

ThyssenKrupp Elevator Americas Business Unit



ThyssenKrupp

Product Development



To: Owners, Architects, and AHJs
From: John W. Koshak
cc:
Date: February 1, 2008
Re: 2006 IBC 84" Stretcher Requirements

Dear Owners and/or Architects

I am writing to provide information regarding the change in the ICC/IBC 2004 and later Editions that require an 84" x 24" stretcher and how ThyssenKrupp has responded to this significant Building Code change.

After researching stretchers used in North America, ThyssenKrupp determined that no domestic manufacturers or users of ambulance stretchers have products that are 84" long nor are any stretchers geometrically a rectangle. All are designed with corners that have a minimum radius of 5 in. and one manufacturer utilizing an 8 in. radius.

As a result of this investigation, ThyssenKrupp and NEII have submitted a proposal to change the language to the ICC to modify the Building Code to more accurately reflect the available stretcher products.

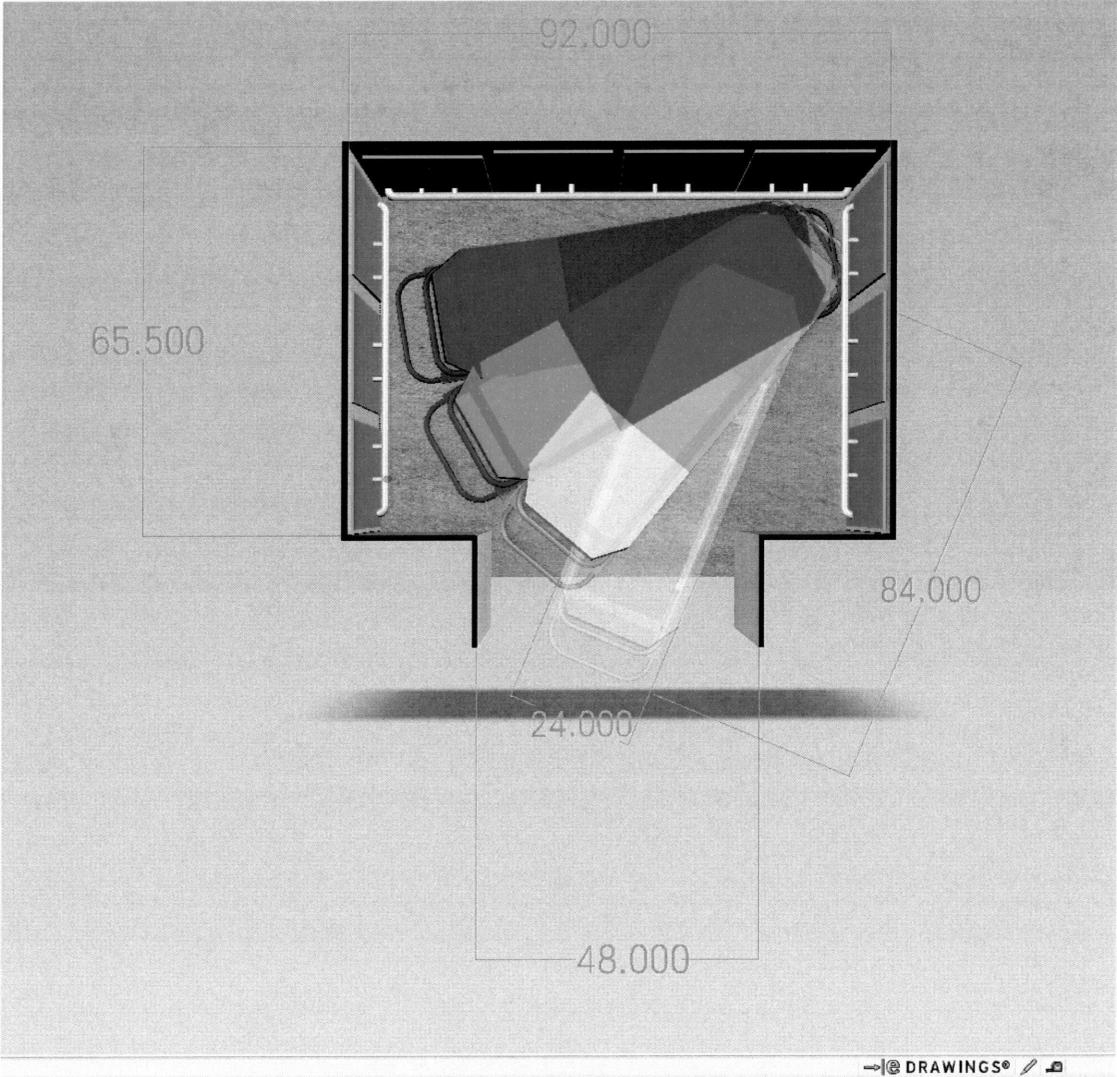
Using standard products, we can demonstrate compliance with requirement IBC 3002.4 with our #3,500 with 42 in. side slide doors and with our #4,000 with 48 in. center open doors as shown in the attached renderings that will accommodate the 84" contemporary stretchers. We also do provide a #4,000, 42 in. side slide door standard design in addition to using these two acceptable sizes.

We know that as more jurisdictions adopt the later versions of the Building Code it has become more of a question and therefore we are officially responding to the requests of our customers.

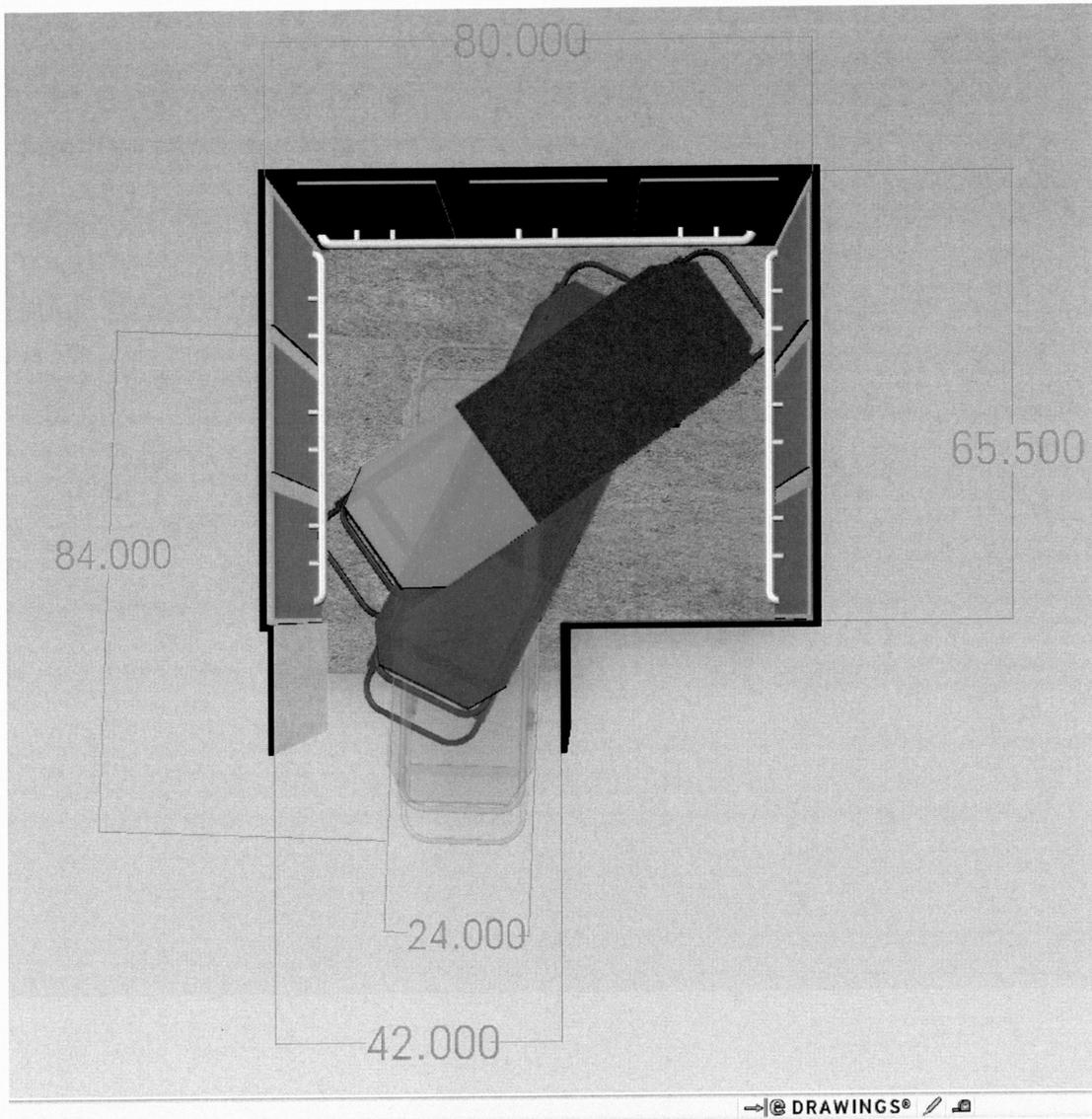
Respectfully submitted,

A handwritten signature in black ink that reads 'John W. Koshak'.

John W. Koshak
Director of Codes and Standards



#4,000 Center Opening



#3,500 Side Opening

1ST TRANSMITTAL REVISE & RESUBMIT WARRANTY SHOP FABRICATION

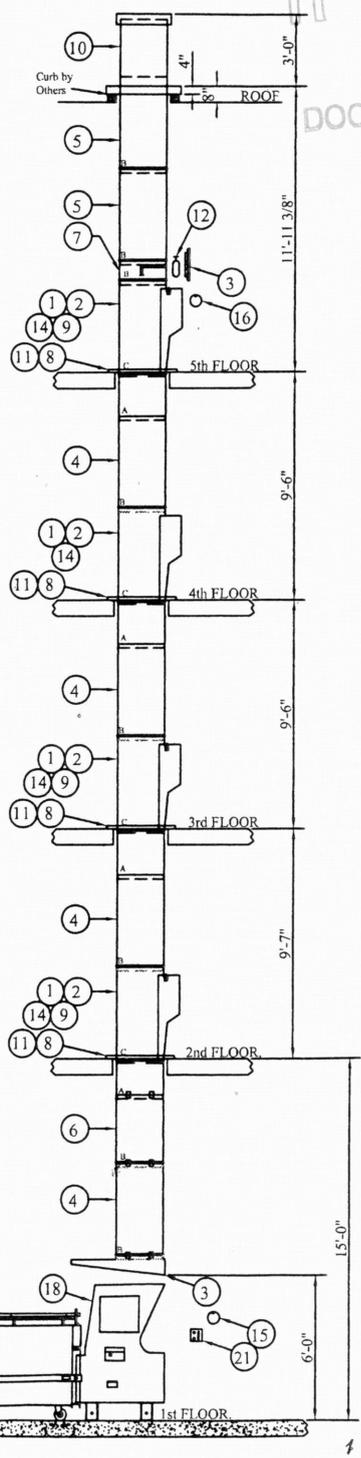
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PART NUMBER	QTY	
	24"Ø Chute: -(1)RUBBISH -16ga -Galvaneal	1
143111	24"Ø x 72" Intake Section.- See Detail Sheet (Page #2) -WITH Sound Dampening (Daubert 932)	4
2584N2	15"x18" BOTTOM HINGED. -See detail sheet (Page #2) -ELECTRICAL INTERLOCK (EI) -ADA PNEUMATIC -HAND OPERATED *Thum latch and trigger -Stainless Steel FOUR piece trim "RUBBISH" -Cylinder Lock. *Keyed alike *Normally Open *(2) Keys per lock	4
20015D	Discharge Door - See detail sheet (Page #2) -Type "A": Horizontal Insulated Sliding Steel door held open by fusible link.	1
14411T	24"Ø x 48" Pipe - WITH Sound Dampening (Daubert 932) -WITH Companion Clips Top & Bottom (1)	4
14412T	24"Ø x 48" Pipe - WITHOUT Sound Dampening.	1
14311T	24"Ø x 36" Pipe - WITH Sound Dampening (Daubert 932) -WITH Companion Clips Top & Bottom	1
14212Z	24"Ø x 24" Pipe - WITHOUT Sound Dampening -With Flushing Spray Head. 3/4" IPS flushing spray head assembled in 24" pipe section located above top intake ready for connection by others.	1
14042W	Floor Frames. -See detail sheet (Page #2)	4
91F006	Sprinkler Heads. -See detail sheet. (Page #3) Located at Floors: 5,3 & 2	3
1441SV	Full diameter Vent With Flat Flashing. W/SCREEN.	1
91B002	Korfound Isolator Pad. -Four Pieces for each floor frame.	16
91A002	Disinfecting and Sanitizing Unit. -See detail sheet (Page #3)	1
2554NQ	15"x15" RHDR. -See detail sheet (Page #2) -HAND OPERATED *Thum latch and trigger -Stainless Steel FOUR piece trim -Cylinder Lock. *Keyed alike *Normally Locked *(2) Keys per lock	1
91A033	RUBBER DOOR BAFFLES	4
91A020	Smoke detector units located as marked on chute elevation drawing. for connection by others.	1
91A024	Heat detector units located as marked on chute elevation drawing. for connection by others.	1
91A071	Air Compressor.	1
32011C	400 CS COMPACTOR	1
32011P	POWER PACK	1
30111T	TWO CUBIC YARD CONTAINER (Front Load)	2
91A126	Master Switch. Door riser power must be located at lockout switch location. Lockout Switch will reset after 45 minutes of continuous use and must be reset.	1

D

C

B

A

DESCRIPTION	REV.	DATE	INIT.
Revise	1	09/27/10	EM

This Drawing is the property of WILKINSON HI-RISE. It is loaned on the condition that it is not to be reproduced, copied or otherwise disposed of, and is not to be used in part to furnish information for the making of drawings, prints, or parts there of. The acceptance of the foregoing conditions and the recognition of the exclusive ownership in and to the drawings as the property of WILKINSON HI-RISE.

Job: MIRACLES CLUB
Address: PORTLAND, OR
Job #: D111648



WILKINSON-HI-RISE
3001 Greene Street
Hollywood, FL 33020
Tel: 800 231 3888

CUSTOMER: **RAM FORCE COMPACTION**
DWG. SCALE **NTS** SHEET **1 OF 4**

1.

2.

3.

4.

5.

6.

7.

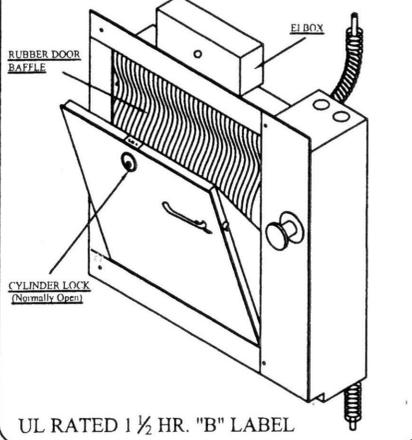
8.

