3.0 DFCM REQUIREMENTS

3.5 MECHANICAL

PART 1: General HVAC, Plumbing & Fire Protection

DETAIL DRAWINGS

DFCM DESIGN MANUAL
UNIVERSITY OF UTAH SUPPLEMENT

November 21, 2003
PREFACE
University of Utah Supplement

GENERAL INTRODUCTION TO THE UNIVERSITY OF UTAH SUPPLEMENT:

The DFCM Design Manual “Design Requirements” (State of Utah, Department of Administrative Services, Division of Facilities Construction and Management, referred to herein as “DFCM Manual” or “Manual”) dated June 11, 2009 including highlighted updates is the basis for A/E design services provided for all University of Utah projects.

This document accepts the DFCM Manual as the University of Utah standard, and supplements the Manual with requirements which are needed to satisfy University organization and mission objectives.

REVISIONS SUMMARY
for the University of Utah Supplement:

<table>
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<th>REVISION DATE</th>
<th>LOCATION</th>
<th>SUMMARY OF CHANGE</th>
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<tr>
<td>06 January 2012</td>
<td>- - -</td>
<td>University Design Standards. The former University Design Standards Chapters 1 through 12 have been reformatted and re-issued as the University of Utah Supplement to the DFCM Design Manual. Most of Chapter 1 is included in the “Design Process” supplement while other chapters have become supplemental text in the “Design Requirements” volume.</td>
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Note: The last revision to Mechanical Detail Drawings occurred on 21 November 2003.
### 3.5 Mechanical Part 1 Drawing Details: General HVAC, Plumbing & Fire Protection

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<td>MECH-D7</td>
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<td>VAV Hot Water Coil Piping Schematic</td>
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<td>MECH-P5</td>
<td>Cooling Coil Drain Detail</td>
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<tr>
<td>MECH-P6</td>
<td>Heating Coil Piping Schematic</td>
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<td>Cooling Coil Piping Schematic</td>
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<td>Domestic Water Piping Schematic for HTW Converter</td>
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<td>MECH-P9</td>
<td>Multiple Heating Coil Piping Schematic</td>
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<td>MECH-P10</td>
<td>Multiple Cooling Coil Piping Schematic</td>
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<tr>
<td>MECH-P11</td>
<td>Heating Coil Piping Schematic</td>
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</table>
METAL DUCT SHALL INSERT A MIN. OF 4" INTO FLEXIBLE DUCT

FLEXIBLE DUCT

WRAP TIGHTLY W/ TWO LAYERS OF SEALER TAPE. TAPE TO COVER SCREWS AND TO EXTEND 2" MIN. OVER METAL DUCT. (TAPE NOT SHOWN FOR CLARITY)

TAPE TO BE SIMILAR TO "HARDEST" HIGH PRESSURE TAPE.

(3) SCREWS W/ 1" WASHERS SHALL BE PROVIDED AT 1/3 POINTS AROUND DUCT. SCREW TO BE ON FLEX SIDE OF WIRE W/WIRE PASSING UNDER WASHER.

Drawing Title: FLEXIBLE DUCT/RIGID DUCT CONNECTION

Revision Date: 21 NOV. 2003

Drawing No.: MECH-D1
CLEARANCE FOR THERMAL EXPANSION 1/8" PER FOOT OF DUCT DIMENSION. MAX. 1/2" - HALF FOR EACH SIDE

RETAINING ANGLES ATTACHED TO SLEEVES W/1/4" BOLTS OR 1/2" WELDS 6" O.C. BEGIN 2" FROM CORNERS

1" MINIMUM RETAINING ANGLES MIN. 1 1/2"x 1 1/2" x 12 GA. FOR DUCTS 0-48", 2"x 2"x 1/8" FOR DUCTS 48" AND LARGER - ALL SIDES

ACCESS DOOR

BOLT OR WELD DAMPER TO SLEEVE. (TYPICAL)

