2002. He was only the second judge from Hawai‘i since statehood to sit on the nation’s largest and busiest appellate court. Often called a “judge’s judge,” Clifton is renowned for his evenhandedness and his ability to ask hard yet fair questions to both sides during oral argument.

Richard R. Clifton has made multiple quiet contributions to the State of Hawai‘i. He served for many years on the Hawai‘i Public Radio Board of Directors, including five years as chair during one of public radio’s most challenging periods. He has also been an active board member of the Hawai‘i Women’s Legal Foundation (HWLF)—on which he has been the only male for many years. He has played important roles throughout his active involvement in the Hawai‘i and American Bar Associations, the local chapter of the Federal Bar Association, and the American Judicature Society—Hawai‘i Chapter. He has also been instrumental in arranging for Ninth Circuit judges to regularly hear full calendars of oral arguments at the Law School when they sit in Hawai‘i.

Most recently, he achieved considerable notoriety as a member of the Ninth Circuit panel that unanimously upheld the stay of President Trump’s January 2017 Executive Order dealing with immigration, yet he is also greatly admired for his opinions in less well-publicized cases, including for his strong yet balanced dissents, such as in Korab v. Fink (2014), in which the majority upheld Hawai‘i’s denial of Medicaid benefits to Micronesian residents who immigrated under the terms of the federal Compact of Free Association (COFA) agreement. Richard R. Clifton’s nomination for the Honorary Doctorate of Humane Letters is supported by several prominent members of the legal community, and his long and distinguished career, marked by a reputation for honesty and fairness, make him a strong candidate to receive the Honorary Doctorate of Humane Letters from the University of Hawai‘i.

ACTION RECOMMENDED:
It is recommended that the Board of Regents confer the Honorary Doctorate of Humane Letters upon Richard R. Clifton.

c: Executive Administrator and Secretary of the Board Quinn
Program Officer Goodwin
MEMORANDUM

TO: Jan N. Sullivan
Chairperson, Board of Regents

VIA: David Lassner
President

FROM: Vassilis L. Syrmos
Vice President for Research and Innovation

SUBJECT: TRANSMITTAL OF AGENDA MATERIALS FOR BOARD OF REGENTS APRIL 20, 2017 MEETING: FY17 Q3 EXTRAMURAL AWARDS

Please find attached materials for the following agenda item that will be discussed at the April 20, 2017 Board of Regents meeting:

V. Items for Discussion and/or Approval

B. For Information/Discussion:

1. FY17 Q3 Extramural Awards Analysis

Attachments
Extramural Sponsor Awards
Quarterly Summary

<table>
<thead>
<tr>
<th>Program Type</th>
<th>Jan 1 - Mar 31 2017</th>
<th>Jan 1 - Mar 31 2016</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Count</td>
<td>Amount</td>
</tr>
<tr>
<td>Research</td>
<td>234</td>
<td>$44,996,874</td>
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<tr>
<td>Non-Research</td>
<td>160</td>
<td>$22,381,214</td>
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<tr>
<td><strong>Total</strong></td>
<td><strong>394</strong></td>
<td><strong>$67,378,088</strong></td>
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Note: The detailed award listing is available at:

http://www.ors.hawaii.edu/index.php/bor-reports

The FY 2016 year-to-date total was: $288,946,984
The unofficial FY 2017 year-to-date total is: $308,381,826
Contracts and Grants Awards
As of Quarter Three – FY 2017

Contracts and Grants Awards
Amount Awarded by Quarter

<table>
<thead>
<tr>
<th>Quarter</th>
<th>FY 2016 Quarterly Awards</th>
<th>FY 2017 Quarterly Awards</th>
<th>FY 2016 Cumulative Awards</th>
<th>FY 2017 Cumulative Awards</th>
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<tbody>
<tr>
<td>Quarter 1</td>
<td>180</td>
<td>450</td>
<td>300</td>
<td>650</td>
</tr>
<tr>
<td>Quarter 2</td>
<td>100</td>
<td>350</td>
<td>150</td>
<td>500</td>
</tr>
<tr>
<td>Quarter 3</td>
<td>120</td>
<td>250</td>
<td>70</td>
<td>370</td>
</tr>
<tr>
<td>Quarter 4</td>
<td>160</td>
<td>200</td>
<td>30</td>
<td>230</td>
</tr>
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</table>

