City of Portland, Maine - Building or Use Permit Application

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

PERMIT ISSUED

Permit No:	Issue Date:	CBL:
03-0504	JUN 2 6 2003	114 D005001

Location of Construction:	Owner Name:	Owner Address:	Phone:
302 Forest Ave	University Of Maine System	107 Maine Ave	207-780-4742
Business Name:	**Contractor Name:**	**Contractor Address:** CITY OF PORTLAND	**Phone**
n/a	Wright Ryan Construction, Inc	10 Danforth Street Portland	2077733625
Lessee/Buyer's Name	**Phone:**	**Permit Type:**	**Zone:**
n/a	n/a	Alterations - Commercial	B2

Past Use:	Proposed Use:	Permit Fee:	Cost of Work:	CEO District:
University of Southern Maine / Library	Library / Additional Library Space; Interior fit-up of floors 5, 6, and 7, also minor renovations on lower floor.	$13,533.00	$1,929,110.00	2

FIRE DEPT: ☑ Approved ☐ Denied

Signature: [signature]

INSPECTION: Use Group: B/A-3 Type: 5B 6/24/03

Signature: [signature]

Proposed Project Description:
Additional Library space on the 5th, 6th and 7th floors; minor renovations on the lower floors.

PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.)

Action: ☐ Approved ☐ Approved w/Conditions ☐ Denied

Signature: Date:

Permit Taken By:	Date Applied For:
gg	05/13/2003

1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal Rules.
2. Building permits do not include plumbing, septic or electrical work.
3. Building permits are void if work is not started within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work..

Zoning Approval

Special Zone or Reviews	Zoning Appeal	Historic Preservation
☐ Shoreland	☐ Variance	☑ Not in District or Landmark
☐ Wetland	☐ Miscellaneous	☐ Does Not Require Review
☐ Flood Zone	☐ Conditional Use	☐ Requires Review
☐ Subdivision	☐ Interpretation	☐ Approved
☐ Site Plan	☐ Approved	☐ Approved w/Conditions
Maj ☐ Min ☐ MM ☐	☐ Denied	☐ Denied
Date: 5/14/03	Date:	Date:

Separate permits are required for any new signage

continued use

#3

CERTIFICATION

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provision of the code(s) applicable to such permit.

SIGNATURE OF APPLICANT | ADDRESS | DATE | PHONE

RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE | DATE | PHONE

PLUMBING APPLICATION

Department of Human Sciences
Division of Health Engineering

PROPERTY ADDRESS

Town or Plantation	Portland Me
Street Subdivision Lot #	22 Forest Ave

PROPERTY OWNERS NAME

Glickman Library - University of Southern Maine

Last: First:

Applicant Name:	Johnson & Jordan
Mailing Address of Owner/Applicant (If Different)	18 Mussey Road Scarborough ME 04074

PORTLAND 8495 TOWN COPY

Date Permit Issued: 6/19/03 $300.00 FEE ☐ If Double Fee Charged

Local Plumbing Inspector Signature [signature] L.P.I. # 0736

2003-8209

Owner/Applicant Statement

I certify that the information submitted is correct to the best of my knowledge and understand that any falsification is reason for the Local Plumbing Inspectors to deny a Permit.

[signature] 6-12-03

Signature of Owner/Applicant Date

Caution: Inspection Required

I have inspected the installation authorized above and found it to be in compliance with the Maine Plumbing Rules.

[signature]

Local Plumbing Inspector Signature Date Approved

PERMIT INFORMATION

This Application is for

1. ☑ NEW PLUMBING
2. ☐ RELOCATED PLUMBING

Type of Structure To Be Served:

1. ☐ SINGLE FAMILY DWELLING
2. ☐ MODULAR OR MOBILE HOME
3. ☐ MULTIPLE FAMILY DWELLING
4. ☑ OTHER – SPECIFY Library

Plumbing To Be Installed By:

1. ☑ MASTER PLUMBER
2. ☐ OIL BURNERMAN
3. ☐ MFG'D. HOUSING DEALER/MECHANIC
4. ☐ PUBLIC UTILITY EMPLOYEE
5. ☐ PROPERTY OWNER

LICENSE # 02460

Hook-Up & Piping Relocation
Maximum of 1 Hook-Up

☐ HOOK-UP: to public sewer in those cases where the connection is not regulated and inspected by the local Sanitary District.

OR

☐ HOOK-UP: to an existing subsurface wastewater disposal system.

☐ PIPING RELOCATION: of sanitary lines, drains, and piping without new fixtures.

OR

☐ TRANSFER FEE [$6.00]

Number	Column 2 Type of Fixture	Number	Column 1 Type of Fixture
	Hosebibb / Sillcock		Bathtub (and Shower)
2	Floor Drain		Shower (Separate)
4	Urinal	17	Sink
3	Drinking Fountain	2	Wash Basin
	Indirect Waste	13	Water Closet (Toilet)
	Water Treatment Softener, Filter, etc.		Clothes Washer
	Grease / Oil Separator		Dish Washer
	Dental Cuspidor		Garbage Disposal
	Bidet		Laundry Tub
	Other:	3	Water Heater
14	Fixtures (Subtotal) Column 2	35	Fixtures (Subtotal) Column 1
		14	Fixtures (Subtotal) Column 2
		49	Total Fixtures
		6.00	Fixture Fee
			Transfer Fee
			Hook-Up & Relocation Fee
		300	Permit Fee (Total)

SEE PERMIT FEE SCHEDULE FOR CALCULATING FEE

CK # 15108

300
10
210

TOWN COPY

389 Congress St.Rm 315
Portland, ME 04101
Phone: (207)874-8700
Fax: (207)874-8716

facsimile transmittal

To: Janet Hansen **From:** Mike Nugent

Fax: 772-1070 **Date:** June 17, 2003

Phone 772-3846 **Pages:** 1

Re: ~~Glickman Library Project (114 d005)~~

☐ Urgent ☐ For Review ☐ Please Comment ☑ Please Reply ☐ Please Recycle

~~I am reviewing the above project and need the following:~~

1) A statement of Special Inspections for the structural infill area of the 6th floor system. 7th Floor -
2) The 6th floor circulation is of concern, as the plan doesn't show how the "General Stacks" area will be organized with regard to exit access. The entire floor seems to be…a challenge, let's talk about it.
3) Does the elevator shaft extent to the basement floor and the underside of the roof sheathing?
4) ~~What is the fire rating of the existing exit stairways?~~
5) What is the roof ceiling assembly rating?

GLICKMAN LIBRARY
UNIVERSITY OF SOUTHERN MAINE
PORTLAND, MAINE

4/11/03

ADDENDUM NO. 3
TO
CONTRACT DRAWINGS AND SPECIFICATIONS
Dated
MARCH 17, 2003

GLICKMAN LIBRARY
UNIVERSITY OF SOUTHERN MAINE
PORTLAND, MAINE

Date of Addendum Issuance: April 11, 2003

The specifications and drawings are amended herein. This addendum consists of 1 text page. These items replace original items previously issued or are to be added to the Bidding and Construction Documents as indicated.

Bidders are required to acknowledge receipt of this addendum on the BID FORM in the space provided. Failure to acknowledge all addenda may cause the bid to be considered not responsive to the invitation, which would require rejection of the Bid.

The Contract Documents for solicitation of Bids for the construction are hereby changed as follows:

PART I – PERTAINING TO THE SPECIFICATIONS:

No changes.

PART II – PERTAINING TO THE DRAWINGS:

No changes.

PART III – QUESTIONS/ANSWERS/INFORMATION RELATING TO THE PROJECT:

General Information

1. The bid opening will be held at USM Glickman Library, 314 Forest Avenue, Room 423/424 at 1:15 p.m. on April 17, 2003. The address to mail or deliver your bids to (as stated on the Proposal Form) has not changed; only the physical location of the bid opening has been changed.

2. An additional (non-mandatory) site walk-through has been scheduled for Tuesday, April 15, 2003 at 1:00 p.m. Meet in the 4th floor elevator lobby of the Library.

END OF ADDENDUM No. 1

WR WRIGHT-RYAN CONSTRUCTION, INC.

TO: Tom Markley
FAX: 874-8716
SUBJECT: Steel inspection / Glickman Library

FROM: Randy Allred
DATE: 3/24/04

This Fax Includes This Sheet Plus 1 Sheet(s)

If you have problems receiving this transmittal, please call us immediately at (207) 773-3625

10 Danforth Street, Portland, Maine 04101 Phone (207) 773-3625 Fax (207) 773-5173

Elite Inspection Services Inc.
220 INDUSTRIAL WAY
PORTLAND, ME. 04103
TELEPHONE (207) 797-2496
FAX (207) 797-2284

FAX INFORMATION

DATE: 3-25-04

TO: Tom Markley

COMPANY:

FAX NUMBER: 874-8716

SENDER: Art Pollard

NUMBER OF PAGES INCLUDING COVER PAGE:

COMMENTS: Here are Reports as Requested
If any questions, Please advise.

Regards
Art Pollard

From: Mike Nugent
To: Tom Markley
Date: Fri, Mar 19, 2004 1:09 PM
Subject: Cobb Ave.

Let's talk about this..The complainant called a bit angry and I'd like to have us meet with owner on site to try to achieve a consistent land use pattern in the neighborhood

From: Tom Markley
To: Mike Nugent
Date: Fri, Mar 19, 2004 3:03 PM
Subject: Re: Cobb Ave.

The complaintant was angry because he did not get his way. I do not think we need to do more at this point and really feel we are going beyond our scope of responsibility in this matter.
>>> Mike Nugent 03/19 1:09 PM >>>
Let's talk about this..The complainant called a bit angry and I'd like to have us meet with owner on site to try to achieve a consistent land use pattern in the neighborhood

SMRT

ARCHITECTURE
ENGINEERING
PLANNING

Fax Transmission

To:	Mike Nugent, City of Portland	**Fax #:**	874-8716
From:	Janet Hansen, AIA	**Date:**	June 18, 2003
Re:	114 d005	**Job #:**	99092
		Job Name:	USM Glickman Library

2 pages, including cover.

REMARKS:

Attached please find my responses to your fax of June 17, 2003. Please call if you have any questions.

Northeast

Mid-Atlantic

Southeast

cc: Dana Gray (fax 780-4538), Randy Allred (fax 773-5173), JLH, SLB, File 99092/22

144 Fore Street
PO Box 618
Portland, Maine 04104
☎ 207 772-3846
207 772-1070
www.smrtinc.com

389 Congress St Rm 315
Portland, ME 04101
Phone: (207)874-8700
Fax: (207)874-8716

facsimile transmittal

To: Janet Hansen | From: Mike Nugent

Fax: 772-1070 | Date: June 17, 2003

Phone 772-3846 | Pages: 1

~~Re: Glickman Library Project (114-d005)~~

☐ Urgent ☐ For Review ☐ Please Comment ☑ Please Reply ☐ Please Recycle

~~I am reviewing the above project and need the following:~~

1) A statement of Special Inspections for the structural infill area of the 6th floor system. — will be submitted in early July
2) The 6th floor circulation is of concern, as the plan doesn't show how the "General Stacks" area will be organized with regard to exit access. The entire floor seems to be…a challenge, let's talk about it. — an additional exit light maybe required due to stack layout.
3) Does the elevator shaft extent to the basement floor and the underside of the roof sheathing? yes
4) ~~What is the fire rating of the existing exit stairways?~~ ~~2 hr. CMU~~
5) What is the roof ceiling assembly rating? — 8" thick +/- concrete (no metal deck)

99092 / 122 SLB, JHH

Routing

Project

Dana Gray
Wright/Ryan

PERMIT ISSUED

JUN 26 2003

PERMIT ISSUED

JUN 26 2003

CITY OF PORTLAND

CITY OF PORTLAND

Form # P 04

DISPLAY THIS CARD ON PRINCIPAL FRONTAGE OF WORK

Please Read Application And Notes, If Any, Attached

CITY OF PORTLAND

BUILDING INSPECTION

PERMIT

Permit Number: 030504

This is to certify that University Of Maine System/Albright Ryan Construction, Inc

has permission to Additional Library space on the 5th, 6th and 7th floors; minor renovations on the lower floors.

AT 302 Forest Ave CBL: 114 D005001

provided that the person or persons, firm or corporation accepting this permit shall comply with all of the provisions of the Statutes of Maine and of the Ordinances of the City of Portland regulating the construction, maintenance and use of buildings and structures, and of the application on file in this department.

Apply to Public Works for street line and grade if nature of work requires such information.

Notification of inspection must be given and written permission procured before this building or part thereof is lathed or otherwise closed-in. 24 HOUR NOTICE IS REQUIRED.

A certificate of occupancy must be procured by owner before this building or part thereof is occupied.

OTHER REQUIRED APPROVALS

Fire Dept. Approved

Health Dept.

Appeal Board

Other

Department Name

6/24/03

Director - Building & Inspection Services

PENALTY FOR REMOVING THIS CARD

City of Portland, Maine - Building or Use Permit

389 Congress Street, 04101 Tel: (207) 874-8703, Fax: (207) 874-8716

Permit No:	Date Applied For:	CBL:
03-0504	05/13/2003	114 D005001

Location of Construction:	Owner Name:	Owner Address:	Phone:
302 Forest Ave	University Of Maine System	107 Maine Ave	207-780-4742
Business Name:	**Contractor Name:**	**Contractor Address:**	**Phone**
n/a	Wright Ryan Construction, Inc	10 Danforth Street Portland	(207) 773-3625
Lessee/Buyer's Name	**Phone:**	**Permit Type:**	
n/a	n/a	Alterations - Commercial	

Proposed Use:	Proposed Project Description:
Library / Additional Library Space; Interior fit-up of floors 5, 6, and 7, also minor renovations on lower floor.	Additional Library space on the 5th, 6th and 7th floors; minor renovations on the lower floors.

Dept: Zoning **Status:** Approved **Reviewer:** Marge Schmuckal **Approval Date:** 05/14/2003

Note:

Ok to Issue: ☑

Dept: Building **Status:** Approved with Conditions **Reviewer:** Mike Nugent **Approval Date:** 06/19/2003

Note:

Ok to Issue: ☑

1) A statement of special inspections must be submitted and approved prior to the fabrication, installation of steel/ Concrete flooring infill area.

Dept: Fire **Status:** Approved with Conditions **Reviewer:** Lt. McDougall **Approval Date:** 05/19/2003

Note:

Ok to Issue: ☑

1) the fire alarm company shall notify Ben Diaz @ 874-8489 for information on masterboxes
2) the sprinkler system and fire alarm system shall be tested in accordance with thier standard and the results submitted to the Portland Fire Department

Comments:

5/14/2003-gg: Wright Ryan construction brout in 11" x 17" , I sent him back and asked for PDF File. The reduced set was much to thick to scan. WAITING FOR PDF. /GG

6/17/2003-mjn: Sent list to Architect for comment.

Completed

CITY OF PORTLAND MAINE
389 Congress St., Rm 315
Portland, ME 04101
Tel. – 207-874-8704
Fax – 207-874-8716

TO: Inspector of Buildings City of Portland, Maine
Planning & Urban Development
Division of Housing & Community Services

FROM DESIGNER: Janet Hansen

DATE: 5/12/03

Job Name: USM Glickman Library

Address of Construction: 314 Forest Avenue

THE BOCA NATIONAL BUILDING CODE/1999 FourteenthEDITION
Construction project was designed according to the building code criteria listed below:

Building Code and Year: BOCA 1999 Use Group Classification(s): A-3

Type of Construction: 1B Bldg. Height: 87' above grade Bldg. Sq. Footage: 105,600 S.F.

Seismic Zone: N/A Group Class: N/A

Roof Snow Load Per Sq. Ft.: N/A Dead Load Per Sq. Ft.: 77 lbs./s.f. at new floor

Basic Wind Speed (mph): N/A Effective Velocity Pressure Per Sq. Ft.: N/A

Floor Live Load Per Sq. Ft.: 150 lbs./s.f. at new floor infill

Structure has full sprinkler system? Yes ✓ No ___ Alarm System? Yes ✓ No ___
Sprinkler & Alarm systems must be installed according to BOCA and NFPA Standards with approval from the Portland Fire Department.

Is structure being considered unlimited area building: Yes X No ___

If mixed use, what subsection of 313 is being considered ___

List Occupant loading for each room or space, designed into this Project.

Codereview is on Coversheet of Construction Documents.

(Designers Stamp & Signature)

LICENSED ARCHITECT ★ JANET L. HANSEN #1991 ★ STATE OF MAINE

PSH 6/07/2K

CITY OF PORTLAND, MAINE
DEVELOPMENT REVIEW APPLICATION
PLANNING DEPARTMENT PROCESSING FORM
Planning Copy

2003-0063
Application I. D. Number

Preble Street Resource
Applicant

03/31/2003
Application Date

331 Cumberland Ave, Portland, ME 04101
Applicant's Mailing Address

Renovations
Project Name/Description

Consultant/Agent

9 - 9 Portland St, Portland, Maine
Address of Proposed Site

Agent Ph: Agent Fax:
Applicant or Agent Daytime Telephone, Fax

033 L004001
Assessor's Reference: Chart-Block-Lot

Proposed Development (check all that apply): ☐ New Building ☑ Building Addition ☐ Change Of Use ☐ Residential ☐ Office ☐ Retail ☐ Manufacturing ☐ Warehouse/Distribution ☐ Parking Lot ☐ Other (specify)

Proposed Building square Feet or # of Units | Acreage of Site | B-3 Zoning

Check Review Required:

☑ Site Plan (major/minor)
☐ Subdivision # of lots
☐ PAD Review
☐ 14-403 Streets Review
☐ Flood Hazard
☐ Shoreland
☐ HistoricPreservation
☐ DEP Local Certification
☐ Zoning Conditional Use (ZBA/PB)
☐ Zoning Variance
☐ Other

Fees Paid: Site Plan $400.00 Subdivision Engineer Review Date 04/03/2003

Planning Approval Status:

Reviewer Kandi Talbot

☑ Approved
☐ Approved w/Conditions See Attached
☐ Denied

Approval Date 05/06/2003 Approval Expiration 05/06/2004 Extension to ☐ Additional Sheets Attached

☑ OK to Issue Building Permit Kandi Talbot (signature) (date)

Performance Guarantee ☐ Required* ☑ Not Required

* No building permit may be issued until a performance guarantee has been submitted as indicated below

☐ Performance Guarantee Accepted — date | amount | expiration date
☐ Inspection Fee Paid — date | amount
☐ Building Permit Issue — date
☐ Performance Guarantee Reduced — date | remaining balance | signature
☐ Temporary Certificate of Occupancy — date | ☐ Conditions (See Attached) | expiration date
☐ Final Inspection — date | signature
☐ Certificate Of Occupancy — date
☐ Performance Guarantee Released — date | signature
☐ Defect Guarantee Submitted — submitted date | amount | expiration date
☐ Defect Guarantee Released — date | signature

CITY OF PORTLAND, MAINE
DEVELOPMENT REVIEW APPLICATION
PLANNING DEPARTMENT PROCESSING FORM
DRC Copy

2003-0063
Application I. D. Number

Preble Street Resource
Applicant

03/31/2003
Application Date

331 Cumberland Ave, Portland, ME 04101
Applicant's Mailing Address

Renovations
Project Name/Description

Consultant/Agent

9 - 9 Portland St, Portland, Maine
Address of Proposed Site

Agent Ph: Agent Fax:
Applicant or Agent Daytime Telephone, Fax

033 L004001
Assessor's Reference: Chart-Block-Lot

Proposed Development (check all that apply): ☐ New Building ☑ Building Addition ☐ Change Of Use ☐ Residential ☐ Office ☐ Retail ☐ Manufacturing ☐ Warehouse/Distribution ☐ Parking Lot ☐ Other (specify)

Proposed Building square Feet or # of Units | Acreage of Site | B-3 Zoning

Check Review Required:

☑ Site Plan (major/minor) ☐ Subdivision # of lots ☐ PAD Review ☐ 14-403 Streets Review
☐ Flood Hazard ☐ Shoreland ☐ HistoricPreservation ☐ DEP Local Certification
☐ Zoning Conditional Use (ZBA/PB) ☐ Zoning Variance ☐ Other

Fees Paid: Site Plan $400.00 Subdivision Engineer Review Date 04/03/2003

DRC Approval Status:

Reviewer Sebago Technic

☑ Approved ☐ Approved w/Conditions See Attached ☐ Denied

Approval Date 05/06/2003 Approval Expiration 05/06/2004 Extension to ☐ Additional Sheets Attached

☑ Condition Compliance Kandi Talbot signature date

Performance Guarantee ☐ Required* ☑ Not Required

* No building permit may be issued until a performance guarantee has been submitted as indicated below

☐ Performance Guarantee Accepted	date	amount	expiration date
☐ Inspection Fee Paid	date	amount	
☐ Building Permit Issue	date		
☐ Performance Guarantee Reduced	date	remaining balance	signature
☐ Temporary Certificate of Occupancy	date	☐ Conditions (See Attached)	expiration date
☐ Final Inspection	date	signature	
☐ Certificate Of Occupancy	date		
☐ Performance Guarantee Released	date	signature	
☐ Defect Guarantee Submitted	submitted date	amount	expiration date
☐ Defect Guarantee Released	date	signature	

All Purpose Building Permit Application

If you or the property owner owes real estate or personal property taxes or user charges on any property within the City, payment arrangements must be made before permits of any kind are accepted.

Location/Address of Construction: Glickman Library - 314 Forest Ave. - Portland, ME

Total Square Footage of Proposed Structure	Square Footage of Lot
Building = 105,600 Sq/Ft Area of Work = 38,232 Sq/Ft	

Tax Assessor's Chart, Block & Lot	Owner:	Telephone:
Chart# 114 Block# D Lot# 5	University of Southern Maine	780-4742

Lessee/Buyer's Name (If Applicable)	Applicant name, address & telephone: 773-3625.	Cost Of Work: $ 1,929,110
	Wright-Ryan Construction 10 Danforth Street Portland, ME 04101	Fee: $ 13,496.77

Current use: Library

If the location is currently vacant, what was prior use: _____

Approximately how long has it been vacant: _____

Proposed use: Additional Library Space

Project description: Interior fit-up of Floors 5, 6, & 7
Minor renovations on Lower Floors

$ 13,503.00
Waiting for POD File

Contractor's name, address & telephone: Wright-Ryan Construction
10 Danforth Street
Portland, ME 04101
773-3625

Who should we contact when the permit is ready: Randy Allred

Mailing address: Same

We will contact you by phone when the permit is ready. You must come in and pick up the permit and review the requirements before starting any work, with a Plan Reviewer. A stop work order will be issued and a $100.00 fee if any work starts before the permit is picked up. PHONE: 773-3625

IF THE REQUIRED INFORMATION IS NOT INCLUDED IN THE SUBMISSIONS THE PERMIT WILL BE AUTOMATICALLY DENIED AT THE DISCRETION OF THE BUILDING/PLANNING DEPARTMENT, WE MAY REQUIRE ADDITIONAL INFORMATION IN ORDER TO APROVE THIS PERMIT.

