DFCM REQUIREMENTS
4.0 LANDSCAPE and IRRIGATION STANDARDS
DETAIL DRAWINGS

DFCM DESIGN MANUAL
UNIVERSITY OF UTAH SUPPLEMENT

May 1, 2015
**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>
<thead>
<tr>
<th>REVISION DATE</th>
<th>LOCATION</th>
<th>SUMMARY OF CHANGE</th>
</tr>
</thead>
<tbody>
<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>
</tbody>
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*Note:* The last revision to Landscape/Irrigation Detail Drawings occurred on 5 December 2005.
4.0  LANDSCAPE AND IRRIGATION STANDARDS

4.0 Landscape and Irrigation Detail Drawings

<table>
<thead>
<tr>
<th>DRAWING NUMBER</th>
<th>TITLE / DESCRIPTION</th>
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<tbody>
<tr>
<td>LS-1</td>
<td>Thrust Blocking</td>
</tr>
<tr>
<td>LS-2</td>
<td>Thrust Block Sizing Procedure</td>
</tr>
<tr>
<td>LS-3</td>
<td>Direct Bearing Thrust Blocks</td>
</tr>
<tr>
<td>LS-4</td>
<td>Ball Valve Assembly</td>
</tr>
<tr>
<td>LS-5</td>
<td>Ball / Garden Valve Assembly</td>
</tr>
<tr>
<td>LS-6</td>
<td>Quick Coupler Assembly</td>
</tr>
<tr>
<td>LS-7</td>
<td>Valve Manifold</td>
</tr>
<tr>
<td>LS-8</td>
<td>Spray Head</td>
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<tr>
<td>LS-9</td>
<td>Rotor</td>
</tr>
<tr>
<td>LS-10</td>
<td>Automatic Clock Installation</td>
</tr>
<tr>
<td>LS-11</td>
<td>Pedestal Mounted Controller</td>
</tr>
<tr>
<td>LS-12</td>
<td>Trench Detail</td>
</tr>
<tr>
<td>LS-13</td>
<td>Tree Planting</td>
</tr>
<tr>
<td>LS-14</td>
<td>Shrub Planting Detail</td>
</tr>
<tr>
<td>LS-15</td>
<td>Parking Lot Concrete Planter Detail</td>
</tr>
<tr>
<td>LS-16</td>
<td>Mow Strip &amp; Concrete Paving Detail</td>
</tr>
<tr>
<td>LS-17</td>
<td>Backflow Preventer</td>
</tr>
</tbody>
</table>
NOTES:

1. MAIN LINE PIPING SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH MANUFACTURER’S INSTALLATION INSTRUCTIONS.
2. THRUST BLOCKS MUST BE POURED AGAINST UNDISTURBED SOIL.
3. ALL PIPE JOINTS MUST BE LEFT ACCESSIBLE.
4. CONCRETE MUST BE ALLOWED TO CURE FOR 5 DAYS PRIOR TO PRESSURIZING WATER LINES.
5. CONCRETE MUST HAVE A MINIMUM OF 2500 PSI COMPRESSIVE STRENGTH IN 28 DAYS.
6. THRUST BLOCKS MUST BE POURED AS CLOSE AS POSSIBLE TO THE CONFIGURATION SHOWN.
7. BEARING AREAS FOR HORIZONTAL BEND THRUST BLOCKS ARE BASED ON TEST PRESSURE OF 200 PSIG & AN ALLOWABLE SOIL BEARING STRESS OF 2000 LBS./SQ.FT.
8. BEARING AREAS, VOLUMES, & SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER THIS STANDARD.
9. BEARING AREAS FOR PIPE SIZES OR CONFIGURATION NOT SHOWN REQUIRE A SPECIAL DESIGN.
10. ALL WORK MUST BE INSPECTED BY IRRIGATION FOREMAN PRIOR TO BACKFILL.
THRUST BLOCK SIZING PROCEDURE:

