NOTES:
1. INITIAL BACKFILL: COMMON FILL COMPACTED TO 95% (98% UNDER PAVEMENT) OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
2. TRENCH BACKFILL: COMMON FILL COMPACTED TO 95% (98% UNDER PAVEMENT) OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
3. TYPE A BEDDING MATERIAL SHALL CONFORM TO FDOT NO. 57 AGGREGATE.
4. 15" MAX. (12" MIN.) FOR PIPE DIAMETER LESS THAN 24" AND 24" MAX (12" MIN) FOR PIPE DIAMETER 24" AND LARGER.
5. WATER SHALL NOT BE PERMITTED IN THE TRENCH DURING CONSTRUCTION.
6. ALL PIPE TO BE INSTALLED WITH BELL FACING UPSTREAM TO THE DIRECTION OF THE FLOW.
7. BEDDING DEPTH SHALL BE 4" MINIMUM FOR PIPE DIAMETER UP TO 12" AND 6" MINIMUM FOR PIPE DIAMETER 16" AND LARGER.
8. DEPTH FOR REMOVAL OF UNSUITABLE MATERIAL SHALL GOVERN DEPTH OF BEDDING ROCK BELOW THE PIPE. UTILITIES SHALL DETERMINE IN THE FIELD REQUIRED REMOVAL OF UNSUITABLE MATERIAL TO REACH SUITABLE FOUNDATION.
9. FINAL RESTORATION IN IMPROVED AREAS SHALL BE IN COMPLIANCE WITH ALL APPLICABLE REGULATIONS OF GOVERNING AGENCIES. SURFACE RESTORATION WITHIN MARION COUNTY RIGHT-OF-WAY SHALL COMPLY WITH REQUIREMENTS OF RIGHT-OF-WAY UTILIZATION REGULATIONS AND ROAD CONSTRUCTION SPECIFICATIONS.
NOTES:
1. INITIAL BACKFILL AND HAUNCHING: SELECT COMMON FILL COMPACTED TO 95% (98% UNDER PAVEMENT) OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
2. TRENCH BACKFILL: COMMON FILL COMPACTED TO 95% (98% UNDER PAVEMENT) OF THE MAXIMUM DENSITY AS PER AASHTO T-180.
3. PIPE BEDDING UTILIZING SELECT COMMON FILL OR BEDDING ROCK IN ACCORDANCE WITH TYPE A BEDDING AND TRENCHING DETAIL MAY BE REQUIRED AS DIRECTED BY MCU.
4. 15" MAX. (12" MIN.) FOR PIPE DIAMETER LESS THAN 24" AND 24" MAX (12" MIN) FOR PIPE DIAMETER 24" AND LARGER.
5. WATER SHALL NOT BE PERMITTED IN THE TRENCH DURING CONSTRUCTION.
6. ALL PIPE TO BE INSTALLED WITH BELL FACING UPSTREAM TO THE DIRECTION OF THE FLOW.
7. FINAL RESTORATION IN IMPROVED AREAS SHALL BE IN COMPLIANCE WITH ALL APPLICABLE REGULATIONS OF GOVERNING AGENCIES. SURFACE RESTORATION WITHIN MARION COUNTY RIGHT-OF-WAY SHALL COMPLY WITH REQUIREMENTS OF RIGHT-OF-WAY UTILIZATION REGULATIONS AND ROAD CONSTRUCTION SPECIFICATIONS.
NOTES:
1. PVC PIPE SHALL REQUIRE INSULATED METALLIC LOCATING WIRE (10 GAUGE COPPER) CAPABLE OF DETECTION BY A CABLE LOCATOR AND SHALL BE BURIED DIRECTLY ABOVE THE CENTERLINE OF THE PIPE.
2. LOCATING WIRE SHALL TERMINATE AT EACH VALVE BOX AND BE CAPABLE OF EXTENDING 12" ABOVE TOP OF BOX IN SUCH A MANNER SO AS NOT TO INTERFERE WITH VALVE OPERATION.
3. USE DUCT TAPE AS NECESSARY TO HOLD WIRE DIRECTLY ON THE TOP OF THE PIPE.
4. ALL WIRE CONNECTIONS IN VALVE BOXES SHALL BE SPICED TOGETHER AND TAPED.
5. FOR HORIZONTAL DIRECTIONAL DRILLING, UTILIZE 2 LOCATING WIRES WITH ALUMINUM TENSILE STRENGTH OF 1800 PSI.
NOTES:
1. EACH POTABLE WATER SERVICE SHALL SERVE TWO LOTS.
2. EACH SERVICE SHALL BE EQUIPPED WITH A DUAL CHECK BACKFLOW PREVENTER.
3. EACH RESIDENTIAL UNIT SHALL BE INDIVIDUALLY METERED.
4. SITEWORK — CONTRACTOR SHALL INSTALL WATER, WASTEWATER AND RECLAIMED WATER SERVICES.
5. METER AND DUAL CHECK BACKFLOW DEVICE SHALL BE INSTALLED BY MCU. METER BOX SHALL BE INSTALLED BY A LICENSED CONTRACTOR.
6. WASTEWATER LATERAL CLEAN-OUTS TO BE INSTALLED BY A LICENSED BUILDING PLUMBING CONTRACTOR.
7. AN APPROPRIATE BACKFLOW PREVENTION ASSEMBLY, PER THE COUNTY CROSS-CONNECTION ORDINANCE, SHALL BE REQUIRED WHERE OTHER PRESSURIZED WATER SOURCES, INCLUDING SWIMMING POOLS, ARE PRESENT.
8. SERVICE CONNECTIONS SHALL BE PERMANENTLY MARKED BY ETCHING OR STAMPING A "W" IN THE CURB DIRECTLY OVER THE SERVICE LATERAL.
NOTES:
1. SINGLE SERVICES SHALL HAVE A MINIMUM SIZE OF 1". DOUBLE SERVICES SHALL HAVE A MINIMUM SIZE OF 1½".
2. CURB STOP SHALL BE INSTALLED ON STREET SIDE OF THE SIDEWALK BETWEEN SIDEWALK AND CURB.
3. CONTRACTOR TO LOCATE CURB STOP BY PLACING A METER BOX FLUSH WITH FINISH GRADE.
4. PVC CASING TO BE USED UNDER PAVEMENT, EXTENDING A MINIMUM OF 5' ON EITHER SIDE OF THE PAVEMENT WHERE POSSIBLE.
5. CORP STOPS SHALL BE HORIZONTAL TO WATER MAINS.
6. LOCATE WIRE SHALL BE INSTALLED ON SERVICE LATERAL LINE.
7. PIPE AND FITTING SIZES TO BE DETERMINED BY SERVICE TYPE.
8. COMPACTION SHALL BE MADE UNDER AND AROUND THE CONNECTION TO THE SATISFACTION OF THE ENGINEER.
9. POTABLE WATER SERVICE CONNECTIONS SHALL BE PERMANENTLY MARKED BY ETCHING OR STAMPING A "W" IN THE CURB DIRECTLY OVER THE SERVICE LATERAL.
10. RECLAIMED WATER SERVICE CONNECTIONS SHALL BE PERMANENTLY MARKED BY ETCHING OR STAMPING A "RW" IN THE CURB DIRECTLY OVER THE SERVICE LATERAL.
NOTES:
1. MARKERS ARE REQUIRED WHEN UTILITY MAIN IS LOCATED OVER 30 FEET FROM EDGE OF PAVEMENT OR IN AN EASEMENT NOT ADJACENT TO THE RIGHT-OF-WAY.
2. MARKERS SHALL BE 4" DIAMETER SCH 80 OR DR18 PVC: BLUE FOR WATER; GREEN FOR WASTEWATER; AND PANTONE PURPLE 522C FOR RECLAIMED WATER.
3. MARKERS SHALL BE PLACED AT ALL DIRECTIONAL CHANGES AND AT ALL VALVES EXCEPT WATER VALVES NEAR FIRE HYDRANTS.
4. ADDITIONAL MARKERS SHALL BE INSTALLED AS NEEDED SO THAT THE DISTANCE BETWEEN MARKERS DOES NOT EXCEED 1,000 FEET.
NOTES:
1. FOR ALL MAINS 6.0 FEET DEEP OR GREATER, PVC PIPE EXTENSIONS SHALL BE USED ON VALVE BOX INSTALLATION.
24" DIAMETER CONCRETE PAD TYP EACH VALVE BOX
VALVE BOX AND LOCKING COVER
6" THICK 2500 PSI (MIN) CONCRETE WITH #4 REBAR CONTINUOUS

LOCATE WIRE ACCESS
TOP FLUSH WITH FINISHED GRADE
BASE
2" PVC PIPE 4-6" LONG
LOCATING WIRE
VALVE BOX AND COVER (TYP)

IDENTIFICATION DISC (SEE NOTE 1 AND DETAILS BELOW)

OUTSIDE PAVEMENT

LETTERING TO BE MACHINE ENGRAVED WITH 1/4" TO 3/8" CAP. LETTERS
M.C.U
XXX
XXX
WATER
L-20
2009

MANUFACTURER AND SIZE
TYPE OF VALVE
UTILITY
DIRECTION AND NUMBER OF TURNS
YEAR

INSIDE PAVEMENT

3" MIN.

