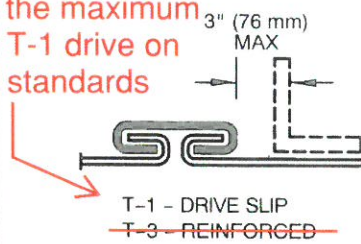


For use with the 1" WG and
2" WG approved Standards



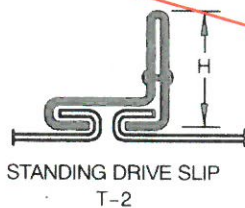
icon Mechanical
1616 Cleveland Blvd. • Granite City, IL 62040
www.iconmech.com

NOTE: 18" is the maximum
length for the T-1 drive on
the approved standards

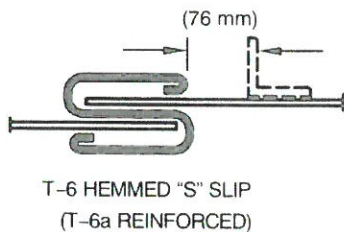
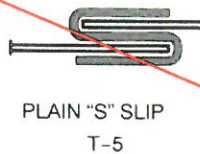


Refer to Approved
Standards

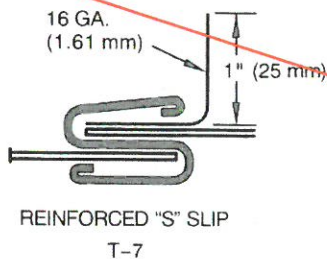
- Gage no less than two gages less than duct gage
- ~~24 ga minimum~~
- Qualification as reinforcement per Table 2-48
- ~~T-3 Slip Gage as per T-1~~
 - Any length at 2 in. wg
 - 36 in. maximum length at 3 in. wg
 - 30 in. maximum length at 4 in. wg
 - Not allowed above 4 in. wg



- Fasten standing portions within 2 in. of each end and elsewhere at 8 in. spacing or less
- Any length at 2 in. wg
- 36 in. maximum length at 3 in. wg
- 30 in. maximum length at 4 in. wg
- Not allowed above 4 in. wg

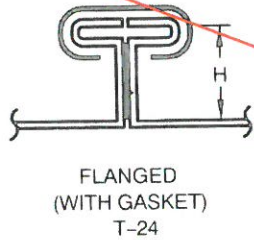


- Not less than two gages less than duct gage
- 24 ga minimum
- When used on all 4 sides, fasten within 2 in. of the corners and at 12 in. maximum intervals
- 2 in. wg maximum pressure

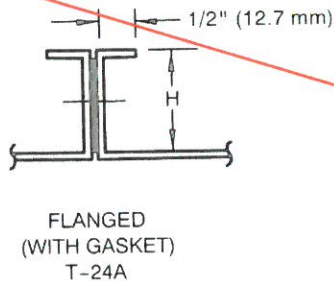


- Use slips conforming to T-6
- Use 16 ga angle of 1 in. height into slip pocket
- Fasten with screws at ends
- Angle used only for A, B, or C rigidity class
- 2 in. wg maximum pressure

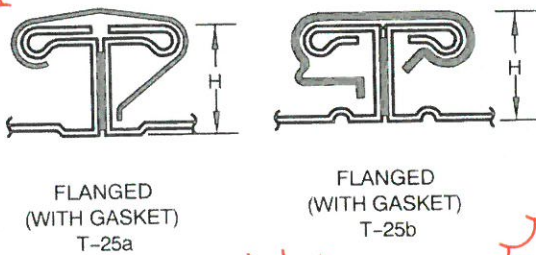
FIGURE 2-1 RECTANGULAR DUCT/TRANSVERSE JOINTS



- Assemble per Figure 2-16
- Close corners with minimum 16 ga corner pieces and $\frac{3}{8}$ in. bolts min.
- Lock flanges together with 6 in. long clips located within 6 in. of each corner
- Clips spaced at 15 in. maximum for 3 in. wg pressure class or lower
- Clips spaced at 12 in. maximum for 4, 6 and 10 in. wg
- Gasket to be located to form an effective seal

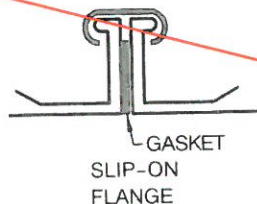


- Bolt, rivet 1 in. maximum from ends and at 6 in. maximum intervals
- Limited to 2 in. wg pressure class
- See Figure 2-16
- Gasket to be located to form an effective seal