I hereby certify that I am the Owner of record of the named property, or that the owner of record authorizes the proposed work and that I have been authorized by the owner to make this application as his/her authorized agent. I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in this application is issued, I certify that the Code Official's authorized representative shall have the authority to enter all areas covered by this permit at any reasonable hour to enforce the provisions of the codes applicable to this permit.

Signature of applicant: Randy Allred	Date: 5-13-03

Project Manager - Wright-Ryan

This is NOT a permit, you may not commence ANY work until the permit is issued.
If you are in a Historic District you may be subject to additional permitting and fees with the Planning Department on the 4th floor of City Hall

WR

WRIGHT-RYAN CONSTRUCTION, INCORPORATED

May 13, 2003

City of Portland Maine
Inspector of Buildings
389 Congress Street
Portland, Maine 04101

Re: Cover Letter – Glickman Library Fit-Up

Inspector of Buildings:

The enclosed building permit is for renovation and interior space fit-up of the existing Glickman Library to provide expanded and enhanced operations. The scope of work will include interior fit-up of floors five through seven and incidental renovations on floors one through four. The work on floors one through four involve demo of existing walls to provide door access into an existing elevator shaft for a new elevator. Currently floors five through seven are vacant. It is the intention of this scope of work to replicate similar library space on the top three floors as currently exists on floors one through four. Work includes but is not limited to selective demolition, concrete topping slabs, steel structure and decking, repairs to existing roof membrane, metal stud partitions, insulation, gypsum board walls and ceilings, ceramic tile, acoustical ceilings, resilient flooring, carpeting, custom cabinets and fixtures, carpentry, interior aluminum storefront system, painting, metal doors, wood doors, metal frames, door hardware, toilet partitions and accessories, signage, new passenger elevator, renovations to existing fire protection and detection systems, electrical, and heating, ventilating, and air conditioning.

Submitted for your review is a complete set of construction documents detailing the proposed work. Should you require more information regarding this project, please do not hesitate to call.

Thank you,

Randy Allred
Project Manager

10 Danforth Street, Portland, Maine 04101 Phone (207) 773-3625 Fax (207) 773-5173

CITY OF PORTLAND
ACCESSIBILITY CERTIFICATE

Designer: Janet Hansen

Address of Project 314 Forest Avenue

Nature of Project Interior fit-up of Floors 5, 6 & 7.
Minor renovations on lower floors.

Date 5/12/03

The technical submissions covering the proposed construction work as described above have been have been designed in compliance with applicable referenced standards found in the Maine Human Rights Law and Federal Americans with Disability Act.

(SEAL)

LICENSED ARCHITECT
JANET L. HANSEN
#1831
STATE OF MAINE

Signature Janet L Hansen
Title Principal / Architect
Firm SMRT
Address 144 Fore Street
Portland, Maine 04101
Telephone 207-772-3846
(FAX # 772-1070)

CITY OF PORTLAND
BUILDING CODE CERTIFICATE
389 Congress St., Rm 315
Portland, ME 04101

TO: Inspector of Buildings City of Portland, Maine
Department of Planning & Urban Development
Division of Housing & Community Service

FROM: Janet Hansen

RE: Certificate of Design

DATE: 5/12/03

These plans and/or specifications covering construction work on:

USM Glickman Library

Have been designed and drawn up by the undersigned, a Maine registered architect/engineer according to the BOCA National Building Code/1999 Fourteenth Edition, and local amendments.

(SEAL) LICENSED ARCHITECT JANET L. HANSEN #1991 STATE OF MAINE

Signature Janet L Hansen

Title Architect/Principal

Firm SMRT

Address 144 Fore Street, Portland, ME

As per Maine State Law:

$50,000.00 or more in new construction, repair, expansion, addition, or modification for Building or Structures, shall be prepared by a registered design Professional.

PSH 6/20/2k

GLICKMAN LIBRARY
UNIVERSITY OF SOUTHERN MAINE
PORTLAND, MAINE

3/27/03

ADDENDUM NO. 1
TO
CONTRACT DRAWINGS AND SPECIFICATIONS
Dated
MARCH 17, 2003

GLICKMAN LIBRARY
UNIVERSITY OF SOUTHERN MAINE
PORTLAND, MAINE

Date of Addendum Issuance: March 27, 2003

The specifications and drawings are amended herein. This addendum consists of 2 text pages, and attached Specification Section 00830 – Wage Determination (1 page). These items replace original items previously issued or are to be added to the Bidding and Construction Documents as indicated.

Bidders are required to acknowledge receipt of this addendum on the BID FORM in the space provided. Failure to acknowledge all addenda may cause the bid to be considered not responsive to the invitation, which would require rejection of the Bid.

The Contract Documents for solicitation of Bids for the construction are hereby changed as follows:

PART I – PERTAINING TO THE SPECIFICATIONS:

1. **Specification Section 00800 – SUPPLEMENTARY CONDITIONS**
Revise paragraph 14 to read:

"14. SALVAGE AND DEMOLITION DEBRIS

a. All materials removed from the building as part of this work shall become property of the Contractor unless specific specification section states otherwise.

b. The Contractor is responsible for all recycling and disposal services, containers, transportation etc., for all equipment and materials to be removed as part of this project. In support of sustainable practices, the Contractor is required to recycle all recyclable materials and equipment removed as part of this project. The Contractor is responsible to have all materials sorted as specified below:

1) Metals
2) Wood
3) Corrugated Cardboard
4) Paper
5) Plastics
6) Concrete, gypsum wallboard
7) Fluorescent lamps, ballasts
8) All other materials

The Contractor is responsible for disassembling building components, assemblies into parts that will allow constituent materials to be sorted and recycled. For example, disassemble framed wall sections to separate wood or metal studs from the gypsum wallboard.

The Contractor must provide to USM's project representative documentation (e.g. manifests) as to the final destination, final reuse/recycling disposition and weight of all recycled material prior to final payment. Failure to provide timely recycling and reporting will result in USM's having to assemble the data at the Contractor's expense.

EXCEPTION: For projects where less than 20 cubic yards of demolition and construction debris will be generated, the recycling and/or disposal of this material shall be as specified above but without the need for the detailed segregation specified above.

All materials removed from the building as part of this work shall become property of the Contractor unless specific specification section states otherwise."

2. **Specification Section 00830 – WAGE DETERMINATION**
Replace Section 00830 from Project Manual with attached Wage Determination from the State of Maine Department of Labor.

PART II – PERTAINING TO THE DRAWINGS:

No changes.

PART III – QUESTIONS/ANSWERS/INFORMATION RELATING TO THE PROJECT:

General Information

An additional (non-mandatory) site walk-through has been scheduled for Monday, March 31, 2003 at 1:00 p.m. Meet in the Glickman Library Lobby.

END OF ADDENDUM No. 1

State of Maine
Department of Labor
Bureau of Labor Standards
Technical Services Division
Augusta, Maine 04333-0045
Telephone (207) 624-6445

Wage Determination - In accordance with 26 MRSA §1301 et. seq., this is a determination by the Bureau of Labor Standards, of the fair minimum wage rate to be paid laborers and workers employed on the below titled project.

Title of Project ——- Glickman Library Renovation and Expansion (6-7-76107)

Location of Project – Portland, Maine in Cumberland County

2003 Fair Minimum Wage Rates
Building 2 Cumberland County
(other than 1 or 2 family homes)

Occupation Title	Median Wage	Median Benefit	Total	Occupation Title	Median Wage	Median Benefit	Total
Asbestos Abatement Wrkr	$13.00	$1.61	$14.61	Insulation Installer	$13.50	$1.86	$15.36
Assembler - Metal Bldg	$11.16	$2.10	$13.25	Ironworker - Reinforcing	$11.00	$0.35	$11.35
Backhoe Loader Operator	$13.80	$1.47	$15.37	Ironworker - Structural	$18.04	$2.69	$20.73
Boilermaker	$17.00	$4.16	$21.16	Laborers/Helper/Tender	$10.70	$0.45	$11.15
Bricklayer	$19.00	$0.00	$19.00	Laborer - Skilled	$12.50	$1.70	$14.20
Bulldozer Operator	$13.00	$1.21	$14.21	Loader Op, Front-End	$12.00	$0.75	$12.75
Carpenter	$16.00	$2.03	$18.03	Mechanic - Maintenance	$15.81	$2.87	$18.68
Carpenter - Acoustical	$15.72	$2.75	$18.47	Mechanic - Refrigeration	$17.88	$2.50	$20.38
Carpenter - Rough	$12.50	$0.56	$13.06	Millwright	$17.50	$2.37	$19.87
Cement Mason/Finisher	$13.50	$0.89	$14.39	Oil Burner Serv & Instr	$19.50	$3.50	$23.00
Commun Equip Installer	$13.50	$3.12	$16.62	Painter	$11.60	$0.62	$12.22
Concrete Pump Operator	$17.00	$0.00	$17.00	Paperhanger	$12.00	$0.00	$12.00
Crane Operator <15 Tons	$14.97	$1.75	$16.72	Pipe/Sim/Sprkler Fitter	$18.00	$4.25	$22.25
Dry-Wall Applicator	$17.00	$0.00	$17.00	Plumber (Licensed)	$16.38	$1.64	$18.02
Dry-Wall Taper & Finisher	$18.00	$0.00	$18.00	Plumber Trainee	$13.00	$1.74	$14.74
Electrician	$19.00	$4.62	$23.62	Roofer	$12.90	$1.56	$14.46
Electrician Hlpr (Licensed)	$12.00	$2.32	$14.32	Sheet Metal Worker	$15.00	$2.69	$17.69
Elevator Constructor	$24.97	$10.69	$35.66	Sider	$10.50	$0.00	$10.50
Excavator Operator	$16.54	$3.42	$19.96	Truck Driver - Heavy	$12.60	$2.69	$15.29
Floor Layer	$14.00	$1.75	$15.75	Truck Driver, Tractor Trlr	$12.75	$2.26	$15.01
Glazier	$14.59	$2.76	$17.35	Truck Driver, Mixer, Cemnt	$9.00	$0.00	$9.00

If any specific occupation is not listed in this determination, there has been no fair minimum wage determined by the Bureau of Labor Standards and there will be none in effect for this project.

Welders are classified in the trade to which the welding is incidental.

Apprentices - The minimum wage rate for registered apprentices are those set forth in the standards and policies of the Maine State Apprenticeship and Training Council for approved apprenticeship programs.

Posting of Schedule - Posting of this schedule is required in accordance with 26 MRSA §1301 et. seq., by any contractor holding a State contract for construction valued at $10,000 or more and any subcontractors to such a contractor.

Appeal - Any person affected by the determination of these rates may appeal to the Commissioner of Labor by filing a written notice with the Commissioner stating the specific grounds of the objection within ten (10) days from the filing of these rates with the Secretary of State.

Determination No: B2-046-2003

Filing Date: March 10, 2003

Expiration Date: 12-31-2003

A true copy

Attest: Michael V. Frett
Michael V. Frett
Director
Bureau of Labor Standards

GLICKMAN LIBRARY
UNIVERSITY OF SOUTHERN MAINE
PORTLAND, MAINE

4/15/03

ADDENDUM NO. 4
TO
CONTRACT DRAWINGS AND SPECIFICATIONS
Dated
MARCH 17, 2003

GLICKMAN LIBRARY
UNIVERSITY OF SOUTHERN MAINE
PORTLAND, MAINE

Date of Addendum Issuance: April 15, 2003

The specifications and drawings are amended herein. This addendum consists of 2 text pages and sketches ADD-4 A-1 through A-3.. These items replace original items previously issued or are to be added to the Bidding and Construction Documents as indicated.

Bidders are required to acknowledge receipt of this addendum on the BID FORM in the space provided. Failure to acknowledge all addenda may cause the bid to be considered not responsive to the invitation, which would require rejection of the Bid.

The Contract Documents for solicitation of Bids for the construction are hereby changed as follows:

PART I – PERTAINING TO THE SPECIFICATIONS:

No changes.

PART II – PERTAINING TO THE DRAWINGS:

1. **Drawing AE601 – ROOM FINISH SCHEDULE**
   Delete the following finish schedules: Second Floor, Third Floor and Fourth Floor.
   Replace with finish schedules on attached Sketches ADD-4, A-1, A-2 and A-3.

PART III – QUESTIONS/ANSWERS/INFORMATION RELATING TO THE PROJECT:

General Information

1. **The bid date for General Contractors will be extended to Tuesday, April 22, 2003 at 1:00 pm.**

2. The address for hand deliveries of bids is USM Facilities Management Office, 25 Bedford Street, Portland, Maine. The address in the Notice to Contractors – Long Form (Advertisement) for Bids is the mailing address.

3. The Bid Opening will be at 1:15 PM at the Glickman Family Library, 314 Forest Avenue, Portland, Maine. All interested parties should meet in the 4th Floor Elevator Lobby.

GLICKMAN LIBRARY
UNIVERSITY OF SOUTHERN MAINE
PORTLAND, MAINE

4/15/03

4. **Delete** the following sentence from the second page of the Notice to Contractors – Long Form (Advertisement): "There will be no work performed during the week of June 16, 2003."
Replace with the following sentence: "Work may now be performed during the week of June 16, 2003."

END OF ADDENDUM No. 4

THIRD FLOOR ROOM FINISH SCHEDULE

ROOM NUMBER	ROOM NAME	FLOOR	BASE	WALLS NORTH	WALLS SOUTH	WALLS EAST	WALLS WEST	CEILING MATERIAL	CEILING HEIGHT	ROOM NUMBER	REMARKS
301	STAIR A	KEYNOTE 0	KEYNOTE 0	KEYNOTE 0	KEYNOTE 0	KEYNOTE 0	KEYNOTE 0	KEYNOTE 0	EXIST	301	
302	STAIR B	KEYNOTE 0	KEYNOTE 0	KEYNOTE 0	KEYNOTE 0	KEYNOTE 0	KEYNOTE 0	KEYNOTE 0	EXIST	302	
303	WOMENS' ROOM	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	303	
304	MENS' ROOM	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	304	
305	CORRIDOR	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	305	* NEW THRESHOLD @ ELEVATORS (WIDTH OF JAMB)
306	ELEVATOR LOBBY	EXIST *	EXIST	KEYNOTE 0	------	------	------	EXIST	EXIST	306	
307	ELEC.	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	307	
308	MECHANICAL	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	308	
309	JANITOR	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	309	
311	FREIGHT ELEV. LOBBY	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	311	
312	SERIALS DESK	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXP	312	
313	TOILETS	EXIST	(KEYNOTE 3)	EXIST	EXIST	PAINT	EXIST	KEYNOTE 2	EXP	313	
314	STAIRS	EXIST	KEYNOTE 3	EXIST	EXIST	EXIST	PAINT	KEYNOTE 2	EXP	314/B	
315	VESTIBULE	EXIST	KEYNOTE 3	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	315	
316	MAINE PHILANTHROPY CTR.	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	316	
324	CURRENT ISSUES READING	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	324	
326	SERIALS OFFICE	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	326	
327	ASST. HEAD OFFICE	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	327	
335	GENERAL STACKS	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	335	
335A	OVERSIZED BOOKS	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	335A	
336	GENERAL STACKS	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	336	
337	BACK PERIODICALS	EXIST	EXIST	------	EXIST	EXIST	EXIST	EXIST	EXIST	337	

SMRT

ARCHITECTURE ENGINEERING PLANNING

SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT: ALBERT BRENNER GLICKMAN FAMILY LIBRARY

SUBJECT: THIRD FLOOR ROOM FINISH SCHEDULE REVISIONS AS NOTED

SCALE:	NO SCALE
CAD FILE:	AE601-99092
PROJECT No.	99092
REF. SHEET:	AE601
PM: SLB	ADDENDUM No. ADD-4
A/E: JLH	SKETCH No. A-2
DATE: 4-14-03	

FOURTH FLOOR ROOM FINISH SCHEDULE

ROOM NUMBER	ROOM NAME	FLOOR	BASE	WALLS				CEILING		ROOM NUMBER	REMARKS
				NORTH	SOUTH	EAST	WEST	MATERIAL	HEIGHT		
401	STAIR A	KEYNOTE 6	KEYNOTE 6	KEYNOTE 6	KEYNOTE 6	KEYNOTE 6	KEYNOTE 6	KEYNOTE 6	EXIST	401	
402	STAIR B	KEYNOTE 6	KEYNOTE 6	KEYNOTE 6	KEYNOTE 6	KEYNOTE 6	KEYNOTE 6	KEYNOTE 6	EXIST	402	
403	WOMENS' ROOM	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	PAINT GWB	MATCH EXIST	403	
404	MENS' ROOM	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	PAINT GWB	MATCH EXIST	404	
406	ELEVATOR LOBBY	EXIST	EXIST	KEYNOTE 9	EXIST	EXIST	EXIST	EXIST	EXIST	406	• NEW THRESHOLD @ ELEVATORS (WIDTH OF JAMB)
407	ELEC.	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	407	
408	MECHANICAL	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	408	
409	JANITOR	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	409	
411	FREIGHT ELEV. LOBBY	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	411	
412	CORRIDOR	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	412	
412A	CORRIDOR	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	412A	
414	KITCHENETTE	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	414	
416	LAV.	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	416	
417	LAV.	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	417	
418	CORRIDOR	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	418	
419	COMM.	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	419	
419A	VESTIBULE	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	419A	
421	GENERAL STACKS	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	421	
422	GENERAL STACKS	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	422	
423	MULTI-PURPOSE ROOM	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	423	
424	MULTI-PURPOSE ROOM	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	424	
426	LIBRARIAN OFFICE	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	426	
427	RECEPTION / STAFF	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	427	
428	ASSOC. LIBRARIAN OFFICE	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	428	
429	CONFERENCE	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	429	
431	CORRIDOR	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	431	
432	STORAGE	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	432	
433	STORAGE	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	EXIST	433	

SMRH

ARCHITECTURE ENGINEERING PLANNING

SMRT
144 Fore Street/P.O. Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT: ALBERT BRENNER GLICKMAN FAMILY LIBRARY

SUBJECT: FOURTH FLOOR ROOM FINISH SCHEDULE REVISIONS AS NOTED

SCALE: NO SCALE
CAD FILE: AE601-99092
PROJECT No. 99092
REF. SHEET: AE601
PM: SLB
A/E: JLH
DATE: 4-14-03
ADDENDUM No. ADD-4
SHEET No. A-3

ADDENDUM NO. 2
TO
CONTRACT DRAWINGS AND SPECIFICATIONS
Dated
MARCH 17, 2003

GLICKMAN LIBRARY
UNIVERSITY OF SOUTHERN MAINE
PORTLAND, MAINE

Date of Addendum Issuance: April 7, 2003

The specifications and drawings are amended herein. This addendum consists of 12 text pages, plus sketches ADD-2 A-1 through A-3, M-1 through M-5 and P-1 through P-11, full size drawings MP651 and PL105, and attached specification sections 13925 (4 pages) and 15950 (29 pages). These items replace original items previously issued or are to be added to the Bidding and Construction Documents as indicated.

Bidders are required to acknowledge receipt of this addendum on the BID FORM in the space provided. Failure to acknowledge all addenda may cause the bid to be considered not responsive to the invitation, which would require rejection of the Bid.

The Contract Documents for solicitation of Bids for the construction are hereby changed as follows:

PART I – PERTAINING TO THE SPECIFICATIONS:

1. **Specification Section 01400 – QUALITY REQUIREMENTS**

   a. Add to Article 1.2 the following paragraph D:
   "D. **Scheduling, documentation and reporting of all testing, inspection, and start-up activities shall be coordinated with the Owner.**"

   b. Revise the third sentence of Article 1.7, paragraph I. to read:
   "Submit schedule within 30 days of date established for commencement of the Work **for review and approval of the Architect and Owner.**"

2. **Specification Section 13910 – FIRE PROTECTION BASIC MATERIALS AND METHODS**
   a. Add to Article 2.03 the following paragraph H.:
   "H. **Seismic Bracing: Provide sway bracing on the sixth floor pre-action system per NFPA-13 requirements. C-type beam attachments for this system to include retaining straps.**
      1. **Seismic Performance Category: C.**
      2. **Seismic Hazard Exposure Group: II.**"

b. Add to Article 3.01, Paragraph A, the following subparagraphs 1. and 2.:
"1. **Completely remove the sprinkler system in the area shaded on Drawing FP106. Cap and otherwise modify remaining portions of the sixth floor system to maintain integrity.**
2. **Preaction piping on the sixth floor to be completely new.**"

c. Add the following Article 3.02:

"3.02 PIPING APPLICATIONS

A. **Piping 2-1/2-inches and larger: Schedule 10 black steel with rolled groove couplings.**

1. **Threadable lightwall not allowed.**

B. **Piping up to 2 inches: Schedule 40 black steel with threaded fittings.**"

3. **Specification Section 13925 – FIRE SUPPRESSION SPRINKLERS**
Replace section in its entirety with attached Section 13925.

4. **Specification Section 15000 – BASIC MECHANICAL REQUIREMENTS**
a. Add the following Article 1.00:

"1.00 GENERAL
A. **Testing and balancing of the HVAC system (Section 15950 – 'Testing, Adjusting and Balancing') will be the responsibility of the General Contractor.**
1. **See Section 01400 – 'Quality Requirements.'"**

b. Delete paragraph B of Article 1.14 in its entirety.

c. Revise Article 1.16 to read:

"1.16 ENERGY EFFICIENCY

A. All equipment shall meet the minimum energy efficient design standards as established in ASHRAE/IES standard 90.1-**1999.**
B. All equipment shall have minimum efficiency as described in paragraph 10.4.1 of Standard 90.1-**1999.** All equipment suppliers must be aware of the requirements and submitted equipment shall meet these minimum requirements."

d. Add the following Article 1.19:

"1.19 SEISMIC BRACING

A. **General: Provide seismic bracing on new Mechanical equipment installations. Additionally, provide bracing on new piping and ductwork installations on floors 5,6 and 7. Bracing to be per BOCA 1999.**

1. **Seismic Performance Category: C.**
2. **Seismic Hazard Exposure Group: II.**"

5. Specification Section 15145 – PLUMBING PIPING

a. **Delete** paragraph B. of Article 2.01 in its entirety.

b. **Add** the following Article 2.11:

"2.11 ACCEPTABLE MANUFACTURERS

A. Valves: Apollo, Stockham, Watts, Grinnell.
B. Hangers and Supports: B-Line, Carpenter & Patterson, Grinnell."

c. **Add** the following Article 3.02:

"3.02 TESTING & CLEANING

A. General: Test and clean new and modified portions of the existing systems per the requirements of the Plumbing Official(s). In the absence of such direction, perform the following:
1. Make corrections and retest as necessary until satisfactory results are obtained.

B. Fuel Gas Piping Systems: Per NFPA 54.

C. Drainage, Waste & Vent Piping Systems: Plug piping outlets and/or connections to new work. Test piping to 10-foot head of water for a period of 2-hours. Water level shall not drop.