M.C.U
XXX
XXX
WATER
L-20
2009

3" MIN.
1/4"

DISC TO BE HANGING IN THE BOX ANCHORED TO THE LOCATING WIRE.

OUTSIDE PAVEMENT

DISC TO BE EMBEDDED IN PAD

3" MIN.
1/8" MIN.

2" MIN.

THEFT PROOF ANCHOR PIN

DISC EXAMPLE

NOTES:
1. BRONZE (OR STAINLESS STEEL) IDENTIFICATION DISC SHALL BE REQUIRED FOR ALL VALVES, EXCEPT HYDRANT VALVES.
## Restrainted Pipe Table

**Water and Reclaimed Mains**

### Table: Length of Restrainted Pipe (in ft)

<table>
<thead>
<tr>
<th>Diameter (in.)</th>
<th>4&quot;</th>
<th>6&quot;</th>
<th>8&quot;</th>
<th>10&quot;</th>
<th>12&quot;</th>
<th>14&quot;</th>
<th>16&quot;</th>
<th>18&quot;</th>
<th>20&quot;</th>
<th>24&quot;</th>
<th>28&quot;</th>
<th>32&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75</td>
<td>12</td>
<td>18</td>
<td>24</td>
<td>30</td>
<td>36</td>
<td>42</td>
<td>48</td>
<td>54</td>
<td>60</td>
<td>72</td>
<td>84</td>
<td>96</td>
</tr>
<tr>
<td>1.0</td>
<td>15</td>
<td>22</td>
<td>29</td>
<td>36</td>
<td>43</td>
<td>50</td>
<td>57</td>
<td>64</td>
<td>71</td>
<td>84</td>
<td>97</td>
<td>110</td>
</tr>
<tr>
<td>1.25</td>
<td>18</td>
<td>26</td>
<td>34</td>
<td>42</td>
<td>50</td>
<td>58</td>
<td>66</td>
<td>74</td>
<td>82</td>
<td>96</td>
<td>110</td>
<td>124</td>
</tr>
</tbody>
</table>

### Minimum Design Criteria
- **Bedding Type**: 4 Design
- **Pressure**: 150 PSI
- **Safety Factor**: 1.5
- **Depth of Cover**: 3.0 ft.
- **Soil**: Sand-Silt

### Minimum Restrainted Length (FT)
- Each Side of Fitting
  - A = Bare DIP
  - B = Polywrapped DIP or Bare PVC
  - H = Horizontal
  - VU = Vertical-Up
  - VD = Vertical-Down

### Notes:
1. For length of pipe and number of joints to be restrained, see table.
2. Only ductile iron fittings shall be used at joints to be restrained unless otherwise specified by the MCU.
3. In-line valves shall be restrained both ways.
#4 BARS @ 6" O.C. ALL AROUND (MIN 2" CLEARANCE AROUND PIPE)

TIE RODS (ASTM A307 B) INCLUDING NUTS AND WASHERS (SEE SCHEDULE BELOW)

MECHANICAL JOINTS

4" X 4" X 1/2"
STEEL BEARING PLATE (TYP)

#4 BARS @ 6"
O.C. ALL AROUND
(MIN 2" CLEARANCE AROUND PIPE)

UNDISTURBED EARTH

ENCASE TIE RODS IN 1-1/2" PVC SLEEVE

SEE TRENCH DETAILS FOR PIPE BEDDING REQUIREMENTS

### SCHEDULE OF DIMENSIONS AND MATERIALS

<table>
<thead>
<tr>
<th>PIPE SIZE (INCHES)</th>
<th>DIMENSIONS (FT)</th>
<th>TIE RODS REQ'D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>8</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>10</td>
<td>3.0</td>
<td>3.0</td>
</tr>
<tr>
<td>12</td>
<td>4.0</td>
<td>4.0</td>
</tr>
<tr>
<td>16</td>
<td>5.0</td>
<td>5.0</td>
</tr>
<tr>
<td>20</td>
<td>6.0</td>
<td>6.0</td>
</tr>
</tbody>
</table>

NOTE: THRUST COLLAR AREAS TO BE COMPUTED ON BASIS OF 2000 LBS/SF SOIL RESISTANT BEARING.

### NOTES:
1. ADDITIONAL REINFORCEMENTS SHALL BE AS SPECIFIED BY THE ENGINEER.
2. MINIMUM COMPRESSION STRENGTH FOR CONCRETE SHALL BE 3000 PSI.
3. BEDDING, BACKFILL AND COMPACTION SHALL BE AS SPECIFIED ELSEWHERE IN THE LAND DEVELOPMENT CODE.
4. ALL FORM BOARDS SHALL BE REMOVED PRIOR TO BACKFILL.
5. NO ALLOWANCE SHALL BE MADE FOR FRICTION BETWEEN THE PIPE WALL AND THE THRUST COLLAR.
6. DESIGN PRESSURE: 150 PSI.
NOTES:
1. MAXIMUM OF 5 5/8" METERS
2. METERS WILL NOT BE INSTALLED IF THE METER BOXES ARE IN A DRIVING SURFACE.
NOTES:
1. A TEMPORARY JUMPER CONNECTION IS REQUIRED AT ALL CONNECTIONS BETWEEN EXISTING ACTIVE WATER MAINS AND PROPOSED NEW WATER MAIN IMPROVEMENTS. TEMPORARY JUMPER WATER METERS WILL BE SUPPLIED BY MCU.
2. THIS DETAIL IS TO BE USED FOR FILLING ANY NEW WATER MAIN OF ANY SIZE FOR EXISTING ACTIVE WATER MAINS AND FOR FLUSHING OF NEW MAINS, AND FOR PULLING BACTERIOLOGICAL SAMPLES FROM ANY NEW WATER MAIN OF ANY SIZE. THE JUMPER CONNECTION SHALL BE MAINTAINED UNTIL AFTER FILLING, FLUSHING, TESTING, AND DISINFECTION OF THE NEW MAIN HAS BEEN SUCCESSFULLY COMPLETED AND CLEARANCE FOR USE FROM FDEP HAS BEEN RECEIVED. THIS JUMPER CONNECTION SHALL ALSO BE USED TO MAINTAIN A MINIMUM PRESSURE OF 20 PSI IN THE NEW MAINS ALL THE TIME AFTER DISINFECTION AND UNTIL THE FDEP CLEARANCE LETTER IS OBTAINED. ADEQUATE THRUST BLOCKING AND/OR RESTRAINTS SHALL BE PROVIDED TEMPORARILY, AS REQUIRED. PIPE AND FITTINGS USED FOR CONNECTING THE NEW PIPE TO THE EXISTING PIPE SHALL BE DISINFECTED PRIOR TO INSTALLATION IN ACCORDANCE WITH AWWA C651, LATEST EDITION.
3. THE TAPPING SLEEVE AND THE EXTERIOR OF THE MAIN TO BE TAPPED SHALL BE DISINFECTED BY SPRAYING OR SWABBING PER SECTION II OF AWWA C651, LATEST EDITION.
4. UPON RECEIPT OF CLEARANCE FOR USE FROM FDEP AND MCU, THE CONTRACTOR SHALL REMOVE THE TEMPORARY JUMPER CONNECTION. THE 2" CORP VALVES ARE TO BE CLOSED AND PLUGGED WITH 2" BRASS PLUGS. THE MAINS CAN NOW BE CONNECTED BY SLEEVE OR FLANGED CONNECTIONS.
5. ALL INSTALLATION AND MAINTENANCE OF THE TEMPORARY JUMPER CONNECTION AND ASSOCIATED BACK FLOW PREVENTION DEVICE, FITTINGS, VALVE, ETC., SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
6. WATER FOR TESTING AND DISINFECTION OF THE NEW WATER MAIN AND WATER FOR MAINTENANCE OR OTHER USES SHALL BE AT THE CONTRACTOR'S EXPENSE.
7. ALL PIPING AND APPURTENANCES TO BE 2" FOR 8" AND BELOW WATER MAINS; 4" FOR 12" WATER MAINS; 8" FOR 16" WATER MAINS; 12" FOR 24" WATER MAINS.
NOTES:
1. PVC extensions shall not be used on valve box installation.
2. The actuating nut for deeper valves shall be extended to come up to 4 foot depth below finished grade.
3. Gate valves shall be used with all water mains through twelve (12) inches. Butterfly valves shall be used for all larger sizes, unless stated otherwise.
4. When valve box is to be installed in roadway or other traffic areas set valve box on five (5) solid common bricks.
5. Valve box lid to be lettered with the word "water" or "reclaimed".
6. Install brass ID tag in concrete.