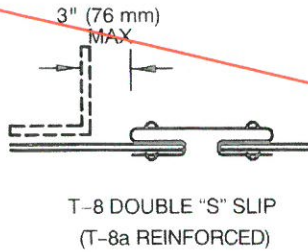
For use with the 1", 2", 3", 4", 6", and 10" WG approved galvanized standards

- Assemble per Figure 2-17
- Ratings may be adjusted with EI-rated bar stock or members from Tables 2-29 and 2-30
- Supplemental members may be attached to the duct wall on both sides of the joint
- Single members may be used if they are fastened through both mating flanges
- Gasket to be located to form an effective seal

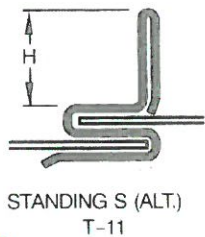
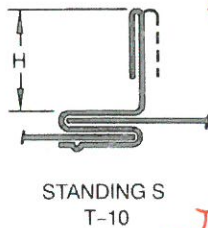


- Consult manufacturers for ratings established by performance documented to functional criteria in Chapter 11

FIGURE 2-1 RECTANGULAR DUCT/TRANSVERSE JOINTS (CONTINUED)



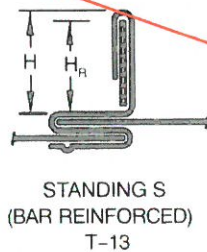
- 24 ga for 30 inch width or less
- 22 ga over 30 inch width
- Fasten to each section of the duct within 2 in. from corners and at 6 in. maximum intervals
- 5/8 in. minimum tabs to close corners



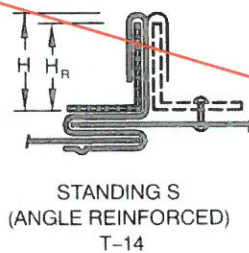
For use with the 1" WG and 2" WG approved standards

- When using S on all four sides, fasten slip to duct within 2 in. of the corner and at 12 in. maximum intervals
- ~~Any length at 2 in. wg~~
- ~~36 in. maximum length at 3 in. wg~~
- ~~30 in. maximum length at 4 in. wg~~
- Not allowed above 4 in. wg

Refer to Approved Standards



- Fasten as per Joint T-10
- Standing portion as per T-10 or T-11 to hold Flat Bar
- Fasten bar stock to the connector within 2 in. of the corner and at 12 in. maximum intervals
- Any length at 2 in. wg
- 36 in. maximum length at 3 in. wg
- 30 in. maximum length at 4 in. wg
- Not allowed above 4 in. wg



- Fasten as per Joint T-10
- Fasten angle to the connector or duct wall within 2 in. of the corner and at 12 in. maximum intervals
- Any length at 2 in. wg
- 36 in. maximum length at 3 in. wg
- 30 in. maximum length at 4 in. wg
- Not allowed above 4 in. wg

FIGURE 2-1 RECTANGULAR DUCT/TRANSVERSE JOINTS (CONTINUED)

