

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:

Santa Cruz Residence Hall Re-Roofing Project, Bldg 548
Project No. FM080118S/292-18

Addendum No. 2

March 7, 2008

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

Bid date is **Friday, March 14, 2008 at 2:30P. M.** 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 Two

to the

Construction Documents

March 7, 2008

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 PROJECT DIRECTORY

Item No.

1. Replace in it's entirety with attached "Revised Project Directory". 1 page.

II. INFORMATION AVAILABLE TO BIDDERS

Item No.

1. Replace in it's entirety with attached "Revised Information Available to Bidders". 8 pages.

III. BID FORM

Item No.

1. Replace in it's entirety with attached "Revised Bid Form" on yellow paper. 9 pages. No other bid form will be accepted. Any bids not submitted on "Revised Bid Form" will be rejected.

IV AGREEMENT

Item No.

1. Replace in it's entirety with attached "Revised Agreement". 4 pages.

V. SUPPLEMENTARY CONDITIONS

Item No.

1. **Replace** in it's entirety with attached "Revised Supplementary Conditions", 3 pages.

VI. EXHIBITS

Item No.

1. **Replace** in it's entirety with attached "Revised Exhibits". Table of Contents.
2. **Replace** in it's entirety with attached "Payment Bond". Exhibit 2.
3. **Replace** in it's entirety with attached "Performance Bond". Exhibit 3.

VII. SPECIFICATIONS

Item No.

1. Specifications Cover page, bottom of page. Change from January, 2008 to read "February, 2008.
2. Table of Contents, second page. Remove "Appendix and 6 page "Bulk Asbestos Analysis Report".
3. Section 01014, Contractor's Use Of The Project Site, 1.02, Work Hours and Days. Add "B" to read as follows: "Perform roof removal and demolition activities on calendar days between the hours of 9:00AM and 5:00 PM".
4. Section 01155, Unit Prices. Replace in it's entirety with attached Revised Section 01155, Unit Prices.
5. Section 01565, Hazardous Material Procedures, Part 1, General, 1.01, Hazardous Materials Procedures, "B", Change to read in it's entirety: " An asbestos report has been completed by Forensic Analytical, report number BO62644 and is included in section "Information to Bidders".

6. Section 02074. Alteration Project Procedures. 3.03. Installation. "A:". **Delete** the word "Agency".
7. Section 02080. Asbestos-Related Demolition Work. **Replace** in it's entirety with attached Revised Section 02080. Asbestos-Related Demolition Work.
8. Section 07542. PVC Thermoplastic Membrane Roofing. **Replace** in it's entirety with attached Revised Section 07542. PVC Thermoplastic Membrane Roofing.
9. Section 07620. Sheet Metal Flashing and Trim. Part 2. Products. 2.1. Metals. "B:". **Remove** the word "Architect" and **Replace** with the words "University Representative."

END OF ADDENDUM NO. TWO

REVISED PROJECT DIRECTORY

Project Name: Santa Cruz Residence Hall Re-Roofing Project, Bldg. 548
Project Number: FM080118S/292-18
Location: Building No. 548
University: The Regents of the University of California
University's Representative: George. Levinthal
Design & Construction Services, Bldg. 370
Santa Barbara, CA 93106-1030
Telephone: 805-893-2661 x 2205 FAX: 805/893-4493

ALL BIDDING INQUIRIES SHALL BE DIRECTED ONLY TO UNIVERSITY REPRESENTATIVE

University's Director,
Contracting Services: Anna Galanis
University of California, Santa Barbara
Facilities Management, Building 439
Santa Barbara, CA 93106-1030
Telephone: (805) 893-3298 FAX: (805) 893-8592

University's Representative's: Architects Consulting Service
Consultants: 1187 Coast Village Road, Suite 10-H
Santa Barbara, CA 93108
Telephone: 805-565-8909
Fax: 805-565-8919

Address for Stop Notices: Lynn Tran
University of California, Santa Barbara
Student Affairs & Administrative Services Bldg. 568, Room 3201
Accounting Department
Santa Barbara, California 93106

Address for Demand For Arbitration: Western Case Management Center
6795 N. Palm Avenue, 2nd Floor
Fresno, California 93704

A copy of the Demand for Arbitration must be sent to:

Chair, Construction Review Board
University of California
Office of the General Counsel
1111 Franklin Street, 8th Floor
Oakland, CA 94607-5200

REVISED INFORMATION AVAILABLE TO BIDDERS

The following information is made available for the convenience of bidders and is not a part of the Contract. The information is provided subject to the provisions of Article 3 of the General Conditions.

1. **Guide to Parking Service and Regulations**

By Transportation and Parking Services

University of California, Santa Barbara

Available on line at <http://www.tps.ucsb.edu>

2. **UCSB, Design, Construction & Physical Facilities**

<http://facilities.ucsb.edu>

3. **Prevailing Wage Information:** A Bidder can obtain prevailing wage information through the internet at www.dir.ca.gov or by contacting University's principal Facility office.

4. **Safety in the Laboratory: Information for Contractors and Physical Facilities Personnel Working in UCSB Labs**

<http://www.ehs.ucsb.edu/units/labsfty/labrsc/pdfs/lspfinlabs.pdf>

5. **Bulk Asbestos Analysis** –Report Number BO62644, Dated 6/28/2004, 7 pages, Attached.



Bulk Asbestos Analysis

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

B062644 Santa Cruz 548 Mech
Room Roof

U.C. Santa Barbara
J. Ripley
Environmental Health & Safety
Building 565 Mesa Road
Santa Barbara, CA 93106

Client ID: 5151
Report Number: B062644
Date Received: 06/28/04
Date Analyzed: 06/28/04
Date Printed: 06/28/04
First Reported: 06/28/04

Job ID/Site: Santa Cruz Boiler Roof Replacement

FASI Job ID: 5151-1019

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
20040625-548-01	10335290						
Layer: Black Tar			ND				
Layer: Black Felt			ND				
Layer: Black Tar			ND				
Layer: Black Felt			ND				
Layer: Black Tar			ND				
Layer: Black Felt			ND				

Total Composite Values of Fibrous Components: Asbestos (ND)
 Cellulose (55 %) Fibrous Glass (10 %)
 Comment: Bulk complex sample. Collected on 06/25/2004

20040625-548-02	10335291						
Layer: Black Tar			ND				
Layer: Black Felt			ND				
Layer: Black Tar			ND				
Layer: Black Felt			ND				
Layer: Black Tar			ND				
Layer: Black Felt			ND				
Layer: Black Tar			ND				
Layer: Black Felt			ND				

Total Composite Values of Fibrous Components: Asbestos (ND)
 Cellulose (55 %) Fibrous Glass (10 %)
 Comment: Bulk complex sample. Collected on 06/25/2004



Bulk Asbestos Analysis

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

U.C. Santa Barbara
J. Ripley
Environmental Health & Safety
Building 565 Mesa Road
Santa Barbara, CA 93106

Client ID: 5151
Report Number: B062644
Date Received: 06/28/04
Date Analyzed: 06/28/04
Date Printed: 06/28/04
First Reported: 06/28/04

Job ID/Site: Santa Cruz Boiler Roof Replacement

FASI Job ID: 5151-1019

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
20040625-548-03	10335292						
Layer: Black Tar			ND				
Layer: Black Felt			ND				
Layer: Black Tar			ND				
Layer: Black Felt			ND				
Layer: Black Tar			ND				
Layer: Black Felt			ND				
Layer: Black Tar			ND				
Layer: Black Felt			ND				

Total Composite Values of Fibrous Components: Asbestos (ND)
 Cellulose (55 %) Fibrous Glass (10 %)
 Comment: Bulk complex sample. Collected on 06/25/2004

20040625-548-04	10335293						
Layer: Black Tar			ND				
Layer: Black Felt		Chrysotile	60 %				
Layer: Black Tar			ND				
Layer: Black Felt		Chrysotile	60 %				
Layer: Black Tar			ND				
Layer: Black Felt		Chrysotile	60 %				

Total Composite Values of Fibrous Components: Asbestos (36%)
 Cellulose (25 %) Fibrous Glass (5 %)
 Comment: Bulk complex sample. Collected on 06/25/2004

20040625-548-05	10335294						
Layer: Black Tar			ND				
Layer: Black Felt		Chrysotile	60 %				
Layer: Black Tar			ND				
Layer: Black Felt		Chrysotile	60 %				
Layer: Black Tar			ND				
Layer: Black Felt		Chrysotile	60 %				

Total Composite Values of Fibrous Components: Asbestos (36%)
 Cellulose (25 %) Fibrous Glass (5 %)
 Comment: Bulk complex sample. Collected on 06/25/2004



Bulk Asbestos Analysis

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

U.C. Santa Barbara
J. Ripley
Environmental Health & Safety
Building 565 Mesa Road
Santa Barbara, CA 93106

Client ID: 5151
Report Number: B062644
Date Received: 06/28/04
Date Analyzed: 06/28/04
Date Printed: 06/28/04
First Reported: 06/28/04

Job ID/Site: Santa Cruz Boiler Roof Replacement

FASI Job ID: 5151-1019

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
20040625-548-06	10335295						
Layer: Black Tar			ND				
Layer: Black Felt		Chrysotile	60 %				
Layer: Black Tar			ND				
Layer: Black Felt		Chrysotile	60 %				
Layer: Black Tar			ND				
Layer: Black Felt		Chrysotile	60 %				
Layer: Black Tar			ND				
Layer: Black Felt			ND				

Total Composite Values of Fibrous Components: Asbestos (32%)
 Cellulose (25 %) Fibrous Glass (5 %)
 Comment: Bulk complex sample. Collected on 06/25/2004

20040625-548-07	10335296						
Layer: Black Tar			ND				
Layer: Black Felt		Chrysotile	60 %				
Layer: Black Tar			ND				
Layer: Black Felt		Chrysotile	60 %				
Layer: Black Tar			ND				
Layer: Black Felt		Chrysotile	60 %				
Layer: Black Tar			ND				
Layer: Black Felt			ND				

Total Composite Values of Fibrous Components: Asbestos (32%)
 Cellulose (25 %) Fibrous Glass (5 %)
 Comment: Bulk complex sample. Collected on 06/25/2004



Bulk Asbestos Analysis

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

U.C. Santa Barbara
J. Ripley
Environmental Health & Safety
Building 565 Mesa Road
Santa Barbara, CA 93106

Client ID: 5151
Report Number: B062644
Date Received: 06/28/04
Date Analyzed: 06/28/04
Date Printed: 06/28/04
First Reported: 06/28/04

Job ID/Site: Santa Cruz Boiler Roof Replacement

FASI Job ID: 5151-1019

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
20040625-548-08	10335297						
Layer: Black Mastic		Chrysotile	10 %				
Layer: Black Tar			ND				
Layer: Black Felt		Chrysotile	60 %				
Layer: Black Tar			ND				
Layer: Black Felt		Chrysotile	60 %				

Total Composite Values of Fibrous Components: Asbestos (29%)
 Cellulose (15%) Fibrous Glass (Trace)
 Comment: Collected on 06/25/2004

20040625-548-09	10335298						
Layer: Black Semi-Fibrous Tar		Chrysotile	10 %				

Total Composite Values of Fibrous Components: Asbestos (10%)
 Cellulose (Trace)
 Comment: Collected on 06/25/2004

20040625-548-10	10335299						
Layer: Black Semi-Fibrous Tar		Chrysotile	10 %				
Layer: Black Felt			ND				
Layer: Black Tar			ND				
Layer: Black Felt			ND				

Total Composite Values of Fibrous Components: Asbestos (4%)
 Cellulose (45%) Fibrous Glass (Trace)
 Comment: Collected on 06/25/2004



Bulk Asbestos Analysis

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

U.C. Santa Barbara
J. Ripley
Environmental Health & Safety
Building 565 Mesa Road
Santa Barbara, CA 93106

Client ID: 5151
Report Number: B062644
Date Received: 06/28/04
Date Analyzed: 06/28/04
Date Printed: 06/28/04
First Reported: 06/28/04

Job ID/Site: Santa Cruz Boiler Roof Replacement

FASI Job ID: 5151-1019

Sample ID	Lab Number	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer	Asbestos Type	Percent in Layer
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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 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. This report must not be used by the client to claim product endorsement by NVLAP or any other agency of the U.S. Government. 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. All samples were received in acceptable condition unless otherwise noted.