MCBCC EFFECTIVE
04/27/2018

GATE VALVE
WATER AND RECLAIMED MAINS

UT 204
NOTES:
1. PVC PIPE EXTENSIONS SHALL NOT BE USED ON VALVE BOX INSTALLATION.
2. THE VALVE ACTUATING NUT SHALL BE EXTENDED TO BE WITHIN 3’ OF FINISHED GRADE.
3. PROVIDE A PLASTIC DEBRIS SHIELD / ALIGNMENT RING WHICH INSTALLS BELOW THE VALVE ACTUATING NUT. THIS SHIELD SHALL CENTER THE RISER PIPE BOX OVER THE ACTUATING NUT AND MINIMIZE INFILTRATION.
4. LOCATING WIRE SHALL BE CONTINUOUS WITH NO SPLICES AND SHALL EXTEND 12” ABOVE TOP OF COLLAR. WIRE SHALL BE COLOR CODED TO MATCH THE UTILITY INSTALLED.
5. FOR NEW CONSTRUCTION, THE VALVE BOX SHALL BE ADJUSTED TO MIDRANGE TO ALLOW FOR FUTURE BOX ADJUSTMENTS.
6. INSTALL BRASS ID TAG IN CONCRETE.
7. VALVE BOX LID TO BE LETTERED WITH THE WORDS “WATER” OR “RECLAIMED”.

BUTTERFLY VALVE AND BOX
WATER AND RECLAIMED MAINS
ARV ENCLOSURE (BLUE FOR WATER AND PANTONE PURPLE 522C FOR RECLAIMED)

2" NIPPLE

ADJUSTABLE CAST IRON VALVE BOX

36"X36"X6" DEEP CONCRETE PAD

2" BALL CORP STOP WITH ELBOW

AIR RELEASE VALVE WITH SCREENED, DOWNWARD FACING ELBOW

12" MIN

6" MIN

MIN 24" COVER

SLOPE

2" SCH 80 PVC

SADDLE TAP

4" DIA. HOLE

#57 BEDDING ROCK

2" BRASS ELBOW AND TUBING (THREADED)

2" GATE VALVE (IRON BODY) W/ 2" SQUARE NUT

PVC/BRASS TRANSITION COUPLING

VARIIES - SEE NOTE 2

NOTES:
1. FOR WATER OR RECLAIM USE ONLY.
2. OFFSET DISTANCE TO BE FIELD DETERMINED AND AS CLOSE TO THE RIGHT-OF-WAY AS POSSIBLE.
3. ADJUST HORIZONTAL POSITION OF SIDEWALK AS REQUIRED TO AVOID ARV ENCLOSURE.
4. LOCATE ARV ENCLOSURE WITHIN 6" OF RIGHT-OF-WAY.
NOTE: AUTOMATIC BLOW-OFF VALVES TO BE PROVIDED ON AN AS-NEEDED BASIS AS DETERMINED BY MCU.
NOTES:
1. REQUIRED FOR SITES WITH SEPARATE DOMESTIC AND FIRE SYSTEM SUPPLY PIPING.
2. BACKFLOW ASSEMBLY SHALL BE OWNED AND MAINTAINED BY THE PROPERTY OWNER.
3. MCU SHALL OWN AND MAINTAIN THE METER.
4. UTILITY EASEMENT REQUIRED FOR BY-PASS METER READING. MINIMUM EASEMENT SIZE IS 10 FEET BY 15 FEET.
5. DETAIL NOT APPLICABLE WHEN AN RPZ IS REQUIRED IN ACCORDANCE WITH THE MARION COUNTY MANUAL OF CROSS-COMMUNICATION CONTROL AND BACKFLOW PREVENTION. SERVICES SMALLER THAN 3-INCHES SHALL REQUIRE AN RPZ AND SHALL BE METERED. METER AND TAP SIZE SHALL BE DETERMINED BY A FLORIDA LICENSED SPRINKLER CONTRACTOR, ARCHITECT, OR ENGINEER. METER SHALL BE INSTALLED BY MCU.
7. FREEZE PROTECTION SHALL BE PROVIDED IN ACCORDANCE WITH THE FIRE MARSHALL.
NOTES:
1. RPZ SHALL BE MAINTAINED AS PER MARION COUNTY CROSS CONNECTION CONTROL ORDINANCE.
2. PIPES LARGER THAN 4" SHALL BE DUCTILE IRON.
NOTES:
1. BONNET COLORS SHALL BE IN ACCORDANCE WITH SEC. 6.18.2-G.
2. HYDRANT SHALL BE 1' INSIDE OF RIGHT-OF-WAY, WHEN POSSIBLE.
3. BLUE REFLECTOR SHALL BE PLACED IN THE MIDDLE OF THE ADJACENT TRAVEL LANE.
4. RADIUS OF CLEAR SPACE AROUND THE FIRE HYDRANT SHALL BE IN ACCORDANCE WITH NFPA STANDARDS (NFPA 1 SEC. 18.5.7, AS AMENDED).
NOTE: POLY IS TO BE REMOVED AND CORPORATION STOP CLOSED AND CAPPED OFF AFTER WATER SAMPLES ARE COLLECTED AND SYSTEM IS PLACED INTO SERVICE BY FDEP.
NOTES:
1. FITTINGS SHALL HAVE RESTRAINED JOINTS UNLESS OTHERWISE INDICATED.
2. INSTALL FULL LENGTH JOINTS WITH TOTAL LENGTH EQUAL TO OR GREATER THAN LENGTH SHOWN IN THE TABLE.
3. WHERE TWO OR MORE FITTINGS ARE IN SERIES, SELECT FITTING RESTRAINT LENGTH THAT YIELDS THE LONGEST RESTRAINT DISTANCE.
4. ALL IN-LINE VALVES SHALL BE RESTRAINED.
5. WHERE INTERNAL RESTRAINED JOINTS ARE USED, THE ENTIRE BELL SHALL BE PAINTED RED.
6. LENGTHS SHOWN IN THE TABLE WERE CALCULATED IN ACCORDANCE WITH PROCEDURES OUTLINED IN "THRUST RESTRAINT DESIGN FOR DUCTILE IRON PIPE" GUIDELINES PUBLISHED BY DIPRA.
7. THE DESIGN ENGINEER SHALL INCREASE THE VALUES IN THE TABLE AS WARRANTED BY SITE-SPECIFIC PARAMETERS, SUCH AS SOIL DESIGNATIONS AND LAYING CONDITIONS.
8. FOR LENGTH OF PIPE AND NUMBER OF JOINTS TO BE RESTRAINED SEE TABLE.
9. ONLY DUCTILE IRON FITTINGS SHALL BE USED AT JOINTS TO BE RESTRAINED UNLESS OTHERWISE SPECIFIED BY THE MCU.

REQUIRED LENGTH OF RESTRAINED PIPE FOR FORCE MAINS

<table>
<thead>
<tr>
<th>להקית</th>
<th>4&quot;</th>
<th>6&quot;</th>
<th>8&quot;</th>
<th>10&quot;</th>
<th>12&quot;</th>
<th>14&quot;</th>
<th>16&quot;</th>
<th>18&quot;</th>
<th>20&quot;</th>
<th>24&quot;</th>
<th>28&quot;</th>
<th>30&quot;</th>
<th>36&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>זווית</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
<td>90</td>
</tr>
<tr>
<td>זווית</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
<td>60</td>
</tr>
<tr>
<td>זווית</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>זווית</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
<td>30</td>
</tr>
</tbody>
</table>

MCBCC EFFECTIVE 04/27/2018
REVISION # 1
SCHEDULE OF DIMENSIONS AND MATERIALS

<table>
<thead>
<tr>
<th>PIPE SIZE (INCHES)</th>
<th>DIMENSIONS (FT.)</th>
<th>TIE RODS REQ'D</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>6</td>
<td>2.0</td>
<td>2.0</td>
</tr>
<tr>
<td>8</td>
<td>2.5</td>
<td>2.5</td>
</tr>
<tr>
<td>10</td>
<td>3.0</td>
<td>2.5</td>
</tr>
<tr>
<td>12</td>
<td>4.0</td>
<td>3.0</td>
</tr>
<tr>
<td>16</td>
<td>5.5</td>
<td>3.5</td>
</tr>
<tr>
<td>20</td>
<td>7.5</td>
<td>4.0</td>
</tr>
<tr>
<td>24</td>
<td>8.5</td>
<td>5.0</td>
</tr>
</tbody>
</table>

NOTE: THRUST COLLAR AREAS TO BE COMPUTED ON BASIS OF 2000 LBS/SF SOIL RESTRAINT BEARING.

