

UNIVERSITY OF CALIFORNIA, SANTA BARBARA

BERKELEY • DAVIS • IRVINE • LOS ANGELES • MERCED • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

OFFICE OF DESIGN & CONSTRUCTION SERVICES and PHYSICAL FACILITIES

CONTRACTING SERVICES
Building 439
Santa Barbara, California 93106-1030
Telephone (805) 893-3356
Fax (805) 893-8592

SENT VIA: FAX ON THIS DATE
 HAND DELIVERY ON THIS DATE
 FEDERAL EXPRESS ON THIS DATE
 UNITED PARCEL SERVICE ON THIS DATE

HOLDERS OF PLANS AND SPECIFICATIONS:

New Chiller System Biology II Bldg. 571
Project No: FM100281L/137-14

Addendum No. 2

May 3, 2011

Enclosed is **ADDENDUM NO. TWO** to the Construction Documents on the above-captioned project.

Bid date is Tuesday, May 10, 2011 at 2:30PM to be held at:

CONTRACTING SERVICES
Facilities Management, Bldg. 439,
Door #E, Reception Counter
University of California, Santa Barbara
Santa Barbara, CA 93106-1030.

Late arrivals shall be disqualified. Please allow time for unforeseen traffic delays, securing a parking permit and potential parking problems.

A handwritten signature in black ink, appearing to read "Anna Galanis".

Anna Galanis
Director, Contracting Services

ADDENDUM NUMBER 2

to the

CONSTRUCTION DOCUMENTS

May 3, 2011

GENERAL

The following changes, additions or deletions shall be made to the following document(s) as Indicated; all other conditions shall remain the same.

I. INFORMATION AVAILABLE TO BIDDERS

Item No.

1. Information Available to Bidders **Add** number 6. Reports in its entirety:

6. Reports:

Asbestos and Pb (Lead) Survey UCSB Biological Sciences II Bldg. 572, prepared by Gene Horstin, dated 4/27/2011, 14 pages, attached.

Reports available to bidders at: <http://facilities.ucsb.edu/contracts/bid/>

II. SPECIFICATIONS

Item No.

1. Table of Contents, **Add** the following sections:

Section 01560 – Temporary Storm Pollution Prevention, 1-13

Section 01565 – Hazardous Material Procedures

Section 15180 – Heating & Cooling Piping Water Treatment Equipment, 1-7

2. Section 01150 – “Environmental Protection Requirements”, “Part 1 – General”, “1.03 Environmental Protections”, “B” – **Delete** 1.03.B in its entirety
3. Section 01560 – “Temporary Storm Pollution Prevention” – **Add** in its entirety, attached 13 pages.
4. Section 01565 – “Hazardous Material Procedures” – **Add** in its entirety, attached 1 page.

5. Section 15180 – “Heating and Cooling Piping Water Treatment Equipment” – **Add** in its entirety, attached 7 pages.
6. Section 15950 - "Energy Monitoring and Controls System", “Part 1 - General”, “1.03 Definitions” – **Replace** paragraph 1.03.D to read in its entirety:

“D. FMS subcontractor: The single contractor or subcontractor to provide the work of this section. This contractor or subcontractor shall be the primary manufacturer, installer, commissioner and ongoing service provider for the FMS work.”
7. Section 15950 - "Energy Monitoring and Controls System", “Part 1 - General”, “1.04 FMS Description” – **Replace** paragraph 1.04.D to read in its entirety:

“D The work shall be as defined individually and collectively in all Sections of this Division specifications together with the associated Point Sheets and Drawings and the associated interfacing work as referenced in the related documents as are listed in Part 1 of this Section.”
8. Section 15950 – “Energy Monitoring and Controls System”, “Part 1 – General”, “1.05 Quality Assurance”, “A. General” – **Revise** paragraph 1.05.A.1 second sentence to read in its entirety:

“1..... EMCS shall be provided by the Johnson Controls, Inc. to match existing campus standard.”
9. Section 15950 – “Energy Monitoring and Controls System”, “Part 1 – General”, “1.05 Quality Assurance”, “A. General” – **Replace** paragraph 1.05.A.6 to read in its entirety:

“6. The system specified herein shall be Johnson Controls, Inc to match existing Campus Standard. This system shall seamlessly integrate to the existing web based server. No new front ends or third party integrations shall be acceptable.”
10. Section 15950 – “Energy Monitoring and Controls System”, “Part 1 – General”, “1.09 Warranty”, “A. Standard Material and Labor Warranty” – **Revise** paragraph 1.09.A.2 to read in its entirety:

“2. If within twelve (12) months from the date of acceptance of product, upon written notice from the owner, it is found to be defective in operation, workmanship or materials, it shall be replaced, repaired or adjusted.”
11. Section 15950 - "Energy Monitoring and Controls System", “Part 1 - General”, “1.09 Warranty”, “A. Standard Material and Labor Warranty” – **Revise** paragraph 1.09.A.3 to read in its entirety:

“3. Maintain an adequate supply of materials within 100 miles of the Project site such that replacement of key parts and labor support, including programming.”

12. Section 15950 - "Energy Monitoring and Controls System", "Part 2 - Products", "2.05 Electrical Power Metering", "A. Chiller Power Metering" – **Replace** paragraph 2.05.A.1 to read in its entirety:

“1. Veris” H81XX series meters shall be used for electrical chiller metering. Veris meters shall be complete with installation, programming and wiring meter for BACnet compatibility for seamless integration to existing FMS.”

13. Section 15950 – "Energy Monitoring and Controls System", "Part 2 – Products", "2.06 Chilled Water BTU Metering"– **Replace** paragraph 2.06.B to read in its entirety:

“B. BTU meters are to be provided, installed and wired by the installer of this section, except wet-side components shall be installed by Division 15.”

14. Section 15950 - "Energy Monitoring and Controls System", "Part 2 – Products" – **Add** paragraph 2.07.A to read in its entirety:

“2.07 Chilled Water FLOW Metering at chiller

A. Provide an ONICON Model F-3500 Insertion Electromagnetic Flow Meter, complete with all installation hardware necessary to enable insertion and removal of the meter without system shutdown. The flow meter shall be hand-insertable up to 400 psi. Materials of construction for wetted metal components shall be 316 SS. The flow meter shall average velocity readings from two sets of diametrically opposed electrodes. Each flow meter shall be individually wet-calibrated against a primary volumetric standard that is accurate to within 0.1% and traceable to NIST*. A certificate of calibration shall be provided with each flow meter. Accuracy shall be within $\pm 1\%$ of rate from 2-20 ft/s. Overall turndown shall exceed 80:1. Output signals shall be completely isolated and shall consist of the following: (1) high resolution frequency output for use with peripheral devices such as an ONICON display module or Btu meter, (1) analog output; 4-20mA, 0-10V, or 0-5V jumper selectable, and (1) scalable dry contact output for totalization. Each flow meter shall be covered by the manufacturer’s two-year warranty.”

15. Section 15950 - "Energy Monitoring and Controls System", "Part 2 – Products" – **Add** paragraph 2.07.B to read in its entirety:

“B. Flow meters are to be provided, installed and wired by the installer of this section, except wet-side components shall be installed by Division 15.”

III. DRAWINGS

Item No.

1. Sheet M1.1 “Symbols, Abbreviations, Schedule, and Details”, “Pumps” schedule circled key note 2 – **Revise** to read in its entirety:

"2 VARIABLE SPEED PUMP. VFD PROVIDED BY DIVISION 15,
(MOUNTED AND WIRED BY DIVISION 16)."

2. Sheet M1.1 “Symbols, Abbreviations, Schedule, and Details”, “Pumps” schedule circled key note 2 at bottom – **Revise** to read:

“3 VFD: DANFOSS VLTHVAC.....”

3. Sheet M1.1 “Symbols, Abbreviations, Schedule, and Details”, “Cooling Tower Drive/Motor”– **Add** item 3. in its entirety:

“3. Contractor shall provide all materials, parts, labor, and supervision to complete the following scope of work by a factory authorized service representative:

- a. Supply and Provide a new 60 HP TEAO premium efficiency inverter duty fan motor to replace the existing 2 speed motor that is on the unit. The new motor will be a cooling tower duty motor. The BAC Part Number is 22ARDEBBDR
- b. Provide installation of the motor with new hardware and new flex coupling between the motor and the drive and of the gear assembly. The unit shall be mechanically aligned.
- c. Drain gear box from oil, and replace with new BAC recommended Mineral Oil for the gear assembly.
- d. Replace the input and output seals on the gear and conduct a visual inspection of the gears and the inside of the gear box. Make recommendations for further replacement if necessary.
- e. Inspect the Oil Pump on the unit for proper operation
- f. Inspect and test the Vibration Cut out switches for proper operation
- g. Inspect and test that the low water cutoff switch for proper operation.
- h. Replace any necessary hoses on the unit and clean the sight glass
- i. Inspect all the hardware on the prop assembly to insure that it is per specification and has no visible wear or cracks.
- j. Inspect tip clearance on unit and the pitch of the blades on the unit.
- k. Conduct a vibration analysis on the complete mechanical to determine proper operation, balance and align as required.
- l. Conduct vibration analysis on the gear to make sure gears are within

operational tolerance.