Project: Santa Cruz Boiler roof replacement Date: 06/25/04 W.O.#: Bulk Hrs

Sampler Name: Eric C. Ruse

Building Name/Number: Santa Cruz

Sample Analysis


Turn Around

PLM	12 HR	24 HR	Other
Lab Instructions :rush	Due Date: 06/28/04		

Sample No.	Material(s)	EID No.	Location
20040625-548-01	Floodcoat rock layer, three layers felt with brown cementitious base		Mid field of Santa Cruz Center area Roof Note base material deteriorated and wet
20040625-548-02	Floodcoat rock layer, three layers felt with white cementitious base		West side field of Santa Cruz Center area roof
20040625-548-03	Floodcoat rock layer, three layers felt with white cementitious base		East side field of Santa Cruz Center area roof
20040625-548-04	Grey cant sheet with two layers of felt on concrete		North west corner of Santa Cruz Center area roof
20040625-548-05	Grey cant sheet with two layers of felt on concrete		North east corner of Santa Cruz Center area roof
20040625-548-06	Grey sheet on three layers of felt		Sky light mid roof of Santa Cruz center area roof
20040625-548-07	Grey sheet on three layers of felt on concrete		South west corner of roof cant sheet
20040625-548-08	Grey sheet on three layers of felt		On cant strip going up brick flue for boiler
20040625-548-09	Bituminous coating on felt		Pipe penetration mid field of
20040625-548-10	Bituminous coating on felt		Solar panel pipe support penetration

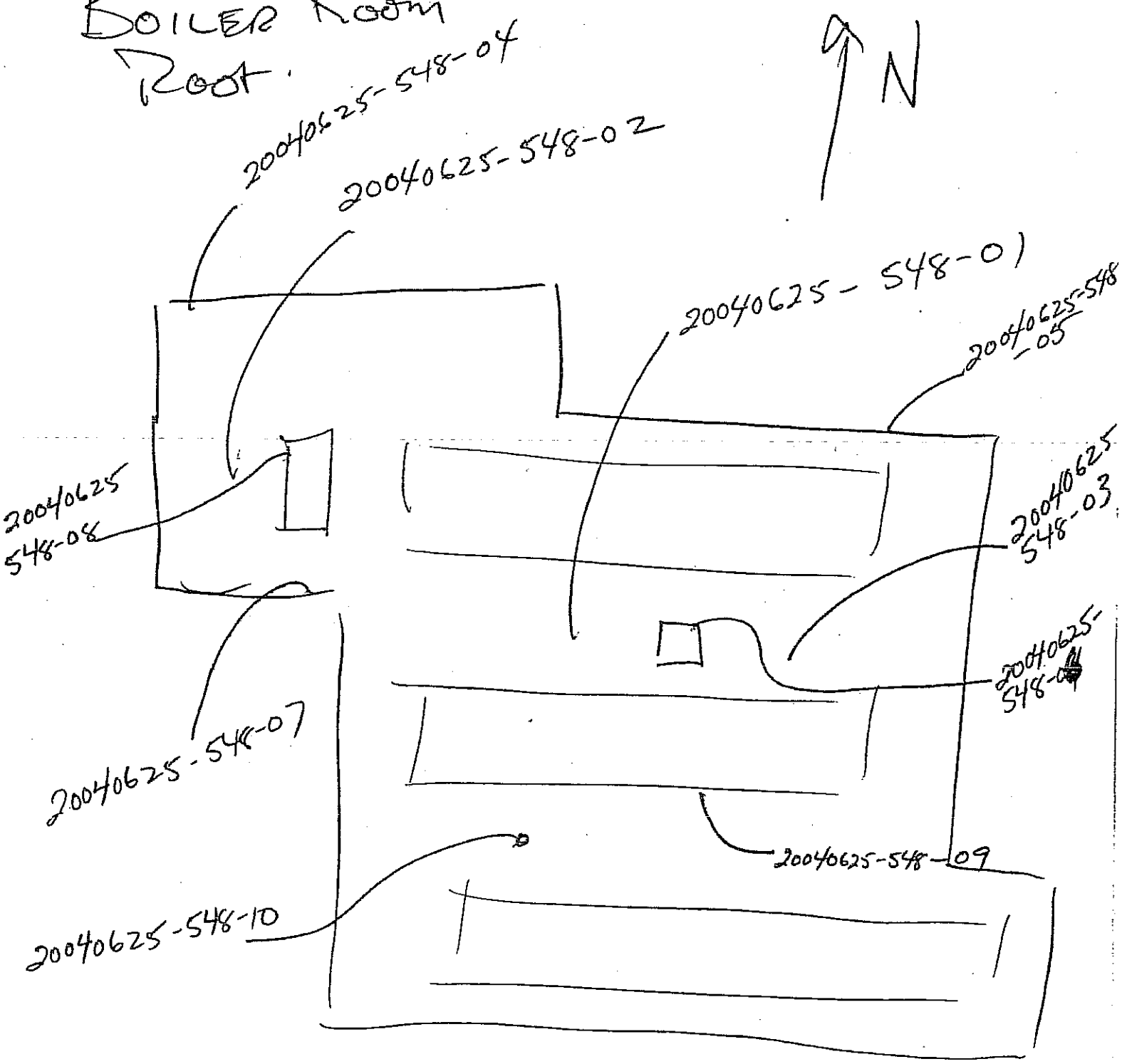
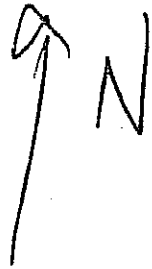
Chain of Custody

Relinquished by Name: Eric C. Ruse Company: UCSB Date/Time:

Received by Name:  Company: FASI Date/Time: 6/28/04 12:00

SANTA CRUZ BLDG 548 ^{06/25/04} (21)

Boiler Room
Root.



REVISED BID FORM

FOR: Santa Cruz Residence Hall Re-Roofing Project, Bldg. 548

FM080118S/292-18

UNIVERSITY OF CALIFORNIA
SANTA BARBARA
SANTA BARBARA, CALIFORNIA

February 2008

BID TO: University of California, Santa Barbara
Facilities Management, Building 439
Door E, Reception Counter
Santa Barbara, CA 93106
(805)893-3298

BID FROM:

(Name of Bidder)

(Address)

(City

(State)

(Zip)

(Telephone Number)

(Fax Number)

(Email Address)

DATE BID SUBMITTED

(Date)

Note: All portions of this Bid Form must be completed and the Bid Form must be signed before the Bid is submitted. Failure to do so may result in the BID being rejected as non-responsive.

1.0 BIDDER'S REPRESENTATIONS

Bidder, represents that a) Bidder and all Subcontractors, regardless of tier, has the appropriate current and active Contractor's licenses required by the State of California and the Bidding Documents; b) it has carefully read and examined the Bidding Documents for the proposed Work on this Project; c) it has examined the site of the proposed Work and all Information Available to Bidders; d) it has become familiar with all the conditions related to the proposed Work, including the availability of labor, materials, and equipment. Bidder hereby offers to furnish all labor, materials, equipment, tools, transportation, and services necessary to complete the proposed Work on this Project in accordance with the Contract Documents for the sums quoted. Bidder further agrees that it will not withdraw its Bid within 60 days after the Bid Deadline, and that, if it is selected as the apparent lowest responsive and responsible Bidder, that it will, within 10 days after receipt of notice of selection, sign and deliver to University the Agreement in triplicate and furnish to University all items required by the Bidding Documents. If awarded the Contract, Bidder agrees to complete the proposed Work within Thirty Five (35) calendar days after the date of commencement specified in the Notice to Proceed.

2.0 ADDENDA

Bidder acknowledges that it is Bidder's responsibility to ascertain whether any Addenda have been issued and if so, to obtain copies of such Addenda from University's facility at the appropriate address stated on Page 1 of this Bid Form. Bidder therefore agrees to be bound by all Addenda that has been issued for this Bid.

3.0 NOT USED

4.0 LUMP SUM BASE BID

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(Place Figures in appropriate boxes)

5.0 SELECTION OF APPARENT LOW BIDDER

Refer to the Instructions to Bidders for selection of apparent low bidder

6.0 UNIT PRICES

The quantities set forth in the unit prices are estimates. University does not represent that the actual quantity of any Unit Price item will equal the Estimated Quantity stated below. University will perform the extension of the Unit Price times the respective Estimated Quantity.

Unit Price for the furnishing and installation of PVC walk way tread
(Description of Item)
as specified in Section 01155, Unit Prices
(Specification Section Number)

Estimated Quantity of units: Two (2) rolls
(MULTIPLIER)

\$

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 .

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per Roll (39.3" x 32.8')
(Place unit price figures in appropriate boxes)

7.0 DAILY RATE OF COMPENSATION FOR COMPENSABLE DELAYS (Used As Basis For Award)

Bidder shall determine and provide below the daily rate of compensation for any Compensable Delay caused by University at any time during the performance of the Work:

\$, . x 10 **MULTIPLIER**
 (Place Amount in Figures in appropriate boxes)

University will perform the extension of the daily rate times the multiplier.

The daily rate shown above will be the total amount of Contractor entitlement for each day of Compensable Delay caused by University at any time during the performance of the Work and shall constitute payment in full for all delay costs, direct or indirect (including, without limitation, compensation for all extended home office overhead and extended general conditions), of the Contractor and all subcontractors, suppliers, persons, and entities under or claiming through Contractor on the Project. The number of days of Compensable Delay shown as a "multiplier" above is not intended as an estimate of the number of days of Compensable Delay anticipated by the University. The University will pay the daily rate of compensation only for the actual number of days of Compensable Delay, as defined in the General Conditions; the actual number of days of Compensable Delay may be greater or lesser than the "multiplier" shown above.

8.0 ALTERNATES – NOT USED

11.0 BIDDER INFORMATION

TYPE OF ORGANIZATION:

(Corporation, Partnership, Individual, Joint Venture, etc.)

- IF A CORPORATION, THE CORPORATION IS ORGANIZED UNDER THE LAWS OF THE STATE OF _____

NAME OF PRESIDENT OF THE CORPORATION:

(Insert Name)

NAME OF SECRETARY OF THE CORPORATION:

(Insert Name)

- IF A PARTNERSHIP, NAMES OF ALL GENERAL PARTNERS:

(Insert Names)

CALIFORNIA CONTRACTORS LICENSE(S):

(Classification)

(License Number)

(Expiration Date)

(For Joint Venture, list Joint Venture's license and licenses for all Joint Venture partners.)

EMPLOYER IDENTIFICATION NUMBER (EIN):

12.0 REQUIRED COMPLETED ATTACHMENTS

The following documents are submitted with and made a condition of this Bid:

1. Bid Security in the form of _____

(Bid Bond or Certified Check)

13.0 DECLARATION

I, _____, hereby declare that I am
(Printed Name)

the _____ of _____
(Title) (Name of Bidder)

submitting this Bid Form; that I am duly authorized to execute this Bid Form on behalf of Bidder;
and that all information set forth in this Bid Form and all attachments hereto are, to the best of my
knowledge, true, accurate, and complete as of its submission date.

I declare, under penalty of perjury, that the foregoing is true and correct and that this declaration
was

executed at: _____
(Name of City if within a City, otherwise Name of County)

in the State of _____

on _____
(Date)

(Signature)

BID BOND

KNOW ALL PERSONS BY THESE PRESENTS:

That we, _____

as Principal, and _____, as Surety, are held and firmly bound unto THE REGENTS OF THE UNIVERSITY OF CALIFORNIA, hereinafter called THE REGENTS, in the sum of ten percent (10%) of the Lump Sum Base Bid amount for payment of which in lawful money of the United States, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH THAT, WHEREAS, Principal has submitted a Bid for the work described as follows:

Santa Cruz Residence Hall Re-Roofing Project, Bldg. 548

FM080118S/292-18

NOW, THEREFORE, if Principal shall not withdraw said Bid within the time period specified after the Bid Deadline, as defined in the Bidding Documents, or within sixty (60) days after the Bid Deadline if no time period be specified, and, if selected as the apparent lowest responsible Bidder, Principal shall, within the time period specified in the Bidding Documents, do the following:

- (1) Enter into a written agreement, in the prescribed form, in accordance with the Bid.
- (2) File two bonds with THE REGENTS, one to guarantee faithful performance and the other to guarantee payment for labor and materials, as required by the Bidding Documents.
- (3) Furnish certificates of insurance and all other items as required by the Bidding Documents.

In the event of the withdrawal of said Bid within the time period specified, or within sixty (60) days if no time period be specified, or the disqualification of said Bid due to failure of Principal to enter into such agreement and furnish such bonds, certificates of insurance, and all other items as required by the Bidding Documents, if Principal shall pay to THE REGENTS an amount equal to the difference, not to exceed the amount hereof, between the amount specified in said Bid and such larger amount for which THE REGENTS procure the required work covered by said Bid, if the latter be in excess of the former, then this obligation shall be null and void, otherwise to remain in full force and effect.

In the event suit is brought upon this bond by THE REGENTS, Surety shall pay reasonable attorneys' fees and costs incurred by THE REGENTS in such suit.

IN WITNESS WHEREOF, we have hereunto set our hands this ____ day of _____, 20

Principal

Surety

By: _____

By: _____

Title: _____

Title: _____

Address for Notices:

NOTE: Notary acknowledgement for Surety and Surety's Power of Attorney must be attached.

REVISED AGREEMENT

THIS AGREEMENT is made as of the _____ day of _____, 20____, between
THE REGENTS OF THE UNIVERSITY OF CALIFORNIA ("University")

Whose facility is: University of California Santa Barbara

Whose address for notices is: University of California, Santa Barbara
Facilities Management, FM Building 439
Santa Barbara, California 93106-1030

And Contractor: _____
(Company Name)

Whose address for notices is: _____
(Street Address)

(City, State Zip code)

For the Project: Santa Cruz Residence Hall Re-Roofing Project, Bldg. 548
FM080118S/292-18
University of California
UC, Santa Barbara, County of Santa Barbara
Santa Barbara, California 93106-1030

University's Responsible Administrator: Jack Wolever, Director
(Name) (Title)
Design & Construction Services
(Department)

University's Representative is: G. Levinthal, University's Representative
(Name & Title)
Design & Construction Services
(Department)

Whose Address for Notices is: University of California, Santa Barbara
Facilities Management, Bldg. 439
Santa Barbara, California 93106

Contract Documents for the Work Prepared by: Architects Consulting Service
1187 Coast Village Road, Suite 10-H
Santa Barbara, CA 93108
Telephone: 805-565-8909 FAX: 805-565-8919

University and Contractor hereby agree as follows:

ARTICLE 1 WORK

Contractor shall provide all work required by the Contract Documents (the "Work"). Contractor agrees to do additional Work arising from changes ordered by the University pursuant to Article 7 of the General Conditions. Contractor shall (1) pay all sales, consumer and other taxes and (2) obtain and pay for any governmental licenses and permits necessary for the work, other than building and utility permits.

ARTICLE 2 CONTRACT DOCUMENTS

"Contract Documents" means the Advertisement For Bids, Instructions To Bidders, Supplementary Instructions to Bidders, Bid Form, this Agreement, General Conditions, Supplementary Conditions, Exhibits, Specifications, List of Drawings, Drawings, Addenda, Notice to Proceed, Change Orders, Notice of Completion, and all other documents identified in this Agreement of which together form the contract between University and Contractor for the Work (the "Contract"). The contract constitutes the complete agreement between University and Contractor and supersedes any previous agreements or understandings.

ARTICLE 3 CONTRACT SUM

Subject to the provisions of the Contract Documents University shall pay to Contractor, for the performance of the Work, \$ _____, the "Contract Sum".

Unit prices, if any, are as follows:

(LIST ITEMS AND UNIT PRICES)

The Contract Sum will be increased by an amount equal to the Unit Price multiplied by the actual number of units of each Unit Price item incorporated in the Work.

ARTICLE 4 CONTRACT TIME

Contractor shall commence the Work on the date specified in the Notice to Proceed and fully complete the work within Thirty Five (35) days, the "Contract Time".