D. Domestic Water Piping Systems:

1. Testing: Pressure test to 150 psig for a period of 2-hours. Pressure shall not drop.
2. Cleaning: Flush with potable water. Fill system(s) with a water/chlorine solution, (200 ppm chlorine) and allow to stand for 3-hours. Thoroughly flush chlorine from system using potable water."

6. Specification Section 15146 – PLUMBING SPECIALTIES

a. **Add** to Article 1.01 the following paragraph D.:
"D. Electric Water Heaters."

b. **Add** to Article 2.01 the following paragraphs B. and C.:

"B. Floor Drain (FD-2):
1. ASME A112.21.1M; lacquered cast iron two piece body with double drainage flange, weep holes, reversible clamping collar, sediment bucket, and round, adjustable nickel-bronze strainer.

C. Acceptable manufacturers: Zurn, J. R. Smith, Wade, Watts."

c. Add the following Article 2.04:

"2.04 ELECTRIC WATER HEATERS

A. General: Heaters to be: commercial grade, glass-lined, with safety controls. Elevated units to include galvanized steel drain pans and piped indirect waste.
B. Include thermostatic mixing valve in heater discharge.
C. Acceptable manufacturers: Rheem/Ruud, State, Lochinvar, A.O. Smith.
D. Warrantee: Heater to include a minimum 5-year warrantee."

7. Specification Section 15182 – HYDRONIC PIPING

a. Add the following Article 2.08:

"2.08 ACCEPTABLE MANUFACTURERS

A. Valves: Apollo, Stockham, Watts, Grinnell
Hangers and Supports: B-Line, Carpenter & Patterson, Grinnell."

b. Add the following Article 3.02:

"3.02 TESTING

A. General: Test new and modified portions of the existing systems per the requirements of the Plumbing Official(s). In the absence of such direction, perform the following:
1. Make corrections and retest as necessary until satisfactory results are obtained.

B. Hydronic Piping Systems:

1. Testing: Pressure test to 150 psig for a period of 2-hours. Pressure shall not drop.

8. Specification Section 15183 – HYDRONIC SPECIALTIES

a. Delete Article 2.01, EXPANSION TANKS, in its entirety.

b. Add the following Article 2.10:

"2.10 ACCEPTABLE MANUFACTURERS

A. Expansion Tank: Taco, Armstrong, Bell & Gossett.
Specialties: Taco, Bell & Gossett, Watts, Armstrong."

9. **Specification Section 15188 – HVAC PUMPS**

Add the following Article 2.04:

"2.04 ACCEPTABLE MANUFACTURERS

A. **HVAC pumps: Taco, Armstrong, Bell & Gossett, Gould, Paco."**

10. **Specification Section 15410 – PLUMBING FIXTURES**

a. Add to Article 2.03, paragraph E., the following subparagraph 4.:
"4. **Safety Covers: Include safety covers per Section 15083."**

b. Revise Article 2.04, paragraph A.1.b. to read:
"b. Accessories: Chrome plated 17 gage (1.3 mm) brass P-trap with clean-out plug and offset arm with escutcheon, wheel handle stop, rigid supplies."

c. Add to Article 2.04, paragraph A.1. the following paragraph d.:
"d. **Safety Covers: Include safety covers per Section 15083."**

d. Add the following Article 2.07:

"2.07 ACCEPTABLE ALTERNATE MANUFACTURERS

A. **Vitreous China & Enameled Cast Iron Fixtures: American-Standard, Kohler, Crane.**
B. **Stainless Steel Sinks: Elkay, Just, Kindred.**
C. **Cast Brass Faucets: Chicago, T&S Brass, Speakman."**

e. Add to Article 3.01 the following paragraph F.:

"F. **Install accessible fixtures per ADA requirements.**

1. **Water Closets: Where indicated as accessible on the Architectural drawings.**
2. **Urinals: All occurrences.**
3. **Lavatories: All occurrences.**
4. **Double-bowl Sinks: All occurrences."**

11. **Specification Section 15514 – FINNED WATER-TUBE BOILERS**

a. Add to Article 3.02 the following paragraphs B. through I.:

"B. **Engage a factory-authorized service representative to test, inspect, and adjust boiler components and equipment installation and to perform startup service.**
C. **Perform installation and startup checks according to manufacturer's written instructions.**

D. Leak Test: Hydrostatic test. Repair leaks and retest until no leaks exist.
E. Operational Test: Start units to confirm proper motor rotation and unit operation. Adjust air-fuel ratio and combustion.

F. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

G. Adjust initial temperature set points.

H. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

I. Prepare written report that documents testing procedures and results.

12. Specification Section 15622 – AIR COOLED WATER CHILLERS

a. Add the following Article 2.05:

"2.05 ACCEPTABLE MANUFACTURERS

A. Air Cooled Chillers: York, Trane, Carrier, McQuay."

b. Add the following Article 3.02:

"3.02 STARTUP & TESTING

A. Engage a factory-authorized service representative to test, inspect, and adjust chiller components and equipment installation and to perform startup service.

B. Perform installation and startup checks according to manufacturer's written instructions.

C. Leak Test: Hydrostatic test. Repair leaks and retest until no leaks exist.

D. Operational Test: Start units to confirm proper motor rotation and unit operation.

E. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

F. Adjust initial temperature set points.

G. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

H. Prepare written report that documents testing procedures and results."

13. Specification Section 15720 – AIR HANDLING UNITS

a. Revise Article 2.03, paragraph A. to read:

"A. Type: Forward curved, single width, single inlet, centrifugal type fan. **Vibration isolation between the fan and the casing will be internal to the fan section."**

b. Add the following Article 2.07:

"2.07 ACCEPTABLE MANUFACTURERS

A. Air Handling Units: Trane, McQuay, York, Carrier."

c. Add the following Article 3.02:

" 3.02 STARTUP & TESTING

A. Engage a factory-authorized service representative to test, inspect, and adjust air handling components and equipment installation and to perform startup service.

B. Perform installation and startup checks according to manufacturer's written instructions.

C. Air and Water Leak Tests: Hydrostatic test. Repair leaks and retest until no leaks exist. Examine casing for any air leakage and correct.

D. Operational Test: Start units to confirm proper motor rotation and unit operation.

E. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

F. Adjust initial airflow set points.

G. Set field-adjustable switches and circuit-breaker trip ranges as indicated.

H. Prepare written report that documents testing procedures and results."

14. **Specification Section 15755 – STEAM HUMIDIFIERS**

Revise Article 2.01, paragraph A. to read:

"A. Nortec Industries. Inc.; Model NHMC, **or equivalent as manufactured by Herrmidifier, Electro-Steam Generator, Pure Humidifier."**

15. **Specification Section 15762 – TERMINAL HEAT TRANSFER UNITS**

Revise Article 2.01, paragraph A.1. to read:

"1. Sterling Corporation; Model VB-PM-C143 **or equivalent as manufactured by Trane, Vulcan, Slant-fin."**

16. **Specification Section 15810 – DUCTS**

a. **Delete** paragraph B. of Article 2.01 in its entirety.

b. **Revise** Article 3.01, paragraph C. to read:
"C. Install and seal metal and flexible ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible - **to a Class "B" level."**

17. **Specification Section 15833 – CENTRIFUGAL FANS**

Delete Specification Section 15833 in its entirety.

18. **Specification Section 15840 – AIR TERMINAL UNITS**

Add the following Article 2.03:

"2.03 ACCEPTABLE MANUFACTURERS

A. **VAV Boxes as scheduled or by Anemostat, Price or Enviro-Tec."**

19. **Specification Section 15926 – ENERGY MANAGEMENT AND CONTROL SYSTEM**

a. **Delete** Article 1.2 in its entirety.

b. **Revise** Article 1.5, paragraph C. to read:

"C. ADD ALTERNATE #7 – **Add alternate** #7 will remove the existing Pneumatic/DDC Honeywell controls on AHU-1B, 2, 3 and 4 and replace them with controls as described for AHU-5, 6A, 6B and 7 above. See the points lists in paragraph 3.22."

c. **Revise** Article 3.22, paragraph B. to read:

"B. ADD ALTERNATE #7: See Appendix A (at end of Section)."

20. **Specification Section 15940 – HVAC SEQUENCE OF OPERATION**

a. **Revise** Article 1.01, paragraph B. to read:

"B. All new air handling systems will be controlled by the new DDC system. The existing Honeywell control system will be retained for systems AHU-1B, AHU-2, AHU-3, and AHU-4 unless Bid Alternate #7 is accepted, when the existing controls will be changed to new DDC. **At present ACCH-2 and its associated pumps are controlled by an independent Delta DDC BACNET control system. This system will be the core of the new control system for the upper floors (5,6 & 7)."**

b. **Revise** Article 3.03, paragraph B.3.b. to read:

"b. **Duct-mounted** Smoke Detector: Stop fans, close outside air dampers, and signal alarm."

c. **Revise** Article 3.03, paragraph C. to read:

"C. Air Handling Units: AHU-5, AHU-6 (**AHU-6A & AHU-B if Add Alternate #4**) and AHU-7 (Variable Air Volume)."

d. **Revise** Article 3.03, paragraph C.6. to read:

"6. Exhaust Fan Speed Control: Exhaust fan VFD speed shall be modulated so that exhaust air cfm equals outside air cfm minus exhaust and pressurization, and building pressure on the fifth and seventh floors is maintained constant. **The contractor shall use AFMS or building pressure sensors to achieve this setpoint.**"

e. **Delete** the last sentence of Article 3.03, paragraph D.8. so the paragraph reads:

"8. In-Duct Heating Coils: The space temperature sensor in each zone will modulate the duct coil control valve to satisfy zone requirements."

f. **Delete** "AND CONVECTORS" from Article 3.05 heading so that it reads:

"3.05 RADIATION"

21. **Specification Section 15950 – TESTING, ADJUSTING AND BALANCING**

Replace section in its entirety with attached Section 15950.

PART II – PERTAINING TO THE DRAWINGS:

1. **Drawing M-501 – DETAILS**
   a. **Add** Detail A-1 showing in-line pump detail as indicated on Sketch ADD-2, M-1.
   b. **Clarify** new and existing pump base components and change MPV to flowcheck in Detail M8 as indicated in Sketch ADD-2, M-2.

2. **Drawing M-601 – SCHEDULES**
   a. **Clarify** Notes 2 & 3 of Pump Schedule as indicated on Sketch ADD-2, M-3.
   b. **Add** Note 4 to Air Handling Unit Schedule to clarify Add Alternate #4, as indicated on Sketch ADD-2, M-4.

3. **Drawing M-602 – SCHEDULES**
   Add Notes 5 & 6 to Humidifier Schedule to add water quenching and to clarify Add Alternate #4, as indicated on Sketch ADD-2, M-5.

4. **Drawing PL100 – BASEMENT PLUMBING PLAN**
   a. **Change** sanitary line from 2" to 4" to reduce slope to 1/8"/foot, as indicated on Sketch ADD-2, P-1.
   b. **Clarify** natural gas piping around gas booster(s) to indicate new and existing, as indicated on Sketch ADD-2, P-2.

5. **Drawing PL106 – SIXTH FLOOR PLUMBING PLAN**
   Add sanitary vents to floor drains as indicated on Sketch ADD-2, P-3.

6. **Drawing PL107 – SEVENTH FLOOR PLUMBING PLAN**
   Add sanitary vent to floor drain and add note concerning gas train vents as indicated on Sketch ADD-2, P-4.

7. **Drawing PL401 – DOMESTIC WATER & SANITARY/VENT PART PLANS**
   a. **Add** sanitary vents to floor drains @ fifth floor as indicated on Sketch ADD-2, P-5.
   b. **Add** sanitary vents to floor drains @ sixth floor as indicated on Sketch ADD-2, P-6.
   c. **Add** sanitary vents to floor drains @ seventh floor and **delete** sanitary from relocated drinking fountain as indicated on Sketch ADD-2, P-7.
   d. **Delete** water line to relocated drinking fountain as shown on Sketch ADD-2, P-8.

8. **Drawing PL601 – SCHEDULES & DETAILS**
   a. **Add** water quencher to humidifier drain line as shown on Sketch ADD-2, P-9.
   b. **Add** details for mixing valve and drain pan as shown on Sketch ADD-2, P-10.
   c. **Add** Note 2 to P-6 of Plumbing Fixture Schedule to clarify sink drain location as shown on Sketch ADD-2, P-11.

PART III – QUESTIONS/ANSWERS/INFORMATION RELATING TO THE PROJECT:
These items provide supplemental information to the Construction Documents.
The following are questions, and their answers, submitted by Bid Question/Clarification Request Form.

Question #1: I need the following information with reference to the enclosure panels referenced in Floor Plan Note #5 on drawings AE100 through AE107:
- Specifications outlining material, thickness, paint system, type of fasteners, etc.
- Details and cross sections with dimensions
- Locations – I need the ability to quantify
- Do these panels apply to window sills and heads?

Answer #1: Reference attached Details shown in Sketches ADD-2, A-1 and A-2.

Question #2: Reference Drawing AD105: There are rectangular objects shown on column lines B, C, D, E and F between column lines 3 and 4. The objects are also shown on AE105, A112. What are they?

Answer #2: The items are existing concrete walls.

Questions #3: Drawing AE 502, Detail F10 states in part:
1. "New mortar parging/leveling @ sill, head & jambs as required for level surface."
Please provide all locations of the areas requiring parging and/or leveling in order that we may quantify.
2. "New conc. topping slab, re: struct."
Structural drawings do not indicate which floor areas are to receive topping or the thickness of the topping. Please provide.

Answer #3: Reference attached Detail shown in Sketch ADD-2, A-3.

Question #4: General Note # 13 on Drawing GI002 states:
"13. GC is to patch and repair all existing damaged or incomplete surfaces. These surfaces to include but not be limited to CMU walls, roof/floor deck, window sills/jambs/heads, etc. Re: all other drawings in this set for additional information on these areas."
Please provide all locations of these "existing damaged or incomplete surfaces" in order that we may quantify these repairs.

Answer #4: On the fifth, sixth and seventh floors, the existing concrete walls, concrete ceilings/roof deck and concrete @ exterior windows need to be patched, parged and repaired to the level of finish found at the existing 4th floor. This was discussed at the walk-through.

Question #5: Reference Specification Section 12494:
Paragraph 2.1 A. – Sheerweave material? B. 12 oz. fiberglass?
We're not sure which windows are to receive shades, and also which type of shade is to be used at each window. On dual shades – are both shades on each window to be motorized? Where do motorized shades go? Are the electricians responsible for all the electrical work to set up and function the motorized window treatment plus running wires through walls to switches & motors?

Answer #5: Reference Sheet AE107 – Delete Keynote 20 at windows in Special Events 717. Add Keynote 21: Provide motorized dual shades with room darkening and black-out shades. Reference Specification Section 12494 and Sheet EP107.

Question #6: Reference Specification Section 03300, Paragraph 2.4 B.1:
Nominal maximum size aggregate is specified as 3/4". Would 3/8" aggregate be acceptable?

Answer #6: Yes.

Question #7: Reference Specification Section 03300, Paragraph 2.10 D.3. & D.4:
Slump is specified as 4" or 8" with high range water reducer. Instead of a high-range water reducer could we use a Type A mid-range water reducer and raise the slump to 7"?

Answer #7: Yes.

Question #8: Reference Specification Section 16000 and Drawing EP651, Detail A1: Please advise MDP and EMDP breaker manufacturer and type.

Answer #8: MDP – Square D, 65,000 AIC
EMDP – Square D, 25,000 AIC

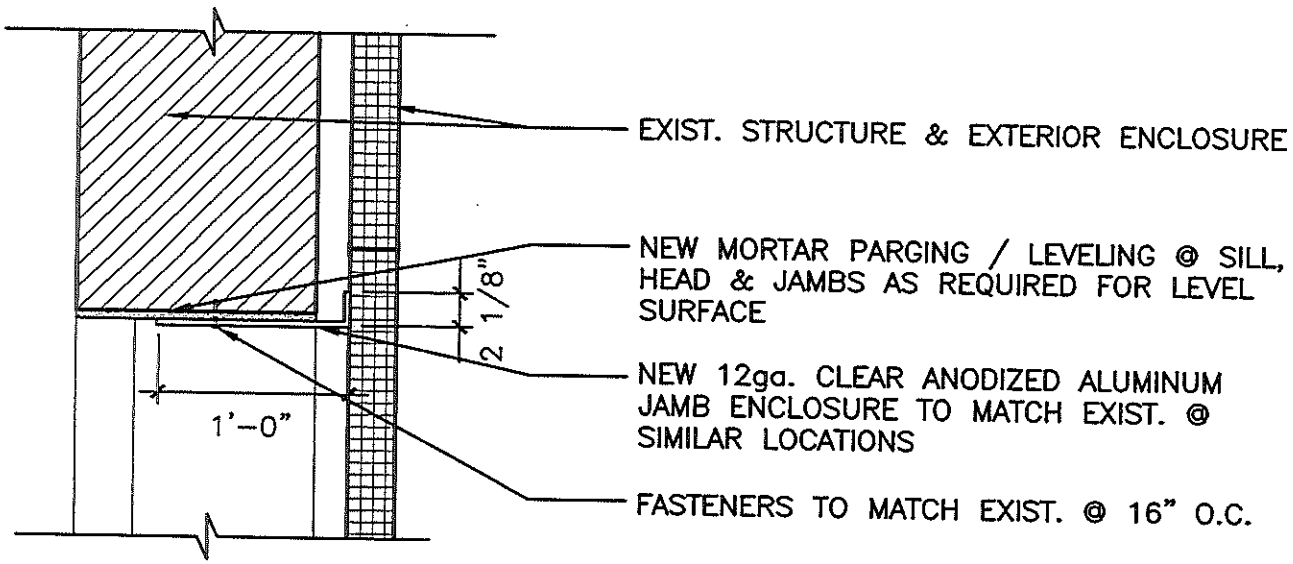
Question #9:
a. What is the CMP allowance that we are to carry?
b. What manufacturer is the existing switch gear?
c. What is the purpose of the new 1000 KVA pad mount?
d. What does retrofit mean in Alternate 3?
e. Who is to do the tel data cabling? Will this be bid at a later time?

Answer #9:
a. No CMP allowance is required.
b. Square D.
c. Increased load of library.
d. The only lighting to be re-circuited is shown on EL101 through EL104.
e. Tel/data cabling will be done by Owner.

General Information

1. The CMP advisor for this project is Chris Bond, phone no. 828-2854.
2. The louvers which are noted on Sheets AD105 and AD106 are part of the Kalwall system. Kalwall will need to be involved in their removal to maintain warranty on the curtain wall.

END OF ADDENDUM No. 2



F5	WINDOW JAMB DETAIL
1" = 1'-0"	AE105, AE106, AE107

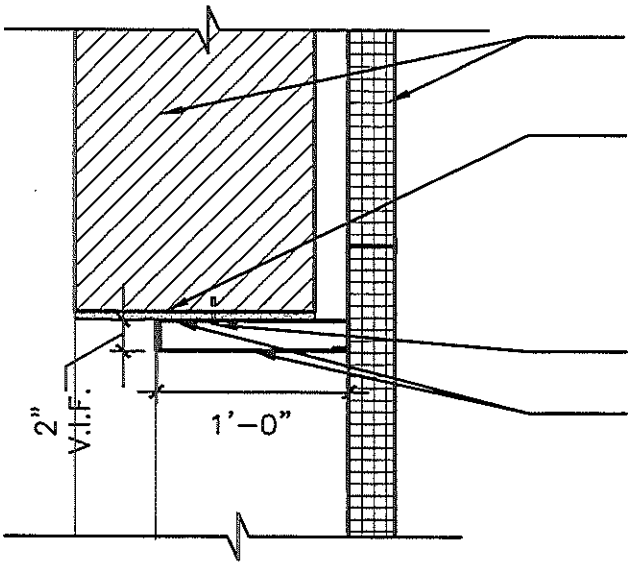
SMRT

ARCHITECTURE ENGINEERING PLANNING

SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT:	ALBERT BRENNER GLICKMAN FAMILY LIBRARY
SUBJECT:	NEW DETAIL F5/AE502 EXTERIOR WINDOW JAMB DETAIL

SCALE:	1"=1'-0"
CAD FILE:	AE502-99092
PROJECT No.	99092
REF. SHEET:	AE502
PM: SLB	ADDENDUM No. ADD-2
A/E: JLH	SKETCH No. A-1
DATE04-04-03	



EXIST. STRUCTURE & EXTERIOR ENCLOSURE

NEW MORTAR PARGING / LEVELING @ SILL, HEAD & JAMBS AS REQUIRED FOR LEVEL SURFACE

FASTENERS TO MATCH EXIST. @ 16" O.C.

NEW ALUMINUM HEAD ENCLOSURE SUPPORT FOR NEW ALUMINUM HEAD ENCLOSURE TO MATCH EXIST. @ 5TH & 6TH FLOOR. ENCLOSURE TO BE RIVETED TO SUPPORT PIECE. RIVETS TO MATCH ENCLOSURE FINISH / COLOR.