- m. Advise University's Representative of minimum operation (% speed) of cooling tower fan and any resonant speeds to avoid.
- n. Disassemble the balance clean chamber on the unit and replace the internal strainer as well as new gaskets on the unit. Clean and inspect all the nozzles in the hot water basin, replace with new as necessary.
- o. Clean the interior of the unit and cold water basin, to remove any and all debris.
- p. Inspect fill material, along with basin, structure and casing, and note any signs of potential future service or maintenance required.
- q. Complete an itemized service report confirming the completion of this scope of work
- r. Dispose of all trash material and leave site in clean condition."

4. Sheet M1.1 "Symbols, Abbreviations, Schedule, and Details" – **Delete** in its entirety:

"Alternate Bids"

5. Sheet E.3.1 "Partial Roof Plan and One Line Diagram", "Cooling Tower Electrical Plan" – **Add** note 1. to read in its entirety:

1. VFD PROVIDED BY DIVISION 15, (MOUNTED AND WIRED BY DIVISION 16)."

6. Sheet E.3.1 "Partial Roof Plan and One Line Diagram", "CT-1 One Line Diagram" – **Add** note 1. to read in its entirety:

"1. VFD PROVIDED BY DIVISION 15, (MOUNTED AND WIRED BY DIVISION 16)."

7. Sheet E.3.1 "Partial Roof Plan and One Line Diagram" – **Delete** in its entirety:

"Bid Alt. #1"

END OF ADDENDUM NO. 2

April 27, 2011

Asbestos and Pb (Lead) Survey UCSB Biological Sciences II Building 571

The University of California Santa Barbara (UCSB), Design and Construction Services (DC&S) has compiled this report to disclose existing knowledge of asbestos and Pb (Lead) containing building components located at Building 571 on the UCSB Campus.

Asbestos Sampling

Table 1.0 Asbestos Laboratory Reports lists the reports attached by Report Number, Date, Laboratory, Analysis Type, and Comments.

Table 1.0 - Asbestos Laboratory Reports

Report #	Report Date	Laboratory	Analysis Type	Comments
B147271	04/05/2011	Forensic Analytical	PLM EPA Method 600/R-93-116	Baseboard mastic in rm. 0129
B147048	04/01/2011	Forensic Analytical	PLM EPA Method 600/R-93-116	Floor tile and plaster samples in rm. 0129
B147699	04/14/2011	Forensic Analytical	PLM EPA Method 600/R-93-116	Caulking on chiller on roof.

Lead Paint Sampling Results

Table 2.0 Pb (Lead) Laboratory Reports lists the reports attached by Report Number, Date, Laboratory, Analysis Type, and Comments.

Table 2.0 – Pb (Lead) Laboratory Reports

Report #	Report Date	Laboratory	Analysis Type	Comments
M118004	03/23/2011	Forensic Analytical	TTLc Metal Analysis Flame AA	Various paint samples on components in rm. 0127.
M118250	03/31/2011	Forensic Analytical	TTLc Metal Analysis Flame AA	Paint on condensate return line in rm. 0127.
M118677	04/14/2011	Forensic Analytical	TTLc Metal Analysis Flame AA	Paint on surfaces on roof chiller unit.

UCSB's industrial wastewater permit¹ local limit for lead is 1.040 mg/l. The California Code of Regulations, Title 22 classifies waste containing more than 50 ppm lead as hazardous² without further waste characterization. If you have any question regarding this report please contact me at 805-451-1918 or gene.horstin@dcs.ucsb.edu

Sincerely,

Gene Horstin

University of California Santa Barbara
 Asbestos and Pb Clerk of the Works
 Asbestos Abatement Project Designer Cert# PD39-11
 Asbestos Inspector & Management Planner Cert# BIMP91-11
 Asbestos Contractor & Supervisor Cert# CS182-11
 CDPH Lead Inspector/Assessor ID# 20134

¹Industrial Wastewater Discharge Permit Number IV-413, Part I, Wastewater Discharge Limitations and Monitoring Requirements – Local Limits

²TITLE 22, Social Security, Division 4.5. Environmental Health Standards for the Management of Hazardous Waste, Chapter 11. Identification and Listing of Hazardous Waste, Article 3. Characteristics of Hazardous Waste, §66261.24, Characteristic of Toxicity



Bulk Asbestos Analysis

(EPA Method 600/R-93-116, Visual Area Estimation)

U.C. Santa Barbara
Project Manager
Design and Construction Svcs
Building 370
Santa Barbara, CA 93106

Client ID: 5151
Report Number: B147271
Date Received: 04/04/11
Date Analyzed: 04/05/11
Date Printed: 04/05/11
First Reported: 04/05/11

Job ID/Site: Bio II Chiller Replacement, Building 571 room. 0129

FALI Job ID: 5151-6593

Date(s) Collected:

Total Samples Submitted: 3

Total Samples Analyzed: 3

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
20110330-571-PLM-01	11096844						
Layer: Tan Mastic			ND				
Layer: Paint			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace)							
20110330-571-PLM-02	11096845						
Layer: White Paint			ND				
Layer: Tan Mastic			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace)							
20110330-571-PLM-03	11096846						
Layer: Tan Mastic			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace)							

James Flores, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

Analytical results and reports are generated by Forensic Analytical Laboratories Inc. (FALI) at the request of and for the exclusive use of the person or entity (client) named on such report. Results, reports or copies of same will not be released by FALI to any third party without prior written request from client. This report applies only to the sample(s) tested. Supporting laboratory documentation is available upon request. This report must not be reproduced except in full, unless approved by FALI. The client is solely responsible for the use and interpretation of test results and reports requested from FALI. Forensic Analytical Laboratories Inc. is not able to assess the degree of hazard resulting from materials analyzed. FALI reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. All samples were received in acceptable condition unless otherwise noted.

Project: Bio II Chiller Replacement

Date: 03/30/2011

W.O.#: 118-74

Sampler Name: G. Horstin

Building Name/Number: Bldg. 571 rm. 0129

Sample Analysis

Turn Around

PLM	12 HR	24 HR	Other
Lab Instructions:	Due Date: <u>04/04/2011 4:5:11</u>		

Sample No.	Material(s)	ID No.	Location
20110330-571-PLM-01	Tan baseboard mastic.		Bldg. 571, rm. 0129, north wall.
20110330-571-PLM-02	Tan baseboard mastic.		Bldg. 571, rm. 0129, north wall.
20110330-571-PLM-03	Tan baseboard mastic.		Bldg. 571, rm. 0129, east wall.

Chain of Custody

Relinquished by Name: G. Horstin Company: UCSB

Date/Time: for 7/20/11

Received by Name: [Signature] Company: FASI

Date/Time: 4-4-11 @ 10am [Signature]

Digitally signed by G. Horstin
 DN: cn=G. Horstin, o=UCSB, ou=Design and Construction, email=g.horstin@dcs.ucsb.edu
 Reason: I am the author of the document
 Date: 2011.03.31 08:54:32 -0700



Bulk Asbestos Analysis

(EPA Method 600/R-93-116, Visual Area Estimation)

U.C. Santa Barbara
Project Manager
Design and Construction Svcs
Building 370
Santa Barbara, CA 93106

Client ID: 5151
Report Number: B147048
Date Received: 03/30/11
Date Analyzed: 04/01/11
Date Printed: 04/01/11
First Reported: 04/01/11

Job ID/Site: W.O.# 118-74 - Bio II Chiller Replacement - Bldg. 571 Rms. 0129 and 0127

FALI Job ID: 5151-6593

Date(s) Collected: 03/29/2011

Total Samples Submitted: 5
Total Samples Analyzed: 5

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
20110329-571-PLM-01	11095303						
Layer: White Cementitious Material			ND				
Layer: Paint			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace)							
20110329-571-PLM-02	11095304						
Layer: White Cementitious Material			ND				
Layer: Paint			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace)							
20110329-571-PLM-03	11095305						
Layer: White Cementitious Material			ND				
Layer: Paint			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace)							
20110329-571-PLM-04	11095306						
Layer: White Plaster			ND				
Layer: Paint			ND				
Layer: Grey Fibrous Material			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace)	Fibrous Glass (10 %)						
20110329-571-PLM-05	11095307						
Layer: Tan Tile		Chrysotile	Trace				
Layer: Black Mastic		Chrysotile	2 %				
Total Composite Values of Fibrous Components:		Asbestos (Trace)					
Cellulose (Trace)							

Client Name: U.C. Santa Barbara

Report Number: B147048

Date Printed: 04/01/11

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
-----------	------------	---------------	------------------	---------------	------------------	---------------	------------------



James Flores, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

Analytical results and reports are generated by Forensic Analytical Laboratories Inc. (FALI) at the request of and for the exclusive use of the person or entity (client) named on such report. Results, reports or copies of same will not be released by FALI to any third party without prior written request from client. This report applies only to the sample(s) tested. Supporting laboratory documentation is available upon request. This report must not be reproduced except in full, unless approved by FALI. The client is solely responsible for the use and interpretation of test results and reports requested from FALI. Forensic Analytical Laboratories Inc. is not able to assess the degree of hazard resulting from materials analyzed. FALI reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. All samples were received in acceptable condition unless otherwise noted.