SLEEVE TO EXTEND A MIN. OF 3" BEYOND FLOOR LINE

STEEL SLEEVE MIN. 14 GAUGE

INTERIOR OF OPENING LINED W/ U.L. LISTED MATERIAL HAVING SAME FIRE RESISTIVE RATING AS FLOOR

FIRE DAMPER BLADES

Drawing Title:
FLOOR FIRE DAMPER DETAIL

Revision Date:
21 NOV. 2003

Drawing No.:
MECH-D2
NOTE:
PROVIDE SLEEVE WITH ANGLES
AT ALL FIRE RATED PARTITIONS

1-1/2" X 1-1/2" X
1/8" ANGLE W/ 1/4"
BOLTS AT 8" O.C.

WALL

1/4"

14 GA. SLEEVE

U.L. FIRE DAMPER
(F.L.F.D.)

1-1/4"-20 RHMS
X 3/4" LONG W/
NUT AT 12" O.C.
(TYPICAL)

NOTE:
PROVIDE ACCESS
DOOR IN DUCT
NEAR DAMPER

14 GA. SLEEVE
W/ 1-1/2" X
1.1/2" X 1/8"
ANGLE ALL AROUND
OPENING

Drawing Title:
FIRE DAMPER
DUCT DETAIL

Revision Date:
2-13-97

Drawing No.:
MECH-D4
2" X 1-1/2" PERIMETER ANGLES

16 GA. SLEEVE

U.L. LISTED FUSIBLE LINK

U.L. CLASSIFIED FIRE DAMPER (FLFD)

ROUND OR OVAL DUCT

FIRE RATED WALL

PROVIDE SCREWS ON 12" CENTERS AND APPLY NON-HARDENING DUCT SEALANT

Drawing Title:
ROUND OR OVAL FIRE DAMPER DETAIL

Revision Date:
3-23-91

Drawing No.:
MECH-D5

MicroStation: Licensed For Academic Use Only
DUCT LINER. (AS REQ'D.)

SUPPLY AIR DUCT

INSULATION SHIELD WHERE DUCT IS LINED

OUTSIDE AIR SEAL RING

SEE DUCT/RIGID DUCT CONNECTION DETAIL

FLEXIBLE DUCT

SPIN-IN FITTING W/BALANCING DAMPER & LOCKING QUADRANT

SUPPORT FROM STRUCTURE (TYPICAL)

CEILING OR FIXTURE LINE

CEILING DIFFUSER
DUCT MOUNTED FIRE DAMPER DETAIL

GASKETED ACCESS DOOR

BREAKAWAY SLEEVES, JOINTS & ANGLES FASTENED SECURELY TO WALL

WALL

FIRE DAMPER

DUCT

TYPE 'A'

WALL

GASKETED ACCESS DOOR

BLADES OUT OF AIRSTREAM

FIRE DAMPERS

S DRIVES (TYP.)

BREAKAWAY SLEEVES, JOINTS & ANGLES FASTENED SECURELY TO WALL

TYPE 'B'

TYPE 'C'
ALUMINUM HOOD

PRE-Fabricated Curb w/2" Min. Glass Fiber Insul.
By Roof Hood Mfr. (8" Min. Height Above Roof)

Extend Duct Over Side of Curb & Solder

Roof Insulation

Note:
Curb to be Installed Before Built-Up Roof is Applied
LOCAL DISCONNECT UNDER FAN HOOD

FACTORY CURB SHALL BE INSTALLED BEFORE ROOF MEMBRANE IS APPLIED

ANCHOR FAN SECURELY TO CURB

CANT STRIP

ANGLE IRON SUPPORT

ANCHOR CURB TO BUILDING STRUCTURE

ALUMINUM HOOD

BIRDSCREEN

WOOD NAILER STRIP AT TOP OF CURB

BACKDRAFT DAMPER

ROOF LINE

WOOD BLOCKING SAME THICKNESS AS INSULATION

EXHAUST DUCT FROM BELOW

Drawing Title:

ROOF MOUNTED EXHAUST FAN DETAIL

Revision Date:

3-15-91

Drawing No.:

MECH-EQ2
VERIFY SIZE OF BOLT WITH MANUFACTURES CATALOG.