1ST TRANSMITTAL REVISE & RESUBMIT WARRANTY SHOP FABRICATION

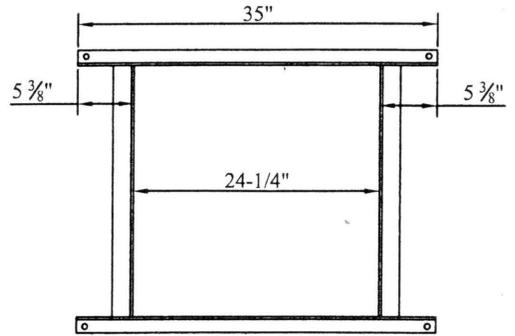
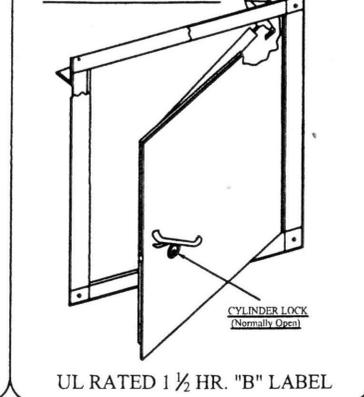
GENERAL NOTES:

1. All Chutes to have Wilkinson type vertical lock-seams and inside lap round-about joint. See Detail Sheet. (Or, whatever we reference the detail info in the shop drawings)
2. All cutting of floors, walls, or roof to allow for chute installation to be done by others.
3. Chute venting per NFPA 82 - Full size vent extending 3 ft. above finished roof.
4. Wilkinson Hi-Rise LLC complies with all NFPA guidelines and accepts no responsibility for the deviation of these standards by local codes or ordinances.

CHUTE DOOR DETAIL



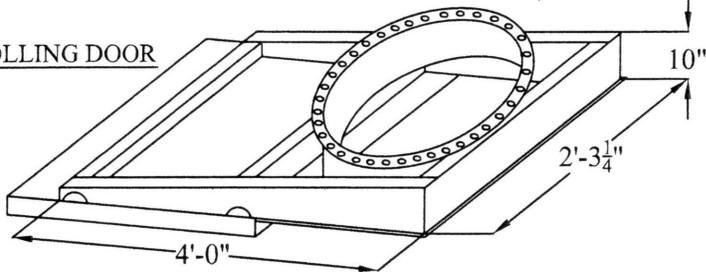
ACCESS DOOR DETAIL



FLOOR FRAME

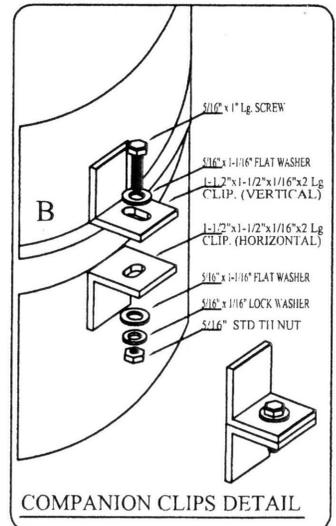
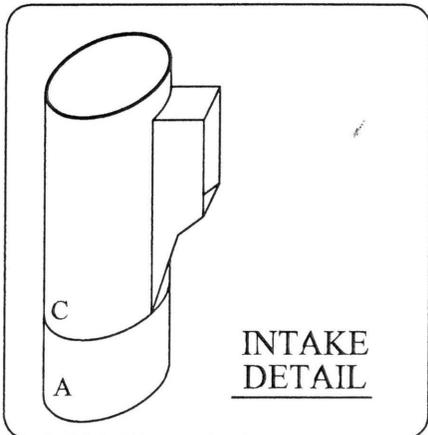
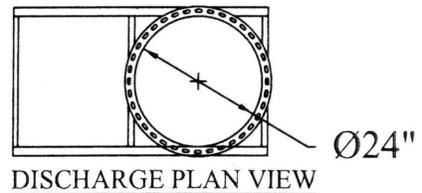
1-1/2"x1-1/2"x3/16" steel angle supports provided at each floor level. Steel hanger clips are factory welded at 90° onto chute.

ROLLING DOOR



DISCHARGE TYPE "A" DETAIL

DISCHARGE A



DESCRIPTION	REV.	DATE	INIT.
		08/30/10	EM
Revise	1	09/27/10	EM

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Job: MIRACLES CLUB
Address: PORTLAND, OR
Job #: DI11648



WILKINSON-HI-RISE
3001 Greene Street
Hollywood, FL 33020
Tel: 800 231 3888

CUSTOMER: **RAM FORCE COMPACTION**
DWG. SCALE: NTS SHEET: 2 OF 4

1

2

3

4

5

6

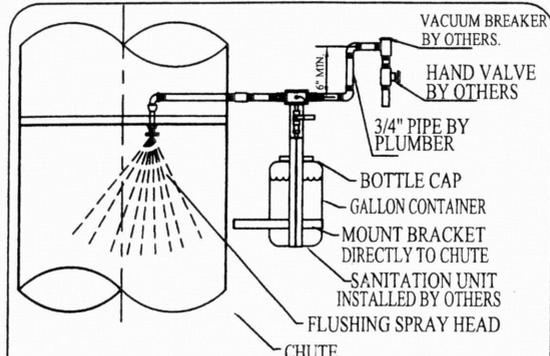
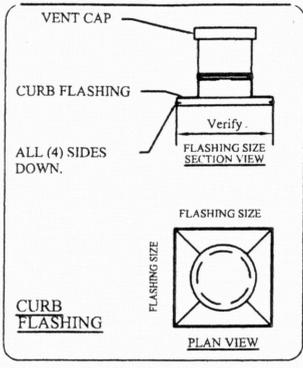
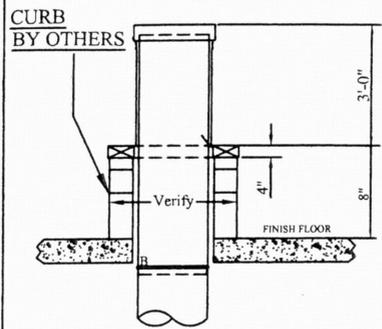
7

8

1ST TRANSMITTAL REVISE & RESUBMIT WARRANTY SHOP FABRICATION

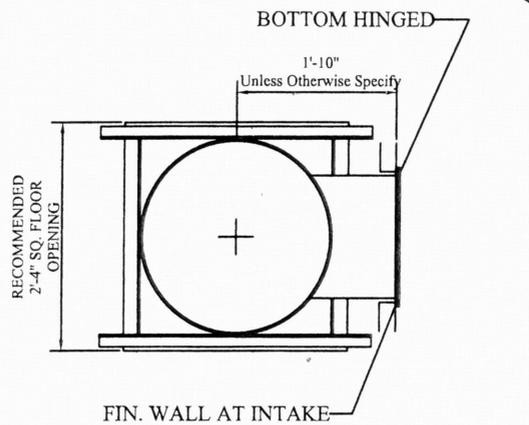
FIELD NOTE
 ENCLOSING WALLS AROUND CHUTES ARE NOT TO BE ERECTED UNTIL AFTER CHUTE IS INSTALLED
NOTE
 CONTRACTOR TO VERIFY AND APPROVE ALL DIMENSIONS ON THIS DRAWING WITH CONDITIONS AT THE JOB SITE. WILKINSON RESPONSIBLE FOR DEVIATIONS FROM THIS DRAWING ONCE APPROVED

NOTE:
 Customer needs to provide dimensions marked as VERIFY

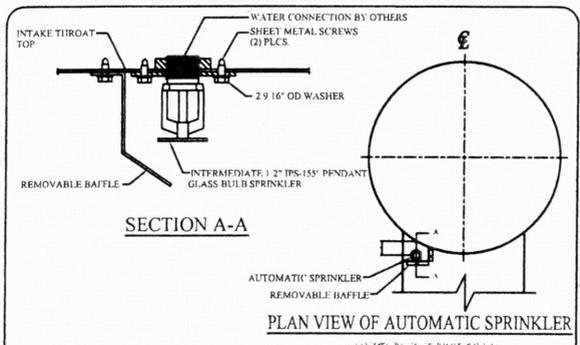


Fill solution tank with concentrated disinfecting solution. The syphon hose should reach the bottom of the solution container. To flush with clear water turn the lever handle to the OFF position. To flush with disinfecting solution turn the lever handle to the ON position. The proportioning valve is set at the factory for 50 gallons of water for 1 gallon of disinfecting solution.

SANITATION UNIT DETAIL

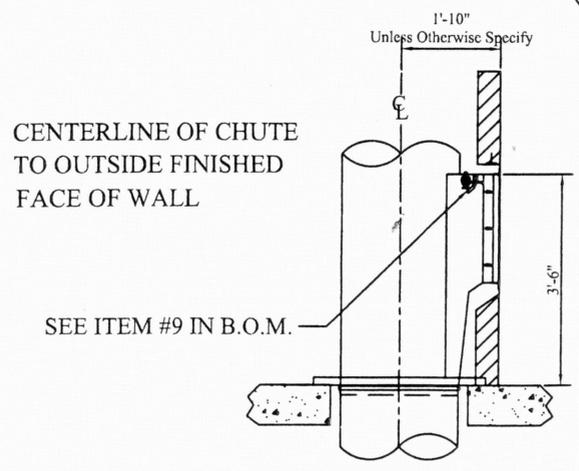


INTAKE PLAN VIEW
 TYPICAL VIEW

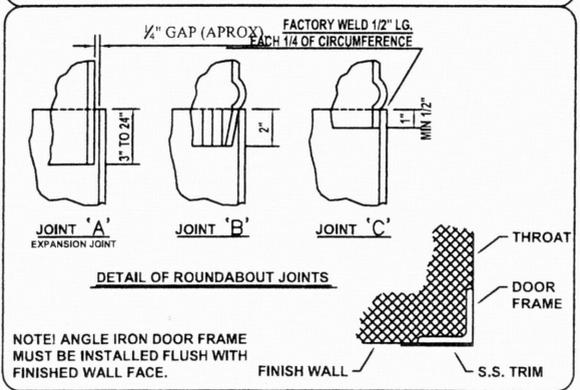


SECTION A-A

PLAN VIEW OF AUTOMATIC SPRINKLER



INTAKE SIDE VIEW
 TYPICAL VIEW



DETAIL OF ROUNDABOUT JOINTS

NOTE! ANGLE IRON DOOR FRAME MUST BE INSTALLED FLUSH WITH FINISHED WALL FACE.

DESCRIPTION	REV.	DATE	INIT.
		08/30/10	EM
Revise	1	09/27/10	EM

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Job: MIRACLES CLUB
Address: PORTLAND, OR
Job #: DI11648

WILKINSON-HI-RISE
 3001 Greene Street
 Hollywood, FL 33020
 Tel: 800 231 3888

CUSTOMER: RAM FORCE COMPACTION

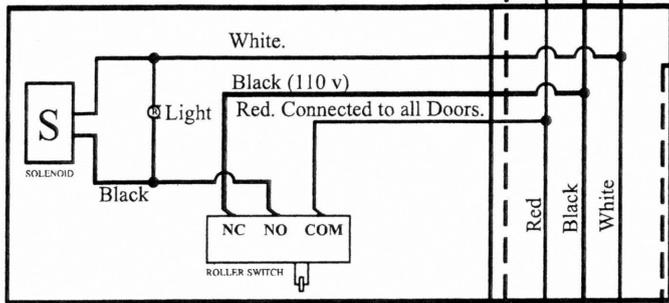
DWG. SCALE **NTS** SHEET **3 OF 4**

1 2 3 4 5 6 7 8

D

D

EI INTAKE BOX

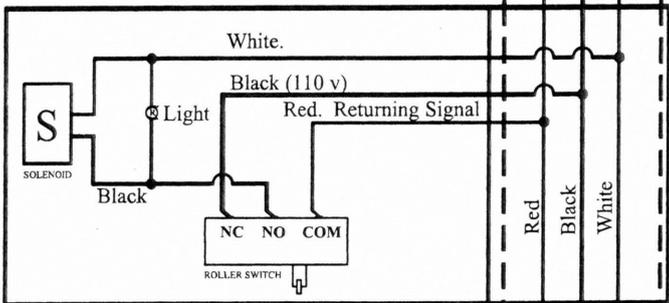


To Next Floors

C

C

EI INTAKE BOX

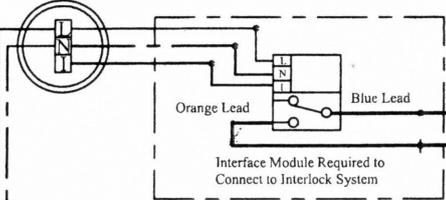


To Next Floors

B

B

SMOKE DETECTOR
(IF REQUIRED).
(Installed in Trash Room.)

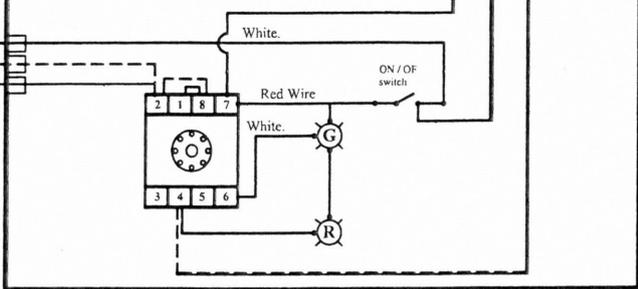


DO NOT CONNECT
ADDITIONAL DEVICES TO
THIS COMMUNICATION
CIRCUIT

LEGEND

SYMBOL	DESC.
	ON / OF Switch
	RED LIGHT
	GREEN LIGHT
	SOLENOID
	ROLLER SWITCH
	FIELD WIRING
	FACTORY WIRING

MASTER SWITCH



Black (110 v Line)
White (Neutral)
Green (Ground)

Power Requirements
120 VAC 60Hz Grounded Supply
L-N-G Polarity
Dedicated Brake Circuit to
feed the system

A

A

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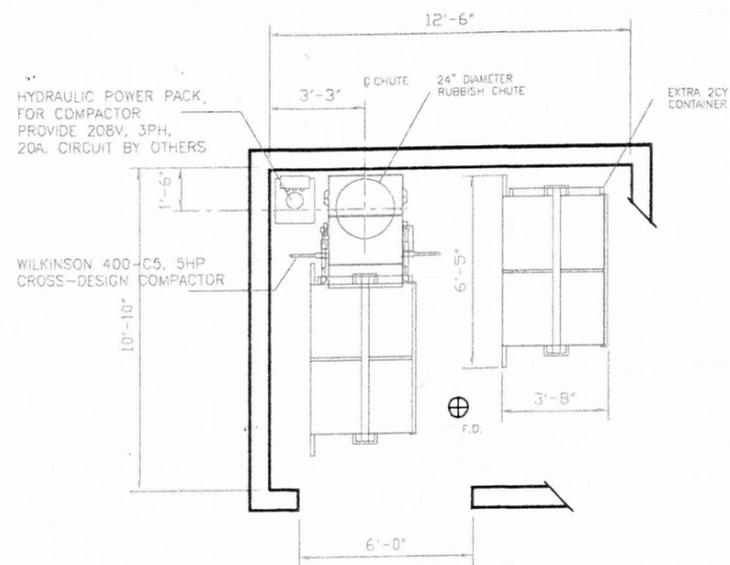


