<table>
<thead>
<tr>
<th>Exhibit No.</th>
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<tbody>
<tr>
<td>W-1A</td>
<td>WATER METER ASSEMBLY - COMMERCIAL METERS LESS THAN 1 1/2 INCH</td>
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<tr>
<td>W-1B</td>
<td>WATER METER ASSEMBLY - COMMERCIAL 1 1/2 INCH &amp; 2 INCH METERS</td>
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<td>W-1C</td>
<td>MASTER WATER METER ASSEMBLY SITE DEVELOPMENT - 3 INCH METER &amp; LARGER (PROFILE VIEW)</td>
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<td>RESIDENTIAL METER SERVICE INSTALLATION (NEAR SIDE)</td>
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<td>W-3G</td>
<td>RESIDENTIAL DUAL LOT METERED SERVICE (FAR SIDE)</td>
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<td>W-6A</td>
<td>BLOW-OFF ASSEMBLY</td>
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<td>W-6C</td>
<td>BLOW-OFF ASSEMBLY AND FIRE HYDRANT AT CUL-DE-SAC ROAD GREATER THAN 150 FEET</td>
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<td>W-7B</td>
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<td>W-11</td>
<td>DITCH BOTTOM CLEARANCE AND CONCRETE PROTECTIVE SLAB</td>
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<td>VALVE AND TRACER WIRE (FOR PAVED AND NON-PAVED AREAS)</td>
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<td>W-12B</td>
<td>VALVE EXTENSION FOR GATE VALVES</td>
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<td>W-14</td>
<td>TRENCH DETAILS - BACKFILL &amp; COMPACTION</td>
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LIMITS OF BRASS PIPING

WATER METER ASSEMBLY
COMMERCIAL - METERS LESS THAN 1-1/2 INCH
HILLSBOROUGH COUNTY, FLORIDA

NOTES:
1. ALL PIPING TO BE A MINIMUM OF 2-INCHES UP THROUGH THE LOCKING CURB STOP.
2. 2 INCH COMMERCIAL SERVICE LINES SHALL USE A 2 INCH SADDLE & TAPPING VALVE (INSTEAD OF A CORPORATION STOP) AT THE WATER MAIN CONNECTION. WHEN THE TAPPING VALVE IS LOCATED WITHIN 10 FEET OF THE METER ASSEMBLY, THE 2 INCH VALVE MAY BE ELIMINATED BY SPECIAL REQUEST TO DSD.
3. WHEN THE TAPPING VALVE IS LOCATED WITHIN 10 FEET OF THE METER ASSEMBLY AND IT MEETS PUD SAFETY CRITERIA, THE 2" GATE VALVE MAY BE ELIMINATED BY SPECIAL REQUEST TO DSD.
4. SEE EXHIBIT W-1D FOR BOLLARD LAYOUT. (TYPICAL)
5. SEE EXHIBIT W-1H FOR A LISTING OF GENERAL NOTES.
6. JOINTS BETWEEN DIFFERING MATERIALS SHALL BE ISOLATED PER THE FLORIDA PLUMBING CODE.

SCALE: N.T.S.
3/2020
NOTES:

1. ALL PIPING TO BE A MINIMUM OF 2-INCHES UP THROUGH THE LOCKING CURB STOP.
2. 2 INCH COMMERCIAL SERVICE LINES SHALL USE A 2 INCH SADDLE & TAPPING VALVE (INSTEAD OF A CORPORATION STOP) AT THE WATER MAIN CONNECTION.
3. WHEN THE TAPPING VALVE IS LOCATED WITHIN 10 FEET OF THE METER ASSEMBLY RISER, AND IT MEETS PUD SAFETY CRITERIA, THE 2” GATE VALVE AT THE METER ASSEMBLY MAY BE ELIMINATED BY SPECIAL REQUEST TO DSD.
4. SEE EXHIBIT W-1D FOR BOLLARD LAYOUT. (TYPICAL)
5. SEE EXHIBIT W-1H FOR A LISTING OF GENERAL NOTES.
6. JOINTS BETWEEN DIFFERING MATERIALS SHALL BE ISOLATED PER THE FLORIDA PLUMBING CODE.
NOTES:

1. SEE EXHIBIT W-1H FOR GENERAL NOTES
2. SEE EXHIBIT W-1D FOR BOLLARD LAYOUT, PLAN VIEW, AND SLAB DIMENSIONS
ADJUSTABLE PIPE SUPPORT (TYP.)

SPOOL PIECE (AS NEEDED)

1/2" PVC THREADED PLUG

1/2" S.S. LOCKING BALL VALVE

1"X1/2" REDUCING BUSHING

FLOW

TAP AT TOP OF PIPE AS REQ'D FOR AIR RELIEF

BACK FLOW PREVENTER ASSEMBLY

12 INCH+PIPE DIAMETER (MIN. DISTANCE ABOVE PIPE SUPPORTS)

18 INCH+ PIPE DIA. (MAX)

RELIEF VALVE DISCHARGE *

COMPACTED BACKFILL

36 INCH MIN. COVER

90° BEND (FLG'D) (TYP.)