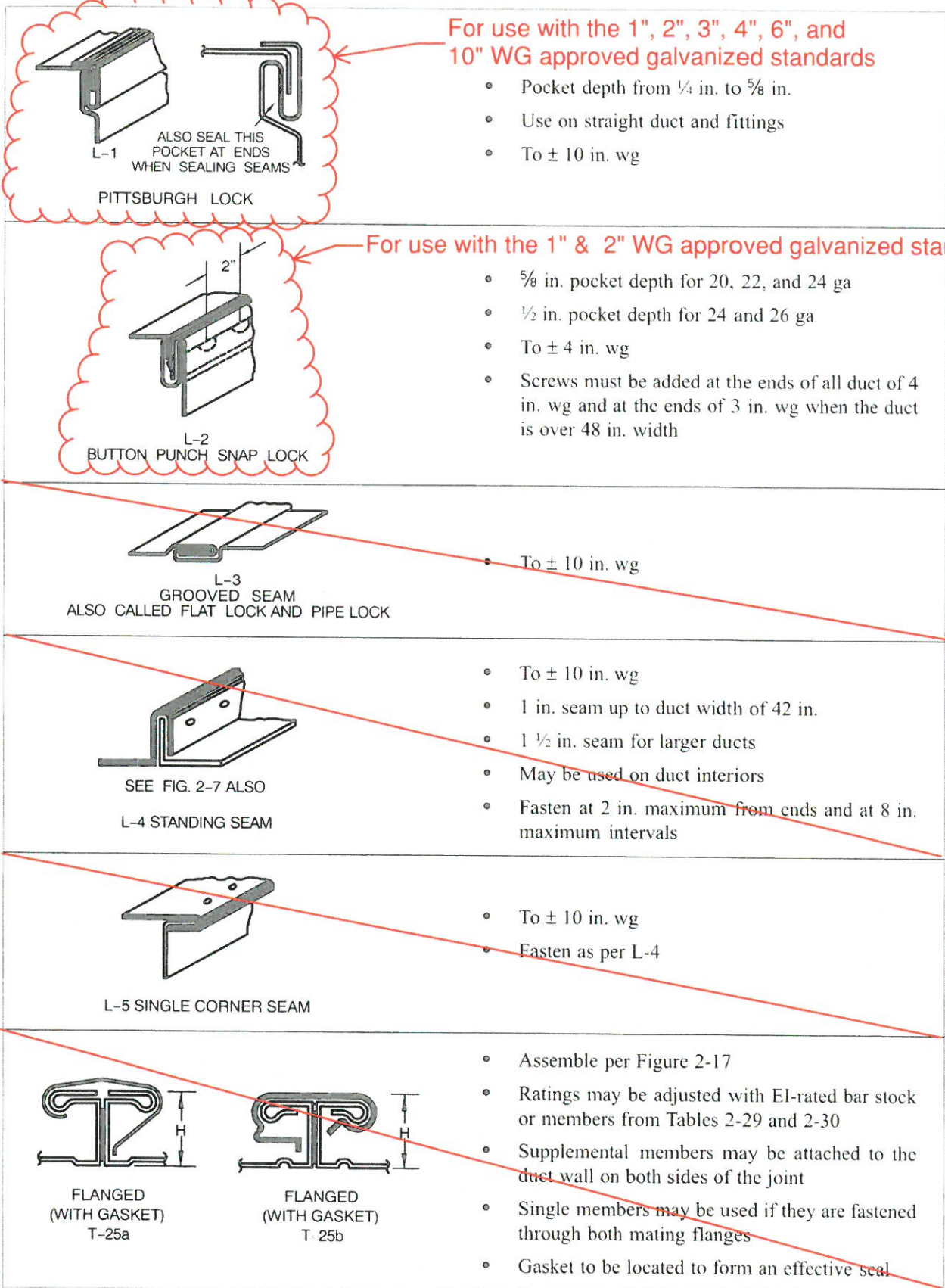


FIGURE 2-2 RECTANGULAR DUCT/LONGITUDINAL SEAMS

Shop Drawing Submittal Review

Transmitted To: Cannon Design

Date: September 22, 2016

Attention: stl-cac@cannondesign.com

Contact Person / WTA Field Inspector:
Patrick Garner

Project Name: Webster University-**ISB**

Reviewed by: Mark Schaefer

Project No. WT 14127.01

☐

UPS

☐

Courier

☒

Email

Copies	No.	Description
1 PDF	238800M05	(Submittal No.'s) (R&B CxSRC)
		(Cannon #238800-008) - (Paric #15051-0203) - (WES #607)
		• Ductwork Product Data

***Remarks: Please see PAGE 2 for remarks.**

c: **Kelvin Patel**
Kpatel@cannondesign.com

☐ Furnish as Submitted

☒ ***Furnish as Noted**

☐ Rejected

☐ Revise & Resubmit

☐ Reviewed

☐

Corrections or comments made on shop drawings during this review do not relieve contractor from compliance with requirements of drawings and specifications. This check is only for review of general conformance with the design concept of project and general compliance with information given in contract documents. Contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.