1. MULTIPLY THE WORKING PRESSURE BY THE APPROPRIATE VALUE SHOWN IN THE FOLLOWING TABLE TO OBTAIN TOTAL THRUST IN N(LB)

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>DEAD END OR TEE</th>
<th>90° ELBOW</th>
<th>45° ELBOW</th>
<th>22/2° ELBOW</th>
</tr>
</thead>
<tbody>
<tr>
<td>IN.</td>
<td>MM</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>89</td>
<td>9.80</td>
<td>13.90</td>
<td>7.51</td>
</tr>
<tr>
<td>4</td>
<td>114</td>
<td>16.20</td>
<td>23.00</td>
<td>12.40</td>
</tr>
<tr>
<td>6</td>
<td>168</td>
<td>34.80</td>
<td>49.20</td>
<td>26.70</td>
</tr>
<tr>
<td>8</td>
<td>219</td>
<td>59.00</td>
<td>83.50</td>
<td>45.20</td>
</tr>
<tr>
<td>10</td>
<td>273</td>
<td>91.50</td>
<td>130.00</td>
<td>70.00</td>
</tr>
<tr>
<td>12</td>
<td>324</td>
<td>129.00</td>
<td>182.00</td>
<td>98.50</td>
</tr>
</tbody>
</table>

2. DETERMINE THE BEARING STRENGTH OF THE SOIL FROM THE TABLE BELOW.

BEARING STRENGTH OF SOILS

<table>
<thead>
<tr>
<th>SOILS AND SAFE BEARING LOADS</th>
<th>18/SQ.FT.</th>
<th>KPA</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOUND SHALE</td>
<td>10,000</td>
<td>500</td>
</tr>
<tr>
<td>CEMENTED GRAVEL &amp; SAND DIFFICULT TO PICK</td>
<td>4,000</td>
<td>200</td>
</tr>
<tr>
<td>COARSE AND FINE COMPACT SAND</td>
<td>3,000</td>
<td>100</td>
</tr>
<tr>
<td>MEDIUM CLAY-CAN BE SPADED</td>
<td>2,000</td>
<td>150</td>
</tr>
<tr>
<td>SOFT CLAY</td>
<td>1,000</td>
<td>50</td>
</tr>
<tr>
<td>MUCK</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

3. DIVIDE THE TOTAL THRUST OBTAINED IN STEP 1 BY THE BEARING STRENGTH OF THE SOIL TO GET THE AREA NEEDED, M/SQ.FT.
NOTES

1. ALL WORK MUST BE INSPECTED BY PROJECT MANAGER PRIOR TO BACKFILL.
2. THRUST BLOCKS MUST BE POURED AGAINST UNDISRUPTED SOIL.
3. ALL PIPE JOINTS MUST BE LEFT ACCESSIBLE.
4. CONCRETE MUST BE ALLOWED TO CURE FOR 5 DAYS PRIOR TO PRESSURIZING WATER LINES.
5. CONCRETE MUST HAVE A MINIMUM OF 2500 P.S.I. COMPRESSIVE STRENGTH IN 28 DAYS.
6. THRUST BLOCKS MUST BE POURED AS CLOSE AS POSSIBLE TO THE CONFIGURATION SHOWN.
7. BEARING AREAS FOR HORIZONTAL BEND THRUST BLOCKS ARE BASED ON TEST PRESSURE OF 200 P.S.I.G. & AN ALLOWABLE SOIL BEARING STRESS OF 2000 LBS./SQ. FT. TO COMPUTE BEARING AREAS FOR DIFFERENT TEST PRESSURES.
   SOIL BEARING STRESS USE THE FOLLOWING EQUATION: BEARING AREA = TEST PRESSURE/2000 x TABLE VALUE.
8. BEARING AREAS, VOLUMES, SPECIAL BLOCKING DETAILS SHOWN ON PLANS TAKE PRECEDENCE OVER THIS STANDARD.
9. BEARING AREAS FOR PIPE SIZES OR CONFIGURATION NOT SHOWN REQUIRE A SPECIAL DESIGN.