NOTES:
1. ADDITIONAL REINFORCEMENTS SHALL BE AS SPECIFIED BY THE ENGINEER.
2. MINIMUM COMpressive STRENGTH FOR CONCRETE SHALL BE 3000 PSI.
3. BEDDING, BACKFILL, AND CONPACTION SHALL BE AS SPECIFIED ELSEWHERE IN THE STANDARD DRAWINGS.
4. ALL FORM BOARDS SHALL BE REMOVED PRIOR TO BACKFILL.
5. NO ALLOWANCE SHALL BE MADE FOR FRICTION BETWEEN THE PIPE WALL AND THE THRUST COLLAR.
6. DESIGN PRESSURE: 100 PSI.
7. REQUIRED FOR LINE STOPS.
NOTES:
1. FORCE MAIN ORIENTED TO FACILITATE FLOW AND SHALL ENTER MANHOLE WITHIN 1' ABOVE INVERT OF THE EFFLUENT PIPE.
2. BENCH AS REQUIRED FOR NEW FORCE MAIN.
3. MANHOLE RECEIVING FORCE MAIN AND NEXT MANHOLE SHALL BE LINED PER MARION COUNTY LAND DEVELOPMENT CODE. FOR CONNECTIONS TO EXISTING MANHOLES, MANHOLE RECEIVING FORCE MAIN AND NEXT MANHOLE SHALL BE COATED OR LINED PER MARION COUNTY LAND DEVELOPMENT CODE.
4. CONTRACTOR TO COORDINATE THE PRESENCE OF MCU INSPECTOR DURING CORING AND CONNECTIONS TO EXISTING MANHOLES.
NOTES:
1. DROP PIPE AND FITTINGS SHALL BE OF EQUAL SIZE AND MATERIAL AS THE INFLUENT SEWER.
2. AN OUTSIDE DROP CONNECTION SHALL BE REQUIRED FOR ALL INFLUENT LINES WHICH HAVE AN INVERT 2' OR MORE ABOVE THE MANHOLE INVERT.
3. CONTRACTOR TO COORDINATE THE PRESENCE OF MCU INSPECTOR DURING CORING AND CONNECTIONS TO EXISTING MANHOLES.
4. POUR NEW BENCH FOR CONNECTION.
NOTES:
1. PVC PIPE EXTENSIONS SHALL BE USED ON VALVE BOX INSTALLATION.
2. THE VALVE ACTUATING NUT SHALL BE EXTENDED TO BE WITHIN 3' OF FINISHED GRADE.
3. PROVIDE A PLASTIC DEBRIS SHIELD / ALIGNMENT RING WHICH INSTALLS BELOW THE VALVE ACTUATING NUT. THIS SHIELD SHALL CENTER THE RISER PIPE BOX OVER THE ACTUATING NUT AND MINIMIZE INFILTRATION.
4. LOCATING WIRE SHALL BE CONTINUOUS WITH NO SPLICES AND SHALL EXTEND 12" ABOVE TOP OF COLLAR. WIRE SHALL BE COLOR CODED TO MATCH THE UTILITY INSTALLED.
5. FOR NEW CONSTRUCTION, THE VALVE BOX SHALL BE ADJUSTED TO MIDRANGE TO ALLOW FOR FUTURE BOX ADJUSTMENTS.
NOTES:
1. DROP CONNECTIONS ARE REQUIRED WHENEVER INVERT OF INFLOW SEWER IS 24" OR MORE ABOVE THE INVERT OF THE MANHOLE. SEE GRAVITY MANHOLE CONNECTION DETAIL UT303.
2. ECCENTRIC CONE DESIGN MAY BE USED FOR CONFLICT RESOLUTION WITH MCU APPROVAL.
3. A FLOW CHANNEL SHALL BE CONSTRUCTED INSIDE MANHOLE TO DIRECT INFLOW INTO FLOW STREAM.
4. LIFT HOLES THROUGH STRUCTURE ARE NOT PERMITTED.
5. USE EXTERNAL WRAP TO TIGHTLY WRAP MANHOLE AROUND CASTING JOINTS AND APPLY HIGH INTENSITY PROPANE TORCH TO EFFECTIVELY SEAL THEM FROM GROUND WATER INFILTRATION. ALL EXTERNAL HEAT SHRINK WRAPS SHALL BE INSPECTED IN PERSON, OR THROUGH A MCU APPROVED METHOD, BY A MCU CONSTRUCTION REPRESENTATIVE.
6. INFLOW PREVENTION LIDS SHALL BE REQUIRED FOR ALL MANHOLES.
7. HOPE ADJUSTING RINGS MAY BE SUBSTITUTED FOR BRICK RISERS.
8. SECTION HEIGHTS VARY AS REQUIRED, AND AS AVAILABLE.
NOTES:
1. ABOVE DETAIL IS BASED ON 2" COMBINATION AIR/VACUUM RELEASE VALVE. CHANGE PIPE AND FITTINGS ACCORDINGLY FOR OTHER VALVE SIZES AND TYPES. VALVE SIZES TO BE DETERMINED BY THE ENGINEER AND APPROVED BY MCU PRIOR TO INSTALLATION.
2. THE MINIMUM DIMENSION FROM TOP OF PIPE TO FINISHED GRADE SHALL BE 4.0 FEET.
3. LID TO BE LETTERED WITH THE APPROPRIATE WORD "SEWER".
4. PRESSURE GAUGE SHALL BE ASHCROFT TYPE 1009SW STAINLESS CASE WITH STAINLESS STEEL SYSTEM (GAUGE MODEL #25-1009-SWL-02B-100 AND DIAPHRAM MODEL #25-310SS-02T-CG).
5. COMPACT BEDDING AROUND THE PIPE.
6. ALL AIR RELEASE VALVE VAULTS SHALL BE TRAFFIC RATED (H20 LOADING).
7. AIR RELEASE VALVE VAULTS SHALL BE LINED ON THE INSIDE AND LINER SHALL EXTEND UP TO MID FRAME AND COVER.
Notes:

1. Above detail applies to a 2" ARV. For larger ARVs, pipe diameter shall be equal to the size of the ARV.
2. The minimum dimension from top of pipe to finished grade shall be 4.0 feet.
3. All vault internal piping, valves, and appurtenances to be brass or 316SS except where specified otherwise.
4. Offset distance to be field determined and as close to the right of way as possible and clear of pedestrian walkways. If pipe at right-of-way line, no offset required.
5. Pressure gauge shall be Ashcroft type 1009SW stainless steel case with stainless steel system (gauge model #25-1009-SWL-02B-100 and Diaphragm model #25-310SS-02T-CG).
6. All air release valve vaults shall be traffic rated (H2O loading).
7. Air release valve vaults shall be lined on the inside and liner shall extend up to mid frame and cover.