90° BEND (M.J./M.J.) (RESTRAINED)

FINISHED GRADE

TYP. 2 FTX2 FTX6 INCH CONC. PAD FOR SUPPORT

NOTES:

1. SEE EXHIBIT W-1G FOR CONNECTION ASSEMBLY WORKSHEET

2. NO TAPS ON PIPING UPSTREAM OF THE BACKFLOW PREVENTER AND NO MODIFICATION OR USE OF BACKFLOW PREVENTER TEST PORTS FOR ANYTHING OTHER THAN TESTING.

HILLSBOROUGH COUNTY, FLORIDA

TEMPORARY CONSTRUCTION BACKFLOW ASSEMBLY

FOR RESIDENTIAL OR COMMERCIAL DEVELOPMENT 6" AND LARGER

3/2020

SCALE: N.T.S.
<table>
<thead>
<tr>
<th>PIPE DIAMETER (IN)</th>
<th>PIPE LENGTH (FT)</th>
<th>VOLUME (GAL)</th>
<th>COMMENTS</th>
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TOTAL VOLUME

____ MULTIPLIER

____ MULTIPLIER
GENERAL NOTES:

1. A MASTER METER ASSEMBLY SHALL BE DIRECTLY ACCESSIBLE BY BOOM TRUCK OFF A COUNTY ROW, OR BY AN INTERIOR ROAD THAT IS NOT BLOCKED BY A WALL OR GATE. THE TRUCK ACCESS ROAD SHALL BE 12 FT WIDE (MIN.) AND PAVED (CONCRETE OR ASPHALT).

2. ALL ABOVE GROUND PIPES AND FITTINGS SHALL BE CLASS 53 D.I.P. FOR 4 INCH AND LARGER PIPE.

3. CERTIFICATION OF PROPER OPERATION WILL BE REQUIRED FROM A CERTIFIED BACKFLOW TESTER PRIOR TO THE WATER MAIN ACCEPTANCE BY THE HILLSBOROUGH COUNTY PUBLIC UTILITIES DEPARTMENT.

4. ALL BACKFLOW ASSEMBLIES OR DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH AND SHALL MEET THE REQUIREMENTS FOUND IN CHAPTER 121 OF THE HILLSBOROUGH COUNTY CODE OF ORDINANCES, PART B, PUBLIC UTILITIES.

5. THE PROPER OPERATION, MAINTENANCE, AND TESTING OF THE BACKFLOW PREVENTION ASSEMBLY, SHALL BE IN ACCORDANCE WITH CHAPTER 121 OF THE HILLSBOROUGH COUNTY CODE OF ORDINANCES PART B, PUBLIC UTILITIES.

6. THE 6 INCH CONCRETE SLAB SHALL BE REINFORCED WITH 6x6-W1.4xW1.4 WELDED WIRE FABRIC AND SHALL BE TYPE I, PORTLAND CEMENT WITH A MINIMUM 28-DAY STRENGTH OF 3000psi.

7. SLAB WIDTH AND LENGTH SHALL VARY WITH ASSEMBLY. THE TOP OF SLAB SHALL BE 2 INCHES ABOVE FINISHED GRADE.

8. THE METER ASSEMBLY & BOLLARDS SHALL BE PAINTED IN ACCORDANCE WITH SPECIFICATION 331001, PART 2.6.

9. IF THE METER ASSEMBLY IS LOCATED WITHIN A TRAFFIC/VEHICLE AREA (PARKING LOT, DRIVEWAY, OR WITHIN 15 FT OF EDGE OF PAVEMENT/BACK OF CURB), METERS UP TO 2 INCHES SHALL HAVE A MINIMUM OF 4 TRAFFIC BOLLARD PROTECTION POSTS, AND FOR METERS 3 INCHES & LARGER A MINIMUM OF 6 TRAFFIC BOLLARDS ARE REQUIRED.

TEMPORARY BACKFLOW ASSEMBLY NOTES:

1. THE IN-LINE VALVE IS TO REMAIN CLOSED UNTIL AFTER THE CONSTRUCTION AND ACCEPTANCE OF THE DEVELOPMENT WATER DISTRIBUTION SYSTEM. NO DOWNSTREAM TIE-INS TO THE PUD WATER DISTRIBUTION SYSTEM ARE ALLOWED UNTIL AFTER A PASSING PRESSURE TEST AND 2 BAC-T TESTS ARE CERTIFIED BY THE EOR AND SUBMITTED TO PUD INSPECTION. ONCE FINAL TIE-INS ARE MADE 2 ADDITIONAL BAC-T TESTS ARE REQUIRED FOR EACH TIE-IN BEFORE SUBMITTING TO THE DOH FOR FINAL CLEARANCE.

2. THE BACKFLOW ASSEMBLY IS TO BE REMOVED BY THE CONTRACTOR AFTER FINAL ACCEPTANCE OF THE WATER DISTRIBUTION SYSTEM BY THE HILLSBOROUGH COUNTY DOH AND HILLSBOROUGH COUNTY DSD.