WILKINSON-HI-RISE
2321 Evans Street
Hollywood, FL 33020
Tel: 800 231 3888

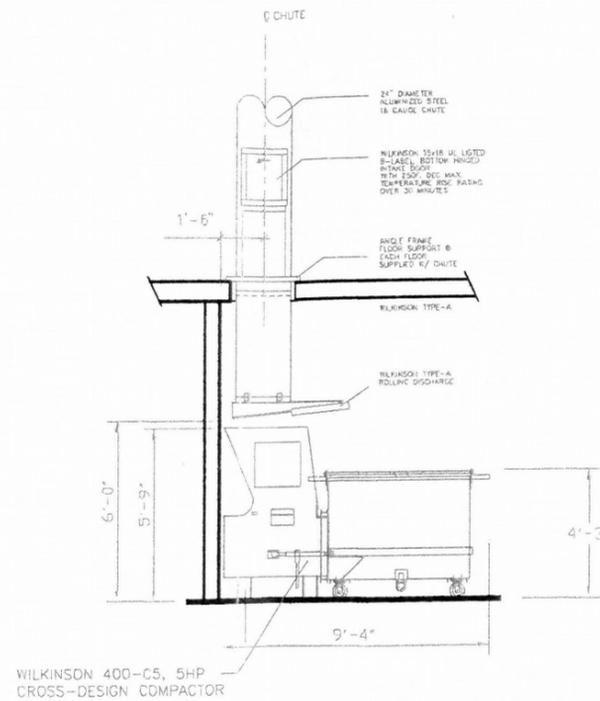
EI SCHEMATIC

DWG. SCALE NTS SHEET 4 OF 4

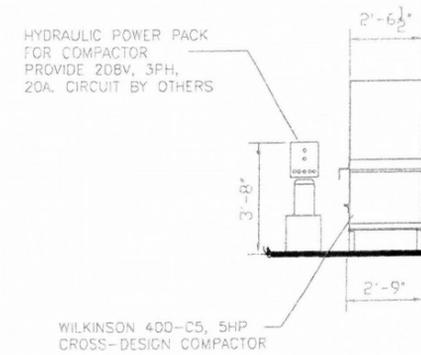
1 2 3 4 5 6 7 8



TYPICAL PLAN



SIDE ELEVATION / SECTION



FRONT ELEVATION



WILKINSON-HI-RISE, LLC
SPECIALTY
COMPACTORS:
MODEL 400-C5

QUESTIONS? DESIGN ASSISTANCE?

800.231.3888

COMPLETE DETAILS AVAILABLE

www.wilkinsonhirise.com

info@wilkinsonhirise.com

**** NOTICE ****

This is a proprietary patented system. It's manufacture, use or sale is strictly prohibited without the expressed written consent of Wilkinson-Hi-Rise, LLC, a North Carolina Corporation.

Life Safety Checksheet Response

Permit #: 12-132453-000-00-CO

Date: 7-13-12

Customer name and phone number: Mike Coyle, (503) 680-5497

Note: In the spaces below, please provide specific information concerning the changes that you have made in response to the checksheet. Note the checksheet item number, your response or a description of the revision, and the location of the change on the plans (i.e. page number and/or detail number). Use as many lines as needed. *If the item is not in response to a checksheet, write "Applicant" in the column labeled "Checksheet item number."*

Checksheet item number	Description of changes, corrections, additions, etc.	Location on plans
Additional question asked in email of June 19th, 2012: "Additional item not noted on checksheet. 2010 OSSC Section 1007.2.1 was revised on March 1 and now requires at least one elevator to serve as an accessible means of egress.	Please see A2.01 for revised elevator and generator notes. Elevator cab dimensions are identical to that which was submitted to the City of Portland previously. For your information, Page 6 of Code Summary, A0.03 was revised to reflect the elevator standby power requirement with Revision 3, submitted previously.	A2.01

Plan Bin Location: AX 11-2

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J. Butler

Life Safety Checksheet Response (Revised)

Permit #: 12-132453-000-00-CO

Date: 7-27-12

Customer name and phone number: Mike Coyle, (503) 680-5497

Note: In the spaces below, please provide specific information concerning the changes that you have made in response to the checksheet. Note the checksheet item number, your response or a description of the revision, and the location of the change on the plans (i.e. page number and/or detail number). Use as many lines as needed. *If the item is not in response to a checksheet, write "Applicant" in the column labeled "Checksheet item number."*

Checksheet item number	Description of changes, corrections, additions, etc.	Location on plans
Additional question asked in email of June 19th, 2012: "Additional item not noted on checksheet. 2010 OSSC Section 1007.2.1 was revised on March 1 and now requires at least one elevator to serve as an accessible means of egress.	Please see A2.01 and A5.03 for revised elevator and generator notes.	A2.01, A5.03

Plan Bin Location: AX 11-2

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DOCUMENT SERVICES

John BUTLER
L/S



CARLETON HART ARCHITECTURE
322 nw 8th avenue portland, oregon 97209
t 503 243 2252 | f 503 243 3261 | carletonhart.com

TRANSMITTAL

to Mike Coyle, Manager/ Rob Humphrey date 07.27.2012
Faster Permits
P.O. Box 42597
Portland OR 97242

from Christian Sterner via hand
project 21021 - Eliot MLK cc

# copies	date	description
1	07.27.12	Revised response to elevator standby comment
4	07.27.12	A2.01 First Floor Plan-Revision 4A
4	07.27.12	A5.03 Second Floor Plan-Revision 4A

remarks:

Please find the above enclosed for your submission to the COP. Attached are 8 full size sheets and responses to the one outstanding Life Safety comment.

Thank you,
Christian Sterner



CARLETON HART ARCHITECTURE
322 nw 8th avenue portland, oregon 97209
t 503 243 2252 | f 503 243 3261 | carletonhart.com

TRANSMITTAL

to John Butler
Bureau of Development Services

date 06.27.2012

from Christian Sterner

via Mike Coyle

project 21021 - Eliot MLK

cc Jean Hester, Planning and Zoning

copies date description

remarks:

John,



In addition to submitting the sheets revised in response to your comments, we are including other sheets to be inserted in the record drawing sets. These sheets are included to bring these sets up to date with recent revisions. Changes came about because of internal review, from a property line shift and from Design Review comments which we responded to in May. Below is an outline of changes.

A0.01 Project Information and Drawing Index: updated site areas in the Zoning Code Information language.

A0.06 Existing Conditions Survey: updated to the latest survey for reference only

A1.01 Site Plan: updated Site plan to show reconfigured south-east corner where property line adjustment was made.

A3.01 and A3.04 Exterior Elevations: updated to respond to Design Review comments.

A3.01 and A3.04: Added a "brow" at the 5th floor between gridlines 6 & 7 and C & D.

A3.01: Reconfigured locations of bay projections on north elevation

A7.01, A7.02 Stair One and Stair Two: updated dimensions to show width clearance at stair runs

A8.02 and A8.03 Assembly Types: updated these assembly types:

A1 changed to Not Used

A3 Added note, "where occurs per structural" in reference to 1/2" plywood sheathing

A8 Added note, "where occurs per structural" in reference to 1/2" plywood sheathing

B8 revised to show GA 1021 and GA1052 for sound and fire rating requirement

R1 revised to show type "C" gyp. board

R2, R3 and R4: Added 1 layer of 1/2" Type "X" gyp. board per GA Fire Resistance Design Manual, Section I, General Note 11.

Thank you,
Christian Sterner
Ben White

John B

Life Safety Checksheet Response

Permit #: 12-132453-000-00-CO

Date: 6-27-12

Customer name and phone number: Mike Coyle, (503) 680-5497

Note: In the spaces below, please provide specific information concerning the changes that you have made in response to the checksheet. Note the checksheet item number, your response or a description of the revision, and the location of the change on the plans (i.e. page number and/or detail number). Use as many lines as needed. *If the item is not in response to a checksheet, write "Applicant" in the column labeled "Checksheet item number."*

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DOCUMENT SERVICES

Checksheet item number	Description of changes, corrections, additions, etc.	Location on plans
1	Please see revised sheet A0.03.	A0.03
2	Please see revised sheet A0.03.	A0.03
3	Please see revised sheet A0.03. See also Unit Plans 5/A5.01 for revised dimensions at typical Accessible Unit.	A0.03, A5.01
4	Revised trash rooms to show 1 hour rated walls at all levels. One hour horizontal assemblies are indicated on A0.04. Doors at trash rooms revised to show 45 min. rating. Chute and access doors to be as specified, rating of access doors is to be 1 1/2" hour. Attached submittal is for reference, project specifications call for the same or equal to this example.	A0.04, A0.05, A2.01, A2.02, A2.03, A2.04, A2.05, A9.20
5	A0.05 revised to graphically indicate areas of minimum egress lighting.	A0.04, A0.05
6	Column rating indicated with a revised symbol.	A0.04
7	Retail revised to indicate, "Shell, No Occupancy".	A0.04, A2.01
8	Walls of Elevator Machine Room revised to show 2 hour rating.	A2.01, A8.01
9	Elev. Mach. Rm. door #124A is now shown with a 90 min. rating	A9.20
10	Elevator doors on all levels now shown with 90 min. rating and smoke seals per specs, see A9.20 and note 6/A9.20	A9.20
11	Corridor doors are labeled "S" and 20 min., see A9.20	A9.20
12	Elevation sheets have been revised to show locations of tempered glazing.	A3.01, A3.02, A3.03, A3.04
13	Door schedule now shows 90 minute rating for all Stair #1 & #2 doors	A9.20
14	Restrooms #119 and #120 revised to show required clearances	A5.03
15	A5.03 revised to describe function of room #117.	A5.03
16	Second Floor Plan identifies roof space. Access from unit #203 clarified.	A2.02
17	Fire Extinguisher Cabinet detail added, see A6.03 and 10/A8.47	A6.03, A8.47
18	Elevator accommodates stretcher, please see elevator manufacturer's information, attached.	
19	Roof plan revised to not show future solar panels.	A2.06
20	Roof at 5th floor deck revised to show construction. Insulation manufacturer data including ICC report attached.	A2.05, keynote 15; details 6 & 7/A8.47

21	Electrical room door 114A on ground floor requires panic hardware, electrical rooms on floors 2-5 do not require panic hardware nor outswinging doors per electrical engineer. 1 hour Fire rating shown at ground floor Electrical Room, no fire rating on floors 2-5 per electrical engineer.	A9.20
22	First floor plan revised to describe use of range.	A2.01

Plan Bin Location: AX 11-2



Building Permit Application
City of Portland, Oregon - Bureau of Development Services
 1900 SW 4th Avenue, Portland, Oregon 97201 • 503-823-7310 • TTY 503-823-6868 • www.portlandoregon.gov/bds

Type of work

New construction Addition/alteration/replacement
 Demolition Other:

Category of construction

1 & 2 family dwelling Commercial/industrial Accessory building
 Multifamily Master builder Other:

Job site information and location

Job no.: Job address: 3250 NE MLK
 City/State/ZIP:
 Suite/bldg./apt. no.: Project name:
 Cross street/directions to job site:
 Subdivision: Lot no. Tax map/parcel no.

Description of work

5 STORY MULTIFAMILY 50 UNIT APARTMENTS FOR LIMITED INCOME TENANTS. INCLUDES GROUND FLOOR RETAIL + SITE IMPROVEMENTS

Reference RS / Combination Permit no.

Property owner **Tenant**

Name: INNOVATIVE HOUSING INC
 Address: 219 NW 2nd
 City/State/ZIP: PORTLAND OR 97209
 Phone: FAX:

Owner installation: This installation is being made on property that I own, which is not intended for sale, lease, rent, or exchange.
 Owner signature: Date:

Contractor

Business name: WALSH CONST.
 Address:
 City/State/ZIP:
 Phone: FAX:
 CCB lic. no. 11398
 Authorized signature: [Signature]
 Print name: MIKE COTLE Date: 4/20/12

Applicant **Contact Person**

Business name: FASTER PERMITS
 Contact name: MIKE COTLE
 Address:
 City/State/ZIP:
 Phone: FAX:
 E-mail:
 Authorized signature: [Signature]
 Print name: MIKE COTLE Date: 4/20/12

This permit application expires if a permit is not obtained within 180 days after it has been accepted as complete.

Office Use Only

Permit no:
 Date received:
 By:

Required Data: One and Two Family Dwelling

Permit fees* are based on the value of the work performed. Indicate the value (rounded to the nearest dollar) of all equipment, materials, labor, overhead, and the profit for the work indicated on this application.

Valuation:	
Number of bedrooms:	
Number of bathrooms:	
Total number of floors:	
New dwelling area:	square feet
Garage/carport area:	square feet
Covered porch area:	square feet
Deck area:	square feet
Other structure area:	square feet

Required Data: Commercial Use

Permit fees* are based on the value of the work performed. Indicate the value (rounded to the nearest dollar) of all equipment, materials, labor, overhead, and the profit for the work indicated on this application.

Valuation:	<u>97,214,576.00</u>
Existing building area:	square feet
New building area:	square feet
Number of stories:	
Type of construction:	
Occupancy groups	
Existing:	
New:	

Notice

All contractors and subcontractors are required to be licensed with the Oregon Construction Contractors Board under ORS 701 and may be required to be licensed in the jurisdiction in which work is being performed. If the applicant is exempt from licensing, the following reasons apply:

Statement of Fact: I certify that the facts and information set forth in this application are true and complete to the best of my knowledge. I understand that any falsification, misrepresentation or omission of fact (whether intentional or not) in this application or any other required document, as well as any misleading statement or omission, may be cause for revocation of permit and/or certificate of occupancy, regardless of how or when discovered.

Building Permit Fees*

Please refer to fee schedule

Fees due upon application	
Amount received	
Date received	

Sub-contractor information can be faxed ' _____'



CITY OF PORTLAND, OREGON Development Services Center

Effective July 1, 2010

1900 SW Fourth Avenue, Suite 1500 • Portland, Oregon 97201 • www.portlandoregon.gov/bds

Systems Development Charge Form, Commercial Projects

FOR INTAKE, STAFF USE ONLY

Date Rec _____ by _____ Address _____

Qtr Sec Map(s) _____

Building Permit # _____ Tax Account # _____

Systems Development Charges (SDCs) are collected by the bureaus of Environmental Services, Parks and Recreation, Portland Water Bureau and the Portland Office of Transportation to help offset the impact your project will add to the City's infrastructure of storm and sanitary sewer systems, parks and recreation facilities, water and street systems. Commercial SDC fees for Parks went in to effect January 1, 2009, please call 503-823-5105 for details. The Bureau of Development Services does not charge SDCs.

- Complete for:**
- new construction
 - adding or removing plumbing fixtures
 - building additions or tenant improvements that change the number of units
(as indicated on pages 2 and 3).
 - change of use or occupancy
 - increase of impervious surfaces over 500 sq. ft.

Applicant Name Julie Garver, Innovative Housing, Inc.

Address 219 NW 2nd Ave.