Project: Bio II Chiller Replacement

Date: 03/29/2011

W.O.#: 118-74

Sampler Name: G. Horstin

Building Name/Number: Bldg. 571 Rms. 0129 and 0127

Sample Analysis

Turn Around

PLM	12 HR	24 HR	Other
Lab Instructions:	Due Date: 04/01/2011		

Sample No.	Material(s)	HID No.	Location
20110329-571-PLM-01	Tan paint, stucco, plaster.		Bldg. 571, rm. 0129, exterior, north wall, west end.
20110329-571-PLM-02	Tan paint, stucco, plaster.		Bldg. 571, rm. 0129, exterior, north wall, east end.
20110329-571-PLM-03	Tan paint, stucco, plaster.		Bldg. 571, rm. 0129, exterior, north wall, east end.
20110329-571-PLM-04	Firestop (plaster?), fiberglass.		Bldg. 571, rm. 0127, south wall, around condensate return line.
20110329-571-PLM-05	Tan 12" floor tile, black mastic.		Bldg. 571, rm. 0129, floor, 6" from north wall, 1' from west wall.

Chain of Custody

Relinquished by Name: G. Horstin Company: UCSB

Date/Time: for 4/5

Received by Name: [Signature] Company: FASI

Date/Time: 3-30-11 @ 10:15 am
[Signature]

Printed by: G. Horstin
 Date: 2011-03-29 14:34:01
 CT02



Bulk Asbestos Analysis

(EPA Method 600/R-93-116, Visual Area Estimation)

U.C. Santa Barbara
Project Manager
Design and Construction Svcs
Building 370
Santa Barbara, CA 93106

Client ID: 5151
Report Number: B147699
Date Received: 04/13/11
Date Analyzed: 04/14/11
Date Printed: 04/14/11
First Reported: 04/14/11

Job ID/Site: Bio II Chiller Replacement

FALI Job ID: 5151-6593

Date(s) Collected:

Total Samples Submitted: 1
Total Samples Analyzed: 1

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
20110412-571-PLM-01	11100695						
Layer: Grey Semi-Fibrous Material			ND				
Total Composite Values of Fibrous Components:		Asbestos (ND)					
Cellulose (Trace)	Synthetic (5 %)						

James Flores, Laboratory Supervisor, Hayward Laboratory

Note: Limit of Quantification ('LOQ') = 1%. 'Trace' denotes the presence of asbestos below the LOQ. 'ND' = 'None Detected'.

Analytical results and reports are generated by Forensic Analytical Laboratories Inc. (FALI) at the request of and for the exclusive use of the person or entity (client) named on such report. Results, reports or copies of same will not be released by FALI to any third party without prior written request from client. This report applies only to the sample(s) tested. Supporting laboratory documentation is available upon request. This report must not be reproduced except in full, unless approved by FALI. The client is solely responsible for the use and interpretation of test results and reports requested from FALI. Forensic Analytical Laboratories Inc. is not able to assess the degree of hazard resulting from materials analyzed. FALI reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. All samples were received in acceptable condition unless otherwise noted.



Metals Analysis of Paints

U.C. Santa Barbara
Project Manager
Design and Construction Svcs
Building 370
Santa Barbara, CA 93106

Client ID: 5151
Report Number: M118004
Date Received: 03/22/11
Date Analyzed: 03/23/11
Date Printed: 03/23/11
First Reported: 03/23/11

Job ID / Site: Bio II Chiller Replacement , W.O.# 118-74
Date(s) Collected: 3-21-2011

FALI Job ID: 5151-6593
Total Samples Submitted: 4
Total Samples Analyzed: 4

Sample Number	Lab Number	Analyte	Result	Result Units	Reporting Limit*	Method Reference
20110321-571-PB-01	30397519	Pb	2400	ppm	200	EPA 3050B/7420
20110321-571-PB-02	30397520	Pb	24000	ppm	2000	EPA 3050B/7420
20110321-571-PB-03	30397521	Pb	3300	ppm	200	EPA 3050B/7420
20110321-571-PB-04	30397522	Pb	80	ppm	70	EPA 3050B/7420

* The Reporting Limit represents the lowest amount of analyte that the laboratory can confidently detect in the sample, and is not a regulatory level. The Units for the Reporting Limit are the same as the Units for the Final Results.

Dave Sandusky, CIH, Laboratory Supervisor, Hayward Laboratory

Analytical results and reports are generated by Forensic Analytical at the request of and for the exclusive use of the person or entity (client) named on such report. Results, reports or copies of same will not be released by Forensic Analytical to any third party without prior written request from client. This report applies only to the sample(s) tested. Supporting laboratory documentation is available upon request. This report must not be reproduced except in full, unless approved by Forensic Analytical. The client is solely responsible for the use and interpretation of test results and reports requested from Forensic Analytical. Forensic Analytical is not able to assess the degree of hazard resulting from materials analyzed. Forensic Analytical reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. Any modifications that have been made to referenced test methods are documented in Forensic Analytical's Standard Operating Procedures Manual. Sample results have not been blank corrected. Quality control and sample receipt condition were acceptable unless otherwise noted.

Project: Bio II Chiller Replacement Date: 03/21/2011 W.O.#: 113-74

Sampler Name: G. Horstin Building Name/Number: Bldg. 571, rm. 0127

Sample Analysis	Turn Around		
	TTLc Pb	12 HR	24 HR
Lab Instructions:	Due Date: 03/23/2011		

Sample No.	Material(s)	HID No.	Location
20110321-571-Pb-01	Brown paint on concrete substrate.		Bldg. 571, rm. 0127, floor, north of rm. 0129.
20110321-571-Pb-02	Grey paint on metal substrate.		Bldg. 571, rm. 0127, on pad for pump CHWP-1.
20110321-571-Pb-03	Green paint on concrete substrate.		Bldg. 571, rm. 0127, on pad for pump CDWP-1.
20110321-571-Pb-04	Orange paint on metal substrate.		Bldg. 571, rm. 0127, on supports on pad for pump CDWP-1.

Chain of Custody

Relinquished by Name: G. Horstin Company: UCSB

Date/Time: for 11:00

Received by Name: [Signature] Company: FASI

Date/Time: 3-22-11 @

Digitally signed by Gene Horstin
 DN: cn=Gene Horstin, o=UCSB, ou=Design and Construction, email=horstin@ucsb.edu
 Reason: I am the author of this document.
 Date: 2011.03.21 14:10:04 -0700

*10 an
 [Signature]*



Metals Analysis of Paints

U.C. Santa Barbara
Jerome Ripley
Design and Construction Svcs
Building 370
Santa Barbara, CA 93106

Client ID: 5151
Report Number: M118250
Date Received: 03/30/11
Date Analyzed: 03/31/11
Date Printed: 03/31/11
First Reported: 03/31/11

Job ID / Site: Bio II Chiller Replacement , Bldg. 517, rm .0127
Date(s) Collected: 3/29/2011

FALI Job ID: 5151-6593
Total Samples Submitted: 1
Total Samples Analyzed: 1

Sample Number	Lab Number	Analyte	Result	Result Units	Reporting Limit*	Method Reference
20110329-571-PB-01	30398207	Pb	180000	ppm	20000	EPA 3050B/7420

* The Reporting Limit represents the lowest amount of analyte that the laboratory can confidently detect in the sample, and is not a regulatory level. The Units for the Reporting Limit are the same as the Units for the Final Results.

Dave Sandusky, CIH, Laboratory Supervisor, Hayward Laboratory

Analytical results and reports are generated by Forensic Analytical at the request of and for the exclusive use of the person or entity (client) named on such report. Results, reports or copies of same will not be released by Forensic Analytical to any third party without prior written request from client. This report applies only to the sample(s) tested. Supporting laboratory documentation is available upon request. This report must not be reproduced except in full, unless approved by Forensic Analytical. The client is solely responsible for the use and interpretation of test results and reports requested from Forensic Analytical. Forensic Analytical is not able to assess the degree of hazard resulting from materials analyzed. Forensic Analytical reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. Any modifications that have been made to referenced test methods are documented in Forensic Analytical's Standard Operating Procedures Manual. Sample results have not been blank corrected. Quality control and sample receipt condition were acceptable unless otherwise noted.



Metals Analysis of Paints

U.C. Santa Barbara
Jerome Ripley
Design and Construction Svcs
Building 370
Santa Barbara, CA 93106

Client ID: 5151
Report Number: M118677
Date Received: 04/13/11
Date Analyzed: 04/14/11
Date Printed: 04/14/11
First Reported: 04/14/11

Job ID / Site: Bio II Chiller Replacement , Bldg. 571 , roof , W.O.# 118-74
Date(s) Collected: 4/12/2011

FALI Job ID: 5151-6593
Total Samples Submitted: 3
Total Samples Analyzed: 3

Sample Number	Lab Number	Analyte	Result	Result Units	Reporting Limit*	Method Reference
20110412-571-PB-01	30399449	Pb	< 60	ppm	60	EPA 3050B/7420
20110412-571-PB-02	30399450	Pb	< 70	ppm	70	EPA 3050B/7420
20110412-571-PB-03	30399451	Pb	1700	ppm	70	EPA 3050B/7420

* The Reporting Limit represents the lowest amount of analyte that the laboratory can confidently detect in the sample, and is not a regulatory level. The Units for the Reporting Limit are the same as the Units for the Final Results.