HOLD DOWN BOLT

EQUIPMENT BASE

PIPE SLEEVE

WASHER

*4 @ 12" O.C. EACH WAY, TOP AND BOTTOM

FILL

1/2" EXPANSION JOINT

BOLT SIZE

<table>
<thead>
<tr>
<th>BOLT SIZE</th>
<th>PIPE SIZE SCH. 40</th>
<th>AM. STD. FLAT WASHER</th>
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<tbody>
<tr>
<td></td>
<td>I.D. MIN. LEN. O.D. GAGE</td>
<td></td>
</tr>
<tr>
<td>3/8&quot;</td>
<td>1/2&quot; 4&quot; 1-3/8 12</td>
<td></td>
</tr>
<tr>
<td>1/2&quot;</td>
<td>3/4&quot; 6&quot; 1-3/8 12</td>
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<tr>
<td>3/4&quot;</td>
<td>1&quot; 6&quot; 2&quot; 9</td>
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<tr>
<td>7/8&quot;</td>
<td>1&quot; 7&quot; 2&quot; 8</td>
<td></td>
</tr>
<tr>
<td>1&quot;</td>
<td>1-1/4 8&quot; 2-1/4 8</td>
<td></td>
</tr>
</tbody>
</table>

HOLD DOWN BOLT

CONCRETE

FILL
REDWOOD RAILS TO FORM A CONTINUOUS CURB. BOLT EACH SECTION TO ROOF IN 3 PLACES.

CANT STRIP & ROOF FLASHING

8" CLEAR MIN.

ROOF LINE

DRILL THRU ROOF STRUCTURE & BOLT DOWN EQUIPMENT RAIL

FLOOD RECESS WITH PITCH

22 GAUGE GALV. SHEET METAL PAN OVER TOP OF BASE

3/4" PLYWOOD ON TOP OF RAILS

3/4" STEEL STOVE BOLT IN RECESS W/ 2" WASHER

ROOF INSULATION

3/4" NUT & 3" DIA. WASHER
2'-0" x 2'-0" ACCESS PANEL

EXISTING SUPPORT CHANNELS

CEILING SUPPORT CHANNELS

WILKINSON 2'-0" x 2'-0" FIRE RESISTANT ACCESS PANEL.
CUT OPENING IN EXISTING CEILING. SIZE OPENING TO MANUFACTURERS SPECIFICATIONS & INSTALL AS PER MANUFACTURERS SPECIFICATIONS.

MASTIC

5/8" GYPSUM BOARD

1/2" ACOUSTICAL CEILING TILE

HINGE

NOTE:
CUT & REBUILD CEILING STRUCTURE AS NEEDED.
VENT THRU ROOF
RETURN BEND, ELEVATE TO HIGHEST POINT POSSIBLE
SINK
ISLAND CABINET
P-TRAP
FLOOR LINE
LONG SWEEP FITTING (TYPICAL)
FOOT VENT
PITCH UP
PITCH DOWN
2-WAY ATC VALVE
EXCEPT WHERE 3-WAY
MIXING VALVES ARE
NOTED ON PLANS

BALL VALVE (TYP.)

RETURN MAIN

SUPPLY MAIN

MANUAL AIR VENT

HEATING COIL

UNION (TYP.)

CIRCUIT SETTER (TYP.)