Note: The chart shows the amount awarded by quarter for FY 2016 and FY 2017.
Contracts and Grants Expenditures
As of Quarter Three – FY 2017

Contracts and Grants Awards
Expenditures by Quarter

Quarterly

0 20 40 60 80 100
Millions

Quarter 1 Quarter 2 Quarter 3 Quarter 4

Cumulative

0 50 100 150 200 250 300 350 400 450

FY 2016 Quarterly Expenditures
FY 2017 Quarterly Expenditures
FY 2016 Cumulative Expenditures
FY 2017 Cumulative Expenditures
Contracts and Grants F&A Recovery
As of Quarter Three – FY 2017

Contracts and Grants Awards
F&A Recovery by Quarter

Quarterly F&A Recovery

Quarter 1: FY 2016 Quarterly F&A, FY 2017 Quarterly F&A
Quarter 2: FY 2016 Quarterly F&A, FY 2017 Quarterly F&A
Quarter 3: FY 2016 Quarterly F&A, FY 2017 Quarterly F&A
Quarter 4: FY 2016 Cumulative F&A, FY 2017 Cumulative F&A
## Operating Budget

<table>
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<tr>
<th></th>
<th>FY17-18</th>
<th>FY18-19</th>
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<tbody>
<tr>
<td>Board Request</td>
<td>47.00</td>
<td>$ 28,700,000</td>
</tr>
<tr>
<td>Governor Approved</td>
<td>16.00</td>
<td>$ 21,900,372</td>
</tr>
<tr>
<td>After GM2</td>
<td>4.00</td>
<td>$ 5,000,000</td>
</tr>
<tr>
<td>House Draft</td>
<td>2.00</td>
<td>$ 270,000</td>
</tr>
<tr>
<td>Senate Draft</td>
<td>13.64</td>
<td>$ 7,109,800</td>
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</table>

- **Governor’s Message No. 2 (GM2)** significantly reduced the Governor’s December budget request
  - Only $5,000,000 each year for Cancer Center remained
  - Detailed comparison of House Draft vs. Senate Draft on next slide
Operating Budget Comparison
HD1 vs. SD1

<table>
<thead>
<tr>
<th>Description</th>
<th>House Draft</th>
<th>Senate Draft</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer Center</td>
<td>$3,000,000</td>
<td></td>
</tr>
<tr>
<td>Concussion Awareness</td>
<td>$350,000</td>
<td></td>
</tr>
<tr>
<td>Heeia Reserve</td>
<td>$240,800</td>
<td></td>
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<tr>
<td>Hawai‘i Promise Program</td>
<td>$1,829,000</td>
<td></td>
</tr>
<tr>
<td>Title IX</td>
<td>$1,290,000</td>
<td></td>
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<tr>
<td>CIP Positions</td>
<td>$400,000</td>
<td></td>
</tr>
<tr>
<td>School Psychologists</td>
<td>$600,000</td>
<td></td>
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<tr>
<td>Transfer-out 4 positions from CTAHR to HDOA</td>
<td>$(330,000)</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>$270,000</strong></td>
<td><strong>$7,109,800</strong></td>
</tr>
</tbody>
</table>

Amounts represent General Fund appropriations for each year of the biennium.

Board-approved budget request had $5,000,000 for Cancer Center and $1,850,000 for Title IX, VAWA, and Compliance.
House Draft provides nearly the same amount of funding as Governor’s request but comprises approximately 50 line items instead of 1 lump sum. Senate provides significantly less funding in a little over 40 line items.

<table>
<thead>
<tr>
<th></th>
<th>FY2017-18</th>
<th>FY2018-19</th>
<th>2-year total</th>
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<tbody>
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<td>Board Request</td>
<td>$216,600,000</td>
<td>$236,100,000</td>
<td>$452,700,000</td>
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<td>Approved by Governor</td>
<td>$150,000,000</td>
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<td>$150,000,000</td>
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<tr>
<td>House Draft*</td>
<td>$129,833,000</td>
<td>$10,700,000</td>
<td>$140,533,000</td>
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<tr>
<td>Senate Draft</td>
<td>$62,830,000</td>
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<td>$62,830,000</td>
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</tbody>
</table>

*House Draft also provides $10 million in private contribution fund ceiling for Culinary Institute of the Pacific Phase II to match $20 million in General Obligation Bonds
SECTION 17. Provided that of the general fund appropriation for University of Hawaii systemwide support (UOH900):