3. ALL CONSTRUCTION MUST MEET APPLICABLE STATE AND/OR LOCAL ROADWAY/ROADSIDE DESIGN STANDARDS INCLUDING, BUT NOT LIMITED TO, CLEAR ZONE REQUIREMENTS.
NOTES:

1. ALL PIPING TO BE A MINIMUM OF 2 INCHES UP THROUGH THE LOCKING CURB STOP.
2. 2-INCH COMMERCIAL SERVICE LINES SHALL USE A 2-INCH SADDLE & TAPPING VALVE (INSTEAD OF A CORPORATION STOP) AT THE WATER MAIN CONNECTION.
3. WHEN THE TAPPING VALVE IS LOCATED WITHIN 10 FEET OF THE METER ASSEMBLY RISER, AND IT MEETS PUD SAFETY CRITERIA, THE 2-INCH GATE VALVE AT THE ASSEMBLY MAY BE ELIMINATED BY SPECIAL REQUEST TO DSD.
4. FOUR BOLLARDS, TO PROTECT ASSEMBLY.
5. SEE EXHIBIT W-1H FOR GENERAL NOTES.
6. JOINTS BETWEEN DIFFERING MATERIALS SHALL BE ISOLATED PER THE FLORIDA PLUMBING CODE.
7. NON-HEALTH HAZARD - DCVA; HEALTH HAZARD - RP.
RESILIENT SEAT GATE VALVES (TYPICAL)

BACKFLOW PREVENTER ASSEMBLY

EXHIBIT NO. W-2B

RESILIENT SEAT GATE VALVES (TYPICAL)

24" MIN (TYP)

1 INCH CHAMFER

FINISHED GRADE

24" MIN (TYP)

12 INCH+ PIPE DIA. (MIN)

18 INCH + PIPE DIA. (MAX)

RELIEF VALVE DISCHARGE *

90° BEND (FL./M.J.)

90° BEND (M.J./M.J.)

1/2 INCH PREFORMED JOINT MATERIAL TO BE PLACED BETWEEN DIP AND CONCRETE SLAB (TYPICAL OF 2)

COMPACTED BACKFILL

12" MIN

TWO (2) #5 BARS CONTINUOUS w/#3 TIES @ 12 INCH O.C.

3 FT COVER

5 FT COVER

NOTE:

1. ALL PIPE AND FITTINGS SHALL BE DUCTILE IRON, CLASS 53, CEMENT LINED INTERIOR WITH FLANGE FITTINGS FOR ABOVE GROUND USE. MANUFACTURERS RESTRAINED JOINTS SHALL BE USED FOR UNDERGROUND PIPING.

2. CERTIFICATION OF PROPER INSTALLATION AND OPERATION WILL BE REQUIRED FROM THE ENGINEER OF RECORD PRIOR TO WATER MAIN ACCEPTANCE BY THE HILLSBOROUGH COUNTY PUBLIC UTILITIES DEPARTMENT. THE ASSEMBLY SHALL ALSO BE TESTED BY A CERTIFIED TESTER, AS REQUIRED BY THE POINT OF SERVICE BACKFLOW ASSEMBLY PERMIT.

3. ALL BACKFLOW ASSEMBLIES OR DEVICES SHALL BE IN ACCORDANCE WITH AND SHALL MEET THE REQUIREMENTS FOUND IN CHAPTER 121 OF THE HILLSBOROUGH COUNTY CODE OF ORDINANCES, PART B, PUBLIC UTILITIES.

4. THE PROPERTY OWNER SHALL BE RESPONSIBLE FOR THE PROPER OPERATION, MAINTENANCE AND TESTING OF THE BACKFLOW PREVENTION ASSEMBLY.

5. THE 6 INCH CONCRETE SLAB SHALL BE REINFORCED WITH 6x6-W1.4xW1.4 WELDED WIRE FABRIC AND SHALL BE TYPE I, PORTLAND CEMENT WITH A MINIMUM 28-DAY STRENGTH OF 3000psi.

6. SLAB WIDTH SHALL BE 5 FT TYPICAL AND LENGTH SHALL VARY WITH ASSEMBLY.

7. WHEN ASSEMBLY IS LOCATED WITHIN A TRAFFIC/VEHICLE AREA SEE W-1D FOR BOLLARD LAYOUT. A MINIMUM OF (4) FOUR 6 INCH BOLLARDS ARE REQUIRED.

HILLSBOROUGH COUNTY, FLORIDA

3/2020
1. SLEEVE SHALL BE EXTENDED 24 INCH PAST ANY PAVED SURFACE WITHIN DEDICATED R/W.

2. EACH SERVICE SHALL TERMINATE AT A CURB METER VALVE WHICH SHALL BE BURIED 6 INCHES, ± 1 INCH, BELOW FINAL GRADE AND SHALL BE CLEARLY MARKED WITH A 2 INCH x 2 INCH x 18 INCH STAKE WITH THE TOP PAINTED BLUE AND MARKED WITH THE LOT(S) NUMBER SERVED.

3. STATIONING NOT REQUIRED IF SERVICE IS LOCATED ON LOT LINE.

4. 18 INCH MIN. SPACING BETWEEN SERVICE TAPS ON WATER MAIN SHALL BE MAINTAINED.