<table>
<thead>
<tr>
<th>Main Diameter</th>
<th>ARV (Air Release Valve)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12&quot; and Smaller</td>
<td>2&quot;</td>
</tr>
<tr>
<td>16&quot;</td>
<td>3&quot;</td>
</tr>
<tr>
<td>20&quot;, 24&quot;</td>
<td>4&quot;</td>
</tr>
<tr>
<td>30&quot;, 36&quot;</td>
<td>6&quot;</td>
</tr>
</tbody>
</table>
NOTES:
1. CLEARANCE OF 30" FREE FROM OBSTRUCTIONS IN ALL DIRECTIONS.
2. AREAS SUPPORTING CONCRETE COLLAR OR SLAB SHALL BE PROPERLY COMPACTED.
3. TOP OF MANHOLE SHALL BE 2" ABOVE FINISHED GRADE, CROWN OF ADJACENT ROADWAY, OR 100 YEAR FLOOD ELEVATION, WHICHEVER IS GREATER.
NOTES:
1. SPECIFIC DESIGN DETAILS MUST IN ALL ASPECTS MEET APPLICABLE FLORIDA PLUMBING AND ADMINISTRATIVE CODE.
2. SIZE GREASE INTERCEPTOR PER MARION COUNTY LAND DEVELOPMENT CODE.
3. INTERCEPTORS SHALL BE WATER AND GAS TIGHT.
4. ALL FIXTURES LOCATED IN FOOD AND BEVERAGE PREPARATION AREAS SHALL BE ROUTED THROUGH GREASE INTERCEPTOR. RESTROOM WASTE SHALL NOT BE ROUTED THROUGH INTERCEPTOR.
5. BAFFLE REQUIRED; ALTERNATIVE DESIGNS ARE ACCEPTABLE. DESIGN MUST MEET FLORIDA PLUMBING AND ADMINISTRATIVE CODE.
6. LOADS: H-20 TRUCK WHEELS WITH 30% IMPACT PER AASHTO. TRAFFIC BEARING FRAME AND COVER TO MEET AASHTO STANDARDS IF APPLICABLE.
NOTES:
1. INVERT OF SERVICE LATERAL SHALL NOT ENTER SEWER MAIN BELOW SPRING LINE.
2. WYE TO BE NO SHALLOWER THAN 3- FEET AND NO DEEPER THAN 5- FEET.
3. ALL FITTINGS SHOWN ARE TO BE INSTALLED.
4. SERVICE CONNECTIONS SHALL BE PERMANENTLY MARKED BY ETCHING OR STAMPING AN "S" IN THE CURB DIRECTLY OVER THE LATERAL. WHERE NO CURB EXISTS, LOCATION SHALL BE MARKED BY PLACEMENT OF ADHESIVE REFLECTIVE MARKERS AS SPECIFIED BY MCU.
5. BUILDER'S PLUMBER WILL REMOVE PLUG, INSTALL CLEANOUT, AND CONNECT SERVICE LATERAL TO HOUSE.
6. CLEANOUT SHALL BE INSTALLED AT THE PROPERTY LINE AND SET A MINIMUM OF 2" ABOVE THE FINISHED GRADE.
7. DURING CONSTRUCTION SERVICE LATERAL AND CLEANOUTS SHALL BE STUBBED OUT A MINIMUM OF 1' AND SHALL BE CAPPED BY DEVELOPER'S SITE-WORK CONTRACTOR UNTIL PROPERTY IS DEVELOPED AND CONNECTION TO CENTRAL SEWER IS MADE.
NOTES:
1. Change pipe and fittings accordingly for other valve sizes and types. Valve sizes to be determined by the engineer and approved by MCU prior to installation.
2. The minimum dimension from top of pipe to finished grade shall be 4.0 feet lid to be lettered with the appropriate word "water" or "sewer".
NOTES:
1. SIGN TO BE PROVIDED BY CONTRACTOR.
2. HEIGHT OF SIGN WILL DEPEND ON LOCATION AND SURROUNDING LANDSCAPE PLANT TYPES. IN ALL CASES, THE SIGN SHALL BE VISIBLE TO THE PUBLIC.
3. BACKGROUND SHALL BE WHITE, LETTERS SHALL BE BLACK (HELVETICA, SWISS 721 COREL OR ACCEPTABLE EQUAL) AND BORDER SHALL BE PANTONE PURPLE 522C.
4. ENGINEERING GRADE REFLECTIVE MATERIALS SHALL BE USED.
5. SIGN MATERIAL SHALL BE OF 0.040 GAUGE METAL.
6. POST SHALL BE 2-3/8" OD STEEL PIPE, HOT DIP GALVANIZED PER ASTM A-123. POST TO BE PROVIDED BY CUSTOMER.
7. MOUNTING HARDWARE SHALL BE STAINLESS STEEL.
8. SIGNS SHALL BE PLACED BY THE CONTRACTOR IN ACCORDANCE WITH CHAPTER 62-610 "ACCESS CONTROL AND ADVISORY SIGNS", FAC, MCU APPROVED ENGINEERING PLANS AND/OR AS APPROVED BY MCU.
NOTES:
1. ENGINEER SHALL PROVIDE A SCALED (1" = 20' MIN.) SITE SPECIFIC DETAIL.
2. MINIMUM DISTANCE BETWEEN FENCE AND ALL INSTALLED EQUIPMENT SHALL BE 5'.
3. MANHOLE & WETWELL SHALL HAVE TOP LACING.
NOTES:
1. EACH PUMP SHALL BE FITTED WITH 6 FEET (6'-0") OF TYPE 316 SS, 3/4" CHAIN ATTACHED TO THE LIFTING MECHANISM AND AIRCRAFT RATED 1/4" SS CABLE PROVIDED BETWEEN THE CABLE HOLDER AND THE CHAIN.
2. WALL SLEEVE AND COMPRESSION SEALS SHALL BE COMPATIBLE WITH LINER.
3. IF PLUG VALVE ≤ 4 IN, LEVER OPERATED; IF PLUG VALVE > 4 IN, GEAR OPERATED WHEEL VALVE.
4. ELEVATION X = ELEVATION Z ≥ 5 FEET.
5. PUMP OFF ELEVATION TO BE PER MANUFACTURER'S MINIMUM SUBMERGENCE.
6. SEE FIGURE UT503 FOR DESCRIPTIONS OF DIMENSION SYMBOLS.
7. INSTALLED TO PROVIDE DRY CONTACT FOR SCADA.
8. ALL FLANGES: PIPE, VALVES AND APPURTENANCES SHALL HAVE 316 SS HARDWARE.
9. EMERGENCY PUMP OUT CONNECTION FEMALE QUICK CONNECT AND CHAIN-LOCK CAP (MIN. 4") SHALL BE IN VALVE VAULT.
10. FLOWMETER AND METER BOX TO BE INSTALLED AS REQUIRED BY MCU, DETAIL SHOWING FLOWMETER AND METER BOX TO BE SUBMITTED TO AND APPROVED BY MCU.
NOTES:
1. SEE DETAIL UT503 FOR DESCRIPTIONS OF DIMENSION SYMBOLS.
2. MCU APPROVAL IS REQUIRED PRIOR TO PIPE LAYOUT CHANGES.
3. PRESSURE GAUGE ASSEMBLY SHALL BE INSTALLED ON A 4-WAY CROSS.
4. ODOR CONTROL PROVISIONS, SEE DETAIL UT500. MCU APPROVAL IS REQUIRED PRIOR TO PRECAST INSTALLATION.
MANUFACTURER: ___________  VOLTAGE: ___________HZ
MODEL: ___________  PHASE: ___________
IMP: ___________  H.P.: ___________
DIA: ___________MM.  MAX. SOLID SIZE (3 IN MIN): ___________IN
SPEED: ___________RPM  CURVE NUMBER: ___________
DISCHARGE SIZE: ___________IN

SHUT OFF HEAD: ___________ FEET TDH
HIGH HEAD CONDITION: ___________ GPM AT ___________ FEET TDH
MINIMUM HEAD CONDITION: ___________ GPM AT ___________ FEET TDH

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>SYMBOL</th>
<th>DIMENSION</th>
<th>ELEVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>THICKNESS OF WALL</td>
<td>A</td>
<td>8&quot; (MIN)</td>
<td></td>
</tr>
<tr>
<td>DIAMETER OF WET WELL</td>
<td>B</td>
<td>6' (MIN)</td>
<td></td>
</tr>
<tr>
<td>WIDTH OF BOTTOM FILLET</td>
<td>C</td>
<td>SEE NOTE 1</td>
<td></td>
</tr>
<tr>
<td>C/L OF WET WELL TO C/L OF PIPES</td>
<td>D</td>
<td>SEE NOTE 1</td>
<td></td>
</tr>
<tr>
<td>LENGTH OF PUMP ACCESS OPENING</td>
<td>E</td>
<td>SEE NOTE 1</td>
<td></td>
</tr>
<tr>
<td>WIDTH OF PUMP ACCESS OPENING</td>
<td>F</td>
<td>SEE NOTE 1</td>
<td></td>
</tr>
<tr>
<td>CENTER OF WET WELL TO EDGE OF HATCH</td>
<td>G</td>
<td>SEE NOTE 1</td>
<td></td>
</tr>
<tr>
<td>VALVE BOX HATCH OPENING</td>
<td>H</td>
<td></td>
<td></td>
</tr>
<tr>
<td>VALVE BOX HATCH OPENING</td>
<td>I</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LIP WIDTH OF WETWELL BASE</td>
<td>R</td>
<td>18&quot; (MIN)</td>
<td></td>
</tr>
<tr>
<td>THICKNESS OF WETWELL BASE</td>
<td>S</td>
<td>12&quot; (MIN)</td>
<td></td>
</tr>
<tr>
<td>TOP OF WET WELL</td>
<td>T</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FINISHED GRADE</td>
<td>U</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HIGH LEVEL ALARMS</td>
<td>V</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LAG PUMP ON</td>
<td>W</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LEAD PUMP ON / INFLUENT PIPE INVERT</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PUMPS OFF (TOP OF PUMP VOLUTE)</td>
<td>Y</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BOTTOM OF PUMP TO FLOOR OF WET WELL</td>
<td>P</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STEP HEIGHT (IF REQUIRED)</td>
<td>Q</td>
<td></td>
<td></td>
</tr>
<tr>
<td>FLOOR OF WET WELL</td>
<td>Z</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTES:
1. PER PUMP MANUFACTURER'S REQUIREMENTS.
2. DIMENSION P AND ELEVATIONS Y AND Z MUST MEET MANUFACTURER'S REQUIREMENTS.
3. ELEVATION X = ELEVATION Z = 5'
4. TOP ELEVATION OF WET WELL SHALL BE A MINIMUM OF 1' ABOVE THE 100 YEAR FLOOD ELEVATION AND THE ELEVATION OF THE CROWN OF THE ROAD.
5. SYMBOLS SHOWN IN TABLE ARE USED IN DETAILS UT501 AND UT502.
NOTES:
1. FOR PUMP STATIONS WITH VALVE VAULTS, PRESSURE GAUGE ASSEMBLY SHALL BE INSTALLED ON A 4-WAY CROSS.
2. FOR PUMP STATIONS WITH ABOVEGROUND VALVE ARRAYS, PRESSURE GAUGE ASSEMBLY SHALL BE INSTALLED ON THE SPOOL PIECE BETWEEN THE ARV AND THE FLOWMETER.
NOTES:
1. TIE TO FENCE, MINIMUM TWO (2) LOCATIONS, NOT REQUIRED WHERE PVC COATED, BLOCK, OR WOOD FENCE IS INSTALLED.
2. PROVIDE EXOTHERMIC WELDS UNLESS NOTED OTHERWISE.
3. ODOR CONTROL RETURN OPTIONAL PER MCU APPROVAL.
4. ODOR CONTROL VACUUM OPTIONAL PER MCU APPROVAL.
5. GROUND STRAP TO OPTIONAL FLOW METER VAULT COVER ASSEMBLY.