City Portland State OR Zip Code 97209

Day Phone 503.226.4368 FAX _____ email jgarver@innovativehousinginc.com

Describe the scope of the project. If applicable, include detail on the existing use(s) of the structure. If a building has been demolished, provide the demolition permit number. Do not include the previous use information in column 4 in the following table (attach additional sheets as necessary).

New construction on currently vacant lot of 5-story residential multifamily development. Project consists of 50 apartments for limited income tenants in a mix of one and two bedroom unit types. Ground floor retail space near the street corner & along MLK Jr. Blvd. to be developed as shell space for future tenant(s) - tenants to be determined. Support spaces for the residential include management office, community room, and lobby at the first floor. Exterior site improvements and streetscape upgrades are also included in the project.

What county is your project in?

Multnomah, inside Portland Clackamas

Multnomah, outside Portland Washington

12-132453CO

Complete the table below and on the following page

Column 3: Enter the size (number of units) of your proposed development.

Column 4: If the project site has existing buildings or structures, enter the size (number of units) of the existing or most recent use.

(1) Building Use Type	(2) Unit of Measure	(3) Units In Proposed Development	(4) Units In Existing or Most Recent Use
Residential			
Multi Family (number of Units/Buildings)	dwelling	50	0
Senior Housing	dwelling	0	0
Rowhouse	dwelling	0	0
Nursing Home	beds	0	0
Congregate Care/Assisted Living	dwelling	0	0

Low-income housing? (attach "Waiver Letter" from Portland Development Commission)

Commercial Services

Bank	sq ft/GFA		
Walk-in Bank	sq ft/GFA		
Day Care	students		
Library	sq ft/GFA		
Post Office	sq ft/GFA		
Hotel/Motel	rooms		
Service Station	Vehicle Fueling Position - VFP		
Movie Theater	screen		
Car Wash	wash stall		
Health Club	sq ft/GFA		
Marina	berth		

Commercial Institutional

School, K-12	student		
University/College	student		
Church	sq ft/GFA		
Hospital	Sq ft/GFA		
Park	acre		

Commercial Restaurant

Restaurant	sq ft/GFA		
Quick Service Restaurant (drive-through)	sq ft/GFA		

(1) Building Use Type	(2) Unit of Measure	(3) Units In Proposed Development	(4) Units In Existing or Most Recent Use
Commercial Retail			
Shopping Center	sq ft/GFA		
Supermarket	sq ft/GFA		
Convenience Market	sq ft/GFA		
Discount / Department Store	sq ft/GFA		
Miscellaneous Retail	sq ft/GFA		
Car Sales, New and Used	sq ft/GFA		

Commercial Office			
Administrative Office	sq ft/GFA		
Medical Office / Clinic	sq ft/GFA		

Commercial Industrial			
Light Industrial / Manufacturing	sq ft/GFA		
Self-storage	sq ft/GFA		
Warehouse / Storage	sq ft/GFA		
Truck Terminal	acre		

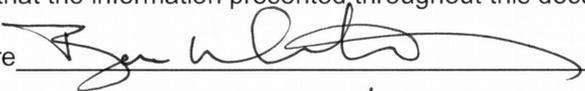
PRIOR PAYMENT OF SDCs (This information can be researched at the Records and Resources Counter)

Has the existing use paid a Transportation SDC since October 17, 1997? yes no

If yes, specify date paid: _____ amount paid: \$ _____ permit # on which it was paid: _____

Signature and Date (to be completed by all development review customers)

I certify that the information presented throughout this document is current and accurate to the best of my knowledge:

Signature  Date 04/19/12

Print name BEN WHITE

Company name and your position CARLETON HART ARCHITECTURE, PROJECT ARCHITECT

Bureau of Environmental Services (BES)

Fixture Worksheet and Stormwater Information Form

Residential/Multiple Dwellings (number of units): 50

NOTE: Residential units for mixed-use developments will be charged 0.8 EDU per unit or \$3,068.00/unit.
The commercial spaces will be charged by Plumbing Fixture Unit (PFU).

Part I: Calculation of Plumbing Fixture Units (PFUs) for Commercial, Retail and Office spaces only.						
Fixture Type (for Commercial only)	Number of Fixtures to be Added [1]	Number of Fixtures to be Removed [2]	Net Change in Number of Fixtures [3]	Equivalency Factor [4]	Net Change in Number of PFUs	
<i>Calculation</i>			[1] - [2]		[3] x [4]	
Bathtub or combination bath/shower	46			2.0	92	
Clothes washer	50			6.0	300	
Dental unit or cuspidor				1.0		
Dishwasher	51			2.0	102	
Drinking fountain or water cooler	1			0.5	.5	
Laundry sink				2.0		
Lavatory (wash basin) single	52			1.0	52	
Lavatory (wash basin) sets of 2 or 3				2.0		
Shower stall	4			2.0	8	
Sink, commercial, food & service	2			3.0	6	
Sink, general	51			2.0	102	
Urinal				2.0		
Water closet (toilet) private	52			4.0	204	
Other*(floor sink / floor drain)	3			1.0	3	
Other*(Specify)						
Other*(Specify)						
Other*(Specify)						
* For Other fixtures, use PFU values from Oregon Plumbing Specialty Code					Total of Net Changes in PFUs (if negative enter negative number) (if applicable show negative number for future credit)	869.5

Storm Water Identification:

Are you increasing the impervious surface: yes no

If yes, please note the Impervious Surface Area (i.e. hard surface such as roof, asphalt, concrete, building footprint, etc.) as requested below:

Total impervious area on site after completion: 19,096 sq. ft.

Existing impervious area before construction: 0 sq. ft.

New impervious area to be added to site: 19,096 sq. ft.

Provide the amount of lineal footage of property fronting all public rights-of-way: 307 l. ft.

Portland Water Bureau Water Meter Sizing Worksheet - Commercial or Mixed Use

Revised: May 2008 According to UPC-2005-Appendix A

Building Permit Number	Service Address
------------------------	-----------------

(1) Type of Fixture	(2) Fixtures in New Structure	+	(3) Fixtures in Existing Structure	--	(4) Fixtures Re- moved	=	(5) Total Fixtures	x	(6) Fixture Value	=	(7) Total Fixture Unit Value
Sink, Clinic		+		--		=		x	3.0	=	
Sink, Kitchen	51	+		--		=		x	1.5	=	76.5
Sink, Service or Mop Basin	2	+		--		=		x	3.0	=	6
Sink, Laundry		+		--		=		x	1.5	=	
Sink, Bar		+		--		=		x	2.0	=	
Sink, Lavatory	52	+		--		=		x	1.0	=	52
Bathtub or Tub/Shower	46	+		--		=		x	4.0	=	184
Shower	4	+		--		=		x	2.0	=	8
Urinal, 1.0 GPF		+		--		=		x	4.0	=	
Urinal, > 1.0 GPF		+		--		=		x	5.0	=	
Water Closet, 1.6 GPF Gravity Tank	50	+		--		=		x	2.5	=	125
Water Closet, 1.6 GPF Flushometer Valve	2	+		--		=		x	5.0	=	10
Water Closet, >1.6 GPF Flushometer Valve		+		--		=		x	8.0	=	
Clothes Washer, domestic	50	+		--		=		x	4.0	=	200
Dishwasher	50	+		--		=		x	1.5	=	75
Drinking Fountain	1	+		--		=		x	0.5	=	.5
Hose Bibb	1	+		--		=		x	2.5	=	2.5
Hose Bibb, each additional	9	+		--		=		x	1.0	=	9

Note: Fixture units for flushometers are approximate values. Values may be adjusted by Portland Water Bureau Staff on a case by case basis.

Total Fixture Units = 748.5

Instructions

- Column 2: Enter the total number of each fixture type intended for the completed new structure
- Column 3: If the project has an existing structure that will be utilizing the same water meter enter the total number of each fixture type currently in the existing structure.
- Column 4: Enter the number of fixture connections that will be permanently removed from the new structure.
- Column 5: Sum of column 2 and 3 minus column 4
- Column 6: Per unit value of each fixture type
- Column 7: Enter the number of column 5 times Column 6

Fixture Unit Count (column 7 total)	Required Meter Size
0 – 22	5/8" meter
22.5 – 37	3/4" meter
37.5 – 89	1" meter
89.5 – 286	1.5" meter
286.5 – 532	2" meter
532.5 – 1,300	3" meter
1,300.5 – 3,600	4" meter
3,600.5 – 8,200	6" meter

NOTE: There may be SDC credit if existing meters are utilized or removed. SDC fees are not assessed to fire lines. Fees are due at time water service installation is paid. Call Portland Water Bureau Development Services, 503-823-7368 with any questions.

Definitions

from [Institute of Transportation Engineers Trip Generation Manual](#)

Gross Floor Area (GFA)

The sum (in square feet) of the area of each floor level in the building, including cellars, basements, mezzanines, penthouses, corridors, lobbies, stores and offices, that are within the principal outside faces of exterior walls, not including architectural setbacks or projections. Included are all areas that have floor surfaces with clear standing head room (6 feet, 6 inches minimum) regardless of their use. If a ground-level area, or part thereof, within the principal outside faces of the exterior walls is not enclosed, this GFA is considered part of the overall square footage of the building. However, unroofed areas and unenclosed roofed-over spaces, except those contained within the principle outside faces of exterior walls, should be excluded from the area calculations. For purposes of trip generation and parking generation calculations, the GFA of any parking garages within the building should not be included within the GFA of the entire building. The unit of measurement for office buildings is currently GFA; however, it may be desirable to also obtain data related to gross rentable area and net rentable area. With the exception of buildings containing enclosed malls or atriums, GFA is equal to gross leasable area (GLA, explained next) and gross rentable area.

Gross Leasable Area (GLA)

The total floor area designed for tenant occupancy and exclusive use, including any basements, mezzanines, or upper floors, expressed in square feet and measured from the centerline of joint partitions and from outside wall faces. For purposes of trip generation and parking generation calculations, the floor area of any parking garages within the building should not be included within the GLA of the entire building. GLA is the area for which tenants pay rent; it is the area that produces income. In the retail business, GLA lends itself to measurement and comparison; thus, it has been adopted by the shopping center industry as its standard for statistical comparison. Accordingly, GLA is used for shopping centers. For strip centers, discount stores and freestanding retail facilities, GLA usually equals GFA.

Optional Alternate Rate and Fee Calculation

Transportation

If you want us to use trip generation rates other than those used in the City's Transportation SDC Ordinance and Rate Study, you must submit data certified by a professional traffic engineer. Use *Request for Alternate Trip Generation Rate and SDC Calculation Form TSDC-3* to submit such data, and attach it to this application. Institutional development (educational and medical campuses) may elect to base SDC on annual changes in trip generation. Submit *Election by Institutional Development of Special Trip Generation Rate and SDC Calculation Form TSDC-4*.

Parks

If you want us to use an alternate number of persons per Dwelling Unit than those used in the City's Parks SDC Methodology Study, you need to submit documentation, analyzed and certified by a suitable and competent

professional. Alternative SDC rate calculations must be based on analysis of occupancy of classes of structures, not on the intended occupancy of a particular New Development. Use Request for Alternative occupancy and SDC Calculation (Form PSDC-6) to submit such data, and attach it to this application.

Optional Credit for Providing Qualified Public Improvements Transportation

If you want to reduce the amount of your Transportation SDC, you may make improvements to specific transportation facilities in the City of Portland. Use "Request for Credit for Qualified Public Improvement" Form TSDC-5 to submit such data, and attach it to this application.

Parks

To reduce the amount of your Parks SDC, you may donate property or improvements to certain qualified park facilities in the City of Portland. Use "Request for Parks SDC Credit for Qualified Public Improvement" (Form PSDC-7) to submit a request, and attach it to this application.

Timing and Method of Payment

The City will give you a Notification of SDC Fees if you are required to pay any charges for your development. At this point you will decide when and how to pay for the SDCs.

For all SDCs...

- Pay by cash, check, money order or credit card at the time the City issues a building permit.
- Water SDCs are due when water services are purchased. Pay by check, money order or credit card.
- Request a City loan by completing and signing an installment contract to pay the SDCs in monthly installments over a number of years.*
- Defer payment for 6, 9, or 12 months, depending on the project valuation.
- Transfer SDC credits (contact respective bureaus for more information).

* **SPECIAL NOTE:** The City secures a loan or deferral by recording a lien on the benefited property. The lien remains in effect until the SDCs are paid in full. The City charges a non-refundable processing fee to cover the expense of setting up a loan or deferral. The installment contract must be signed by the property owner of record before the City authorizes a loan for the SDCs.

If you need help:

If you need help with this form or have questions about your Systems Development Charge (SDC) please call:
Portland Office of Transportation..... 503-823-7002
Bureau of Parks and Recreation 503-823-5105
Bureau of Environmental Services 503-823-7761
Bureau of Water Works 503-823-7368

Portland Housing Bureau (PHB) administers an SDC exemption program for housing projects:

Website: www.portlandonline.com/phb/sdc
E-mail: indirect@portlandoregon.gov | 503-823-3270
Location: 421 SW 6th Ave, STE 500, Portland, OR 97204
PHB Contact: Marilyn Hurlley and Sharon Johnson, SDC Exemption Program Administrators



COMcheck Software Version 3.9.0

Envelope Compliance Certificate

Oregon Energy Efficiency Specialty Code

Section 1: Project Information

Project Type: **New Construction**
Envelope Compliance Method: **Simplified Trade-Off**
Project Title : Eliot MLK

Construction Site:
3256 NE MLK JR. BLVD
Portland, OR 97202-2635

Owner/Agent:
Julie Garver
Innovative Housing, Inc.
219 NW Second Avenue
Portland, OR 97209-3905
503 226 4368
jgarver@innovativehousinginc.com

Designer/Contractor:
Ben White
Carleton Hart Architecture
322 NW 8th Avenue
Portland, OR 97209-3504
503 206 3174
ben.white@carletonhart.com

Section 2: General Information

Building Location (for weather data): **Portland, Oregon**
Climate Zone: **4c**
Building Type for Envelope Requirements: **Residential**
Vertical Glazing / Wall Area Pct.: **17%**

Building Type	Floor Area
Floors 1-5 (Multifamily)	46701
Floor 1 (Retail)	1580

Section 3: Requirements Checklist

Envelope PASSES: Design 5% better than code.