5. A NEAR SIDE DUAL SERVICE CONNECTION SERVICING MORE THAN ONE RESIDENCE IS ONLY ALLOWED WHERE RECLAIMED WATER SERVICE IS AVAILABLE.
Exhibit No. W-3B

WATER METER & METER BOX (BY COUNTY)

SIDWALK

FLOW

CONNECTION TO BE MADE BY PLUMBER

PLAN

SECTION "A-A"

NOTES:

1. NO SERVICE LINE SHALL TERMINATE UNDER A DRIVEWAY.
2. TEMPORARY IDENTIFICATION: EACH SERVICE SHALL TERMINATE AT A METER VALVE WHICH SHALL BE BURIED 6 INCHES, ± 1 INCH, BELOW FINAL GRADE AND SHALL BE CLEARLY MARKED WITH A 2 INCH x 2 INCH x 18 INCH STAKE WITH THE TOP PAINTED BLUE AND MARKED WITH THE LOT NUMBER SERVED.

RESIDENTIAL SINGLE METER SERVICE (NEAR SIDE & FAR SIDE)
HILLSBOROUGH COUNTY, FLORIDA

3/2020

SCALE: N.T.S.
1. NO SERVICE LINE SHALL TERMINATE UNDER A DRIVEWAY.
2. TEMPORARY IDENTIFICATION: EACH SERVICE SHALL TERMINATE AT A METER VALVE WHICH SHALL BE BURIED 6 INCHES, ± 1 INCH, BELOW FINAL GRADE AND SHALL BE CLEARLY MARKED WITH A 2 INCH x 2 INCH x 18 INCH STAKE WITH THE TOP PAINTED BLUE AND MARKED WITH THE LOT NUMBER SERVED.
NOTE:

1. CAST BRONZE COMPRESSION FITTING CONNECTIONS SHALL BE USED & INSTALLED IN ACCORDANCE WITH COUNTY SPECIFICATIONS.

2. METER AND METER BOX SUPPLIED BY HILLSBOROUGH COUNTY.

3. USE 1 INCH DIAMETER HDPE FOR SINGLE SERVICE.

4. REDUCE HDPE AT THE METER WITH A BRASS REDUCER.

5. NO SERVICE LINE SHALL TERMINATE UNDER A DRIVEWAY.

6. EACH SERVICE SHALL TERMINATE AT A METER VALVE WHICH SHALL BE BURIED 6 INCHES, ± 1 INCH, BELOW FINAL GRADE AND SHALL BE CLEARLY MARKED WITH A 2 INCH x 2 INCH x 18 INCH STAKE WITH THE TOP PAINTED BLUE AND MARKED WITH THE LOT NUMBER SERVED.
NOTE:

1. CAST BRONZE COMPRESSION FITTING CONNECTIONS SHALL BE USED & INSTALLED IN ACCORDANCE WITH COUNTY SPECIFICATIONS.

2. METER AND METER BOX SUPPLIED BY HILLSBOROUGH COUNTY.

3. USE 1 INCH DIAMETER HDPE FOR SINGLE SERVICE.

4. REDUCE HDPE AT THE METER WITH A BRASS REDUCER.

5. NO SERVICE LINE SHALL TERMINATE UNDER A DRIVEWAY.

6. EACH SERVICE SHALL TERMINATE AT A METER VALVE WHICH SHALL BE BURIED 6 INCHES, ± 1 INCH, BELOW FINAL GRADE AND SHALL BE CLEARLY MARKED WITH A 2 INCH x 2 INCH x 18 INCH STAKE WITH THE TOP PAINTED BLUE AND MARKED WITH THE LOT NUMBER SERVED.
NOTE:

1. CAST BRONZE COMPRESSION FITTING CONNECTIONS SHALL BE USED & INSTALLED IN ACCORDANCE WITH COUNTY SPECIFICATIONS.

2. METER AND METER BOX SUPPLIED BY HILLSBOROUGH COUNTY.

3. USE 1 INCH DIAMETER HDPE FOR SINGLE SERVICE.

4. REDUCE HDPE AT THE METER WITH A BRASS REDUCER.

5. NO SERVICE LINE SHALL TERMINATE UNDER A DRIVEWAY.

6. EACH SERVICE SHALL TERMINATE AT A METER VALVE WHICH SHALL BE BURIED 6 INCHES, ± 1 INCH, BELOW FINAL GRADE AND SHALL BE CLEARLY MARKED WITH A 2 INCH x 2 INCH x 18 INCH STAKE WITH THE TOP PAINTED BLUE AND MARKED WITH THE LOT NUMBER SERVED.
NOTE:
1. ALL LETTERING SHALL BE CAPITALIZED AND AT LEAST ONE INCH IN HEIGHT.
2. REMAINDER OF OPEN SURFACE SHALL BE CROSS HATCHED TO REDUCE SLIPPING ACCIDENTS.
3. COLOR OF BOX AND LID SHALL BE BLACK.
4. A METAL REINFORCED PICK HOLE SHALL BE CENTERED ON THE LIFTING SIDE OF THE LID.
5. THE OPTION OF HAVING LOCKING TABS TO PREVENT "FLOATING" SHALL BE BY REQUEST ONLY.
6. METER BOXES ARE TRAFFIC RATED (H-20).
7. LID THICKNESS TO BE 1.5 INCH MIN.