(NOTE: NEW HEAD ASSEMBLY REQ. @ 7TH FLOOR ONLY)

F1	WINDOW HEAD DETAIL
1" = 1'–0"	AE107

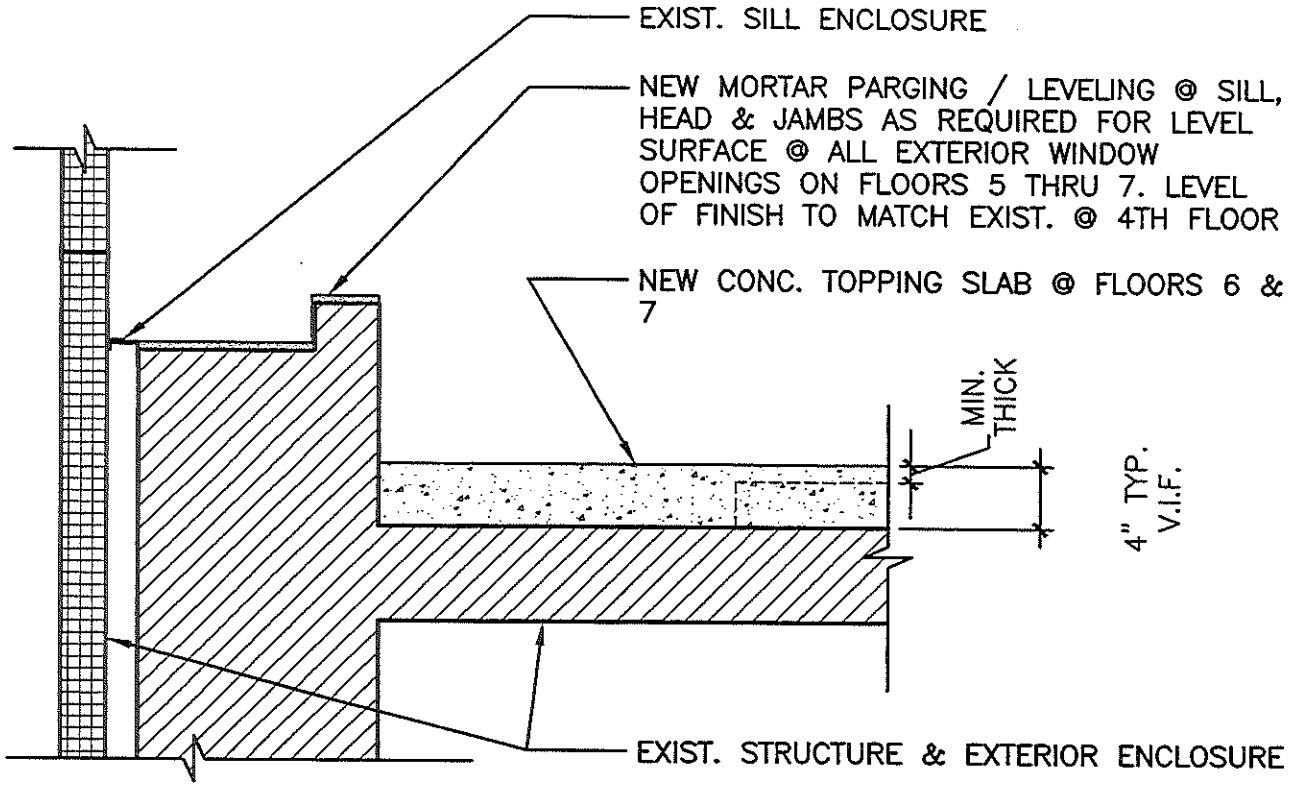
SMRT

ARCHITECTURE ENGINEERING PLANNING

SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT:	ALBERT BRENNER GLICKMAN FAMILY LIBRARY
SUBJECT:	NEW DETAIL F1/AE502 EXTERIOR WINDOW HEAD DETAIL

SCALE:	1"=1'–0"
CAD FILE:	AE502–99092
PROJECT No.	99092
REF. SHEET:	AE502
PM: SLB	ADDENDUM No. ADD–2
A/E: JLH	SKETCH No. A–2
DATE04–04–03	



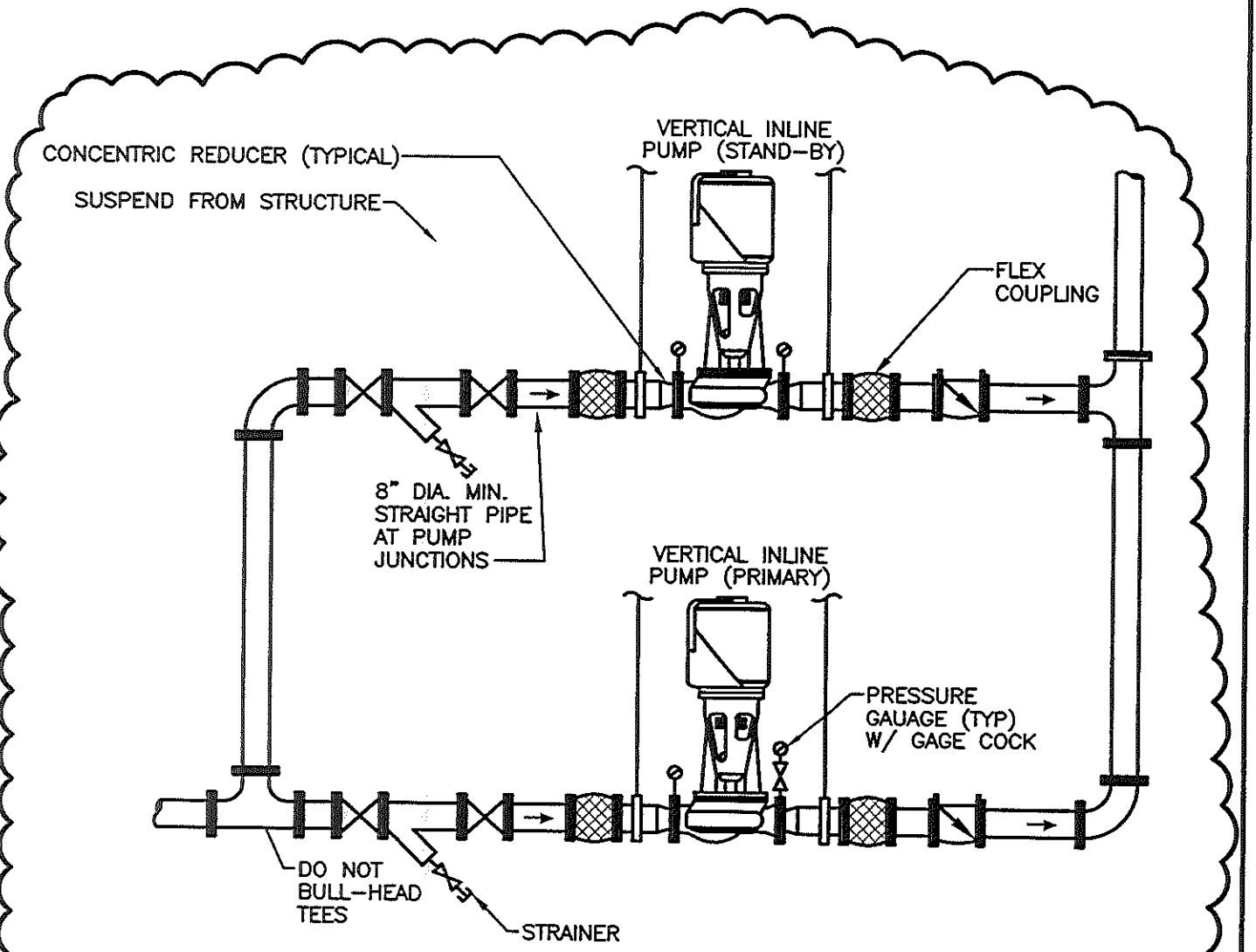
(NOTE: EXTENT OF EXISTING FLOOR PADS AND TOPPING IS DEPICTED ON SHEETS AD106 & AD107 AND IS TO BE FIELD VERIFIED BY G.C.)

F10	WINDOW SILL DETAIL (HEAD & JAMB SIM.)
1" = 1'-0"	AE107

SMRT
ARCHITECTURE ENGINEERING PLANNING
SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT:	ALBERT BRENNER GLICKMAN FAMILY LIBRARY
SUBJECT:	NEW DETAIL F10/AE502 EXTERIOR WINDOW SILL DETAIL (HEAD & JAMB SIM.)

SCALE:	1"=1'-0"
CAD FILE:	AE502-99092
PROJECT No.	99092
REF. SHEET:	AE502
PM: SLB	ADDENDUM No. ADD-2
A/E: JLH	SKETCH No. A-3
DATE04-04-03	



A1	VERT. IN-LINE PUMP PIPING DETAIL
NOT TO SCALE	

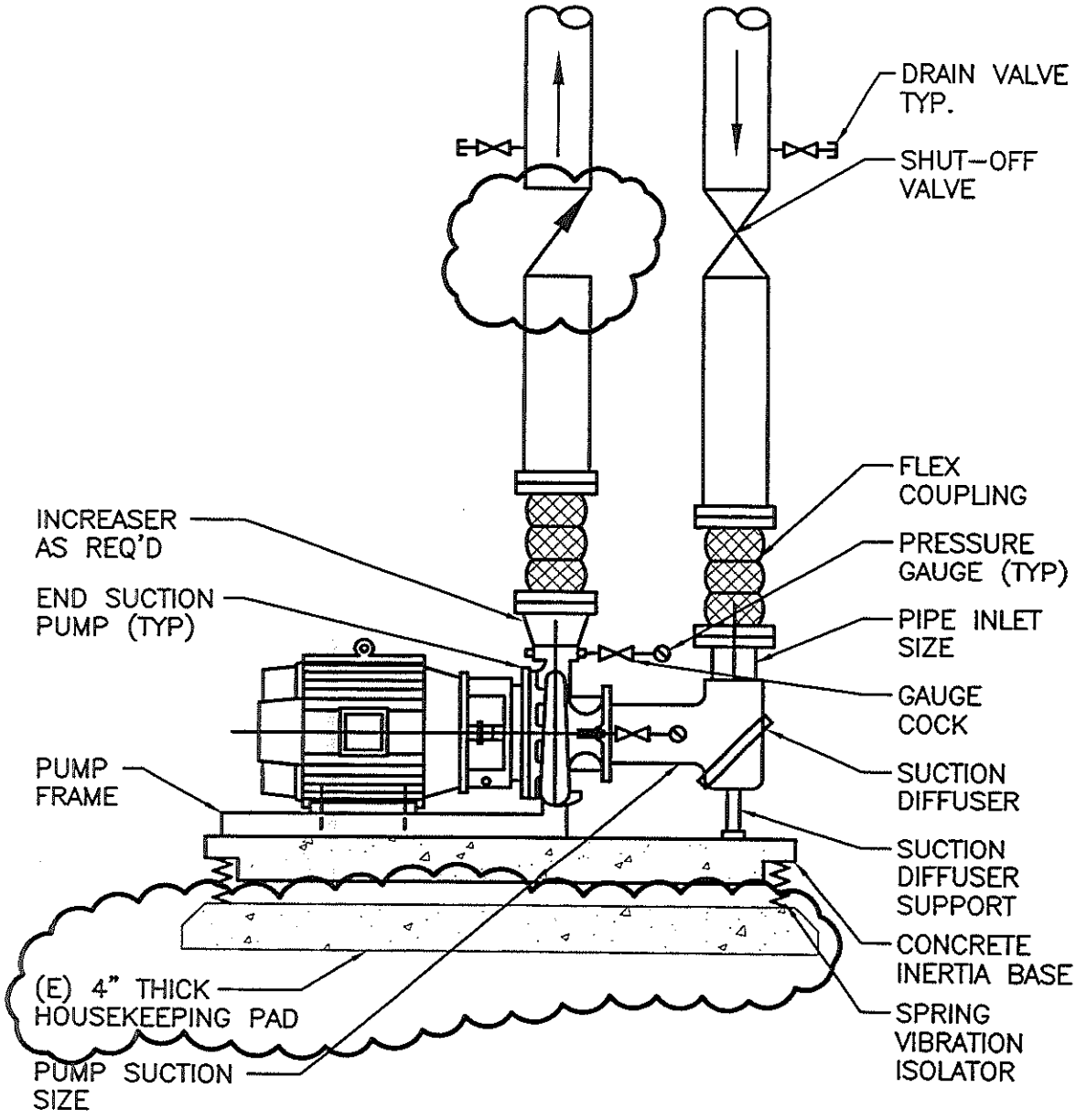
SMRT

ARCHITECTURE ENGINEERING PLANNING

SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT:	ALBERT BRENNER GLICKMAN FAMILY LIBRARY
SUBJECT:	DETAILS

SCALE:	NOT TO SCALE
CAD FILE:	M-501-99092
PROJECT No.	99092
REF. SHEET:	M-501
PM: SLB	ADDENDUM No. ADD-2
A/E: DBR	SKETCH No. M-1
DATE: 4-7-03	



M8 BASE MOUNTED PUMP DETAIL

NOT TO SCALE

SMRT
ARCHITECTURE ENGINEERING PLANNING
SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT: ALBERT BRENNER GLICKMAN FAMILY LIBRARY

SUBJECT: DETAILS

SCALE:	NOT TO SCALE
CAD FILE:	M-501-99092
PROJECT No.	99092
REF. SHEET:	M-501
PM: SLB	ADDENDUM No. ADD-2
A/E: DBR	SKETCH No. M-2
DATE: 4-7-03	

PUMP SCHEDULE

TAG	LOCATION	SERVICE	GPM	HD (FT.)	BHP	ELECTRICAL DATA				TYPICAL UNIT MFG & MODEL NO.	NOTES:
						HP	RPM	VOLTS	PH		
P-1	MECH ROOM 708	PRIMARY FHW HEATING	447	73.8	11.5	15	1760	480	3	TACO FE3010	(1) (2)
P-2	MECH ROOM 708	PRIMARY FHW HEATING	447	73.8	11.5	15	1760	480	3	TACO FE3010	(1) (2)
P-3	MECH ROOM 708	PRIMARY CHW COOLING	655	73	15.6	20	1760	480	3	TACO FE4010	(1) (2)
P-4	MECH ROOM 708	PRIMARY CHW COOLING	655	73	15.6	20	1760	480	3	TACO FE4010	(1) (2)
P-5	MECH ROOM B04	OSHER CHW COOLING	48	45	1.03	1.5	1750	480	3	TACO 1619	(3)
P-6	MECH ROOM B04	OSHER CHW COOLING	48	45	1.03	1.5	1750	480	3	TACO 1619	(3)
P-7	NOT USED										
P-8	NOT USED										
P-9	MECH ROOM 708A	ACCH-4 CHW CIRC	48	45	1.03	1.5	1750	480	3	TACO 1619	(4)
P-10	MECH ROOM 708A	ACCH-4 CHW-CIRC	48	45	1.03	1.5	1750	480	3	TACO 1619	(4)
P-11	MECH ROOM 708	BOILER INJECTION	68.4	24.6	.67	3/4	1750	480	3	TACO 1635	
P-12	MECH ROOM 708	BOILER INJECTION	68.4	24.6	.67	3/4	1750	480	3	TACO 1635	
P-13	MECH ROOM 708	BOILER INJECTION	68.4	24.6	.67	3/4	1750	480	3	TACO 1635	
P-14	MECH ROOM 708	BOILER INJECTION	68.4	24.6	.67	3/4	1750	480	3	TACO 1635	(4)

NOTES: (1) REPLACES EXISTING (2) PROVIDE PREMIUM EFFICIENCY MOTOR FOR VFD (BY DIV. 16)
(3) EXISTING TO BE RETAINED & RE-BALANCED. (4) PUMPS TO BE ADDED AS PART OF ADD ALT. #4.

SMRT
ARCHITECTURE ENGINEERING PLANNING
SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT: ALBERT BRENNER GLICKMAN FAMILY LIBRARY

SUBJECT: SCHEDULES

SCALE: NOT TO SCALE
CAD FILE: M-601-99092
PROJECT No. 99092
REF. SHEET: M-601
PM: SLB
A/E: DBR
DATE: 4-7-03

ADDENDUM No. ADD-2
SKETCH No. M-3

HUMIDIFIER SCHEDULE

TAG	SERVICE	OUTPUT PPH	INPUT PSIG	DUCT DIMENSIONS W(IN.)	DUCT DIMENSIONS H(IN.)	CFM	ABSORPTION DIST. (#)	TUBE O.D.	MAX VEL FPM	TYPICAL UNIT MFG & MODEL NO.	NOTES:
HU-5	AHU-5	50	–	42/30	16ø	8500	CSD-42 CSD-30	1-3/4"	–	NORTEC NHMC-50	1 2 5
HU-6	AHU-6	50	–	45/32	16ø	8590	CSD-45 CSD-32	1-3/4"	–	NORTEC NHMC-50	1 2 5 6
HU-6A	AHU-6A	34	–	30	24ø	6500	CSD-30	1-3/4"	–	NORTEC NHMC-30	1 2 4 5
HU-6B	AHU-6B	20	–	30	16ø	3200	BSD-30	7/8"	–	NORTEC NHMC-20	1 4 5
HU-7	AHU-7	100	–	30	30	10000	CSD-30	1-3/4"	–	NORTEC NHMC-100	1 5

NOTES: (1) UNIT TO BE 480V/3PH/60HZ (2) TWO DISTRIBUTORS REQ'D. (3) UNITS ARE 120V/1PH/60HZ
(4) PART OF ADD ALT. #4. (5) PROVIDE MAKE-UP WATER & DRAIN QUENCHING AT EACH UNIT, (RE: A7/PL601).
(6) THIS UNIT WILL BE REPLACED BY HU-6A & HU-6B, IF ALT. #4 IS ACCEPTED.

SMRT
ARCHITECTURE ENGINEERING PLANNING
SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

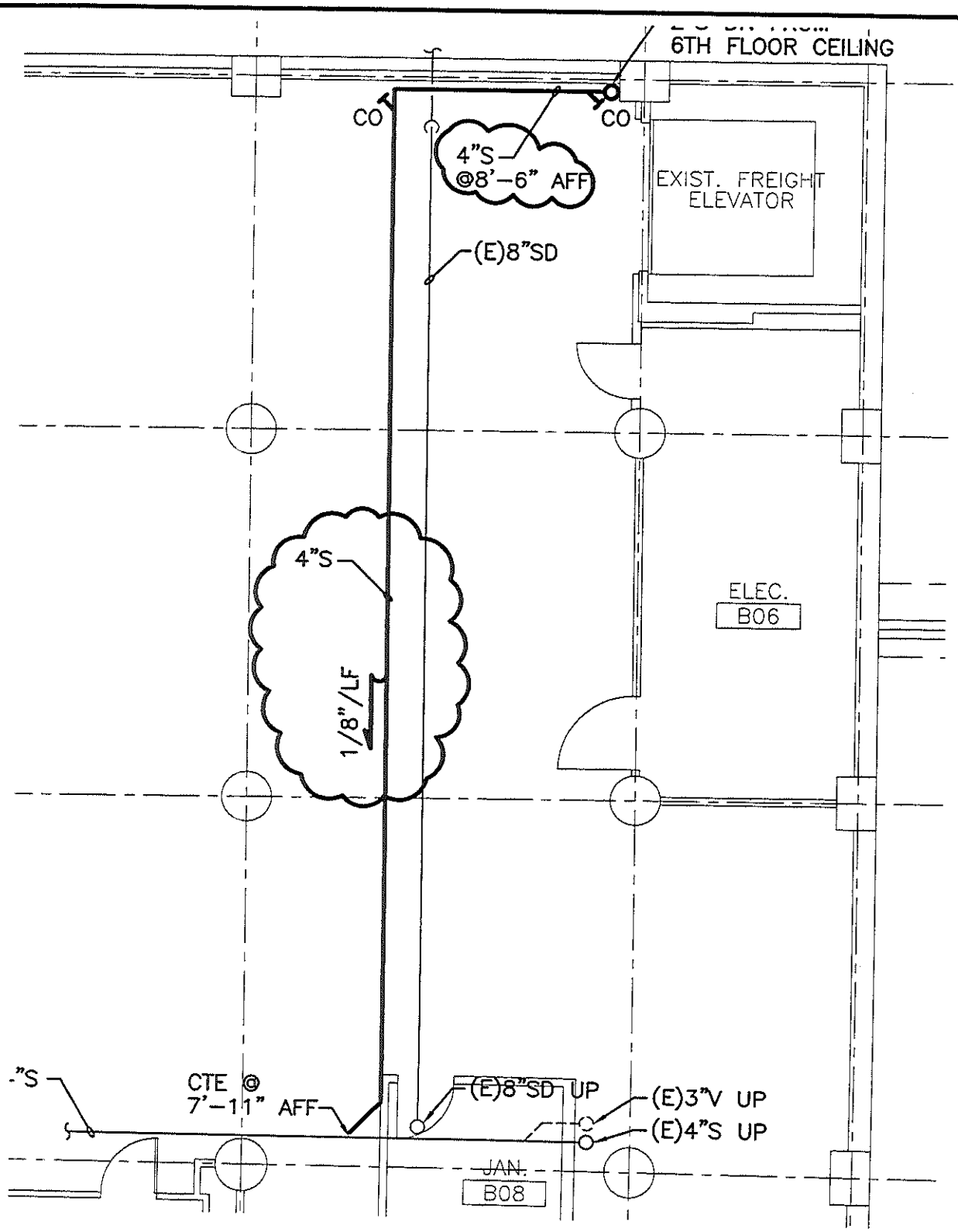
PROJECT: ALBERT BRENNER GLICKMAN FAMILY LIBRARY

SUBJECT: SCHEDULES

SCALE:	NOT TO SCALE
CAD FILE:	M-602-99092
PROJECT No.	99092
REF. SHEET:	M-602
PM:	SLB
A/E:	DBR
DATE:	4-7-03

ADDENDUM No. ADD-2

SKETCH No. M-5



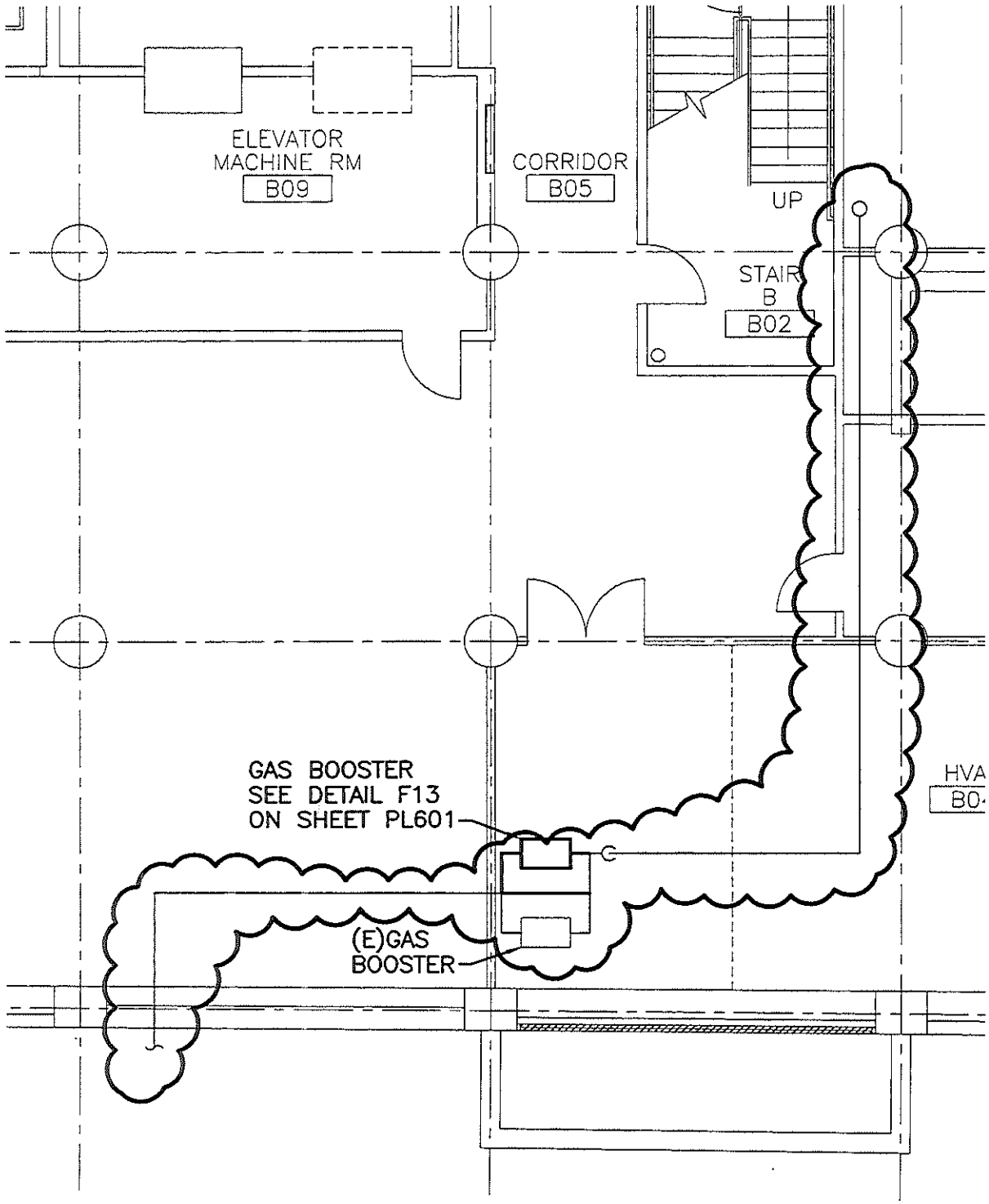
SMRT

ARCHITECTURE ENGINEERING PLANNING

SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT:	ALBERT BRENNER GLICKMAN FAMILY LIBRARY
SUBJECT:	BASEMENT PLUMBING PLAN