By signing this agreement, Contractor represents to University that the contract time is reasonable for completion of the work and that Contractor will complete the Work within the Contract Time. Time limits stated in the Contract Documents are of the essence of the Contract.

ARTICLE 5 LIQUIDATED DAMAGES

If Contractor fails to complete the Work within the Contract Time, Contractor shall pay to University, as liquidated damages and not as a penalty, the sum of Two Hundred Fifty Dollars (\$250.00) for each day after the expiration of the Contract Time that the Work remains incomplete. After Substantial Completion, the rate for liquidated damages shall be reduced to the sum of \$125.00 per day. University and Contractor agree that if the Work is not completed within the Contract Time, University's damages would be extremely difficult or impracticable to determine and that the aforesaid amounts are reasonable estimates of and reasonable sums for such damages. University may deduct any liquidated damages due from Contractor from any amounts otherwise due to Contractor under the Contract Documents. This provision shall not limit any right or remedy of University in the event of any other default of Contractor other than failing to complete the Work within the Contract Time.

ARTICLE 6 COMPENSABLE DELAY

If Contractor is entitled to an increase in the Contract Sum as a result of a Compensable Delay, determined pursuant to Articles 7 and 8 of the General Conditions, the Contract Sum will be increased by the sum of \$ _____ per day for each day for which such compensation is payable.

ARTICLE 7 DUE AUTHORIZATION

The person or persons signing this Agreement on behalf of Contractor hereby represent and warrant to University that this Agreement is duly authorized, signed, and delivered by Contractor.

(Signatures Located on Following Page.)

THIS AGREEMENT is entered into by University and Contractor as of the date set forth above.

UNIVERSITY:

CONTRACTOR:

THE REGENTS OF THE UNIVERSITY
OF CALIFORNIA

University of California, Santa Barbara
Santa Barbara, CA 93106

By: _____
(Signature)

J.J. Wolever, Director
(Printed Name)

Design and Construction Services
(Title)

(Name of the Firm)

a _____
(Type of Organization)

By: _____
(Signature)

(Printed Name)

(Title)

By: _____
(Signature)

(Printed Name)

(Title)

California Contractor's License(s):

(Name of License)

(Classification and License Number)

(Expiration Date)

(Employer Identification Number)

(Attach notary acknowledgement for all signatures of Contractor. If signed by other than the sole proprietor, a general partner, or corporate officer, attach original notarized power of attorney or corporate resolution.)

REVISED SUPPLEMENTARY CONDITIONS

1. 2.1 "INFORMATION AND SERVICES PROVIDED BY UNIVERSITY," revise paragraph 2.1.3 to read as follows:

"Contractor will be furnished, free of charge, One (1) copy of the Contract Documents for execution of the Work."
2. 3.8 "SUPERINTENDENT", revise paragraph 3.8.4 to read as follows:

The Superintendent may perform the Work of any trade, pick-up materials, or perform any Work not directly related to the supervision and coordination of the Work at the Project site when Work is in progress.
3. 7.3 "CHANGE ORDER PROCEDURES" revise 2nd sentence of paragraph 7.3.2.7 to read as follows:

"Such rental charges shall be at rates, as approved by University Representative, not exceeding competitive rates obtainable from unrelated third parties in the area in which the Work is performed."
4. 7.3 "CHANGE ORDER PROCEDURES" revise paragraph 7.3.9.2.1 to read as follows:

"1 An error or omission in the Contract Documents which does not result in any Extra Work for which Contractor is compensated pursuant to Subparagraph 7.3.5; or . . ."
5. 7.3 "CHANGE ORDER PROCEDURES" revise paragraph 7.3.9.2.2 to read as follows:

"2 University's decision to change the scope of the Work, where such decision is not the result of any default or misconduct of Contractor, and where the change in the scope of the Work does not result in any Extra Work for which Contractor is compensated pursuant to Subparagraph 7.3.5; or . . ."
6. 8.3 "DELAY" add paragraph 8.3.2 to read as follows:

"8.3.2 Unscheduled Power Outages:

 - a. The University may be subject to power outages during the performance of the contract. The Contractor should plan its schedule accordingly and take such other steps as it deems necessary to provide temporary power should outages occur. Any plan to provide temporary power shall be coordinated with and approved, in advance, by the University's Representative.
 - b. The Contractor agrees to bear the risk of any delays to the completion of the Work, or increase costs, attributable to such power outages."

7. MODIFICATION OF ARTICLE 8 – CONTRACT TIME

Rainy weather in excess of the following number of days will be granted a Contract Time extension pursuant to Article 8.4 of the General Conditions:

- March - 6 days
- April - 3 days
- May - 2 days

8. 8.4 "ADJUSTMENT OF THE CONTRACT TIME FOR DELAY", add the following to 8.4.1.6.9

- .3 the Contractor must have employed all reasonable rain mitigation measures to enable the Work to continue on the day; and
- .4 all other conditions of Article 8 must be met.

9. 8.5 "COMPENSATION FOR DELAY" add paragraph 8.5.3 to read as follows:

"8.5.3 Contractor shall not be entitled to receive any compensation for delay for Contract Time extensions resulting from Extra Work. Where Contract Time extensions result from or are granted in change orders which authorize Extra Work, payment by University to Contractor in consideration of any such Extra Work, payment by University to Contractor in consideration of any such Extra Work, pursuant to Subparagraph 7.3.5, shall constitute compensation in full for delay, interruption or disruption resulting from or arising out of any such Extra Work."

10. 8.5 "COMPENSATION FOR DELAY" add paragraph 8.5.4 to read as follows:

"8.5.4 Compensation Delay damages, if any, will be paid to Contractor by University as part of the final payment."

11. MODIFICATION OF GENERAL CONDITIONS, ARTICLE 11 – INSURANCE AND BONDS

Contractor shall furnish and maintain insurance in the amounts below.

The insurance required by 11.1.2.1 and 11.1.2.2 shall be (i) issued by companies with a Best rating of A- or better, and a financial classification of VIII or better (or an equivalent rating by Standard & Poor or Moody's) or (ii) guaranteed, under terms consented to by the University (such consent to not be unreasonably withheld), by companies with a Best rating of A- or better, and a financial classification of VIII or better (or an equivalent rating by Standard & Poor or Moody's). Such insurance shall be written for not less than the following:

Minimum Requirement

11.1.2.1 Commercial Form General Liability Insurance-Limits of Liability	
Each Occurrence-Combined Single Limit for Bodily Injury and Property	<u>\$1,000,000.00</u>
Products-Completed Operations Aggregate	<u>\$1,000,000.00</u>

	Personal and Advertising Injury	<u>\$1,000,000.00</u>
	General Aggregate	<u>\$2,000,000.00</u>
11.1.2.2	Business Automobile Liability Insurance- Limits of Liability	
	Each Accident-Combined Single Limit for Bodily Injury and Property Damage	<u>\$1,000,000.00</u>

Insurance required by Paragraph 11.1.2.3 shall be issued by companies (i) that have a Best rating of B+ or better, and a financial classification of VIII or better (or an equivalent rating by Standard & Poor or Moody's); or (ii) that are acceptable to the University. Such insurance shall be written for not less than the following:

- 11.1.2.3 WORKER'S COMPENSATION AND EMPLOYER'S LIABILITY –
(as required by Federal and State of California law).

REVISED EXHIBITS

Exhibit 1	Certificate of Insurance
Exhibit 2	Payment Bond
Exhibit 3	Performance Bond
Exhibit 4	Application For Payment; Certificate for Payment
Exhibit 5A	Selection of Retention Options
Exhibit 5B	Escrow Agreement for Deposit of Securities In Lieu of Retention and Deposit of Retention
Exhibit 6	Submittal Schedule
Exhibit 7	Cost Proposal
Exhibit 8	Field Order
Exhibit 9	Change Order
Exhibit 10	Conditional Waiver and Release Upon Progress Payment
Exhibit 11	Unconditional Waiver and Release Upon Progress Payment
Exhibit 12	Summary of Builder's Risk Insurance Policy
Exhibit 13A	Report of Subcontractor Information
Exhibit 13B	Distribution of Contract Dollars Form
Exhibit 14	Self Certification-Contractor/Subcontractor Form
Exhibit 15	Material/Product Substitution Request
Exhibit 16	Automated Sprinkler Systems – Contractor's Material and Test Certificate for Underground Piping
Exhibit 17	Automated Sprinkler Systems – Contractor's Material and Test Certificate for Aboveground Piping
Exhibit 18	Certificate of Substantial Completion
Exhibit 19	Contractor Claim Form
Exhibit 20	Subcontractor Claim Form
Exhibit 21	Subcontractor Conditional Waiver and Release Upon Final Payment
Exhibit 22	Subcontractor Unconditional Waiver and Release Upon Final Payment

BOND NUMBER: _____

PAYMENT BOND

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, The Regents of the University of California ("The Regents") have awarded to _____ as Principal a contracted dated the __ day of _____, 20____, (the "Contract") for the work described as follows:

Santa Cruz Residence Hall Re-Roofing Project, Bldg 548, FM080118S/292-18

AND WHEREAS, Principal is required to furnish a bond in connection with the Contract to secure the payment of claims of laborers, mechanics, material suppliers, and other persons as provided by law:

NOW, THEREFORE, we, the undersigned Principal and _____ as Surety, are held and firmly bound unto The Regents in the sum of _____ Dollars (\$ _____), for which payment well and truly to be made we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its heirs, executors, administrators, successors, or assigns approved by The Regents, or its subcontractors shall fail to pay any of the persons named in State of California Civil Code Section 3181, or amounts due under the State of California Unemployment Insurance Code with respect to work or labor performed under the Contract, or for any amounts required to be deducted, withheld, and paid over to the State of California Employment Development Department from the wages of employees of Principal and subcontractors pursuant to Section 13020 of the State of California Unemployment Insurance Code with respect to such work and labor, that Surety will pay for the same in an amount not exceeding the sum specified in this bond, otherwise the above obligation shall become and be null and void.

This bond shall inure to the benefit of any of the persons named in State of California Civil Code Section 3181 as to give a right of action to such persons or their assigns in any suit brought upon this bond.

Surety, for value received, hereby expressly agrees that no extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder, shall in any way affect the obligation of this bond; and it does hereby waive notice of any such extension of time, change, modification, alteration, or addition to the undertakings, covenants, terms, conditions, and agreements of the Contract, or to the work to be performed thereunder.

Surety's obligations hereunder are independent of the obligations of any other surety for the payment of claims of laborers, mechanics, material suppliers, and other persons in connection with the Contract; and suit may be brought against Surety and such other sureties, jointly and severally, or against any one or more of them, or against less than all of them without impairing The Regents' rights against the other.

In the event suit is brought upon this bond, the parties not prevailing in such suit shall pay reasonable attorneys' fees and costs incurred by the prevailing parties in such suit.

Correspondence or claims relating to this bond shall be sent to Surety at the address set forth below.

IN WITNESS WHEREOF, we have hereunto set our hands this ___ day of _____, 20__.

Principal: _____
(Name of Firm)

Surety: _____
(Name of Firm)

By: _____
(Signature)

By: _____
(Signature)

(Printed Name)

(Printed Name)

Title: _____

Title: _____

NOTE: Notary acknowledgement for Surety and
Surety's Power of Attorney must be attached.

Address for Notices:

Ph: _____

Bond No.: _____

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, The Regents of the University of California ("The Regents") has awarded to _____ as Principal a contract dated the _____ day of _____, 20____ the "Contract"), which Contract is by this reference made a part hereof, for the work described as follows:
Santa Cruz Residence Hall Re-Roofing Project, Bldg 548, FM080118S/292-18

AND WHEREAS, Principal is required to furnish a bond in connection with the Contract, guaranteeing the faithful performance thereof;

NOW, THEREFORE, we, the undersigned Principal and

_____ as Surety are held and firmly bound unto The Regents in the sum of _____ dollars (\$ _____), to be paid to The Regents or its successors and assigns; for which payment, well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that if Principal, or its heirs, executors, administrators, successors, or assigns approved by The Regents, shall promptly and faithfully perform the covenants, conditions, and agreements of the Contract during the original term and any extensions thereof as may be granted by The Regents, with or without notice to Surety, and during the period of any guarantees or warranties required under the Contract, and shall also promptly and faithfully perform all the covenants, conditions, and agreements of any alteration of the Contract made as therein provided, notice of which alterations to Surety being hereby waived, on Principal's part to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify, defend, protect, and hold harmless The Regents as stipulated in the Contract, then this obligation shall become and be null and void; otherwise it shall be and remain in full force and effect.

No extension of time, change, alteration, modification, or addition to the Contract, or of the work required thereunder, shall release or exonerate Surety on this bond or in any way affect the obligation of this bond; and Surety does hereby waive notice of any such extension of time, change, alteration, modification, or addition.

Whenever Principal shall be and declared by The Regents to be in default under the Contract, Surety shall promptly remedy the default, or shall promptly:

1. Undertake through its agents or independent contractors, reasonably acceptable to The Regents, to complete the Contract in accordance with its terms and conditions and to pay and perform all obligations of Principal under the Contract, including without limitation, all obligations with respect to warranties, guarantees, and the payment of liquidated damages, or, at Surety's election, or, if required by The Regents.

2. Obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and, upon determination by The Regents of the lowest responsible bidder, arrange for a contract between such bidder and The Regents and make available as work progresses (even though there should be a default or a succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract Sum, and to pay and perform all obligations of Principal under the Contract, including, without limitation, all obligations with respect to warranties, guarantees, and the payment of liquidated damages; but, in any event, Surety's total obligations hereunder shall not exceed the amount set forth in the third paragraph hereof. The term "balance of the Contract Sum," as used in this paragraph, shall mean the total amount payable by The Regents to the Principal under the Contract and any amendments thereto, less the amount paid by The Regents to Principal.

Surety's obligations hereunder are independent of the obligations of any other surety for the performance of the Contract, and suit may be brought against Surety and such other sureties, jointly and severally, or against any one or more of them, or against less than all of them without impairing The Regents' rights against the others.

No right of action shall accrue on this bond to or for the use of any person or corporation other than The Regents or its successors or assigns.

Surety may join in any arbitration proceedings brought under the Contract and shall be bound by any arbitration award

In the event suit is brought upon this bond by The Regents, Surety shall pay reasonable attorney's fees and costs incurred by The Regents in such suit.