MINIMUM BEARING AREA IN SQUARE FEET

<table>
<thead>
<tr>
<th>SIZE OF PIPE</th>
<th>TEES, VALVES, DEAD ENDS</th>
<th>90 DEG. BEND</th>
<th>45 DEG. BEND</th>
<th>22.5 DEG. BEND</th>
<th>11.25 DEG. BEND</th>
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<tbody>
<tr>
<td>4&quot;</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
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<tr>
<td>6&quot;</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>8&quot;</td>
<td>5</td>
<td>8</td>
<td>4</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>10&quot;</td>
<td>8</td>
<td>12</td>
<td>6</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td>12&quot;</td>
<td>12</td>
<td>16</td>
<td>9</td>
<td>5</td>
<td>3</td>
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<tr>
<td>14&quot;</td>
<td>19</td>
<td>26</td>
<td>14</td>
<td>7</td>
<td>4</td>
</tr>
<tr>
<td>16&quot;</td>
<td>21</td>
<td>29</td>
<td>16</td>
<td>8</td>
<td>4</td>
</tr>
</tbody>
</table>
The Dept. of CAMPUS DESIGN CONSTRUCTION
1795 E. So. Campus Drive, Rm 20
Salt Lake City, UT 84112-940
Phone: (801)581-88
FAX: (801)581-608

Drawing Title: BALL/GARDEN VALVE ASSEMBLY
Revision Date: AUG. 2005
Drawing No.: LS-5

2" BELOW VALVE BOX LID

FINISH GRADE

1" INVERTED GARDEN VALVE

1" NIPPLE
SIZE AS TO MEET 2" SPEC. FROM LID

1" MIP X FIP PREFABRICATED SWING JOINT
BRASS INSERT WITH STABILIZER ELBOW

SCH 80 SLIP X SLIP X THREAD TEE
(SAME SIZE AS MAIN LINE)

SCH 40 PVC SLIP X SLIP COUPLING
OR BELL END OF PIPE

SCH 80 TOE NIPPLE

SCH 40 PVC SLIP X SLIP COUPLING
OR BELL END OF PIPE

CLEARANCE

6"

PEA GRAVEL
2" BELOW VALVE BOX LID

1" BRASS QUICK COUPLER

1" MIP X MIP PREFABRICATED SWING JOINT

FINISH GRADE

SCH 80 PIPE

CLEARANCE

PEA GRAVEL

SCH 80 SLIP X SLIP COUPLING OR BELL END OF PIPE

SCH 80 SLIP X SLIP X THREAD TEE SAME SIZE AS MAIN LINEI

SCH 80 SLIP X SLIP COUPLING OR BELL END OF PIPE

DRAWING TITLE:

DRAWING No.:

REVISED DATE:

AUG. 2005

THE UNIVERSITY OF UTAH

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1795 E. So. Campus Drive, Rm 20
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REVISION DATE:

AUG. 2005

DRAWING No.:

LS-6
KEEP HEADS A MINIMUM OF 2" FROM ALL HARDSCAPE

FINISH GRADE

TURF POP-UP SPRAY HEAD

SWING PIPE RAIN BIRD OR TORO

1/2" MARLEX STREET ELL

1/2" SWING PIPE ELL

1/2" SWING PIPE ELL

LATERAL LINE WITH PVC TEE OR ELL

Drawing Title:

Drawing No.: LS-8

Revision Date: AUG. 2005

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Phone: (801)581 88
FAX: (801)581 88

DETAILS\LS\LS_8-sprayhead.dgn 8/31/2005 9:45:14 AM
KEEP HEADS A MINIMUM OF 2" FROM ALL HARDSCAPE FINISH GRADE

SET HEAD FLUSH WITH FINISH GRADE

TURF ROTATOR

SWING JOINT, PRE-FABRICATED WHERE POSSIBLE

7 GPM OR MORE

Revision Date: NOV. 2005
Orwting No.: LS-9
NOTES:

1. PREPARE A HOLE FOR FOUNDATION AND CONDUIT.

2. SEE FIGURE 1. POSITION SWEEP ELL CONDUIT SECTIONS IN HOLE AS SHOWN. COVER CONDUIT ENDS WITH TAPE TO SEAL OUT DIRT AND DEBRIS. BACKFILL SOIL TO ABOUT 12" BELOW FINISHED GRADE LEVEL.