Climate-Specific Requirements:

Component Name/Description	Gross Area or Perimeter	Cavity R-Value	Cont. R-Value	Proposed U-Factor	Budget U-Factor ^(a)
Exterior Wall 1: Wood-Framed, 16" o.c.	24776	21.0	18.0	0.028	0.051
Window 1: Other Window, Clear, SHGC 0.30	3924	---	---	0.290	0.350
Door 1: Other Door, Swinging	1009	---	---	0.320	0.700
Door 5: Insulated Metal, Swinging	22	---	---	0.650	0.700
Exterior Wall 2: Steel-Framed, 16" o.c.	4668	21.0	18.0	0.036	0.064
Window 2: Other Window, Clear, SHGC 0.30	602	---	---	0.290	0.350
Window 3: Metal Frame with Thermal Break:Double Pane with Low-E, Clear, SHGC 0.39	659	---	---	0.250	0.460
Door 2: Other Door, Swinging	197	---	---	0.320	0.700
Door 3: Glass (> 50% glazing):Metal Frame, Entrance Door, SHGC 0.39	219	---	---	0.250	0.800
Door 4: Insulated Metal, Swinging	88	---	---	0.650	0.700
Exterior Wall 3: Solid Concrete:8" Thickness,Normal Density , Furring: None	684	---	18.0	0.051	0.090
Door 6: Insulated Metal, Swinging	45	---	---	0.650	0.700
Exterior Wall 4: Solid Concrete:10" Thickness,Normal Density , Furring: None	654	---	18.0	0.050	0.090
Door 7: Insulated Metal, Swinging	22	---	---	0.650	0.700
Exterior Wall 5: Solid Concrete:12" Thickness,Normal Density , Furring: None	342	---	18.0	0.050	0.090

12-132453-0

Roof 1: Attic Roof with Wood Joists	10312	38.0	0.0	0.027	0.027
Floor 1: Slab-On-Grade:Unheated, Horizontal without vertical 2 ft.	6348	---	18.0	---	---

(a) Budget U-factors are used for software baseline calculations ONLY, and are not code requirements.

(b) 'Other' components require supporting documentation for proposed U-factors.

In the following requirements, the relevant code section reference is shown in []. '+' denotes that more details exist in the specified code section. Checkboxes identify requirements that the applicant has not acknowledged as being met. Check marked requirements identify those the applicant acknowledges are met or excepted from compliance. 'Plans reference page/section' identifies where in the plans/specs the requirement can be verified as being satisfied.

Fenestration Product Rating:

- ✓ 1. [303.1.3] U-factors of fenestration products (windows, doors and skylights) are determined in accordance with NFRC 100 by an accredited, independent laboratory, and labeled and certified by the manufacturer or are determined using the commercial size category values listed in Chapter 15 of the 2009 ASHRAE Handbook of Fundamentals, Table No.4 and shall include the effects of the window frame. The temporary label affixed to the fenestration products must not be removed prior to inspection.

Plans reference page/section: Spec Section 085313

- ✓ 2. [303.1.3] Solar heat gain coefficient (SHGC) of glazed fenestration products (windows, glazed doors and skylights) shall be determined in accordance with NFRC 200 by an accredited, independent laboratory, and labeled and certified by the manufacturer or be determined using the Solar Heat Gain Coefficients (SHGC) in Chapter 15 of the 2009 ASHRAE Handbook of Fundamentals, Table No.10. The overall values must consider type of frame material and operator for the SHGC at normal incidence.

Plans reference page/section: Spec Section 085313

Air Leakage, Insulation, and Component Certification:

- ✓ 3. [502.4.3] Sealing of the building envelope. Openings and penetrations in the building envelope are sealed with caulking materials or closed with gasketing systems compatible with the construction materials and location. Joints and seams are sealed in the same manner or taped or covered with a moisture vapor-permeable wrapping material. Sealing materials spanning joints between construction materials allow for expansion and contraction of the construction materials.

Plans reference page/section: Plans and Specs

- ✓ 4. [502.4.1 +] Window and door assemblies. The air leakage of window and sliding or swinging door assemblies that are part of the building envelope are determined in accordance with AAMA/WDMA/CSA 101/I.S.2/A440, or NFRC 400 by an accredited, independent laboratory, and labeled and certified by the manufacturer.

Plans reference page/section: Spec Section 085313

- ✓ 5. [502.4.2 +] Curtain wall, storefront glazing and commercial entrance doors. Curtain wall, storefront glazing and commercial-glazed swinging entrance doors and revolving doors are tested for air leakage in accordance with ASTM E 283. For curtain walls and storefront glazing, the maximum air leakage rate is 0.3 cubic foot per minute per square foot of fenestration area. For commercial glazed swinging entrance doors and revolving doors, the maximum air leakage rate is 1.00 cfm/ft2 of door area.

Plans reference page/section: Spec Section 084113

- ✓ 6. [303.1.1 +] Building thermal envelope insulation. An R-value identification mark is applied (by manufacturer) to each piece of insulation 12 inches or greater in width. Alternately, the insulation installers have provided a signed, dated and posted certification listing the type, manufacturer and R-value of insulation installed. Refer to code section for blown or sprayed insulation installation/settling depths and marker requirements.

- ✓ 7. [303.1.2] Insulation mark installation. Insulating materials are installed such that the manufacturer's R-value mark is readily observable upon inspection.

- ✓ 8. [303.1.4] Insulation product rating. The thermal resistance (R-value) of insulation has been determined in accordance with the U.S. FTC R-value rule.

- ✓ 9. [303.2] Installation. All material, systems and equipment are installed in accordance with the manufacturer's installation instructions and the International Building Code.

- ✓ 10.[502.4.4] Outdoor air intakes and exhaust openings. Stair and elevator shaft vents and other outdoor air intakes and exhaust openings integral to the building envelope shall be equipped with not less than a Class I motorized, leakage-rated damper with a maximum leakage rate of 4 cfm per square foot at 1.0 inch water gauge when tested in accordance with AMCA 500D. Stair and shaft vent dampers shall be capable of being automatically closed during normal building operation and interlocked to open as required by fire and smoke detection systems.

Plans reference page/section: A2.06

- ✓ 11.[502.4.5] Loading dock weatherseals. Cargo doors and loading dock doors are equipped with weather seals to restrict infiltration when vehicles are parked in the doorway.

Requirement is not applicable.

Plans reference page/section: N/A

- ✓ 12.[502.4.7 +] Recessed lighting. Recessed luminaires installed in the building thermal envelope are sealed to limit air leakage between conditioned and unconditioned spaces. All recessed luminaires are IC-rated and labeled as meeting ASTM E 283. All recessed luminaires are sealed with a gasket or caulk between the housing and interior wall or ceiling covering.



COMcheck Software Version 3.9.0

Interior Lighting Compliance Certificate

Oregon Energy Efficiency Specialty Code

Section 1: Project Information

Project Type: **New Construction**

Project Title : Eliot MLK

Construction Site:
3256 NE MLK JR. BLVD
Portland, OR 97202-2635

Owner/Agent:
Julie Garver
Innovative Housing, Inc.
219 NW Second Avenue
Portland, OR 97209-3905
503 226 4368
jgarver@innovativehousinginc.com

Designer/Contractor:
Ben White
Carleton Hart Architecture
322 NW 8th Avenue
Portland, OR 97209-3504
503 206 3174
ben.white@carletonhart.com

Section 2: Interior Lighting and Power Calculation

A	B Floor Area	C Allowed Watts / ft2	D Allowed Watts
Floors 1-5 (Multifamily)	46701	0.58	27087
Floor 1 (Retail)	1580	1.32	2086
Total Allowed Watts =			29172

Section 3: Interior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Floors 1-5 (Multifamily 46701 sq.ft.)				
V-1: Quad 2-pin 26W / Electronic	4	10	26	260
R-1: 24" T8 17W / Electronic	1	44	17	748
M-1: Quad 4-pin 18W / Electronic	2	105	36	3780
K-1: 48" T8 32W / Electronic	2	58	64	3712
B-1: 24" T8 17W / Electronic	2	52	34	1768
B-2: 48" T8 32W (Super T8) / Electronic	2	21	64	1344
C-1: 22" T5 14W / Electronic	1	102	15	1530
F-1: Triple 4-pin 26W / Electronic	1	56	26	1456
X-1: Other / Electronic	1	16	3	48
H-2: Quad 2-pin 13W / Electronic	2	77	26	2002
F-2: Other / Electronic	1	50	250	12500
Floor 1 (Retail 1580 sq.ft.)				
Total Proposed Watts =				29148

Section 4: Requirements Checklist

In the following requirements, the relevant code section reference is shown in []. '+' denotes that more details exist in the specified code section. Checkboxes identify requirements that the applicant has not acknowledged as being met. Check marked requirements identify those the applicant acknowledges are met or excepted from compliance. 'Plans reference page/section' identifies where in the plans/specs the requirement can be verified as being satisfied.

Lighting Wattage:

1. [505.1 +] Total proposed watts must be less than or equal to total allowed watts.
Allowed Wattage: 29172 Proposed Wattage: 29148

Complies: YES

Mandatory Requirements:

- ✓ 2. [505.4] Exit signs. Internally illuminated exit signs shall not exceed 5 watts per side.
Plans reference page/section: E.1

- ✓ 3. [505.2.2.3 +] Daylight zone control. All daylight zones are provided with individual controls that control the lights independent of general area lighting in the non-daylight zone. In all individual daylight zones larger than 350 sq.ft., automatic daylight controls is provided. Automatic daylight sensing controls reduce the light output of the controlled luminaires at least 50 percent, and provide an automatic OFF control, while maintaining a uniform level of illumination. Contiguous daylight zones adjacent to vertical fenestration may be controlled by a single controlling device provided that they do not include zones facing more than two adjacent cardinal orientations (i.e., north, east, south, west). Daylight zones under skylights shall be controlled separately from daylight zones adjacent to vertical fenestration.
Plans reference page/section: _____

- ✓ 4. [505.2.1 +] Interior lighting controls. At least one local shutoff lighting control has been provided for every 2,000 square feet of lit floor area and each area enclosed by walls or floor-to-ceiling partitions. The required controls are located within the area served by the controls or are a remote switch that identifies the lights served and indicates their status.
✓ **Exception applies:** Lighting in public areas such as concourses, stairways or corridors that are elements of the means of egress with switches that are accessible only to authorized personnel.
Plans reference page/section: Lighting Plans

- ✓ 5. [505.2.3 +] Sleeping unit controls. Master switch at entry to hotel/motel guest room.
Plans reference page/section: Lighting Plans

- ✓ 6. [505.2.1.1] Egress lighting. Egress illumination is controlled by a combination of listed emergency relay and occupancy sensors to shut off during periods that the building space served by the means of egress is unoccupied.
Plans reference page/section: Lighting Plans

- ✓ 7. [505.2.2 +] Additional controls. Each area that is required to have a manual control shall have additional controls that meet the requirements of Sections 505.2.2.1 and 505.2.2.2.
Plans reference page/section: Spec Section 26

- ✓ 8. [505.2.2.1 +] Light reduction controls. Each space required to have a manual control also allows for reducing the connected lighting load by at least 50 percent by either
 - 1) controlling (dimming or multi-level switching) all luminaires; or
 - 2) dual switching of alternate rows of luminaires, alternate luminaires, or alternate lamps; or
 - 3) switching the middle lamp luminaires independently of other lamps; or
 - 4) switching each luminaire or each lamp.✓ **Exception applies:** An occupant-sensing device controls the area.
Plans reference page/section: Spec Section 26

- ✓ 9. [505.2.2.2] Buildings larger than 2,000 square feet are equipped with an automatic control device to shut off lighting in those areas. This automatic control device shall function on either:
 - 1) a scheduled basis, using time-of-day, with an independent program schedule that controls the interior lighting in areas that do not exceed 10,000 square feet and are not more than one floor; or
 - 2) an occupant sensor that shall turn lighting off within 30 minutes of an occupant leaving a space; or
 - 3) a signal from another control or alarm system that indicates the area is unoccupied.Plans reference page/section: E2L.01

- ✓ 10.[505.2.2] Occupancy sensors in rooms that include daylight zones are required to have Manual ON activation.
Plans reference page/section: E2L.01

- ✓ 11.[505.2.2] An occupant sensor control device is installed that automatically turns lighting off within 30 minutes of all occupants leaving a space.
Plans reference page/section: E2L.01

- ✓ 12.[505.2.2] Additional controls. An occupant sensor control device that automatically turns lighting off within 30 minutes of all occupants leaving a space or a locally activated switch that automatically turns lighting off within 30 minutes of being activated is installed in all storage and supply rooms up to 1000 square feet.
Plans reference page/section: _____

- ✓ 13.[505.2.2.2.1] Occupant override. Automatic lighting shutoff operating on a time-of-day scheduled basis incorporates an override switching device that: 1) is readily accessible, 2) is located so that a person using the device can see the lights or the area controlled



COMcheck Software Version 3.9.0

Exterior Lighting Compliance Certificate

Oregon Energy Efficiency Specialty Code

Section 1: Project Information

Project Type: **New Construction**

Project Title : Eliot MLK

Exterior Lighting Zone: **2 (Residential mixed use area)**

Construction Site:

3256 NE MLK JR. BLVD
Portland, OR 97202-2635

Owner/Agent:

Julle Garver
Innovative Housing, Inc.
219 NW Second Avenue
Portland, OR 97209-3905
503 226 4368
jgarver@innovativehousinginc.com

Designer/Contractor:

Ben White
Carleton Hart Architecture
322 NW 8th Avenue
Portland, OR 97209-3504
503 206 3174
ben.white@carletonhart.com

Section 2: Exterior Lighting Area/Surface Power Calculation

A Exterior Area/Surface	B Quantity	C Allowed Watts / Unit	D Tradable Wattage	E Allowed Watts (B x C)	F Proposed Watts
Parking area	5736 ft2	0.06	Yes	344	1410
Lobby and Retail (Main entry)	24 ft of door width	20	Yes	480	300
Other door (not main entry)	156 ft of door width	20	Yes	3120	1728
Walkway < 10 feet wide	250 ft of walkway length	0.7	Yes	175	128
Total Tradable Watts* =				4119	3566
Total Allowed Watts =				4119	
Total Allowed Supplemental Watts** =				600	

* Wattage tradeoffs are only allowed between tradable areas/surfaces.

** A supplemental allowance equal to 600 watts may be applied toward compliance of both non-tradable and tradable areas/surfaces.

Section 3: Exterior Lighting Fixture Schedule

A Fixture ID : Description / Lamp / Wattage Per Lamp / Ballast	B Lamps/ Fixture	C # of Fixtures	D Fixture Watt.	E (C X D)
Parking area (5736 ft2): Tradable Wattage				
P-1: Other	1	5	250	1250
B-1: Triple 4-pin 32W / Electronic	1	5	32	160
Lobby and Retail (Main entry 24 ft of door width): Tradable Wattage				
E-1: Other / Electronic	1	6	50	300
Other door (not main entry) (156 ft of door width): Tradable Wattage				
A-1: Triple 4-pin 32W / Electronic	1	54	32	1728
Walkway < 10 feet wide (250 ft of walkway length): Tradable Wattage				
Linear Fluorescent 2: Other / Electronic	1	4	32	128
Total Tradable Proposed Watts =				3566

Section 4: Requirements Checklist

In the following requirements, the relevant code section reference is shown in []. '+' denotes that more details exist in the specified code section. Checkboxes identify requirements that the applicant has not acknowledged as being met. Check marked requirements identify those the applicant acknowledges are met or excepted from compliance. 'Plans reference page/section' identifies where in the plans/specs the requirement can be verified as being satisfied.

Lighting Wattage:

- ✓ 1. [505.6.2 +] Within each non-tradable area/surface, total proposed watts must be less than or equal to total allowed watts. Across all tradable areas/surfaces, total proposed watts must be less than or equal to total allowed watts.