Shop Drawing Submittal Review

Submittal Review Comments

1. Replace material list for sheet metal with the following:

Webster University ISB Job # 5768

Ductwork Specification Submittal

DUCT SYSTEM	SHAPE	MATERIAL	JOINTS	NOTES
LOW PRESSURE SUPPLY	Round	G-60	Gasketed	1,7,8
	Rectangular	G-90	Slip & Drive	
RETURN, OUTDOOR AIR, RELIEF, EXHAUST	Round	G-90	Gasketed	1,7,8
	Rectangular	G-90	Slip & Drive	
MEDIUM PRESSURE SUPPLY DUCT	Round	G-90	Gasketed	2,7,8
	Rectangular	G-90	Slip & Drive	
RANGE HOOD KITCHEN EXHAUST DUCT (CONCEALED)	Round	16 Gauge Carbon Steel	Welded and Flanged	3
	Rectangular	16 Gauge Carbon Steel	Welded and Flanged	
RANGE HOOD KITCHEN EXHAUST DUCT (EXPOSED)	Round	14 Gauge 304 Stainless Steel	Welded and Flanged	3
	Rectangular	14 Gauge 304 Stainless Steel	Welded and Flanged	
ACID RESISTANT FUME HANDLING DUCT	Round	304L Stainless Steel	Welded and Flanged	4,5,6
	Rectangular	304L Stainless Steel	Welded and Flanged	

NOTES

1. ALL RETURN, EXHAUST, OUTDOOR AIR, MAKEUP, RELIEF, AND SUPPLY DUCT WORK DOWNSTREAM FROM VAVS SHALL BE CONSTRUCTED OF GAUGES AND REINFORCEMENT TO +/- 2" W.G.
2. ALL MEDIUM PRESSURE SUPPLY DUCTWORK, UNLESS SPECIFIED OTHERWISE, SHALL BE CONSTRUCTED OF GAUGES AND REINFORCEMENT TO 4" W.G. STATIC PRESSURE.
3. RANGE HOOD KITCHEN EXHAUST DUCTS WILL COMPLY WITH NFPA PAMPHLET 96. ALL JOINTS WILL BE LIQUID TIGHT EXTERNALLY WELDED AND FLANGED. DUCT SHALL SLOPE TOWARDS HOODS AND BE INSTALLED WITHOUT FORMING DIPS OR TRAPS. ACCESS PANELS SHALL BE PROVIDED AT
4. ALL ACID RESISTANT FUME EXHAUST BRANCHES FROM THE FUME HOODS TO THE EXHAUST MAINS SHALL BE CONSTRUCTED 304 STAINLESS STEEL WITH A NO. 4 FINISH. SEAMS AND JOINTS SHALL BE LIQUID TIGHT EXTERANALLY WELDED AND FLANGED. THE MATERIAL WITH TRANSITION TO GALVANIZED STEEL AT THE HEADER.
5. ALL BRANCH AND HEADER ACID RESISTANT FUME EXHAUST DUCTWORK IN CHEMISTRY LAB CLASSROOM 472 SHALL BE CONTRUCTED OF A
6. TURNING VANES FOR ACID RESISTANT FUME EXHAUST DUCTS SHALL BE FABRICATED OF 304 STAINLESS STEEL. VOLUME DAMPERS SHALL HAVE
7. ALL MEDUIM PRESSURE ROUND DUCTS SHALL HAVE SPIRAL SEAMS.
8. ALL ROUND AND RECTANGULAR DUCT SHALL USE PROSEAL SEALANT WHERE SEALANT IS REQUIRED.

2. Radius elbows with centerline radius equal to 1.5 x diameter is preferred. Only use the 1 x diameter if space is not available for the 1.5 x diameter elbow.
3. Mitered elbows shall not be used except if necessary for space constraints and have turning vanes.
4. Abrupt reducers shall not be used.
5. Do not use straight pressed or saddle taps for medium pressure ductwork.
6. Do not use bullhead tees, unless no other configuration is available.
7. Avoid use cross style tees.

WTASHOP - Webster ISB - 23 8800-008

From: STL-CAC <STL-CAC@CANNONDESIGN.COM>
To: 'Patrick Garner' <pgarner@wmtao.com>, WTASHOP <wtashop@wmtao.com>
Date: 9/1/2016 9:33 AM
Subject: Webster ISB - 23 8800-008
Cc: "Patel, Kelvin" <kpatel@CANNONDESIGN.COM>
Attachments: 238800-008 Ductwork Product Data.pdf

Attached for review.