SCALE:	1/8"=1'-0"
CAD FILE:	PL100-99092
PROJECT No.	99092
REF. SHEET:	PL100
PM:	SLB
A/E:	DBR
DATE:	4-7-03
ADDENDUM No.	ADD-2
SKETCH No.	P-1



SMRT

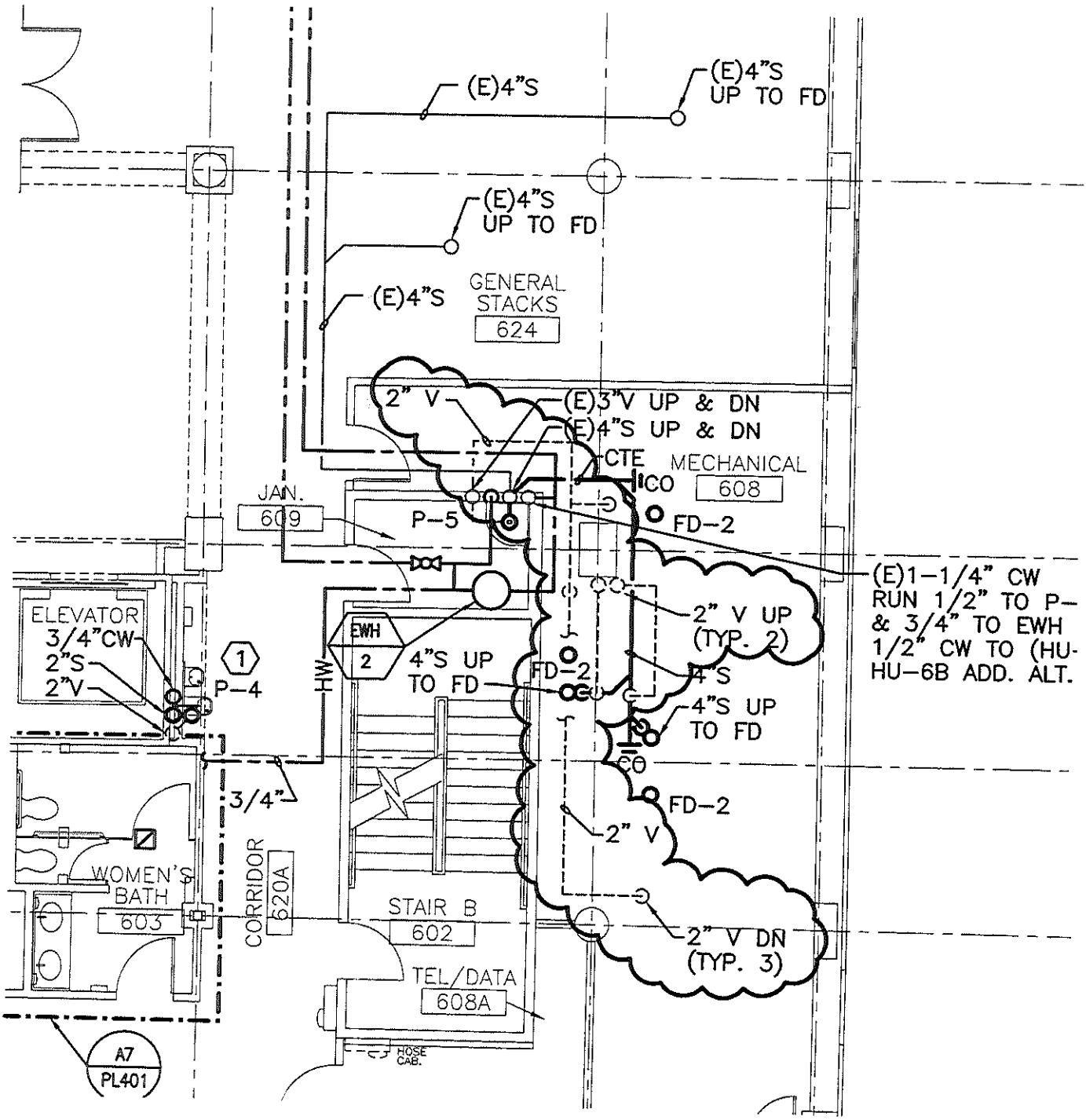
ARCHITECTURE ENGINEERING PLANNING

SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT: ALBERT BRENNER GLICKMAN FAMILY LIBRARY

SUBJECT: BASEMENT PLUMBING PLAN

SCALE:	1/8"=1'-0"
CAD FILE:	PL100-99092
PROJECT No.	99092
REF. SHEET:	PL100
PM: SLB	ADDENDUM No. ADD-2
A/E: DBR	SKETCH No. P-2
DATE: 4-7-03	



SMRT

ARCHITECTURE ENGINEERING PLANNING

SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT: ALBERT BRENNER GLICKMAN FAMILY LIBRARY

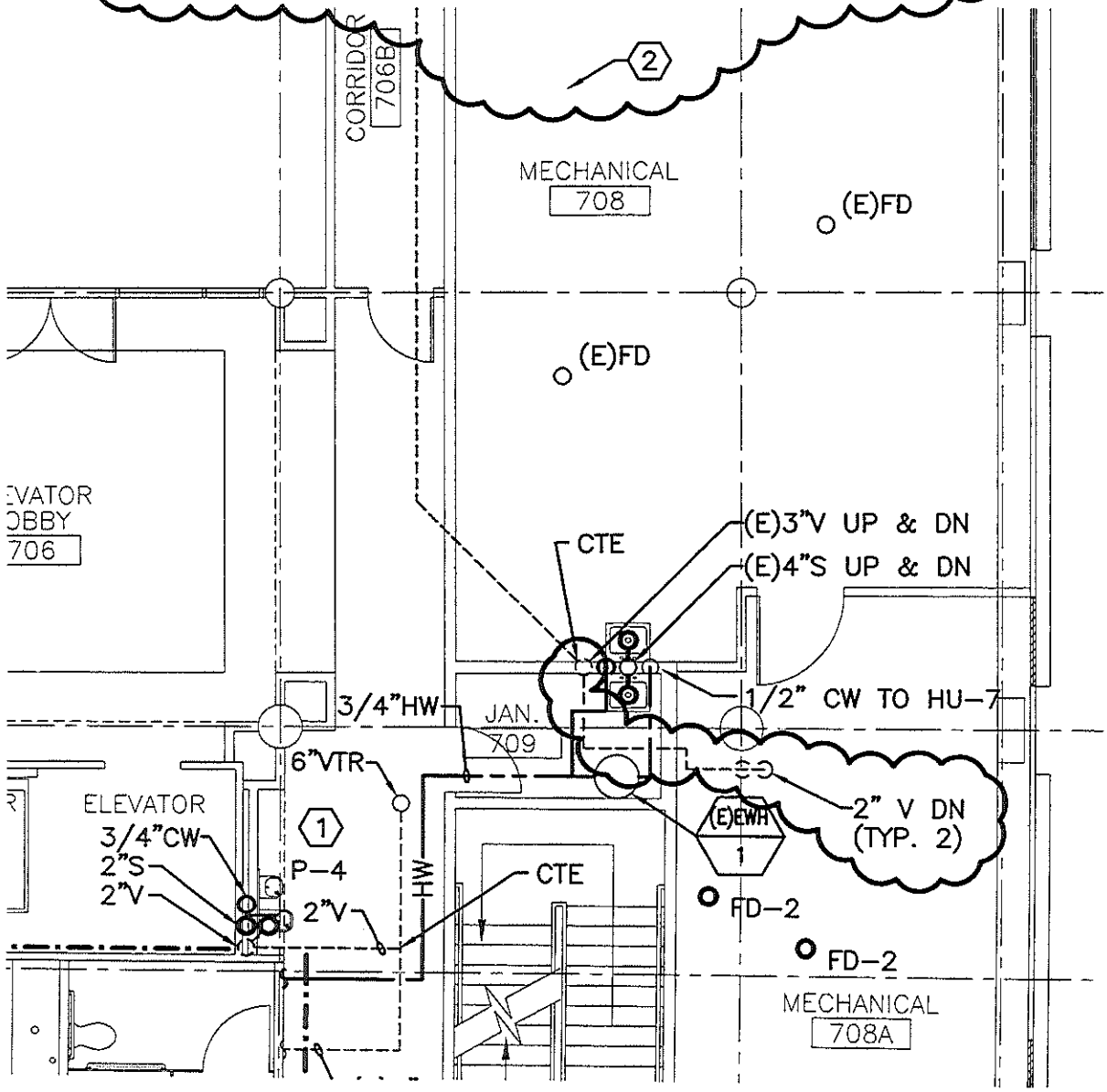
SUBJECT: SIXTH FLOOR PLUMBING PLAN

SCALE:	1/8"=1'-0"
CAD FILE:	PL106-99092
PROJECT No.	99092
REF. SHEET:	PL106
PM: SLB	ADDENDUM No. ADD-2
A/E: DBR	SKETCH No. P-3
DATE: 4-7-03	

KEYED NOTES:

(1) CHILLER FOR P–4 TO BE LOCATED IN JAN. 709. RUN CW PIPES TO & FROM THIS LOCATION FOR P–4.

(2) ADDENDUM #4: CONNECT TO EXISTING NG AND DROP NEW NG TO B–4 GAS TRAIN INVERT. CONNECT TO EXISTING GAS TRAIN VENTS AND RUN UP THROUGH ROOF INDEPENDENTLY. TERMINATE EACH WITH A GOOSENECK AND INSECT SCREEN. GAS VENTS TO BE 1–INCH, MIN.



SMRT

ARCHITECTURE ENGINEERING PLANNING

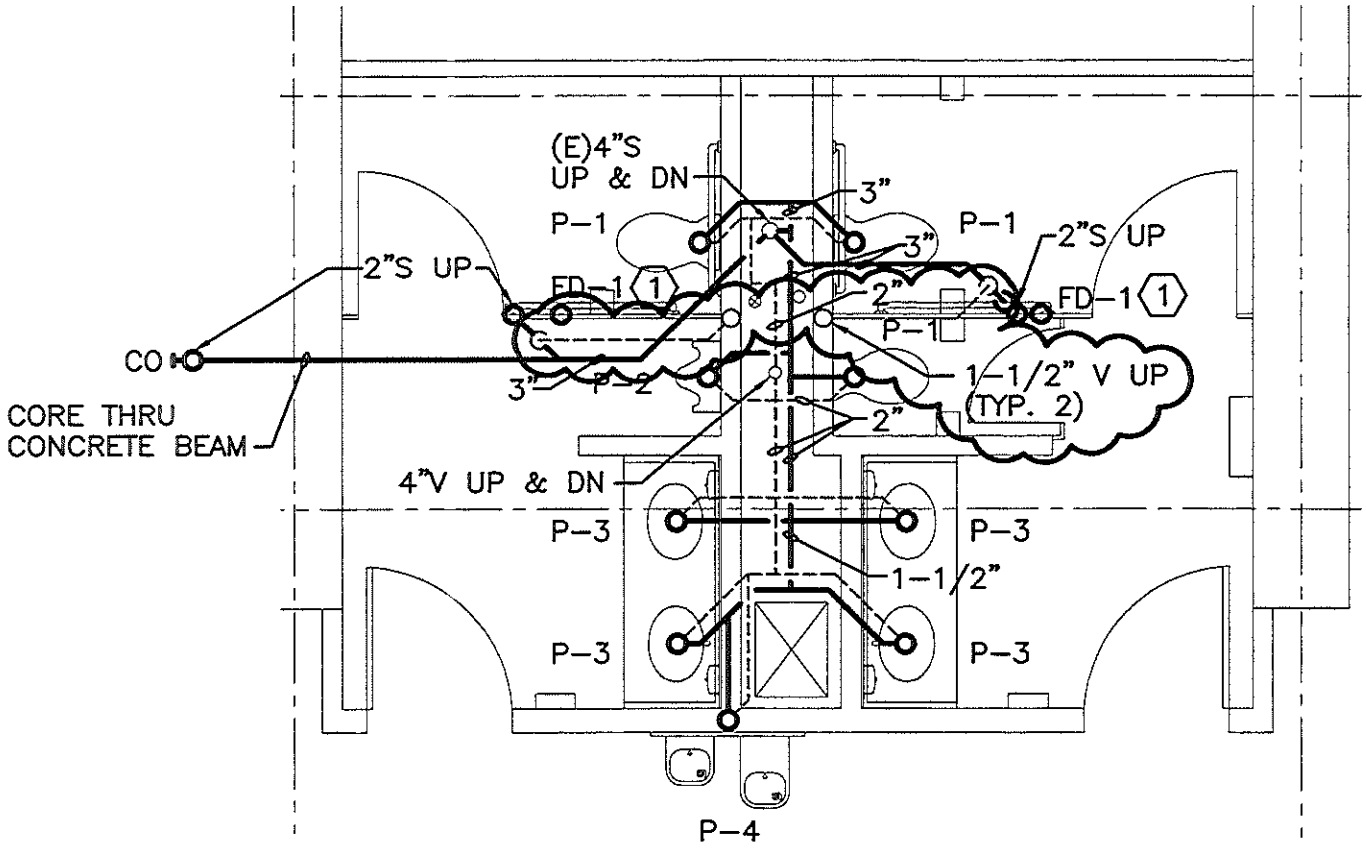
SMRT

144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104

tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT:	ALBERT BRENNER GLICKMAN FAMILY LIBRARY
SUBJECT:	SEVENTH FLOOR PLUMBING PLAN

SCALE:	1/8"=1'–0"
CAD FILE:	PL107–99092
PROJECT No.	99092
REF. SHEET:	PL107
PM: SLB	ADDENDUM No. ADD–2
A/E: DBR	SKETCH No. P–4
DATE: 4–7–03	



H1	FIFTH FLOOR SANITARY & VENT PLAN
1/4"=1'-0"	*

SMRT

ARCHITECTURE ENGINEERING PLANNING

SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT: ALBERT BRENNER GLICKMAN FAMILY LIBRARY

SUBJECT: PART PLANS

SCALE:	1/4"=1'-0"
CAD FILE:	PL401-99092
PROJECT No.	99092
REF. SHEET:	PL401
PM: SLB	ADDENDUM No. ADD-2
A/E: DBR	SKETCH No. P-5
DATE: 4-7-03	

TAG	LOCATION	AIRFLOW (CFM)	MIN. OA. (CFM)	)L) °F	GPM	WPD–FT
AHU–5	MECH RM 508	8500	1400	5	55.8	17.8
AHU–6 (4)	MECH RM 508	8590	1400	5	55.8	17.8
AHU–6A (3)	MECH RM 608	6500	1400	5	71.5	30.27
AHU–6B (3)	MECH RM 608	3200	600	1	39.15	18.31
AHU–7	MECH RM 708	10000	7000	5	80.54	25.49

NOTES: (1) VFD, IF REQ'D, BY DIV. 1 IS ACCEPTED.

SMRT
ARCHITECTURE ENGINEERING PLANNING
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

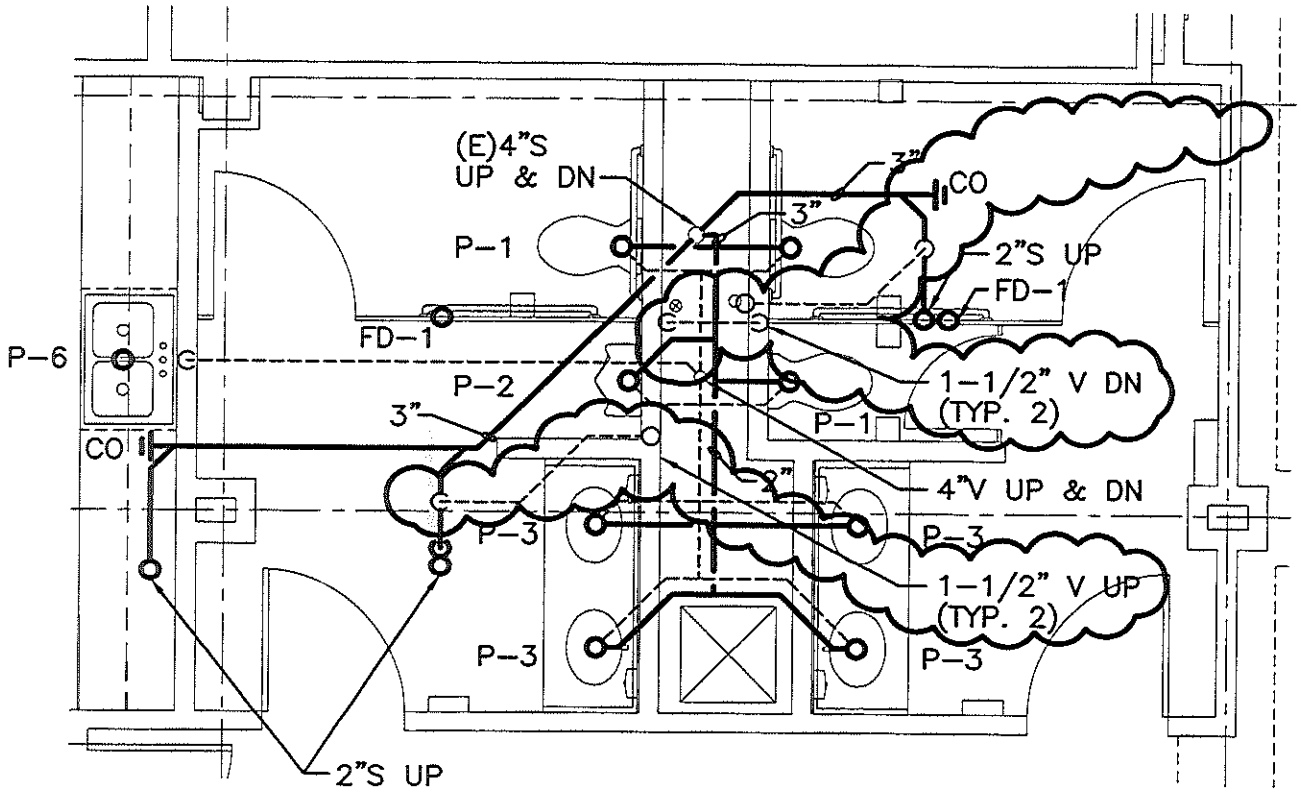
PROJECT: ALBERT BRENNER GLICKMAN FAMILY LIBRARY

SUBJECT: SCHEDULES

SCALE: NOT TO SCALE
PROJECT MANAGER: SLB
REF. SHEET: M–601
A/E OF RECORD: DBR
SMRT CAD FILE: M–601–99092
PROJECT No. 99092
DATE: 4–7–03

ADDENDUM No. ADD–2

SKETCH No. M–4



H7 SIXTH FLOOR SANITARY & VENT PLAN

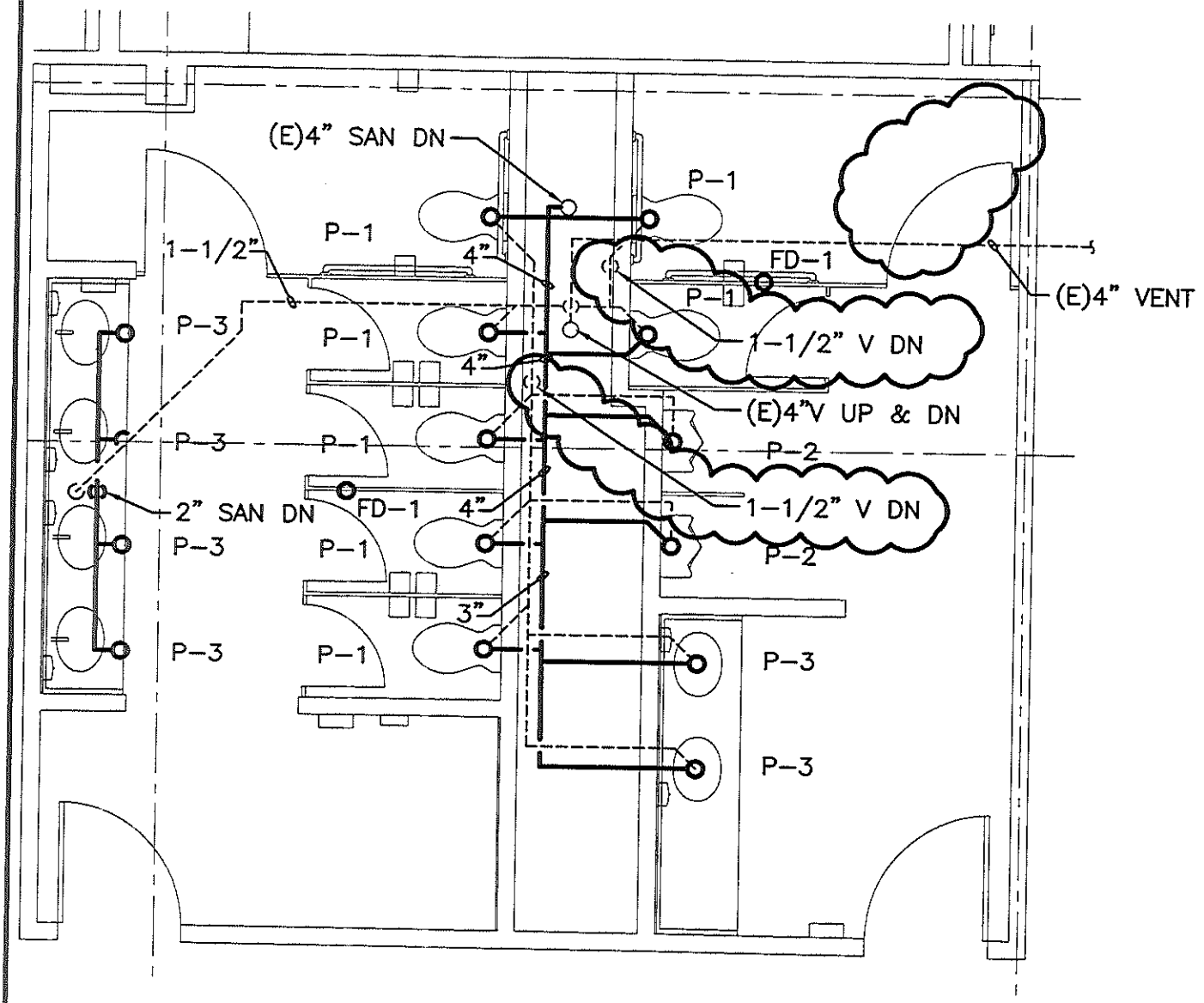
1/4"=1'-0" *

SMRT
ARCHITECTURE ENGINEERING PLANNING
SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT: ALBERT BRENNER GLICKMAN FAMILY LIBRARY