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### SHORT SIDE VIEW

- **A**: 11-1/8 INCHES
- **B**: 18 INCHES
- **C**: 12 INCHES

### LONG SIDE VIEW

- **A**: 14-5/8 INCHES
- **B**: 16-5/8 INCHES
- **C**: 12 INCHES

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<tr>
<th>DIMENSION *</th>
<th>SINGLE</th>
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<tbody>
<tr>
<td>A</td>
<td>11-1/8 INCHES</td>
<td>14-5/8 INCHES</td>
</tr>
<tr>
<td>B</td>
<td>18 INCHES</td>
<td>16-5/8 INCHES</td>
</tr>
<tr>
<td>C</td>
<td>12 INCHES</td>
<td>12 INCHES</td>
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* ALL DIMENSIONS ± 1/8 INCH
Exhibit No. W-5A

Notes:

1. Shear pad required for all hydrants along arterial and collector roadways. 20 inch min clearance to be maintained between pad and hydrant nozzles.
2. Clearance between bottom of flange and top of shear pad shall be 6 inch ± 1/2 inch tolerance.
3. Fire hydrants shall be installed between back of curb and face of sidewalk except where conditions and/or regulations prohibit.
4. Pumper nozzle to face street.
5. Per NFPA 1, clearances of 5' in front and 3' to sides the fire hydrant, and 3 feet to the rear of the hydrant must be maintained.
6. When an inline isolation valve falls within 50 ft of an existing isolation valve, the EOR may contact the utility design team to determine if the number of valves can be reduced.
7. Maintain 3 ft clearance between all valves and hydrants.

R/W 24 INCH MIN. PROPERTY LINE 1 FT MAX.

GV IN-LINE REQ'D

Anchor tee sized as required

Maintain 48" from BOC to front of pumper nozzle

4 1/2 inch pumper nozzle to face street

3-way fire hydrant

24 inch Min.

36" Min.

6 INCH PIPE

Water Main

6 INCH PIPE SLEEVE AS REQUIRED

Frangible flange location for "Traffic" type hydrant

1/2 inch pentagon operating nut

Valve Box

Conc. Valve Pad

Finished Grade

Compacted Backfill

6 INCH PIPE SLEEVE AS REQUIRED

Mechanical joint 6 inch resilient seat gate valve-open left (CCW)

Mechanical rest. Joints (Typical)

24 Inch Min.

24 Inch Min.

24 inch square or round, and 6 inch thick concrete shear pad w/2-#4 rebar @6 inch o/c all around (See Note 2)

Hydrant extension as required for additional depth of bury

Drain outlet shall not be provided

Notes:

1. Shear pad required for all hydrants along arterial and collector roadways. 20 inch min clearance to be maintained between pad and hydrant nozzles.
2. Clearance between bottom of flange and top of shear pad shall be 6 inch ± 1/2 inch tolerance.
3. Fire hydrants shall be installed between back of curb and face of sidewalk except where conditions and/or regulations prohibit.
4. Pumper nozzle to face street.
5. Per NFPA 1, clearances of 5' in front and 3' to sides the fire hydrant, and 3 feet to the rear of the hydrant must be maintained.
6. When an inline isolation valve falls within 50 ft of an existing isolation valve, the EOR may contact the utility design team to determine if the number of valves can be reduced.
7. Maintain 3 ft clearance between all valves and hydrants.
NOTES:

1. SHEAR PAD REQUIRED FOR ALL HYDRANTS ALONG ARTERIAL AND COLLECTOR ROADWAYS. 20 IN MIN CLEARANCE TO BE MAINTAINED BETWEEN PAD AND HYDRANT NOZZLES.
2. CLEARANCE BETWEEN BOTTOM OF FLANGE AND TOP OF SHEAR PAD SHALL BE 6 INCH ± 1/2 IN TOLERANCE.
3. FIRE HYDRANTS SHALL BE INSTALLED BETWEEN BACK OF CURB AND FACE OF SIDEWALK EXCEPT WHERE CONDITIONS AND/OR REGULATIONS PROHIBIT.
4. PUMPER NOZZLE TO FACE STREET.
5. PER NFPA 1, CLEARANCES OF 5 FEET TO FRONT AND 3 FT TO SIDES, AND 3 FT TO THE REAR OF THE HYDRANT MUST BE MAINTAINED.
6. WHEN AN INLINE ISOLATION VALVE FALLS WITHIN 50 FT OF AN EXISTING ISOLATION VALVE, THE EOR MAY CONTACT THE UTILITY DESIGN TEAM TO DETERMINE IF THE NUMBER OF VALVES CAN BE REDUCED.
7. MAINTAIN 3 FT CLEARANCE BETWEEN ALL VALVES AND HYDRANTS.
FIRE HYDRANT OR RELOCATED FIRE HYDRANT

SPOOL PIECES (TYPICAL) AS REQUIRED

3-6 INCH GATE VALVES (RESTRAINED)