(1) $6,360,818 for fiscal year 2017-2018 and the same sum for fiscal year 2018-2019 may be transferred to other University of Hawaii program IDs in accordance with performance-based outcomes relating to student achievement and degree attainment as established by the president of the University of Hawaii; and

(2) The amount transferred to a University of Hawaii program ID shall be expended at the discretion of the head of the University of Hawaii college, campus, or school of that program ID; and

(3) The president of the University of Hawaii shall submit a report to the legislature at least twenty days prior to each regular session on the distribution of funds and their uses to enhance student achievement and degree attainment.
SECTION 27. Act 119, Session Laws of Hawaii 2015, part V, as amended by section 6 of Act 124, Session Laws of Hawaii 2016, is amended by amending section 48.2 to read as follows:

"SECTION 48.2. Provided that of the general obligation bond fund with debt service cost to be paid from special funds appropriation for natural energy laboratory of Hawaii authority (BED 146), the sum of $5,200,000 of so much thereof as may be necessary for fiscal year 2016-2017 shall not be expended until the natural energy laboratory of Hawaii authority works with the University of Hawaii community colleges and Kealakehe high school to develop an ocean thermal energy conversion curriculum-to-career pathway program."

SECTION 72. The director of finance may expend general fund, special fund, and revolving fund savings or balances determined to be available from authorized general fund, special fund, and revolving fund program appropriations, up to an aggregate total of $20,000,000 for fiscal year 2017-2018 and $20,000,000 for fiscal year 2018-2019, for municipal lease payments under financing agreements entered into pursuant to chapter 37D, Hawaii Revised Statutes, to finance the acquisition of depreciable assets including but not limited to automobiles, computers, printers, and telecommunications equipment; provided that designated expending agencies (including the department of education and the University of Hawaii) for municipal lease payments and for depreciable assets, including but not limited to automobiles, computers, printers, and telecommunications equipment, authorized in this Act may delegate to the director of finance the implementation of such acquisitions when it is determined by all involved agencies that it is advantageous to do so.
SECTION 75. (a) Provided that pursuant to section 37-74(f), Hawaii Revised Statutes, no funds shall be expended to fill a permanent or temporary position for the lowest level of the program if the filling of that position causes the position ceiling for that level of the program to be exceeded; provided that this prohibition shall not apply to a:

1. Position established by the University of Hawaii or the Hawaii health systems corporation;
2. Position that is entirely federally funded;
3. Position necessary for compliance without undue delay with a court order or decree, if the director of human resources development determines that the recruitment through normal civil service procedures would result in delay or noncompliance;
4. Position approved by the governor for a special, research, or demonstration project of an agency;
5. Position approved by the governor to perform an emergency management function under the department of defense pursuant to the authority of section 127A-12(b)(9), Hawaii Revised Statutes;
6. Casual hire position;
7. Vicing position;
8. Position established by an agency pursuant to express statutory authority to establish the position; and
9. Position established by an agency for a program or project funded by an appropriation in an act other than a general or supplemental appropriations act.
SECTION 75. (continued)
(b) Provided that with regard to any of the positions identified in paragraphs (1), (2), (3), (4), (5), (8), and (9) of subsection (a), the respective agency or department shall submit a report to the legislature within five days of each use of this provision; provided further that the report shall include:
   (1) Authority used to establish the position;
   (2) Date the position was established;
   (3) Projected date the position will be filled;
   (4) Amounts projected to be expended in fiscal year 2017-2018 and in fiscal year 2018-2019;
   (5) Source of funds used to pay for the position; and
   (6) Functions to be performed by the position.
2017 UH Legislative Package

SB 134 (UOH-01)
Prohibiting smoking, including the use of electronic smoking devices, and tobacco use on all University of Hawai‘i campuses.

*Note: SB 134 failed to meet Second Decking deadline.*

HB 1594 (UOH-02)
“Hawai‘i Promise Program” which provides scholarships for the unmet need of qualified students at any UH community college campus.

*Note: HB 1594 pending conference.*

HB 424 (UOH-03)
Reinstates the President of the University as the chief procurement officer for contracts for construction and professional services furnished by licensees under chapter 464. Requires that two members of the University of Hawai‘i board of regents be faculty members. Prohibits the University of Hawai‘i board of regents from increasing tuition fees until an unspecified date. Mandates employment contracts for certain employees. Establishes a cap on the University of Hawaii’s general fund appropriation for operating expenses for the next five fiscal years.