PROVIDE BY-PASS LINE ON 3-WAY VALVE INSTALLATION

STRAINER

BALL VALVE WITH CAP

(FOR SMALL COILS)
CEILING OF PLENUM

INSULATED SHEET METAL PLENUM PARTITION

COOLING COIL
DRAIN PAN

1"

AIR FLOW

COOLING COIL
(TYPICAL)

FLOOR LINE

CONCRETE PAD
BY GENERAL CONTRACTOR

EXTEND DRAIN LINE
FROM DRAIN PAN TO NEAREST FLOOR DRAIN

COOLING COIL
DRAIN DETAIL
2-WAY ATC VALVE EXCEPT WHERE 3-WAY MIXING VALVES ARE SHOWN ON PLANS

REDUCER (TYPICAL)

BELL & GOSSETT CIRCUIT SETTER

BALL VALVE OR BUTTERFLY VALVE (TYPICAL)

RETURN

PROVIDE BY-PASS LINE W/ CIRCUIT SETTER ON 3-WAY VALVE INSTALLATION

SUPPLY

STRAINER WITH BLOW-OFF

\( \frac{3}{4} \)" DRAIN VALVE W/ THREADED HOSE CONNECTION

THERMOMETER (TYPICAL)

MANUAL AIR VENT (TYPICAL)

UNION (TYPICAL)
2-WAY ATC VALVE EXCEPT WHERE 3-WAY MIXING VALVES ARE SHOWN ON PLANS

REDUCER (TYPICAL)

BELL & GOSSETT CIRCUIT SETTER

BALL VALVE OR BUTTERFLY VALVE (TYPICAL)

RETURN

PROVIDE BY-PASS LINE W/ CIRCUIT SETTER ON 3-WAY VALVE INSTALLATION

SUPPLY

STRAINER WITH BLOW-OFF

¾" DRAIN VALVE W/ THREADED HOSE CONNECTION

THERMOMETER (TYPICAL)

MANUAL AIR VENT (TYPICAL)

UNION (TYPICAL)

Drawing Title: COOLING COIL PIPING SCHEMATIC (FOR CONSTANT FLOW)

Drawing No.: MECH-P7

Revision Date: 21 NOV. 2003
THERMOMETER (TYPICAL)

MANUAL AIR VENT (TYPICAL)
2-WAY ATC VALVE EXCEPT WHERE 3-WAY MIXING VALVES ARE SHOWN ON PLANS

REDUCER (TYPICAL)

RETURN

PROVIDE BY-PASS LINE W/ CIRCUIT SETTER ON VALVE INSTALLATION

STRAINER W/ BLOW-OFF

BALL VALVE OR BUTTERFLY VALVE (TYP.)

CIRCUIT SETTER (TYPICAL)

HEADERS TO BE LINE SIZE

TO OTHER BANK OF COILS WHERE REQ'D

SAME SIZE AS COIL TAPPING (TYPICAL)

UNION (TYPICAL)

3/4" BALL VALVE DRAIN WITH HOSE END

AIR FLOW

COILS

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THERMOMETER (TYPICAL)
MANUAL AIR VENT (TYPICAL)
3-WAY ATC VALVE
REDUCER (TYP.)

PROVIDE BY-PASS W/ CIRCUIT SETTER & CHECK VALVE FOR CONSTANT SPEED PUMPS

RETURN

SUPPLY

STRAINER W/ BLOW-OFF

BALL VALVE OR BUTTERFLY VALVE (TYP.)
CIRCULATING PUMP
CIRCUIT SETTER (TYP.)

HEADERS TO BE LINE SIZE

NOTE:
USE CIRCULATING PUMP WHEN HEATING COIL IS IN DANGER OF FREEZING.

TO OTHER BANK OF COILS WHERE REQ'D

AIR FLOW

COILS

SAME SIZE AS COIL TAPPING (TYPICAL)
UNION (TYPICAL)

3/4" BALL VALVE
DRAIN WITH HOSE END

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Drawing Title: HEATING COIL PIPING SCHEMATIC
Revision Date: 21 NOV. 2003
Drawing No.: MECH-P11

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