Correspondence or claims relating to this bond shall be sent to Surety at the address set forth below.

IN WITNESS WHEREOF, we have hereunto set our hands this ___ day of _____, 20__.

Principal: _____
(Name of Firm)

Surety: _____
(Name of Firm)

By: _____
(Signature)

By: _____
(Signature)

(Printed Name)

(Printed Name)

Title: _____

Title: _____

Address for Notices:

Ph: _____

NOTE: Notary acknowledgement for Surety and Surety's Power of Attorney must be attached

REVISED SECTION 01155

UNIT PRICES

PART 1. GENERAL

1.01 SUMMARY

- A. This Section specifies administrative and procedural requirements for unit prices.
1. A unit price is an amount proposed by Bidders and stated on the Bid Form as a price per unit of measurement for materials or services that will be added to or deducted from the Contract Sum by Change Order in the event that the quantities of Work required by the Contract Documents are increased or decreased.
 2. Unit prices shall include all labor, material, tools, and equipment; all other direct and indirect costs necessary to complete the item of Work and to coordinate the unit price Work with adjacent work; and shall include all overhead and profit. Contractor shall accept compensation computed in accordance with the unit prices as full compensation for furnishing such Work.
 3. Refer to individual Specification Sections for construction activities requiring the establishment of unit prices.
 4. If the actual quantity of a particular item of unit price Work is so different from the estimated quantity that use of the unit price with the actual quantity will be notably unfair to either the University or the Contractor, the unit price shall be adjusted.

PART 2. PRODUCTS

2.01 LIST OF UNIT PRICES ITEMS AND DESCRIPTIONS

- A. **Unit Price No. 1: Provide a unit price for the furnishing and installation of PVC walk way tread.**
1. Unit of Measure: Per each roll (39.3 inches x 32.8 feet).
 2. Estimated Quantity: Two (2) rolls.

PART 3. EXECUTION

3.01 ADVANCED COORDINATION

- A. Immediately notify University's Representative when conditions require the use of unit price item of A listed above.
- B. The applicability of measurement methods for, documentation of, and the final adjustment of the Contract Sum for unit price items of Work shall be determined by the University Representative.

END OF SECTION

REVISED SECTION 02080

ASBESTOS-RELATED DEMOLITION WORK

PART 1 GENERAL

1.01 DESCRIPTION

- A. This section consists of furnishing all work necessary to perform asbestos-related demolition of asbestos-containing and/or contaminated roofing materials located within the limits of the Santa Cruz Residence Hall Re-Roofing project. All work shall be performed in accordance with all federal, state, and local requirements and statutes. The work specified herein is Class II (as defined by CCR Title 8 Section 1529) removal of asbestos-containing and contaminated roofing materials and shall be done by persons knowledgeable, qualified, trained, and experienced in the removal, treatment, handling, transportation, and disposal of asbestos-containing material, and the subsequent cleaning of the affected environment. The work specified herein shall also include performing soft demolition of non-hazardous materials. These persons shall comply with all federal, state, and local regulations and mandated work practices, and shall be capable of performing the work. In the event that any requirement in this section differs from any applicable regulations, the contractor shall report the difference to the University's representative and shall comply with the more stringent requirement.

1.02 DEFINITIONS

- A. Asbestos-Containing Material (ACM): Any material containing greater than one percent asbestos as defined in 8 CCR 1529.
- B. Asbestos-Containing Construction Material (ACCM): Any material containing less than one percent but greater than one tenth of one percent asbestos as defined in 8 CCR 1529.

1.03 SCOPE OF WORK

- A. General Requirements: Work of this section includes but is not limited to the following:
1. Obtaining all notifications and permits required to perform the work.
 2. Developing asbestos-related demolition work plan, including work sequence, work area isolation, HVAC, plumbing, electrical, and fire/life/safety isolation, fall protection plan, decommissioning, asbestos removal methods, and transport/disposal procedures.
 3. Removing and legally disposing of ACM and ACCM located within the Santa Cruz Residence Hall Re-Roofing project site.
 4. Performing demolition of non-hazardous (Non-ACM, Non-ACCM) materials as necessary to access asbestos materials for removal.
 5. Performing employee exposure monitoring as required by Cal-OSHA during the project.

6. Coordinating with the University's Representative, the isolation and shutdown of all water sources (domestic and utility) supplying the work area.
7. Providing and installing temporary water supply to each work area as necessary to accomplish the work. The Contractor shall provide all equipment, materials, and labor required for connection to the water pipe and providing water throughout the project.
8. Coordinating with the University's Representative, the isolation, shutdown, and lockout of all electric circuitry servicing or traversing the work area. Contractor is responsible for testing electric circuitry to ensure proper disconnect and for compliance with Cal-OSHA requirements. Electric circuitry that cannot be isolated and/or shutdown shall be clearly identified with red marking paint "Danger Electrocutation Hazard. A trained, certified, and licensed electrician shall perform all electrical work.
9. Providing and installing temporary power and lighting to each work area. Contractor to provide temporary power and lighting with the distribution panel located outside of the hazardous materials removal area. Contractor to ensure safe installation (including ground fault protection) of temporary power sources, lighting, and equipment and ensure compliance with applicable code requirements and Cal-OSHA requirements for temporary electrical systems. The Contractor's electrician shall provide all equipment, materials, and labor required for connection to the electrical source and providing temporary power and lighting throughout the project.

B. Project Specific Requirements: The Contractor shall remove, transport, and properly dispose of the following materials. Please refer to the drawings for specific locations. Quantities shall be field verified.

1. Contractor shall remove the following asbestos-containing materials, as indicated on the drawings. Abatement actions shall be according to procedures set forth in Part 3 of this specification section:
 - a. Roofing materials which include asbestos containing felts and mastics shall be removed as Class II asbestos work. Critical barrier containment is not a requirement. Waste shall be disposed as non-friable, non-hazardous asbestos waste. Final clearance will be visual inspection by university asbestos coordinator.
 - b. See additional Information to Bidders Forensic Analytical Report Number B062644 Dated 6/28/2004.

1.04 RELATED WORK

- A. SECTION 01080 – REGULATORY REQUIREMENTS
- B. SECTION 01300 – SUBMITTALS
- C. SECTION 07620 – ROOF TEAROFF AND RE-ROOFING PREPARATION

1.05 REQUIRED LICENSURE

- A. Contractor performing work associated with this section shall itself be, or have a subcontractor that is, licensed by the State of California, Contractors State License Board and be registered to perform asbestos related work with the Division of Occupational Safety and Health, Department of Industrial Relations. At a minimum, Contractor shall hold the following license classifications:
1. ASB - Asbestos Certification Supplement
- B. Transportation of Non-Friable Asbestos-Containing Materials:
Contractor shall itself be, or have a subcontractor that is, a registered hazardous waste transporter with the State of California, Department of Toxic Substances Control.

1.06 APPLICABLE DOCUMENTS AND REGULATIONS

- A. It is the responsibility of the Contractor to know the current regulations controlling work and to perform all related work in accordance with such regulations that provide for worker and public safety against asbestos exposure.
- B. The publications listed below form a part of this specification to the extent referenced. The current issue of each document shall govern. Where conflict among requirements or with these Specifications exists, the more stringent requirements shall apply.

1. CODE OF FEDERAL REGULATIONS (CFR)

29 CFR Part 1910 Occupational Safety and Health Standards for General Industry
29 CFR 1910.1200 Hazard Communication
29 CFR 1910.134 Respiratory Protection
29 CFR 1910.145 Specifications for Accident Prevention Signs and Tags
29 CFR 1910.1020 Access to Employee Medical Records
29 CFR Part 1926 Occupational Safety and Health Regulations for Construction
29 CFR 1926.1101 Construction Standard for Asbestos, Tremolite, Anthophyllite and Actinolite

2. U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA)

40 CFR 61 Sub A & B General Provisions
40 CFR 61 Sub M National Emissions Standard for Hazardous Air Pollutants (NESHAP)
40 CFR 260 Hazardous Waste Management Systems: General
40 CFR 261 Identification and Listing of Hazardous Waste
40 CFR 262 Standards Applicable to Generators of Hazardous Waste
40 CFR 263 Standards Applicable to Transporters of Hazardous Waste
40 CFR 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities

- 40 CFR 268 Land Disposal Restrictions
- 40 CFR 763 Sub G Worker Protection Rule
- 40 CFR 763 Asbestos Hazard Emergency Response Act (AHERA)

3. U.S. DEPARTMENT OF TRANSPORTATION (DOT)

- 49 CFR 171 & 172 Transportation of Hazardous Waste

4. NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

- NFPA 701 (1989) Methods of Fire Test for Flame Resistant Textiles and Films

5. UNDERWRITERS LABORATORIES (UL)

- UL 586 (1990) High-Efficiency Particulate Air Filter Units

6. CALIFORNIA CODE OF REGULATIONS (CCR)

- Title 8 5208 General Industry Safety Orders - Asbestos
- Title 8 Article 2.5 Registration - Asbestos Related Work
- Title 8 5194 Hazard Communication
- Title 8 1529 Construction Industry Safety Orders - Asbestos
- Title 22 Div. 4 Cpt. 30 Hazardous Waste Handling

7. CALIFORNIA LABOR CODE

Section 6501.5-6505.5

8. SANTA BARBARA AIR POLLUTION CONTROL DISTRICT (APCD)

- Rule 1001 National Emission Standards for Hazardous Air Pollutants (NESHAPS)

1.07 NOTIFICATIONS AND PERMITS

- A.** Contractor shall make all required written notifications or applications to regulatory agencies including the following:

1. California Division of Occupational Safety and Health Notification shall be in accordance with Section 341.9 of Title 8 of the California Code of Regulations

1.08 SUPERVISOR/COMPETENT PERSON, FOREPERSON, AND WORKERS

- A.** The Contractor shall have an Asbestos-Related Demolition Supervisor/Competent Persons present at all times while asbestos-related work on this Contract is in progress.
- B.** The Asbestos Related Demolition Supervisor/Competent Person shall have successfully completed a five (5) day EPA-approved Asbestos Abatement

Contractor/Supervisor training course, and be thoroughly familiar and experienced with asbestos removal and related work, and shall be familiar with and enforce the use of all safety procedures and equipment. He/she shall be knowledgeable of all EPA, OSHA, and NIOSH requirements and guidelines.

- C. In addition to the Asbestos-Related Supervisor/Competent Person, the Contractor shall furnish one (1) foreperson for each area where work is being performed who has successfully completed a five (5) day EPA-approved Asbestos Abatement Contractor/Supervisor training course, and who is familiar and experienced with asbestos abatement and its related work, safety procedures, and equipment.
- D. It shall be a requirement of this Contract that the Contractor's Asbestos-Related Demolition Supervisor/Competent Person and each of the foremen be onsite at all times while work is in progress. A foreman will be required to conduct inspections of the work practices, and enclosure condition inside the work area at least three (3) times during each work shift.
- E. All workers shall, at a minimum, have successfully completed a four (4) day EPA approved Asbestos Abatement Worker training course.

1.09 SUBMITTALS

- A. Submit, as applicable, the following to the University's Representative for approval within ten days of receiving the Notice to Proceed. These submittals are in addition to those required in Section 01300. These submittals shall conform to the requirements of Section 01300. In addition to the copies required by 01300, the Contractor shall submit the listed submittals here as electronic PDF files. Any scanned documents shall be scanned at a minimum resolution of 300x300dpi.
 - 1. Copies of the written notification to the following regulatory agencies:
 - a. California Division of Occupational Safety and Health
 - 2. Copies of waste haulers Hazardous Waste Transporter Registration and Environmental Protection Agency Acknowledgment of Notification of Hazardous Waste Activity.
 - 3. Identification of the landfill to be used for the disposal of the asbestos-containing waste generated at the project site and the landfill disposal and packaging requirements.
 - 4. Identification of the project's Asbestos Related Demolition Supervisor/Competent Person who meets the requirements of 29 CFR Part 1926.1101 and 8 CCR Part 1529 and is experienced in administration and supervision of asbestos abatement projects, including work practices, protective measures for building and personnel, disposal procedures, etc.
 - 5. A listing of the employees on the work site with the expiration dates for their training, fit testing, and medical monitoring. This listing shall be provided in the initial submittal and shall also be provided electronically in Microsoft Excel and updated weekly throughout the project.
 - 6. Documentation that the Contractor's employees performing asbestos removal, disposal, and air sampling operations have received training which meets the

- criteria of the Federal EPA Model Accreditation Plan (40 CFR Part 763, Subpart E, Appendix C).
- a. Training certification shall be provided prior to the start of work involving asbestos abatement, for all of the Contractor's workers, forepersons, and Asbestos-Related Demolition Supervisors/Competent Persons. Training shall meet the requirements of 29 CFR Part 1926.1101 and 8 CCR Part 1529 and the criteria of the Federal EPA Model Accreditation Plan (40 CFR Part 763, Subpart E, Appendix C). Training shall be provided prior to the time of job assignment and, at least, annually.
 7. Documentation from a physician that employees or agents who may be exposed to airborne asbestos fibers in excess of the Permissible Exposure Limit have received medical monitoring to determine whether they are physically capable of working while wearing the respirator required without suffering adverse health effects. Contractor shall be aware of and provide information to the examining physician about unusual conditions in the workplace environment (e.g. high temperatures, humidity, and chemical contaminants) that may impact on the employee's ability to perform work activities. Medical monitoring shall be performed in accordance with the requirements of 29 CFR Part 1926.1101 and 8 CCR Part 1529.
 8. Documentation of respirator fit-testing for Contractor employees and agents who must enter the work area. This fit-testing shall be in accordance with qualitative procedures as required by OSHA regulations or be quantitative in nature.
 9. Documented NIOSH approvals for respiratory protective devices utilized on site, including manufacturer's certification of HEPA filtration capabilities for cartridges and filters.
 10. Material Safety Data Sheets (MSDS) for solvents, encapsulants, wetting agents, replacement materials, biocides, and other materials and chemicals, expected to be used on the project site.
- B.** During asbestos abatement activities, submit to the University's Representative on a weekly basis, documentation that includes, without limitation, the following:
1. An updated listing of the employees on the work site with the expiration dates for their training, fit testing, and medical monitoring. This listing shall be provided electronically in Microsoft Excel.
 2. OSHA required personal air monitoring results.
 3. Accident/incident reports where injury or damage has occurred on or to the University's property.
 4. Non-hazardous waste data forms, trip tickets and disposal receipts for asbestos waste materials removed from the work area shall be provided within 24 hours of the transport. Send to:

University of California, Santa Barbara
Environmental Health and Safety Department
Santa Barbara, California 93106
Attention: Jerome C. Ripley Asbestos & Lead Coordinator
 5. The exposure assessment report from the third party asbestos consultant shall be provided 48 hours following completion of the exposure monitoring. The exposure

assessment shall include the results of the personal monitoring, a narrative describing the work procedures used during the monitoring, and respirator and personal protective equipment requirements for performing the work described in Article 1.03 of this section.