Dave Sandusky, CIH, Laboratory Supervisor, Hayward Laboratory

Analytical results and reports are generated by Forensic Analytical at the request of and for the exclusive use of the person or entity (client) named on such report. Results, reports or copies of same will not be released by Forensic Analytical to any third party without prior written request from client. This report applies only to the sample(s) tested. Supporting laboratory documentation is available upon request. This report must not be reproduced except in full, unless approved by Forensic Analytical. The client is solely responsible for the use and interpretation of test results and reports requested from Forensic Analytical. Forensic Analytical is not able to assess the degree of hazard resulting from materials analyzed. Forensic Analytical reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified. Any modifications that have been made to referenced test methods are documented in Forensic Analytical's Standard Operating Procedures Manual. Sample results have not been blank corrected. Quality control and sample receipt condition were acceptable unless otherwise noted.

SECTION 01560

TEMPORARY STORMWATER POLLUTION PREVENTION
CONSTRUCTION SITES LESS THAN ONE ACRE

PART 1 - GENERAL

1.01 GENERAL

- A. Stormdrains at the University of California Santa Barbara Campus discharge directly to creeks, the Goleta Slough, the Campus Lagoon, and the Pacific Ocean without treatment. Discharge of Pollutants or Contaminants (any substance, material, or waste other than uncontaminated stormwater) from this Project into the stormdrain system is strictly prohibited by the State Water Resources Control Board (SWRCB) and the Central Coast Regional Water Quality Control Board (RWQCB).
- B. The Contractor is responsible for stormwater quality within the Project site (which includes the staging area, material storage, waste management areas, construction areas, on-site parking, site entrances and exists, and anywhere Project construction disturbs soil) and the quality of stormwater leaving the Project site.
- C. The Contractor is required to prevent erosion of disturbed areas during construction and ensure pollutants, including sediment, do not leave the Project site, either water-borne, air-borne, on the tires of vehicles, or by spillage from offsite hauling of soils.
- D. The Contractor is responsible for properly managing all construction debris, solid and construction waste materials including litter, liquid waste including fluids from vehicles, construction materials, hazardous materials and waste, and sanitary and septic waste.
- E. The requirements in this section are intended to be implemented on a year-round basis, not just during the part of year when there is a high probability of a rain event which results in stormwater runoff. The requirements and practices discussed in this Section should be implemented at the appropriate level and in a proactive manner during all seasons while construction is ongoing.
- F. The following terms and their definitions will be used throughout this Section.
 - 1. Best Management Practices (BMPs) – The term BMP is used to describe the controls and activities used to prevent stormwater pollution.
 - 2. BMP Site Map – A map typically 11"x17" including, but not limited to, the following: entire construction site, site perimeter, adjacent roadways, all existing and proposed stormdrains on and near the site, site entrances/exits, building footprint, construction trailer, topography including slope, all current BMPs, NOI, and the location of the Questionnaire or Stormwater Pollution Prevention Plan (SWPPP).
 - 3. Contaminants or Pollutants – Any substance, material, or waste other than uncontaminated stormwater, including, but not limited to materials such as acids, adhesives, asphalts, concrete compounds, curing compounds, detergents, fertilizers, glues, lime, paints, pesticides and herbicides, petroleum products, plaster, roofing tar, solvents, wood preservatives, soil

and any materials that may be detrimental if released to the environment.

4. Contractor – The term "Contractor" refers to the person or firm responsible for performing the work and is identified as such in the Agreement. The Contractor may use subcontractors, and the subcontractors may use sub-subcontractors to perform parts of the work. However, the Agreement is between the University and the Contractor, and the Contractor alone is responsible for completing the Project.
5. Final Stabilization – Final stabilization is achieved when all construction activities are complete, all disturbed soil areas have been properly stabilized, all stormwater regulations have been achieved, and a uniform vegetative cover with 70 percent coverage has been established.
6. General Permit - National Pollutant Discharge Elimination System (NPDES) General Permit For Storm Water Discharges Associated with Construction Activity Water Quality Order 00-08-DWQ, Waste Discharge Requirements Order No. 99-08 DWQ (National Pollution Discharge Elimination System (NPDES) Permit No. CAS000002), Resolution No. 2001-046, Modification of Water Quality Order 99-08, State Water Resources Control Board, and any amendments or revisions of these permits or orders.
7. Hazardous Materials – Materials such as paints, solvents, petroleum products, pesticides, wood preservatives, treated wood, acids, roofing tar, batteries, Fluorescent lights, light ballasts, etc.
8. Maximum Extent Practicable (MEP) – Less-effective treatment or activities may not be substituted when it is practicable to provide more effective treatment or activities.
9. Notice of Intent (NOI) – Document that must be submitted to the State of California to obtain coverage under the General Permit and be permitted to develop property one acre or larger.
10. Notice of Termination (NOT) – Document that must be submitted to the State of California once the Project is complete and has achieved Final Stabilization, which certifies that all State and local requirements have been met in accordance with Special Provisions for Construction Activity, C.7, of the General Permit.
11. Post-Construction BMPs – Permanent features designed to minimize pollutant discharges, including sediment, from the site after construction has been completed. These features; such as bioswales, rain gardens, roof drains connected to landscaping, permeable pavement, etc.; will be installed and maintained by the Contractor during the construction of the Project until the Project has achieved Final Stabilization.
12. Project or Project site – All areas including the staging area, material storage, waste management areas, construction areas, on-site parking, site entrances and exits, and anywhere Project construction disturbs soil.
13. Questionnaire - UCSB Construction Stormwater Quality Questionnaire for Site Less than 1 Acre.
14. Storm drain System - Stormwater conduits, stormdrain inlets and other stormdrain structures, street gutters, channels, watercourses, creeks, the Goleta Slough, the Campus Lagoon, and the Pacific Ocean.
15. Stormwater Pollution Prevention Plan (SWPPP) Sites greater than or equal to

one acre – A living document that is site specific and created by the Contractor that specifies Best Management Practices that will prevent construction pollutants from contacting stormwater and with the intent of keeping all products of erosion from moving off site into receiving waters. The SWPPP will be written to comply with all requirements of the State Water Resources Control Board (SWRCB) National Pollution Discharge Elimination System (NPDES) General Permit for Construction Stormwater Discharges (General Permit), and will be modified throughout the life of the Project, as needed, to maintain compliance with the General Permit.

1.02 RELATED SECTIONS

- A. Section 01010, "Summary of Work".

1.03 GENERAL CONTRACTOR SCOPE

- A. Provide all material, labor, and equipment, for installation, implementation, and maintenance of all stormwater quality control measures. This work includes the following:
 - 1. Complying with applicable standards and regulations per Paragraph 1.04 REGULATIONS AND STANDARDS.
 - 2. Furnishing, placing, and installing effective measures for preventing erosion and runoff of soil, silts, gravel, hazardous chemicals, all construction materials including wastes, or other materials prohibited by the Central Coast RWQCB from leaving the site and/or entering the stormwater drainage system.
 - 3. Management of onsite construction materials and waste in such a manner as to prevent said materials and waste from contacting stormwater or wash water and running off site and/or into the stormdrain system.
- B. Contractor shall have stormdrain pollution prevention measures in place and follow this Specification at all times. It is the responsibility of the Contractor to be prepared for a rain event, and to be aware of weather predictions. The University is not responsible for informing the Contractor of rain predictions.
- C. Contractor shall not allow any unauthorized non-stormwater to enter the stormdrain system or leave the construction site. Non-stormwater includes domestic supply water used onsite to wash painting and drywall equipment, tools, equipment, or vehicles.
- D. Sanitary sewer discharge regulations are intended to provide protection of the sanitary sewer system and Goleta Sanitary District (GSD) and Goleta West Sanitary District's (GWSD) wastewater treatment plants. In this Section, "sanitary sewer" shall include any sanitary sewer manhole, clean-out, side sewer or other connection to the GSD and GWSD wastewater treatment plants.
- E. Sanitary sewer blockage will likely result in a back-up and overflow to the stormdrain system. The Contractor shall immediately notify the University's Representative if there is a clogged sanitary sewer.

1.04 REGULATIONS AND STANDARDS

- A. Contractor shall comply with the following applicable regulations:

1. Clean Water Act, United States Environmental Protection Agency.
 2. The Porter-Cologne Clean Water Act, State of California.
 3. Central Coast Basin (Region 3) Water Quality Control Plan (Basin Plan).
 4. National Pollutant Discharge Elimination System (NPDES) General Permit For Storm Water Discharges Associated with Construction Activity (General Permit) Water Quality Order 00-08-DWQ, Waste Discharge Requirements Order No. 99-08 DWQ (National Pollution Discharge Elimination System (NPDES) Permit No. CAS000002), Resolution No. 2001-046, Modification of Water Quality Order 99-08, State Water Resources Control Board, and any amendments or revisions of these permits or orders. These orders are referred to as the General Permit.
- B. Contractor shall comply with the following standards and guidelines on stormwater pollution prevention:
1. [University of California, Santa Barbara BMP Handbook](#)
 2. California Stormwater Quality Association Handbooks – Construction, Municipal, Industrial and Commercial, and New Development and Redevelopment. These documents can be viewed and downloaded from the UCSB Environmental Health & Safety website, or at <http://www.cabmphandbooks.com/>.
 3. Caltrans Storm Water Quality Handbooks - This document can be viewed and downloaded from the UCSB Environmental Health & Safety website, or at <http://www.dot.ca.gov/hq/construc/stormwater/manuals.htm>.