 Marion County
FLORIDA
UTILITIES

MCBCC EFFECTIVE 04/27/2018
REVISION # NA

PUMP STATION GROUNDING W/ VALVE VAULT (TYPICAL)

UT 505

7.3.2
NOTES:
1. On covers with multiple doors, provide braid from frame to door on each door. Provide waterproof caulking where ground cable and conduit penetrates wetwell to prevent intrusion of groundwater and escape of vapors from wetwell.
2. Install ground wire so that it will not cross clear opening or prevent or impede normal method of removing floats or pumps.
GROUND TEST ENCLOSURE

- PRE-CAST CONCRETE
- 3" HIGH LETTERS CAST IN COVER
- RECESSED HOLD DOWN (TYP)
- GROUND TEST WELL
- LIFTING HOLE
- CAST IRON COVER
- BROOKS PRODUCTS 10" X 17" SERIES 36 PULL BOX, OR EQUAL
- DRILL & TAP
- FINISHED GRADE
- #4 AWG TINNED COPPER GROUNDING CONDUCTOR, PROVIDE 36" SLACK
- MECHANICAL CONNECTION
- 2"
- NO. 2/0 AWG TINNED COPPER GROUNDING CONDUCTOR TO COUNTERPOISE
- GRAVEL
- GROUND ROD
Hose Bibb Assembly

- 3/4" Hose Bib
- Anti-Siphon Device
- 1" Tee
- 1" Lockable Ball Valve (Brass)
- Secure pipe to post with 1" Unistrut pipe clamp
- 1" SCH 80 PVC Pipe
- 1" Red Brass Adapter
- 90° Elbow
- 4"x4" Precast Concrete Post
- 1"x 3/4" 90° Elbow
- PVC to Red Brass Adapter
- One #4 Rebar

Marion County, Florida
MCBCC Effective 04/27/2018
Utilities
Revision # NA

7.3.2
UT 508
**NEMA 3R CONTROL PANEL**

**ALUMINUM LIGHT POST**
2"X 2" SQUARE

**ALARML LIGHT**

**THIRD 6"x6" CONCRETE POST AS REQUIRED BY MCU**

**6"x6" CONCRETE POST**

**AUDIBLE ALARM HORN**

**CONTRACTOR MUST COORDINATE WITH MANUFACTURER FOR HOLE PLACEMENT**

2" ALUMINUM CONDUITS WITH PVC INTERNAL COATED NIPPLES FROM THE PANEL TO THE SEAL OFFS

**CONDUIT SEAL OFFS**

**EXTEND 8" CONCRETE SLAB WHEN THIRD POST IS REQUIRED**

**8" CONCRETE SLAB**

2" PVC CONDUITS FROM THE SEAL OFFS INTO THE WET WELL

**3/4" X 10'-0" COPPER CLAD GROUND ROD**

**HIGH PRESSURE SODIUM LIGHT FIXTURE MIN. 10' ABOVE GRADE, WITH ON/OFF SWITCH OUTSIDE PANEL.**

**EMERGENCY GENERATOR RECEPTACLE**
CROUSE-HINDS AR 2041

**PADLOCK HASP**

**3/4" HOSE BIB WITH BACKFLOW PREVENTOR**

**3/4" UNISTRUT PIPE CLAMP**

**1" WATER SERVICE**

**FROM POWER SOURCE**
3" MIN. CONDUIT PIPE FOR PUMPS POWER

**PANEL TO INCLUDE A TCU WITH HIGH SPEED RADIO (PRE-INSTALLED BY MANUFACTURER)**

### FRONT ELEVATION

**TABLE 1**

<table>
<thead>
<tr>
<th>PANEL SIZE HEIGHT</th>
<th>PANEL HEIGHT ABOVE GRADE</th>
<th>SEAL OFF DISTANCE BELOW PANEL</th>
</tr>
</thead>
<tbody>
<tr>
<td>36&quot;</td>
<td>36&quot;</td>
<td>18&quot;</td>
</tr>
<tr>
<td>42&quot;</td>
<td>24&quot;</td>
<td>15&quot;</td>
</tr>
<tr>
<td>48&quot;</td>
<td>24&quot;</td>
<td>12&quot;</td>
</tr>
<tr>
<td>60&quot;</td>
<td>12&quot;</td>
<td>6&quot;</td>
</tr>
</tbody>
</table>

**NOTES:**
1. SET COVERS FLUSH IN PAVED AREAS, 0.1' ABOVE IN UNPAVED AREAS, AND 0.75' BELOW GRADE IN GRADED ROADS.
2. TRIPLEX PUMP STATIONS REQUIRE ADDITIONAL SPECIFICATIONS. CONTACT MCU FOR INFORMATION.
A NEW EQUIPMENT MOUNTING STAND CONSISTS OF THREE (3) EACH CONCRETE POSTS AND ALUMINUM OR STAINLESS STEEL STRUT TO BE CONSTRUCTED BY THE CONTRACTOR. FOR CONTROL PANELS THAT ARE 48" HIGH X 36" WIDE X 12" DEEP (OR SMALLER), 6" X 6" BY 9' 0" LONG POSTS WILL BE USED TO CONSTRUCT THE EQUIPMENT MOUNTING STAND. FOR ENCLOSURES LARGER THAN 48" HIGH X 36" WIDE X 12" DEEP, 6" X 6" BY 10' 0" CONCRETE POSTS WILL BE USED.

2. THE CONCRETE POSTS WILL BE STABILIZED USING TWO (2) EACH 80 lb. BAGS OF CONCRETE MIX PER POST, ONE (1) BAG AROUND THE BASE OF THE POST AND THE SECOND BAG APPROXIMATELY 3" BELOW THE GRAD. THE CONCRETE WILL BE ALLOWED TO SET A MINIMUM OF 12 HOURS PRIOR TO MOUNTING THE CONTROL PANEL. CARE IS TO BE TAKEN TO ENSURE ALL POSTS ARE PLUMB, IN LINE, AND AT EQUAL HEIGHT.

3. THE CONTROL PANEL WILL BE MOUNTED ON 12 GAUGE, 1-5/8" ALUMINUM OR STAINLESS STEEL STRUT, WHICH SPANS ALL THREE (3) POSTS, AS NEEDED. THE NEW CONTROL PANEL WILL BE MOUNTED TO THE RIGHT SIDE (DEPENDING ON SITE REQUIREMENTS) OF THE EQUIPMENT MOUNTING STAND, LEAVING ROOM ON THE LEFT HALF OF THE STAND FOR FUTURE EQUIPMENT.