Melissa Pirtle
Construction Admin

CANNONDESIGN

1100 Clark Ave
St. Louis, Missouri 63102
T [314.425.8797](tel:314.425.8797) • M
cannondesign.com

SUBMITTAL IDENTIFICATION SHEET

To be completed by Contractor/CM

PROJECT NAME	
ADDRESS	
NUMBER	
OWNER	
ARCHITECT / ENGINEER	
SUBMITTED BY	
CONTRACTOR / CM SUBMITTAL NO.	CANNON DESIGN SUBMITTAL NO.
DRAWING / DETAIL REFERENCE	SPECIFICATION SECTION / PARAGRAPH
MANUFACTURER / SUPPLIER	ITEM / PRODUCT ID
REQUIRED DATE	PRIORITY
CRITICALITY	

To be completed by Reviewer

CANNON DESIGN SUBMITTAL NUMBER
RECEIVED DATE

- ☐ **A. No Exceptions Taken**
No further review of submittal is required.
- ☐ **B. Make Corrections Noted**
Incorporate corrections in work;
resubmission is not required.
- ☐ **C. Revise and Resubmit**
Revise as noted, and resubmit for review.
- ☐ **D. Rejected**
Submittal is not in compliance with Contract Documents;
provide new submittal.
- ☐ **E. For Record / Information Only**
Submittal was reviewed for Record / Information
purposes only.
- ☐ **F. Not Required for Review**
Submittal is not required by Contract Documents
and has not been reviewed.

Review is for conformance with the design concept of this project and for general compliance with contract documents. Contractor is responsible for quantities, dimensions and compliance with contract documents and for information that pertains to fabrication processes, construction techniques and coordination of this work with all trades which will be affected thereby. This review is null and void if submittal deviates from contract documents and does not indicate or note deviations.

ITEM BEING SUBMITTED (check only one)

- ☐ Shop Drawings ☐ Certification / Qualifications ☐ Coordination Drawing
☐ Samples ☐ Record Documents ☐ Calculations
 (_____ copies) ☐ Product Data ☐ Schedules
☐ LEED Submittal ☐ O&M Manuals
☐ Other

ITEM BEING SUBMITTED FOR (check only one)

- ☐ Action ☐ Information Only ☐ Record

REMARKS OR DEVIATIONS

CONTRACTOR / CM CERTIFICATION
(SUBMITTALS NOT CERTIFIED WILL BE RETURNED WITHOUT REVIEW)



PARIC CORPORATION
SUBMITTAL STAMP

THIS SHOP DRAWING HAS BEEN REVIEWED BY PARIC CORPORATION

Subcontractor remains responsible for dimensions, quantities, coordination with other trades and compliance with contract documents.

Ry:

By:
Devin D. Gates

REVIEWED BY	DATE

A/E COMMENTS

- ☐
- See attached sheet(s) for additional comments

REVIEWED BY	DATE



77 Westport Plaza
Suite 250
St. Louis, MO 63146

TRANSMITTAL

No. 15051-0203

Paric Corporation

PROJECT: 15051-Webster University Interdisciplinary Science Building

DATE: 08/31/2016

TO: Cannon Design
1100 Clark Ave
St Louis MO 63102

RE: DuctWork Product Data

ATTN: Kelvin Patel

JOB: 15051

WE ARE SENDING:		SUBMITTED FOR:	ACTION TAKEN:
☐ Shop Drawings		☒ Approval	☐ Approved as Submitted
☐ Letter		☐ Your Use	☐ Approved as Noted
☐ Prints		☐ As Requested	☐ Returned After Loan
☐ Change Order		☐ Review and Comment	☐ Resubmit
☐ Plans			☐ Submit
☐ Samples		SENT VIA:	☐ Returned
☐ Specifications		☐ Attached	☐ Returned for Corrections
☒ Other: Product Data		☐ Separate Cover Via:	☐ Due Date:

Item	Package	Code	Rev.	Copies	Date	Description	Status
Submittal		238800-008	1		08/31/2016	DuctWork Product Data	Submitted

NOTES:

CC:

Signed: _____
Devin Gates



Mechanical

LETTER OF TRANSMITTAL

TO: Paric Corporation

77 West Port Plaza #250

St. Louis, MO 63146

ATTN: Jason Szachnieski, Devin Gates

DATE: 8/30/16

JOB #: 5768

RE: Webster ISB

We are sending you

☒

Shop drawings

☐ Attached

☐ Prints

☐ Under separate cover

☐ Plans

☐ Samples

☐ Specifications

☐ Copy of letter

☐ Change order

☐ Other

COPIES	DATE	NO.	DESCRIPTION
1	8/30/16	238800	Sheet Metal Duct Work

These are transmitted as checked below:

☐ For signature

☐ For your use

☐ As requested

☐ For bids due

☒

For review and comment

☐ Approved as submitted

☐ Approved as noted

☐ Returned for corrections

☐ Prints returned after loan to us

☐ Other

☐ Resubmit

☒ Submit

☐ Return

☐ copies for approval

☐ copies for distribution

☐ corrected prints

Remarks: Please return by 9/12/16

COPY TO: file

SIGNED:

Alex Chambers



Mechanical

Webster University ISB Webster Groves, MO

Submittal #:

238800

Submittal Description:

Sheet Metal Duct Work

Return By:

9/12/16

Please Note: To avoid scheduling delays and equipment release delays, please submit by the "Return By" date.