SUBJECT: PART PLANS

SCALE:	1/4"=1'-0"
CAD FILE:	PL401-99092
PROJECT No.	99092
REF. SHEET:	PL401
PM: SLB	ADDENDUM No. ADD-2
A/E: DBR	SKETCH No. P-6
DATE: 4-7-03	



H13 SEVENTH FLOOR SAN. & VENT PLAN

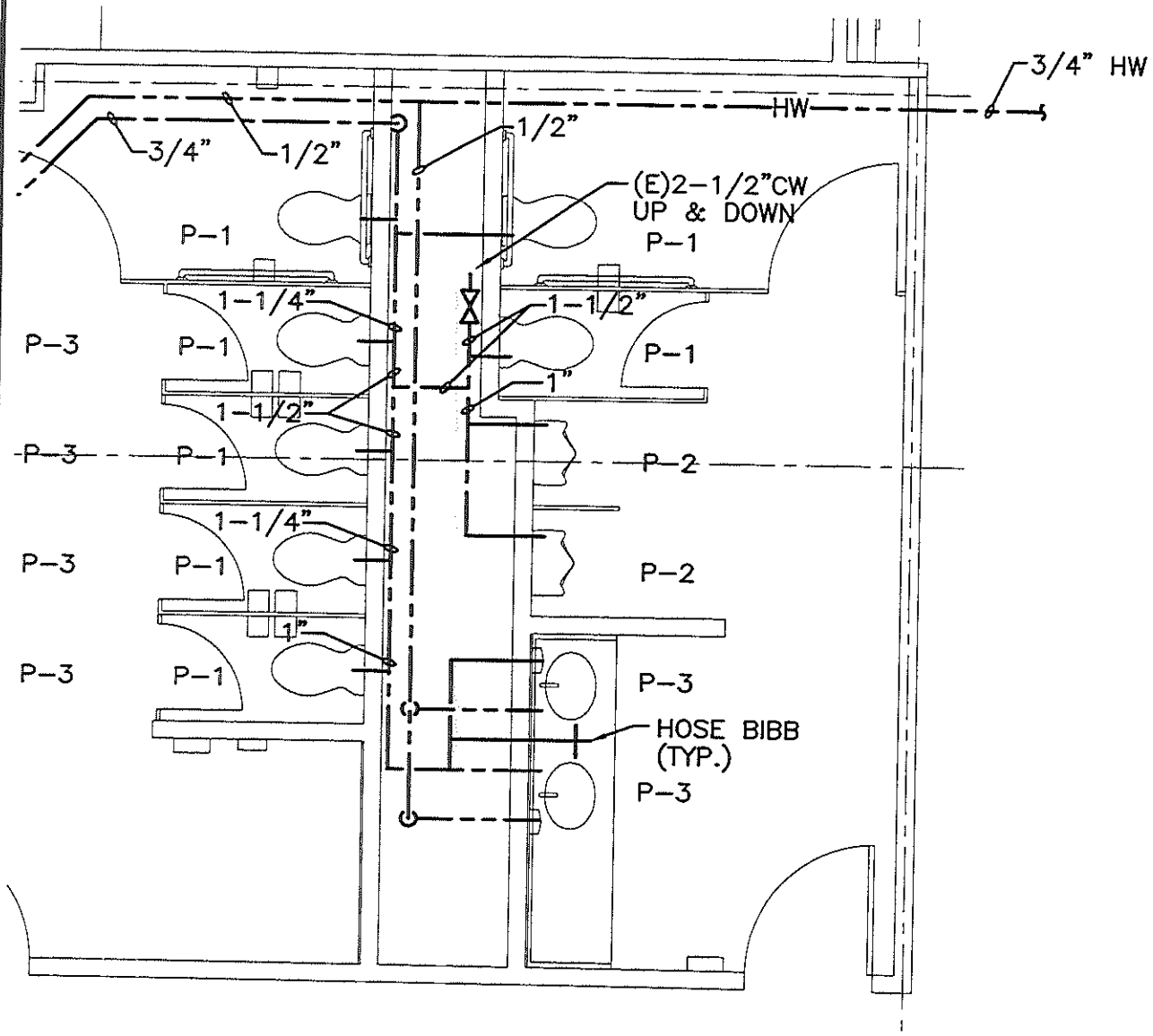
1/4"=1'-0" *

SMRT
ARCHITECTURE ENGINEERING PLANNING
SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT: ALBERT BRENNER GLICKMAN FAMILY LIBRARY

SUBJECT: PART PLANS

SCALE:	1/4"=1'-0"
CAD FILE:	PL401-99092
PROJECT No.	99092
REF. SHEET:	PL401
PM: SLB	ADDENDUM No. ADD-2
A/E: DBR	SKETCH No. P-7
DATE: 4-7-03	



A13 SEVENTH FLOOR DOM. WATER PLAN

1/4"=1'-0" *

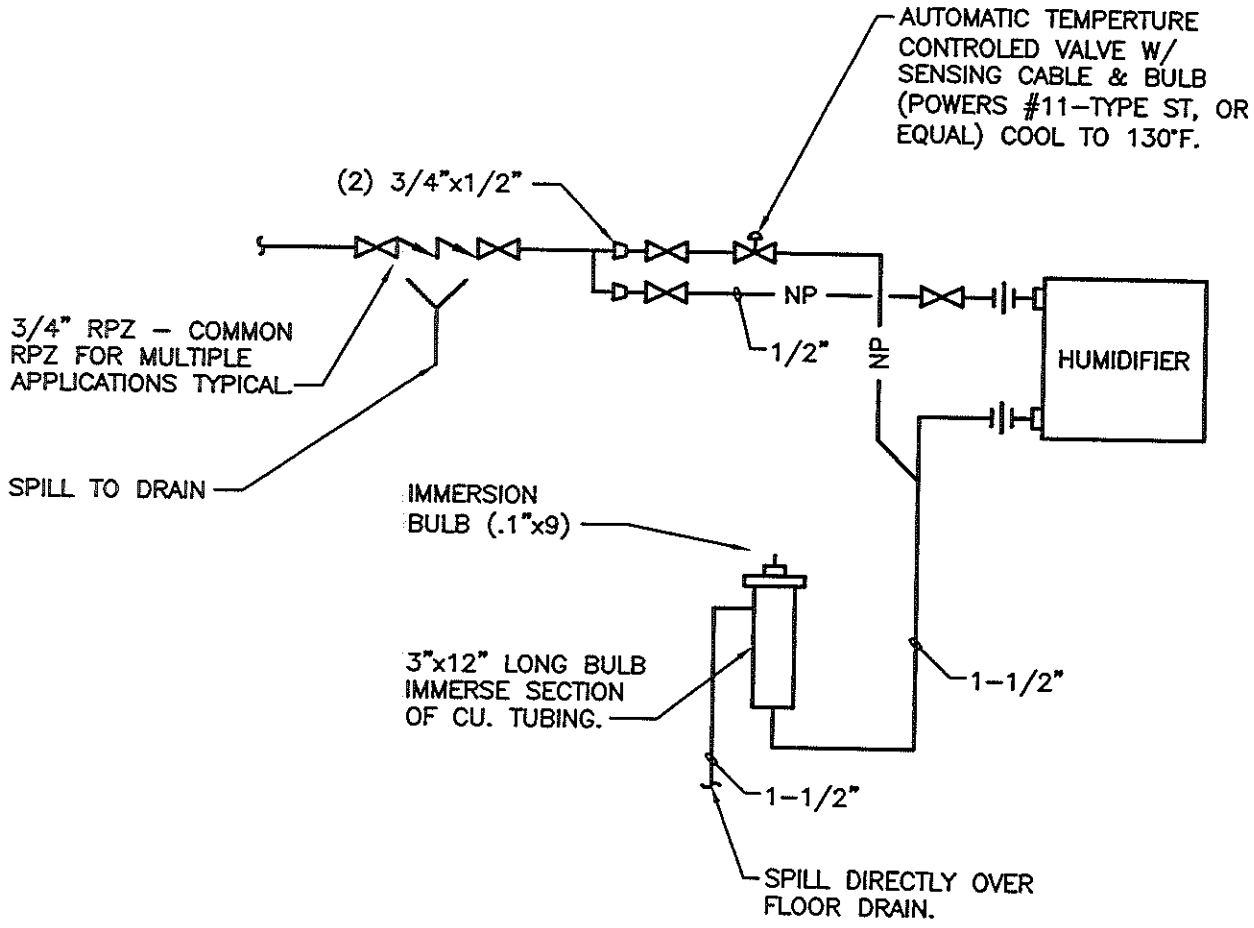
SMRT

ARCHITECTURE ENGINEERING PLANNING

SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT:	ALBERT BRENNER GLICKMAN FAMILY LIBRARY
SUBJECT:	PART PLANS

SCALE:	1/4"=1'-0"
CAD FILE:	PL401-99092
PROJECT No.	99092
REF. SHEET:	PL401
PM: SLB	ADDENDUM No. ADD-2
A/E: DBR	SKETCH No. P-8
DATE: 4-7-03	



A8 HUMIDIFIER CONNECTION DETAIL

NOT TO SCALE

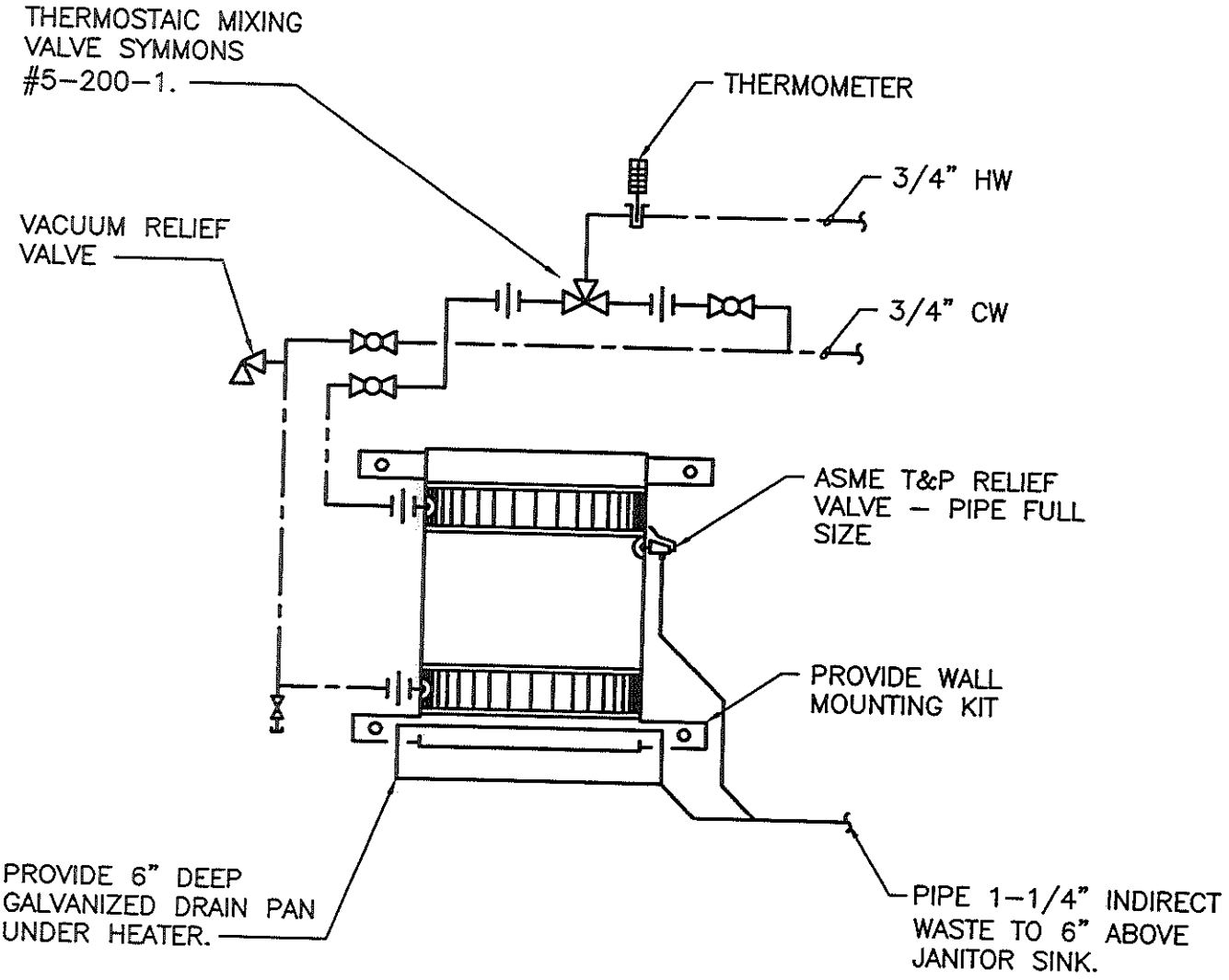
SMRT

ARCHITECTURE ENGINEERING PLANNING

SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT:	ALBERT BRENNER GLICKMAN FAMILY LIBRARY
SUBJECT:	SCHEDULES & DETAILS

SCALE:	NOT TO SCALE
CAD FILE:	PL601–99092
PROJECT No.	99092
REF. SHEET:	PL601
PM: SLB	ADDENDUM No. ADD–2
A/E: DBR	SKETCH No. P–9
DATE: 4–7–03	



NOTE: HEAT WATER TO 140°F MIX TO 115°F.

A13 ELECTRIC WATER HEATER DETAIL

NOT TO SCALE

SMRT
ARCHITECTURE ENGINEERING PLANNING
SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT:	ALBERT BRENNER GLICKMAN FAMILY LIBRARY
SUBJECT:	SCHEDULES & DETAILS

SCALE:	NOT TO SCALE
CAD FILE:	PL601-99092
PROJECT No.	99092
REF. SHEET:	PL601
PM: SLB	ADDENDUM No. ADD-2
A/E: DBR	SKETCH No. P-10
DATE: 4-7-03	

PLUMBING FIXTURE SCHEDULE

TAG	FIXTURE	CW	HW	WASTE	VENT	REMARKS:
P-1	WALL-HUNG WATER CLOSET	1"	–	3"	2"	CRANE MODEL 3446 W/SLOAN MODEL 111-ES-S FLUSH VALVE
P-2	WALL-HUNG URINAL	3/4"	–	2"	1-1/2"	CRANE MODEL 7309 W/SLOAN MODEL 186.1-ES-S FLUSH VALVE
P-3	(1) LAVATORY COUNTER	1/2"	1/2"	1-1/2"	1-1/2"	AMER STD MODEL 0476.028 W/ CHICAGO FAUCET MODEL 802A-665
P-4	WATER-COOLER WALL HUNG-ADA	1/2"	–	1-1/2"	1-1/2"	HALSEY-TAYLOR MODEL HRFSEBD W/ REMOTE CHILLER MODEL SJ8-Q
P-5	JANITOR SERVICE SINK	1/2"	1/2"	3"	1-1/2"	AMER STD MODEL 7741.000 SINK W/ CHICAGO FAUCET MODEL 897-RCF
P-6	(2) DOUBLE-BOWL SS SINK	1/2"	1/2"	2"	1-1/2"	ELKAY SINK MODEL GECR-3321 W/ CHICAGO FAUCET MODEL 200A-L9-E3-320

NOTES: (1) UNDER EACH COUNTER MOUNT A HOSE BIBB – CHICAGO MODEL 293

(2) SINK TO BE FURNISHED WITH DRAINS LOCATED IN THE BACK-CENTER POSITION FOR ADA COMPLIANCE.

SMRT

ARCHITECTURE ENGINEERING PLANNING

SMRT
144 Fore Street/P.O.Box 618 PORTLAND, MAINE 04104
tel. (207) 772-3846 / fax. (207) 772-1070

PROJECT: ALBERT BRENNER GLICKMAN FAMILY LIBRARY

SUBJECT: SCHEDULES & DETAILS

SCALE: NOT TO SCALE

CAD FILE: PL601-99092

PROJECT No. 99092

REF. SHEET: PL601

PM: SLB

A/E: DBR

DATE: 4-7-03

ADDENDUM No. ADD-2

SKETCH No. P-11

SECTION 13925

FIRE SUPPRESSION SPRINKLERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cross-linked, Double-Interlock, Pre-action sprinkler system.

B. System design, installation, and certification.

1.02 RELATED SECTIONS

A. Section 13910 - Fire Protection Basic Materials and Methods: Pipe, fittings, and valves.

1.03 SUBMITTALS

A. See Section 01300 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on sprinklers, valves, and specialties, including manufacturers catalog information. Submit performance ratings, rough-in details, weights, support requirements, and piping connections.

C. **Shop Drawings:**

1. **Floors 1-4: Submit drawings which indicate sprinkler head locations. Differentiate between existing, existing-to-be-removed, and proposed new head locations. Indicate any piping work as well.**
2. **Floors 5-7: Submit complete drawings for these levels. Drawings to include system piping, elevations, head locations and types. Differentiate between existing and proposed new items.**
3. **Hydraulic Calculations: Provide hydraulically designed systems on floors 5-7. Calculations to be run back through the facility fire pump and shall be keyed to point of flow testing.**
   a) **Pipeline velocities shall be limited to 25 fps.**
   b) **Include a 10 psig cushion between available supplies and system demand.**
4. **Perform a hydrant flow test to serve as the basis for hydraulically designed systems. Test elevation to be interpolated to project floor elevation datum.**
5. **Seismic Bracing: Submit product data and installation details. Indicate brace locations on the sixth floor shop drawings, (Pre-Action portion).**

PART 2 PRODUCTS

2.01 SPRINKLERS

A. Suspended Ceiling Type: Standard pendant type with matching push on escutcheon plate.
   1. Finish: Chrome plated.

2. Escutcheon Plate Finish: Chrome plated.
3. Fusible Link: Glass bulb type temperature rated for specific area hazard.

B. Exposed Area Type: Standard upright type with guard when indicated .
1. Finish: Brass.
2. Fusible Link: Fusible solder link type temperature rated for specific area hazard.

C. Sidewall Type: Standard horizontal sidewall type with matching push on escutcheon plate and guard when indicated.
1. Finish: Chrome plated.
2. Escutcheon Plate Finish: Chrome plated.
3. Fusible Link: Glass bulb type temperature rated for specific area hazard.

D. Dry Sprinklers: Standard pendant type with matching push on escutcheon plate.
1. Finish: Chrome plated.
2. Escutcheon Plate Finish: Chrome plated.
3. Fusible Link: Glass bulb type temperature rated for specific area hazard.

E. Guards: Finish to match sprinkler finish.

F. Acceptable Sprinkler Manufacturers:
1. Reliable
2. Viking
3. Grinnell/Central

2.02 PIPING SPECIALTIES

A. Deluge Valves, (for Pre-Action Systems): UL260, cast-iron body, hydraulically operated, differential-pressure type. Include bronze seat with o-ring seals, trim sets for bypass, drain, electrical sprinkler alarm switch, pressure gages, drip cup assembly piped without valves and separate from main drain line, fill-line attachment with strainer, and push-rod chamber supply connection.

1. Dry, Pilot-Line Trim Set: Include dry, pilot-line actuator; air- and water-pressure gages; low-air-pressure warning switch; air relief valve; and actuation device. Dry, pilot-line actuator includes cast-iron, operated, diaphragm-type valve with resilient facing plate, resilient diaphragm, and replaceable bronze seat. Valve includes threaded water and air inlets and outlet. Loss of air pressure on dry, pilot-line side allows pilot-line actuator to open and causes deluge valve to open immediately.

2. Panel: Single-area, two-area, or single-area cross-zoned type control panel as indicated, including NEMA ICS 6, Type I enclosure, detector, alarm, and solenoid-valve circuitry for operation of deluge valves. Panels contain power supply; battery charger; standby batteries; field-wiring terminal strip; electrically supervised solenoid valves and polarized fire alarm bell; lamp test facility; single-pole, double-throw auxiliary contacts; and rectifier.

a) UL listed and FMG approved when used with thermal detectors and Class A detector circuit wiring. Electrical characteristics

are 120-V ac, 60 Hz, with 24-V dc rechargeable batteries.

3. **Manual Pull Stations: Provide a manual pull station directly adjacent to the deluge valve; electric operation, metal enclosure.**

4. **Detection: Heat detectors are provided and installed by the project Fire Alarm Contractor.**

5. **Basis of Design: Viking "Total-Pac" or individual components as manufactured by: Viking, Grinnell/Central or Reliable.**

B. Water Flow Switch: Vane type switch for mounting horizontal or vertical, with two contacts; rated 10 amp at 125 volt AC and 2.5 amp at 24 volt DC.

2.03 AIR COMPRESSOR

A. Compressor: Single unit, electric motor driven, motor, motor starter, safety valves, check valves, air maintenance device incorporating electric pressure switch and unloader valve.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with referenced NFPA design and installation standard.

B. Install equipment in accordance with manufacturer's instructions.

C. Place pipe runs to minimize obstruction to other work.

D. Place piping in concealed spaces above finished ceilings.

E. Center sprinklers in two directions in ceiling tile and provide piping offsets as required.

F. Apply masking tape or paper cover to ensure concealed sprinklers, cover plates, and sprinkler escutcheons do not receive field paint finish. Remove after painting. Replace painted sprinklers.

G. Install air compressor on vibration isolators.

H. Flush entire piping system of foreign matter.

I. Install guards on sprinklers where indicated.

J. Hydrostatically test entire system.

3.02 SCHEDULES

A. System Hazard Areas:

1. Sixth Floor Special Collections: Ordinary Hazard, Group I, Cross-linked, double-interlock, preaction - remove existing standard wet system as required.
   a) **Pre-Action system sprinkler heads to be pendant type on arm-overs, (return bends) or use dry pendant heads tied directly off branch piping.**
2. Remaining Area - Top Three Floors: Ordinary Hazard, Group 1 - Existing Standard Wet System to remain.
3. Lower Five Floors: Ordinary Hazard, Group 1, - Existing Standard Wet System – (Remove existing On-Off Heads and replace with standard heads – Add Alternate #2).