3. USE ø16 x 4-1/2" MOUNTING BOLTS AND 5/16-18 HEX NUTS SUPPLIED. PREPARE PLASTIC MOUNTING TEMPLATE AS SHOWN IN FIGURE 2. THREADED END BOLTS SHOULD PROTRUDE 1-1/8" TO 1-1/4" FROM TOP SURFACE OF TEMPLATE.

4. POUR CONCRETE INTO HOLE AND SMOOTH WITH TROWEL.

5. PRESS MOUNTING TEMPLATE INTO CONCRETE UNTIL FLUSH. CENTER TEMPLATE WITH CONDUIT AS SHOWN TO PREVENT PEDESTAL/CONDUIT INTERFERENCE. SEE FIGURE 3.

6. TO PREVENT POOLING AT BASE OF PEDESTAL, FINISH FOUNDATION WITH GRADUAL SLOPE AWAY FROM MOUNTING TEMPLATE.
FIGURE 1.
MOUNTING BOLT POSITIONER ---++-::::-...:
PLASTIC CAB. BASE AREA
3" CONDUIT- FIELD
(32 STATIONS EACH)
1" CONDUIT- EARTH GROUND
METAL CAB. BASE AREA
1" CONDUIT- AC POWER
WOOD FORM

MOUNTING BOLT POSITIONER
MOUNTING BOLT
W/ HEX NUTS
TYP. 4 PLACES

FIGURE 2.
GROUND WIRE
TO ADDITIONAL
GROUND RODS,
(3) TOTAL, REQ.
8' COPPER-CLAD
GROUND ROD

6' ROUND BOX
SOLID COPPER
GROUND WIRE
12'-0" MAX.

THE110
UNIVERSITY
OF UTAH

Drawing Title:
PEDESTAL MOUNTED
CONTROLLER

Rev. Date:
MARCH 2003

MicroStation: Licensed For Academic Use Only
NOTES:

- **R** Use excavated trench material not to exceed 2" diameter rocks.

- **R** In cases where lateral line is installed in main line trench, use sand to backfill trench so that lateral line is 12" below finish grade.

- **C** Use sand to a depth of 2" to bed all main line pipe.

- **C** Minimum main line depth 18" to the top of pipe.

- **C** Minimum 6" distance between each pipe.

- **R** Irrigation control wire only. No other utilities may be buried in the same trench as irrigation.

GENERAL NOTE:

Locate all trenches 12" away from all buildings, sidewalks or any hard surfaces. Settle all trenches with water prior to installation of topsoil.
NOTE: ________________
SEE TREE "PLANTING OPERATIONS" FOR ADDITIONAL DIRECTIONS.

DO NOT PRUNE LEADER. REMOVE ALL DEAD AND BROKEN BRANCHES.

BACKFILL: ________________
SEE TREE "PLANTING OPERATIONS" INSURE THAT TREE IS VERTICAL BEFORE BACKFILLING

STAKING: ________________
USE (3J GALVANIZED TURNBUCKLES
USE (3J 1/2" X 18" REBAR STAKES
USE 14 GA. WIRE
USE (3) SECTIONS OF HOSE, 3' LONG ©CENTER OF TREE TRUNK, ALLOW SOME MOVEMENT.

FILL TO FINISH GRADE. SETTLE WITH WATER IN 12" LIFTS

NOTE: * TREE FLARE 1" TO 2" ABOVE FINISH GRADE
DO NOT PLANT LAWN IN TREE PIT

NOTE: ________________
DO NOT USE AN AUGAR FOR TREE HOLES.

REMOVED SOD AT DRIPLINE OF TREE TO FORM TREE WELL

DIAMETER = 3 X ROOTBALL DIA.
DIAMETER = DRIPLINE OF TREE

DO NOT PRUNE LEADER. REMOVE ALL DEAD AND BROKEN BRANCHES.

