3.0 DFCM REQUIREMENTS

General HVAC, Plumbing & Fire Protection

DETAIL DRAWINGS

DFCM DESIGN MANUAL
UNIVERSITY OF UTAH SUPPLEMENT

January 15, 2016
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>
<thead>
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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>
</tr>
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</table>

Note: The last revision to Mechanical Detail Drawings occurred on 21 November 2003.
### 3.0 DFCM REQUIREMENTS

#### DESIGN REQUIREMENTS

University of Utah Supplement

**Drawing Details:** General HVAC, Plumbing & Fire Protection

#### 3.0 DFCM REQUIREMENTS

**Drawing Details:** General HVAC, Plumbing & Fire Protection

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<td>MECH-D6</td>
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<td>MECH-EQ6</td>
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<td>MECH-P3</td>
<td>Schematic Piping to In-Line Pump</td>
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<td>MECH-P4</td>
<td>VAV Hot Water Coil Piping Schematic</td>
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<tr>
<td>MECH-P5</td>
<td>Cooling Coil Drain Detail</td>
</tr>
<tr>
<td>MECH-P6</td>
<td>Heating Coil Piping Schematic</td>
</tr>
<tr>
<td>MECH-P7</td>
<td>Cooling Coil Piping Schematic</td>
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<td>MECH-P8</td>
<td>Domestic Water Piping Schematic for HTW Converter</td>
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<tr>
<td>MECH-P9</td>
<td>Multiple Heating Coil Piping Schematic</td>
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<tr>
<td>MECH-P10</td>
<td>Multiple Cooling Coil Piping Schematic</td>
</tr>
<tr>
<td>MECH-P11</td>
<td>Heating Coil Piping Schematic</td>
</tr>
</tbody>
</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 "HARDCAST" 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.
CLEARANCE FOR THERMAL EXPANSION
1/8" PER FOOT OF DUCT DIMENSION.
MAX. 112" - 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
BRANCH TAKE-OFF

MANUAL BALANCING DAMPER

HINGE PIN

DAMPER OPERATOR WITH LOCK

TURNING VANES TRAILING EDGES

SPLITTER

TEE CONNECTION

TURNING VANES WITH TRAILING EDGES

ELBOW
NOTE:
PROVIDE SLEEVE WITH ANGLES AT ALL FIRE RATED PARTITIONS

1-112" X 1-112" X 1/8" ANGLE W/ 1/4" BOLTS AT 8" O.C.

1-114"-20 RHMS X 314" LONG WI NUT AT 12" O.C. CTYPICAL)

NOTE:
PROVIDE ACCESS DOOR IN DUCT NEAR DAMPER

1-112" X 118" ANGLE ALL AROUND OPENING

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FAX: (801)581-6881
2" X 1-1/2" PERIMETER ANGLES------

16 GA. SLEEVE

U.L. LISTED FUSIBLE LINK

ROUND OR OVAL DUCT

FIRE RATED WALL

U.L. CLASSIFIED FIRE DAMPER (FLFD)

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

DRAWING TITLE:

DRAWING NO.: MECH-05

REVISION DATE: 3 23 91

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MicroSlation: Licensed For Academic Use Only
GASKETED ACCESS DOOR

BREAKAWAY SLEEVES, JOINTS & ANGLES FASTENED SECURELY TO WALL

DUCT MOUNTED FIRE DAMPER

WALL

FIRE DAMPER

DUCT

WALL

GASKETED ACCESS DOOR

WALL

GASKETED ACCESS DOOR

WALL

GASKETED ACCESS DOOR

WALL

BREAKAWAY SLEEVES, JOINTS & ANGLES FASTENED SECURELY TO WALL

TYPE 'A'

TYPE 'B'

TYPE 'C'

BLADES OUT OF AEROSTREAM

-- FIRE DAMPERS S DRIVES <TYP.>
ALUMINUM HOOD

PRE-FABRICATED CURB W/2" MIN. GLASS FIBER INSUL. BY ROOF HOOD MFGR. (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