CHECKED BY:			
DESIGNER:		ENGINEER:	
☒	NO EXCEPTION TAKEN	☐	MAKE CORRECTIONS NOTED
☐	SUBMIT SPECIFIED ITEM	☐	REVISE AND RESUBMIT
☐	REJECTED	☐	
Checking is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. Equipment supplier is responsible for: dimensions which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of his work with that of all other trades; and satisfactory performance of his work.			
		Job #:	5768
		Date:	8/30/16
		By:	ARC



Webster University ISB Job # 5768

Ductwork Specification Submittal

See revised list in WTA comments.

DUCT SYSTEM	SHAPE	MATERIAL	JOINTS	NOTES
LOW PRESSURE SUPPLY, RETURN, OUTDOOR AIR, RELIEF, EXHAUST	Round	G-60	Gasketed	1,7,8
	Rectangular	G-60	Slip & Drive	
MEDIUM PRESSURE SUPPLY DUCT	Round	G-60	Gasketed	2,7,8
	Rectangular	G-60	Slip & Drive	
RANGE HOOD KITCHEN EXHAUST DUCT (CONCEALED)	Round	16 Gauge Carbon Steel	Welded and Flanged	3
	Rectangular	16 Gauge Carbon Steel	Welded and Flanged	
RANGE HOOD KITCHEN EXHAUST DUCT (EXPOSED)	Round	14 Gauge 304 Stainless Steel	Welded and Flanged	3
	Rectangular	14 Gauge 304 Stainless Steel	Welded and Flanged	
ACID RESISTANT FUME HANDLING DUCT	Round	304L Stainless Steel	Welded and Flanged	4,5,6
	Rectangular	304L Stainless Steel	Welded and Flanged	
NOTES				
1. ALL RETURN, EXHAUST, OUTDOOR AIR, MAKEUP, RELIEF, AND SUPPLY DUCT WORK DOWNSTREAM FROM VAVS SHALL BE CONSTRUCTED OF GAUGES AND REINFORCEMENT TO +/- 2" W.G.				
2. ALL MEDIUM PRESSURE SUPPLY DUCTWORK, UNLESS SPECIFIED OTHERWISE, SHALL BE CONSTRUCTED OF GAUGES AND REINFORCEMENT TO 4" W.G. STATIC PRESSURE.				
3. RANGE HOOD KITCHEN EXHAUST DUCTS WILL COMPLY WITH NFPA PAMPHLET 96. ALL JOINTS WILL BE LIQUID TIGHT EXTERNALLY WELDED AND FLANGED. DUCT SHALL SLOPE TOWARDS HOODS AND BE INSTALLED WITHOUT FORMING DIPS OR TRAPS.				
4. ALL ACID RESISTANT FUME EXHAUST BRANCHES FROM THE FUME HOODS TO THE EXHAUST MAINS SHALL BE CONSTRUCTED 304 STAINLESS STEEL WITH A NO. 4 FINISH. SEAMS AND JOINTS SHALL BE LIQUID TIGHT EXTERANALLY WELDED AND FLANGED. THE MATERIAL WITH TRANSITION TO GALVANIZED STEEL AT THE HEADER.				
5. ALL BRANCH AND HEADER ACID RESISTANT FUME EXHAUST DUCTWORK IN CHEMISTRY LAB CLASSROOM 472 SHALL BE CONSTRUCTED OF A MINIMUM 16 GAUGE THICKNESS.				
6. TURNING VANES FOR ACID RESISTANT FUME EXHAUST DUCTS SHALL BE FABRICATED OF 304 STAINLESS STEEL. VOLUME DAMPERS SHALL HAVE STAINLESS STEEL BEARINGS AND SHAFTS WITH EPOXY COATED BLADES.				
7. ALL ROUND DUCTS SHALL HAVE SPIRAL SEAMS.				
8. ALL ROUND AND RECTANGULAR DUCT SHALL USE PROSEAL SEALANT WHERE SEALANT IS REQUIRED.				