4. THE MOUNTING STRUT WILL BE 8" LONG WITH ONE (1) CENTER POST FOR A THREE POST CONFIGURATION. THE CONTROL PANEL MOUNTING STRUT WILL BE FASTENED TO THE 6" POSTS USING 3/8" X 3" STAINLESS STEEL SLEEVE ANCHORS. ALL CUT ENDS, STRUTS AND DRILLED HOLES WILL BE DE-BURLED. ALL BOLTS, NUTS AND WASHERS SHALL BE STAINLESS STEEL. STRUT NUTS (SPRING NUTS) SHALL BE STAINLESS STEEL.

5. THE PANEL MOUNTING HEIGHT WILL BE IN UT 509, TABLE 1.

6. MCU REQUIRES THE USE OF CROUSE HINDS EY6R63 SPLIT CONDUIT SEAL OFFS AT DISTANCE NOTED IN TABLE 1. USE ALUMINUM NIPPLES WITH INTERNAL PVC COATING BETWEEN PANEL & SEAL OFFS.


8. EQUIP THE FACILITY WITH A SCADA SYSTEM TO MONITOR POWER USAGE, PUMP OPERATION, FLUID LEVEL, ETC.

SCADA TOWER
FOR SITES REQUIRING TOWER HEIGHTS GREATER THAN 20 FEET. SEE MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION.

DOME LIGHT
FLUSH MOUNT
ALARM LIGHT

2 POST PLAN VIEW

3 POST PLAN VIEW

NOTES:
1. CONTROL PANEL SHALL CONFORM TO ALL APPLICABLE NEC REGULATIONS.
NOTES:
1. CONDUIT LAYOUT IS TYPICAL. FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.
2. MOTOR #2 CONDUIT SHALL BE CUT AT A MINIMUM OF 5.125" FROM CENTER TO EDGE OF INSIDE ENCLOSURE WALL ON RIGHT SIDE FACING IN.
1" POTABLE WATER SERVICE

DOUBLE SERVICE METER BOX (16" X 22" X 12")

3/4" SCH 80 PVC CONDUIT W/ TRANSDUCER SIGNAL WIRE AND POWER CABLE

3/4" 180 DEGREE CONDUIT JUNCTION BOX

2-#18 TSP (1 PR- 4-20 MA SIGNAL) ENCASE WIRE IN WEATHER RESISTANT FLEX CONDUIT

PRESSURE TRANSDUCER W/ 1/4" NPT
4-20 MA OUTPUT
0-100 PSI RANGE

0-100 PSIG PRESSURE GAUGE W/ 1/4" NPT BACK ENTRY

SCH 80 3/4" X 3/4" X 3/4" SLIP TEE W/
(2) SCH 80 3/4" SLIP X 3/4" FIP FOR PRESSURE GAUGE AND PRESSURE TRANSDUCER
BRASS 1" MIP X 3/4" FIP

NEPTUNE T-10 POTABLE WATER METER

BALL VALVE BRANCH ASSEMBLY

1" POTABLE WATER SERVICE
NOTES:
1. ENGINEER SHALL PROVIDE A SCALED (1" = 20' MIN.) SITE SPECIFIC DETAIL.
2. MINIMUM DISTANCE BETWEEN FENCE AND ALL INSTALLED EQUIPMENT SHALL BE 5'.
3. MANHOLE & WETWELL SHALL HAVE HOPE LINING.
4. AIR RELEASE VALVE DISCHARGE LINE SHALL BE A MINIMUM OF 2" SCHEDULE 80 PVC PIPE.
NOTES:
1. EACH PUMP SHALL BE FITTED WITH 6 FEET (6'-0") OF TYPE 316 SS, 3/4" CHAIN ATTACHED TO THE LIFTING MECHANISM AND AIRCRAFT RATED 1/4" SS CABLE PROVIDED BETWEEN THE CABLE HOLDER AND THE CHAIN.
2. WALL SLEEVE AND COMPRESSION SEALS SHALL BE COMPATIBLE WITH LINER.
3. IF PLUG VALVE ≤ 4 IN, LEVER OPERATED; IF PLUG VALVE > 4 IN, GEAR OPERATED WHEEL VALVE.
4. ELEVATION X = ELEVATION Z ± 5 FEET.
5. PUMP OFF ELEVATION TO BE PER MANUFACTURER'S MINIMUM SUBMERGENCE.
6. SEE FIGURE UT5.18 FOR DESCRIPTIONS OF DIMENSION SYMBOLS.
7. INSTALLED TO PROVIDE DRY CONTACT FOR SCADA.
8. ALL FLANGES: PIPE, VALVES AND APPURTENANCES SHALL HAVE 316 SS HARDWARE.
9. EMERGENCY PUMP OUT CONNECTION SHALL BE A QD (QUICK DISCONNECT) MALE BY FLANGE (MIN. 4") ASSEMBLY.
10. FLOWMETER AND METER BOX TO BE INSTALLED AS REQUIRED BY MCU, DETAIL SHOWING FLOWMETER AND COVER TO BE SUBMITTED TO AND APPROVED BY MCU.
NOTES:
1. TIE TO FENCE, MINIMUM 2 LOCATIONS. NOT REQUIRED WHERE PVC COATED, BLOCK, OR WOOD FENCE IS INSTALLED.
2. PROVIDE EXOTHERMIC WELDS UNLESS NOTED OTHERWISE.
3. ODOR CONTROL RETURN OPTIONAL PER MCU APPROVAL.
4. ODOR CONTROL VACUUM OPTIONAL PER MCU APPROVAL.
5. GROUND STRAP TO OPTIONAL FLOW METER VAULT COVER ASSEMBLY.
MANUFACTURER: __________  VOLTAGE: ___________HZ
MODEL: __________  PHASE: __________
IMP: __________  H.P.: __________
DIA: __________MM.  MAX. SOLID SIZE (3 IN MIN): __________IN
SPEED: __________RPM  CURVE NUMBER: __________
DISCHARGE SIZE: __________IN

SHUT OFF HEAD: __________ FEET TDH
HIGH HEAD CONDITION: __________ GPM AT __________ FEET TDH
MINIMUM HEAD CONDITION: __________ GPM AT __________ FEET TDH

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>SYMBOL</th>
<th>DIMENSION</th>
<th>ELEVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>THICKNESS OF WALL</td>
<td>A</td>
<td>8” (MIN)</td>
<td>—</td>
</tr>
<tr>
<td>DIAMETER OF WET WELL</td>
<td>B</td>
<td>6’ (MIN)</td>
<td>—</td>
</tr>
<tr>
<td>WIDTH OF BOTTOM FILLET</td>
<td>C</td>
<td>SEE NOTE 1</td>
<td>—</td>
</tr>
<tr>
<td>C/L OF WET WELL TO C/L OF PIPES</td>
<td>D</td>
<td>SEE NOTE 1</td>
<td>—</td>
</tr>
<tr>
<td>LENGTH OF PUMP ACCESS OPENING</td>
<td>E</td>
<td>SEE NOTE 1</td>
<td>—</td>
</tr>
<tr>
<td>WIDTH OF PUMP ACCESS OPENING</td>
<td>F</td>
<td>SEE NOTE 1</td>
<td>—</td>
</tr>
<tr>
<td>CENTER OF WET WELL TO EDGE OF HATCH</td>
<td>G</td>
<td>SEE NOTE 1</td>
<td>—</td>
</tr>
<tr>
<td>LIP WIDTH OF WETWELL BASE</td>
<td>R</td>
<td>18” (MIN)</td>
<td>—</td>
</tr>
<tr>
<td>THICKNESS OF WETWELL BASE</td>
<td>S</td>
<td>12” (MIN)</td>
<td>—</td>
</tr>
<tr>
<td>TOP OF WET WELL</td>
<td>T</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>FINISHED GRADE</td>
<td>U</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>HIGH LEVEL ALARMS</td>
<td>V</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>LAG PUMP ON</td>
<td>W</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>LEAD PUMP ON / INFLUENT PIPE INVERT</td>
<td>X</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>PUMPS OFF (TOP OF PUMP VOLUTE)</td>
<td>Y</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>BOTTOM OF PUMP TO FLOOR OF WET WELL</td>
<td>P</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>STEP HEIGHT (IF REQUIRED)</td>
<td>Q</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>FLOOR OF WET WELL</td>
<td>Z</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