- C.** Upon completion of all asbestos-related demolition activities, submit to the University's Representative, documentation that includes, without limitation, the following:
1. Work area entry/exit logbook. The logbook must record the name, affiliation, time in, and time out for each entry into each of the work areas.
 2. Material Safety Data Sheets (MSDS) for solvents, encapsulants, wetting agents and replacement materials, as necessary.
 3. OSHA required personal air monitoring results.
 4. Accident/incident reports where injury or damage has occurred on or to the University's property.
 5. Supervisor/foreman logs describing the work performed each day during the project.
 6. A listing of all employees who worked on the project site and training certificates, medical monitoring records, and fit test records for these employees.
 7. Copies of hazardous waste manifests, non-hazardous waste data forms, trip tickets and disposal receipts for asbestos waste materials removed from the project site for the duration of the project. Manifests, non-hazardous waste data forms, trip tickets, and disposal receipts shall be provided in chronological order.

1.10 NOTICES AND POSTINGS

- A.** Post in the decontamination unit, a list containing the names, addresses, and telephone numbers of the Contractor, University's Representative, Asbestos and Lead Coordinator, emergency contact numbers and the following additional postings:

Additional postings shall include:

1. Visitor entry and exit log.
 2. Employee daily sign in/out log.
 3. Work area entry and exit procedures.
 4. Emergency procedures.
 5. One copy of the Cal-OSHA regulations.
- B.** Posted Warnings and Notices: The following regulations, warnings, and notices shall be posted at the work site in accordance with 29 CFR Part 1926.1101 and 8 CCR Part 1529.
1. Warning Signs and Labels: Warning signs shall be provided at building entrances and approaches to asbestos abatement areas. Signs shall be located at a sufficient distance from the asbestos control areas that will allow personnel to read the sign and take the necessary protective actions required before entering the asbestos control area.

2. Post at least two (2) safety warning signs, in English and Spanish, which follow the "Sample Format Warning Sign" shown below:

Sample Format Warning Sign
Minimum Size - 24" x 36"
Material - Aluminum or Fiberglass
Script:

DANGER
ASBESTOS
CANCER AND LUNG DISEASE HAZARD
AUTHORIZED PERSONNEL ONLY
RESPIRATORS AND PROTECTIVE
CLOTHING ARE REQUIRED
IN THIS AREA

Color - Black Letters on Red Background

1.11 WORK AREA SECURITY

- A. The asbestos work control area shall be restricted only to authorized personnel, including Contractor, Contractor's employees, University's Representative(s), and state, and local inspectors.
- B. Entry into the asbestos work control area by unauthorized individuals shall be reported immediately to the University's Representative.
- C. Contractor shall be responsible for Project site security during asbestos-related demolition operations in order to protect work efforts and equipment.

1.12 WORK SEQUENCE

- A. Work Sequence: The following is the work sequence for each phase of the project.
 - 1. Interior demolition of walls and ceilings shall be done prior to removal of asbestos floorings and pipe insulation.

1.13 PERSONAL PROTECTION AND SAFETY

- A. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his/her appliances, methods, and for any damages which may result from his/her operations, improper construction practices, or maintenance. He shall erect and properly maintain at all times as required by the conditions and progress of the work, proper safeguards for the protection of workmen and the public and shall post warning signs around the job site.

B. Respiratory protection requirements:

1. All respiratory protection programs shall be established in accordance with the respiratory protection requirements of 29 CFR Part 1910.134, 8 CCR Part 5144, 29 CFR Part 1910.1001, 8 CCR 1529 and 29 CFR Part 1926.1101. Copies of these regulations are included herein by reference and shall be considered as a requirement of these Specifications.
2. All respirators used shall be selected from those approved by NIOSH for use in atmospheres containing asbestos fibers.
3. Respirators shall be qualitatively fit-tested a minimum of every 12 months in accordance with Title 8 CCR 1529.

C. Provide workers and authorized visitors with sufficient sets of protective full body impervious protective clothing. Such clothing shall consist of full body coveralls and headgear. Provide eye protection and hard hats as required by applicable safety regulations. Reusable type protective clothing and footwear shall be left in the equipment room until the end of the asbestos abatement work, at which time such items shall be disposed of as asbestos waste. Disposable type protective clothing, headgear, and footwear may be provided.

D. Worker Protection Procedures:

1. Each worker and authorized visitor shall, upon entering the job site remove street clothes in the clean room and put on a respirator and clean protective clothing before entering the equipment room or the work area.
2. All workers and authorized visitors shall, each time they leave the work area shall; remove gross contamination from clothing before leaving the work area; proceed to the equipment room and remove all clothing except respirators; still wearing the respirator proceed to the showers, clean the outside of the respirator with soap and water while showering; remove the respirator; thoroughly shampoo and wash themselves.
3. Following showering and drying off, each worker and authorized visitor shall proceed directly to the clean room and dress in clean clothes at the end of each day's work, or before eating, smoking, or drinking. Before reentering the work area from the clean room each worker and authorized visitor shall put on a clean respirator and shall dress in clean protective clothing.
4. Contaminated work footwear shall be stored in the equipment room when not in use in the work area. Upon completion of asbestos abatement, the footwear will either be disposed of as contaminated waste, or will be bagged and sealed for use at another abatement project.
5. Workers removing waste containers from the equipment decontamination enclosure shall enter the holding area from outside wearing a respirator and dressed in clean disposable coveralls. No worker shall use this system as a means to leave or enter the washroom or the work area.
6. Workers shall not eat, drink, smoke, or chew gum or tobacco while in the work area.

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7. Workers shall be fully protected with respirators and protective clothing from the time of first disturbance of asbestos-containing or contaminated materials prior to commencing actual asbestos abatement and until final cleanup is completed.
- E. If evacuation of the work area is required by contaminated personnel due to an emergency, all work efforts shall stop, and all forces shall be directed at minimizing the area contamination, cleanup operations, and first-aid procedures. These activities shall be noted in the daily logbook.
 - F. During work activities requiring decontamination procedures, the Contractor shall provide a means of communication for the workers inside the work area without requiring personnel to enter or leave the work area. The method of communication shall be a two-way radio, localized wire-connected telephone, or similar system. This communication system shall remain intact until the final isolation plastic is removed. Then all equipment shall be wiped down; HEPA vacuumed or disposed of as asbestos-contaminated material.
 - G. Adequate shower facilities shall be provided by the Contractor. An employee leaving the work area shall follow all decontamination procedures necessary or as described herein.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Handling and Storage:
 1. Deliver all materials to the project in the original package(s), container(s), or bundle(s) bearing the name of the manufacturer, brand name and the model number.
 2. Store all materials subject to damage off the ground, away from wet or damp surfaces, and under cover sufficient to prevent damage or contamination.
 3. Damaged or deteriorating materials shall not be used and shall be removed from the premises. Material that becomes contaminated with asbestos shall be disposed of in accordance with the applicable regulations.
- B. Plastic (Polyethylene) Sheeting: Provide 6-mil thickness or greater polyethylene sheeting as specified in sizes to minimize the frequency of joints. Fire retardant polyethylene sheeting is required.
- D. Tape: Provide two inch or wider duct tape capable of sealing joints of adjacent sheets of polyethylene and for attachment of polyethylene sheets to finished or unfinished surfaces of dissimilar materials. Duct tape shall be capable of adhering under both dry and wet conditions, including use of amended water.
- E. Spray Cement: Provide aerosol based spray cement specifically formulated to stick tenaciously to sheet polyethylene.
- F. Surfactant: Provide a 50 percent polyoxyethylene ether and 50 percent polyoxyethylene ester, or equivalent and mix with water to provide a concentration of one ounce surfactant to 5 gallons of water.

- G. Impermeable Containers:** Provide impermeable containers suitable to receive and retain any asbestos-containing or contaminated materials until disposal at Disposal Site labeled in accordance with OSHA Regulation 29 CFR 1910.1101, DOT 49 CFR 171-177, Title 8 CCR and ACPD. Containers must be both air and watertight and must be resistant to damage and rupture. Plastic bags shall be a minimum of 6-mil thick.
- H. Warning Labels and Signs:** Provide warning labels and signs as required by OSHA Regulation 29 CFR Part 1910.1101, 8 CCR Part 1529 and SBAPCD Rule 1001.
- I. Other Materials:** Provide all other materials, such as lumber, nails and hardware, which may be required to construct and dismantle the decontamination area and the barriers that isolate the work area.
- J. Solvents used for the removal of resilient flooring mastics shall be a low-odor, biodegradable, non-hazardous product.**

2.02 TOOLS AND EQUIPMENT

- A. Provide all tools and equipment necessary to perform the required asbestos removal/abatement.**
- B. Air Filtration Equipment:** High Efficiency Particulate Air (HEPA) filtration systems shall be equipped with filtration equipment in compliance with ANSI Z9-2-79, local exhaust ventilation. No air movement system or air filtering equipment shall discharge unfiltered air outside the work area. A pressure differential system shall be established in the work area continuously (24 hours per day) from the start of the work in the area until the area has been decontaminated and certified as such by the required testing. The system shall produce a minimum of four filtered air changes per hour in the work area and maintain a negative pressure differential of at least 0.020-inches water gauge between the inside and outside of the work area. All filtered, exhausted air shall be discharged outside the building away from any building air-intake devices (unless stated otherwise).
- C. Manometer:** A continuous recording monitor shall measure, record and provide a circular printed record of the difference in air pressure between that inside the work area from that outside the work area. The recording system shall be accurate to the nearest 0.001 inches of water pressure differential and be equipped with an alarm that sounds if the difference becomes less than 0.020-inches water gauge.

PART 3 EXECUTION

3.01 ASBESTOS REMOVAL PREPARATION PROCEDURES

- A. General Work Area Preparation:** Contractor shall perform the following general work area preparation procedures prior to commencement of any abatement activities:
 - 1. Danger signs meeting the specifications of 29 CFR Part 1926.1101 and 8 CCR 1529 shall be posted at any location and approaches to locations where airborne concentrations of asbestos may exceed ambient background levels. Signs shall be posted at a distance sufficiently far enough away from the work area to permit an employee to read the sign and take the necessary protective measures to reduce or avoid exposure. Additional signs may need to be posted following construction of workplace enclosure barriers. The signs shall be in accordance with Article 1.10.D.2 of this Section.

2. Asbestos handlers shall don personnel protective equipment as required in Article 1.13 of this Section.
3. Contractor, in conjunction with the University, shall shut down and lock out electric power to work areas, where necessary, to provide a safe work environment. Contractor shall provide temporary power source and equipment, including ground faulting, in compliance with all applicable electrical code requirements and Cal-OSHA requirements for temporary electrical systems. The Contractor shall utilize a licensed electrician to perform all electrical power shut down and temporary power installation. All electrical equipment used during the removal of asbestos-containing materials shall be connected to a Ground Fault Interrupted (GFI) circuit.
4. Contractor, in conjunction with the University, shall shut down and lock out heating, ventilating, and air-conditioning (HVAC) system components that supply, return, or pass through the work area.
5. The Contractor shall isolate the asbestos removal work areas from other occupied areas of the building.

3.02 WORKER DECONTAMINATION ENCLOSURE SYSTEMS

- A. Three-stage decontamination enclosure system: At least one three-stage decontamination enclosure system shall be provided. Worker decontamination enclosure systems constructed at the worksite shall utilize 6-mil opaque black or white polyethylene sheeting or other acceptable materials for privacy.

3.03 EMERGENCY EXITS

- A. Emergency exits shall be established and clearly marked.

3.04 MAINTENANCE OF WORKPLACE BARRIERS

- A. Following completion of the construction of polyethylene barriers and decontamination system enclosures, at least twelve hours settling time shall be required to ensure that barriers will remain intact and secured to walls and fixtures before beginning actual abatement activities.
- B. Workplace barriers shall be visually inspected at the beginning of each work period or shift by the Supervisor/Competent Person.
- C. Damage and defects in the enclosure system shall be repaired immediately upon discovery. This information shall also be noted in the Contractor's daily log.
- D. At any time during the abatement activities after barriers have been erected, if visible material is observed outside of the work area or if damage occurs to barriers, work shall immediately stop, repairs made to barriers, and debris/residue cleaned up using appropriate HEPA-vacuuming and wet-mopping procedures. This information shall also be noted in the Contractor's daily log.

3.05 COMMENCEMENT OF WORK SHALL NOT OCCUR UNTIL

- A. Enclosure systems have been constructed and tested.

- B. The three-stage decontamination unit with shower is operational. This decontamination unit can be the same as the lead-related demolition decontamination unit.
- C. Pre-abatement submissions, notifications, and permits have been provided and are satisfactory to the University's Representative.
- D. Equipment for abatement, cleanup, and disposal are available.
- E. Worker training, medical examination, and respirator fit testing (and certification) is completed or applicable, current documentation of this information is provided. This information shall also be provided for new workers on the first day they arrive at the work site.
- F. Contractor receives permission from the University to commence asbestos-related demolition work.