1-6 INCH PLUG (RESTRAINED)

MIN. ONE FULL LENGTH OF 6 INCH DIP (TYPICAL)

1-6 INCH x 6 INCH CROSS TEE (RESTRAINED)

EXIST. 6 INCH GATE VALVE & ANCHOR COUPLING

EXIST. WATER MAIN

TO WATER MAIN EXTENSION

WATER MAIN EXTENSION WITH HYDRANT DETAIL
HILLSBOROUGH COUNTY, FLORIDA

3/2020

SCALE: N.T.S.
NOTES:
1. ALL BRASS PIPE AND FITTINGS SHALL BE THREADED SCH. 40.
2. CAM-LOCK MALE ADAPTER & DUST CAP SHALL BE STAINLESS STEEL/THREADED.
3. ACTUAL LENGTH OF THE BLOWOFF PIPING TO BE DETERMINED IN THE FIELD.
4. DEFLECT OR INSTALL FITTINGS AS REQUIRED TO MAINTAIN COVER AND TO SET BLOW-OFF ASSEMBLY PLUMB.
5. EXTENSION OF VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.
6. A FULL SIZE IN-LINE VALVE MAY BE USED AT PROJECT PHASE LINES. THE VALVE MAY REQUIRE RELOCATION, IF THE VALVE FALLS WITHIN CONCRETE IN THE NEXT PHASE.
BLOW-OFF ASSEMBLY AND FIRE HYDRANT @ CUL-DE-SAC ROAD UP TO 150 FT IN LENGTH

HILLSBOROUGH COUNTY, FLORIDA

3/2020

SCALE: N.T.S.
EOP OF LANDSCAPED ISLAND (PREFERRED)

BLOW-OFF ASSEMBLY TO BE INSTALLED BEYOND LAST DRIVEWAY IN CUL-DE-SAC.

LOCATE FIRE HYDRANT WITHIN 150 FT OF CENTER OF CUL-DE-SAC.

BLOW-OFF ASSEMBLY AND FIRE HYDRANT @ CUL-DE-SAC GREATER THAN 150 FT IN LENGTH

HILLSBOROUGH COUNTY, FLORIDA

3/2020

SCALE: N.T.S.
### RESTRAINED JOINTS

**TOTAL LENGTH OF RESTRAIN FOR PVC**

**TOTAL LENGTH OF RESTRAIN FOR D.I. PIPE**

**RESTRAINER**

**PLUG**

**MECHANICAL JOINT VALVE**

**STANDARD JOINT**

**RESTRAINED JOINTS**

**NOTES:**

1. FOR LENGTH OF PIPE AND NUMBER OF JOINTS TO BE RESTRAINED SEE TABLE (THIS PAGE).

2. ONLY DUCTILE IRON FITTINGS SHALL BE USED AT JOINTS TO BE RESTRAINED UNLESS OTHERWISE SPECIFIED BY THE PUD DEPARTMENT.

3. ALL INTERNALLY RESTRAINED JOINTS SHALL BE MARKED RED.

**DESIGN ENGINEER SHALL CALCULATE PROPER VALUES AND FILL IN TABLE PRIOR TO SUBMITTAL.**

### MINIMUM FOOTAGE OF PIPE RESTRAINT

<table>
<thead>
<tr>
<th>PIPE SIZE (INCHES)</th>
<th>H-B</th>
<th>VU-B</th>
<th>VD-B</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-1/4&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>22-1/2&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>45°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>90°</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TEE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DEAD END PLUG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REDUCER</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**H-B: HORIZONTAL BEND**

**VU-B: VERTICAL-UP BEND**

**VD-B: VERTICAL-DOWN BEND**

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**MINIMUM DESIGN CRITERIA BEDDING**

TYPE: 3

DESIGN PRESSURE: 150 PSI.

SAFETY FACTOR: 1.5

DEPTH OF COVER: 3.0 FT.
METHOD OF RESTRaining PUSH-ON JOINT PIPE

DETAIL PUSH-ON JOINT

DETAIL M.J. JOINT

RESTRAINED JOINT FOR PVC C-900 PIPE (4 IN TO 12 IN)

HILLSBOROUGH COUNTY, FLORIDA

3/2020

SCALE: N.T.S.
NOTES:

1. THE MINIMUM DEPTH OF THE ENTIRE PROPOSED WATER MAIN SHALL BE INCREASED AS SHOWN TO ENSURE THE VALVE VAULT FOR AN AUTOMATIC ARV CAN BE INSTALLED FLUSH WITH THE PROPOSED GRADE.
2. ENGINEER SHALL SUBMIT A FLOTATION CALCULATION TO THE COUNTY. VAULT SHALL BE TRAFFIC BEARING (H-20).
3. THE OPEN END OF THE AIR RELIEF PIPE WILL BE PROVIDED WITH A SCREENED, DOWNWARD-FACING ELBOW.
4. SEE APPENDIX B FOR APPROVED PRODUCTS.
NOTE:

1. The minimum depth of the entire proposed water main shall be increased as shown to ensure the valve vault for an automatic ARV can be installed flush with the proposed grade. * If a foster adapter is used the depth of bury can be reduced 10 inches
2. Engineer shall submit a flotation calculation to the county. Vault shall be traffic bearing (H-20).
3. The open end of the air relief pipe will be provided with a screened, downward-facing elbow.
4. See Appendix B for approved products.
NOTE:

1. THE MINIMUM DEPTH OF THE ENTIRE PROPOSED WATER MAIN SHALL BE INCREASED AS SHOWN TO ENSURE THE VALVE VAULT FOR AN AUTOMATIC ARV CAN BE INSTALLED FLUSH WITH THE PROPOSED GRADE. *IF A FOSTER ADAPTER IS USED THE DEPTH OF BURY CAN BE DECREASED 10 INCHES.