1.05 SUBMITTALS

- A. When the entire construction Project, including the staging area, material storage, waste management areas, construction areas, onsite parking, site entrances and exists, and anywhere Project construction disturbs soil, is less than 1 acre and is not part of a common plan of development, the Contractor shall comply with UCSB Construction Stormwater Quality Questionnaire for Site Less than 1 Acre (Questionnaire) which is available as Information available to bidders.
1. Submit the Questionnaire to the University's Representative for review 14 calendar days prior to scheduled implementation. At the completion of the review, a meeting will be conducted by the University's Representative and the Contractor to discuss and agree upon the implementation of the Questionnaire.
 2. No work shall begin until the Questionnaire has been approved by the University's Representative and the Questionnaire has been implemented.
 3. The Contractor shall bear all cost of design, installation, and maintenance of all stormwater quality control measures.
 4. The Contractor shall submit written reports of inspections and maintenance. Submit all completed inspection sheets from the previous week, to the University's Representative on the first day of each week. Written reports include:
 - a. Pre-rain event inspections.
 - b. Post-rain event inspections.

- c. Weekly inspections.
- d. Maintenance inspections.

1.06 Environmental Enforcement

The SWRCB and the RWQCB have the authority to enforce, through codified regulations, any portions of this Section that if not implemented may violate applicable regulations. Agency enforcement may include but is not limited to: citations, orders to abate, bills for cleanup costs and administration, civil suits, and/or criminal charges. Regulating agencies will cite UCSB for all violations which will be the Contractor's responsibility to correct, pay any fines issued, and remedy all violations as needed. The University's Representative may stop all construction activities as deemed necessary until such violations are remedied.

PART 2 - PRODUCTS

2.01 GENERAL

- A. Provide products and materials as indicated in the Questionnaire/SWPPP, including Activity and Best Management Practice sheets and Drawings.
- B. Where product or material requirements are not specified in the Questionnaire/SWPPP, comply with other applicable sections of the Specifications and obtain approval of the University's Representative.

PART 3 - EXECUTION

3.01 GENERAL

- A. The Contractor will write and implement the Questionnaire/SWPPP and include a BMP Site Map and written description of pollution prevention methods. The intent of this requirement is to ensure Contractor compliance with applicable regulations for the discharge of stormwater from the Project. The Contractor will choose the best available performance-based technology and methods to prevent stormwater pollution from construction activities to the Maximum Extent Practicable (MEP). The method(s) chosen shall be appropriate for each specific site condition.
- B. The Contractor will implement the Questionnaire/SWPPP once it has been reviewed and approved by the University's Representative. Construction activities including clearing and grading will not begin until the Questionnaire/SWPPP has been implemented.
- C. The University's Representative and the Contractor will meet to discuss and agree upon implementation of the Questionnaire/SWPPP.
- D. The Contractor is required to maintain a standby crew for emergency work at all times during the rainy season, October 1 through May 1. Necessary materials shall be available on the Project site and stockpiled at convenient locations to facilitate rapid construction of temporary devices or to repair any damaged stormwater quality control measures when rain is imminent.

3.02 IMPLEMENTATION

- A. Stormwater Quality Control Measures

Comply with all requirements and stormwater quality control measures of the Questionnaire/SWPPP including, but not limited to, the following approved BMPs

referenced in the UCSB BMP Handbook. This list is not all inclusive and the Contractor should refer to the resources listed in Paragraph 1.04 REGULATIONS AND STANDARDS of this Section for additional information. The Contractor will consult the University's Representative before implementing a BMP that is not included in the UCSB BMP Handbook. The Contractor is required to, at a minimum, implement the following applicable BMPs. The Contractor may implement equivalent BMPs as long as the University's Representative approves. The Contractor is required to include BMP specification sheets for all BMPs that are not currently listed in the UCSB BMP Handbook.

1. Best Management Practices

a. Erosion Control (EC)

Provide a description of erosion control measures, including a time schedule, to be implemented during construction to minimize erosion on disturbed areas of the Project site, and identify the controls on the BMP Site Map. Areas requiring erosion control measures are exposed soil, such as soil piles, bare soil, sloped soil, and any area of disturbed soil. All inactive soil disturbed areas on the Project site and some active areas that are not experiencing high traffic, including relatively flat areas, must be protected from erosion. Both erosion and sediment control practices are designed to be implemented as an integrated system of pollution control. Without erosion controls, sediment controls are easily overwhelmed and will not prevent pollution. Preserve existing vegetation where feasible, limit disturbance of existing vegetation, and stabilize and revegetate disturbed areas as soon as possible after grading or construction. Stabilize exposed soil to the Maximum Extent Practicable (MEP) throughout the duration of the Project.

1. The Contractor is required to implement the following applicable BMPs, or equivalent BMPs with the approval of the University's Representative:

EC – 1 Scheduling of Activities

EC – 2 Preserving Existing Vegetation

EC – 3 Temporary Soil Stabilization: Erosion Control Blanket

b. Temporary Sediment Control (TSC)

Provide a description of temporary sediment control measures that will be used on the Project site, and identify the controls on the BMP Site Map. Temporary sediment control measures generally involve intercepting sediment laden runoff, slow the flow of stormwater, and cause suspended sediment particles to drop out of suspension to ensure contaminants do not leave the Project site and enter the waters of the United States. An example of temporary sediment control measures include stormdrain inlet protection and site perimeter controls. Do not use sand bags near the Project site perimeter or near stormdrain inlets. Install sediment control BMPs at appropriate locations along the site perimeter and at all operational inlets to the stormdrain system. All new and existing roadways, curbs, and gutters must be protected from sediment-laden runoff, are considered as perimeters of the site, and will need perimeter controls installed. Sediment control BMPs should be installed and maintained according to specifications. Ensure that adequate erosion

control, sediment control, and soil stabilization BMPs are available onsite throughout the life of the Project.

1. The Contractor is required to implement, at a minimum, at least one of the following applicable perimeter control BMPs, or equivalent BMPs with the approval of the University's Representative:

TSC – 1 Cut Back Curb (Perimeter Control)

TSC – 2 Fiber Roll (Perimeter Control)

TSC – 3 Gravel Bag Berm (Perimeter Control)

2. The Contractor is required to implement the following applicable BMPs, or equivalent BMPs with the approval of the University's Representative:

TSC – 4 Stormdrain Inlet Protection (Secondary Control)

TSC – 5 Slope BMP: Fiber Roll or Gravel Bag

c. Tracking Control (TC)

All new and existing roadways, curbs, and gutters must be protected from sediment-laden runoff, are considered as perimeters of the site, and will need to be swept and vacuumed daily to ensure sediment and pollutants from construction activities are not leaving the site and potentially entering the stormdrain system. Identify and clearly mark one or two locations where vehicles will enter and exit the construction site and focus stabilizing measures at these locations. Install and maintain a stabilized entrance at all Project site entrances and exits to prevent tracking of mud and sediment off site. Vacuum and sweep sidewalks, roadways, site entrance/exit, curb, and gutter daily. Do not use kick brooms or sweeper attachments. Dispose of sweeper waste at an approved disposal facility. If construction parking is permitted on the Project site, then the area needs to be properly maintained and free of tracking and trash.

1. The Contractor is required to implement the following applicable BMPs, or equivalent BMPs with the approval of the University's Representative:

TC – 1 Stabilized Construction Entrance: Rumble Strips

TC – 2 Sweeping and Vacuuming

d. Wind Erosion Control (WEC)

Contractor shall use best available dust suppression equipment and methods to control dust so that the dust does not cause discomfort or nuisance to occupants of the Project site neighboring property. Contractor shall control dust suppression water so that it is effective in controlling dust, but does not leave the Project site or enter the stormdrain system. Contractor shall describe their dust suppression water management methods in the Questionnaire/SWPPP

1. The Contractor is required to implement the following applicable BMP, or equivalent BMPs with the approval of the University's Representative:

WEC – 1 Dust Control

e. Non-Stormwater Management (NSM)

Non-stormwater discharges include a wide variety of sources, including

improper dumping, spills, or leakage from storage tanks or transfer areas. Eliminate all unauthorized non-stormwater discharges to the Maximum Extent Practicable. Assign a qualified person the responsibility for ensuring that no materials other than stormwater, free of all contaminants, are discharged. Include the name, contact information, and qualifications of said person in the Questionnaire/SWPPP.