3.06 WORKPLACE ENTRY AND EXIT PROCEDURES

- A. General: The following procedures shall be followed prior to entrance into any regulated asbestos work area:
 - 1. Personnel who enter the work area shall sign the entry log upon entry and exit.
 - 2. Personnel, before entering the work area, shall read and be familiar with posted regulations, personal protection requirements (including workplace entry and exit procedures), and emergency procedures.
 - 3. Personnel shall wear appropriate respiratory protection and disposable coveralls, head covering, and foot covering. Hardhats, eye protection, and gloves shall also be utilized, as required. Clean respirator filter cartridges and protective clothing shall be provided and utilized by each person for each separate entry into the work area.
 - 4. Personnel wearing designated personal protective equipment shall proceed to the work area.
 - 5. To exit the work area, personnel shall proceed to the equipment room where they shall remove protective equipment, except respirators, and deposit disposable clothing into appropriately labeled containers for disposal.
 - 6. Clothing or footwear worn into a regulated work area will not be permitted out of the regulated work area.
 - 7. Reusable, contaminated footwear shall be stored in the equipment room when not in use in the work area. Upon completion of abatement, it shall be disposed of as asbestos-contaminated waste. (Rubber boots may be decontaminated at the completion of the abatement for reuse).
- C. Disposal of Asbestos-Containing Materials and Asbestos Contaminated Waste:
 - 1. The Contractor is responsible for properly bagging and then transporting all asbestos-containing and contaminated waste to a waste bin at a designated location on site. The waste bin is to be locked at all times when it is not attended. Contractor will provide the University with a suitable lock and key. The Contractor shall line bottom and sides of the waste bin with polyethylene sheet and seal all

- seams with tape to provide a durable leakproof liner prior to depositing any materials in the waste bin.
2. As the work progresses, workers from uncontaminated areas in full protective clothing and appropriate respiratory protection (based on results of exposure assessment) shall enter the equipment decontamination unit and place an adequate supply of plastic bags within the clean room. Workers in the wash room shall be passed plastic bags for receiving single-bagged material already vacuumed and wiped clean. Waste in cleaned, single bags shall then be placed into the new bags to accomplish double-bagging of the waste. Ensure that all plastic bags are sealed properly and appropriately labeled before removing for transport and disposal.
 3. Plastic bags used for asbestos-containing and contaminated waste shall be sealed by using a HEPA vacuum to remove as much air as possible from the bag, then twisting the neck of the bag several full turns and wrapping the neck of the bag with duct tape, next folding the twisted neck over to form a "U", and finally wrapping the neck with duct tape once more.
 4. Plastic bags that contain any standing water (e.g. from settling or over wetting) shall not be sealed and removed from the work area until the excess water has been removed from the plastic bags.
 5. Vehicles or carts used for transporting asbestos-containing materials to the waste bin shall have a completely enclosed storage compartment. Loads of waste shall be sized to allow the compartment door or lid to fully close. Storage compartments shall be plasticized and sealed with a minimum of one (1) layer of 6-mil polyethylene on the sides and on the floor. The compartments shall be thoroughly wet cleaned and HEPA vacuumed following the transfer of each load of material to the waste bin. At the conclusion of the project (or before transport vehicles are used for other purposes), the polyethylene shall be properly removed and disposed of as contaminated waste. After this is accomplished, compartments shall once again be wet cleaned and HEPA vacuumed. (Note: Rental vehicles shall not be used unless accompanied by a letter from the rental company verifying the disclosure of planned use. Rented vehicles shall receive clearance inspection prior to being returned to the rental company.)
 6. Maintain a log to account for the number of pieces of waste, i.e., number of bags, boxes, etc. Piece count shall be reported to the University as well as shipping weight.

3.07 ASBESTOS-CONTAINING MATERIAL REMOVAL PROCEDURES

A. General

1. Work area shall be cleaned and isolated in accordance with the procedures set forth in Article 3.01 of this Section.
2. Waste containers shall be sealed when full. Bags shall not be overfilled. Bags shall be securely sealed to prevent accidental opening and leakage by tying the tops of bags in an overhand knot or by taping in gooseneck fashion. Bags shall not be sealed with wire or cord.
3. Large components removed intact may be wrapped in two layers of 6-mil polyethylene sheeting secured with duct tape for transport to a landfill.

4. Contractor shall adhere to disposal authority's size and weight requirements for containers (bags or packages).
5. Cleanup shall proceed in accordance with Article 3.08 - Cleanup Procedures.

F. Roofing Material Removal Procedures:

1. Asbestos-containing roofing materials and lightweight concrete material shall be wetted by spraying with amended water using spray equipment capable of providing a low-pressure application. Critical barrier containment is not required.
2. Roofing waste materials shall be sealed in labeled 6-mil plastic bags as it is removed. ACCM lightweight concrete waste shall be sealed in clear, unlabeled, 6-mil bags. In the event that removal is accomplished by cutting off sections of the roof deck with roofing still in place, the sections may be wrapped in two layers of 6-mil plastic sheeting, labeled as non-friable asbestos waste, and stored in a container for disposal. Sequence work so as to minimize contamination of non-asbestos building materials with asbestos roofing or lightweight concrete debris. Material shall not be allowed to dry out prior to bagging or wrapping.
3. Following removal, all adjacent areas shall be decontaminated utilizing HEPA vacuum and wet wipe procedures.
4. Dispose of all asbestos containing roofing materials or mixed waste having both asbestos roofing as non-hazardous asbestos waste in accordance with Article 3.10 - Disposal Procedures. ACCM lightweight concrete waste materials containing no asbestos-containing roofing materials may be disposed of as non-hazardous construction debris.

3.08 CLEANUP PROCEDURES

A. General

1. Visible accumulations of ACM, ACCM and asbestos-contaminated debris shall be removed and containerized utilizing nonmetallic tools (squeegees, shovels, and the like). Surfaces in the work area, including plastic sheeting, shall then be wet cleaned. Equipment used in the work area shall be included in the cleanup, and shall be removed from work areas via the decontamination enclosure system or waste load-out, at appropriate times in the cleaning sequence.
2. None of the procedures described in this Article relieve the Contractor of the responsibility to meet the final clearance criteria as established by this Section.

3.09 CLEARANCE

A. The following clearance procedures will be used.

1. After completion of cleanup operations, Contractor shall notify the University that the work areas are ready for clearance air monitoring. Notification shall be a minimum of 24 hours prior to the need for clearance air monitoring. Final visual clearance shall be conducted only after the procedures set forth in Article 3.08 of this Section have been completed, the area has been satisfactorily cleaned and encapsulated, and the abatement area has been thoroughly dried.
2. The University shall conduct the final visual clearance.

3. Abatement areas not achieving clearance shall be re-cleaned using procedures set forth in Article 3.08 of this Section, and retested until clearance is achieved. The cost of additional samples, consultant air monitoring fees, and labor for re-cleaning the work areas that fail final air clearances shall be paid for by the Contractor.

3.10 DISPOSAL PROCEDURES

- A. As the work progresses, to prevent exceeding available storage capacity on site, sealed and labeled containers of asbestos-containing waste shall be removed and transported to the prearranged disposal location.
- B. Unless other arrangements are made satisfactory to the University, bagged or wrapped material shall be removed from the work areas and placed in a Contractor supplied dumpster a minimum of every day. The dumpster shall be marked with asbestos warning signs and be locked at all times when not in use. When a dumpster is full, it shall be removed from University property by the end of the next business day.
- C. Disposal shall occur at an authorized site, in accordance with regulatory requirements of NESHAPs and applicable state and local guidelines and regulations, including the California State Department of Health Services, Toxic Substances Control Division.
- D. Uniform hazardous waste manifests, non-hazardous waste dated forms, dump receipts; trip tickets, transportation manifests, or other documentation of disposal shall be delivered to the University Representative for their records.

3.11 OSHA PERSONNEL AIR MONITORING

- A. Air monitoring required by OSHA for asbestos exposure determination is work of the contractor. The contractor is responsible for providing daily OSHA compliance monitoring as per 8 CCR 1529 and 29 CFR 1926.1101.
 1. At minimum, Contractor shall conduct representative (25% of crew) breathing zone personal air monitoring of its employees twice each shift and repeated daily.
 2. Monitoring shall be conducted by a qualified air professional experienced and knowledgeable about the methods of air monitoring and in accordance with 8 CCR 1529 and CFR 1926.1101.
 3. Monitoring results and appropriate laboratory analysis work shall be submitted to the University within twenty-four (24) hours of the monitoring work.

3.12 ALTERNATE PROCEDURES

- A.** The procedures described in this Section shall be utilized at all times, unless alternate procedures are submitted and approved by the University.
- B.** If contractor desires to use alternate procedures, a request shall be made in writing to the University providing details of the proposed alternative(s).
- C.** Alternative procedures shall provide equivalent or greater protection than the procedures that they replace.
- D.** Alternative procedures shall be approved in writing by the University prior to implementation.

END OF SECTION

**REVISED SECTION 07542
PVC THERMOPLASTIC MEMBRANE ROOFING**

PART 1 - GENERAL CONDITIONS

1.01 DESCRIPTION

A. Work Includes

New adhered feltbacked Single Ply Thermoplastic (PVC) Roofing Membrane with flashings and other components to comprise a waterproof roofing system. The work includes but is not necessarily limited to the installation of:

1. Removal of Existing Roofing and Insulation
2. Substrate Preparation
3. Wood Blocking
4. Roof Membrane
5. Fasteners
6. Adhesive for Flashings
7. Roof Membrane Flashings
8. Walkways
9. Metal Flashings
10. Sealants
11. Field painting of roof equipment

B. Upon successful completion of work the following warranties are required:

1. Manufacturer Warranty
2. Roofing Contractor Warranty

1.02 QUALITY ASSURANCE

- A.** This roofing system shall be installed only by a Roofing Contractor authorized by the Manufacturer. The Contractor shall have at least five (5) years of experience as an installer with the submitted manufacturer as certified by the manufacturer.
- B.** Upon completion of the installation and the delivery to the Manufacturer by the Contractor of a certification that all work has been done in strict accordance with the contract specifications and the Manufacturer's requirements, an inspection shall be made by a Technical Representative of the Manufacturer to review the installed roof system.
- C.** There shall be no deviation made from the Project Specification or the approved shop drawings without prior written approval by the University's Representative.
- D.** All work pertaining to the installation of the membrane and flashings shall only be completed by the Contractor personnel trained and authorized by the Manufacturer in those procedures.

- E. Membrane to have no formulation changes in the last fifteen (15) years as certified by the manufacturer.

1.03 SUBMITTALS

A. SUBMITTALS

1. A list of each primary component to be used in the roof system and the Manufacturer's current literature for each component.
2. Sample copy of Roofing Manufacturer's warranty.
3. Sample copy of The Contractor's warranty.
4. Letter from Roofing Manufacturer confirming that the **Installer** is an authorized the applicator of the specified roof system.
5. Material Safety Data Sheets (MSDS)

1.04 CODE REQUIREMENTS

The **Contractor** shall submit evidence that the proposed roof system meets the requirements of the local building code and has been tested and approved or listed by the following test organizations. These requirements are minimum standards and no roofing work shall commence without written documentation of the system's compliance, as required in the "Submittals" section of this specification.

- A. Underwriters Laboratories, Inc. - Northbrook, IL
1. Class A assembly

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All products delivered to the job site shall be in the original unopened containers or wrappings bearing all seals and approvals.
- B. Handle all materials to prevent damage. Place all materials on pallets and fully protect from moisture.
- C. Membrane rolls shall be stored lying down on pallets and fully protected from the weather with clean canvas tarpaulins. Unvented polyethylene tarpaulins are not accepted due to the accumulation of moisture beneath the tarpaulin in certain weather conditions that may affect the ease of membrane weldability.
- D. All adhesives shall be stored at temperatures between 40° F (5° C) and 80° F (27° C).

- E. All flammable materials shall be stored in a cool, dry area away from sparks and open flames. Follow precautions outlined on containers or supplied by material manufacturer/supplier.
- F. All materials which are determined to be damaged by the University's Representative or the manufacturer are to be removed from the job site and replaced at no cost to the University.

1.06 JOB CONDITIONS

- A. Membrane materials may be installed under certain adverse weather conditions but only after consultation with the Manufacturer, as installation time and system integrity may be affected.
- B. Only as much of the new roofing as can be made weathertight each day, including all flashing and detail work, shall be installed. All seams shall be cleaned and heat welded before leaving the job site that day.
- C. All work shall be scheduled and executed without exposing the interior building areas to the effects of inclement weather. The existing building and its contents shall be protected against all risks.
- D. All surfaces to receive membrane or flashings shall be dry. Should surface moisture occur, the **Contractor** shall provide the necessary equipment to dry the surface prior to application.
- E. All new and temporary construction, including equipment and accessories, shall be secured in such a manner as to preclude wind blow-off and subsequent roof or equipment damage.
- F. Uninterrupted waterstops shall be installed at the end of each day's work and shall be completely removed before proceeding with the next day's work. Waterstops shall not emit dangerous or unsafe fumes and shall not remain in contact with the finished roof as the installation progresses. Contaminated membrane shall be replaced at no cost to the University.
- G. The **Contractor** is cautioned that certain membranes are incompatible with asphalt, coal tar, heavy oils, roofing cements, creosote and some preservative materials. Such materials shall not remain in contact with the membranes. The **Contractor** shall consult the manufacturer regarding compatibility, precautions and recommendations.
- H. Arrange work sequence to avoid use of newly constructed roofing as a walking surface or for equipment movement and storage. Where such access is absolutely required, the Contractor shall provide all necessary protection and barriers to segregate the work area and to prevent damage to adjacent areas. A substantial protection layer consisting of plywood over Felt or plywood over insulation board shall be provided for all new and existing roof areas that receive rooftop traffic during construction.