END OF SECTION 13925

SECTION 15950

TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.0 GENERAL

A. Testing and balancing of the HVAC system (as defined herein) will be the responsibility of the General Contractor.
   1. See Section 01400, "Quality Requirements."

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

B. The requirements of Section 15000, "Basic Mechanical Requirements" apply to work defined by this Section.

1.2 SUMMARY

A. This Section includes TAB to produce design objectives for the following:

   1. Air Systems:

      a. Constant-volume air systems.
      b. Variable-air-volume systems.

   2. Hydronic Piping Systems:

      a. Constant-flow systems.
      b. Primary-secondary systems.

   3. HVAC equipment quantitative-performance settings.
   4. Space pressurization testing and adjusting.
   5. Vibration measuring.
   6. Sound level measuring.
   7. Existing systems TAB.
   8. Verifying that automatic control devices are functioning properly.
   9. Reporting results of activities and procedures specified in this Section.

1.3 DEFINITIONS

A. Adjust: To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.

B. Balance: To proportion flows within the distribution system, including submains, branches, and terminals, according to indicated quantities.

C. Barrier or Boundary: Construction, either vertical or horizontal, such as walls, floors, and ceilings that are designed and constructed to restrict the movement of airflow, smoke, odors, and other pollutants.

D. Draft: A current of air, when referring to localized effect caused by one or more factors of high air velocity, low ambient temperature, or direction of airflow, whereby more heat is withdrawn from a person's skin than is normally dissipated.

E. NC: Noise criteria.

F. Procedure: An approach to and execution of a sequence of work operations to yield repeatable results.

G. RC: Room criteria.

H. Report Forms: Test data sheets for recording test data in logical order.

I. Smoke-Control System: An engineered system that uses fans to produce airflow and pressure differences across barriers to limit smoke movement.

J. Smoke-Control Zone: A space within a building that is enclosed by smoke barriers and is a part of a zoned smoke-control system.

K. Stair Pressurization System: A type of smoke-control system that is intended to positively pressurize stair towers with outdoor air by using fans to keep smoke from contaminating the stair towers during an alarm condition.

L. Static Head: The pressure due to the weight of the fluid above the point of measurement. In a closed system, static head is equal on both sides of the pump.

M. Suction Head: The height of fluid surface above the centerline of the pump on the suction side.

N. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.

O. System Effect Factors: Allowances used to calculate a reduction of the performance ratings of a fan when installed under conditions different from those presented when the fan was performance tested.

P. TAB: Testing, adjusting, and balancing.

Q. Terminal: A point where the controlled medium, such as fluid or energy, enters or leaves the distribution system.

R. Test: A procedure to determine quantitative performance of systems or equipment.

S. Testing, Adjusting, and Balancing (TAB) Firm: The entity responsible for performing and reporting TAB procedures.

1.4 SUBMITTALS

A. Qualification Data: Within 15 days from Contractor's Notice to Proceed, submit 2 copies of evidence that TAB firm and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.

B. Contract Documents Examination Report: Within 30 days from Contractor's Notice to Proceed, submit 6 copies of the Contract Documents review report as specified in Part 3.

C. Strategies and Procedures Plan: Within 30 days from Contractor's Notice to Proceed, submit 2 copies of TAB strategies and step-by-step procedures as specified in Part 3 "Preparation" Article. Include a complete set of report forms intended for use on this Project.

D. Certified TAB Reports: Submit two copies of reports prepared, as specified in this Section, on approved forms certified by TAB firm.

E. Sample Report Forms: Submit two sets of sample TAB report forms.

F. Warranties specified in this Section.

1.5 QUALITY ASSURANCE

A. TAB Firm Qualifications: Engage a TAB firm certified by either AABC or NEBB.

B. TAB Conference: Meet with Owner's and Architect's representatives on approval of TAB strategies and procedures plan to develop a mutual understanding of the details. Ensure the participation of TAB team members, equipment manufacturers' authorized service representatives, HVAC controls installers, and other support personnel. Provide seven days' advance notice of scheduled meeting time and location.

1. Agenda Items: Include at least the following:

a. Submittal distribution requirements.
b. The Contract Documents examination report.
c. TAB plan.
d. Work schedule and Project-site access requirements.
e. Coordination and cooperation of trades and subcontractors.
f. Coordination of documentation and communication flow.

C. Certification of TAB Reports: Certify TAB field data reports. This certification includes the following:

1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
2. Certify that TAB team complied with approved TAB plan and the procedures specified and referenced in this Specification.

D. TAB Report Forms: Use standard forms from TAB firm's forms approved by Architect.

E. Instrumentation Type, Quantity, and Accuracy: As described in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems," Section II, "Required Instrumentation for NEBB Certification."

F. Instrumentation Calibration: Calibrate instruments at least every six months or more frequently if required by instrument manufacturer.

1. Keep an updated record of instrument calibration that indicates date of calibration and the name of party performing instrument calibration.

1.6 PROJECT CONDITIONS

A. Partial Owner Occupancy: Owner may occupy completed areas of building before Substantial Completion. Cooperate with Owner during TAB operations to minimize conflicts with Owner's operations.

1.7 COORDINATION

A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, HVAC controls installers, and other mechanics to operate HVAC systems and equipment to support and assist TAB activities.

B. Notice: Provide seven days' advance notice for each test. Include scheduled test dates and times.

C. Perform TAB after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

1.8 WARRANTY

A. Special Guarantee: Provide a guarantee on NEBB forms stating that NEBB will assist in completing requirements of the Contract Documents if TAB firm fails to comply with the Contract Documents. Guarantee shall include the following provisions:

1. The certified TAB firm has tested and balanced systems according to the Contract Documents.

2. Systems are balanced to optimum performance capabilities within design and installation limits.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.

1. Contract Documents are defined in the General and Supplementary Conditions of Contract.
2. Verify that balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are required by the Contract Documents. Verify that quantities and locations of these balancing devices are accessible and appropriate for effective balancing and for efficient system and equipment operation.

B. Examine approved submittal data of HVAC systems and equipment.

C. Examine Project Record Documents described in Division 1 Section "Project Record Documents."

D. Examine design data, including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine equipment performance data including fan and pump curves. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system. Calculate system effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from those presented when the equipment was performance tested at the factory. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," Sections 7 through 10; or in SMACNA's "HVAC Systems--Duct Design," Sections 5 and 6. Compare this data with the design data and installed conditions.

F. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting, and commissioning specified in individual Sections have been performed.

G. Examine system and equipment test reports.

H. Examine HVAC system and equipment installations to verify that indicated balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers, are properly installed, and that their locations are

accessible and appropriate for effective balancing and for efficient system and equipment operation.

I. Examine systems for functional deficiencies that cannot be corrected by adjusting and balancing.

J. Examine HVAC equipment to ensure that clean filters have been installed, bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.

K. Examine terminal units, such as variable-air-volume boxes, to verify that they are accessible and their controls are connected and functioning.

L. Examine plenum ceilings used for supply air to verify that they are airtight. Verify that pipe penetrations and other holes are sealed.

M. Examine strainers for clean screens and proper perforations.

N. Examine three-way valves for proper installation for their intended function of diverting or mixing fluid flows.

O. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

P. Examine system pumps to ensure absence of entrained air in the suction piping.

Q. Examine equipment for installation and for properly operating safety interlocks and controls.

R. Examine automatic temperature system components to verify the following:

1. Dampers, valves, and other controlled devices are operated by the intended controller.
2. Dampers and valves are in the position indicated by the controller.
3. Integrity of valves and dampers for free and full operation and for tightness of fully closed and fully open positions. This includes dampers in multizone units, mixing boxes, and variable-air-volume terminals.
4. Automatic modulating and shutoff valves, including two-way valves and three-way mixing and diverting valves, are properly connected.
5. Thermostats and humidistats are located to avoid adverse effects of sunlight, drafts, and cold walls.
6. Sensors are located to sense only the intended conditions.
7. Sequence of operation for control modes is according to the Contract Documents.
8. Controller set points are set at indicated values.
9. Interlocked systems are operating.
10. Changeover from heating to cooling mode occurs according to indicated values.

S. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures.

B. Complete system readiness checks and prepare system readiness reports. Verify the following:

1. Permanent electrical power wiring is complete.
2. Hydronic systems are filled, clean, and free of air.
3. Automatic temperature-control systems are operational.
4. Equipment and duct access doors are securely closed.
5. Balance, smoke, and fire dampers are open.
6. Isolating and balancing valves are open and control valves are operational.
7. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
8. Windows and doors can be closed so indicated conditions for system operations can be met.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems".

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to insulation Specifications for this Project.

C. Mark equipment and balancing device settings with paint or other suitable, permanent identification material, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. For variable-air-volume systems, develop a plan to simulate diversity.

D. Determine the best locations in main and branch ducts for accurate duct airflow measurements.

E. Check airflow patterns from the outside-air louvers and dampers and the return- and exhaust-air dampers, through the supply-fan discharge and mixing dampers.

F. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

G. Verify that motor starters are equipped with properly sized thermal protection.

H. Check dampers for proper position to achieve desired airflow path.

I. Check for airflow blockages.

J. Check condensate drains for proper connections and functioning.

K. Check for proper sealing of air-handling unit components.

L. Check for proper sealing of air duct system.

3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.

1. Measure fan static pressures to determine actual static pressure as follows:

   a. Measure outlet static pressure as far downstream from the fan as practicable and upstream from restrictions in ducts such as elbows and transitions.
   b. Measure static pressure directly at the fan outlet or through the flexible connection.
   c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from flexible connection and downstream from duct restrictions.
   d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.

2. Measure static pressure across each component that makes up an air-handling unit, rooftop unit, and other air-handling and -treating equipment.

   a. Simulate dirty filter operation and record the point at which maintenance personnel must change filters.

3. Measure static pressures entering and leaving other devices such as sound traps, heat recovery equipment, and air washers, under final balanced conditions.
4. Compare design data with installed conditions to determine variations in design static pressures versus actual static pressures. Compare actual system effect factors with calculated system effect factors to identify where variations occur. Recommend corrective action to align design and actual conditions.
5. Obtain approval from Architect for adjustment of fan speed higher or lower than indicated speed. Make required adjustments to pulley sizes, motor sizes, and electrical connections to accommodate fan-speed changes.
6. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full cooling, full

heating, economizer, and any other operating modes to determine the maximum required brake horsepower.

B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows within specified tolerances.

1. Measure static pressure at a point downstream from the balancing damper and adjust volume dampers until the proper static pressure is achieved.

a. Where sufficient space in submain and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.

2. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust submain and branch ducts to indicated airflows within specified tolerances.

C. Measure terminal outlets and inlets without making adjustments.

1. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.

D. Adjust terminal outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using volume dampers rather than extractors and the dampers at air terminals.

1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.
2. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.6 PROCEDURES FOR VARIABLE-AIR-VOLUME SYSTEMS

A. Compensating for Diversity: When the total airflow of all terminal units is more than the indicated airflow of the fan, place a selected number of terminal units at a maximum set-point airflow condition until the total airflow of the terminal units equals the indicated airflow of the fan. Select the reduced airflow terminal units so they are distributed evenly among the branch ducts.

B. Pressure-Independent, Variable-Air-Volume Systems: After the fan systems have been adjusted, adjust the variable-air-volume systems as follows:

1. Set outside-air dampers at minimum, and return- and exhaust-air dampers at a position that simulates full-cooling load.
2. Select the terminal unit that is most critical to the supply-fan airflow and static pressure. Measure static pressure. Adjust system static pressure so the entering static pressure for the critical terminal unit is not less than the sum of terminal-unit manufacturer's recommended minimum inlet static pressure plus the static pressure needed to overcome terminal-unit discharge system losses.
3. Measure total system airflow. Adjust to within indicated airflow.

4. Set terminal units at maximum airflow and adjust controller or regulator to deliver the designed maximum airflow. Use terminal-unit manufacturer's written instructions to make this adjustment. When total airflow is correct, balance the air outlets downstream from terminal units as described for constant-volume air systems.
5. Set terminal units at minimum airflow and adjust controller or regulator to deliver the designed minimum airflow. Check air outlets for a proportional reduction in airflow as described for constant-volume air systems.

    a. If air outlets are out of balance at minimum airflow, report the condition but leave outlets balanced for maximum airflow.

6. Remeasure the return airflow to the fan while operating at maximum return airflow and minimum outside airflow. Adjust the fan and balance the return-air ducts and inlets as described for constant-volume air systems.
7. Measure static pressure at the most critical terminal unit and adjust the static-pressure controller at the main supply-air sensing station to ensure that adequate static pressure is maintained at the most critical unit.
8. Record the final fan performance data.

C. Pressure-Dependent, Variable-Air-Volume Systems without Diversity: After the fan systems have been adjusted, adjust the variable-air-volume systems as follows:

1. Balance systems similar to constant-volume air systems.
2. Set terminal units and supply fan at full-airflow condition.
3. Adjust inlet dampers of each terminal unit to indicated airflow and verify operation of the static-pressure controller. When total airflow is correct, balance the air outlets downstream from terminal units as described for constant-volume air systems.
4. Readjust fan airflow for final maximum readings.
5. Measure operating static pressure at the sensor that controls the supply fan, if one is installed, and verify operation of the static-pressure controller.
6. Set supply fan at minimum airflow if minimum airflow is indicated. Measure static pressure to verify that it is being maintained by the controller.
7. Set terminal units at minimum airflow and adjust controller or regulator to deliver the designed minimum airflow. Check air outlets for a proportional reduction in airflow as described for constant-volume air systems.

    a. If air outlets are out of balance at minimum airflow, report the condition but leave the outlets balanced for maximum airflow.

8. Measure the return airflow to the fan while operating at maximum return airflow and minimum outside airflow. Adjust the fan and balance the return-air ducts and inlets as described for constant-volume air systems.

D. Pressure-Dependent, Variable-Air-Volume Systems with Diversity: After the fan systems have been adjusted, adjust the variable-air-volume systems as follows:

1. Set system at maximum indicated airflow by setting the required number of terminal units at minimum airflow. Select the reduced airflow terminal units so they are distributed evenly among the branch ducts.

2. Adjust supply fan to maximum indicated airflow with the variable-airflow controller set at maximum airflow.
3. Set terminal units at full-airflow condition.
4. Adjust terminal units starting at the supply-fan end of the system and continuing progressively to the end of the system. Adjust inlet dampers of each terminal unit to indicated airflow. When total airflow is correct, balance the air outlets downstream from terminal units as described for constant-volume air systems.
5. Adjust terminal units for minimum airflow.
6. Measure static pressure at the sensor.
7. Measure the return airflow to the fan while operating at maximum return airflow and minimum outside airflow. Adjust the fan and balance the return-air ducts and inlets as described for constant-volume air systems.

3.7 GENERAL PROCEDURES FOR HYDRONIC SYSTEMS

A. Prepare test reports with pertinent design data and number in sequence starting at pump to end of system. Check the sum of branch-circuit flows against approved pump flow rate. Correct variations that exceed plus or minus 5 percent.

B. Prepare schematic diagrams of systems' "as-built" piping layouts.

C. Prepare hydronic systems for testing and balancing according to the following, in addition to the general preparation procedures specified above:

1. Open all manual valves for maximum flow.
2. Check expansion tank liquid level.
3. Check makeup-water-station pressure gage for adequate pressure for highest vent.
4. Check flow-control valves for specified sequence of operation and set at indicated flow.
5. Set differential-pressure control valves at the specified differential pressure. Do not set at fully closed position when pump is positive-displacement type unless several terminal valves are kept open.
6. Set system controls so automatic valves are wide open to heat exchangers.
7. Check pump-motor load. If motor is overloaded, throttle main flow-balancing device so motor nameplate rating is not exceeded.
8. Check air vents for a forceful liquid flow exiting from vents when manually operated.

3.8 PROCEDURES FOR HYDRONIC SYSTEMS

A. Measure water flow at pumps. Use the following procedures, except for positive-displacement pumps:

1. Verify impeller size by operating the pump with the discharge valve closed. Read pressure differential across the pump. Convert pressure to head and correct for differences in gage heights. Note the point on manufacturer's pump curve at zero flow and verify that the pump has the intended impeller size.
2. Check system resistance. With all valves open, read pressure differential across the pump and mark pump manufacturer's head-capacity curve. Adjust pump discharge valve until indicated water flow is achieved.

3. Verify pump-motor brake horsepower. Calculate the intended brake horsepower for the system based on pump manufacturer's performance data. Compare calculated brake horsepower with nameplate data on the pump motor. Report conditions where actual amperage exceeds motor nameplate amperage.
4. Report flow rates that are not within plus or minus 5 percent of design.

B. Set calibrated balancing valves, if installed, at calculated presettings.

C. Measure flow at all stations and adjust, where necessary, to obtain first balance.

1. System components that have Cv rating or an accurately cataloged flow-pressure-drop relationship may be used as a flow-indicating device.

D. Measure flow at main balancing station and set main balancing device to achieve flow that is 5 percent greater than indicated flow.

E. Adjust balancing stations to within specified tolerances of indicated flow rate as follows:

1. Determine the balancing station with the highest percentage over indicated flow.
2. Adjust each station in turn, beginning with the station with the highest percentage over indicated flow and proceeding to the station with the lowest percentage over indicated flow.
3. Record settings and mark balancing devices.

F. Measure pump flow rate and make final measurements of pump amperage, voltage, rpm, pump heads, and systems' pressures and temperatures including outdoor-air temperature.

G. Measure the differential-pressure control valve settings existing at the conclusions of balancing.

3.9 PROCEDURES FOR PRIMARY-SECONDARY-FLOW HYDRONIC SYSTEMS

A. Balance the primary system crossover flow first, then balance the secondary system.

3.10 PROCEDURES FOR MOTORS

A. Motors, 1/2 HP and Larger: Test at final balanced conditions and record the following data:

1. Manufacturer, model, and serial numbers.
2. Motor horsepower rating.
3. Motor rpm.
4. Efficiency rating.
5. Nameplate and measured voltage, each phase.
6. Nameplate and measured amperage, each phase.
7. Starter thermal-protection-element rating.

B. Motors Driven by Variable-Frequency Controllers: Test for proper operation at speeds varying from minimum to maximum. Test the manual bypass for the controller to prove proper

operation. Record observations, including controller manufacturer, model and serial numbers, and nameplate data.

3.11 PROCEDURES FOR CHILLERS

A. Balance water flow through each evaporator and condenser to within specified tolerances of indicated flow with all pumps operating. With only one chiller operating in a multiple chiller installation, do not exceed the flow for the maximum tube velocity recommended by the chiller manufacturer. Measure and record the following data with each chiller operating at design conditions:

1. Evaporator-water entering and leaving temperatures, pressure drop, and water flow.
2. If water-cooled chillers, condenser-water entering and leaving temperatures, pressure drop, and water flow.
3. Evaporator and condenser refrigerant temperatures and pressures, using instruments furnished by chiller manufacturer.
4. Power factor if factory-installed instrumentation is furnished for measuring kilowatt.
5. Kilowatt input if factory-installed instrumentation is furnished for measuring kilowatt.
6. Capacity: Calculate in tons of cooling.
7. If air-cooled chillers, verify condenser-fan rotation and record fan and motor data including number of fans and entering- and leaving-air temperatures.

3.12 PROCEDURES FOR BOILERS

A. If hydronic, measure entering- and leaving-water temperatures and water flow.

B. If steam, measure entering-water temperature and flow and leaving steam pressure, temperature, and flow.

3.13 PROCEDURES FOR HEAT-TRANSFER COILS

A. Water Coils: Measure the following data for each coil:

1. Entering- and leaving-water temperature.
2. Water flow rate.
3. Water pressure drop.
4. Dry-bulb temperature of entering and leaving air.
5. Wet-bulb temperature of entering and leaving air for cooling coils.
6. Airflow.
7. Air pressure drop.

B. Refrigerant Coils: Measure the following data for each coil:

1. Dry-bulb temperature of entering and leaving air.
2. Wet-bulb temperature of entering and leaving air.
3. Airflow.
4. Air pressure drop.

5. Refrigerant suction pressure and temperature.

3.14 PROCEDURES FOR TEMPERATURE MEASUREMENTS

A. During TAB, report the need for adjustment in temperature regulation within the automatic temperature-control system.

B. Measure indoor wet- and dry-bulb temperatures every other hour for a period of two successive eight-hour days, in each separately controlled zone, to prove correctness of final temperature settings. Measure when the building or zone is occupied.

C. Measure outside-air, wet- and dry-bulb temperatures.

3.15 PROCEDURES FOR SPACE PRESSURIZATION MEASUREMENTS AND ADJUSTMENTS

A. Before testing for space pressurization, observe the space to verify the integrity of the space boundaries. Verify that windows and doors are closed and applicable safing, gaskets, and sealants are installed. Report deficiencies and postpone testing until after the reported deficiencies are corrected.

B. Measure, adjust, and record the pressurization of each room, each zone, and each building by adjusting the supply, return, and exhaust airflows to achieve the indicated conditions.

C. Measure space pressure differential where pressure is used as the design criteria, and measure airflow differential where differential airflow is used as the design criteria for space pressurization.

1. For pressure measurements, measure and record the pressure difference between the intended spaces at the door with all doors in the space closed. Record the high-pressure side, low-pressure side, and pressure difference between each adjacent space.
2. For applications with cascading levels of space pressurization, begin in the most critical space and work to the least critical space.
3. Test room pressurization first, then zones, and finish with building pressurization.

D. To achieve indicated pressurization, set the supply airflow to the indicated conditions and adjust the exhaust and return airflow to achieve the indicated pressure or airflow difference.

E. For spaces with pressurization being monitored and controlled automatically, observe and adjust the controls to achieve the desired set point.

1. Compare the values of the measurements taken to the measured values of the control system instruments and report findings.
2. Check the repeatability of the controls by successive tests designed to temporarily alter the ability to achieve space pressurization. Test overpressurization and underpressurization, and observe and report on the system's ability to revert to the set point.

3. For spaces served by variable-air-volume supply and exhaust systems, measure space pressurization at indicated airflow and minimum airflow conditions.

F. In spaces that employ multiple modes of operation, such as normal mode and emergency mode or occupied mode and unoccupied mode, measure, adjust, and record data for each operating mode.

G. Record indicated conditions and corresponding initial and final measurements. Report deficiencies.

3.16 PROCEDURES FOR VIBRATION MEASUREMENTS

A. Use a vibration meter meeting the following criteria:

1. Solid-state circuitry with a piezoelectric accelerometer.
2. Velocity range of 0.1 to 10 inches per second (2.5 to 254 mm/s).
3. Displacement range of 1 to 100 mils (0.0254 to 2.54 mm).
4. Frequency range of at least 0 to 1000 Hz.
5. Capable of filtering unwanted frequencies.

B. Calibrate the vibration meter before each day of testing.

1. Use a calibrator provided with the vibration meter.
2. Follow vibration meter and calibrator manufacturer's calibration procedures.

C. Perform vibration measurements when other building and outdoor vibration sources are at a minimum level and will not influence measurements of equipment being tested.