LAG (4 PLACES>)
CANT STRIP
METAL DECK
SAME THICKNESS WOOD BLOCKING AS ROOF INSULATION
DAMPER AS REQUIRED

ROOF HOOD DETAIL

Drawing Title:
MECH-EQ1

Revision Date:
21 NOV. 2003

Drawing No.:
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

WOOD BLOCKING SAME THICKNESS AS INSULATION

EXHAUST DUCT FROM BELOW

Drawing Title:

ROOF MOUNTED EXHAUST FAN DETAIL

Revision Date:

MECH-E02

MicroStation: Licensed For Academic Use Only
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

<table>
<thead>
<tr>
<th>BOLT SIZE</th>
<th>PIPE SIZE SCH.4D</th>
<th>AM. STD. FLAT WASHER</th>
</tr>
</thead>
<tbody>
<tr>
<td>I.D.</td>
<td>MIN. LEN.</td>
<td>O.D.</td>
</tr>
<tr>
<td>3/8&quot;&quot;</td>
<td>112&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>112&quot;</td>
<td>3/4&quot;&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>5/8&quot;&quot;</td>
<td>3/4&quot;&quot;</td>
<td>6&quot;</td>
</tr>
<tr>
<td>3/4&quot;&quot;</td>
<td>1&quot;&quot;</td>
<td>6&quot;</td>
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<tr>
<td>7/8&quot;&quot;</td>
<td>1&quot;&quot;</td>
<td>7&quot;</td>
</tr>
<tr>
<td>1&quot;&quot;</td>
<td>1-114</td>
<td>8&quot;</td>
</tr>
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</table>

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

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<td>1&quot;&quot;</td>
<td>1-114</td>
<td>8&quot;</td>
</tr>
</tbody>
</table>
REDWOOD RAILS TO FORM A CONTINUOUS CURB. BOLT EACH SECTION TO ROOF IN 3 PLACES
CANT STRIP & ROOF FLASHING
8" CLEAR MIN.
ROOF LINE
ROOF STRUCTURE
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
--- 3/4" NUT & 3" DIA. WASHER

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Drawing Title: ROOFTOP EQUIPMENT BASE DETAIL
Revision Date: 21 NOV. 2003
Drawing No.: MECH-EQ4
EQUIPMENT SUPPORT

LEG ----SPRING TYPE VIBRATION ISOLATOR

LAG ISOLATOR TO REDWOOD RAIL & CAULK

CANT STRIP

---26 GAUGE G.I. COUNTER FLASHING CAP. FLOOD BELOW CAP WITH MASTIC

-ROOF INSULATION VERIFY THICKNESS BEFORE SETTING REDWOOD RAILS

8" CLEAR ABOVE ROOF

ROOF DECK

ROOFING
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

½" GYPSUM BOARD

½" ACOUSTICAL CEILING TILE

NOTE:
CUT & REBUILD CEILING STRUCTURE AS NEEDED.
1" DRAIN LINE
RUN TO WALL, DROP
TO FLOOR, AND RUN
TO TRENCH DRAIN

11" MINIMUM CLEARANCE

18" x 8"
GALVANIZED DRAIN
PAN UNDER REDUCED
PRESSURE BACKFLOW
PREVENTER

INLET

OUTLET

REDUCED PRESSURE BACKFLOW PREVENTER
VENT THRU ROOF

RETURN BEND.

ELEVATE TO HIGHEST POINT POSSIBLE

SINK

ISLAND CABINET

P-TRAP

FLOOR LINE

LONG SWEEP FITTING CTYPICAU

FOOT VENT

PITCH UP

PITCH DOWN

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Drawing Title: ISLAND SINK INSTALLATION DETAIL
Revision Date: SEPT. 1992
Drawing No.: MECH-P2

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PRESSURE GAUGE
<0-60 PSI) WITH
SNUBBER & GAUGE
COCK

--- BELL & GOSSETT
CIRCUIT SETTER.