- I. Prior to and during application, all dirt, debris and dust shall be removed from surfaces either by vacuuming, sweeping, blowing with compressed air and/or similar methods.
- J. The Contractor shall follow all safety regulations as required by OSHA and any other applicable authority having jurisdiction.
- K. All roofing, insulation, flashings and metal work removed during construction shall be immediately taken off site to a legal dumping area authorized to receive such materials. Hazardous materials, such as materials containing asbestos, are to be removed and disposed of in strict accordance with applicable City, State and Federal requirements.
- L. All new roofing waste material (i.e., scrap roof membrane, empty cans of adhesive) shall be immediately removed from the site by the Contractor and properly transported to a legal dumping area authorized to receive such material.
- M. The Contractor shall take precautions that storage and/or application of materials and/or equipment does not overload the roof deck or building structure.
- N. Flammable adhesives and deck primers shall not be stored and not be used in the vicinity of open flames, sparks and excessive heat.
- O. All rooftop contamination that is anticipated or that is occurring shall be reported to the manufacturer to determine the corrective steps to be taken.
- P. The Contractor shall verify that all roof drain lines are functioning correctly (not clogged or blocked) before starting work. The **Contractor** shall report any such blockages in writing (letter copy to the manufacturer) to the University's Representative for corrective action prior to installation of the roof system.
- Q. The **Contractor** shall immediately stop work if any unusual or concealed condition is discovered and shall immediately notify University of such condition in writing for correction at the University's expense (letter copy to the manufacturer).
- R. Site cleanup, including both interior and exterior building areas that have been affected by construction, shall be completed to the University's satisfaction.
- S. All landscaped areas damaged by construction activities shall be repaired at no cost to the University.
- T. The Contractor shall conduct fastener pullout tests in accordance with the latest revision of the SPRI/ANSI Fastener Pullout Standard to help verify condition of deck/substrate and to confirm expected pullout values.

- U. The adhered membrane shall not be installed under the following conditions without consulting the manufacturer's technical department for precautionary steps:
 - 1. The roof assembly permits interior air to pressurize the membrane underside.
 - 2. Any exterior wall has 10% or more of the surface area comprised of opening doors or windows.
 - 3. The wall/deck intersection permits air entry into the wall flashing area.
- V. Precautions shall be taken when using adhesives at or near rooftop vents or air intakes. Adhesive odors could enter the building. Coordinate the operation of vents and air intakes in such a manner as to avoid the intake of adhesive odor while ventilating the building. Keep lids on unused cans at all times.
- W. Protective wear shall be worn when using solvents or adhesives or as required by job conditions.

1.07 BIDDING REQUIREMENTS

A. Pre-Bid Meeting:

A pre-bid meeting shall be held with the University's Representative and involved trades to discuss all aspects of the project. The Contractor field representative or roofing foreman for the work shall be in attendance. Procedures to avoid rooftop damage by other trades shall be determined.

B. Site Visit:

Bidders shall visit the site and carefully examine the areas in question as to conditions that may affect proper execution of the work. All dimensions and quantities shall be determined or verified by the contractor. No claims for extra costs will be allowed because of lack of full knowledge of the existing conditions unless agreed to in advance with the University or University's Representative.

1.08 WARRANTIES

A. Manufacturer's System Warranty (only products purchased from the membrane manufacturer are covered under System Warranty)

"Furnish to the University a written manufactures' guarantee for the roof membrane, all accessories that comprise a roof system, and contractor labor against all defects in materials and workmanship, including water tightness of the system for a period of 20 years from the date of acceptance. The Warranty shall be Non-Prorated provide for No Dollar Limit (NDL), and shall not exclude ponding water and no time limit shall be assigned for any such ponding water during the warranty period.

Refer to Section 01740, GUARANTEES, WARRANTIES, BONDS, SERVICE AND MAINTENANCE CONTRACTS for submittal form."

B. ~~Roofing~~ Contractor Warranty

The Contractor shall supply the University with a separate five-year workmanship warranty. In the event any work related to roofing, flashing, or metal is found to be within the warranty term, defective or otherwise not in accordance with the Contract Documents, the **Contractor** shall repair that defect at no cost to the University. The Contractor's warranty obligation shall run directly to the University, and a copy shall be sent to the manufacturer.

C. University Responsibility

University shall notify both the manufacturer and the Contractor of any leaks as they occur during the time period when both warranties are in effect.

PART 2 - PRODUCTS

2.01 GENERAL

- A. The components of the Adhered roof system are to be products of the membrane manufacturer as indicated on the Detail Drawings and specified in the Contract Documents.
- B. Components to be used that are other than those supplied or manufactured by the membrane manufacturer may be submitted for review and acceptance by the manufacturer. The manufacturer's acceptance of any other product is only for a determination of compatibility with membrane products and not for inclusion in the manufacturer's warranty. The specifications, installation instructions, limitations, and/or restrictions of the respective manufacturers must be reviewed by the University's Representative for acceptability for the intended use with the manufacturer's products.
- C. Membrane shall be certified by the manufacturer to be within two (2) mils of the specified membrane thickness as stated in this section.
- D. Membrane shall have a minimum of twenty-two (22) mils of waterproofing polymers above the reinforcements as documented by a third party source.

2.02 ROOF SYSTEM MEMBRANE MANUFACTURER

- A. Sika Sarnafil (basis of design).
- B. Or Equal, no known equal.

2.03 MEMBRANE

- B. G410 Feltback fiberglass reinforced membrane with a factory-applied integral lacquer coating to repel dirt and sustain reflectivity.

C. Membrane shall conform to ASTM D4434-96 (or latest revision), "Standard for Polyvinyl Chloride Sheet Roofing". Classification: Type II, Grade I.

1. Feltback, 72 mil (1.8 mm), thermoplastic membrane with fiberglass reinforcement and a factory applied 9 oz. geotextile felt backing.

D. Color of Membrane

1. Color: Tan with initial reflectivity of 0.72, initial emissivity 0.90, solar reflective index (SRI) of >89.

E. Typical Physical Properties

<u>Parameters</u>	<u>ASTM Test Method</u>	<u>Typical Physical Properties</u>
Reinforcing Material	-	Fiberglass
Overall Thickness, min., inches (mm)	D638	[0.072 inches]
Tensile Strength, min., psi (MPa)	D638	1600 (11.1)
Elongation at Break, min. (machine x transverse)	D638	270% / 250%
Seam strength*, min. (% of tensile strength)	D638	80
Retention of Properties After Heat Aging	D3045	-
Tensile Strength, min., (% of original)	D638	95
Elongation, min., (% of original)	D638	90
Tearing Resistance, min., lbf (N)	D1004	14 (63.0)
Low Temperature Bend, -40° F (-40° C)	D2136	Pass
Accelerated Weathering Test (Xenon Arc)	D2565	10,000 Hours
Cracking (7x magnification)	-	None
Discoloration (by observation)	-	Negligible
Crazing (7 x magnification)	-	None
Linear Dimensional Change	D1204	0.02%
Weight Change After Immersion in Water	D570	2.5%
Static Puncture Resistance, 33 lbf (15 kg)	D5602	Pass
Dynamic Puncture Resistance, 7.3 ft-lbf (10 J)	D5635	Pass

*Failure occurs through membrane rupture not seam failure.

2.04 FLASHING MATERIALS

A. Wall/Curb Flashing

1. Flashing Membrane

A fiberglass reinforced membrane adhered to approved substrate using adhesive.

2. Flashing G459 Membrane

An asphalt-resistant, fiberglass reinforced membrane adhered to approved substrate using adhesive.

3. Clad Metal

PVC-coated, heat-weldable sheet metal capable of being formed into a variety of shapes and profiles. Clad is 25 gauge, G90 galvanized metal sheet with a 20 mil (1 mm) unsupported membrane laminated on one side.

Color: Tan, matching field membrane color.

B. Perimeter Edge Flashing

1. Clad Metal

2. Non-Typical Edge

Project-specific perimeter edge detail reviewed and accepted for one-time use by the manufacturer's Technical Department.

C. Miscellaneous Flashing

1. Flash

A prefabricated expansion joint cover made from membrane. Flash is designed for securement to wall or horizontal surfaces to span and accommodate the movement of new and existing expansion gaps from 1 inch to 4½ inches (25 mm to 114 mm) across.

2. Reglet

A heavy-duty, extruded aluminum flashing termination reglet used at walls and large curbs. Reglet is produced from 6063-T5, 0.10 inch - 0.12 inch (2.5 mm - 3.0 mm) thick extruded aluminum. Reglet has a 2¼ inch (57 mm) deep profile, and is provided in 10 foot (3 m) lengths. Use prefabricated Reglet mitered inside and outside corners where walls intersect.

3. Stack

A prefabricated vent pipe flashing made from 0.048 inch (48 mil/1.2 mm) thick G410 membrane.

4. Circle-"G"

Circular 0.048 inch (48 mil/1.2 mm) thick G410 membrane patch welded over T-joints formed by overlapping thick membranes.

5. Corner

Prefabricated outside and inside flashing corners made of 0.060 inch (60 mil/1.5 mm) thick membrane that are heat-welded to membrane or Clad base flashings. Corner is available in 2 outside sizes (5 inch and 8½ inch diameter/127 mm and 215 mm) and 1 inside size.

6. Multi-Purpose Sealant

A sealant used at flashing terminations.

7. StaBond Adhesive

A solvent-based reactivating-type adhesive used to attach membrane to flashing substrate.

8. Felt

A non-woven polyester or polypropylene mat cushion layer that is necessary behind G410 or G459 Flashing Membrane when the flashing substrates are rough-surfaced or incompatible with the flashing membrane.

2.04 SEPARATION BOARD

- A. Dens-Deck: Siliconized gypsum, fire-tested hardboard with glass-mat facers. Dens-Deck is provided in a 4 ft x 8 ft (1.2 m x 2.4 m) board size and in thicknesses. Use ¼" board for application to masonry parapet walls.

2.05 ATTACHMENT COMPONENTS

A. Membrane adhesive

1. 2142S Adhesive:

A urethane-based adhesive used to attach the feltback membrane to the horizontal or near-horizontal substrate. Consult Product Data Sheets for additional information. Application rates are as follows:

APPLICATION RATES FOR FELTBACK MEMBRANE					
	Adhesive Rates - Gallons/100 Ft ² (Liters/Meter ²)			Approximate Sq. Ft./Pail (meter ²)	
	Substrate (1 st coat)		Substrate (2 nd coat)		Total
Concrete deck	1.25 (0.51)	+	0	= 1.25 (0.51)	400 (37.16)

Notes:

- a) Due to an increase in viscosity when outdoor temperatures during installation approach 40° F (5° C), add ½ gal/100 ft² (0.2 l/m²) to rate for estimating purposes. 2142S contains some solvent.
 - b) Do not allow 2142S adhesive to skin-over or surface-dry prior to installation of membrane.
 - c) Use a water-filled, foam-covered lawn roller to consistently and evenly press the membrane into the adhesive layer.
- C. Plate: Used with various Fasteners to attach insulation boards to roof deck. Plate is a 3 inch (75 mm) square or round, 26 gauge stamping of SAE 1010 steel with an AZ 55 Galvalume coating.
- D. Plate-HD/CD: Used with Fastener-HD or Fastener-CD10 to attach insulation boards to wood or concrete roof decks. Plate-HD/CD is a 3 inch (75 mm) round stamping of SAE 1010 steel with an AZ 55 Galvalume coating.
- E. Fastener-HD: #14 corrosion-resistant fastener used with Plate-HD/CD to attach insulation boards or with Disc and Bar to attach membrane to structural concrete or wood roof decks. Fastener-HD has a shank diameter of 0.190 inch (4.8 mm), a thread diameter of 0.245 inch (6.2 mm) and a #3 Phillips drive head with a diameter of 0.435 inch (11 mm).
- F. Fastener-CD10: Nail-in, corrosion-resistant fastener used with Plate-HD/CD, Stop or Bar to attach insulation or membrane to normal weight concrete roof deck. Fastener-CD10 has a shank diameter of 0.215 inch (5.5 mm), a split diameter of 0.265/0.275 inch (6.7/7.0 mm) and a flat head with a 0.435 inch (11 mm) diameter.
- G. Fastener-King Con: A nail-in, corrosion-resistant fastener used with Plate to attach insulation or with Bar to attach membrane to poured structural concrete roof decks.
- H. Stop: Extruded aluminum, low profile bar used with certain Fasteners to attach to the roof deck or to walls/curbs at terminations, penetrations and at incline changes of the substrate. Stop is a 1 inch (25 mm) wide, flat aluminum bar 1/8 inch (3 mm) thick that has predrilled holes every 6 inches (152 mm) on center.
- I. Bar: FM-approved, heavy-duty, 14 gauge, galvanized or stainless, roll-formed steel bar used to attach membrane to roof decks. The formed steel is pre-punched with holes every 1 inch (25 mm) on center to allow various Fastener spacing options.

- J. Cord: 5/32 inch (4 mm) diameter, red-colored, flexible thermoplastic extrusion that is welded to the top surface of the membrane and against the side of the Bar, used to hold the membrane in position.

2.06 WALKWAY PROTECTION

- A. Tread: Polyester reinforced, 0.096 inch (96 mil/2.4 mm), weldable membrane with surface embossment. Used as a protection layer from rooftop traffic. Tread is supplied in rolls of 39.3 inches (1.0 m) wide and 32.8 feet (10 m) long.

2.07 MISCELLANEOUS ACCESSORIES

- A. Aluminum Tape: 2 inch (50 mm) wide pressure-sensitive aluminum tape used as a separation layer between small areas of asphalt contamination and the membrane and as a bond-breaker under the coverstrip at Clad joints.
- B. Sealing Tape Strip: Compressible foam with pressure-sensitive adhesive on one side. Used with metal flashings as a preventive measure against air and wind blown moisture entry.
- C. Multi-Purpose Tape: High performance sealant tape with used with metal flashings as a preventive measure against air and wind blown moisture entry.
- D. Seam Welder 641mc: 220 volt, self-propelled, hot-air welding machine used to seal long lengths of membrane seams.
- E. Perimat Welder: 120 volt, self-propelled, hot-air welding machine used to seal long-lengths of membrane seams along perimeter details.
- F. Solvent

A high quality solvent cleaner used for the general cleaning of residual asphalt, scuff marks, etc., from the membrane surface. Solvent is also used daily to clean seam areas prior to hot-air welding in tear off or dirty conditions or if the membrane is not welded the same day it is unrolled.

2.08 MISCELLANEOUS FASTENERS AND ANCHORS

- A. All fasteners, anchors, nails, straps, bars, etc. shall be post-galvanized steel, aluminum or stainless steel. Mixing metal types and methods of contact shall be assembled in such a manner as to avoid galvanic corrosion. Fasteners for attachment of metal to masonry shall be expansion type fasteners with stainless steel pins. All concrete fasteners and anchors shall have a minimum embedment of 1¼ inch (32 mm) and shall be approved for such use by the fastener manufacturer. All miscellaneous wood fasteners and anchors used for flashings shall have a minimum embedment of 1 inch (25 mm) and shall be approved for such use by the fastener manufacturer.