1. Turn off equipment in the building that might interfere with testing.
2. Clear the space of people.

D. Perform vibration measurements after air and water balancing and equipment testing is complete.

E. Clean equipment surfaces in contact with the vibration transducer.

F. Position the vibration transducer according to manufacturer's written instructions and to avoid interference with the operation of the equipment being tested.

G. Measure and record vibration on rotating equipment over 3 hp (2.2 kW).

H. Measure and record equipment vibration, bearing vibration, equipment base vibration, and building structure vibration. Record velocity and displacement readings in the horizontal, vertical, and axial planes.

1. Pumps:

a. Pump Bearing: Drive end and opposite end.
b. Motor Bearing: Drive end and opposite end.

c. Pump Base: Top and side.
d. Building: Floor.
e. Piping: To and from the pump after flexible connections.

2. Fans and HVAC Equipment with Fans:

a. Fan Bearing: Drive end and opposite end.
b. Motor Bearing: Drive end and opposite end.
c. Equipment Casing: Top and side.
d. Equipment Base: Top and side.
e. Building: Floor.
f. Ductwork: To and from equipment after flexible connections.
g. Piping: To and from equipment after flexible connections.

3. Chillers and HVAC Equipment with Compressors:

a. Compressor Bearing: Drive end and opposite end.
b. Motor Bearing: Drive end and opposite end.
c. Equipment Casing: Top and side.
d. Equipment Base: Top and side.
e. Building: Floor.
f. Piping: To and from equipment after flexible connections.

I. For equipment with vibration isolation, take floor measurements with the vibration isolation blocked solid to the floor and with the vibration isolation floating. Calculate and report the differences.

J. Inspect, measure, and record vibration isolation.

1. Verify that vibration isolation is installed in the required locations.
2. Verify that installation is level and plumb.
3. Verify that isolators are properly anchored.
4. For spring isolators, measure the compressed spring height, the spring OD, and the travel-to-solid distance.
5. Measure the operating clearance between each inertia base and the floor or concrete base below. Verify that there is unobstructed clearance between the bottom of the inertia base and the floor.

3.17 PROCEDURES FOR SOUND-LEVEL MEASUREMENTS

A. Perform sound-pressure-level measurements with an octave-band analyzer complying with ANSI S1.4 for Type 1 sound-level meters and ANSI S1.11 for octave-band filters. Comply with requirements in ANSI S1.13, unless otherwise indicated.

B. Calibrate sound meters before each day of testing. Use a calibrator provided with the sound meter complying with ANSI S1.40 and that has NIST certification.

C. Use a microphone that is suitable for the type of sound levels measured. For areas where air velocities exceed 100 fpm (0.51 m/s), use a windscreen on the microphone.

D. Perform sound-level testing after air and water balancing and equipment testing are complete.

E. Close windows and doors to the space.

F. Perform measurements when the space is not occupied and when the occupant noise level from other spaces in the building and outside are at a minimum.

G. Clear the space of temporary sound sources so unrelated disturbances will not be measured. Position testing personnel during measurements to achieve a direct line-of-sight between the sound source and the sound-level meter.

H. Take sound measurements at a height approximately 48 inches (1200 mm) above the floor and at least 36 inches (900 mm) from a wall, column, and other large surface capable of altering the measurements.

I. Take sound measurements in dBA and in each of the 8 unweighted octave bands in the frequency range of 63 to 8000 Hz.

J. Take sound measurements with the HVAC systems off to establish the background sound levels and take sound measurements with the HVAC systems operating.

1. Calculate the difference between measurements. Apply a correction factor depending on the difference and adjust measurements.

K. Perform sound testing at two locations on Project for each of the following space types. For each space type tested, select a measurement location that has the greatest sound level. If testing multiple locations for each space type, select at least one location that is near and at least one location that is remote from the predominant sound source.

1. Private office.
2. Open office area.
3. Conference room.
4. Auditorium/large meeting room/lecture hall.
5. Classroom/training room.
6. Sound or vibration sensitive reading room.
7. Inside each mechanical equipment room.

3.18 PROCEDURES FOR TESTING, ADJUSTING, AND BALANCING EXISTING SYSTEMS

A. Perform a preconstruction inspection of existing equipment that is to remain and be reused.

1. Measure and record the operating speed, airflow, and static pressure of each fan.
2. Measure motor voltage and amperage. Compare the values to motor nameplate information.
3. Check the refrigerant charge.
4. Check the condition of filters.
5. Check the condition of coils.
6. Check the operation of the drain pan and condensate drain trap.
7. Check bearings and other lubricated parts for proper lubrication.

8. Report on the operating condition of the equipment and the results of the measurements taken. Report deficiencies.

B. Before performing testing and balancing of existing systems, inspect existing equipment that is to remain and be reused to verify that existing equipment has been cleaned and refurbished.

1. New filters are installed.
2. Coils are clean and fins combed.
3. Drain pans are clean.
4. Fans are clean.
5. Bearings and other parts are properly lubricated.
6. Deficiencies noted in the preconstruction report are corrected.

C. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.

1. Compare the indicated airflow of the renovated work to the measured fan airflows and determine the new fan, speed, filter, and coil face velocity.
2. Verify that the indicated airflows of the renovated work result in filter and coil face velocities and fan speeds that are within the acceptable limits defined by equipment manufacturer.
3. If calculations increase or decrease the airflow and water flow rates by more than 5 percent, make equipment adjustments to achieve the calculated airflow and water flow rates. If 5 percent or less, equipment adjustments are not required.
4. Air balance each air outlet.

3.19 TEMPERATURE-CONTROL VERIFICATION

A. Verify that controllers are calibrated and commissioned.

B. Check transmitter and controller locations and note conditions that would adversely affect control functions.

C. Record controller settings and note variances between set points and actual measurements.

D. Check the operation of limiting controllers (i.e., high- and low-temperature controllers).

E. Check free travel and proper operation of control devices such as damper and valve operators.

F. Check the sequence of operation of control devices. Note air pressures and device positions and correlate with airflow and water flow measurements. Note the speed of response to input changes.

G. Check the interaction of electrically operated switch transducers.

H. Check the interaction of interlock and lockout systems.

I. Check main control supply-air pressure and observe compressor and dryer operations.

J. Record voltages of power supply and controller output. Determine whether the system operates on a grounded or nongrounded power supply.

K. Note operation of electric actuators using spring return for proper fail-safe operations.

3.20 TOLERANCES

A. Set HVAC system airflow and water flow rates within the following tolerances:

1. Supply, Return, and Exhaust Fans and Equipment with Fans: Plus 5 to plus 10 percent.
2. Air Outlets and Inlets: 0 to minus 10 percent.
3. Heating-Water Flow Rate: 0 to minus 10 percent.
4. Cooling-Water Flow Rate: 0 to minus 5 percent.

3.21 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

B. Status Reports: As Work progresses, prepare reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.22 FINAL REPORT

A. General: Typewritten, or computer printout in letter-quality font, on standard bond paper, in three-ring binder, tabulated and divided into sections by tested and balanced systems.

B. Include a certification sheet in front of binder signed and sealed by the certified testing and balancing engineer.

1. Include a list of instruments used for procedures, along with proof of calibration.

C. Final Report Contents: In addition to certified field report data, include the following:

1. Pump curves.
2. Fan curves.
3. Manufacturers' test data.
4. Field test reports prepared by system and equipment installers.
5. Other information relative to equipment performance, but do not include Shop Drawings and Product Data.

D. General Report Data: In addition to form titles and entries, include the following data in the final report, as applicable:

1. Title page.
2. Name and address of TAB firm.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.
7. Contractor's name and address.
8. Report date.
9. Signature of TAB firm who certifies the report.
10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
11. Summary of contents including the following:

    a. Indicated versus final performance.
    b. Notable characteristics of systems.
    c. Description of system operation sequence if it varies from the Contract Documents.

12. Nomenclature sheets for each item of equipment.
13. Data for terminal units, including manufacturer, type size, and fittings.
14. Notes to explain why certain final data in the body of reports varies from indicated values.
15. Test conditions for fans and pump performance forms including the following:

    a. Settings for outside-, return-, and exhaust-air dampers.
    b. Conditions of filters.
    c. Cooling coil, wet- and dry-bulb conditions.
    d. Face and bypass damper settings at coils.
    e. Fan drive settings including settings and percentage of maximum pitch diameter.
    f. Inlet vane settings for variable-air-volume systems.
    g. Settings for supply-air, static-pressure controller.
    h. Other system operating conditions that affect performance.

E. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:

1. Quantities of outside, supply, return, and exhaust airflows.
2. Water and steam flow rates.
3. Duct, outlet, and inlet sizes.
4. Pipe and valve sizes and locations.
5. Terminal units.
6. Balancing stations.
7. Position of balancing devices.

F. Air-Handling Unit Test Reports: For air-handling units with coils, include the following:

1. Unit Data: Include the following:

    a. Unit identification.
    b. Location.
    c. Make and type.
    d. Model number and unit size.
    e. Manufacturer's serial number.
    f. Unit arrangement and class.
    g. Discharge arrangement.
    h. Sheave make, size in inches (mm), and bore.
    i. Sheave dimensions, center-to-center, and amount of adjustments in inches (mm).
    j. Number of belts, make, and size.
    k. Number of filters, type, and size.

2. Motor Data:

    a. Make and frame type and size.
    b. Horsepower and rpm.
    c. Volts, phase, and hertz.
    d. Full-load amperage and service factor.
    e. Sheave make, size in inches (mm), and bore.
    f. Sheave dimensions, center-to-center, and amount of adjustments in inches (mm).

3. Test Data (Indicated and Actual Values):

    a. Total airflow rate in cfm (L/s).
    b. Total system static pressure in inches wg (Pa).
    c. Fan rpm.
    d. Discharge static pressure in inches wg (Pa).
    e. Filter static-pressure differential in inches wg (Pa).
    f. Preheat coil static-pressure differential in inches wg (Pa).
    g. Cooling coil static-pressure differential in inches wg (Pa).
    h. Heating coil static-pressure differential in inches wg (Pa).
    i. Outside airflow in cfm (L/s).
    j. Return airflow in cfm (L/s).
    k. Outside-air damper position.
    l. Return-air damper position.
    m. Vortex damper position.

G. Apparatus-Coil Test Reports:

1. Coil Data:

    a. System identification.
    b. Location.
    c. Coil type.
    d. Number of rows.
    e. Fin spacing in fins per inch (mm) o.c.
    f. Make and model number.

g. Face area in sq. ft. (sq. m).
h. Tube size in NPS (DN).
i. Tube and fin materials.
j. Circuiting arrangement.

2. Test Data (Indicated and Actual Values):

a. Airflow rate in cfm (L/s).
b. Average face velocity in fpm (m/s).
c. Air pressure drop in inches wg (Pa).
d. Outside-air, wet- and dry-bulb temperatures in deg F (deg C).
e. Return-air, wet- and dry-bulb temperatures in deg F (deg C).
f. Entering-air, wet- and dry-bulb temperatures in deg F (deg C).
g. Leaving-air, wet- and dry-bulb temperatures in deg F (deg C).
h. Water flow rate in gpm (L/s).
i. Water pressure differential in feet of head or psig (kPa).
j. Entering-water temperature in deg F (deg C).
k. Leaving-water temperature in deg F (deg C).
l. Refrigerant expansion valve and refrigerant types.
m. Refrigerant suction pressure in psig (kPa).
n. Refrigerant suction temperature in deg F (deg C).
o. Inlet steam pressure in psig (kPa).

H. Gas-Fired Heat Apparatus Test Reports: In addition to manufacturer's factory startup equipment reports, include the following:

1. Unit Data:

a. System identification.
b. Location.
c. Make and type.
d. Model number and unit size.
e. Manufacturer's serial number.
f. Fuel type in input data.
g. Output capacity in Btuh (kW).
h. Ignition type.
i. Burner-control types.
j. Motor horsepower and rpm.
k. Motor volts, phase, and hertz.
l. Motor full-load amperage and service factor.
m. Sheave make, size in inches (mm), and bore.
n. Sheave dimensions, center-to-center, and amount of adjustments in inches (mm).

2. Test Data (Indicated and Actual Values):

a. Total airflow rate in cfm (L/s).
b. Entering-air temperature in deg F (deg C).
c. Leaving-air temperature in deg F (deg C).
d. Air temperature differential in deg F (deg C).

e. Entering-air static pressure in inches wg (Pa).
f. Leaving-air static pressure in inches wg (Pa).
g. Air static-pressure differential in inches wg (Pa).
h. Low-fire fuel input in Btuh (kW).
i. High-fire fuel input in Btuh (kW).
j. Manifold pressure in psig (kPa).
k. High-temperature-limit setting in deg F (deg C).
l. Operating set point in Btuh (kW).
m. Motor voltage at each connection.
n. Motor amperage for each phase.
o. Heating value of fuel in Btuh (kW).

I. Fan Test Reports: For supply, return, and exhaust fans, include the following:

1. Fan Data:

a. System identification.
b. Location.
c. Make and type.
d. Model number and size.
e. Manufacturer's serial number.
f. Arrangement and class.
g. Sheave make, size in inches (mm), and bore.
h. Sheave dimensions, center-to-center, and amount of adjustments in inches (mm).

2. Motor Data:

a. Make and frame type and size.
b. Horsepower and rpm.
c. Volts, phase, and hertz.
d. Full-load amperage and service factor.
e. Sheave make, size in inches (mm), and bore.
f. Sheave dimensions, center-to-center, and amount of adjustments in inches (mm).
g. Number of belts, make, and size.

3. Test Data (Indicated and Actual Values):

a. Total airflow rate in cfm (L/s).
b. Total system static pressure in inches wg (Pa).
c. Fan rpm.
d. Discharge static pressure in inches wg (Pa).
e. Suction static pressure in inches wg (Pa).

J. Round, Flat-Oval, and Rectangular Duct Traverse Reports: Include a diagram with a grid representing the duct cross-section and record the following:

1. Report Data:

a. System and air-handling unit number.
b. Location and zone.

c. Traverse air temperature in deg F (deg C).
d. Duct static pressure in inches wg (Pa).
e. Duct size in inches (mm).
f. Duct area in sq. ft. (sq. m).
g. Indicated airflow rate in cfm (L/s).
h. Indicated velocity in fpm (m/s).
i. Actual airflow rate in cfm (L/s).
j. Actual average velocity in fpm (m/s).
k. Barometric pressure in psig (Pa).

K. Air-Terminal-Device Reports:

1. Unit Data:

a. System and air-handling unit identification.
b. Location and zone.
c. Test apparatus used.
d. Area served.
e. Air-terminal-device make.
f. Air-terminal-device number from system diagram.
g. Air-terminal-device type and model number.
h. Air-terminal-device size.
i. Air-terminal-device effective area in sq. ft. (sq. m).

2. Test Data (Indicated and Actual Values):

a. Airflow rate in cfm (L/s).
b. Air velocity in fpm (m/s).
c. Preliminary airflow rate as needed in cfm (L/s).
d. Preliminary velocity as needed in fpm (m/s).
e. Final airflow rate in cfm (L/s).
f. Final velocity in fpm (m/s).
g. Space temperature in deg F (deg C).

L. System-Coil Reports: For reheat coils and water coils of terminal units, include the following:

1. Unit Data:

a. System and air-handling unit identification.
b. Location and zone.
c. Room or riser served.
d. Coil make and size.
e. Flowmeter type.

2. Test Data (Indicated and Actual Values):

a. Airflow rate in cfm (L/s).
b. Entering-water temperature in deg F (deg C).
c. Leaving-water temperature in deg F (deg C).
d. Water pressure drop in feet of head or psig (kPa).

e. Entering-air temperature in deg F (deg C).
f. Leaving-air temperature in deg F (deg C).

M. Packaged Chiller Reports:

1. Unit Data:

a. Unit identification.
b. Make and model number.
c. Manufacturer's serial number.
d. Refrigerant type and capacity in gal. (L).
e. Starter type and size.
f. Starter thermal protection size.
g. Compressor make and model number.
h. Compressor manufacturer's serial number.

2. Air-Cooled Condenser Test Data (Indicated and Actual Values):

a. Refrigerant pressure in psig (kPa).
b. Refrigerant temperature in deg F (deg C).
c. Entering- and leaving-air temperature in deg F (deg C).

3. Evaporator Test Reports (Indicated and Actual Values):

a. Refrigerant pressure in psig (kPa).
b. Refrigerant temperature in deg F (deg C).
c. Entering-water temperature in deg F (deg C).
d. Leaving-water temperature in deg F (deg C).
e. Entering-water pressure in feet of head or psig (kPa).
f. Water pressure differential in feet of head or psig (kPa).

4. Compressor Test Data (Indicated and Actual Values):

a. Suction pressure in psig (kPa).
b. Suction temperature in deg F (deg C).
c. Discharge pressure in psig (kPa).
d. Discharge temperature in deg F (deg C).
e. Oil pressure in psig (kPa).
f. Oil temperature in deg F (deg C).
g. Voltage at each connection.
h. Amperage for each phase.
i. Kilowatt input.
j. Crankcase heater kilowatt.
k. Chilled-water control set point in deg F (deg C).
l. Condenser-water control set point in deg F (deg C).
m. Refrigerant low-pressure-cutoff set point in psig (kPa).
n. Refrigerant high-pressure-cutoff set point in psig (kPa).

5. Refrigerant Test Data (Indicated and Actual Values):

a. Oil level.
b. Refrigerant level.
c. Relief valve setting in psig (kPa).
d. Unloader set points in psig (kPa).
e. Percentage of cylinders unloaded.
f. Bearing temperatures in deg F (deg C).
g. Vane position.
h. Low-temperature-cutoff set point in deg F (deg C).

N. Pump Test Reports: Calculate impeller size by plotting the shutoff head on pump curves and include the following:

1. Unit Data:

a. Unit identification.
b. Location.
c. Service.
d. Make and size.
e. Model and serial numbers.
f. Water flow rate in gpm (L/s).
g. Water pressure differential in feet of head or psig (kPa).
h. Required net positive suction head in feet of head or psig (kPa).
i. Pump rpm.
j. Impeller diameter in inches (mm).
k. Motor make and frame size.
l. Motor horsepower and rpm.
m. Voltage at each connection.
n. Amperage for each phase.
o. Full-load amperage and service factor.
p. Seal type.

2. Test Data (Indicated and Actual Values):

a. Static head in feet of head or psig (kPa).
b. Pump shutoff pressure in feet of head or psig (kPa).
c. Actual impeller size in inches (mm).
d. Full-open flow rate in gpm (L/s).
e. Full-open pressure in feet of head or psig (kPa).
f. Final discharge pressure in feet of head or psig (kPa).
g. Final suction pressure in feet of head or psig (kPa).
h. Final total pressure in feet of head or psig (kPa).
i. Final water flow rate in gpm (L/s).
j. Voltage at each connection.
k. Amperage for each phase.

O. Boiler Test Reports:

1. Unit Data:

a. Unit identification.
b. Location.
c. Service.
d. Make and type.
e. Model and serial numbers.
f. Fuel type and input in Btuh (kW).
g. Number of passes.
h. Ignition type.
i. Burner-control types.
j. Voltage at each connection.
k. Amperage for each phase.

2. Test Data (Indicated and Actual Values):

a. Operating pressure in psig (kPa).
b. Operating temperature in deg F (deg C).
c. Entering-water temperature in deg F (deg C).
d. Leaving-water temperature in deg F (deg C).
e. Number of safety valves and sizes in NPS (DN).
f. Safety valve settings in psig (kPa).
g. High-limit setting in psig (kPa).
h. Operating-control setting.
i. High-fire set point.
j. Low-fire set point.
k. Voltage at each connection.
l. Amperage for each phase.
m. Draft fan voltage at each connection.
n. Draft fan amperage for each phase.
o. Manifold pressure in psig (kPa).

P. Vibration Measurement Reports:

1. Date and time of test.
2. Vibration meter manufacturer, model number, and serial number.
3. Equipment designation, location, equipment, speed, motor speed, and motor horsepower.
4. Diagram of equipment showing the vibration measurement locations.
5. Measurement readings for each measurement location.
6. Calculate isolator efficiency using measurements taken.
7. Description of predominant vibration source.

Q. Sound Measurement Reports: Record sound measurements on octave band and dBA test forms and on an NC or RC chart indicating the decibel level measured in each frequency band for both "background" and "HVAC system operating" readings. Record each tested location on a separate NC or RC chart. Record the following on the forms:

1. Date and time of test. Record each tested location on its own NC curve.
2. Sound meter manufacturer, model number, and serial number.
3. Space location within the building including floor level and room number.
4. Diagram or color photograph of the space showing the measurement location.

5. Time weighting of measurements, either fast or slow.
6. Description of the measured sound: steady, transient, or tonal.
7. Description of predominant sound source.

R. Instrument Calibration Reports:

1. Report Data:

a. Instrument type and make.
b. Serial number.
c. Application.
d. Dates of use.
e. Dates of calibration.

3.23 INSPECTIONS

A. Initial Inspection:

1. After testing and balancing are complete, operate each system and randomly check measurements to verify that the system is operating according to the final test and balance readings documented in the Final Report.
2. Randomly check the following for each system:

a. Measure airflow of at least 10 percent of air outlets.
b. Measure water flow of at least 5 percent of terminals.
c. Measure room temperature at each thermostat/temperature sensor. Compare the reading to the set point.
d. Measure sound levels at two locations.
e. Measure space pressure of at least 10 percent of locations.
f. Verify that balancing devices are marked with final balance position.
g. Note deviations to the Contract Documents in the Final Report.

B. Final Inspection:

1. After initial inspection is complete and evidence by random checks verifies that testing and balancing are complete and accurately documented in the final report, request that a final inspection be made by Owner.
2. TAB firm test and balance engineer shall conduct the inspection in the presence of the Owner..
3. Owner shall randomly select measurements documented in the final report to be rechecked. The rechecking shall be limited to either 10 percent of the total measurements recorded, or the extent of measurements that can be accomplished in a normal 8-hour business day.
4. If the rechecks yield measurements that differ from the measurements documented in the final report by more than the tolerances allowed, the measurements shall be noted as "FAILED."
5. If the number of "FAILED" measurements is greater than 10 percent of the total measurements checked during the final inspection, the testing and balancing shall be considered incomplete and shall be rejected.

6. TAB firm shall recheck all measurements and make adjustments. Revise the final report and balancing device settings to include all changes and resubmit the final report.
7. Request a second final inspection. If the second final inspection also fails, Owner shall contract the services of another TAB firm to complete the testing and balancing in accordance with the Contract Documents and deduct the cost of the services from the final payment.

3.24 ADDITIONAL TESTS

A. Within 90 days of completing TAB, perform additional testing and balancing to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

B. Seasonal Periods: If initial TAB procedures were not performed during near-peak summer and winter conditions, perform additional testing, inspecting, and adjusting during near-peak summer and winter conditions.

END OF SECTION 15950