Complies: Passes.

Controls, Switching, and Wiring:

- ✓ 2. [505.6.2 +] All exemption claims are associated with fixtures that have a control device independent of the control of the nonexempt lighting.

Plans reference page/section: Spec Section 26

- ✓ 3. [505.2.4 +] Lighting not designated for dusk-to-dawn operation is controlled by either a photosensor (with time switch), or an astronomical time switch.

Plans reference page/section: E2.06

- ✓ 4. [505.2.4 +] Lighting designated for dusk-to-dawn operation is controlled by an astronomical time switch or photosensor.

Plans reference page/section: E2.06

- ✓ 5. [505.2.4 +] All time switches retain programming and the time setting during loss of power for a period of at least 10 hours.

Plans reference page/section: Spec Section 26

- ✓ 6. [505.2.4 +] Lighting designated to operate more than 2000 hours per year for Uncovered Parking Areas shall be equipped with motion sensors that will reduce the luminaire power by thirty-three percent or turn off one-third the luminaires when no activity is detected.

Plans reference page/section: Spec Section 26

Exterior Lighting Restrictions and Exceptions:

- ✓ 7. [505.6.1 +] Mercury vapor and incandescent lighting is not permitted for use as exterior lighting.
- ✓ 8. [505.6.1 +] Exempt lighting fixtures are equipped with a control device independent of the control of the nonexempt lighting and are identified in Section 3 table above.

Plans reference page/section: _____

Exterior Lighting PASSES: Design 24% better than code.

Section 5: Compliance Statement

Compliance Statement: The proposed exterior lighting design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed lighting system has been designed to meet the Oregon Energy Efficiency Specialty Code requirements in COMcheck Version 3.9.0 and to comply with the mandatory requirements in the Requirements Checklist.

Ryan Keene - Designer
Name Title

Ryan Keene
Signature

4/18/12
Date



COMcheck Software Version 3.9.0

Mechanical Compliance Certificate

Oregon Energy Efficiency Specialty Code

Section 1: Project Information

Project Type: **New Construction**
Envelope Compliance Method: **Simplified Trade-Off**
Project Title : Eliot MLK

Construction Site:
3256 NE MLK JR. BLVD
Portland, OR 97202-2635

Owner/Agent:
Julie Garver
Innovative Housing, Inc.
219 NW Second Avenue
Portland, OR 97209-3905
503 226 4368
jgarver@innovativehousinginc.com

Designer/Contractor:
Ben White
Carleton Hart Architecture
322 NW 8th Avenue
Portland, OR 97209-3504
503 206 3174
ben.white@carletonhart.com

Section 2: General Information

Building Location (for weather data): **Portland, Oregon**
Climate Zone: **4c**

Section 3: Mechanical Systems List

Quantity System Type & Description

- | | |
|---|--|
| 1 | HVAC System HP-1-1 (Single Zone) : Split System Heat Pump
Heating Mode: Capacity = 18 kBtu/h, Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 18 kBtu/h, Efficiency = 13.00 SEER |
| 1 | HVAC System HP-1-2 (Single Zone) : Split System Heat Pump
Heating Mode: Capacity = 24 kBtu/h, Efficiency = 7.70 HSPF
Cooling Mode: Capacity = 24 kBtu/h, Efficiency = 13.00 SEER |
| 1 | HVAC System DS-1 (Single Zone) :
Cooling: 1 each - Split System, Capacity = 18 kBtu/h, Efficiency = 19.20 SEER, Air-Cooled Condenser |
| 8 | HVAC System HV (Single Zone) :
Heating: 1 each - Other, Electric, Capacity = 17 kBtu/h |

Section 4: Requirements Checklist

In the following requirements, the relevant code section reference is shown in [], '+' denotes that more details exist in the specified code section. Checkboxes identify requirements that the applicant has not acknowledged as being met. Check marked requirements identify those the applicant acknowledges are met or excepted from compliance. 'Plans reference page/section' identifies where in the plans/specs the requirement can be verified as being satisfied.

Requirements Specific To: HVAC System HP-1-1 :

- ✓ 1. [503.2.3 +] Equipment meets minimum efficiency: Heat Pump: 7.70 HSPF 13.00 SEER
- ✓ 2. [503.2.6 +] Energy recovery ventilation systems. Individual fan systems that have both a design supply air capacity of 5,000 cfm or greater and a minimum outside air supply of 70 percent or greater of the design supply air quantity have an energy recovery system.

Plans reference page/section: N/A

Requirements Specific To: HVAC System HP-1-2 :

- ✓ 1. [503.2.3 +] Equipment meets minimum efficiency: Heat Pump: 7.70 HSPF 13.00 SEER
- ✓ 2. [503.2.6 +] Energy recovery ventilation systems. Individual fan systems that have both a design supply air capacity of 5,000 cfm or greater and a minimum outside air supply of 70 percent or greater of the design supply air quantity have an energy recovery system.

Plans reference page/section: N/A

Requirements Specific To: HVAC System DS-1 :

- ✓ 1. [503.2.3 +] Equipment meets minimum efficiency: Split System: 13.00 SEER
- ✓ 2. [503.2.6 +] Energy recovery ventilation systems. Individual fan systems that have both a design supply air capacity of 5,000 cfm or greater and a minimum outside air supply of 70 percent or greater of the design supply air quantity have an energy recovery system.

Plans reference page/section: N/A

Requirements Specific To: HVAC System HV :

- ✓ 1. [503.2.6 +] Energy recovery ventilation systems. Individual fan systems that have both a design supply air capacity of 5,000 cfm or greater and a minimum outside air supply of 70 percent or greater of the design supply air quantity have an energy recovery system.

Plans reference page/section: N/A

- ✓ 2. [503.3.2] Hydronic system controls. Hydronic systems of at least 300,000 Btu/h design output capacity supplying heated and chilled water to comfort conditioning systems include controls that meet the requirements of Section 503.4.3.

Plans reference page/section: N/A

Generic Requirements: Must be met by all systems to which the requirement is applicable:

- ✓ 1. [503.2.1 +] Calculation of heating and cooling loads. Design loads are determined in accordance with the procedures described in the ASHRAE/ACCA Standard 183. Alternatively, design loads have been determined by an approved equivalent computation procedure.
- ✓ 2. [503.3.1] Cooling equipment economizers: The total capacity of all units without economizers shall not exceed 240 kBtu/hr per building area served by one utility meter or service, or 10 percent of its total installed cooling capacity, whichever is greater. For this project the total capacity of all cooling equipment without economizers must be less than 240 kBtu/h. This project lists 42 kBtu/h capacity without economizers. That portion of the equipment serving dwelling units and guest rooms is not included in determining the total capacity of units without economizers.

Plans reference page/section: N/A

- ✓ 3. [503.2.2 +] Equipment and system sizing. Heating and cooling equipment and systems capacity do not exceed the loads calculated in accordance with Section 503.2.1.

Plans reference page/section: M1.01

- ✓ 4. [503.2.3 +] HVAC Equipment Performance Requirements. Reported efficiencies have been tested and rated in accordance with the applicable test procedure. The efficiency has been verified through certification under an approved certification program or, if no certification program exists, the equipment efficiency ratings are supported by data furnished by the manufacturer.

- ✓ 5. [503.2.4.1 +] Thermostatic Controls. The supply of heating and cooling energy to each zone is controlled by individual thermostatic controls that respond to temperature within the zone.

Plans reference page/section: M1.01

- ✓ 6. [503.2.4.1.1] Heat pump supplementary heat. Heat pumps having supplementary electric resistance heat have controls that, except during defrost, prevent supplementary heat operation when the heat pump can meet the heating load.

Plans reference page/section: M1.02

- ✓ 7. [503.2.4.2] Set point overlap restriction. Where used to control both heating and cooling, zone thermostatic controls provide a temperature range or deadband of at least 5°F (2.8°C) within which the supply of heating and cooling energy to the zone is capable of being shut off or reduced to a minimum.

Plans reference page/section: M1.01

- ✓ 8. [503.2.4.3] Optimum Start Controls. Each HVAC system has controls that vary the start-up time of the system to just meet the temperature set point at time of occupancy.

Plans reference page/section: M1.01

- ✓ 9. [503.2.4.4 +] Off-hour controls. Each zone is provided with thermostatic setback controls that are controlled by either an automatic time clock or programmable control system.

Plans reference page/section: M1.01

- ✓ 10. [503.2.4.5 +] Shutoff damper controls. Both outdoor air supply and exhaust are equipped with not less than Class I motorized dampers.

Plans reference page/section: M1.02, M2.01

- ✓ 11. [503.2.4.6 +] Freeze Protection and Snow melt system controls. Freeze protection systems, such as heat tracing of outdoor piping and heat exchangers, including self-regulating heat tracing, include automatic controls capable of shutting off the systems when outdoor air temperatures meet code criteria.

Plans reference page/section: N/A

- ✓ 12. [503.2.4.8] Separate air distribution systems. Zones with special process temperature requirements and/or humidity requirements are served by separate air distribution systems from those serving zones requiring only comfort conditions; or shall include supplementary control provisions so that the primary systems may be specifically controlled for comfort purposes only.
- Plans reference page/section: N/A
- ✓ 13. [503.2.4.9] Humidity control. If a system is equipped with a means to add or remove moisture to maintain specific humidity levels in a zone or zones, a humidity control device is provided.
- Plans reference page/section: No humidity control equipment - N/A
- ✓ 14. [503.2.4.9.1] Humidity control. Where a humidity control device exists it is set to prevent the use of fossil fuel or electricity to produce relative humidity in excess of 30 percent. Where a humidity control device is used for dehumidification, it is set to prevent the use of fossil fuel or electricity to reduce relative humidity below 60 percent.
- Plans reference page/section: No humidity control equipment - N/A
- ✓ 15. [503.2.4.9.2] Humidity control. Where a humidity control device exists it is set to maintain a deadband of at least 10% relative humidity where no active humidification or dehumidification takes place.
- Plans reference page/section: No humidity control equipment - N/A
- ✓ 16. [503.2.5] Ventilation. Ventilation, either natural or mechanical, is provided in accordance with Chapter 4 of the International Mechanical Code. Where mechanical ventilation is provided, the system has the capability to reduce the outdoor air supply to the minimum required by Chapter 4 of the International Mechanical Code.
- Plans reference page/section: M1.01
- ✓ 17. [503.2.5.1 +] Demand controlled ventilation (DCV). DCV is required for spaces larger than 500 ft² for simple systems and spaces larger than 150 ft² for multiple zone systems.
- Plans reference page/section: N/A
- ✓ 18. [503.2.5.2 +] Kitchen hoods. Kitchen makeup is provided as required by the Oregon Mechanical Specialty Code.
- Plans reference page/section: N/A
- ✓ 19. [503.2.5.3 +] Enclosed parking garage ventilation controls. In Group S-2, enclosed parking garages used for storing or handling automobiles employ automatic carbon monoxide sensing devices.
- Plans reference page/section: N/A
- ✓ 20. [503.2.7 +] Duct and plenum insulation and sealing. All supply and return air ducts and plenums are insulated with the specified insulation. When located within a building envelope assembly, the duct or plenum is separated from the building exterior or unconditioned or exempt spaces by a minimum of R-8 insulation. All ducts, air handlers and filter boxes are sealed. Joints and seams comply with Section 603.9 of the International Mechanical Code.
- ✓ 21. [503.2.7.1.1 +] Low-pressure duct systems. All longitudinal and transverse joints, seams and connections of low-pressure supply and return ducts are securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems or tapes installed in accordance with the manufacturer's installation instructions.
- Plans reference page/section: M1.01
- ✓ 22. [503.2.7.1.2 +] Medium-pressure duct systems. All ducts and plenums designed to operate medium-pressure are insulated and sealed in accordance with Section 503.2.7. Pressure classifications specific to the duct system are clearly indicated on the construction documents.
- Plans reference page/section: N/A
- ✓ 23. [503.2.7.1.3 +] High-pressure duct systems. Ducts designed to operate at high-pressure are insulated and sealed in accordance with Section 503.2.7. In addition, ducts and plenums are leak-tested in accordance with the SMACNA HVAC Air Duct Leakage Test Manual.
- Plans reference page/section: N/A
- ✓ 24. [503.2.8 +] Piping Insulation. All pipes serving space-conditioning systems (hot water piping for heat systems, chilled water, refrigerant, and brine piping systems, and steam piping) are insulated as specified by this section.
- ✓ 25. [503.2.9.1 +] Air system balancing. Each supply air outlet and zone terminal device is equipped with means for air balancing in accordance with the requirements of IMC 603.17. Discharge dampers intended to modulate airflow are prohibited on constant volume fans and variable volume fans with motors 10 horsepower.
- Plans reference page/section: M1.01
- ✓ 26. [503.2.9.2] Hydronic system balancing. Individual hydronic heating and cooling coils are equipped with means for balancing and pressure test connections.
- Plans reference page/section: N/A
- ✓ 27. [503.2.9.3 +] Manuals. The construction documents require that an operating and maintenance manual be provided to the building owner by the mechanical contractor. See long description for specifications.

Plans reference page/section: M1.01

- ✓ 28. [503.2.10 +] Air System Design and Control. Each HVAC system having a total fan system motor nameplate hp exceeding 5 hp meets the provisions of Sections 503.2.10.1 through 503.2.10.2.

Plans reference page/section: N/A

- ✓ 29. [503.2.10.1 +] Allowable fan floor horsepower. Each HVAC system at fan system design conditions does not exceed the allowable fan system motor nameplate hp (Option 1) or fan system bhp (Option 2) as shown and calculated in requirement details.

✓ **Exception applies:** Individual exhaust fans with motor nameplate horsepower of 1 hp or less.

Plans reference page/section: _____

- ✓ 30. [503.2.10.2 +] Motor nameplate horsepower. For each fan, the selected fan motor is no larger than the first available motor size greater than the brake horsepower (bhp).

Plans reference page/section: M1.01

- ✓ 31. [503.2.10.3.1] Large Volume Fan Systems. Fan systems over 8,000 (7 m³/s) cfm without direct expansion cooling coils that serve single zones reduce airflow based on space thermostat heating and cooling demand. A two-speed motor or variable frequency drive reduces airflow to a maximum 60 percent of peak airflow or minimum ventilation air requirement as required by Chapter 4 of the International Mechanical Code, whichever is greater.

Plans reference page/section: N/A

- ✓ 32. [503.2.10.3.2 +] All air-conditioning equipment and air-handling units with direct expansion cooling and a cooling capacity at ARI conditions greater than or equal to 110,000 Btu/h that serve single zones have their supply fan operation controlled according to code specific requirements.

Plans reference page/section: N/A

- ✓ 33. [503.2.10.4] Series fan-powered terminal unit fan motors. Fan motors for series fan-powered terminal units are electronically-commutated motors and have a minimum motor efficiency of 70 percent when rated in accordance with NEMA Standard MG 1-2006 at full load rating conditions.

Plans reference page/section: N/A

- ✓ 34. [503.2.11] Heating outside a building. Systems installed to provide heat outside a building are radiant systems. Such heating systems are controlled by an occupancy sensing device or a timer switch, so that the system is automatically deenergized when no occupants are present.