REMOVE SOD AT DRIPLINE OF TREE TO FORM TREE WELL

4" MULCH

4" MULCH

LOOSE SOIL

LOOSE SOIL

UNDISTURBED SOIL

TREE BALL

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1795 E. So. Campus Drive, Rm 201
Salt Lake City, UT 84112-9403
Phone: (801) 581-0883
FAX: (801) 581-0081

Drawing Title: TREE PLANTING
Revision Date: FEB. 2003
Drawing No.: LS-13

MicroStation: Licensed For Academic Use Only
CONSTRUCT WATERING DISH AT EACH PLANT USING TOPSOIL.

FINISH GRADE.

EXISTING GRADE

SET PLANT TO GRADE ON UNDISTURBED SOIL

DEEP WATER WITH HOSE ALL PLANTS

WATER PLANT IN POT PRIOR TO REMOVING PLANT FROM POT. DO NOT PLANT DRY PLANTS. ALL POTTED PLANTS MUST HAVE A MOIST ROOT SYSTEM.

4" LAYER OF MEDIUM COURSE BARK MULCH THAT HAS BEEN APPROVED FOR USE BY LANDSCAPE ARCHITECT. NOT UP TO PLANT STEM BASE.

4" LAYER OF TOPSOIL.

SETTLE PLANT BY FILLING PLANTING PIT WITH WATER USING HOSE OR BUCKET.

FILL ENTIRE PLANTING PIT WITH PREPARED TOPSOIL BACKFILL MATERIAL
PLAN VIEW

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1795 E. So. Campus Drive, Rm 201
Salt Lake City, UT 84112-9403
Phone: (801)581-6883
FAX: (801)581-6681

PARKING LOT
CONCRETE
PLANTER DETAIL

Drawing Date: MARCH 2003
Drawing No.: LS-15

MIN. (3) BUBBLERS LOCATED IN PLANTER CORNERS
PLACE ROOTBALL ON UNDISTURBED OR FIRMLY TAMPED SOIL TO PREVENT SETTLING
MIN. (3) BUBBLERS LOCATED IN PLANTER CORNERS

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1795 E. So. Campus Drive, Rm 201
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FAX: (801)581-6681

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CONCRETE, MEDIUM BROOM FINISH

PLANTING AREA
FINISH GRADE

REBAR (2) 4 CONTINUOUS
2" CLEARANCE 11 SIDES

COMPACTED ROAD BASE

NOTE:
WHEN MOWSTRIP IS ADJACENT TO BUILDING, EXPANSION JOINT SHALL BE USED. SLOPE 2Y. AWAY FROM BUILDING.

COMPACTED SUBGRADE 111:

CONCRETE MOWSTRIP

CONCRETE WALK W/ MEDIUM BROOM FINISH OR STAMPED CONCRETE. REINFORCE W/ POLY-PROPYLENE MULTIFILAMENT FIBERS.

FINISH GRADE

1/4" R.

CONCRETE PAVING

SCORE LINE 1/4" WIDE x 114 SLAB DEPTH

COMPACTED ROAD BASE

CONCRETE PAVING DETAIL

SCORE JOINT SECTION

WALL OR RISER

CONCRETE PAVING

1/4" R.

P.R.C. POLYURETHANE SEALANT, 3/8" DEEP

COMPRESSIBLE FILLER 1/2" WIDE ASPHALT IMPREGNATED FIBER EXPANSION JOINT MATERIAL. USE BOND BREAKER JOINT TAPE AT JOINT.

EXPANSION JOINT/SCORE LINE

Drawing Title:
MOW STRIP & CONCRETE PAVING DETAIL

Revision Date:
SEPT. 2003

Drawing No.:
LS-16
1. Conform to University of Utah Plumbing Department Standards and AWWA Codes when connecting water main supply.

2. All backflow preventers are to meet Utah State Codes as approved by the University of Utah Plumbing Department.

3. All standpipes and boxes must have proper provision for draining and frost protection.

4. All metal enclosures and their locations to be approved by the University of Utah Grounds Department.

5. Metal enclosures to be removable or have removable sides.

6. Metal enclosures to be lockable.