2. ENGINEER SHALL SUBMIT A FLOTATION CALCULATION TO THE COUNTY. VAULT SHALL BE TRAFFIC BEARING (H-20).

3. THE OPEN END OF THE AIR RELIEF PIPE WILL BE PROVIDED WITH A SCREENED, DOWNWARD-FACING ELBOW.

4. SEE APPENDIX B FOR APPROVED PRODUCTS.
ASPHALT SURFACE TOP FLUSH WITH 9 INCHES FINISHED GRADE

EXAMPLE "A"

4 IN x 4 IN x 18 IN LONG (MIN.) PRECAST POST WITH 3-1/2 IN DIAMETER BRONZE SURVEY MARKER DISC SET IN GROUT AS SHOWN.

EXAMPLE "B"

NOTE: BRONZE IDENTIFICATION DISC SHALL BE REQUIRED FOR ALL VALVES.

MARKER DISC DETAIL

VALVE BOX & MARKER INSTALLATION FOR PAVED AREAS

HILLSBOROUGH COUNTY, FLORIDA

3/2020

SCALE: N.T.S.
Notes:

1. Concrete to be Type I General Portland Cement with 3/4 in. Top Size Aggregate and shall develop a 28-day strength of 3000 psi.

2. Reinforcing steel shall be welded wire fabric 6x6 - W1.4 x W1.4.

3. Concrete valve pad shall be poured in place and shall be set 1 in. above finished grade.

CONCRETE VALVE PAD
(FOR UNPAVED AREAS)
HILLSBOROUGH COUNTY, FLORIDA

3/2020

SCALE: N.T.S.
**NOTES:**

1. VERTICAL DIMENSIONS TYPICAL FOR CASINGS

2. WITH CURB: 6 FT STATE & 2 FT COUNTY ROADS MINIMUM
   WITHOUT CURB: 8 FT STATE & 4 FT COUNTY ROADS MINIMUM

3. STEEL CASING PIPE SHALL CONFORM TO THE REQUIREMENTS OF AWWA C-200 AND ASTM A-139, GRADE B.

4. WHEN CASING IS INSTALLED WITHOUT BENEFIT OF A PROTECTIVE COATING, AND SAID CASING IS NOT CATHODICALLY PROTECTED, THE WALL THICKNESS SHOWN SHALL BE INCREASED TO THE NEAREST STANDARD SIZE WHICH IS A MINIMUM OF 0.063" GREATER THAN THE THICKNESS SHOWN EXCEPT FOR DIAMETERS LESS THAN 12.75 IN.

5. FOR REFERENCE ONLY.

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**MINIMUM CASING SIZE AND THICKNESS (INCHES)**

<table>
<thead>
<tr>
<th>D.I.P.-M.J.</th>
<th>4</th>
<th>6</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>14</th>
<th>16</th>
<th>18</th>
<th>20</th>
<th>24</th>
<th>30</th>
<th>36</th>
<th>42</th>
<th>48</th>
</tr>
</thead>
<tbody>
<tr>
<td>D.I.P.-P.O.</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>14</td>
<td>16</td>
<td>18</td>
<td>20</td>
<td>24</td>
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<td>36</td>
<td>42</td>
<td>48</td>
</tr>
<tr>
<td>PVC</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>PVC FUSIBLE</td>
<td>4</td>
<td>6</td>
<td>8</td>
<td>10</td>
<td>12</td>
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</tr>
</tbody>
</table>

(3) STEEL CASING PIPE (D2)

| WALL THICKNESS (T) ROADS | .188 | .188 | .25 | .25 | .25 | .25 | .312 | .312 | .312 | .375 | .375 | .5 | .5 | .5 |
| WALL THICKNESS (T) R.R.  | .188 | .188 | .188 | .219 | .25 | .281 | .312 | .406 | .406 | .469 | .469 | .562 | .625 | .719 | .781 | .875 |

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**CASING DETAILS**

**JACK & BORE**

**HILLSBOROUGH COUNTY, FLORIDA**

**SCALE: N.T.S.**

**3/2020**
RESTRAINED JOINT PIPE TO EXTEND A MINIMUM OF 1 FULL PIPE LENGTH BEYOND LAST OFFSET FITTING

MIN. 6" CLEARANCE

MIN. 2'-0" COVER ON SLAB

MIN. 6" COVER

MIN. 3'-0" COVER

11.25°/22.5°/45°BEND

DITCH BOTTOM CLEARANCE DETAIL

FINISHED GRADE

CONCRETE SLAB

COMPACTED BACKFILL

NOTE: SLAB CONCRETE SHALL HAVE A MINIMUM OF 28 DAY COMPRESSIVE STRENGTH OF 3000 psi (min).
NOTES:

1. EXTENSION ON VALVE BOX SHALL BE SET SO AS TO RESERVE 1/2 OF THE ADJUSTMENT LENGTH FOR FUTURE USE.
2. OPERATING NUT SHALL BE SO AS TO BE WITHIN 12 INCHES OF GRADE. EXTENSION TO BE PROVIDED AS REQUIRED.
3. ALL NON-METALIC PIPE SHALL REQUIRE TWO INSULATED 10 GAUGE SOLID COPPER OR COPPER CLAD STEEL CORE LOCATING WIRES TAPED WITH 2 INCH WIDE DUCT TAPE AT THE 10:00 AND 2:00 POSITION ON THE PIPE AT EVERY JOINT AND 4 TO 5 FEET SPACING. WIRE FOR DIRECTIONAL DRILL APPLICATIONS SHALL BE COPPER CLAD "HARD DRAWN" STEEL CORE WITH A MINIMUM BREAKING STRENGTH OF 1000 PSI.
4. LOCATING WIRES TO TERMINATE 4 INCHES ABOVE CONCRETE VALVE PAD AND FOLDED BACK INSIDE 3 INCH PVC ACCESS PIPE AND PLUGGED.
5. LOCATING WIRES SHALL BE CAPABLE OF DETECTION BY A CABLE LOCATOR AND PASS A FIELD CONDUCTIVITY TEST THAT IS WITNESSED BY THE COUNTY FROM END TO END OF WIRES.
6. SPLICES SHALL BE CAPABLE OF COMPLETE SUBMERSION.
7. NO MORE THAN ONE SPLICE BETWEEN VALVES IS ALLOWED.
**NOTE:**
OPERATING NUT SHALL BE WITHIN 12 INCHES OF GRADE.

WELDED CONNECTION

2 INCH MALE NUT (SQ)

WELDED CONNECTION

1 INCH SCH 40 BLACK STEEL PIPE
*LENGTH AS REQUIRED

WELDED CONNECTION

2 INCH FEMALE NUT TO FIT OVER VALVE NUT

VALVE NUT

---

VALVE EXTENSION FOR GATE VALVES
HILLSBOROUGH COUNTY, FLORIDA

3/2020
SCALE: N.T.S.
Example
Divide 30 inch trunk diameter by 2. (30/2=15)
ExcaVation shall be prohibited within 15 ft
of the trunk or the limits of the dripline,
whichever is greater.

Trunk diameter measurement
to be made 4-1/2 ft. above
exist grade.

Profile view

Avoid boring directly beneath tree
if at all possible.

Plan view

Bore beneath
@ 3 ft. depth min.

Bore under tree at least
36 inches deep.
STAGE 3: BACKFILL LAYERS SHALL NOT EXCEED 12 INCH LIFTS.

TRENCH WIDTH
MIN. = 1 FT + PIPE O.D.

STAGE 1: BACKFILL LAYERS SHALL NOT EXCEED 6 INCHES OF LOOSE THICKNESS BEFORE BEING COMPACTED.

TRENCH BOTTOM SHALL BE HAND EXCAVATED TO CLEAR PIPE BELL

UNDISTURBED SOIL

6 INCH PIPE BEDDING (MIN) (AS REQUIRED)

STAGE 2: BACKFILL LAYERS SHALL NOT EXCEED 6 INCHES OF LOOSE THICKNESS BEFORE BEING COMPACTED.

NOTES:
1. TESTING: See Specification 331001, Part 4.12 for testing requirements.
2. BEDDING: 6 INCHES BEDDING (MIN) AS REQUIRED. IN THE EVENT UNSUITABLE OR UNSTABLE SOIL IS ENCOUNTERED, REMOVE IT AND REPLACE WITH MATERIAL MEETING AASHTO SOIL CLASSIFICATION A-1, A-2, OR A-3. SEE SPECIFICATION 331001 PART 4.4.
3. STAGE 1: ADEQUATE COMPACTED FILL SHALL BE PLACED ABOVE THE BEDDING MATERIAL AND BENEATH THE HAUNCHES OF THE PIPE. BACKFILL LAYERS SHALL NOT EXCEED 6 INCHES OF LOOSE THICKNESS BEFORE BEING COMPACTED.
4. STAGE 2: BACKFILL LAYERS SHALL NOT EXCEED 6 INCHES OF LOOSE THICKNESS BEFORE BEING COMPACTED. COMPACTION SHALL BE 98% OF THE MAXIMUM DENSITY (AASHTO T-180/ASTM D1557) TO A POINT 1 FT ABOVE THE PIPE (OR AS STATED IN THE SPECIFICATION).
5. STAGE 3: BACKFILL LAYERS SHALL NOT EXCEED 12-INCH LIFTS. COMPACTION SHALL BE 98% OF THE MAXIMUM DENSITY (AASHTO T-180/ASTM D1557) OR AS STATED IN THE SPECIFICATION