All workers on the Project site must be adequately trained on non-stormwater management procedures and be in compliance with procedures such as the following at all times:

- Washing in designated, contained areas only.
 - Eliminating discharges to the stormdrain system by infiltrating the wash water on site.
 - All washing activities must be approved by the University's Representative if there is a potential to discharge to the stormdrain system or for discharge to leave the Project site.
 - Do not wash paved areas.
 - Route water line flushing and water from water line repair to landscaped areas.
 - Avoid dewatering discharges by using water for dust control or allow to infiltrate onsite.
 - Unauthorized non-stormwater cannot be discharged without obtaining a permit from the Central Coast RWQCB.
 - Send vehicles/equipment offsite to be cleaned, fuelled, and repaired as much as possible. If it cannot be avoided, the Contractor is required to follow the practices described in NSM-3 Vehicle and Equipment Practices.
 - Inspect the site regularly for evidence of illicit connections, illegal dumping, or discharges.
 - Discharges of stormwater and non-stormwater exposed to concrete during curing and finishing may have a high pH and may contain chemicals, metals, and fines. Properly maintain all chemicals and wastes related to concrete curing and finishing as outlined in NSM-5 Concrete Curing and NSM-6 Concrete Finishing.
 - Prevent the discharge of pollutants from paving operations by following the practices described in NSM-7 Paving and Grinding Operations.
 - Minimize use of hazardous materials onsite. Store and dispose of all materials properly. Do not allow hazardous materials to come in contact with stormwater which could run off site and pollute the stormdrain system.
1. The Contractor is required to implement the following applicable BMPs, or equivalent BMPs with the approval of the University's Representative:
- NSM – 1 Water Conservation
 - NSM – 2 Dewatering Operations
 - NSM – 3 Vehicle and Equipment Practices

- NSM – 4 Illicit Connection/Illegal Discharge Detection
- NSM – 5 Concrete Curing
- NSM – 6 Concrete Finishing
- NSM – 7 Paving and Grinding
- NSM – 8 Potable Water/Irrigation
- NSM – 9 Material Use

f. Waste Management (WM)

The Contractor is required to prevent the discharge of pollutants to stormwater from solid or liquid wastes that will be generated at the Project site. Dumpsters or disposal containers of sufficient size, number, complete with no holes or damage where waste could leak out, are watertight, and have proper covering will be provided and properly maintained by the Contractor. Littering on the Project site is prohibited. If necessary, the Contractor may provide and maintain trash receptacles at locations where workers congregate for lunch and breaks, as long as the trash receptacles have no holes or breaks where waste could leak out, are watertight, are properly covered, and are properly maintained. Construction debris and litter from work areas within the construction limits of the Project site shall be collected and placed in watertight dumpster at the end of every work day. Provide convenient, well-maintained, and properly located toilet facilities. All workers on the Project site must be adequately trained on proper material use, storage, and waste disposal. The Contractor is required to implement a comprehensive set of waste-management practices for hazardous or toxic materials including storage, handling, inventory, and clean-up procedures.

All workers on the Project site must be adequately trained on waster management procedures and be in compliance with procedures such as the following at all times:

- Temporary material storage should be covered, have secondary containment, and be located away from vehicular traffic, the Project perimeter, and stormdrains.
- The Contractor shall provide and properly maintain an adequate number of watertight, crack free, covered containers for all trash and waste related to the construction Project. Collect construction trash daily throughout the Project and from around the perimeter of the site.
- Store dry and wet concrete materials under cover, in secondary containment, away from drainage areas and the Project perimeter. Concrete washout is only permitted in a designated and properly maintained concrete washout bin. Concrete is not allowed to be dumped or spilled anywhere onsite except in the concrete washout bin.
- Temporary sanitary facilities should be located away from watercourses, stormdrain inlets, the Project site perimeter, and traffic circulation. If there is a risk of tipping over or being blown over, the temporary sanitary facility should be secured by stakes or ties to prevent overturning. Wastewater should never be discharged or

buried within or anywhere around the Project site.

- Locate stockpiles on a permeable surface a minimum of 50 feet away from concentrated flows of stormwater, stormdrain inlets, and the Project site perimeter. Do not place stockpiles on an impermeable surface. Completely cover all stockpiles with a tarp or some type of cover; anchor the cover to ensure the stockpile is completely covered at all times.
 - Spills of oil, petroleum products, substances listed under 40 CFR Parts 11, 117, and 302, and sanitary wastes should be contained and cleaned up immediately. Practice spill prevention procedures at all times including proper material handling and storage. Provide stockpiles of cleanup materials at key locations throughout the Project site.
1. The Contractor is required to implement the following applicable BMPs, or equivalent BMPs with the approval of the University's Representative:
 - WM – 1 Material Delivery and Storage
 - WM – 2 Trash Containment
 - WM – 3 Temporary Concrete Washout and Waste Management
 - WM – 4 Sanitary Waste Management
 - WM – 5 Stockpile Management
 - WM – 6 Spill Prevention and Control
 - WM – 7 Hazardous Waste Management
 - WM – 8 Contaminated Soil Management

B. Monitoring and Maintenance

Throughout the life of the Project and especially during the rainy season, all protective devices shall be in place at the end of each working day including those protective devices removed during the day's activities. Please note: no protective devices shall be removed during a rain event.

1. Do not move or modify stormwater quality control devices without the approval of the University's Representative.
2. All removable protective devices indicated on the Questionnaire/SWPPP shall be in place at the end of each day and especially any time rain is predicted in the Santa Barbara area.
3. After a rain event, manage and repair all stormwater quality control devices to ensure they are in good working condition. Equipment, materials, and workers must be available for rapid response to failures and emergencies. All corrective maintenance to BMPs shall be performed as soon as possible, depending upon worker safety.

C. Water Main and Sanitary Sewer Line Break Contingency Plan

If working on or near a water main line or sanitary sewer line, the Contractor shall have a written emergency response plan that states procedures for responding to a break and release of supply water or waste water to the stormdrain system. The Contractor shall meet the following requirements:

1. Water Main Work

- a. Determine the direction of water flow if the main were to break.
 - b. Divert water from entering the storm drain system and contain when possible.
 - c. If there is a water main break, pump the water that is collected or diverted to a sanitary sewer, based on the approval of the University Representative.
 - d. Put in place, before digging, sediment control structures upstream of drain inlets and at drain inlets.
 - e. If a break occurs contact the University's Representative or inspector of record immediately. Include in the Plan the phone number of the University's Representative.
2. Sanitary Sewer Line Work
 - a. Determine where the sewage will flow if the work could cause a blockage.
 - b. Contain any sewage spill from entering the storm drain system.
 - c. If a sewage blockage occurs, pump it to a sanitary sewer, and do not allow it to flow into the stormdrain system.
 - d. If a sewage blockage or spill occurs contact the University's Representative or inspector of record immediately. Include in the Plan the phone number of the University's Representative contact.
 3. Excavation Work

This Paragraph applies to Contractors that excavate in the vicinity of sanitary sewer lines and cause or discover a sewage spill, leak or blockage.

 - a. Immediately notify the University's Representative. Include in the Plan the phone number of the University's Representative.
- D. Good Housekeeping Practices
- The Contractor shall implement the following applicable good housekeeping practices:
1. Store materials that have the potential to be transported to the stormdrain system by stormwater runoff or spillage away from areas of heavy traffic and under cover in a contained area or in sealed waterproof containers.
 2. Use tarps on the ground to collect fallen debris or splatters that could contribute to stormwater pollution.
 3. Secure opened bags of powdered materials (if any) that could contribute to stormwater pollution and visible dust emissions.
 4. Pick up litter, construction debris, and other waste generated by Project activities daily from the Project site and adjacent areas, including the sidewalk area, gutter, street pavement, and stormdrains impacted by the Project. All wastes shall be stored in watertight covered containers, disposed of, or recycled immediately.
 5. Clean sidewalks, driveways, or other paved areas within and around the construction site to eliminate or prevent mud-tracking conditions. Dispose of sweepings in a place that will not pollute the stormdrain system. If wash-water is used in the interior of the site ensure it does not leave the site perimeter or enter a stormdrain inlet. The discharge of wash-water to the stormdrain system is prohibited.

-
6. Inspect vehicles and equipment arriving on-site for leaking fluids, and promptly repair leaking vehicles and equipment. Use drip pans to catch leaks until repairs are made.
 7. Avoid spills by handling materials carefully. Keep a stockpile of appropriate spill clean-up materials, such as rags or absorbent materials, readily accessible on site. Clean up all spills of materials brought on site for Project activities.
 8. Train employees regularly on good housekeeping practices and procedures. Assign responsibility to specific employees for inspecting good housekeeping and responding to spills.
- E. Post-Construction Stormwater Run-Off Control Measures
1. All permanent structural and nonstructural control measures that are planned for the Project to control pollutants in stormwater discharges after construction is completed shall be delineated on a post-construction BMP Site Map. Post-construction BMPs include, but are not limited to:
 - a. Minimization of land disturbance.
 - b. Minimization of impervious surfaces.
 - c. Treatment of stormwater run-off using infiltration.
 - d. Water detention/retention, bioswales, or rain gardens.
 - e. Bio-filter BMPs.
 - f. Efficient irrigation systems.
 - g. Ensuring that interior building drains and trash enclosures are tied to the sanitary sewer system, and not the stormdrain system.
 - h. Appropriately designed and constructed energy dissipation devices.
 - i. Ensuring that roof drains are directed to rain gardens or landscaped areas, not the stormdrain system.
 - j. Use permeable pavement and permeable surfaces where possible.
 2. Post construction BMPs must be consistent with all University's and local post-construction stormwater management requirements, policies, and guidelines.
 3. Contractor shall refer to construction drawings for post-construction BMPs and include them in the SWPPP and on the post-construction BMP Site Map.
- F. Personnel Training
1. The Contractor shall train its employees working on the site on the requirements contained in this Section. Training should be both formal and informal, occur on an ongoing basis when it is appropriate and convenient, and should include training/workshops offered by the SWRCB, RWQCB, and other locally recognized agencies or professional organizations.
 2. The Contractor shall document this training in writing. The University's Representative for the site will request to see the training materials and records at the onset of work. All training records will be included in the SWPPP.
 3. The Contractor shall inform all subcontractors (if any) of the water pollution prevention requirements contained in this specification and include appropriate subcontract provisions to ensure that these requirements are

met.