Plans reference page/section: N/A

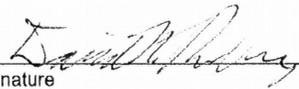
- ✓ 35. [503.2.12] Hot Gas Bypass Limitation. For cooling systems <= 240 kBtu/h, maximum hot gas bypass capacity is no more than 50% total cooling capacity.

Plans reference page/section: NO HGB

Section 5: Compliance Statement

Compliance Statement: The proposed mechanical design represented in this document is consistent with the building plans, specifications and other calculations submitted with this permit application. The proposed mechanical systems have been designed to meet the Oregon Energy Efficiency Specialty Code requirements in COMcheck Version 3.9.0 and to comply with the mandatory requirements in the Requirements Checklist.

DAYE BRADLEY PROJECT ENGINEER
Name - Title


Signature

4/19/12
Date

Section 6: Post Construction Compliance Statement

- HVAC record drawings of the actual installation, system capacities, calibration information, and performance data for each equipment provided to the owner.
- HVAC O&M documents for all mechanical equipment and system provided to the owner by the mechanical contractor.
- Written HVAC balancing and operations report provided to the owner.

The above post construction requirements have been completed.

Principal Mechanical Designer-Name

Signature

Date



COMcheck Software Version 3.9.0

Mechanical Requirements Description

Oregon Energy Efficiency Specialty Code

The following list provides more detailed descriptions of the requirements in Section 4 of the Mechanical Compliance Certificate.

Requirements Specific To: HVAC System HV :

1. [503.2.6] Energy recovery ventilation systems. Individual fan systems that have both a design supply air capacity of 5,000 cfm (2.36 m³/s) or greater and a minimum outside air supply of 70 percent or greater of the design supply air quantity shall have an energy recovery system that provides a change in the enthalpy of the outdoor air supply of 50 percent or more of the difference between the outdoor air and return air at design conditions. Provision shall be made to bypass or control the energy recovery system to permit cooling with outdoor air where cooling with outdoor air is required. Where a single room or space is supplied by multiple units, the aggregate supply (cfm) of those units shall be used in applying this requirement.

Exception(s):

- Where energy recovery systems are prohibited by the International Mechanical Code.
- Systems serving spaces that are not cooled and are heated to less than 60°F (15.5°C).
- Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy.
- Type 1 kitchen exhaust hoods.
- Cooling systems in climates with a 1-percent cooling design wet-bulb temperature less than 64F (18C).
- Systems requiring dehumidification that employ series-style energy recovery coils wrapped around the cooling coil when the evaporative coil is located upstream of the exhaust air stream.
- Systems exhausting toxic, flammable, paint exhaust, corrosive fumes, or dust.
- Laboratory fume hood systems that include at least one of the following features:
 - 1) Variable-air-volume hood exhaust and room supply systems that reduce exhaust and makeup air volume to 50 percent or less of design values during periods of reduced occupancy or system demand
 - or
 - 2) Variable-air-volume hood exhaust and room supply systems that reduce exhaust and makeup air volume and/or incorporate a heat recovery system to precondition makeup air from laboratory exhaust shall meet the following:

$$A + B*(E/M) = 50\%$$

Where:

A = Percentage that the exhaust and makeup air flow rates will be reduced from design conditions.

B = Percentage sensible heat recovery effectiveness.

E = Exhaust airflow rate through the heat recovery device at design conditions

M = Makeup air flow rate of the system at design conditions,

or

- 3) Direct makeup (auxiliary) air supply equal to at least 75 percent of the exhaust rate, heated no warmer than 2°F (1.1°C) below room setpoint, cooled to no cooler than 3°F (1.7°C) above room setpoint, no humidification added, and no simultaneous heating and cooling used for dehumidification control.

2. [503.3.2] Hydronic system controls. Hydronic systems of at least 300,000 Btu/h (87,930W) design output capacity supplying heated and chilled water to comfort conditioning systems shall include controls that meet the requirements of Section 503.4.3.

Requirements Specific To: HVAC System DS-1 :

1. [503.2.3] The specified heating and/or cooling equipment must meet the following minimum efficiency: Split System: 13.00 SEER
2. [503.2.6] Energy recovery ventilation systems. Individual fan systems that have both a design supply air capacity of 5,000 cfm (2.36 m³/s) or greater and a minimum outside air supply of 70 percent or greater of the design supply air quantity shall have an energy recovery system that provides a change in the enthalpy of the outdoor air supply of 50 percent or more of the difference between the outdoor air and return air at design conditions. Provision shall be made to bypass or control the energy recovery system to permit cooling with outdoor air where cooling with outdoor air is required. Where a single room or space is supplied by multiple units, the aggregate supply (cfm) of those units shall be used in applying this requirement.

Exception(s):

- Where energy recovery systems are prohibited by the International Mechanical Code.
- Systems serving spaces that are not cooled and are heated to less than 60°F (15.5°C).

- Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy.
- Type 1 kitchen exhaust hoods.
- Cooling systems in climates with a 1-percent cooling design wet-bulb temperature less than 64F (18C).
- Systems requiring dehumidification that employ series-style energy recovery coils wrapped around the cooling coil when the evaporative coil is located upstream of the exhaust air stream.
- Systems exhausting toxic, flammable, paint exhaust, corrosive fumes, or dust.
- Laboratory fume hood systems that include at least one of the following features:
 - 1) Variable-air-volume hood exhaust and room supply systems that reduce exhaust and makeup air volume to 50 percent or less of design values during periods of reduced occupancy or system demand
or
 - 2) Variable-air-volume hood exhaust and room supply systems that reduce exhaust and makeup air volume and/or incorporate a heat recovery system to precondition makeup air from laboratory exhaust shall meet the following:

$A + B*(E/M) = 50\%$

Where:

A = Percentage that the exhaust and makeup air flow rates will be reduced from design conditions.

B = Percentage sensible heat recovery effectiveness.

E = Exhaust airflow rate through the heat recovery device at design conditions

M = Makeup air flow rate of the system at design conditions,

or

 - 3) Direct makeup (auxiliary) air supply equal to at least 75 percent of the exhaust rate, heated no warmer than 2°F (1.1°C) below room setpoint, cooled to no cooler than 3°F (1.7°C) above room setpoint, no humidification added, and no simultaneous heating and cooling used for dehumidification control.

Requirements Specific To: HVAC System HP-1-2 :

1. [503.2.3] The specified heating and/or cooling equipment must meet the following minimum efficiency: Heat Pump: 7.70 HSPF 13.00 SEER
2. [503.2.6] Energy recovery ventilation systems. Individual fan systems that have both a design supply air capacity of 5,000 cfm (2.36 m3/s) or greater and a minimum outside air supply of 70 percent or greater of the design supply air quantity shall have an energy recovery system that provides a change in the enthalpy of the outdoor air supply of 50 percent or more of the difference between the outdoor air and return air at design conditions. Provision shall be made to bypass or control the energy recovery system to permit cooling with outdoor air where cooling with outdoor air is required. Where a single room or space is supplied by multiple units, the aggregate supply (cfm) of those units shall be used in applying this requirement.

Exception(s):

 - Where energy recovery systems are prohibited by the International Mechanical Code.
 - Systems serving spaces that are not cooled and are heated to less than 60°F (15.5°C).
 - Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy.
 - Type 1 kitchen exhaust hoods.
 - Cooling systems in climates with a 1-percent cooling design wet-bulb temperature less than 64F (18C).
 - Systems requiring dehumidification that employ series-style energy recovery coils wrapped around the cooling coil when the evaporative coil is located upstream of the exhaust air stream.
 - Systems exhausting toxic, flammable, paint exhaust, corrosive fumes, or dust.
 - Laboratory fume hood systems that include at least one of the following features:
 - 1) Variable-air-volume hood exhaust and room supply systems that reduce exhaust and makeup air volume to 50 percent or less of design values during periods of reduced occupancy or system demand
or
 - 2) Variable-air-volume hood exhaust and room supply systems that reduce exhaust and makeup air volume and/or incorporate a heat recovery system to precondition makeup air from laboratory exhaust shall meet the following:

$A + B*(E/M) = 50\%$

Where:

A = Percentage that the exhaust and makeup air flow rates will be reduced from design conditions.

B = Percentage sensible heat recovery effectiveness.

E = Exhaust airflow rate through the heat recovery device at design conditions

M = Makeup air flow rate of the system at design conditions,

or

 - 3) Direct makeup (auxiliary) air supply equal to at least 75 percent of the exhaust rate, heated no warmer than 2°F (1.1°C) below room setpoint, cooled to no cooler than 3°F (1.7°C) above room setpoint, no humidification added, and no simultaneous heating and cooling used for dehumidification control.

Requirements Specific To: HVAC System HP-1-1 :

1. [503.2.3] The specified heating and/or cooling equipment must meet the following minimum efficiency: Heat Pump: 7.70 HSPF 13.00 SEER

2. [503.2.6] Energy recovery ventilation systems. Individual fan systems that have both a design supply air capacity of 5,000 cfm (2.36 m³/s) or greater and a minimum outside air supply of 70 percent or greater of the design supply air quantity shall have an energy recovery system that provides a change in the enthalpy of the outdoor air supply of 50 percent or more of the difference between the outdoor air and return air at design conditions. Provision shall be made to bypass or control the energy recovery system to permit cooling with outdoor air where cooling with outdoor air is required. Where a single room or space is supplied by multiple units, the aggregate supply (cfm) of those units shall be used in applying this requirement.

Exception(s):

- Where energy recovery systems are prohibited by the International Mechanical Code.
- Systems serving spaces that are not cooled and are heated to less than 60°F (15.5°C).
- Where more than 60 percent of the outdoor heating energy is provided from site-recovered or site solar energy.
- Type 1 kitchen exhaust hoods.
- Cooling systems in climates with a 1-percent cooling design wet-bulb temperature less than 64F (18C).
- Systems requiring dehumidification that employ series-style energy recovery coils wrapped around the cooling coil when the evaporative coil is located upstream of the exhaust air stream.
- Systems exhausting toxic, flammable, paint exhaust, corrosive fumes, or dust.
- Laboratory fume hood systems that include at least one of the following features:
 - 1) Variable-air-volume hood exhaust and room supply systems that reduce exhaust and makeup air volume to 50 percent or less of design values during periods of reduced occupancy or system demand
or
 - 2) Variable-air-volume hood exhaust and room supply systems that reduce exhaust and makeup air volume and/or incorporate a heat recovery system to precondition makeup air from laboratory exhaust shall meet the following:

$$A + B*(E/M) = 50\%$$

Where:

 - A = Percentage that the exhaust and makeup air flow rates will be reduced from design conditions.
 - B = Percentage sensible heat recovery effectiveness.
 - E = Exhaust airflow rate through the heat recovery device at design conditions
 - M = Makeup air flow rate of the system at design conditions,

or

 - 3) Direct makeup (auxiliary) air supply equal to at least 75 percent of the exhaust rate, heated no warmer than 2°F (1.1°C) below room setpoint, cooled to no cooler than 3°F (1.7°C) above room setpoint, no humidification added, and no simultaneous heating and cooling used for dehumidification control.

Generic Requirements: Must be met by all systems to which the requirement is applicable:

1. [503.2.1] Calculation of heating and cooling loads. Design loads shall be determined in accordance with the procedures described in the ASHRAE/ACCA Standard 183. Heating and cooling loads shall be adjusted to account for load reductions that are achieved when energy recovery systems are utilized in the HVAC system in accordance with the ASHRAE HVAC Systems and Equipment Handbook. Alternatively, design loads shall be determined by an approved equivalent computation procedure.
2. [503.3.1] Cooling equipment economizers: The total capacity of all units without economizers shall not exceed 240 kBtu/hr per building area served by one utility meter or service, or 10 percent of its total installed cooling capacity, whichever is greater. For this project the total capacity of all cooling equipment without economizers must be less than 240 kBtu/h. This project lists 42 kBtu/h capacity without economizers. That portion of the equipment serving dwelling units and guest rooms is not included in determining the total capacity of units without economizers.
3. [503.2.2] Equipment and system sizing. Heating and cooling equipment and systems capacity shall not exceed the loads calculated in accordance with Section 503.2.1. A single piece of equipment providing both heating and cooling must satisfy this provision for one function with the capacity for the other function as small as possible, within available equipment options.

Exception(s):

 - Required standby equipment and systems provided with controls and devices that allow such systems or equipment to operate automatically only when the primary equipment is not operating.
 - Multiple units of the same equipment type with combined capacities exceeding the design load and provided with controls that have the capability to sequence the operation of each unit based on load.
4. [503.2.3] HVAC Equipment Performance Requirements. Reported efficiencies must be tested and rated in accordance with the applicable test procedure. The efficiency shall be verified through certification under an approved certification program or, if no certification program exists, the equipment efficiency ratings shall be supported by data furnished by the manufacturer. Where multiple rating conditions or performance requirements are provided, the equipment shall satisfy all stated requirements. Where components, such as indoor or outdoor coils, from different manufacturers are used, calculations and supporting data shall be furnished by the designer that demonstrates that the combined efficiency of the specified components meets the requirements herein.
5. [503.2.4.1] Thermostatic Controls. The supply of heating and cooling energy to each zone shall be controlled by individual thermostatic controls that respond to temperature within the zone.