2.09 RELATED MATERIALS

- A. Wood Nailer: Treated wood nailers shall be installed at the perimeter of the entire roof and around such other roof projections and penetrations as specified on Project Drawings. Thickness of nailers must match the insulation thickness to achieve a smooth transition. Wood nailers shall be treated for fire and rot resistance (wolmanized or osmose treated) and be #2 quality or better lumber. Creosote or asphalt-treated wood is not acceptable. Wood nailers shall conform to Factory Mutual Loss Prevention Data Sheet 1-49. All wood shall have a maximum moisture content of 19% by weight on a dry-weight basis.
- B. Plywood: When bonding directly to plywood, a minimum ½ inch (12 mm) CDX (C side out), smooth-surfaced exterior grade plywood with exterior grade glue shall be used. Rough-surfaced plywood or high fastener heads will require the use of Felt behind the flashing membrane. Plywood shall have a maximum moisture content of 19% by weight on a dry weight basis.

PART 3 - EXECUTION

3.01 PRE-CONSTRUCTION CONFERENCE

- A. The Contractor, University's Representative/Designer and Manufacturer(s) shall attend a pre-construction conference.
- B. The meeting shall discuss all aspects of the project including but not limited to:
1. Safety
 2. Set up
 3. Construction schedule
 4. Contract conditions
 5. Coordination of the work

3.02 SUBSTRATE CONDITION

- A. **The Contractor** shall be responsible for acceptance or provision of proper substrate to receive new roofing materials.
- B. The **Contractor** shall verify that the work done under related sections meets the following conditions:
1. Roof drains and/or scuppers have been reconditioned and/or replaced and installed properly.
 2. Roof curbs, nailers, equipment supports, vents and other roof penetrations are properly secured and prepared to receive new roofing materials.
 3. All surfaces are smooth and free of dirt, debris and incompatible materials.
 4. All roof surfaces shall be free of water, ice and snow.

3.03 SUBSTRATE PREPARATION

The roof deck and existing roof construction must be structurally sound to provide support for the new roof system. The **Contractor** shall load materials on the rooftop in such a manner to eliminate risk of deck overload due to concentrated weight. The University's Representative shall ensure that the roof deck is secured to the structural framing according to local building code and in such a manner as to resist all anticipated wind loads in that location.

A. Re-roofing with Removal of Existing Bitumen Roofing

General Criteria: All existing roofing, base flashing, deteriorated wood blocking or deteriorated metal flashings shall be removed. Remove only that amount of roofing and flashing which can be made weathertight with new materials during a one-day period or before the onset of inclement weather.

1. Poured Structural Concrete Deck:

The roof deck shall be smooth, even, free of dust, dirt, excess moisture or oil and be structurally sound. Sharp ridges, other projections and accumulations of bitumen above the surface shall be removed to ensure a smooth surface before roofing. Any deteriorated decking shall be repaired.

3.04 SUBSTRATE INSPECTION

- A. A dry, clean and smooth substrate shall be prepared to receive the Adhered roof system.
- B. The Contractor shall inspect the substrate for defects such as excessive surface roughness, contamination, structural inadequacy, or any other condition that will adversely affect the quality of work.
- C. The substrate shall be clean, smooth, dry, free of flaws, sharp edges, loose and foreign material, oil and grease. Roofing shall not start until all defects have been corrected.
- D. All roof surfaces shall be free of water, ice and snow.
- E. The membrane shall be applied over compatible and accepted substrates only.

3.05 WOOD NAILER INSTALLATION

- A. Install continuous wood nailers at the perimeter of the entire roof and around roof projections and penetrations as shown on the Detail Drawings.

- B. Nailers shall be anchored to resist a minimum force of 300 pounds per lineal foot (4,500 Newtons/lineal meter) in any direction. Individual nailer lengths shall not be less than 3 feet (0.9 meter) long. Nailer fastener spacing shall be at 12 inches (0.3 m) on center or 16 inches (0.4 m) on center if necessary to match the structural framing. Fasteners shall be staggered 1/3 the nailer width and installed within 6 inches (0.15 m) of each end. Two fasteners shall be installed at ends of nailer lengths. Nailer attachment shall meet this requirement and that of the current Factory Mutual Loss Prevention Data Sheet 1-49.
- C. Thickness shall be as required to match substrate or insulation height to allow a smooth transition.
- D. Any existing nailer woodwork which is to remain shall be firmly anchored in place to resist a minimum force of 300 pounds per lineal foot (4,500 Newtons/lineal meter) in any direction and shall be free of rot, excess moisture or deterioration. Only woodwork shown to be reused in Detail Drawings shall be left in place. All other nailer woodwork shall be removed.

3.06 INSTALLATION OF ROOF MEMBRANE

The surface of the insulation or substrate shall be inspected prior to installation of the roof membrane. The substrate shall be clean, dry, free from debris and smooth with no surface roughness or contamination. Broken, delaminated, wet or damaged insulation boards shall be removed and replaced.

A. 2142S Adhesive:

1. Over the properly installed and prepared substrate, 2142S adhesive shall be poured out of the pail and spread using solvent resistant ¾ inch (19 mm) nap paint rollers with a sturdy frame. The 2142S adhesive shall be applied at a rate according to the manufacturer's requirements. No adhesive is applied to the back of the membrane. Do not allow adhesive to skin-over or surface-dry prior to installation of membrane.
2. The G410 feltback roof membrane is unrolled immediately into the wet 2142S adhesive. Adjacent rolls overlap previous rolls by 3 inches (75 mm). This process is repeated throughout the roof area. Immediately after application into adhesive, each roll shall be pressed firmly into place with a water-filled, foam-covered lawn roller by frequent rolling in two directions. Do not allow adhesive to skin-over or surface-dry prior to installation of membrane.

3. Weld G410 coverstrips at all G410 feltback seams that do not have a factory salvage edge.

Notes:

- a) 2142S shall not be used if temperatures below 40° F (5° C) are expected during application or subsequent curing time.
- b) No adhesive shall be applied in seam areas. All membrane shall be applied in the same manner.

3.07 HOT-AIR WELDING OF SEAM OVERLAPS

A. General

1. All seams shall be hot-air welded. Seam overlaps should be 3 inches (75 mm) wide when automatic machine-welding and 4 inches (100 mm) wide when hand-welding, except for certain details.
2. Welding equipment shall be provided by or approved by the manufacturer. All mechanics intending to use the equipment shall have successfully completed a training course provided by a Technical Representative prior to welding.
3. All membrane to be welded shall be clean and dry.

B. Hand-Welding: Hand-welded seams shall be completed in two stages. Hot-air welding equipment shall be allowed to warm up for at least one minute prior to welding.

1. The back edge of the seam shall be welded with a narrow but continuous weld to prevent loss of hot air during the final welding.
2. The nozzle shall be inserted into the seam at a 45 degree angle to the edge of the membrane. Once the proper welding temperature has been reached and the membrane begins to "flow," the hand roller is positioned perpendicular to the nozzle and pressed lightly. For straight seams, the 1½ inch (40 mm) wide nozzle is recommended for use. For corners and compound connections, the ¾ inch (20 mm) wide nozzle shall be used.

C. Machine Welding: Machine welded seams are achieved by the use of automatic welding equipment. When using this equipment, the manufacturer's instructions shall be followed and local codes for electric supply, grounding and over current protection observed. Dedicated circuit house power or a dedicated portable generator is recommended. No other equipment shall be operated off the generator.

1. Metal tracks may be used over the deck membrane and under the machine welder to minimize or eliminate wrinkles.

D. Quality Control of Welded Seams

1. The Contractor shall check all welded seams for continuity using a rounded screwdriver. Visible evidence that welding is proceeding correctly is smoke during the welding operation, shiny membrane surfaces, and an uninterrupted flow of dark grey material from the underside of the top membrane. On-site evaluation of welded seams shall be made daily by the Contractor to locations as directed by the University's Representative or a manufacturer's representative. One inch (25 mm) wide cross-section samples of welded seams shall be taken at least three times a day. Correct welds display failure from shearing of the membrane prior to separation of the weld. Each test cut shall be patched by the Contractor at no extra cost to the University.

3.08 MEMBRANE FLASHINGS

- A. All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the University's Representative and the manufacturer. Approval shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing, the affected area shall be removed and replaced at the Contractor's expense. Flashing shall be adhered to compatible, dry, smooth, and solvent-resistant surfaces. Use caution to ensure adhesive fumes are not drawn into the building.
- B. Adhesive for Membrane Flashings
1. Over the properly installed and prepared flashing substrate, adhesive shall be applied according to instructions found on the Product Data Sheet. The adhesive shall be applied in smooth, even coats with no gaps, globs or similar inconsistencies. Only an area which can be completely covered in the same day's operations shall be flashed. The bonded sheet shall be pressed firmly in place with a hand roller.
 2. No adhesive shall be applied in seam areas that are to be welded. All panels of membrane shall be applied in the same manner, overlapping the edges of the panels as required by welding techniques.
- C. Install Stop/Bar/Cord according to the Detail Drawings with approved fasteners into the structural deck at the base of parapets, walls and curbs. Stop is required by the manufacturer at the base of all tapered edge strips and at transitions, peaks, and valleys according to the manufacturer's details.
- D. The manufacturer's requirements and recommendations and the specifications shall be followed. All material submittals shall have been accepted by the manufacturer prior to installation.
- E. All flashings shall extend a minimum of 8 inches (0.2 m) above roofing level unless otherwise accepted in writing by the University's Representative and the Technical Department.

- F. All flashing membranes shall be consistently adhered to substrates. All interior and exterior corners and miters shall be cut and hot-air welded into place. No bitumen shall be in contact with the membrane.
- G. All flashing membranes shall be mechanically fastened along the counter-flashed top edge with Stop at 6-8 inches (0.15-0.20 m) on center.
- H. Flashings shall be terminated according to the manufacturer's recommended details.
- I. All flashings that exceed 30 inches (0.75 m) in height shall receive additional securement. Consult Technical Department for securement methods.

3.09 METAL FLASHINGS

- A. Metal details, fabrication practices and installation methods shall conform to the applicable requirements of the following:
 - 1. Factory Mutual Loss Prevention Data Sheet 1-49 (latest issue).
 - 2. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - latest issue.
- B. Metal, other than that provided by the manufacturer, is not covered under the warranty.
- C. Complete all metal work in conjunction with roofing and flashings so that a watertight condition exists daily.
- D. Metal shall be installed to provide adequate resistance to bending to allow for normal thermal expansion and contraction.
- E. Metal joints shall be watertight.
- F. Metal flashings shall be securely fastened into solid wood blocking. Fasteners shall penetrate the wood nailer a minimum of 1 inch (25 mm).
- G. Airtight and continuous metal hook strips are required behind metal fascias. Hook strips are to be fastened 12 inches (0.3 m) on center into the wood nailer or masonry wall.
- H. Counter flashings shall overlap base flashings at least 4 inches (100 mm).
- I. Hook strips shall extend past wood nailers over wall surfaces by 1½ inch (38 mm) minimum and shall be securely sealed from air entry.

3.10 CLAD METAL BASE FLASHINGS/EDGE METAL

All flashings shall be installed concurrently with the roof membrane as the job progresses. No temporary flashings shall be allowed without the prior written approval of the University's Representative and the manufacturer. Acceptance shall only be for specific locations on specific dates. If any water is allowed to enter under the newly completed roofing due to incomplete flashings, the affected area shall be removed and replaced at the Contractor's expense.

- A. Clad metal flashings shall be formed and installed per the Detail Drawings.
 - 1. All metal flashings shall be fastened into solid wood nailers with two rows of post galvanized flat head annular ring nails, 4 inches (100 mm) on center staggered. Fasteners shall penetrate the nailer a minimum of 1 inch (25 mm).
 - 2. Metal shall be installed to provide adequate resistance to bending and allow for normal thermal expansion and contraction.
- B. Adjacent sheets of Clad shall be spaced ¼ inch (6 mm) apart. The joint shall be covered with 2 inch (50 mm) wide aluminum tape. A 4 inch minimum (100 mm) wide strip of flashing membrane shall be hot-air welded over the joint.

3.11 WALKWAY INSTALLATION

- A. Tread Walkway: Roofing membrane to receive the Tread Walkway shall be clean and dry. Place chalk lines on deck sheet to indicate location of Walkway. Apply a continuous coat of 2170 adhesive to the deck sheet and the back of Walkway in accordance with manufacturer's technical requirements and press Walkway into place with a water-filled, foam-covered lawn roller. Clean the deck membrane in areas to be welded. Hot-air weld the entire perimeter of the Walkway to the membrane deck sheet. Check all welds with a rounded screwdriver. Re-weld any inconsistencies. **Important:** Check all existing deck membrane seams that are to be covered by Walkway with rounded screwdriver and re-weld any inconsistencies before Walkway installation. Do not run Walkway over Bars.

3.12 TEMPORARY CUT-OFF

All flashings shall be installed concurrently with the roof membrane in order to maintain a watertight condition as the work progresses. All temporary waterstops shall be constructed to provide a 100% watertight seal. The stagger of the insulation joints shall be made even by installing partial panels of insulation. The new membrane shall be carried into the waterstop. The waterstop shall be sealed to the deck and/or substrate so that water will not be allowed to travel under the new or existing roofing. The edge of the membrane shall be sealed in a continuous heavy application of sealant as described in Section 2.10. When work resumes, the contaminated membrane shall be cut out. All sealant, contaminated membrane, insulation fillers, etc. shall be removed from the work area and properly disposed of off site. None of these materials shall be used in the new work.

If inclement weather occurs while a temporary waterstop is in place, the Contractor shall provide the labor necessary to monitor the situation to maintain a watertight condition.

If any water is allowed to enter under the newly-completed roofing, the affected area shall be removed and replaced at the Contractor's expense.

3.13 COMPLETION

Prior to demobilization from the site, the work shall be reviewed by the University's Representative and the Contractor. All defects noted and non-compliances with the Specifications or the recommendations of the manufacturer shall be itemized in a punch list. These items must be corrected immediately by the Contractor to the satisfaction of the University's Representative and the manufacturer prior to demobilization.

END OF SECTION 07542