3.03 Final Stabilization

- A. All disturbed areas of the construction site must be stabilized before the Project is deemed complete. Final Stabilization for the purposes of submitting a NOT is satisfied when all disturbing soil activities are completed, all construction materials and waste have been disposed of properly, the site is in compliance with all stormwater regulations, and a uniform vegetative cover with 70 percent coverage has been established.
- B. When construction is complete, the Project site has achieved Final Stabilization, all construction materials and waste have been disposed of properly, the site is in compliance with all stormwater regulations, and the Project is deemed complete by the University's Representative, submit the completed Notice of Termination (NOT) form to the University's Representative. The NOT will be signed by the University's Representative.
- C. When construction is complete, the Project site has achieved Final Stabilization, all construction materials and waste have been disposed of properly, the site is in compliance with all stormwater regulations, and the Project is deemed complete by the University's Representative, submit the completed SWPPP with all necessary documents including but not limited to inspections, annual certifications, SWPPP amendments, training certificates, schedules, qualifications, BMP Site Maps, NOI, and NOT to the University's Representative.
- D. When construction is complete, the Project site has achieved Final Stabilization, all construction materials and waste have been disposed of properly, the site is in compliance with all stormwater regulations, and the Project is deemed complete by the University's Representative, if the stormwater protections are no longer required and upon obtaining approval from the University's Representative and the University's Representative, remove the protections and restore the site or structure to the required condition.

END OF SECTION 01560

SECTION 15180

HEATING AND COOLING PIPING WATER TREATMENT EQUIPMENT

PART 1

1.01 GENERAL

- A. Contractor shall furnish and install all equipment and material on this project in accordance with the requirements of the authority having jurisdiction, suitable for its intended use on this project, approved by the Environmental Protection Agency (EPA), and so certified by the manufacturer.
- B. Analyze water from the local water company to be used on the project before establishing treatment procedures.
- C. The water treatment chemical, equipment, and service supplier shall be a recognized specialist, active in the field of industrial water treatment, whose business is in the field of water treatment, and who has full-time personnel within the trading area of the job site.

1.02 TREATMENT STANDARDS

- 1. Condenser –Tower Water (Open)
Nalco chemical TRASAR 3DT265 fluorescent technology, real time controls all-organic program with Porta Feed tank and secondary containment. Program is designed for use in systems with recirculating water calcium concentrations greater than 300 ppm (as CaCO₃) at the targeted cycles when the pH is typically greater than 8.7.
- 2. Nalco 3D Trasar Control equipment as specified
- 3. Closed Chill Loop NALCO TRAC 104 . Maintain 250 to 350 ppm molybdenum. *Existing campus standard. Tie in with Campus chill loop*

PART 2 - PRODUCTS:

2.1 ACCEPTABLE MANUFACTURERS

- a. NALCO for chemicals with Porta Feed delivery system to include stainless steel, base tanks and secondary containment, sites glass monitoring for accurate gpd chemical feed to match existing campus standard
- b. Utilize 3D TRASAR controller system with wireless communication Part # 060-TR5500.88 to match existing campus standard
- c. TRASAR 3D 265 Trasar residuals:
Control Level 110 to 120 ppm
Molybdate heavy metal not accepted in cooling.
- d. Nalco 90005 algicide liquid biocide only accepted biocide with Micro Porta Feed tank and secondary containment. Maintain Microbio counts less than 1000.
- e. No acid allowed on campus for cooling towers. *Campus standard for safety.*
- f. Chemical bypass feeder to supplement TRAC 104 feed.

2.2 PRESTART-UP CLEANING and FLUSHING

- A. Contractor shall furnish all required pipe cleaning chemicals, chemical feed equipment, materials, and labor necessary to clean the piping as herein specified. In addition, permanently install necessary chemical injection fittings complete with stop valves and coupon racks, etc.
- B. Provide a prestart-up, non-foaming, liquid detergent dispersant cleaner for cleaning of all water systems to remove oil and foreign matter from the piping and equipment prior to the final filling of the systems. This chemical shall not be injurious to persons, piping, pipe joint compounds, packing, coils, valves, pumps and their mechanical seals, tubes or other parts of the system.
- C. Liquid alkaline compound NALCO 8900 emulsifying cleaner to remove oil, grease, solids, dirt. Dosage 5 gallons Nalco 8900 to 500-gallon systems in the system.

2.3 WATER TREATMENT CHEMICALS:

- A. Provide (1) initial chemical fill MINI PORTA FEED fill (1) - 55 gal NALCO 3DT265 and (1) -15 Micro Porta feed gallon fills 90005 biocide . Each tank includes base and secondary containment tanks and delivery system. Provide one years supply of closed systems treatment and required cleaners.

1. CLOSED CHILLED WATER SYSTEM CHEMICAL TREATMENT:

- a. Closed Chill Loop NALCO TRAC 104 Maintain 200 to 300 ppm Molybdenum. *Existing Campus standard no exceptions.*

2. OPEN CONDENSER WATER CHEMICAL TREATMENT SYSTEM:

- a. Nalco 3D 265 all-organic product, all-organic program with Porta Feed tank and secondary containment. Must utilize TRASAR control system. *No substitutions, campus standard.*
- b. Nalco 90005 biocide accepted biocide with Porta Feed tank and secondary containment. Microbio counts less than 1000. *Campus safety standard.*

2.4 CONDENSER TOWER WATER CHEMICAL TREATMENT CONTROL SYSTEMS:

Controllers

- A. Controllers: Upgrade Equipment
 - Must utilize 3D TRASAR controller system with wireless communication part # 060-TR5500.88 Chemical control panel for bleed control and injection of chemicals is to meet the following minimum requirements:
 - The Controller must be able to directly monitor and control both the addition of the corrosion inhibitor, the Primary Biocide (and the secondary biocide if needed) it must also be able to measure the active polymer in the system. The controller must be microprocessor-based fluorometer, which controls the cooling water inhibitor within +/- 2 ppm of the desired set point.
 - The controller must have the ability to monitor and control conductivity (bleed).
 - The controller is to be equipped with an automatic system that detects and reacts to Biological Activity
 - The controller must also be capable of monitoring and controlling the condenser water's pH, and orp.

- B. Provide a Nalco Trasar TR5500 Wall Mount Controller system with wireless gateway connection and 24/7 monitoring for complete automated system for scale/corrosion TRASAR inhibitor feed, biocide feed, real time mild steel & copper corrosion monitoring, and blowdown. TRASAR inhibitor application shall be fed and controlled by a 3DT TRASAR controller. Blowdown shall be conductivity activated and directly responsive to variations in concentrations of the recirculating water. Conductivity controller shall include a programmable timer treatment package for automatic feed of biocide. Treatment package shall include chemical metering pumps and separate corporation stop injection nozzle assemblies for TRASAR and Biocide 90005 .
- C. Provide a chemical feed pump of suitable materials of construction with adequate capacity to handle chemicals of variable pH. Pumps shall be positive displacement, diaphragm type, with adjustable volume from 0 – 100% of capacity.
TRASAR inhibitor pump shall include foot valve and suction tubing. Pump discharge shall include an anti-siphon valve with 3/8" NPT and hard piped with 1/2" schedule 80 PVC to the corporation stop. 115 volts, single phase, 60 hertz power.
LMI A151-392 SI or equal.
Biocide pump Stenner model # P45M-HP2 or equal. 115 volts, single phase, 60 hertz power. Or comparable.
- D. Provide blowdown piping installation to include a 2" thread-o-let on the common discharge of the condenser water pumps, a 2" isolation valve, throttling valve, solenoid valve, and a totalizing water meter that reads in gallons. Install a bypass around the solenoid valve. Provide 2 inch make up totalizing water meter.
- E. Provide a corporation stop injection nozzle assembly, 1/2 inch CPVC injection nozzle with 3/4 inch NPT male connection for injecting chemical treatment into the center of flow in the condenser water recirculating line. For both products
- F. *Chemical pumps shall be mounted on the support rack inside the secondary containment of the NALCO PORTA FEED tanks.*

2.5 CLOSED SYSTEMS EQUIPMENT (Chilled Loop)

- A. On chilled closed loop Install a 5-gallon by-pass chemical feeder, 3 1/2" opening, with 3/4" isolation valves across the common suction and discharge lines of the circulation pumps. Hard pipe the feeder drain to the nearest floor sink. Install feeder in location convenient for filling.

PART 3 - EXECUTION.

3.1 TECHNICAL SERVICE AND CONTROL

- A. Water treatment equipment shall be located in mechanical equipment rooms or spaces when feasible to do so.
- B. Supervise the installation of water treatment equipment.
- C. Supervise the cleaning of open and closed systems and provide a written certification of cleanliness at completion of cleaning procedure.
- D. Condenser For An initial chemical fill for Porta feed tanks and chilled loop treatment on start up. And after completion of system commissioning. Provide the services of a fully qualified field engineer for one year at no additional cost to the Owner. This field engineer must be a graduate chemist or chemical engineer and shall be active in the water treatment field in this locale. The water treatment company shall also provide laboratory and technical assistance from a fully qualified engineering staff to support the following tasks:
 - 1. Make technical service visits to the installation to perform field inspections and to make water analysis on site, with sufficient complexity as to evaluate the water systems operations. Discuss findings with the Owner's personnel in writing, advising on proper practices, chemical requirements

and any corrective actions needed to protect the water systems from scale, corrosion, and fouling. Copies of the field service report must be forwarded each month to the Owner, Architect, and Engineer.