*Note: HB 424 failed to meet Second Decking deadline.*

* As of April 19, 2017.
HB 847 (UOH-04)
Establishes the Innovation and Commercialization Initiative Program to expressly give the University of Hawai‘i the legal authority to create, promote, and participate in new economic enterprises and expand workforce opportunities based on inventions and discoveries generated by or at the University.

Note: HB 847 pending conference.

HB 425 (UOH-05)
Clarifies that certain sections of the State Ethics Code shall not apply to technology transfer activities.

Note: HB 425 pending conference.

HB 427 (UOH-07)
Establishes a dark night skies protection advisory committee to assist the University of Hawai‘i in the development of a statewide dark night skies protection strategy to preserve dark night skies and reduce light pollution.

Note: HB 427 pending conference.

* As of April 19, 2017.
HB 428 (UOH-08)
Enables the John A. Burns School of Medicine to continue receiving a portion of the physician workforce assessment fee.
*Note: HB 428 pending conference.*

HB 850 (UOH-09)
Repeals legislative reporting requirements that are either obsolete or unworkable. These include: HRS 304A-1144 (Construction Academy); HRS 304A-3305 (Nursing Scholars Program); Act 187, SLH 2012 (Hawai‘i Health Corps Program); and Act 281, SLH 2007 (P-20 Initiative Council).
*Note: HB 850 pending Governor’s signature.*

HB 849 (UOH-11)
Repeals the sunset provisions set forth in Chapter 40, allowing the University to continue to maintain a separate accounting and financial management system that is compatible with the State of Hawai‘i accounting and financial management system.
*Note: HB 849 pending conference.*

HB 848 (UOH-12)
Requires UH to develop a microgrid plan for one demonstration project at any property on Oahu owned, leased, or controlled by UH.
*Note: HB 848 pending conference.*

*As of April 19, 2017.*
Other Notable Bills

HB 794 HD1 SD1 – Establishes the University of Hawai‘i Green Special Fund to fund energy conservation measures to reduce the University’s energy consumption and costs.

*Note: HB 794 pending conference.*

HB 1585 HD1 SD1 – Appropriates funds to UH for positions to implement capital improvement projects. Requires UH employees who hold administrative positions and earn more than $150,000 annually to be employed under an employment contract by July 1, 2018.

*Note: HB 424 failed to meet Second Decking deadline; appropriation for CIP Positions are in HB 100 SD1.*

SB 429 SD2 HD2 - Adopts uniform laws on protecting the online accounts of employees, unpaid interns, applicants, students, and prospective students from employers and educational institutions, respectively

*Note: SB 429 pending conference.*

SB 1040 SD HD1 - Requires the UH system to develop a 5- and 10-year campus master plan that includes academic and facilities plans. Establishes goals that the campus master plan should strive to achieve, and considerations to be integrated into the plan.

*Note: SB 1040 pending conference.*

* As of April 19, 2017.
The Governor submitted his nominations for the following Board of Regents seats and the Senate Committee on Higher Education held a hearing on Tuesday, April 18, 2017. The committee recommended to ADVISE AND CONSENT the following:

- GM 778 - SIMEON ACOBA, for a term to expire June 30, 2022
- GM 779 - BENJAMIN KUDO, for a term to expire June 30, 2022
- GM 780 - NORMA SPARKS, for a term to expire June 30, 2022
- No Hawaii Island nominee was sent to the Senate.
Legislative Calendar

April 13: Second Crossover (Bills)/Disagree
April 27: Final Decking (Non-Fiscal Bills)
April 28: Final Decking (Fiscal Bills)
May 1: Deadline to Final Advise & Consent Reports
May 4: Adjournment (*Sine Die*)
June 26*: (35th Day after *Sine Die*) – Governor must notify the legislature his “intent” to veto any bill pending his approval
July 11*: (45th Day after *Sine Die*) – Last day for Governor to sign, veto, or allow bill to become law without his signature

* Barring any extension of the regular session
Conclude
Item VI.A.1.
Executive Session
Discussion of Collective Bargaining Negotiations Process

Item to be Discussed in Executive Session