CHECK VALVE
<Typical>

UNION <Typical>

CLEVIS TYPE HANGER
WITH "ARMA FLEX"
INSULATION AROUND
PORTION SUPPORTING
PUMP

CIRCULATING PUMP

DISCHARGE LINE

REDUCER <Typical>

G.I. METAL DRIP PAN
SUSPENDED BELOW
PUMP WITH
CHAINS

COMPOUND GAUGE
(30" V - 60 PSI)
WITH SNUBBER &
GAUGE COCK

STRAINER WITH
BLOW-OFF

WATER LINE TO
PUMP

SCHEMATIC PIPING
TO IN-LINE
PUMP

Drawing Title:
MECH-P3

Revision Date:
21 NOV. 2003

Drawing No.:
MANUAL AIR VENT

HEATING COIL

UNION CTYP.)

CIRCUIT SETTER (TYP.)

PROVIDE BY-PASS LINE ON 3-WAY VALVE INSTALLATION

STRAINER

CFOR SMALL COILS)

2-WAY ATC VALVE EXCEPT WHERE 3-WAY MIXING VALVES ARE NOTED ON PLANS

BALL VALVE CTYP.)

RETURN MAIN

SUPPLY MAIN

BALL VALVE WITH CAP

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Drawing Title: VAV HOT WATER COIL PIPING SCHEMATIC

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COOLING COIL DRAIN DETAIL

EXTEND DRAIN LINE FROM DRN PAN TO NEAREST FLOOR DRAIN

---INSULATED SHEET METAL PLENUM PARTITION

COOLING COIL (TYPICAL)

FLOOR LINE

"-----CONCRETE PAD BY GENERAL CONTRACTOR

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Drawing No.: MECH-PS
Revision Date: 21 NOV. 2003
Drawing Tide:
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

1/4" DRAIN VALVE WITH THREAD HOSE CONNECTION

THERMOMETER <TYPICAL

MANUAL AIR VENT <TYPICAL

UNION <TYPICAL

Drawing Title: HEATING COIL PIPING SCHEMATIC

Revision Date: 21 NOV. 2003

Drawing No.: MECH-P6

[Academic use only] N:\DGN\DETAILS\MECH\MECH-P6.DGN 12/19/2003 2:06:28 PM
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

STRAINER WITH BLOW-OFF

%" DRAIN VALVE W/ THREADED HOSE CONNECTION

THERMOMETER (TYPICAL)

MANUAL AIR VENT (TYPICAL)

UNION (TYPICAL)

COOLING COIL PIPING SCHEMATIC (FOR CONSTANT FLOW)

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

Revision Date: 21 NOV. 2003

Drawing No.: MECH-P7

[Academic use only] N\DGNS\DETAILS\MECH\MECH-P7.DGN 12/19/2003 222 02 PM
1. Domestic Hot Water Thermometer Supply to Building

Typical

Pump

Recirculating (Typical)

THERMOMETER TEMPERATURE CONTROL SENSOR

Relief Valve

HTW Return

Relief Valve See Chapter 8

HTW Supply

Storage Tank

Converter

Pipe to Floor Drain

DRAIN VALVE

Expansion Tank

Check Valve (Typical)

Shut-Off (Typical)

DOMESTIC HOT WATER RETURN FROM BUILDING

DOMESTIC COLD WATER SUPPLY FROM WATER SOFTENER

Academic use only] N\DGNDETAILMECHMECH-PS.DGN 12/19/2003 12:44:44 PM
THERMOMETER ------------,
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 3-WAY
VALVE INSTALLATION
STRAINER W/ BLOW-OFF
BALL VALVE OR BUTTERFLY VALVE <TYPICAL>
HEADERS TO BE LINE SIZE
SUPPLY
DRAIN WITH HOSE END
SAME SIZE AS COIL TAPPING (TYPICAL)
UNION (TYPICAL)
3/4" BALL VALVE
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/ 3-WAY 
CIRCUIT SETTER ON VALVE INSTALLATION
STRAINER W/ BLOW-OFF
SUPPLY BALL VALVE OR BUTTERFLY VALVE <TYPICAL>
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

Drawing Title: MULTIPLE COOLING COIL Piping SCHEMATIC
Revision Date: 21 NOV. 2003
Drawing No.: MECH-P10
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.