2. Make on-site inspections of equipment during scheduled or emergency outages in order to properly evaluate the success of the water treatment program and to make recommendations in writing based upon these inspections.

3.2 INSTALLATION

ADVANCED CHEMICAL DELIVERY PROGRAM

This system uses Stainless Steel PortaFeeds to provide an advanced chemical delivery system that eliminates the need for chemical drums and employee handling. This feed system includes a Base Tank, Containment Basin, Drawdown Gauge and Fill Line. Base Tanks and Basins are constructed of 304 SS for additional safety and come with all the accessories to properly set up chemical feed systems.

- A. Provide Mini 75 gallon, 55 gallon and/or Micro 30 gallon 15-gallon PortaFeed stainless steel chemical feed system only. This is the only accepted campus standard for safety. No or equal systems.
- B. Required features of PortaFeed system:
- C. Base Tank Requirements:
- D. Base tank unit must have bottom drain capabilities to ensure positive flooded suction for chemical pumping and injection. Base tank unit must have clear sight glass with gallon/liter measurements for accurate chemical monitoring. Positive flooded suction line and sight glass must be valve to isolate base tank unit from containment basin. Containment volume must be 125% of the delivered chemical volume. Container material construction must be 12-gauge 304 ss with polyethylene lining for storing corrosive chemical material
- E. Containment Basis Requirements: Must be 304 ss with chemical metering pump platform.
- F. Must be able to contain 150% of base tank capacity in the event of a full base tank spill.
- G. Meet DOT requirements of no drain plug or fitting.
- H. Chemical Transporter Requirements:
- I. Must comply with DOT requirements for transporting hazardous material.
- J. Transporter delivery chemical volume must not vary more than 4% on any given delivery to base tank unit.
- K. Must be 304 ss with full drain bottom chemical removal to base tank unit.
- L. Must have the ability to be pressurized using nitrogen to transport chemical to base tank unit.
- M. Transporter is to be removed from base tank unit after chemical transfer is completed and transported immediately to originating chemical source point.
- N. No empty or full transporter is to be stored on site.
- O. Chemical Transfer Requirements
- P. Transfer of chemical from transporter to assigned base tank unit must be made using an integral positive connection transfer with no mechanical pumping device. Transfer of chemical must be made with a self-contained 304 ss unit capable of removing 100% of chemical from transporter to base tank unit.
- Q. Chemical transfer must be performed with no exposure to chemical material during transfer between transporter and base tank unit.
- R. Chemical Feeders:
 - 1. Provide Nalco Mini and/or Micro PortaFeed stainless steel chemical feed system only. This is the only accepted campus standard for safety. No or equal system.
 - 2. Campus Environmental Health and Safety standard for transportation, delivery, and storage and handling of hazardous chemicals requires hands -off program for the University. All chemical treatment products for Cooling Towers & Steam Boiler applications to be delivered to all point of feed locations within the plant with delivery service program.
 - 3. Required features of Nalco PortaFeed system:

Base Tank Requirements:

- a. Base tank unit must have bottom drain capabilities to ensure positive flooded suction for chemical pumping and injection.
- b. Base tank unit must have clear sight glass with gallon/liter measurements for accurate chemical monitoring.
- c. Positive flooded suction line and sight glass must be valve to isolate base tank unit from containment basin.
- d. Containment volume must be 125% of the delivered chemical volume.
- e. Container material construction must be 12-gauge 304 ss with polyethylene lining for storing corrosive chemical material.

Containment Basin Requirements:

- a. Must be 304 ss with chemical metering pump platform.
- b. Must be able to contain 150% of base tank capacity in the event of a full base tank spill.
- c. Meet DOT requirements of no drain plug or fitting.

Chemical Transporter Requirements:

- a. Must comply with DOT requirements for transporting hazardous material.
- b. Transporter delivery chemical volume must not vary more than 4% on any given delivery to base tank unit.
- c. Must be 304 ss with full drain bottom chemical removal to base tank unit.
- d. Must have the ability to be pressurized using nitrogen to transport chemical to base tank unit.
- e. Transporter is to be removed from base tank unit after chemical transfer is completed and transported immediately to originating chemical source point.
- f. No empty or full transporter is to be stored on site.

Chemical Transfer Requirements

- a. Transfer of chemical from transporter to assigned base tank unit must be made using an integral positive connection transfer with no mechanical pumping device.
- b. Transfer of chemical must be made with a self-contained 304 ss unit capable of removing 100% of chemical from transporter to base tank unit.
- c. Chemical transfer must be performed with no exposure to chemical material during transfer between transporter and base tank unit.
- d. No additional inventory must be stored on site outside the base tank unit volume.

S. PIPING:

1. Drain connections at low points of piping
2. Provide accessible water hose connection at system basins for cleaning and flushing.
3. System connections and feeder locations must be approved in field by water treatment firm before installation of treatment equipment begins.

3.3 INITIAL CLEANING OF SYSTEMS

- A. Prior to operation, clean system as specified.
- B. Upon completion of cleaning, dose system with chemicals to obtain specified treatment conditions.

C. PIPE CLEANING Chemical requirements:

1. All chemicals used shall be environmentally safe and acceptable to the EPA, FDA, USDA, State of California, and County of Santa Barbara.
2. All chemicals shall be produced at ISO 9000 certified manufacturing plants. Quality control of chemical formulations shall be monitored via statistical process control charts which are downloaded into an SPC data management program.
3. All chemicals used shall be acceptable to various equipment manufacturers.

D. Chilled Water

Cleaning (per 1,000 gallons of water):

1. Isolate chilled water loop system . Install by- pass loop for chemical cleaning purposes.
2. Fill loop with city water and recirculate for 2 hours.
3. System pumping velocity shall be sufficient to remove any loose debris (above 5 FPS) Additional pumps may be required to achieve this rate, & will be the responsibility of the contractor .
4. Drain /Flush the loop.
5. Remove all screens and strainers, clean, and replace.
6. Fill the entire system with water and add 1% to 2% of alkaline cleaner Nalco 8900. Recirculate system for at least 24 hours contact time (flow rate shall be above 5 fps).
7. Drain system from its lowest point while flushing with water until pH and conductivity match city water values.
8. Remove all screens and strainers, clean and replace.
9. Fill system with water and immediately start pretreatment of TRAC 104 & Biocide H-550 glutaraldehyde

E. Condenser Tube Bundle (bundle & piping)

Cleaning (per 1,000 gallons of water):

NOTE: Isolate cooling tower . Install by-pass loop around cooling tower. Cooling tower shall be cleaned separately. Cleaning shall be completed with NO LOAD.

1. Fill loop with city water and recirculate for 2 hours.
2. System pumping velocity shall be sufficient to remove any loose debris (above 5 FPS) Additional pumps to achieve this rate will be the responsibility of the contractor .
3. Drain /Flush the loop.
4. Remove all screens and strainers, clean, and replace.
5. Fill the entire system with water and add 1% to 2% of alkaline cleaner Nalco 8900. Recirculate system for at least 24 hours (flow rate shall be above 5 fps).
6. Drain system from its lowest point while flushing with water until pH and conductivity match city water values.
7. Remove all screens and strainers, clean and replace.

Fill system with water and immediately start pretreatment of 3DT265 & Biocide H-550 glutaraldehyde Add 5 gallons 3DT265 (per 1000 gallons of water): of corrosion inhibitors and copper inhibitors to the loop and recirculate for 48 hours. Add biocide dosage for condenser loop.

3. **Tower /Condenser Water systems with stainless basin & galvanized metal supports (open loop systems):**

NOTE: Isolate cooling tower from chiller condenser tubes. Install by-pass loop for cooling tower to clean independent of chiller condenser barrel/tubes . Cleaning (cleaning shall be completed with NO LOAD):

- (1) Hose out and flush the internals of the tower basin
- (2) Fill the entire system with city water and recirculate for 3 hours with all pumps running and all valves open.
- (3) Drain & flush system. System water is acceptable when water is clear and conductivity & pH matches incoming city water quality
- (4) Remove all debris from the tower basin, all screens, and strainers.
- (5) Fill the entire system with water and recirculate for 1 hour.
- (6) Add 3DT265 & 90005 biocide water treatment immediately. Have 5-gallon pails on site for treatment supplement. (If water treatment is not able to begin immediately due to delay in construction, contact chemical supplier for wet lay-up procedures.)

(7) Notes:

- a. Add the recommended level of closed loop and tower inhibitor. The system is now ready for operation.
- b. **NOTE:** For towers that will not be immediately operational, the tower must have a chemical level consisting of at least 150 ppm
- c. **3DT265 DOSAGE TO START (3 gallons per 1000 gallon) and 16 to 32 ounces H-550 biocide.**
- d. Contractor shall provide a service report generated by the water treatment representative, certifying that the recirculating system has been cleaned in accordance with the above procedures and shall copied to the University's Representative.
- e. **NOTE:** All flow valves must be open throughout the entire loop. Failure to do so will cause possible pipe damage and contamination of system. **DO NOT** attempt this procedure unless **ALL** piping take-offs can be recirculated through. No dead legs must exist if this procedure is to be used.
- f. Drain systems while making up with city water. The best place to drain is from the lowest point in the system. Draining from multiple points may be required.
- g. Remove all screens and strainers, clean and replace.