NOTES:
1. PER PUMP MANUFACTURER’S REQUIREMENTS, DIMENSION P AND ELEVATIONS Y AND Z MUST MEET MANUFACTURER’S REQUIREMENTS.
2. ELEVATION X – ELEVATION Z ≥ 5’
3. TOP ELEVATION OF WET WELL SHALL BE A MINIMUM OF 1’ ABOVE THE 100 YEAR FLOOD ELEVATION AND THE ELEVATION OF THE CROWN OF THE ROAD.
4. SYMBOLS SHOWN IN TABLE ARE USED IN DETAILS UT515 AND UT516.
1. ENGINEER SHALL PROVIDE A SCALED (1" = 20' MIN.) SITE SPECIFIC DETAIL.
2. MINIMUM DISTANCE BETWEEN FENCE AND ALL INSTALLED EQUIPMENT SHALL BE 5'.
3. COLLECTOR MANHOLE, WETWELL, AND CLOSEST OFFSITE MANHOLE SHALL HAVE HOPE LINING.
4. AIR RELEASE VALVE DISCHARGE LINE SHALL BE A MINIMUM OF 2" SCHEDULE 80 PVC PIPE.
5. ALL EDGES OF CONCRETE SLAB SHALL BE A MINIMUM OF 6" FROM THE OUTSIDE EDGE OF GENERATOR OR ODOR CONTROL UNIT.
6. CONDUITS FROM CONTROL PANEL SHALL BE 2" DIAMETER MINIMUM. PRECAST PENETRATIONS SHALL BE 3" MINIMUM. THERE SHALL BE A MINIMUM OF ONE CONDUIT FOR LEVEL CONTROLS. THE NUMBER OF CONDUITS REQUIRED FOR PUMP LEADS WILL BE AS REQUIRED BY THE PUMP MANUFACTURER. CONDUIT PENETRATIONS SHALL BE A MAXIMUM OF 24" FROM THE TOP SLAB OF THE LIFT STATION.
7. ODOR CONTROL DRAIN LINE SHALL HAVE A P-TRAP INSTALLED. PIPE SHALL BE SLOPED AT 2% TO MAINTAIN PROPER DRAINAGE.
NOTES:

1. EACH PUMP SHALL BE FITTED WITH 6 FEET (6'-0") OF TYPE 316 SS, 3/4" CHAIN ATTACHED TO THE LIFTING MECHANISM AND AIRCRAFT RATED 1/4" SS CABLE PROVIDED BETWEEN THE CABLE HOLDER AND THE CHAIN.
2. WALL SLEEVE AND COMPRESSION SEALS SHALL BE COMPATIBLE WITH LINER.
3. IF PLUG VALVE ≤ 4 IN, LEVER OPERATED; IF PLUG VALVE > 4 IN, GEAR OPERATED WHEEL VALVE.
4. ELEVATION X = ELEVATION Z ≥ 5 FEET.
5. PUMP OFF ELEVATION TO BE PER MANUFACTURER’S MINIMUM SUBMERGENCE.
6. SEE FIGURE UT522 FOR DESCRIPTIONS OF DIMENSION SYMBOLS.
7. INSTALLED TO PROVIDE DRY CONTACT FOR SCADA.
8. ALL FLANGES: PIPE, VALVES AND APPURTENANCES SHALL HAVE 316 SS HARDWARE.
9. EMERGENCY PUMP OUT CONNECTION SHALL BE A GO (QUICK DISCONNECT) MALE BY FLANGE (MIN. 4") ASSEMBLY.
10. FLOWMETER AND METER BOX TO BE INSTALLED AS REQUIRED BY MCU, DETAIL SHOWING FLOWMETER AND COVER TO BE SUBMITTED TO AND APPROVED BY MCU.
NOTES:
1. SEE DETAIL UT522 FOR DESCRIPTIONS OF DIMENSION SYMBOLS.
2. MCU APPROVAL IS REQUIRED PRIOR TO PIPE LAYOUT CHANGES.
3. PRESSURE GAUGE ASSEMBLY SHALL BE INSTALLED ON THE SPOOL PIECE BETWEEN THE ARV AND THE FLOWMETER.
4. ODOR CONTROL PROVISIONS, SEE DETAIL UT519. MCU APPROVAL IS REQUIRED PRIOR TO PRECAST INSTALLATION.
5. HATCH SHALL HAVE INDIVIDUAL LOCKABLE OPENINGS FOR EACH PUMP.
6. CONDUITS FROM CONTROL PANEL SHALL BE 2" DIAMETER MINIMUM. PRECAST PENETRATIONS SHALL BE 3" MINIMUM. THERE SHALL BE A MINIMUM OF ONE CONDUIT FOR LEVEL CONTROLS. THE NUMBER OF CONDUITS REQUIRED FOR PUMP LEADS WILL BE AS REQUIRED BY THE PUMP MANUFACTURER. CONDUIT PENETRATIONS SHALL BE A MAXIMUM OF 24" FROM THE TOP SLAB OF THE LIFT STATION.
7. CONDUITS SHALL EXTEND INTO THE WET WELL A MINIMUM OF 6" TO ALLOW SEALING OF WET WELL LINER. WALL PENETRATIONS TO BE SEALED BY A REMOVABLE, MODULAR, ELASTOMER SEALING SYSTEM.
MANUFACTURER: __________  VOLTAGE: __________HZ
MODEL: __________  PHASE: __________
IMP: __________  H.P.: __________
DIA: __________MM.  MAX. SOLID SIZE (3 IN MIN): __________IN
SPEED: __________RPM  CURVE NUMBER: __________
DISCHARGE SIZE: __________IN

SHUT OFF HEAD: __________ FEET TDH
HIGH HEAD CONDITION: __________ GPM AT __________ FEET TDH
MINIMUM HEAD CONDITION: __________ GPM AT __________ FEET TDH

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>SYMBOL</th>
<th>DIMENSION</th>
<th>ELEVATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>THICKNESS OF WALL</td>
<td>A</td>
<td>8” (MIN)</td>
<td>—</td>
</tr>
<tr>
<td>DIAMETER OF WET WELL</td>
<td>B</td>
<td>6’ (MIN)</td>
<td>—</td>
</tr>
<tr>
<td>WIDTH OF BOTTOM FILLET</td>
<td>C</td>
<td>SEE NOTE 1</td>
<td>—</td>
</tr>
<tr>
<td>C/L OF WET WELL TO C/L OF PIPE</td>
<td>D</td>
<td>SEE NOTE 1</td>
<td>—</td>
</tr>
<tr>
<td>LENGTH OF PUMP ACCESS OPENING</td>
<td>E</td>
<td>SEE NOTE 1</td>
<td>—</td>
</tr>
<tr>
<td>WIDTH OF PUMP ACCESS OPENING</td>
<td>F</td>
<td>SEE NOTE 1</td>
<td>—</td>
</tr>
<tr>
<td>CENTER OF WET WELL TO EDGE OF HATCH</td>
<td>G</td>
<td>SEE NOTE 1</td>
<td>—</td>
</tr>
<tr>
<td>LIP WIDTH OF WETWELL BASE</td>
<td>R</td>
<td>18” (MIN)</td>
<td>—</td>
</tr>
<tr>
<td>THICKNESS OF WETWELL BASE</td>
<td>S</td>
<td>12” (MIN)</td>
<td>—</td>
</tr>
<tr>
<td>TOP OF WET WELL</td>
<td>T</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>FINISHED GRADE</td>
<td>U</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>HIGH LEVEL ALARMS</td>
<td>V</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>LAG PUMP ON</td>
<td>W</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>LEAD PUMP ON / INFLUENT PIPE INVERT</td>
<td>X</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>PUMPS OFF (TOP OF PUMP VOLUTE)</td>
<td>Y</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>BOTTOM OF PUMP TO FLOOR OF WET WELL</td>
<td>P</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>STEP HEIGHT (IF REQUIRED)</td>
<td>Q</td>
<td>—</td>
<td>—</td>
</tr>
<tr>
<td>FLOOR OF WET WELL</td>
<td>Z</td>
<td>—</td>
<td>—</td>
</tr>
</tbody>
</table>

NOTES:
1. PER PUMP MANUFACTURER'S REQUIREMENTS.
2. DIMENSION P AND ELEVATIONS Y AND Z MUST MEET MANUFACTURER'S REQUIREMENTS.
3. ELEVATION X = ELEVATION Z ≥ 5'
4. TOP ELEVATION OF WET WELL SHALL BE A MINIMUM OF 1’ ABOVE THE 100 YEAR FLOOD ELEVATION AND THE ELEVATION OF THE CROWN OF THE ROAD.
5. SYMBOLS SHOWN IN TABLE ARE USED IN DETAILS UT520 AND UT521.
CONDUIT HOLE LAYOUT LOCATIONS
IN BOTTOM OF ENCLOSURE

NOTES:
1. CONDUIT LAYOUT IS TYPICAL. FOLLOW MANUFACTURER’S INSTALLATION INSTRUCTIONS.
2. MOTOR #2 CONDUIT SHALL BE CUT AT A MINIMUM OF 5.125” FROM CENTER TO EDGE OF INSIDE ENCLOSURE WALL ON RIGHT SIDE FACING IN.