6. [503.2.4.1.1] Heat pump supplementary heat. Heat pumps having supplementary electric resistance heat shall have controls that, except during defrost, prevent supplementary heat operation when the heat pump can meet the heating load.
7. [503.2.4.2] Set point overlap restriction. Where used to control both heating and cooling, zone thermostatic controls shall provide a temperature range or deadband of at least 5°F (2.8°C) within which the supply of heating and cooling energy to the zone is capable of being shut off or reduced to a minimum.
Exception(s):
- Thermostats requiring manual change over between heating and cooling modes.
8. [503.2.4.3] Optimum Start Controls. Each HVAC system shall have controls that vary the start-up time of the system to just meet the temperature set point at time of occupancy.
9. [503.2.4.4] Off-hour controls. Each zone shall be provided with thermostatic setback controls that are controlled by either an automatic time clock or programmable control system. Thermostatic setback controls shall have the capability to set back or temporarily operate the system to maintain zone temperatures down to 55°F (13°C) or up to 85°F (29°C). Automatic time clock or programmable controls shall be capable of starting and stopping the system for seven different daily schedules per week and retaining their programming and time setting during a loss of power for at least 10 hours. Additionally, the controls shall have a manual override that allows temporary operation of the system for up to 2 hours; a manually operated timer capable of being adjusted to operate the system for up to 2 hours; or an occupancy sensor.
Exception(s):
- Zones that will be operated continuously.
 - Zones with a full HVAC load demand not exceeding 6,800 Btu/h (2 kW) and having a readily accessible manual shutoff switch.
10. [503.2.4.5] Shutoff damper controls. Both outdoor air supply and exhaust shall be equipped with not less than Class I motorized dampers with a maximum leakage rate of 4 cfm per square foot (6.8 L/s - C m²) at 1.0 inch water gauge (w.g.) (1250 Pa) when tested in accordance with AMCA 500D, that will automatically shut when the systems or spaces served are not in use.
Exception(s):
- Gravity dampers shall be permitted for outside air intake or exhaust airflows of 300 cfm (0.14 m³/s) or less.
11. [503.2.4.6] Freeze Protection and Snow melt system controls. Freeze protection systems, such as heat tracing of outdoor piping and heat exchangers, including self-regulating heat tracing, shall include automatic controls capable of shutting off the systems when outdoor air temperatures are above 40F or when the conditions of the protected fluid will prevent freezing. Snow- and ice-melting systems, supplied through energy service to the building, shall include automatic controls capable of shutting off the system when the pavement temperature is above 50F (10C) and no precipitation is falling and an automatic or manual control that will allow shutoff when the outdoor temperature is above 40F (4C) so that the potential for snow or ice accumulation is negligible.
12. [503.2.4.8] Separate air distribution systems. Zones with special process temperature requirements and/or humidity requirements shall be served by separate air distribution systems from those serving zones requiring only comfort conditions; or shall include supplementary control provisions so that the primary systems may be specifically controlled for comfort purposes only.
Exception(s):
- Zones requiring only comfort heating or comfort cooling that are served by a system primarily used for process temperature and humidity control provided that:
 - 1) The total supply air to those comfort zones is no more than 25 percent of the total system supply air,
 - or
 - 2) The total conditioned floor area of the zones is less than 1,000 square feet (90 m²)
13. [503.2.4.9] Humidity control. If a system is equipped with a means to add or remove moisture to maintain specific humidity levels in a zone or zones, a humidity control device shall be provided.
14. [503.2.4.9.1] Humidity control. Where a humidity control device exists it shall be set to prevent the use of fossil fuel or electricity to produce relative humidity in excess of 30 percent. Where a humidity control device is used for dehumidification, it shall be set to prevent the use of fossil fuel or electricity to reduce relative humidity below 60 percent.
Exception(s):
- Hospitals, process needs, archives, museums, critical equipment, and other non-comfort situations with specific humidity requirements outside this range.
15. [503.2.4.9.2] Humidity control. Where a humidity control device exists it shall be set to maintain a deadband of at least 10% relative humidity where no active humidification or dehumidification takes place.
Exception(s):
- Heating for dehumidification is provided with heat recovery or heat pumping and the mechanical cooling system efficiency is 10 percent higher than required in section 503.2.3, HVAC equipment performance requirements.

16. [503.2.5] Ventilation. Ventilation, either natural or mechanical, shall be provided in accordance with Chapter 4 of the International Mechanical Code. Where mechanical ventilation is provided, the system shall provide the capability to reduce the outdoor air supply to the minimum required by Chapter 4 of the International Mechanical Code.
17. [503.2.5.1] Demand controlled ventilation (DCV). DCV is required for spaces larger than 500 ft² for simple systems and spaces larger than 150 ft² for multiple zone systems and with an average occupant load of 25 people or more per 1000 ft² of floor area (as established in Table 403.3 of the International Mechanical Code) and served by systems with one or more of the following:
1. An air-side economizer;
 2. Automatic modulating control of the outdoor air damper; or
 3. A design outdoor airflow greater than 3,000 cfm.
- Exception(s):
- Systems with energy recovery complying with Section 503.2.6
 - Spaces less than 750 ft² (69.7 m²) where an occupancy sensor turns the fan off, closes the ventilation damper, or closes the zone damper when the space is unoccupied.
18. [503.2.5.2] Kitchen hoods. Kitchen makeup air shall be provided as required by the Oregon Mechanical Specialty Code. For each kitchen with a total exhaust capacity greater than 5,000 cfm (2360 L/s), 50 percent of the required makeup air shall be (a) unheated or heated to no more than 60°F (15.55°C); and (b) uncooled or evaporatively cooled. Each kitchen with a total exhaust capacity greater than 5,000 cfm shall be equipped with a demand ventilation system on at least 75 percent of the exhaust and makeup air. Such systems shall be equipped with automatic controls that reduce airflow in response to cooking appliance operation.
- Exception(s):
- Where hoods are used to exhaust ventilation air that would otherwise be exhausted by other fan systems. Air transferred from spaces served by other fan systems may not be used if those systems are required to meet either Sections 503.2.5.1 or 503.2.6. Occupancy schedule of HVAC system supplying transfer air shall be similar to kitchen exhaust hood operating schedule.
 - Kitchen exhaust systems that include exhaust air energy recovery complying with section 503.2.6.
19. [503.2.5.3] Enclosed parking garage ventilation controls. In Group S-2, enclosed parking garages used for storing or handling automobiles operating under their own power having ventilation exhaust rates 30,000 cfm and greater shall employ automatic carbon monoxide sensing devices. These devices shall modulate the ventilation system to maintain a maximum average concentration of carbon monoxide of 50 parts per million during any 8-hour period, with a maximum concentration not greater than 200 parts per million for a period not exceeding 1 hour. The system shall be capable of producing a ventilation rate of 1.5 cfm per square foot (0.0076 m³/s - m²) of floor area. Failure of such devices shall cause the exhaust fans to operate in the ON position.
20. [503.2.7] Duct and plenum insulation and sealing. All supply and return air ducts and plenums shall be insulated with a minimum of R-5 insulation when located in unconditioned spaces and a minimum of R-8 insulation when located outside the building. When located within a building envelope assembly, the duct or plenum shall be separated from the building exterior or unconditioned or exempt spaces by a minimum of R-8 insulation. All ducts, air handlers and filter boxes shall be sealed. Joints and seams shall comply with Section 603.9 of the International Mechanical Code.
- Exception(s):
- When located within equipment.
 - When the design temperature difference between the interior and exterior of the duct or plenum does not exceed 15°F (8°C).
21. [503.2.7.1.1] Low-pressure duct systems. All longitudinal and transverse joints, seams and connections of supply and return ducts operating at a static pressure less than or equal to 2 inches w.g. (500 Pa) shall be securely fastened and sealed with welds, gaskets, mastics (adhesives), mastic-plus-embedded-fabric systems or tapes installed in accordance with the manufacturer's installation instructions. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the International Mechanical Code. Documentation shall be furnished by the designer demonstrating that representative sections totaling at least 25 percent of the duct area have been tested and that all tested sections meet the requirements of this section.
- Exception(s):
- Continuously welded and locking-type longitudinal joints and seams on ducts operating at static pressures less than 2 inches w.g. (500 Pa) pressure classification.
22. [503.2.7.1.2] Medium-pressure duct systems. All ducts and plenums designed to operate at a static pressure greater than 2 inches w.g. (500 Pa) but less than 3 inches w.g. (750 Pa) shall be insulated and sealed in accordance with Section 503.2.7. Pressure classifications specific to the duct system shall be clearly indicated on the construction documents in accordance with the International Mechanical Code. Documentation shall be furnished by the designer demonstrating that representative sections totaling at least 25 percent of the duct area have been tested and that all tested sections meet the requirements of this section.
23. [503.2.7.1.3] High-pressure duct systems. Ducts designed to operate at static pressures in excess of 3 inches w.g. (746 Pa) shall be insulated and sealed in accordance with Section 503.2.7. In addition, ducts and plenums shall be leak-tested in accordance with the SMACNA HVAC Air Duct Leakage Test Manual with the rate of air leakage (CL) less than or equal to 6.0 as determined in accordance with Equation 5-2. Documentation shall be furnished by the designer demonstrating that representative sections totaling at least 25 percent of the duct area have been tested and that all tested sections meet the requirements of this section.

CL = F x P^(0.65) (Equation 5-2)

where:

F = The measured leakage rate in cfm per 100 square feet of duct surface.

P = The static pressure of the test.

24. [503.2.8] Piping Insulation. All pipes serving space-conditioning systems must be insulated as follows:
- Hot water piping for heating systems:
 - 1.5 in. for pipes ≤ 1.5 in. nominal diameter,
 - 2 in. for pipes > 1.5 in. nominal diameter.
 - Chilled water, refrigerant, and brine piping systems:
 - 1.5 in. insulation for pipes ≤ 1.5 in. nominal diameter,
 - 1.5 in. insulation for pipes > 1.5 in. nominal diameter.
 - Steam piping:
 - 1.5 in. insulation for pipes ≤ 1.5 in. nominal diameter,
 - 3 in. insulation for pipes > 1.5 in. nominal diameter.
- Exception(s):
- Pipe insulation is not required for factory-installed piping within HVAC equipment.
 - Pipe insulation is not required for piping that conveys fluids having a design operating temperature range between 60°F and 105°F.
 - Piping within room fan-coil (with AHRI440 rating) and unit ventilators (with AHRI840 rating).
 - Pipe insulation is not required for runout piping not exceeding 4 ft in length and 1 in. in diameter between the control valve and HVAC coil.
25. [503.2.9.1] Air system balancing. Each supply air outlet and zone terminal device shall be equipped with means for air balancing in accordance with the requirements of Chapter 6 of the International Mechanical Code (IMC 603.17). Discharge dampers intended to modulate airflow are prohibited on constant volume fans and variable volume fans with motors 10 horsepower (hp) (7.5 kW) and larger.
26. [503.2.9.2] Hydronic system balancing. Individual hydronic heating and cooling coils shall be equipped with means for balancing and pressure test connections.
27. [503.2.9.3] Manuals. The construction documents shall require that an operating and maintenance manual be provided to the building owner by the mechanical contractor. The manual shall include, at least, the following:
1. Equipment capacity (input and output) and required maintenance actions.
 2. Equipment operation and maintenance manuals.
 3. HVAC system control maintenance and calibration information, including wiring diagrams, schematics, and control sequence descriptions. Desired or field-determined setpoints shall be permanently recorded on control drawings, at control devices or, for digital control systems, in programming comments.
 4. A complete written narrative of how each system is intended to operate.
28. [503.2.10] Air System Design and Control. Each HVAC system having a total fan system motor nameplate horsepower (hp) exceeding 5 horsepower (hp) (3.7 kW) shall meet the provisions of Sections 503.2.10.1 through 503.2.10.2.
29. [503.2.10.1] Allowable fan floor horsepower. Each HVAC system at fan system design conditions shall not exceed the allowable fan system motor nameplate hp (Option 1) or fan system bhp (Option 2) as shown in Table 503.2.10.1(1). This includes supply fans, return/relief fans, and fan-powered terminal units associated with systems providing heating or cooling capability.

Table 503.2.10.1(1)

Fan Power Limitation	LIMIT	CONSTANT VOLUME	VARIABLE VOLUME
Option 1: Fan system motor nameplate hp	Allowable nameplate motor hp	hp < CFMS *0.0011	hp < CFMS *0.0015
Option 2: Fan system bhp	Allowable fan system bhp	bhp < CFMS *0.00094 + A	bhp < CFMS *0.0013 + A

where:

CFMS = The maximum design supply airflow rate to conditioned spaces served by the system in cubic feet per minute.

hp = The maximum combined motor nameplate horsepower.

Bhp = The maximum combined fan brake horsepower.

A = Sum of [PD x CFMD / 4131].

where:

PD = Each applicable pressure drop adjustment from Table 503.2.10.1(2) in. w.c.

Table 503.2.10.1(2)

Fan Power Limitation Pressure Drop Adjustment Credits:

Fully ducted return and/or exhaust air systems = 0.5 in w.c.

Return and/or exhaust airflow control devices = 0.5 in w.c

Exhaust filters, scrubbers or other exhaust treatment = pressure drop of device calculated at fan system design condition.
Particulate filtration credit: MERV 9 thru 12 = 0.5 in w.c.
Particulate filtration credit: MERV 13 thru 15 = 0.9 in w.c.
Particulate filtration credit: MERV 16 and greater and electronically
Enhanced filters = Pressure drop calculated at 2x clean filter pressure drop at fan system design condition.
Carbon and other gas-phase air cleaners = Clean filter pressure drop at fan system design condition.
Heat recovery device = Pressure drop of device at fan system design condition.
Evaporative humidifier/cooler in series with another cooling coil = Pressure drop of device at fan system design conditions
Sound attenuation section = 0.15 in w.c.
Exhaust system serving fume hoods = 0.35 in. w.c.
Laboratory and vivarium exhaust systems in high-rise buildings = 0.25 in. w.c./100 ft of vertical duct exceeding 75 feet

Exception(s):

- Hospital and laboratory systems that utilize flow control devices on exhaust and/or return to maintain space pressure relationships necessary for occupant health and safety or environmental control shall be permitted to use variable volume fan power limitation.
- Individual exhaust fans with motor nameplate horsepower of 1 hp (0.7 kW) or less.

30. [503.2.10.2] Motor nameplate horsepower. For each fan, the selected fan motor shall be no larger than the first available motor size greater than the brake horsepower (bhp). The fan brake horsepower (bhp) shall be indicated on the design documents to allow for compliance verification by the code official.

Exception(s):

- For fans less than 6 bhp, where the first available motor larger than the brake horsepower has a nameplate rating within 50 percent of the bhp, selection of the next larger nameplate motor size is allowed.
- For fans 6 bhp and larger, where the first available motor larger than the bhp has a nameplate rating within 30 percent of the bhp, selection of the next larger nameplate motor size is allowed.

31. [503.2.10.3.1] Large Volume Fan Systems. Fan systems over 8,000 (7 m³/s) cfm without direct expansion cooling coils that serve single zones are required to reduce airflow based on space thermostat heating and cooling demand. A two-speed motor or variable frequency drive shall reduce airflow to a maximum 60 percent of peak airflow or minimum ventilation air requirement as required by Chapter 4 of the International Mechanical Code, whichever is greater.

Exception(s):

- Systems where the function of the supply air is for purposes other than temperature control, such as maintaining specific humidity levels or supplying an exhaust system

32. [503.2.10.3.2] All air-conditioning equipment and air-handling units with direct expansion cooling and a cooling capacity at ARI conditions greater than or equal to 110,000 Btu/h that serve single zones shall have their supply fans controlled by two-speed motors or variable speed drives. At cooling demands less than or equal to 50 percent, the supply fan controls shall be able to reduce the airflow to no greater than the larger of the following:

1. Two-thirds of the full fan speed, or
2. The volume of outdoor air required to meet the ventilation requirements of ANSI/ASHRAE Standard 62.1-2007.

Exception(s):

- Systems where the function of the supply air is for purposes other than temperature control, such as maintaining specific humidity levels or supplying an exhaust system

33. [503.2.10.4] Series fan-powered terminal unit fan motors. Fan motors for series fan-powered terminal units shall be electronically-commutated motors and have a minimum motor efficiency of 70 percent when rated in accordance with NEMA Standard MG 1-2006 at full load rating conditions.

34. [503.2.11] Heating outside a building. Systems installed to provide heat outside a building shall be radiant systems. Such heating systems shall be controlled by an occupancy sensing device or a timer switch, so that the system is automatically deenergized when no occupants are present.

35. [503.2.12] Hot Gas Bypass Limitation. For cooling systems \leq 240 kBtu/h, maximum hot gas bypass capacity must be no more than 50% total cooling capacity.

